Edgar County Multi-Jurisdictional All Hazards Mitigation Plan Update

Edgar County, Illinois

Draft

Participants:

Edgar County
Brocton, Village of
Chrisman, City of
Chrisman Fire Protection District
Edgar County Community Unit School District #6
Horizon Health
Hume, Village of
Hume Fire Protection District
Kansas, Village of
Kansas Community Unit School District #3
Metcalf, Village of
Metcalf Fire Protection District
Paris, City of
Paris Community Unit School District #4
Paris Union School District #95
Redmon, Village of
Shiloh Community Unit School District #1
Shiloh Township

June 2022

The five year update of this Plan must be completed on or before (date).

EDGAR COUNTY MULTI-JURISDICTIONAL ALL HAZARDS MITIGATION PLAN

EDGAR COUNTY, ILLINOIS

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Researched and written for the Edgar County Multi-Jurisdictional
All Hazards Mitigation Planning Committee
by American Environmental Corporation

1.0 INTRODUCTION

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of the residents of Edgar County. Since 1974, Edgar County has been included in six federally-declared disasters. **Figure I-1** identifies each declaration including the year the disaster was declared and the type of natural hazard that triggered the declaration. The natural hazard(s) recognized as contributing to the declaration for Edgar County is identified in bold.

Figure I-1
Federal Disaster Declarations: Edgar County

Declaration #	Year	Natural Hazard(s) Covered by Declaration
438	1974	severe storms; ***flooding***
860	1990	***severe ice storm***
1416	2002	***severe storms***; tornadoes; ***flooding***
1771	2008	***severe storms; flooding***
1960	2011	***severe winter storm; snowstorm***
4489	2020	***COVID-19 pandemic***

In the last 10 years alone (2012 – 2021), there have been 51 heavy rain events, 27 thunderstorms with damaging winds, 24 flash flood events 20 excessive heat events, 20 extreme cold events, 14 severe storms with hail one inch in diameter or greater, 12 severe winter storms, 9 riverine flood events, 2 tornadoes, and 1 drought verified in the County.

While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning. This prevention-related concept of emergency management often receives the least amount of attention, yet it is one of the most important steps in creating a hazard-resistant community.

What is hazard mitigation planning?

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and man-made hazards. This process helps the County and participating jurisdictions reduce their risk from these hazards by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in an all hazards mitigation plan.

Why update an all hazards mitigation plan?

By updating and adopting an all hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds can help provide local government entities with the opportunity to complete mitigation projects and activities that would not otherwise be financially possible.

The federal hazard mitigation funds are made available through the Disaster Mitigation Act of 2000, an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides federal aid for mitigation projects, but only if the local government entity has a Federal Emergency Management Agency (FEMA) approved hazard mitigation plan.

How is this plan different from other emergency plans?

An all hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural or man-made disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the first time that Edgar County has updated its hazard mitigation plan since the original plan was prepared in 2014. This update describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural and man-made hazards.

1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of having an all hazards mitigation plan, the Edgar County Board authorized the update of the Edgar County Multi-Jurisdictional All Hazards Mitigation Plan (hereto referred to as the Plan). The County then invited all the local government entities within Edgar County to participate. **Figure I-2** identifies the participating jurisdictions represented in the Plan update who sought Plan approval.

Figure I-2
Participating Jurisdictions Represented in the Plan

- Brocton, Village of
- Chrisman, City of
- Chrisman Fire Protection District
- Edgar County
- Edgar County CUSD #6
- Horizon Health
- Hume, Village of
- Hume Fire Protection District
- Kansas, Village of
- Kansas CUSD #3
- Metcalf, Village of
- Metcalf Fire Protection District
- Paris, City of
- Paris CUSD #4
- Paris Union SD #95
- Redmon, Village of
- Shiloh CUSD #1
- Shiloh Township

1.2 COUNTY PROFILE

Edgar County is located along the Indiana border in east-central Illinois and covers approximately 624 square miles. **Figure I-3** provides a location map of the County and the participating municipalities while **Figures I-4, I-5** and **I-6** identify the boundaries of the Edgar County townships, school districts, and fire protection districts.

The County is bounded to the north by Vermilion County, to the east by the Indiana border, to the south by Clark County, and to the west by Coles and Douglas Counties. The City of Paris is the county seat. The topography is gently rolling with stream terraces adjacent to the broad floodplains along the major streams and rivers.

The County is situated in the eastern portion of the Bloomington Ridged Plain in the Till Plains Section of the Central Lowland Province. Soils are characterized by a series of end moraines and ground moraines. Most areas are well-drained for crops grown in this area. The Embarrass River watershed encompasses the western portion of the County while the Wabash River Valley watershed encompasses the eastern portion.

Figure I-3
Location Map

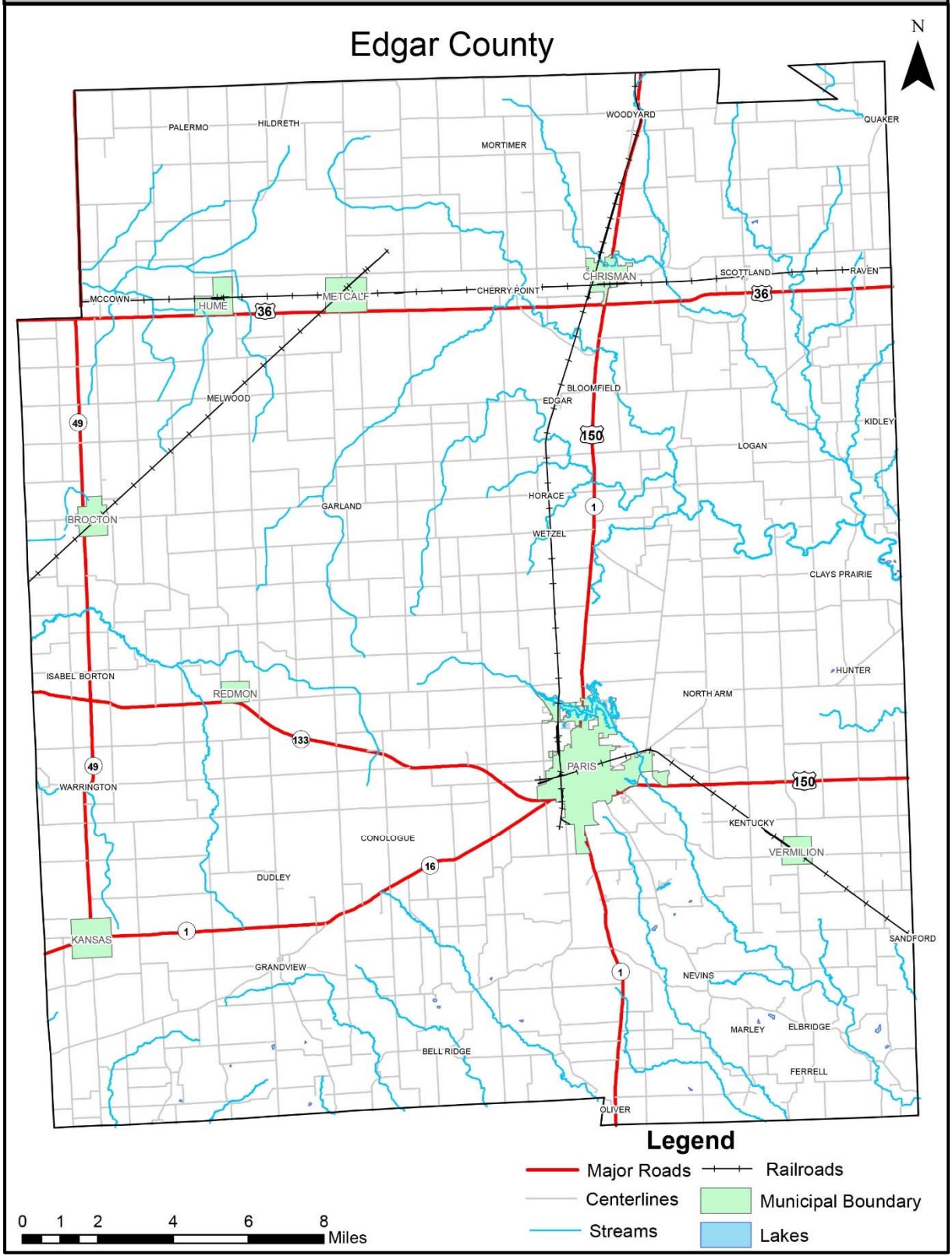


Figure I-4
Township Boundary Map

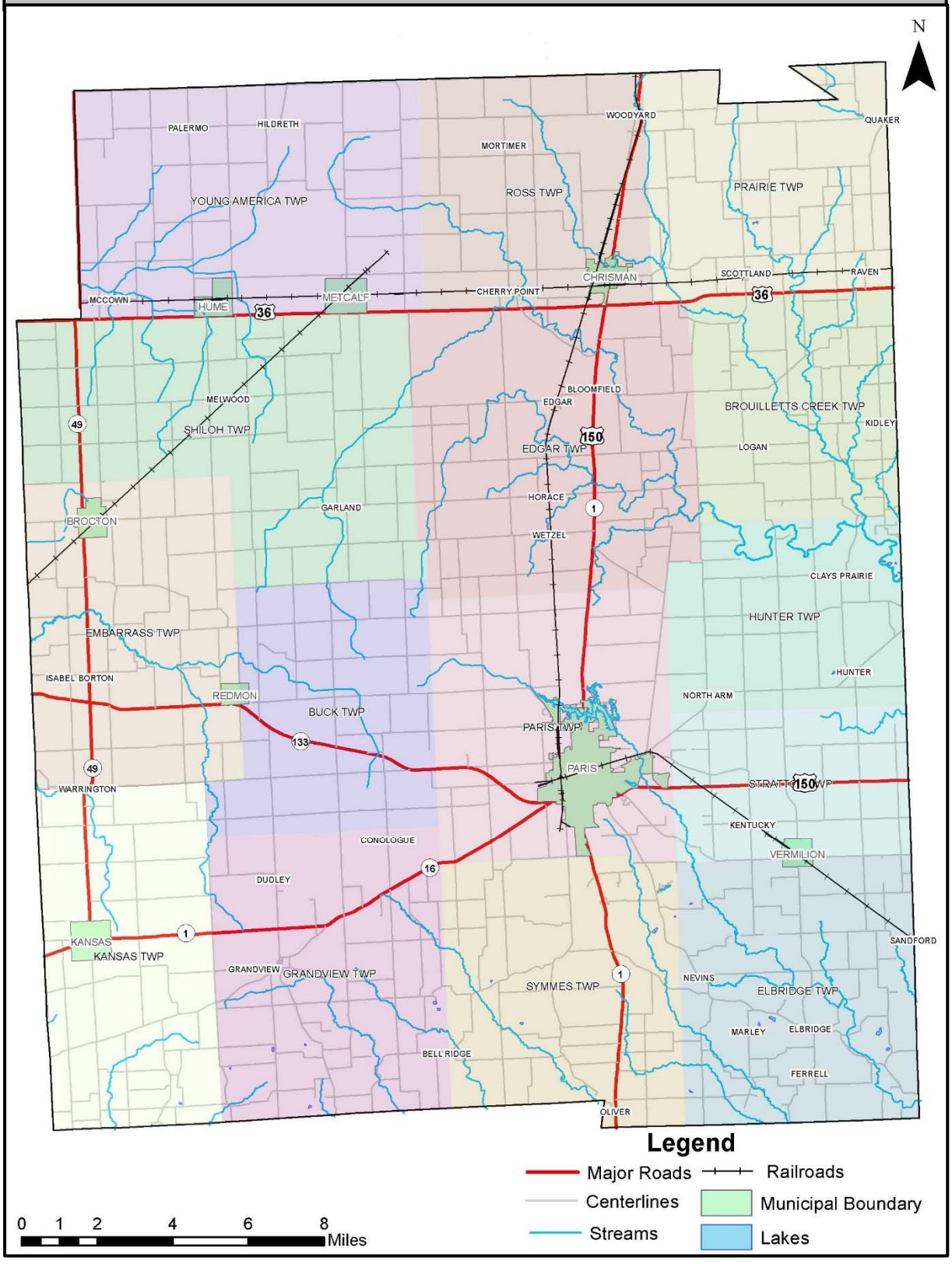


Figure I-5
School District Boundary Map

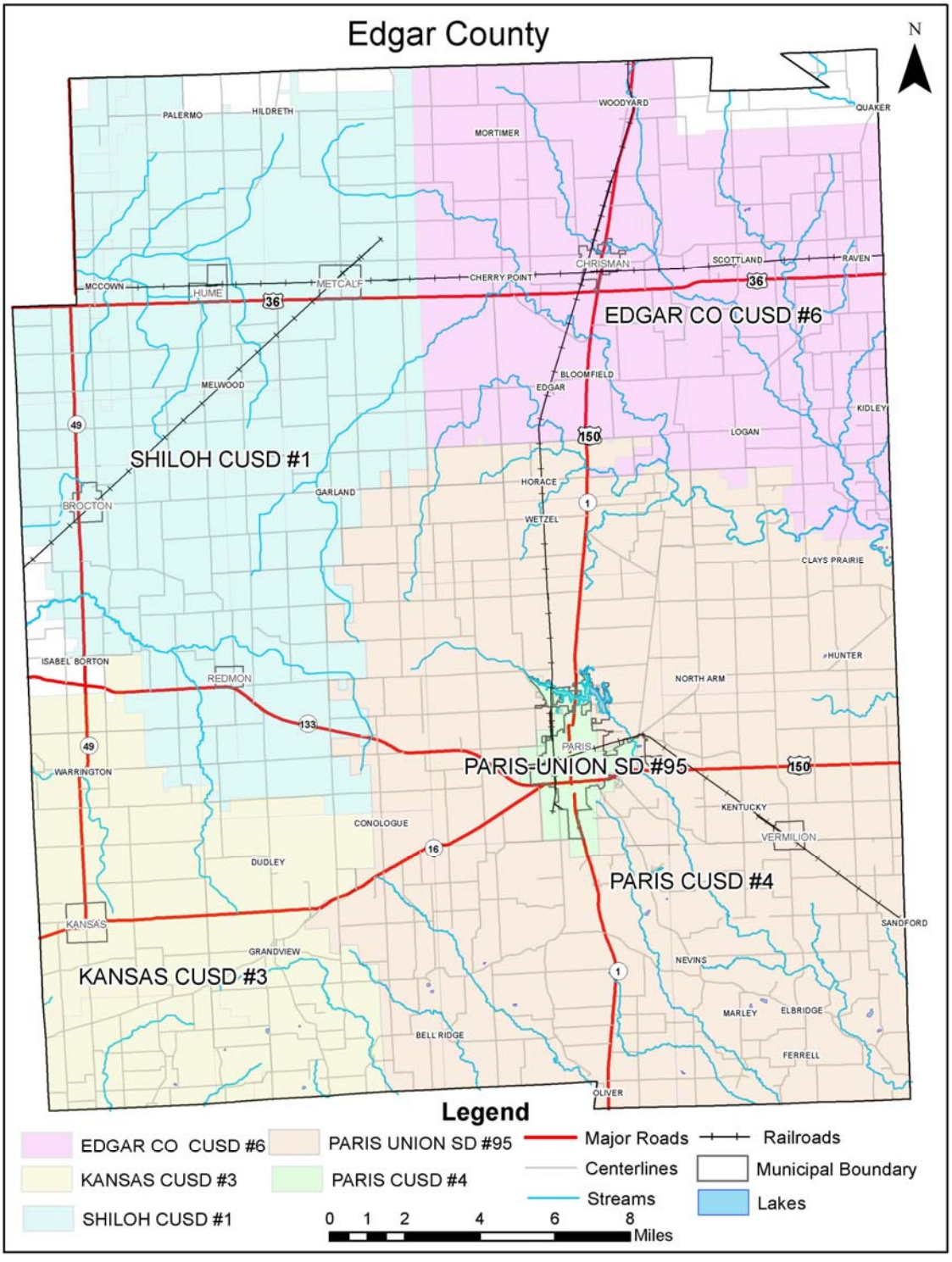
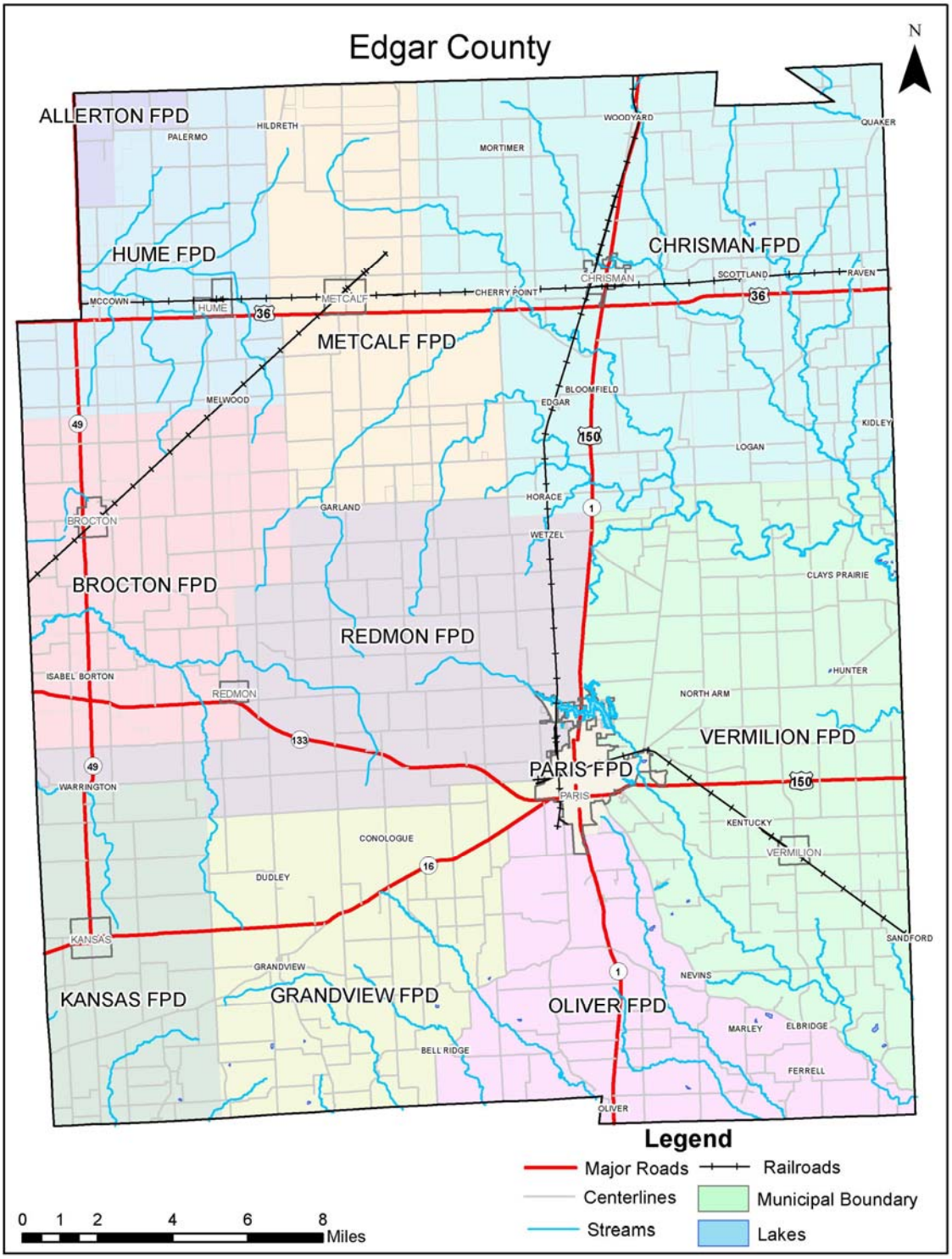


Figure I-6
Fire Protection District Boundary Map



Agriculture is a mainstay of Edgar County's economy. According to the 2017 Census of Agriculture, there were 637 farms in Edgar County occupying approximately 79.7% (318,164 acres) of the total land area in the County. In comparison, there were 673 farms occupying 88.2% (351,684 acres) of the total land area in the County in 2012. The major crops include corn and soybeans while the major livestock includes cattle, goats, and chickens. The County ranks 24th in the State for crop cash receipts.

The largest employment sectors in Edgar County are manufacturing and health care/social assistance followed by retail trade and educational services according to the Illinois Department of Commerce and Economic Opportunity. Leading employers include Campbell's Soup, Kimberly-Clark Corporation, and Horizon Health.

Figure I-7 provides demographic data on the County and each of the participating townships and municipalities along with information on housing units and assessed values. The assessed values are for all residential structures and associated buildings (including farm homes and buildings associated with the main residence.) The assessed value of a residence in Edgar County is approximately one-third of the market value. **Figures I-8** and **I-9** provide basic demographic information about the size and populations served by the participating school districts and fire protection districts.

Figure I-7
Demographic Data by Participating Jurisdiction

Participating Jurisdiction	Population (2015-2019)	Projected Population (2030)	Total Area (Sq. Miles) (2010)	Number of Housing Units (2015-2019)	Total Assessed Value of Housing Units (2021)
Edgar County (unincorporated)	5,684	5,049	613.388	2,607	$44,683,350
Brocton	340	302	0.578	178	$1,492,630
Chrisman	1,452	1,290	0.747	687	$9,726,430
Hume	324	288	0.535	183	$2,645,980
Kansas	689	612	1.025	424	$4,505,230
Metcalf	186	165	0.686	92	$572,010
Paris	8,372	7,437	5.506	4,459	$63,227,670
Redmon	129	115	0.148	101	$1,138,080
Shiloh Township	78	---	58.362	39	$859,160

Sources: Deena Hasler, Edgar County Chief County Assessment Officer.
Illinois Department Public Health, Population Projections – Illinois, Chicago and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition).
U. S. Census Bureau, American Community Survey, 5-Year Data Profile.

1.3 LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Edgar County is almost entirely rural with a population that has seen a decrease between 1900 and 2010 from 28,273 to 18,576. Between 2010 and 2019 the population decreased by 6.3% from 18,576 to 17,407. During that same time period, all of the participating municipalities experienced population decreases with the exception of Brocton and Chrisman which increased slightly.

Figure I-8
Demographic Data by Participating School District

Participating School District	Number of Schools in District	Estimated Population Served	Area Served (Sq. Miles) (2010)	Communities / Unincorp. Areas Served in Mason County
Edgar County CUSD #6	3	1,300	88	Chrisman & Scottland
Kansas CUSD #3	2	1,560	95	Ashmore, Dudley, Grandview, Kansas, & Paris
Paris CUSD#4	2	10,000	235	Oliver, Paris, & Vermilion
Paris Union SD #95	5	10,000	9	Paris
Shiloh CUSD #1	1	2,500	250	Brocton, Hume, Metcalf, Murdock, Newman, & Redmon

Source: Capability Assessment Worksheets – School Districts.

Figure I-9
Demographic Data by Participating Fire Protection Districts

Participating School District	Number of Fire Stations	Estimated Population Served	Area Served (Sq. Miles) (2010)	Communities / Unincorp. Areas Served in Mason County
Chrisman FPD	1	2,500	125	Bloomfield, Chrisman, Edgar, Logan, & Scottland
Hume FPD	1	800	47	Hume & Palermo
Metcalf FPD	1	250	50	Metcalf, Shiloh Township, & Young America Township

Source: Capability Assessment Worksheets – Fire Protection Districts.

Land use in Edgar County is primarily agricultural. As discussed in the previous section, approximately 79.7% of the land within the County is used for farming practices. Agriculture is and will continue to be a major enterprise within the County and a mainstay of the County's economy.

According to the Edgar County Board Chairman, Jeff Voigt, there were no substantial changes in development within the County or any of the participating jurisdictions that have impacted their overall vulnerability since the original Plan was approved. The Paris City Administrator, Michael Martin, confirmed no substantial changes in development within the county seat. The City promotes development and hopes to encourage industrial development in the south and west portions of the community where other industrial facilities currently reside.

In terms of development and economic initiatives within the County and the participating jurisdictions, the County Board recently passed an ordinance to encourage solar energy development. As a result, land in the southern portion of the County near the boundary with Clark County is anticipated to be developed for solar energy production. The County also plans to repurpose the old Vance School property, a 20,000 square foot facility on four acres in the northern portion of Paris, for a County office building and jail complex.

There are no other large-scale economic development initiatives underway in the County. Substantial changes in land use (from forested and agricultural land to residential, commercial, and industrial) are not anticipated within the County in the immediate future. No sizeable increases in commercial or industrial developments are expected within the next five years.

2.0 PLANNING PROCESS

The Edgar County Multi-Jurisdictional All Hazards Mitigation Plan (the Plan) was updated through the Edgar County Multi-Jurisdictional All Hazards Mitigation Planning Committee (Planning Committee). The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the nine recommended tasks for developing or updating a local hazard mitigation plan as outlined in Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook*. **Figure PP-1** provides a brief description of the process utilized to prepare this Plan.

Figure PP-1
Description of Planning Process

Tasks	Description
Task One: Organize the Committee	The Planning Committee was formed with broad representation and specific expertise to assist the County and the Consultant in updating the Plan.
Task Two: Public Involvement	Early and ongoing public involvement activities were conducted throughout the Plan's development to ensure the public was given every opportunity to participate and provide input.
Task Three: Coordination	Agencies and organizations were contacted to identify plans and activities currently being implemented that impact or might potentially impact hazard mitigation activities.
Task Four: Risk Assessment & Vulnerability Analyses	The Consultant identified and profiled the natural and man-made hazards that have impacted the County and conducted vulnerability analyses to evaluate the risk to each participating jurisdiction.
Task Five: Goal Setting	After reviewing existing plans and completing the risk assessment, the Consultant assisted the Planning Committee in updating the goals and objectives for the Plan.
Task Six: Mitigation Strategy & Activities	The participating jurisdictions were asked to identify mitigation actions that had been started and/or completed since the original Plan was adopted. In addition, they were also asked to identify any new mitigation actions based on the results of the risk assessment. The new mitigation actions were then analyzed, categorized, and prioritized.
Task Seven: Draft Plan	The draft Plan update summarized the results of Tasks One through Six. In addition, it described the responsibilities to monitor, evaluate and update the Plan. The draft Plan update was reviewed by the participants and a public forum was held to give the public an additional opportunity to provide input. Comments received were incorporated into the draft Plan update and submitted to the Illinois Emergency Management Agency (IEMA) and FEMA for review and approval.
Task Eight: Finalize Plan & Adoption	Comments received from IEMA and FEMA were incorporated into the final Plan update. The final Plan update was then submitted to the County and participating jurisdictions for adoption. The Plan will be reviewed periodically and updated again in five years.

The Plan update and development was led at the staff level by Jill Taylor, the Edgar County Emergency Services and Disaster Agency (ESDA) Coordinator. American Environmental Corp. (AEC) an environmental consulting firm, with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the County and participating jurisdictions through the planning process.

Participation in the planning process, especially by the County and local government representatives, was crucial to the development of the Plan update. To ensure that all participating jurisdictions took part in the planning process, participation requirements were established. Each participating jurisdiction agreed to satisfy the following requirements in order to be included in the Plan update. All of the participating jurisdictions met the participation requirements.

- Attend at least one Planning Committee meeting.
- Identify/submit a list of documents (i.e., plans, studies, reports, maps, etc.) relevant to the all hazard mitigation planning process.
- Identify/submit a list of critical infrastructure and facilities.
- Review the risk assessment and provide additional information on events and damages when available.
- Participate in the update of the mitigation goals.
- Submit a list of mitigation actions started and/or completed since the adoption of the original Plan.
- Identify and submit a list of new mitigation actions.
- Review and comment on the draft Plan update.
- Formally adopt the Plan update.
- Where applicable, incorporate the Plan update into existing planning efforts.
- Participate in the Plan update maintenance.

2.1 PLANNING COMMITTEE

As previously mentioned, at the start of the planning process, the Edgar County Multi-Jurisdictional All Mitigation Planning Committee was formed to update the hazard mitigation plan. The Planning Committee included representatives from each participating jurisdiction, as well as agriculture, education, emergency services and healthcare.

Figure PP-2 details the entities represented on the Planning Committee and the individuals who attended on their behalf. The Planning Committee was chaired by the Edgar County ESDA.

Additional technical expertise was provided by the staff at the Illinois Emergency Management Agency and the Illinois Department of Natural Resources Office of Water Resources.

Mission Statement

Over the course of the first two meetings, the Planning Committee developed a mission statement that described their objectives for the Plan update.

"The mission of the Edgar County Multi-Jurisdictional All Hazards Mitigation Planning Committee is to develop a mitigation plan that:

1) documents the risks associated with the natural and man-made hazards that impact the County and

2) identifies projects and activities that mitigate the risk to structures, facilities, and systems that provide support to the County, its residents, and economy, as well as community lifelines that enable the continuous operation of critical government and business functions essential to human health and safety, and economic security."

Figure PP-2
Edgar County Planning Committee Member Attendance Record

Representing	Name	Title	10/5/2021	12/7/2021	2/15/2022	4/5/2022	6/7/2022
American Environmental Corporation	Bostwick, Andrea	EMS Manager	X	X	X	X	
American Environmental Corporation	Krug, Zachary	Environmental Specialist	X				
American Environmental Corporation	Runkle, Ken	Risk Assessor			X	X	
Brocton, Village of	Dudley, Chad	Mayor	X		X		
Brocton, Village of	Wahl, Rick	Trustee		X			
Chrisman, City of	Owen, Dan	Mayor	X	X	X	X	
Chrisman Fire Protection District	Marvin, Mike	Fire Chief	X		X	X	
Edgar County - Board	Voigt, Jeff	Board Chairman	X	X	X	X	
Edgar County - ESDA	Lorenzen, Erin	Assistant Coordinator		X	X		
Edgar County - ESDA	Taylor, Jill	Coordinator	X	X	X	X	
Edgar County - Health Department	Beck, Marissa	Director of Emergency Health	X				
Edgar County - Health Department	Dunn, Monica	Assistant Administrator	X				
Edgar County - Highway Department	Knight, Joshua	Engineer Technician	X	X		X	
Edgar County - Sheriff's Department	Weston, Derek	Chief Deputy	X	X	X	X	
Edgar County - Supervisor of Assessments Office	Hasler, Deena	Chief County Assessment Officer	X				
Edgar County - Treasurer's Office	Wiseman, Donald	Treasurer / PIO	X	X		X	
Edgar County CUSD #6	Huber, Cole	Principal	X	X	X	X	
Edgar County Farm Bureau	Williamson, Wyatt	Executive Director	X			X	
Horizon Health	McCarty, Samantha	Director of Emergency Services	X	X	X	X	
Horizon Health	Webb, Adam	EMS Manager		X			
Hume, Village of	Eads, Mike	Mayor	X				
Hume, Village of	Gerberding, Chandra	Trustee	X	X		X	
Hume Fire Protection District	Gerberding, Chandra	Firefighter	X	X		X	
Hume Fire Protection District	Gerberding, Sean	Firefighter	X				
Hume Fire Protection District	Keys, David	Fire Chief	X	X		X	
Kansas, Village of	Carrell, Ross	President				X	
Kansas CUSD #3	Spencer, Cindy	Superintendent / Principal	X	X		X	
Metcalf, Village of	McCord, William	Mayor	X				
Metcalf Fire Protection District	Morris, John	Fire Chief	X	X	X	X	
Paris, City of	Crampton, Chad	Fire Chief	X	X			
Paris, City of	Hutson, Andrew	Sergeant		X			
Paris, City of	Rogers, Terry	Chief of Police	X		X	X	
Paris CUSD #4	Damler, Meghan	Principal	X				
Paris CUSD #4	McCarty, Josh	Maintenance Director			X		
Paris CUSD #4	Young, Danette	Superintendent		X		X	
Paris Township	Wooten, Chuck	Township Commissioner	X				
Paris Union SD #95	Larson, Jeremy	Superintendent	X	X	X	X	
Redmon, Village of	Walton, Shawn	Mayor		X			
Redmon Fire Protection District	Walton, Zach	Fire Chief		X			
Shiloh CUSD #1	Harbaugh, Bethanny	Principal	X	X	X	X	
Shiloh Township	Julian, Kevin	Highway Commissioner			X	X	

Planning Committee Meetings

The Planning Committee met five times between October 2021 and June 2022. **Figure PP-2** identifies the representatives present at each meeting. **Appendices A** and **B** contain copies of the attendance sheets and meeting minutes for each meeting. The purpose of each meeting, including the topics discussed, is provided below.

First Planning Committee Meeting – October 5, 2021

The purpose of this meeting was to explain the planning process to the Planning Committee members and give them a brief overview of the planning process including what mitigation is, what a hazards mitigation plan is and why the Plan needs to be updated. A discussion regarding the hazards to be included in the Plan update was conducted and an electronic survey was sent out following the meeting asking Committee members whether dam failures and/or mine subsidence should be included in the Plan update. Based on the results received, the Committee did not feel either hazard had a significant impact on the County and chose not to include them in the Plan update.

Information needed from each participant was discussed and representatives for the County and the participating jurisdictions were asked to complete the forms entitled "Capability Assessment Worksheet," "Critical Facilities & Infrastructure," "Identification of Severe Weather Shelters" and "Drinking Water Supply Worksheet" distributed electronically and return them at the next meeting.

Committee members were then asked to identify any recent or historic natural or man-made hazard events that have impacted the County and participants. A "Hazard Events Questionnaire" was distributed during the meeting to solicit information on hazard events. Community participation was also discussed. The County and participating jurisdictions were asked to make information available on the planning process at their offices and in the communities. A "Citizen Questionnaire," was also distributed electronically to Committee Members prior to the meeting for distribution to their constituents to gauge the public's perception about the hazards that impact the County. Finally, drafts of a mission statement and updated mitigation goals were presented for review.

Second Planning Committee Meeting – December 7, 2021

At the second Planning Committee meeting portions of the updated natural and man-made hazard risk assessment section were presented for review. Following the review of the risk assessment, the Planning Committee members participated in an exercise to calculate the Risk Priority Index (RPI) for the County and participating jurisdictions. The RPI can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. The Planning Committee then reviewed and discussed the draft mission statement and updated mitigation goals and finalized both with only grammatical corrections.

Next, mitigation actions were defined, and examples were discussed. Committee members were asked to identify any mitigation projects and activities their jurisdictions had started and/or completed since the original Plan was completed in 2014. Ideas for new potential mitigation projects and activities were presented. Representatives for the County and the participating

jurisdictions were asked to complete the forms entitled "Existing Mitigation Project/Activity Status" and "New Hazard Mitigation Projects" and return them at the next meeting.

Third Planning Committee Meeting – February 15, 2022

The purpose of the third Planning Committee meeting was to discuss the vulnerability analysis for select natural hazards and the preliminary results of the RPI exercise. The Planning Committee members then discussed vulnerable community assets and completed the form entitled "Critical Facilities Vulnerability Survey" which will be used in the vulnerability analyses.

The concept of community lifelines was also discussed. Community lifelines enable the continuous operation of critical government and business functions essential to human health and safety or economic security. While the concept was developed to support emergency response and planning, FEMA has begun applying it to all phases of emergency management, including mitigation. Community lifelines will be included in most project descriptions to create a clear connection to the concept.

Next, an explanation of what a mitigation action prioritization methodology is and how it fits into the Mitigation Strategy was provided. The Planning Committee reviewed the updated mitigation project prioritization methodology and approved it with no changes. Finally, a discussion on how the mitigation projects and activities identified by the participating jurisdictions will be presented in the Plan update was provided. Participants were encouraged to provide their mitigation project lists prior to the 4th meeting when draft lists will be distributed for review.

Fourth Planning Committee Meeting – April 5, 2022

At the fourth Planning Committee meeting, Committee members reviewed the draft jurisdiction-specific mitigation action tables which identified and prioritized the new and existing mitigation projects and activities provided by the participants. Members were given the opportunity to add additional projects and activities to their tables. The sections outlining the mitigation strategy, plan maintenance and adoption were also reviewed.

The public forum and adoption process were then discussed, and a date for the public forum was set. Finally, the plan maintenance and update requirements were discussed. The Plan update will be monitored and evaluated on an annual basis by a Plan Maintenance Subcommittee which will be made up of the participating jurisdictions and key members of the Planning Committee. The Plan must be reviewed, revised, and resubmitted to IEMA and FEMA at least once every five years.

Fifth Planning Committee Meeting – June 7, 2022

At this Planning Committee meeting the public was provided an opportunity to ask questions and provide comments on the draft Plan update.

2.2 PUBLIC INVOLVEMENT

To engage the public in the planning process, a comprehensive public involvement strategy was developed. The strategy was structured to engage the public in a two-way dialogue, encouraging

the exchange of information throughout the planning process. A mix of public involvement techniques and practices were utilized to:

- disseminate information;
- identify additional useful information about natural hazard occurrences and impacts;
- assure that interested residents would be involved throughout the Plan update's development; and
- cultivate ownership of the Plan update, thus increasing the likelihood of adoption by the participating jurisdictions.

The dialogue with the public followed proven risk communication principles to help assure clarity and avoid overstating or understating the impacts posed by the natural and man-made hazards identified in the Plan update. The following public involvement techniques and practices were applied to give the public an opportunity to access information and participate in the dialogue at their level of interest and availability.

Citizen Questionnaire

A citizen questionnaire was developed to gather facts and gauge public perceptions about natural hazards that affect Edgar County. The questionnaire was distributed electronically to the Planning Committee members who were encouraged to make it available to their residents. A copy of the questionnaire and social media posts related to the questionnaire are contained in **Appendix C**.

A total of 38 questionnaires were completed and returned to the Planning Committee. Questionnaires were completed by residents in each participating jurisdiction, with the exception of Brocton and Hume. These responses provide useful information to decision makers as they determine how best to disseminate information on natural hazards and safeguard the public. Additionally, these responses identify the types of projects and activities the public is most likely to support. The following provides a summary of the results.

- Respondents felt that severe summer storms were the most frequently encountered natural hazard in Edgar County followed by severe winter storms. These results are consistent with the weather records compiled for the County and as described in this Plan.
- The most effective means of communication identified by respondents to disseminate information about natural hazards were social media and mailings, followed by the Internet, radio and schools. Newspapers, television and fact sheet/brochures disseminated via fire departments/law enforcement also received support among respondents.
- In terms of the most needed mitigation projects and activities, the following five categories received the strongest support:
  - maintain power during storms by burying power lines, trimming trees and/or purchasing backup generators (79%);
  - maintain roadway passages during snowstorms and heavy rains (68%);
  - install/maintain sirens and other alert systems (62%); and
  - retrofit critical infrastructure (52%).

FAQ Fact Sheet

A "Frequently Asked Questions" fact sheet was disseminated to help explain what an all hazards mitigation plan is and briefly described the planning process. The fact sheet was made available at the participating jurisdictions. A copy of the fact sheet is contained in **Appendix D**.

Press Releases

Press releases were prepared and submitted to The Prairie Press and posted to the Edgar County ESDA Facebook page prior to each Planning Committee meeting. The releases announced the purpose of the meetings and how the public could become involved in the Plan update's development. Copies of the releases, Facebook posts and any news articles published can be found in **Appendix E**.

Planning Committee Meetings

All of the meetings conducted by the Planning Committee were open to the public and publicized in advance to encourage public participation. At the end of each meeting, time was set aside for public comment. In addition, Committee members were available throughout the planning process to talk with residents and local government officials and were responsible for relaying any concerns and questions voiced by the public to the Planning Committee.

Public Forum

The final meeting of the Planning Committee, held on June 7, 2022 was conducted as an open-house public forum. The open-house format was chosen for this forum instead of a hearing to provide greater flexibility for residents who wished to participate. Residents were able to come and go at any time during the forum, reducing conflicts with business, family, and social obligations.

In conjunction the public forum, the draft Plan update was made available for review and comment on the Edgar County website. A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website.

At the forum, residents could review a draft of the Plan update; meet with representatives from the County, the participating jurisdictions, and the Consultant; ask any questions; and provide comments on the draft Plan update. Individuals attending the public forum were provided with a two-page handout summarizing the planning process and a comment sheet that could be used to provide feedback on the draft Plan update. **Appendices F** and **G** contain copies of these materials.

Public Comment Period

After the public forum, the draft Plan update was made available for public review and comment through June 21, 2022 at the Edgar County ESDA Office and on the County's website A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website. **Appendix G** contains a copy of the online comment survey. Residents were encouraged to submit their comments electronically, by mail or through representatives of the Planning Committee.

Results of Public Involvement

The public involvement strategy implemented during the planning process created a dialogue among participants and interested residents, which resulted in many benefits, a few of which are highlighted below.

- *Acquired additional information about natural hazards.* Verifiable hazard event and damage information was obtained from participants that presents a clearer assessment of the extent and magnitude of natural hazards that have impacted the County. This information included details about lightning strikes, hail, thunderstorms with damaging winds, severe winter storms, tornadoes and wildfires not available from state and federal databases.
- *Increased awareness of the impacts associated with natural hazard events within the County*. Understanding how mitigation actions can reduce risk to life and property helped generate ***over 75 new mitigation projects and activities*** at the local level that had not been previously identified in any other planning process.

2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES

Businesses, schools, not-for-profit organizations, neighboring counties, and other interested parties were provided multiple opportunities to participate in the planning process. Wide-reaching applications were combined with direct, person-to-person contacts to identify anyone who might have an interest or possess information which could be helpful in updating the Plan.

Agricultural Community

Representatives from the agricultural community were invited to serve on the Planning Committee through the Edgar County Farm Bureau. The Executive Director served as a technical partner on the Planning Committee and provided input into the planning process. .

Education

Representatives from each of the five major school districts in Edgar County [Edgar County Community Unit School District (CUSD) #6, Kansas CUSD #3, Paris CUSD #4, Paris Union SD #95 and Shiloh CUSD #1] served on the Planning Committee and provided input into the planning process. All five school districts chose to be included as participating jurisdiction in the Plan update.

Healthcare

Input was sought from the healthcare community. Representatives from Horizon Health attended the Planning Committee meetings, provided input into the planning process, and chose to be included as a participating jurisdiction in the Plan update.

Not-for-Profit & Other Organizations

The fire departments/fire protection districts, townships and drainage districts in Edgar County were contacted and invited to participate in the Plan update. Representatives from the Chrisman Fire Protection District (FPD) , Hume FPD, Metcalf FPD, Redmon FPD, Paris Fire Department, Paris Township and Shiloh Township served on the Planning Committee and provided input into the planning process. Chrisman FPD, Hume FPD, Metcalf FPD, and Shiloh Township chose to

be included as participating jurisdictions in the Plan update. As a department of Paris, the Paris Fire Department is covered as a participating jurisdiction under the City.

Regional Planning
Coles County Regional Planning & Development Commission was contacted and invited to participate as a technical partner on the Planning Committee and provided input into the planning process; however, they chose not to participate.

Neighboring Counties
A memo was sent to EMA/ESDA coordinators in the neighboring counties inviting them to participate in the mitigation planning process. The counties contacted included Champaign, Vermilion, Douglas, Coles and Clark in Illinois and Vigo and Vermillion in Indiana. **Appendix H** contains a copy of the invitation memo.

2.4 IDENTIFICATION OF EXISTING CAPABILITIES

Each participating jurisdiction has a unique set of capabilities and resources available to accomplish hazard mitigation and reduce long-term vulnerabilities to hazard events. In order to identify these existing capabilities and resources, a Capability Assessment was conducted. The Capability Assessment helps determine the ability of the participating jurisdictions to implement the Mitigation Strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, program, or projects. It is important to try and establish which goals and actions are feasible based on an understanding of the organizational capacity of those entities tasked with their implementation. This assessment is designed to provide a general overview of the key capabilities in place for each participating jurisdiction along with their potential effect of loss reduction.

In order to catalog the existing capabilities of each participant, Capability Assessment Worksheets were distributed to each of the participating jurisdictions at the first Planning Committee meeting on October 5, 2021. The worksheets requested information on four primary types of capabilities: planning and regulatory, administrative, and technical, financial, and education and outreach. The following provides a brief description of each capability type.

Planning & Regulatory Capabilities: Planning and regulatory capabilities are based on the implementation of existing plans, policies, codes, ordinances, resolutions, local laws, and programs that prevent or reduce the impacts of hazards and guide and manage growth and development.

Administrative & Technical Capabilities: Administrative and technical capabilities are based on the available staff and personnel resources as well as their related skills and tools that can be used development and implement mitigation actions, policies, and programs.

Financial Capabilities: Financial capabilities include those resources a jurisdiction has access to or is eligible to use to implement mitigation actions, polices, and programs.

Education & Outreach Capabilities: Education and outreach capabilities includes programs and methods already in place that could be used to support implementation of mitigation actions and communicate hazard-related information.

Figures PP-3 through **PP-14** summarize the results of the Capability Assessment by participating jurisdiction type (i.e., county/municipalities, schools, fire protection districts, townships, healthcare facilities, etc.) A capability level of "Limited", "Moderate" or "High" was assigned by capability type to each participating jurisdiction based on the number of available capabilities and resources as well as the jurisdiction's size/area served. **Figure PP-15** summarizes the individual capability levels by capability type and provides an overall capability ranking for each participant.

This assessment provides a consolidated inventory of existing plans, ordinances, programs, and resources in place. Whenever applicable, these existing capabilities were reviewed and incorporated into the Plan.

Highlights from the Capability Assessment include:

- Only the County and Paris have comprehensive/land use plans in place.
- Only Paris has building codes in place and only Chrisman and Paris have zoning ordinances.
- Only the County has a continuity of operations plan in place.

Edgar County, Paris, Horizon Health, Edgar County CUSD #6, Kansas CUSD #3, Paris CUSD #4, Paris Union SD #95, Shiloh CUSD #1, Chrisman FPD and Hume FPD are fortunate to have the resources and abilities to potentially expand on and improve the existing policies and programs identified. A majority of the participating municipalities have limited resources and abilities to expand on and improve the existing policies and programs identified. The lack of legal authority and policies/programs currently in place, especially with regards to building codes and zoning ordinances, hamper these participants' abilities to expand and strengthen existing policies and programs.

This is due to a general resistance from many residents towards these types of regulations which has resulted in an unwillingness by local officials to implement such policies. Their fiscal and staffing situations are also extremely limited, bordering on inadequate in most cases. These local government officials are part-time and lack the technical expertise and funds to expand or implement new programs and policies.

Overcoming these limitations will require time and a range of actions including, but not limited to improved general awareness of natural hazards and the potential benefits that may come from the development of new standards in terms of hazard loss prevention and the identification of resources available to expand and improve existing policies and programs should the opportunity arise.

Figure PP-3
County / Municipalities – Planning & Regulatory Capabilities

Capability Type	County/Municipality							
	Edgar County	Brocton	Chrisman	Hume	Kansas	Metcalf	Paris	Redmon
Plans, Policies, Codes & Ordinances								
Comprehensive/Master Land Use Plan	X						X	
Continuity of Operations Plan	X							
Stormwater Management Plan								
Transportation Plan	X							
Economic Development Plan							X	
Emergency Operations Plan	X							
Disaster Recovery Plan	X							
Threat & Hazard Identification Risk Assessment (THIRA) - County Only	X							
Infrastructure Maps			X		X		X	
Building Codes							X	
Floodplain Ordinance	X		X			X	X	
Stormwater Ordinance			X					
Zoning Ordinance			X				X	
Subdivision Ordinance	X		X				X	
Historic Preservation Ordinance							X	
Private Sewage Disposal System Ordinance - County Only	X							
Manufactured/Mobile Home Tie Down Ordinance					X	X	X	X
Steep Slope Ordinance								
Mined Areas/Developed Over Mined Areas Ordinance								
National Incident Management System (NIMS) Adoption								
National Flood Insurance Program (NFIP) Participation	X		X			X	X	
Community Rating System (CRS) Participation								
Level of Capability	**L/M**	**L**	**L**	**L**	**L**	**L**	**M**	**L**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-4
County / Municipalities – Administrative & Technical Capabilities

Capability Type	County/Municipality							
	Edgar County	Brocton	Chrisman	Hume	Kansas	Metcalf	Paris	Redmon
Adminstrative & Technical								
Zoning Board			X				X	
Public Utility Board								
Planning Commission	X		X				X	
Mutual Aid Agreements	X	X	X	X	X	X	X	
Administrator/Manager						X	X	
Building Inspector/Officer							X	
Community/Economic Development Planner								
Emergency Manager	X							
Engineer/Construction Project Manager	X							
GIS Coordinator	X							
Grant Administrator/Writer								
Fire Chief - Municipalities Only							X	
Floodplain Administrator	X							
Police Chief - Municipalities Only		X	X		X		X	
Public Works/Streets Director - Municipalities Only			X		X	X	X	
Water Superintendent - Municipalities Only		X	X	X	X	X	X	
Zoning Officer/Administrator								
Solid Waste Director - County Only								
Level of Capability	**L**	**L**	**L**	**L**	**L**	**L**	**M**	**L**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-5
County / Municipalities – Financial / Education & Outreach Capabilities

Capability Type	County/Municipality							
	Edgar County	Brocton	Chrisman	Hume	Kansas	Metcalf	Paris	Redmon
Financial								
Roadway/Bridge Improvement Plan - County Only	X							
Capital Improvements Program	X							
Tax Levies for Special Purposes	X				X	X	X	
Motor Fuel Tax	X	X	X	X	X	X	X	X
General Obligation Bonds and/or Special Tax Bonds	X		X			X	X	
Utility Fees (Stormwater, Sewer, Water, Gas or Electric Service)		X	X		X	X	X	
Impact Fees - New Development			X					
Federal Funding Programs (Non-FEMA)	X					X	X	
Level of Capability	**M**	**L**	**L**	**L**	**L**	**L**	**M**	**L**
Education & Outreach								
StormReady Certification								
Natural Disaster/Safety-Related School Programs	X							
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	X							
Seasonal Outreach								
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)								
Public-Private Partnership Initiatives Addressing Disaster-Related Issues								
Level of Capability	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-6
Townships – Planning & Regulatory / Administrative & Technical Capabilities

Capability Type	Township
	Shiloh Township
Plans, Policies, Codes & Ordinances	
Comprehensive/Master Land Use Plan	
Stormwater Management Plan	
Open Space/Recreational Area Plan	
Building Codes	
Stormwater Ordinance	
Zoning Ordinance	
Subdivision Ordinance	
Private Sewage Disposal System Ordinance	
Manufactured/Mobile Home Tie Down Ordinance	
Steep Slope Ordinance	
Mined Areas/Developed Over Mined Areas Ordinance	
Road Weight Restriction Ordinance	X
Nuisance Weed, Grass & Tree Ordinance	
National Incident Management System (NIMS) Adoption	
Level of Capability	**L**
Adminstrative & Technical	
Zoning Board	
Public Utility Board	
Planning Commission	
Mutual Aid Agreements	X
Assessor	X
Clerk	X
Collector	
Highway/Road District Commissioner	X
Supervisor	X
Level of Capability	**M**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.

Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-7
Townships – Financial / Education & Outreach Capabilities

Capability Type	Township
	Shiloh Township
Financial	
Capital Improvements Program	X
Roadway/Bridge Improvement Plan	X
Tax Levies for Special Purposes	X
Motor Fuel Tax	X
General Obligation Bonds and/or Special Tax Bonds	
Utility Fees (Stormwater, Sewer, Water, Gas or Electric Service)	
Impact Fees - New Development	
Federal Funding Programs (Non-FEMA)	
Level of Capability	**M**
Education & Outreach	
StormReady Certification	
Natural Disaster/Safety-Related School Programs	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	
Seasonal Outreach	
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)	
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	
Level of Capability	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-8
Schools – Planning & Regulatory /
Administrative & Technical Capabilities

Capability Type	School District				
	Edgar County CUSD #6 (Chrisman)	Kansas CUSD #3	Paris CUSD #4 (Crestwood)	Paris Union SD #95	Shiloh CUSD #1
Plans & Policies					
Comprehensive/Master Facilities Plan			X	X	X
Continuity of Operations Plan		X	X	X	X
Strategic Plan			X	X	X
Emergency/Crisis Response Plan	X	X	X	X	X
National Incident Management System (NIMS) Adoption					
Level of Capability	**L**	**L**	**M**	**M**	**M**
Adminstrative & Technical					
Board of Education	X	X	X	X	X
Mutual Aid Agreements		X	X	X	X
Superintendent	X	X	X	X	X
Principal(s)	X	X	X	X	X
Chief Financial Officer/Finance Director	X	X			
Food Services Supervisor	X	X	X	X	X
Grant Writer					X
Health Care Supervisor	X		X	X	X
IT Director/Specialist	X	X	X	X	X
Maintenance Manager	X	X	X	X	X
Communications Director					X
Operations Manager		X			X
Safety & Security Director		X			X
Transportation Director	X	X			X
Level of Capability	**M**	**H**	**M**	**M**	**H**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-9
Schools – Financial / Education & Outreach Capabilities

Capability Type	School District				
	Edgar County CUSD #6 (Chrisman)	Kansas CUSD #3	Paris CUSD #4 (Crestwood)	Paris Union SD #95	Shiloh CUSD #1
Financial					
Capital Improvements Program	X	X			X
Tax Levies for Special Purposes	X	X	X	X	X
General Obligation Bonds and/or Special Tax Bonds	X	X	X	X	X
Federal Funding Programs (Non-FEMA)			X	X	X
Level of Capability	**M**	**M**	**M**	**M**	**H**
Education & Outreach					
StormReady Certification					X
Natural Disaster/Safety-Related School Programs		X	X	X	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)		X	X	X	X
Seasonal Outreach			X	X	X
Public-Private Partnership Initiatives Addressing Disaster-Related Issues			X	X	X
Level of Capability	**L**	**L**	**M**	**M**	**H**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-10
Fire Protection Districts – Planning & Regulatory Capabilities

Capability Type	Fire Protection District		
	Chrisman FPD	Hume FPD	Metcalf FPD
Plans, Policies, Codes, Ordinances, Resolutions & Technical Documents			
Standard Operating Procedures/Guidelines for Structural Fire Fighting (NFPA 1700)	X	X	X
Standard Operating Procedures for Operations at Technical Search & Rescue Incidents (NFPA 1670)			
Pre-Incident Planning (NFPA 1620)		X	
Fire Prevention Codes	X		
Burn Ordinance			
National Incident Management System (NIMS) Adoption	X	X	
Incident Command System (ICS) Adoption	X	X	
Building Inspections		X	
Tier II Reports	X		X
County Emergency Operations Plan	X	X	
Safety Data Sheets	X		
Pipeline Maps	X	X	X
Hazardous Materials Facilities Maps	X	X	
Water Supply Systems Maps	X	X	
Impassable Roads & Bridges Maps	X	X	
Evacuation Zones Maps	X	X	
Community & Special Residential Areas Maps (i.e., manufactured home parks, subdivisions, recreational communities)	X		
Level of Capability	**M/H**	**M**	**L**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-11
Fire Protection Districts –
Administrative & Technical Capabilities

Capability Type	Fire Protection District		
	Chrisman FPD	Hume FPD	Metcalf FPD
Adminstrative & Technical			
Board of Trustees	X	X	X
Board of Fire Commissioners			
Mutual Aid Box Alarm System (MABAS)	X		
Mutual Aid Agreements	X	X	X
Hazardous Materials Response Team	X		X
Water Rescue/Dive Team			
Technical Rescue Team			
Fire Chief	X	X	X
Deputy Fire Chief	X	X	
Administrative Assistant			
Financial/Business Manager		X	
Inspector			
Public Education Director/Officer			
Telecom Director			
Training Coordinator		X	X
Level of Capability	**M**	**M**	**L**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-12
Fire Protection Districts –
Financial / Education & Outreach Capabilities

Capability Type	Fire Protection District		
	Chrisman FPD	Hume FPD	Metcalf FPD
Financial			
Capital Improvements Program			
Tax Levies for Special Purposes	X		X
General Obligation Bonds and/or Special Tax Bonds	X		
Federal Funding Programs (Non-FEMA)			
Level of Capability	**M**	**L**	**L**
Education & Outreach			
Natural Disaster/Safety-Related School Programs	X		
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	X		
Seasonal Outreach			
Public-Private Partnership Initiatives Addressing Disaster-Related Issues			
Level of Capability	**M**	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-13
Healthcare Facilities – Planning & Regulatory / Administrative & Technical Capabilities

Capability Type	Healthcare
	Horizon Health
Plans, Policies, Codes, Ordinances & Resolutions	
Continuity of Operations Plan	X
Strategic Plan	X
Facilities Plan	X
Emergency Preparedness Plan	X
Medical Disaster Preparedness & Response Plan	X
Community Health Needs Assessment (CHNA)	X
Severe Weather Plan	X
National Incident Management System (NIMS) Adoption	X
Level of Capability	**H**
Administrative & Technical	
Board of Directors	X
Patient Advisory Board	X
Mutual Aid Agreements	X
Chief Executive Officer	X
Chief Medical Officer	X
Chief Financial Officer	X
Chief Development Officer	X
Chief Nursing Officer	X
Communications Director	X
EMS Director	X
ER Director	X
Grant Writer	X
IT Director/GIS Specialist	X
Maintenance Manager	X
Rehab & Long-Term Care Director	X
Safety Officer	X
Level of Capability	**H**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.

Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-14
Healthcare Facilities – Financial / Education & Outreach Capabilities

Capability Type	Healthcare
	Horizon Health
Financial	
Capital Improvements Program	X
Tax Levies for Special Purposes	
General Obligation Bonds and/or Special Tax Bonds	
Federal Funding Programs (Non-FEMA)	X
Level of Capability	**M**
Education & Outreach	
StormReady Certification	X
Natural Disaster/Safety-Related School Programs	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	X
Seasonal Outreach	X
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)	
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	X
Level of Capability	**H**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

Figure PP-15
Capability Rankings by Participating Jurisdiction

Capability Type	County/Municipalities								Township	Schools					Fire Protection Districts			Health
	Edgar County	Brocton	Chrisman	Hume	Kansas	Metcalf	Paris	Redmon	Shiloh Township	Edgar County CUSD #6 (Chrisman)	Kansas CUSD #3	Paris CUSD #4 (Crestwood)	Paris Union SD #95	Shiloh CUSD #1	Chrisman FPD	Hume FPD	Metcalf FPD	Horizon Health
Planning & Regulatory	L/M	L	L	L	L	L	M	L	L	L	L	M	M	M	M/H	M	L	H
Administrative & Technical	L	L	L	L	L	L	M	L	M	M	H	M	M	H	M	M	L	H
Financial	M	L	L	L	L	L	M	L	M	M	M	M	M	H	M	L	L	M
Education & Outreach	L	L	L	L	L	L	L	L	L	L	L	M	M	H	M	L	L	H
Overall Capability	**L/M**	**L**	**L**	**L**	**L**	**L**	**M**	**L**	**L/M**	**L/M**	**L/M**	**M**	**M**	**M/H**	**M**	**L/M**	**L**	**H**

Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

3.0 RISK ASSESSMENT

Risk assessment is the process of evaluating the vulnerability of people, buildings, and infrastructure in order to estimate the potential loss of life, personal injury, economic injury, and property damage resulting from natural and man-made hazards. This section summarizes the results of the risk assessment conducted on the natural and man-made hazards in Edgar County. The information contained in this section was gathered by evaluating local, state, and federal records from the last 20 to 70 years.

This risk assessment identifies the natural and man-made hazards deemed most important to the Planning Committee and includes a profile of each hazard that identifies past occurrences, the severity or extent of the events, and the likelihood of future occurrences. It also provides a vulnerability analysis which identifies the impacts to public health and property, evaluates the assets of the participating jurisdictions (i.e., residential buildings, critical facilities, and infrastructure) and estimates the potential impacts each natural hazard would have on the health and safety of the residents as well as buildings, critical facilities and infrastructure. Where applicable, the differences in vulnerability between participating jurisdictions are described.

The subsequent sections provide detailed information on each of the selected natural hazards. The sections are color coded and ordered by the frequency with which the natural hazard has previously occurred within the County. Each natural hazard section contains three subsections: hazard identification, hazard profile and hazard vulnerability.

Hazard Selection

One of the responsibilities of the Planning Committee was to review the natural and man-made hazards detailed in the original Plan and decide if additional hazards should be included in the Plan update. Over the course of the first two meetings, the Planning Committee members discussed their experiences with natural and man-made hazard events and reviewed information on various hazards. After discussing the information provided and completing an online survey, the Planning Committee chose not to add any additional natural hazards (i.e., landslides, etc.) to this Plan update.

The following identifies the hazards included in the Plan update:

- severe storms (thunderstorms, hail, lighting & heavy rain)
- severe winter storms (snow & ice)
- floods
- excessive heat
- extreme cold
- tornadoes
- drought
- earthquakes
- wildfires
- man-made hazards including:
  - hazardous substances (generation, transportation & storage/handling)
  - waste disposal
  - hazardous materials incidents
  - waste remediation
  - terrorism

The Planning Committee chose not to include the following hazards in the Plan: landslides, land/mine subsidence, dam failures and levee failures. According to the U.S. Army Corps of Engineers National Levee Database, there are no public or private levees located in Edgar County. A review of the USGS Landslide Susceptibility Viewer did not identify any areas of the County with a high susceptibility to landslides. In addition, the Illinois State Geological Survey's *Landslide Inventory of Illinois* did not identify any landslide events. Discussions with the Planning Committee did not reveal any recent occurrences of landslides.

A review of the U.S. Army Corps of Engineers' National Inventory of Dams identified six classified dams located in Edgar County. Of the six classified dams located in the County, two have a hazard classification rating of "Significant" while the remaining four have a hazard classification rating of "Low". Neither of the dams with "Significant" hazard classification ratings have reservoirs that are immense in size nor are they located in densely populated areas. According to the Stanford University's National Performance of Dams Incident Database, there are no known recorded dam failures associated with any of the dams.

Karst refers to landforms underlain by limestone that has been dissolved, producing characteristic landscapes such as sinkholes. Mapping prepared by the Illinois State Geological Survey (ISGS) shows no karst geologic characteristics present in Edgar County. In Illinois land subsidence general occurs in areas where mining has been conducted. According to ISGS's *ILMINES* mapper, there are several underground mines located along the eastern edge of Edgar County. None of the mines are located in or near any of the municipalities in the County and they are not considered extensive in size (at least within the County.)

An online survey was prepared and distributed to the Planning Committee members following the 1st meeting to solicit feedback on whether to include dam failures and land/mine subsidence in the Plan update. Based on the feedback provided, the Committee did not either warranted inclusion.

Risk Priority Index

After reviewing the preliminary results of the risk assessment at the second meeting, Planning Committee members and the participating jurisdictions were asked to complete a Risk Priority Index (RPI) exercise for the hazards that have the potential to impact the County and participating jurisdictions. The RPI provides quantitative guidance for ranking the hazards and offers participants with another tool to determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation actions.

Each hazard was scored on three categories: 1) frequency, 2) impacts on life and health and 3) impacts on property and infrastructure. A scoring system was developed that assigned specific factors to point values ranging from 1 to 4 for each category. For those hazards that were not applicable to a particular jurisdiction, a value of "NA" was assigned to each category. The higher the point value, the greater the risk associated with that hazard. **Figure R-1**, located at the end of this section, identifies the factors and point values associated with each category. Participants were asked to score the selected hazards based on the perspective of the entity they represented on the Planning Committee.

The Consultant took the point values assigned to each category and averaged the remaining results and came up with an overall value for each category. The values for each category were then added together to calculate an RPI score for each hazard. A ranking was then assigned to each hazard based on the RPI score. **Figure R-2**, located at the end of this section, provides the hazard rankings for the participating jurisdictions. RPI scores were not generated for Shiloh Township and Chrisman FPD.

Figure R-3 provides a side-by-side comparison of how the hazards ranked between the RPI exercise conducted for the original Plan in 2014 and the exercise conducted for the Plan update for each of the original participants. RPIs were not generated in 2014 for Brocton, Kansas, Kansas CUSD #3, Paris Union SD #95, Hume FPD, and Metcalf FPD and therefore are not included. The top hazard for the County in 2014 was tornadoes followed by floods. In 2021 the top hazards were thunderstorms with damaging winds and severe winter storms.

Critical Facilities & Infrastructure

Critical facilities and infrastructure are structures, institutions and systems that are critical for life safety and economic viability and necessary for a community's response to and recovery from emergencies. The loss of function of any of these assets can intensify the severity of the impacts and speed of recovery associated a hazard event. Critical facilities and infrastructure may include, but are not limited to the following:

- ***Essential Facilities***: Facilities essential to the health and welfare of the whole population including hospitals and other medical facilities, police and fire stations, emergency operations centers, evacuation shelters and schools.
- ***Government Facilities***: Facilities associated with the continued operations of government services such as courthouses, city/village halls, township buildings and highway/maintenance centers.
- ***Infrastructure Systems***: Infrastructure associated with drinking water, wastewater, transportation (roads, railways, waterways), communication systems, electric power, natural gas and oil.
- ***Housing Facilities***: Facilities that serve populations that have access and function needs such as nursing homes, skilled and memory care facilities, residential group homes and day care centers.
- ***High Potential Loss Facilities***: Facilities that would have an impact or high loss associated with them if their functionality is compromised such as nuclear power plants, dams, levees, military installations and facilities housing industrial or hazardous materials.
- ***Gathering Places***: Facilities such as parks, libraries, community centers and churches.

As part of the planning process each participating jurisdiction completed a questionnaire identifying the critical facilities and infrastructure located within their jurisdiction, both publicly and privately-owned. **Figure R-4**, located at the end of this section, identifies the number of critical facilities and infrastructure located in each participating jurisdiction for select categories. Identifying these assets makes local leaders more aware of the critical facilities and infrastructure located within their jurisdictions and helps them make informed choices on how to better protect these key resources.

While considered a "local government entity" for planning purposes, Edgar County Community Unit School District (CUSD) #6, Kansas CUSD #3, Paris CUSD #4, Paris Union School District (SD) #95, Shiloh CUSD #1, Chrisman Fire Protection District (FPD), Hume FPD, Metcalf FPD and Horizon Health do not have an extensive inventory of assets in which to consider when conducting the risk assessment.

Since the assets for these local government entities are located within a participating municipality and are a subset of these municipalities' critical facilities , their risk is considered to be the same or similar to the risk experienced by the municipalities for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.). For those hazards where the risk to the CUSD/SDs, FPDs and medical center varies from the risk facing the municipalities, a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

The critical facilities for Shiloh Township are located in unincorporated Edgar County. Their risk is considered to be the same or similar to the risk experienced by the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) For those hazards where the risk to township critical facilities varies from the risk facing the planning area (i.e., the County), a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Critical Facilities Vulnerability Survey

The participating jurisdictions were also asked to complete a Critical Facilities Vulnerability Survey at the third meeting to assist in the preparation of an overall summary of each jurisdiction's vulnerability to the studied hazards. The Survey asked participants to describe their jurisdiction's greatest vulnerability. This information is summarized under the appropriate hazard's vulnerability subsection.

Figure R-1
Risk Priority Index Scoring System

Category	Factors	Point Value
Hazard Frequency	An event is anticipated to occur within the next year. Based on previous history, at least one event is expected to occur in any given year.	4
	An event is likely to occur in the next 1 to 3 years. Based on previous history, an event has at least a 33% chance of occurring in any given year.	3
	An event is possible in the next 3 to 10 years. Based on previous history, an event has a 10% to 33% chance of occurring in any given year.	2
	An event is unlikely to occur within the next 10 years. These events occur infrequently and based on previous history have a less than 10% chance of occurring in any given year.	1
Impacts on Life & Health	Fatalities are expected to occur during the event.	4
	While fatalities are unlikely, injuries, some requiring hospitalization, may occur during the event.	3
	Minor injuries not requiring hospitalization may occur during the event.	2
	Injuries or fatalities are unlikely to occur during the event.	1
Impacts on Property & Infrastructure	- Substantial property damage is likely to occur including damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at multiple infrastructure and critical facilities (i.e., road & school closures, loss of power to drinking water/wastewater treatment facilities, municipal buildings, etc.) is anticipated for an extended period of time (i.e., a day or more).	4
	- Property damage is expected to occur including superficial damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at multiple infrastructure and critical facilities is anticipated for a period of time (i.e., a day or less).	3
	- Some minor property damage is anticipated (i.e., shingles & siding torn off homes, windows broken, etc.) but no damage to infrastructure or critical facilities is anticipated. AND/OR - Loss of access/operations to infrastructure and critical facilities is anticipated but only for a short period of time (i.e., up to a couple hours).	2
	Property damage is likely to be negligible and no loss of access/operations is anticipated at any infrastructure/critical facilities during the event.	1

Figure R-2
Risk Priority Index Hazard Ranking by Participating Jurisdiction
(Sheet 1 of 2)

Hazard	Hazard Ranking by Participating Jurisdiction							
	Edgar County	Brocton	Chrisman	Hume	Kansas	Metcalf	Paris	Redmon
Drought	8	**1**	10	7/8/9/10	3/4	10/11/12/13/14	12/13	7/8/9/10
Earthquakes	14	12/13/14	11/12/13/14	11/12/13/14	12/13/14	10/11/12/13/14	5/6/7/8/9/10	11/12/13/14
Excessive Heat	6	2	7/8/9	7/8/9/10	**1/2**	7/8/9	5/6/7/8/9/10	3/4/5/6
Extreme Cold	3	3/4/5	7/8/9	**1/2**	**1/2**	7/8/9	**1/2/3/4**	3/4/5/6
Floods	11	3/4/5	4/5/6	7/8/9/10	5	2/3/4/5/6	**1/2/3/4**	7/8/9/10
Hail	7	6/7	4/5/6	3/4/5	9/10/11	7/8/9	11	7/8/9/10
HazMat Incidents: Fixed Facility	12	12/13/14	11/12/13/14	11/12/13/14	12/13/14	10/11/12/13/14	12/13	11/12/13/14
HazMat Incidents: Transportation	10	8/9/10/11	11/12/13/14	11/12/13/14	7/8	10/11/12/13/14	**1/2/3/4**	11/12/13/14
Heavy Rain	4	6/7	7/8/9	7/8/9/10	6	2/3/4/5/6	5/6/7/8/9/10	**1/2**
Lightning	9	8/9/10/11	**1/2**	**1/2**	9/10/11	2/3/4/5/6	5/6/7/8/9/10	7/8/9/10
Terrorism	13	12/13/14	11/12/13/14	11/12/13/14	12/13/14	10/11/12/13/14	14	11/12/13/14
Thunderstorms w/ Damaging Winds	**1/2**	8/9/10/11	**1/2**	6	9/10/11	**1**	5/6/7/8/9/10	**1/2**
Tornadoes	5	8/9/10/11	3	3/4/5	7/8	2/3/4/5/6	**1/2/3/4**	3/4/5/6
Winter Storms	**1/2**	3/4/5	4/5/6	3/4/5	3/4	2/3/4/5/6	5/6/7/8/9/10	3/4/5/6

Figure R-2
Risk Priority Index Hazard Ranking by Participating Jurisdiction
(Sheet 2 of 2)

Hazard	Hazard Ranking by Participating Jurisdiction							
	Edgar County CUSD #6	Kansas CUSD #3	Paris CUSD #4	Paris Union School District #95	Shiloh CUSD #1	Hume FPD	Metcalf FPD	Horizon Health
Drought	14	9/10	13/14	14	11	9	10/11/12/13/14	11/12/13
Earthquakes	6/7/8/9	11/12/13/14	13/14	13	12/13/14	13/14	10/11/12/13/14	14
Excessive Heat	11/12	9/10	2/3/4/5/6/7/8/9	8/9/10	6/7/8/9/10	7/8	7/8/9	8/9/10
Extreme Cold	13	6/7/8	2/3/4/5/6/7/8/9	8/9/10	6/7/8/9/10	2	7/8/9	8/9/10
Floods	6/7/8/9	6/7/8	10/11/12	11	5	7/8	2/3/4/5/6	8/9/10
Hail	10	**1/2**	2/3/4/5/6/7/8/9	8/9/10	6/7/8/9/10	5/6	7/8/9	4/5/6/7
HazMat Incidents: Fixed Facility	6/7/8/9	11/12/13/14	2/3/4/5/6/7/8/9	**1/2/3/4**	12/13/14	11	10/11/12/13/14	11/12/13
HazMat Incidents: Transportation	2/3/4/5	11/12/13/14	2/3/4/5/6/7/8/9	**1/2/3/4**	6/7/8/9/10	12	10/11/12/13/14	11/12/13
Heavy Rain	11/12	**1/2**	2/3/4/5/6/7/8/9	12	3/4	10	2/3/4/5/6	4/5/6/7
Lightning	2/3/4/5	3/4/5	10/11/12	5/6/7	2	**1**	2/3/4/5/6	**1**
Terrorism	6/7/8/9	11/12/13/14	2/3/4/5/6/7/8/9	**1/2/3/4**	12/13/14	13/14	10/11/12/13/14	2/3
Thunderstorms w/ Damaging Winds	2/3/4/5	3/4/5	10/11/12	5/6/7	**1**	3/4	**1**	2/3
Tornadoes	2/3/4/5	6/7/8	**1**	5/6/7	6/7/8/9/10	5/6	2/3/4/5/6	4/5/6/7
Winter Storms	**1**	3/4/5	2/3/4/5/6/7/8/9	**1/2/3/4**	3/4	3/4	2/3/4/5/6	4/5/6/7

Figure R-3
Comparison of 2014 & 2021 Risk Priority Index Hazard Rankings by Participating Jurisdiction
(Sheet 1 of 2)

Hazard	Hazard Ranking by Participating Jurisdiction											
	Edgar County		Chrisman		Hume		Metcalf		Paris		Redmon	
	2014	2021	2014	2021	2014	2021	2014	2021	2014	2021	2014	2021
Drought	4	8	n/a	10	4	7/8/9/10	7	10/11/12/13/14	n/a	12/13	n/a	7/8/9/10
Earthquakes	6	14	n/a	11/12/13/14	8	11/12/13/14	8	10/11/12/13/14	n/a	5/6/7/8/9/10	4	11/12/13/14
Excessive Heat	4	6	n/a	7/8/9	4	7/8/9/10	7	7/8/9	n/a	5/6/7/8/9/10	n/a	3/4/5/6
Extreme Cold	4	3	n/a	7/8/9	7	**1/2**	2	7/8/9	n/a	**1/2/3/4**	2	3/4/5/6
Floods	2	11	**1**	4/5/6	2	7/8/9/10	**1**	2/3/4/5/6	n/a	**1/2/3/4**	n/a	7/8/9/10
Hail	4	7	2	4/5/6	**1**	3/4/5	5	7/8/9	2	11	3	7/8/9/10
HazMat Incidents: Fixed Facility	3	12	3	11/12/13/14	6	11/12/13/14	6	10/11/12/13/14	n/a	12/13	n/a	11/12/13/14
HazMat Incidents: Transportation	3	10	3	11/12/13/14	6	11/12/13/14	6	10/11/12/13/14	n/a	**1/2/3/4**	n/a	11/12/13/14
Heavy Rain	n/a	4	n/a	7/8/9	n/a	7/8/9/10	n/a	2/3/4/5/6	n/a	5/6/7/8/9/10	n/a	**1/2**
Lightning	4	9	2	**1/2**	**1**	**1/2**	5	2/3/4/5/6	2	5/6/7/8/9/10	3	7/8/9/10
Terrorism	n/a	13	n/a	11/12/13/14	n/a	11/12/13/14	n/a	10/11/12/13/14	n/a	14	n/a	11/12/13/14
Thunderstorms w/ Damaging Winds	4	**1/2**	2	**1/2**	**1**	6	5	**1**	2	5/6/7/8/9/10	3	**1/2**
Tornadoes	**1**	5	n/a	3	3	3/4/5	3	2/3/4/5/6	**1**	**1/2/3/4**	**1**	3/4/5/6
Severe Winter Storms	4	**1/2**	n/a	4/5/6	7	3/4/5	2	2/3/4/5/6	n/a	5/6/7/8/9/10	2	3/4/5/6

Figure R-3
Comparison of 2014 & 2021 Risk Priority Index Hazard Rankings by Participating Jurisdiction
(Sheet 2 of 2)

Hazard	Hazard Ranking by Participating Jurisdiction							
	Edgar County CUSD #6		Paris CUSD #4		Shiloh CUSD #1		Horizon Health (formerly Paris Hospital)	
	2014	2021	2014	2021	2014	2021	2014	2021
Drought	3	14	n/a	13/14	n/a	11	8	11/12/13
Earthquakes	5	6/7/8/9	n/a	13/14	5	12/13/14	5	14
Excessive Heat	3	11/12	n/a	2/3/4/5/6/7/8/9	n/a	6/7/8/9/10	8	8/9/10
Extreme Cold	**1**	13	2	2/3/4/5/6/7/8/9	**1**	6/7/8/9/10	3	8/9/10
Floods	**1**	6/7/8/9	n/a	10/11/12	4	5	4	8/9/10
Hail	2	10	**1**	2/3/4/5/6/7/8/9	4	6/7/8/9/10	6	4/5/6/7
HazMat Incidents: Fixed Facility	4	6/7/8/9	3	2/3/4/5/6/7/8/9	3	12/13/14	2	11/12/13
HazMat Incidents: Transportation	4	2/3/4/5	3	2/3/4/5/6/7/8/9	3	6/7/8/9/10	2	11/12/13
Heavy Rain	n/a	11/12	n/a	2/3/4/5/6/7/8/9	n/a	3/4	n/a	4/5/6/7
Lightning	2	2/3/4/5	**1**	10/11/12	4	2	6	**1**
Terrorism	n/a	6/7/8/9	n/a	2/3/4/5/6/7/8/9	n/a	12/13/14	n/a	2/3
Thunderstorms w/ Damaging Winds	2	2/3/4/5	**1**	10/11/12	4	**1**	6	2/3
Tornadoes	**1**	2/3/4/5	4	**1**	2	6/7/8/9/10	**1**	4/5/6/7
Severe Winter Storms	**1**	**1**	2	2/3/4/5/6/7/8/9	**1**	3/4	3	4/5/6/7

Figure R-4
Critical Facilities & Infrastructure by Jurisdiction

Participating Jurisdiction	Critical Facilities				Critical Infrastructure						
	Government[1]	Emergency Protection[2]	Medical & Healthcare[3]	Schools	Drinking Water[4]	Wastewater Treatment[5]	Rail Lines	Bridges	Interstates US/State Routes & Key Roads	Power Plants	Comm. Systems
Edgar County	3	16	6	---	---	---	2	6	5	---	---
Brocton	2	1	---	---	2	---	---	---	---	---	---
Chrisman	3	2	3	2	---	---	---	---	---	---	---
Hume	3	2	---	1	2	---	1	2	2	---	---
Kansas	3	2	1	1	2	---	---	---	---	---	---
Metcalf	1	1	---	---	2	---	1	---	2	---	---
Paris	1	4	12	4	2	9	2	---	5	---	---
Redmon	2	1	---	---	---	---	---	---	2	---	---
Shiloh Township	---	---	---	4	---	1	---	---	3	---	---
Edgar County CUSD #6	---	---	---	3	---	---	---	---	---	---	---
Kansas CUSD #3	---	---	---	2	---	1	---	---	---	---	---
Paris CUSD#4	---	---	---	2	---	---	---	---	---	---	---
Paris Union SD #95	---	---	---	6	---	---	---	---	---	---	---
Shiloh CUSD #1	---	---	---	4	---	1	---	---	3	---	---
Chrisman FPD	---	2	3	2	---	---	1	---	2	---	---
Hume FPD	---	1	---	---	---	---	---	---	---	---	---
Metcalf FPD	---	1	---	---	---	---	1	---	1	---	---
Horizon Health	---	---	4	---	---	---	---	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, libraries, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, jail/correctional facilities and evacuation shelters.
[3] Medical & Healthcare includes: public health departments, hospitals, urgent/prompt care and medical clinics, nursing homes, skilled nursing facilities, memory care facilities, residential group homes, etc.
[4] Drinking Water includes: drinking water treatment plants, drinking water wells and water storage towers/tanks.
[5] Wastewater Treatment includes: wastewater treatment plants and lift stations.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

3.1 SEVERE STORMS (THUNDERSTORMS, HAIL, LIGHTNING & HEAVY RAIN)

HAZARD IDENTIFICATION

What is the definition of a severe storm?

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) defines a "severe storm" as any thunderstorm that produces one or more of the following:

- winds with gust of 50 knots (58 mph) or greater;
- hail that is at least one inch in diameter (quarter size) or larger; and/or
- a tornado.

While severe storms are capable of producing deadly lightning and heavy rain that may lead to flash flooding, the NWS does not use lightning/either to define a severe storm. However, a discussion of both lightning and heavy rain is included in this section because both are capable of causing extensive damage. For the purposes of this report, tornadoes and flooding are categorized as separate hazards and are not discussed under severe storms.

What is a thunderstorm?

A thunderstorm is a rain shower accompanied by lightning and thunder. An average thunderstorm is approximately 15 miles in diameter, affecting a relatively small area when compared to winter storms or hurricanes, and lasts an average of 30 minutes. Thunderstorms can bring heavy rain, damaging winds, hail, lightning and tornadoes.

There are four basic types of thunderstorms: single-cell, multi-cell, squall line, and supercell. The following provides a brief description of each.

Single-cell Thunderstorm

Single cell storms are small, weak storms that only last about ½ hour to an hour and are not usually considered severe. They are typically driven by heating on a summer afternoon. Occasionally a single cell storm will become severe, but only briefly. When this happens, it is called a pulse severe storm.

Multi-cell Thunderstorm

Multi-cell storms are the most common type of thunderstorms. A multi-cell storm is organized in clusters of at least two to four short-lived cells. Each cell usually lasts 30 to 60 minutes while the system as whole may persist for many hours. Multi-cell storms may produce hail, strong winds, brief tornadoes, and/or flooding.

Squall Line

A Squall line is a group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain. The line of storms can be continuous or there can be gaps and breaks in the line. Squall lines tend to pass quickly and can be hundreds of miles long but are typically only 10 to 20 miles wide. A "bow echo" is a radar signature of a squall line that "bows out" as winds fall behind the line and circulation develops on either end.

Supercell Thunderstorm

Supercell storms are long-lived (greater than one hour) and highly organized storms that feed off a rising current of air (an updraft). The main characteristic that sets a supercell storm apart from other thunderstorm types is the presence of rotation in the updraft. The rotating updraft of a supercell (called a mesocyclone when visible on radar) helps a supercell storm produce extreme weather events. Supercell storms are potentially the most dangerous storm type and have been observed to generate the vast majority of large and violet tornadoes, as well as downburst winds and large hail.

Despite their size, all thunderstorms are dangerous and capable of threatening life and property. Of the estimated 100,000 thunderstorms that occur each year in the United States, roughly 10% are classified as severe.

What kinds of damaging winds are produced by a thunderstorm?

Aside from tornadoes, thunderstorms can produce straight-line winds. A straight-line wind is defined as any wind produced by a thunderstorm that is not associated with rotation. There are several types of straight-line winds including downdrafts, downbursts, microbursts, gust fronts and derechos.

Damage from straight-line winds is more common than damage from tornadoes and accounts for most thunderstorm wind damage. Straight-line wind speeds can exceed 87 knots (100 mph), produce a damage pathway extending for hundreds of miles and can cause damage equivalent to a strong tornado.

The NWS measures a storm's wind speed in knots or nautical miles. A wind speed of one knot is equal to approximately 1.15 miles per hour. **Figure SS-1** shows conversions from knots to miles per hour for various wind speeds.

Figure SS-1
Wind Speed Conversions

Knots (kts)	Miles Per Hour (mph)	Knots (kts)	Miles Per Hour (mph)
50 kts	58 mph	60 kts	69 mph
52 kts	60 mph	65 kts	75 mph
55 kts	63 mph	70 kts	81 mph
58 kts	67 mph	80 kts	92 mph

What is hail?

Hail is precipitation in the form of spherical or irregular-shaped pellets of ice that occur within a thunderstorm when strong rising currents of air (updrafts) carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Hailstones grow by colliding with supercooled water drops. The supercooled water drops freeze on contact with ice crystals, frozen rain drops, dust, etc. Thunderstorms with strong updrafts continue lifting the hailstones to the top of the cloud where they encounter more supercooled

water and continue to grow. Eventually the updraft can no longer support the weight of the hail, or the updraft weakens, and the hail falls to the ground.

In the United States, hail causes more than $1 billion in damages to property and crops annually. Hail has been known to cause injuries, although it rarely causes fatalities or serious injury.

How is the severity of a hail event measured?

The severity or magnitude of a hail event is measured in terms of the size (diameter) of the hailstones. The hail size is estimated by comparing it to known objects. **Figure SS-2** provides descriptions for various hail sizes.

Figure SS-2
Hail Size Descriptions

Hail Diameter (inches)	Description	Hail Diameter (inches)	Description
0.25 in.	pea	1.75 in.	golf ball
0.50 in.	marble/mothball	2.50 in.	tennis ball
0.75 in.	penny	2.75 in.	baseball
0.88 in.	nickel	3.00 in.	teacup
1.00 in.	quarter	4.00 in.	grapefruit
1.50 in.	ping pong ball	4.50 in.	softball

Source: NOAA, National Severe Storm Laboratory.

Hail size can vary widely. Hailstones may be as small as 0.25 inches in diameter (pea-sized) or, under extreme circumstances, as large as 4.50 inches in diameter (softball-sized). Typically hail that is one (1) inch in diameter (quarter-sized) or larger is considered severe.

The severity of a hail event can also be measured or rated using the TORRO Hailstorm Intensity Scale. This scale was developed in 1986 by the Tornado and Storm Research Organisation of the United Kingdom. It measures the intensity or damage potential of a hail event based on several factors including: maximum hailstone size, distribution, shape and texture, numbers, fall speed and strength of the accompanying winds.

The Hailstorm Intensity Scale identifies ten different categories of hail intensity, H0 through H10. **Figure SS-3** gives a brief description of each category. This scale is unique because it recognizes that, while the maximum hailstone size is the most important parameter relating to structural damage, size alone is insufficient to accurately categorize the intensity and damage potential of a hail event.

It should be noted that the typical damage impacts associated with each intensity category reflect the building materials predominately used in the United Kingdom. These descriptions may need to be modified for use in other countries to take into account the differences in building materials typically used (i.e., whether roofing materials are predominately shingle, slate or concrete, etc.).

Figure SS-3
TORRO Hailstorm Intensity Scale

Intensity Category		Typical Hail Diameter		Description	Typical Damage Impacts
		millimeters (approx.)*	inches (approx.)*		
H0	Hard Hail	5 mm	0.2"	pea	no damage
H1	Potentially Damaging	5-15 mm	0.2" – 0.6"	pea / mothball	slight general damage to plants, crops
H2	Significant	10-20 mm	0.4" – 0.8"	dime / penny	significant damage to fruit, crops, vegetation
H3	Severe	20-30 mm	0.8" – 1.2"	nickel / quarter	severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40 mm	1.0" – 1.6"	half dollar / ping pong ball	widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50 mm	1.2" – 2.0"	golf ball	wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60 mm	1.6" – 2.4"	golf ball / egg	bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-75 mm	2.0" – 3.0"	egg / tennis ball	severe roof damage, risk of serious injuries
H8	Destructive	60-90 mm	2.4" – 3.5"	tennis ball / teacup	severe damage to aircraft bodywork
H9	Super Hailstorms	75-100 mm	3.0" – 4.0"	teacup / grapefruit	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	> 100 mm	> 4.0"	softball	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

* Approximate range since other factors (i.e., number and density of hailstones, hail fall speed and surface wind speed) affect severity.

Source: Tornado and Storm Research Organisation, TORRO Hailstorm Intensity Scale Table.

What is lightning?

Lightning, a component of all thunderstorms, is a visible electrical discharge that results from the buildup of charged particles within storm clouds. It can occur from cloud-to-ground, cloud-to-cloud, within a cloud or cloud-to-air. The air near a lightning strike is heated to approximately 50,000°F (hotter than the surface of the sun). The rapid heating and cooling of the air near the lightning strike causes a shock wave that produces thunder.

Lightning on average causes 60 fatalities and 400 injuries annually in the United States. Most fatalities and injuries occur when people are caught outdoors in the summer months during the afternoons and evenings. In addition, lightning can cause structure and forest fires. Many of the wildfires in the western United States and Alaska are started by lightning. According to the NWS lightning strikes cost more than $1 billion in insured losses each year.

Are alerts issued for severe storms?

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***severe thunderstorm watches*** and ***warnings*** for Edgar County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when severe thunderstorms are possible in or near the watch area. Individuals should stay alert for the latest weather information and be prepared to take shelter.
- **Warning.** A severe thunderstorm warning is issued when severe weather has been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the storm and individuals should seek safe shelter.

HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe storms occurred previously? What is the extent of these previous severe storms?

Tables 1, 2 and 3, located in **Appendix I,** summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Edgar County. Severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning, and heavy rain. In Edgar County, severe storms are the most frequently occurring natural hazard.

Thunderstorms with Damaging Winds

NOAA's Storm Events Database was used to document 117 reported occurrences of thunderstorms with damaging winds in Edgar County between 1969 and 2021. Of the 117 occurrences, 72 had reported wind speeds of 50 knots or greater. There were 45 occurrences, however, where the wind speed was not recorded. Included in the 117 thunderstorms with damaging winds events are seven events that contributed to two separate federal disaster declarations for Edgar County.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1969 – 2021): ***117***

Number of recorded Severe Hail Events (1974 – 2021): ***43***

Number recorded of Lightning Strike Events (2000 – 2021): ***1***

Number of Heavy Rain Events (2000 – 2021): ***108***

Highest Recorded Wind Speed: ***75 knots (November 6, 2005)***

Largest Hail Recorded: ***3 inches (May 1, 2016)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***May***

Most Likely Month for Severe Hail to Occur: ***April***

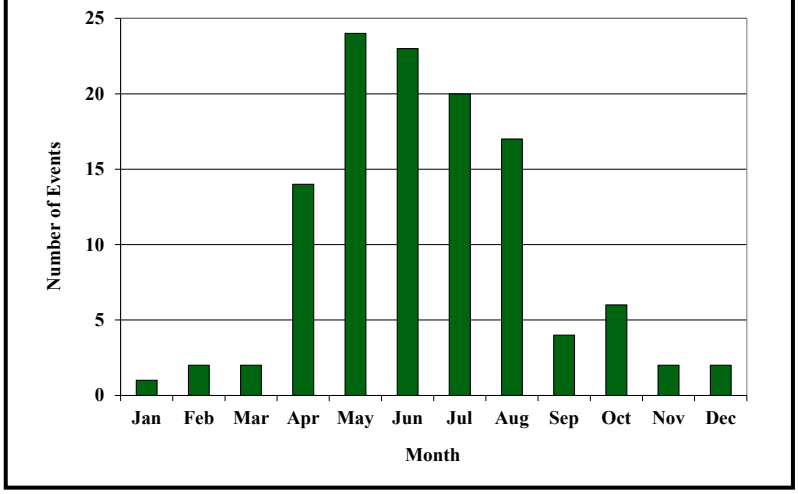
Most Likely Month for Heavy Rain to Occur: ***July***

The highest wind speed recorded in Edgar County occurred in Chrisman on November 6, 2005. when winds reached 75 knots (86 mph) during a thunderstorm event. Thunderstorms with damaging winds have been *recorded* in every participating jurisdiction within the County on multiple occasions.

Of the 117 events, 67 (57%) took place in May, June, and July making this the peak period for thunderstorms with damaging winds in Edgar County. Of those 67 events, 24 (36%) occurred

during May, making this the peak month for thunderstorms with damaging winds. Of the 117 occurrences, 83% of all thunderstorms with damaging winds occurred during the p.m. hours.

Figure SS-4
Thunderstorms with Damaging Winds by Month
1969 – 2021



Hail

NOAA's Storm Events Database was used to document 43 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Edgar County between 1974 and 2021. Of the 43 occurrences, 24 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Edgar County measured 3.00 inches in diameter (teacup sized) and fell on May 1, 2016, near Borton. Hail one (1) inch in diameter or greater has been *recorded* in every participating jurisdiction on at least one occasion, with the exception of Metcalf. This does not mean that hail one inch in diameter or greater has not fallen in Metcalf, it simply indicates it wasn't recorded.

Figure SS-5 charts the reported occurrences of hail by month. Of the 43 occurrences, 27 (63%) took place in April and May, making this the peak period for hail in Edgar County. Of these 27 events, 14 (52%) occurred during April, making this the peak month for hail events. Of the 43 occurrences, 38 (88%) of all severe storms with hail occurred during the p.m. hours.

Lightning

While lightning strike events occur regularly across east-central Illinois, NOAA's Storm Events Database and Committee Member records only identified one recorded occurrence of a lightning strike in Edgar County between 2000 and 2021. On April 22, 2011 lightning struck a residence on Austin Street in Paris causing structural damage. The data limitations are almost certainly due to the rural nature of the County.

According to data from Vaisala's National Lightning Detection Network, Edgar County averaged from to 6 to 12 cloud-to-ground lightning flashes per square mile annually between 2009 and 2018. **Figure SS-6** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile per year) by county for the continental U.S. In comparison, Illinois averaged 12.7 cloud-to-ground lightning flashes per square mile from 2009 to 2018, ranking it eighth in the Country for lightning flash density.

Figure SS-5
Hail Events by Month
1973 – 2021

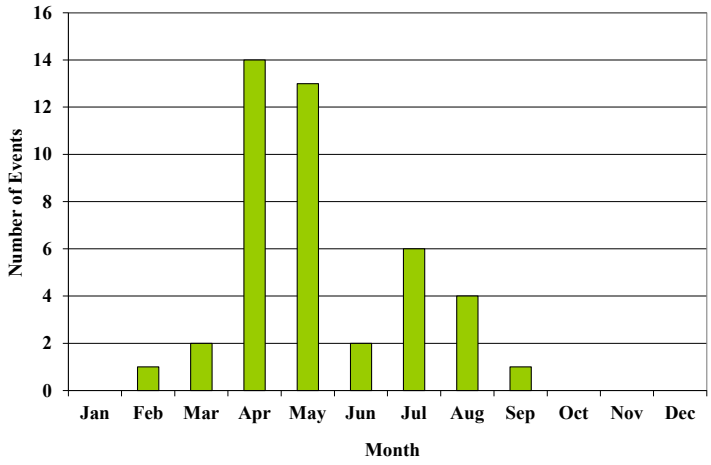
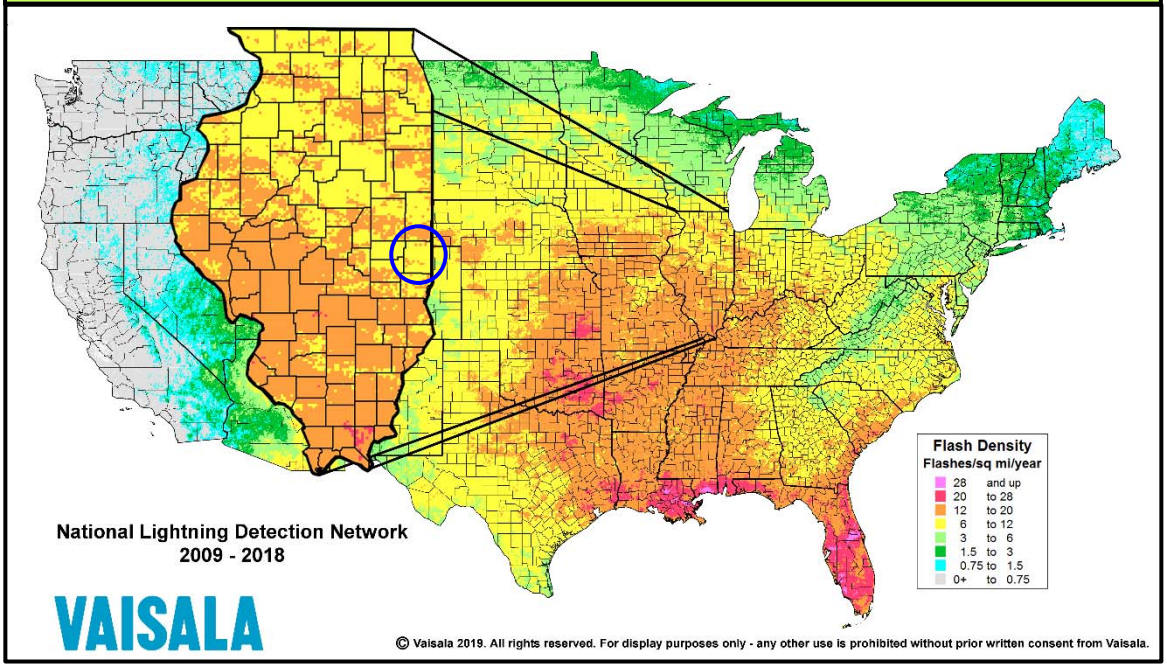


Figure SS-6
Cloud-to-Ground Lightning Flash Density: Continental U.S.

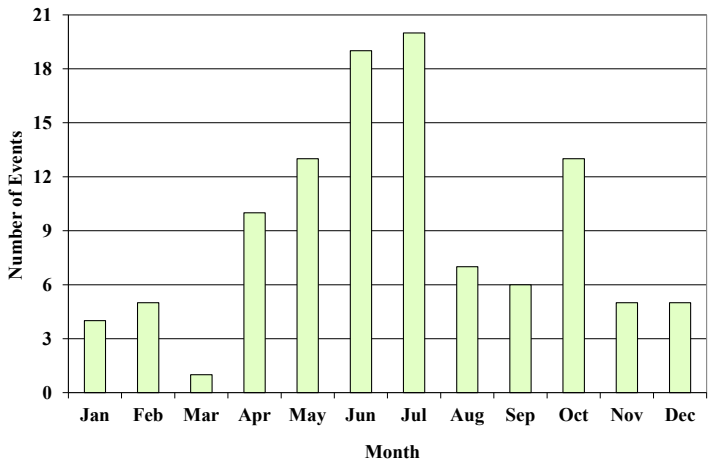


Heavy Rain

NOAA's Storm Events Database, Midwestern Regional Climate Center's cli-MATE database and National Weather Service's COOP data records were used to document 108 heavy rain events for Edgar County between 2000 and 2021. Of the 108 occurrences, 26 events (24%) produced three inches or more of rain.

Figure SS-7 charts the reported occurrences of heavy rain by month. Of the 108 events, 52 (48%) took place in May, June, and July making this the peak period for heavy rain in Edgar County. Of these 52 events, 20 (38%) occurred during July, making this the peak month for heavy rains. Of the 36 events with recorded times, 22 (58%) started during in the p.m. hours.

Figure SS-7
Heavy Rain Events by Month
2000 - 2021



What locations are affected by severe storms?

Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency (IEMA) classifies Edgar County's hazard rating for severe storms as "severe." (IEMA's overall hazard rating system has five levels: very low, low, medium, high, and severe.)

What is the probability of future severe storm events occurring?

Thunderstorms with Damaging Winds

Edgar County has had 117 verified occurrences of thunderstorms with damaging winds between 1969 and 2021. With 117 occurrences over the past 53 years, Edgar County would expect to experience at least two thunderstorms with damaging winds in any given year. There were 22 years over the last 53 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the County is 41.5%.

Hail

There have been 43 verified occurrences of hail one (1) inch in diameter or greater between 1974 and 2021. With 43 occurrences over the past 48 years, Edgar County should expect to experience almost one severe storm with damaging hail in any given year. There were 10 years over the last 48 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the County is 20.8%.

Heavy Rain

Edgar County has had 108 heavy rain events between 2000 and 2021. With 108 occurrences over the past 22 years, the County should expect to experience approximately five heavy rain events each year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Edgar County is vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across north-central Illinois. Since 2012, Edgar County has recorded 27 thunderstorms with damaging winds, 14 severe storms with hail one (1) inch in diameter or greater, and 51 verified heavy rain events.

Figure SS-8 details the number thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **Figure SS-9** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Edgar County. The one verified lightning strike event occurred in Paris.

Figure SS-8
Verified Severe Storm Events by Participating Municipality

Participating Municipality	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Brocton[a]	6	3
Chrisman[1,b]	22	9
Hume[2,a]	6	2
Kansas[c]	19	1
Metcalf [3,a]	4	0
Paris[d,e,§]	68	21
Redmon[a]	9	2

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[§] Horizon Health
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4

Figure SS-9
Verified Severe Storm Events in Unincorporated Edgar County

Unincorporated Area	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Bell Ridge[e]	1	0
Borton[a]	1	1
Edgar[1,b]	6	1
Edgar Co. Airport[e]	2	0
Grandview[c]	2	0
Horace[e]	1	0
Isabel	1	0
Oliver[e]	1	2
Scottland[1,b]	2	2

Of the participating municipalities, Paris has had more recorded occurrences of thunderstorms with damaging winds and the greatest number of recorded hail events than any of the other municipalities. The difference in the number of recorded events is likely due to the relative size of the municipalities as well as the fact that there was a long-term NWS COOP Observation Station is located in the Paris area.

Do Any of the participating jurisdictions consider severe storms to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered severe storms to be among their jurisdiction's greatest vulnerabilities.

- *Edgar County:* Severe storms have the potential to disrupt communications which would adversely impact emergency response services to residents including police, fire and ambulance.
- *Brocton:* Septic systems don't work on the east side of the Village during heavy rain events. They fill with water from the ground which does not allow residents to use their waste systems.
- *Chrisman FPD:* If communications towners are impacted by high winds or a lightning strike, it would disrupt communications and imped emergency response services to residents.
- *Edgar County CUSD #6:* Loss of power can permanently harm our boilers, pipes, etc. during severe storms.
- *Horizon Health*: Loss of power for an extended period of time caused by severe storms could adversely impact patient care.
- *Hume FPD:* Severe storms can down power lines causing outages that impact critical services to residents.
- *Kansas CUSD #3:* Heavy rains cause flooding in and around the school and parking lot, impeding travel. In addition, lightning strikes have the potential to cause power outages which would stop the sump pumps from working. Thunderstorms with damaging winds have the potential to cause roof damage.
- *Metcalf FPD:* The main county road through the Village floods during heavy rain events restricting travel including that of emergency responders.
- *Paris*: Severe storms can down power lines causing outages that impact critical services to residents.
- *Paris CUSD #4:* A lightning strike or brown out could damage our technology equipment. Without a backup generator, an extended power loss would adversely impact learning and would require students to be sent home.
- *Paris Union SD #95:* The school basement floods during heavy rain events.
- *Shiloh CUSD #1:* Heavy rain can cause water to stand and flow across the road leading to the school impeding travel. In addition, the parking lot and playground have flood.

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $2,462,500 in recorded property damages and $195,000 in crop damages. The following provides a breakdown of impacts by category.

Thunderstorms with Damaging Winds

Data obtained from NOAA's Storm Events Database indicates that between 1969 and 2021, 42 of the 117 thunderstorms with damaging winds caused $1,636,000 in property damages and $25,000 in crop damages. Damage information was either unavailable or none was recorded for the remaining 75 reported occurrences.

NOAA's Storm Events Database documented three injuries as the result of two separate thunderstorm with damaging wind events. Detailed information was only available for one of the events. On April 15, 1994 winds blew a pickup truck off of Illinois Route 133 west of Paris injuring one person in the truck.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts:
- Total Property Damage (42 events): ***$1,636,000***
- Total Crop Damage (1 event): ***$25,000***
- Injuries (2 events): ***3***
- Fatalities: ***n/a***

Severe Hail Impacts:
- Total Property Damage (3 events): ***$815,000***
- Total Crop Damage (1 event): ***$170,000***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Lightning Strike Impacts:
- Total Property Damage (1 event): ***$11,500***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Heavy Rain Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Storms Risk/Vulnerability:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

Hail

Data obtained from NOAA's Storm Events Database and Committee Member records indicates that between 1974 and 2021, three of the 43 hail events caused $815,000 in property damages and $170,000 in crop damage. Damage information was either unavailable or none was recorded for the remaining 40 events. Included in the property damage figure provided above is $750,000 in damage sustained by Paris Union SD #95 on April 26, 2016.

No injuries or fatalities were reported as a result of any of the recorded hail events.

Lightning

Data obtained from Committee Member records indicates that April 22, 2011 verified lightning strike event caused $11,500 in property damage to a residence in Paris. No injuries or fatalities were reported as a result of any of the recorded lightning strike events.

Heavy Rain

Damage information was either unavailable or none was recorded for the 108 heavy rain events between 2000 and 2021. No injuries or fatalities were reported as a result of any of the heavy rain events.

What other impacts can result from severe storms?

In Edgar County, the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2014 through 2018 indicates

that wet road surface conditions were present for 10.9% to 14.5% of all crashes recorded annually in the County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure SS-10** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

Figure SS-10
Severe Weather Crash Data for Edgar County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2015	367	47	8	0
2016	302	33	14	1
2017	278	39	17	0
2018	314	39	11	0
2019	303	44	21	0
Total:	**1,564**	**202**	**71**	**1**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe storms?

For Edgar County the level of risk or vulnerability posed by severe storms to public health and safety is considered to be ***low***. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, Horizon Health (formerly Paris Community Hospital) as well as hospitals in Champaign (Champaign County), Danville (Vermilion County), Mattoon (Coles County), Terre Haute, Indiana (Vigo County) and Clinton, Indiana (Vermillion County) are equipped to provide care to persons injured during a severe storm.

Are existing buildings, infrastructure, and critical facilities vulnerable to severe storms?

Yes. All existing buildings, infrastructure and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings, and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines; power substations; transformers and poles; and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days

to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available. Six of the participating jurisdictions acknowledged the need for emergency backup generators to allow continued operation of critical facilities such as county/municipal buildings, drinking facilities, warming/cooling centers, shelters, schools, emergency services (police and fire) and health services.

According to the Critical Facilities Vulnerability Survey completed by the participants, Paris has a backup generator at its wastewater facility while Brocton, Metcalf and Paris have backup generators at their drinking water facilities. None of the participants have backup generators at their administrative buildings.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered, and government services can be affected.

Based on the frequency with which severe storms occur in Edgar County, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is ***medium***.

Are future buildings, infrastructure, and critical facilities vulnerable to severe storms?

Yes and No. While Paris has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms, the County and the six remaining participating municipalities do not.

In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from severe storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 46 of the 269 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. However, according to the Edgar County Supervisor of Assessments the total equalized assessed values of buildings in the planning area is $129,353,780. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to severe storm events.

3.2 SEVERE WINTER STORMS

HAZARD IDENTIFICATION

What is the definition of a severe winter storm?

A severe winter storm can range from moderate snow over a few hours to significant accumulations of sleet and/or ice to blizzard conditions with blinding, wind-driven snow that last several days. The amount of snow or ice, air temperature, wind speed and event duration all influence the severity and type of severe winter storm that results. In general, there are three types of severe winter storms: blizzards, heavy snowstorms and ice storms. The following provides a brief description of each type as defined by the National Weather Service (NWS).

- **Blizzards.** Blizzards are characterized by strong winds of at least 35 miles per hour and are accompanied by considerable falling and/or blowing snow that reduces visibility to ¼ mile or less. Blizzards are the most dangerous of all winter storms.
- **Heavy Snowstorms.** Heavy snowstorms are generally defined as producing snowfall accumulations of four inches or more in 12 hours or less or six inches or more in 24 hours or less.
- **Ice Storms.** An ice storm occurs when substantial accumulations of ice, generally ¼ inch or more, build up on the ground, trees and utility lines as a result of freezing rain.

What is snow?

Snow is precipitation in the form of ice crystals. These ice crystals are formed directly from the freezing of water vapor in wintertime clouds. As the ice crystals fall toward the ground, they cling to each other creating snowflakes. Snow will only fall if the temperature remains at or below 32°F from the cloud base to the ground.

What is sleet?

Sleet is precipitation in the form of ice pellets. These ice pellets are composed of frozen or partially frozen rain drops or refrozen partially melted snowflakes. Sleet typically forms in winter storms when snowflakes partially melt while falling through a thin layer of warm air. The partially melted snowflakes then refreeze and form ice pellets as they fall through the colder air mass closer to the ground. Sleet usually bounces after hitting the ground or other hard surfaces and does not stick to objects.

What is freezing rain?

Freezing rain is precipitation that falls in the form of a liquid (i.e., rain drops), but freezes into a glaze of ice upon contact with the ground or other hard surfaces. This occurs when snowflakes descend into a warmer layer of air and melt completely. When the rain drops that result from this melting fall through another thin layer of freezing air just above the surface they become "supercooled", but they do not have time to refreeze before reaching the ground. However, because the raindrops are "supercooled", they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

Are alerts issued for severe winter storms?

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***winter storm watches*** and ***warnings*** for Edgar County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** The following watches are issued in advance of a storm and indicate the potential for significant winter weather within the next day or two.
  - **Winter Storm Watch**. A winter storm watch is issued when conditions are favorable for the development of a hazardous winter weather event which has the potential to threaten life or property.
  - **Blizzard Watch**. A blizzard watch is issued when conditions are favorable for the development of blizzard conditions:
    - sustained winds or at least 35 mph and
    - reduced visibility of ¼ mile or less.
- **Advisories.** Winter advisories are issued for winter weather events that pose a significant inconvenience, especially to motorist, but should not be life-threatening if caution is exercised. The following advisories are generally issued 12 to 36 hours prior to an event.
  - **Freezing Rain Advisory.** A freezing rain advisory is issued when ice accumulations of up to ¼ inch are expected.
  - **Winter Weather Advisory.** A winter weather advisory is issued for one or more of the following:
    - snow accumulations of 3 to 5 inches in 12 hours or less;
    - sleet accumulations up to ¼ inch;
    - freezing rain in combination with sleet and/or snow; or
    - blowing and/or drifting snow.
- **Warnings.** The following winter weather warnings are issued when severe winter weather conditions are expected to cause a significant impact to life or property and make travel difficult to impossible. Individuals are advised to avoid travel and stay indoors.
  - **Blizzard Warning.** A blizzard warning is issued when reduced visibility of less than ¼ mile due to falling and/or blowing snow and strong winds of at least 35 mph or greater are expected for at least three hours.
  - **Ice Storm Warning.** An ice storm warning is issued when ice accumulations of ¼ inch or greater are expected, resulting in hazardous travel conditions, tree damage and extended power outages.
  - **Winter Storm Warning.** A winter storm warning is issued when there is one or more of the following expected:
    - heavy snow accumulations of at least 6 inches in 12 hours or at least 8 inches in 24 hours; or
    - sleet accumulations of at least ½ inch.

HAZARD PROFILE

The following identifies past occurrences of severe winter storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe winter storms occurred previously? What is the extent of these previous severe winter storm?
Table 4, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) recorded in Edgar County.

Severe Winter Storms

Severe Winter Storm Fast Facts – Occurrences

Number of Severe Winter Storm Events Reported (1950 -2021): ***109***
Maximum 24-Hour Snow Accumulation: ***14 inches (December 19, 1973)***
Most Likely Month for Severe Winter Storms to Occur: ***January***

NOAA's Storm Events Database, NWS's COOP data records, and the Midwestern Regional Climate Center records were used to document 109 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in Edgar County between 1950 and 2021. Of the 109 recorded occurrences there were 80 heavy snowstorms or blizzards; 26 combination events (freezing rain, sleet, ice and/or snow); and 3 ice or sleet storms. Included in the 109 severe winter storms are two events that contributed to two separate federal disaster declarations in Edgar County.

Figure SWS-1 charts the reported occurrences of severe winter storms by month. Of the 109 events, 87 (80%) took place in in December, January, and February making this the peak period for severe winter storms. Of these 87 events, 32 (37%) occurred during January, making this the peak month for severe winter storms. There were two events that spanned two months; however, for illustration purposes only the month when the event started is graphed. Of the 109 occurrences, start times were unavailable for 18 events. Of the remaining 91 severe winter storm events with recorded times, 49 (54%) began during the p.m. hours.

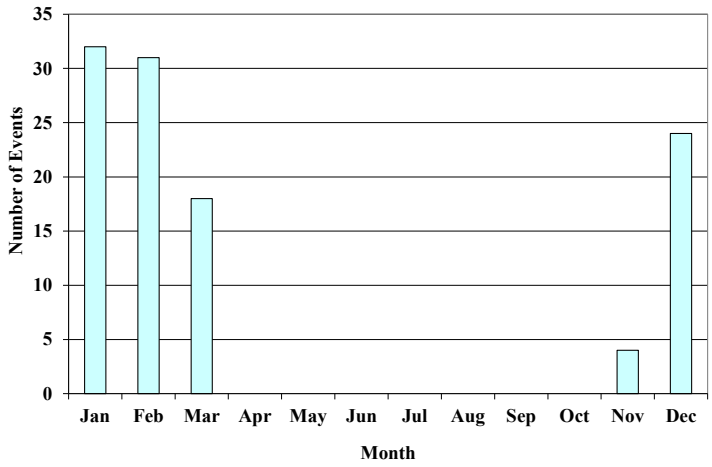
According to the NWS's COOP data records, the maximum 24-hour snow accumulation in Edgar County is 14.0 inches, which occurred on December 19, 1973 at the Paris COOP observation station.

What locations are affected by severe winter storms?
Severe winter storms affect the entire County. All communities in Edgar County have been affected by severe winter storms. Severe winter storms generally extend across the entire County and affect multiple locations. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Edgar County's hazard rating for severe winter storms as "high."

What is the probability of future severe winter storms occurring?
Edgar County has had 109 verified occurrences of severe winter storms between 1950 and 2021. With 109 occurrences over the past 72 years, Edgar County should expect at least one severe winter storm in any given year. There were 32 years over the past 72 years where two or more severe

winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the County is 44%.

Figure SWS-1
Severe Winter Storms by Month
1950 – 2021



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from severe winter storms.

Are the participating jurisdictions vulnerable to severe winter storms?

Yes. All of Edgar County, including the participating jurisdictions, is vulnerable to the dangers presented by severe winter storms. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2011, Edgar County has experienced 12 severe winter storms.

Severe winter storms have immobilized portions of the County, blocking roads; downing power lines, trees, and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the County, township, and municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

Do Any of the participating jurisdictions consider severe winter storms to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considers severe winter storms to be among their community's greatest vulnerabilities.

- *Edgar County CUSD #6:* Loss of power can permanently harm our boilers, pipes, etc. during severe winter storms.

- *Horizon Health*: Loss of power for an extended period of time caused by severe winter storms could adversely impact patient care. Ice storms can lead to a loss of communications that would impact emergency response.
- *Hume FPD:* Ice storms can down power lines causing outages that impact critical services to residents.
- *Paris*: Severe winter storms can down power lines causing outages that impact critical services to residents.
- *Paris CUSD #4:* A lightning strike or brown out could damage our technology equipment. Without a backup generator, an extended power loss would adversely impact learning and would require students to be sent home.
- *Paris Union SD #95:* Emergency backup generators are needed to maintain safe temperatures in the school buildings in the event a severe winter storms caused an extended power outage while students are present.
- *Shiloh CUSD #1:* Ice storms make it hazardous to transport students home following an event. Emergency backup generators are needed to ensure the HVAC system functions if an extended power outage occurs due to an ice storm when students are present.
- *Shiloh Township:* Ice and snow impede travel on township roads.

What impacts resulted from the recorded severe winter storms?

Data obtained from NOAA's Storm Events Database and the Illinois Emergency Management Agency's public assistance figures indicates that between 1950 and 2021, two of the 109 severe winter storms caused $874,441 in property damages. Property damage information was either unavailable or none was recorded for the remaining 107 reported occurrences.

Severe Winter Storms & Extreme Cold Events
Fast Facts – Impacts/Risk

Severe Winter Storm (Snow & Ice) Impacts:
- Total Property Damage (2 events): ***$874,441***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Severe Winter Storm Risk/Vulnerability:
- Public Health & Safety: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium***

In comparison, the State of Illinois has averaged $102 million annually in winter storm losses according to the Illinois State Water Survey's Climate Atlas of Illinois, ranking winter storms second only to flooding in terms of economic loss in the State. While behind floods in terms of the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas, with rural areas being particularly vulnerable.

NOAA's Storm Events Database did not report any injuries or fatalities associated with the recorded severe winter storm events.

What other impacts can result from severe winter storms?

In Edgar County, vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2014 through 2018 indicates that treacherous road conditions caused by snow/slush and ice were present for 1.1% to 10.6% of all crashes recorded annually in the County. **Figure SWS-2** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Persons who are outdoors during and immediately following severe winter storms can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

Figure SWS-2
Severe Winter Weather Crash Data for Edgar County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2015	367	39	3	0
2016	302	21	5	0
2017	278	3	0	0
2018	314	31	3	0
2019	303	15	5	0
Total:	**1,564**	**109**	**16**	**0**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe winter storms?

While severe winter storms occur regularly in Edgar County, the number of injuries and fatalities is relatively low. Taking into consideration the potential for hazardous driving conditions; snow-removal related injuries; and power outages that could leave individuals vulnerable to hypothermia, the risk to public health and safety from severe winter storms is seen as ***low*** to ***medium***.

Are existing buildings, infrastructure, and critical facilities vulnerable to severe winter storms?

Yes. All existing buildings, infrastructure, and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from severe winter storms.

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare but can occur particularly to flat rooftops. Information gathered from Edgar County residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the County. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

When transportation is disrupted, schools close, emergency, and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County, township, and municipalities for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

Based on the frequency with which severe winter storms have occurred in Edgar County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is ***medium***.

Are future buildings, infrastructure, and critical facilities vulnerable to severe winter storms?

Yes. While Paris has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms, the County and six remaining participating municipalities do not.

In addition, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Rural areas of the County have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

What are the potential dollar losses to vulnerable structures from severe winter storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms. Since only two of the 109 recorded events listing property damage numbers for severe winter storms, it is difficult to accurately estimate future potential dollar losses. However, since all existing structures within Edgar County are vulnerable to damage, it is likely that there will be future dollar losses from severe winter storms.

3.3 FLOODS

HAZARD IDENTIFICATION

What is the definition of a flood?

The Federal Emergency Management Agency (FEMA) defines a "flood" as a general or temporary condition where two or more acres of normally dry land or two or more properties are inundated by:

- overflow of inland or tidal waters;
- unusual and rapid accumulation or runoff of surface waters from any source;
- mudflows; or
- a sudden collapse or subsidence of shoreline land.

The severity of a flooding event is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. On average, flooding causes more than $5 billion in damages each year in the United States. Floods cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, decreased land values and impede travel.

What types of flooding occur in the County?

There are two main types of flooding that affect Edgar County: general flooding and flash flooding. General flooding can be broken down into two categories: riverine flooding and shallow flooding. The following provides a brief description of each type.

General Flooding – Riverine Flooding

Riverine flooding occurs when the water in a river or stream gradually rises and overflows its banks. This type of flooding affects low lying areas near rivers, streams, lakes and reservoirs and generally occurs when:

- persistent storm systems enter the area and remain for extended periods of time,
- winter and spring rains combine with melting snow to fill river basins with more water than the river or stream can handle,
- ice jams create natural dams which block normal water flow, and
- torrential rains from tropical systems make landfall.

General Flooding – Shallow Flooding

Shallow flooding occurs in flat areas where there are no clearly defined channels (i.e., rivers and streams) and water cannot easily drain away. There two main types of shallow flooding: sheet flow and ponding. If the surface runoff cannot find a channel, it may flow out over a large area at a somewhat uniform depth in what's called sheet flow. In other cases, the runoff may collect in depressions and low-lying areas where it cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away, they remain in the temporary ponds until the water can infiltrate the soil, evaporate or are pumped out.

Flash Floods

Flash flooding occurs when there is a rapid rise of water along a stream or low-lying area. This type of flooding generally occurs within six hours of a significant rain event and is usually produced when heavy localized precipitation falls over an area in a short amount of time. Considered the most dangerous type of flood event, flash floods happen quickly with little or no warning. Typically, there is no time for the excess water to soak into the ground nor are the storm sewers able to handle the sheer volume of water. As a result, streams overflow their banks and low-lying (such as underpasses, basements etc.) areas can rapidly fill with water.

Flash floods are very strong and can tear out trees, destroy buildings and bridges and roll boulders the size of cars. Flash flood-producing rains can also weaken soil and trigger debris flows that damage homes, roads and property. A vehicle caught in swiftly moving water can be swept away in a matter of seconds. Twelve inches of water can float a car or small SUV and 18 inches of water can carry away large vehicles.

What is a base flood?

A base flood refers to any flood having a 1% chance of occurring in any given year. It is also known as the 100-year flood or the one percent annual chance flood. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and the State of Illinois for the purposes of requiring the purchase of flood insurance and regulating new development.

Many individuals misinterpret the term "100-year flood". This term is used to describe the risk of future flooding; it does not mean that it will occur once every 100 years. Statistically speaking, a 100-year flood has a 1/100 (1%) chance of occurring in any given year. In reality, a 100-year flood could occur two times in the same year or two years in a row, especially if there are other contributing factors such as unusual changes in weather conditions, stream channelization or changes in land use (i.e., open space land developed for housing or paved parking lots). It is also possible not to have a 100-year flood event over the course of 100 years.

While the base flood is the standard most commonly used for floodplain management and regulatory purposes in the United States, the 500-year flood is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year.

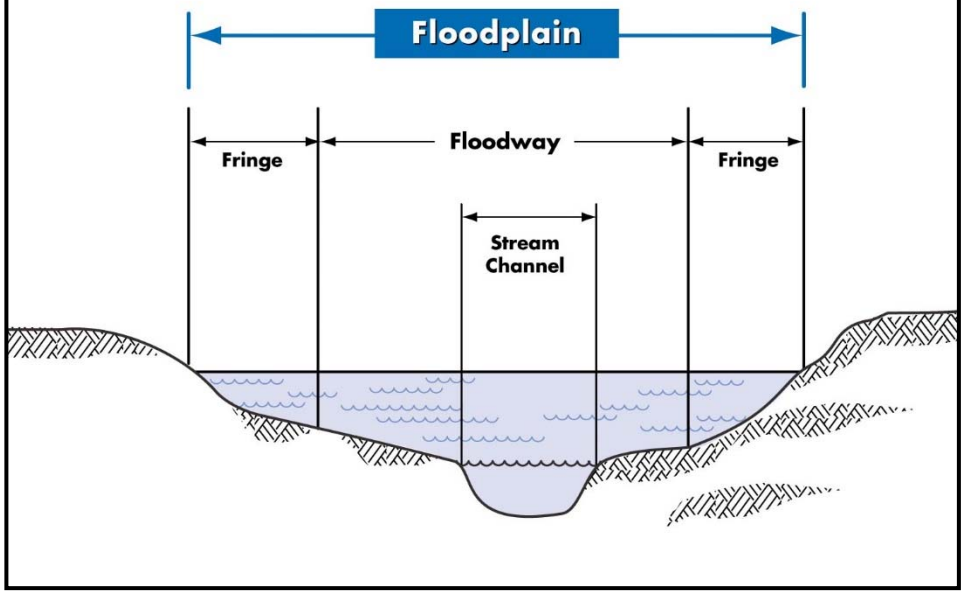
What is a floodplain?

The general definition of a floodplain is any land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). This general definition differs slightly from the regulatory definition of a floodplain.

A regulatory or base floodplain is defined as the land area that is covered by the floodwaters of the base flood. This land area is subject to a 1% chance of flooding in any given year. The base floodplain is also known as the 100-year floodplain or a Special Flood Hazard Area (SFHA). It is this second definition that is generally most familiar to people and the one that is used by the NFIP and the State of Illinois.

A base floodplain is divided into two parts: the floodway and the flood fringe. **Figure F-1** illustrates the various components of a base floodplain.

Figure F-1
Floodplain Illustration



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

The floodway is the channel of a river or stream and the adjacent floodplain that is required to store and convey the base flood without increasing the water surface elevation. Typically, the floodway is the most hazardous portion of the floodplain because it carries the bulk of the base flood downstream and is usually the area where water is deepest and is moving the fastest. Floodplain regulations prohibit construction within the floodway that results in an increase in the floodwater's depth and velocity.

The flood fringe is the remaining area of the base floodplain, outside of the floodway, that is subject to shallow inundation and low velocity flows. In general, the flood fringe plays a relatively insignificant role in storing and discharging floodwaters. The flood fringe can be quite wide on large streams and quite small or nonexistent on small streams. Development within the flood fringe is typically allowed via permit if it will not significantly increase the floodwater's depth or velocity and the development is elevated above or otherwise protected to the base flood elevation.

What is a Special Flood Hazard Area?

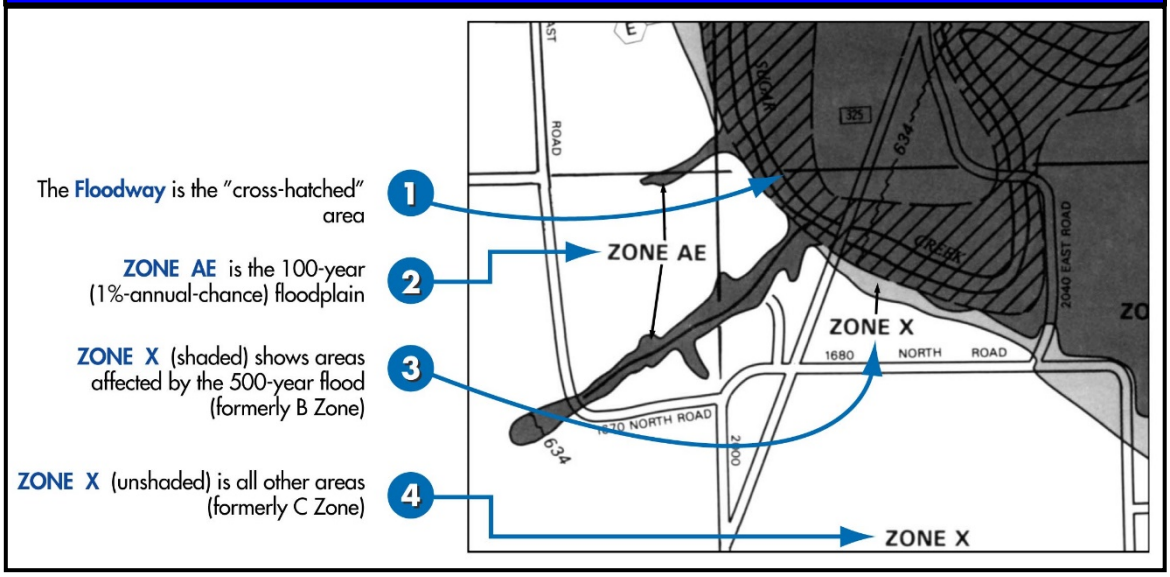
A Special Flood Hazard Area (SFHA) is the base floodplain. As discussed previously, this is the land area that is covered by the floodwaters of the base flood and has a 1% chance of flooding in any given year. The term SFHA is most commonly used when referring to the based floodplain on the Flood Insurance Rate Maps (FIRM) produced by FEMA. The SFHA is the area where floodplain regulations must be enforced by a community as a condition of participation in the NFIP and the area where mandatory flood insurance purchase requirements apply. SFHA are delineated

on the FIRMs and may be designated as Zones A, AE, A1-30, AO, AH, AR, and A99 depending on the amount of flood data available, the severity of the flood hazard or the age of the flood map.

What are Flood Insurance Rate Maps?

Flood Insurance Rate Maps (FIRMs) are maps that identify both the SFHA and the risk premium zones applicable to a community. These maps are produced by FEMA in association with the NFIP for floodplain management and insurance purposes. Digital versions of these maps are referred to as DFIRMs. **Figure F-2** shows an example of a FIRM.

Figure F-2
Example of a Flood Insurance Rate Map (FIRM)



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

A FIRM will generally show a community's base flood elevations, flood zones and floodplain boundaries. The information presented on a FIRM is based on historic, meteorological, hydrologic and hydraulic data as well as open-space conditions, flood-control projects and development. ***These maps only define flooding that occurs when a creek or river becomes overwhelmed. They do not define overland flooding that occurs when an area receives extraordinarily intense rainfall and storm sewers, and roadside ditches are unable to handle the surface runoff.***

What are flood zones?

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. These zones are depicted on a community's FIRM. The following provides a brief description of each flood zone.

- **Zone A.** Zone A, also known as the Special Flood Hazard Area (SFHA) or base floodplain, is defined as the floodplain area that has a 1% chance of flooding in any given year. There are multiple Zone A designations, including Zones A, AO, AH, A1-30, AE, AR or A99. Land areas located within Zone A are considered high-risk flood areas.

During a 30-year period, the length of many mortgages, there is at least a 1 in 4 chance that flooding will occur in a SFHA. The purchase of flood insurance is mandatory for all buildings in SFHAs receiving federal or federally-related financial assistance.

- **Zone X (shaded).** Zone X (shaded), formerly known as Zone B, is defined as the floodplain area between the limits of the base flood (Zone A) and the 500-year flood. Land areas located within Zone X (shaded) are affected by the 500-year flood and are considered at a moderate risk for flooding.

  Zone X (shaded) is also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, shallow flooding areas with average depths of less than one foot or drainage areas less than one square mile. While flood insurance is not federally required in Zone X (shaded), it is recommended for all property owners and renters.

- **Zone X (unshaded).** Zone X (unshaded), formerly known as Zone C, is defined as all other land areas outside of Zone A and Zone X (shaded). Land areas located in Zone X (unshaded) are considered to have a low or minimal risk of flooding. While flood insurance is not federally required in Zone X (unshaded), it is recommended for all property owners and renters.

What is a Repetitive Loss Structure or Property?

FEMA defines a "repetitive loss structure" as a National Flood Insurance Program-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. These structures/properties account for approximately one-fourth of all National Flood Insurance Program (NFIP) insurance claim payments since 1978.

Currently, repetitive loss properties make up about 2% of all NFIP policies, and account for approximately $9 billion in claims or approximately 16% of the total claims paid over the history of the Program. These structures not only increase the NFIP's annual losses, but they also drain funds needed to prepare for catastrophic events. As a result, FEMA and the NFIP are working with states and local governments to mitigate these properties.

What is floodplain management?

Floodplain management is the administration of an overall community program of corrective and preventative measures to reduce flood damage. These measures take a variety of forms and generally include zoning, subdivision or building requirements, special-purpose floodplain ordinances, flood control projects, education and planning. Where floodplain development is permitted, floodplain management provides a framework that minimizes the risk to life and property from floods by maintaining a floodplain's natural function. Floodplain management is a key component of the National Flood Insurance Program.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) is a federal program, administered by FEMA, that:

- mitigates future flood losses nationwide through community-enforced building and zoning ordinances; and

- provides access to affordable, federally-backed insurance protection against losses from flooding to property owners in participating communities.

It is designed to provide an insurance alternative to disaster assistance to meet escalating costs of repairing damage to buildings and their contents due to flooding. The U.S. Congress established the NFIP on August 1, 1968 with the passage of the National Flood Insurance Act of 1968. This Program has been broadened and modified several times over the years, most recently with the passage of the Flood Insurance Reform Act of 2004.

Prior to the creation of the NFIP, the national response to flood disasters was generally limited to constructing flood-control projects such as dams, levees, sea-walls, etc. and providing disaster relief to flood victims. While flood-control projects were able to initially reduce losses, their gains were offset by unwise and uncontrolled development practices within floodplains. In light of the continued increase in flood losses and the escalating costs of disaster relief to taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for protection.

Participation in the NFIP is voluntary and based on an agreement between local communities and the federal government. If a community agrees to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in a SFHA (base floodplain), then the government will make flood insurance available within the community as a financial protection against flood losses.

If a community chooses not to participate in the NFIP or a participating community decides not to adopt new floodplain management regulations or amend its existing regulations to reference new flood hazard data provided by FEMA, then the following sanctions will apply.

- Property owners will not be able to purchase NFIP flood insurance policies and existing policies will not be renewed.
- Federal disaster assistance will not be provided to repair or reconstruct insurable buildings located in identified flood hazard areas for presidentially-declared disasters that occur as a result of flooding.
- Federal mortgage insurance and loan guarantees, such as those written by the Federal Housing Administration and the Department of Veteran Affairs, will not be provided for acquisition or construction purposes within an identified flood hazard area. Federally-insured or regulated lending institutions, such as banks and credit unions, are allowed to make conventional loans for insurable buildings in identified flood hazard areas of non-participating communities. However, the lender must notify applicants that the property is in an identified flood hazard area and that it is not eligible for federal disaster assistance.
- Federal grants or loans for development will not be available in identified flood hazard areas under programs administered by federal agencies such as the Environmental Protection Agency, Small Business Administration and the Department of Housing and Urban Development.

What is the NFIP's Community Rating System?

The NFIP's Community Rating System (CRS) is a voluntary program developed by FEMA to provide incentives (in the form of flood insurance premium discounts) for NFIP participating communities that have gone beyond the minimum NFIP floodplain management requirements to develop extra measures to provide protection from flooding. CRS discounts on flood insurance premiums range from 5% up to 45%. The discounts provide an incentive for communities to implement new flood protection activities that can help save lives and property when a flood occurs.

Are alerts issued for flooding?

Yes. The National Weather Service Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***flood watches*** and ***warnings*** for Edgar County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Flood Watches.** A flood watch is issued when flooding or flash flooding is possible. It does not mean that flooding will occur, just that conditions are favorable. Individuals need to be prepared.
- **Flood Advisories.** A flood advisory is issued when flooding may cause significant inconvenience but is not expected to be to pose an immediate threat to life and/or property. Individuals need to be aware.
- **Warnings.** Warnings indicate a serious threat to life and/or property.
  - **Flood Warning**. A flood warning is issued when flooding is occurring or will occur soon and is expected to last for several days or weeks.
  - **Flash Flood Warning.** A flash flood warning is issued when flash flooding is occurring or is imminent. Flash flooding occurs very quickly so individuals are advised to take action immediately.

HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When has flooding occurred previously? What is the extent of these previous floods?

Tables 5 and **6**, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Edgar County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

General Floods

NOAA's Storm Events Database and Iowa State University's National Weather Service Watch, Warning, and Advisories database were used to document 12 occurrences of general flooding in Edgar County between 2008 and 2021. Included in the 12 general flood events is one event that contributed to one federally-declared disaster for Edgar County.

Flash Floods

NOAA's Storm Events Database and Iowa State University's National Weather Service Watch, Warning, and Advisories database were used to document 64 reported occurrences of flash flooding in Edgar County between 1990 and 2021. Included in the 64 flash flood events are seven events that contributed to two federally-declared disaster in Edgar County.

Flood Fast Facts – Occurrences

Number of General Floods Reported (2008 – 2021): ***12***

Number of Flash Floods Reported (1995 – 2020): ***64***

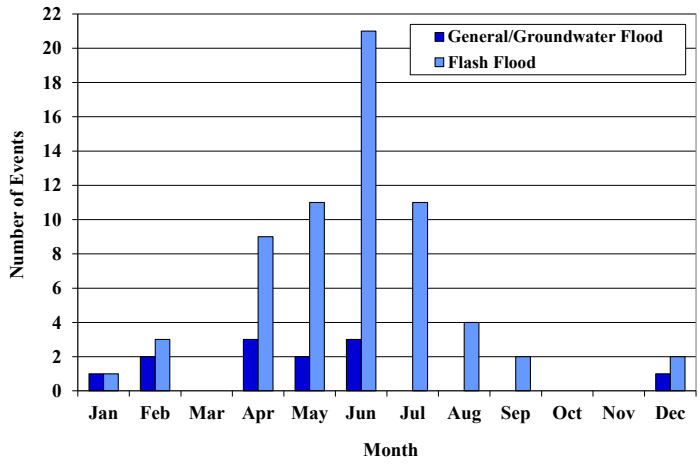
Most Likely Month for General Floods to Occur: ***May***

Most Likely Month for Flash Floods to Occur: ***June***

Number of Federal Disaster Declarations Related to General and Flash Flooding: ***3***

Figure F-3 charts the reported occurrences of flooding by month. Of the 12 general flood events, eight (67%) began in began in April, May and June making these the peak period for general flooding. Of those eight events, three (25%) began during April and an additional three (25%) began during June making these the peak months for general flooding. There was one event that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

Figure F-3
Flood Events by Month



In comparison, 43 of the 64 flash flood events (67%) took place between May, June, and July making this the peak period for flash floods. Of the 43 events, 21 (33%) occurred in June making this the peak month for flash flooding.

Of the 64 flash flood occurrences, start times were unavailable for 28 events. Of the remaining 36 flash flood events with recorded times, approximately 67% began during the p.m. hours. Of the 12 general flood occurrences, start times were only available for three of the events. The remaining three general flood events with recorded time all began during the p.m. hours.

What locations are affected by floods?

Appendix J contains the DFIRMs for Edgar County as well as the participating municipalities. These maps became effective on January 19, 2011. In Edgar County approximately 3.0% of the area in County is designated as being within the base floodplain and susceptible to riverine floods. While a majority of the area prone to riverine flooding is in the unincorporated portions of the County, Chrisman, Hume, Metcalf and Paris are also susceptible to riverine flooding because of their proximity to floodplains.

While specific locations are affected by general flooding, most areas of the County can be impacted by overland and flash flooding because of the topography and seasonally high water table of the area. The *2018 Illinois Natural Hazard Mitigation Plan* classifies (Name) County's hazard rating for floods as "low."

Figure F-4 identifies the bodies of water within or immediately adjacent to participating jurisdictions that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas located within a participating jurisdiction (as identified on the DFIRMs) are identified in bold.

Figure F-4
Bodies of Water Subject to Flooding

Participating Jurisdiction	Water Bodies
Brocton	---
Chrisman	**Tributary Crab Apple Creek**
Hume	**Shiloh #2 Drain**
Metcalf	**Brouilletts Creek**
Paris	**Sugar Creek**
Redmon	---
Unincorporated Edgar County	**Big Creek (West Fork & East Fork)**, **Bonwell Branch**, **Brouilletts Creek (including South Fork and North Fork)**, **Brushy Fork Creek (Clark Branch,** Gilkey Branch**, Pope Branch, McCown Branch)**, **Catfish Creek**, Clear Creek, **Crabapple Creek**, Donica Creek, Drainage Ditch #2, Drainage Ditch #7, **Embarrass River**, Flemington Creek, Goose Creek, **Hickory Grove Creek**, Indian Creek, Lick Run, Mud Creek, **Salt Fork Creek**, **Shiloh #2 Drain**, **Shiloh #3 Ditch**, Shiloh Special Ditch, **Snake Creek, Sugar Creek**, and Willow Creek

Source: FEMA's DFIRMs.

Municipal, Township and County officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities and many unincorporated portions of the County. This overland flooding is known to impair travel.

What jurisdictions within the County take part in the NFIP?

Participating Jurisdictions

Edgar County, Chrisman, Metcalf and Paris participate in the NFIP. **Figure F-5** ***provides information on each NFIP-participating jurisdiction,*** including the date each participant joined, the date of their current effective FIRM and the year of their most recently adopted floodplain zoning ordinance. Brocton, Kansas and Redmon have no identified flood hazard boundaries within

their corporate limits and do not wish to participate in the NFIP at this time. While the current effective DFIRM for Hume (dated January 19, 2011) does identify SFHAs within its limits, the Village chose not to adopt floodplain regulations and participate in the NFIP. As a result, the Village is listed as a community not in the NFIP with a sanction date of January 19, 2012 in FEMA's Community Status Book Report for Illinois. The current Village administration does not see the need to participate since the area within the SFHA only includes one residence.

Figure F-5
NFIP Participating Jurisdictions

Participating Jurisdictions	Participation Date	Current Effective FIRM Date	CRS Participation	Most Recently Adopted Floodplain Zoning Ordinance
Edgar County	01/19/2011	01/19/2011	No	2010
Chrisman	01/19/2011	01/19/2011	No	2010
Metcalf	01/19/2011	01/19/2011	No	2010
Paris	08/19/1985	01/19/2011	No	2010

Sources: FEMA, Community Status Book Report: Illinois.

Non-Participating Jurisdictions

Vermilion has no identified flood hazard boundaries within its corporate limits and has chosen not to participate in the Program.

Jurisdictions that participate in the NFIP are expected to adopt and enforce floodplain management regulations. In Edgar County, all the NFIP participating jurisdictions have adopted floodplain ordinance and as a result, are in compliance with NFIP requirements. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. As a result, all of the NFIP participating jurisdictions are in compliance with NFIP requirements.

Participating jurisdictions will continue to comply with the NFIP by implementing mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within the SFHA. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements is addressed in the Mitigation Action Tables of the participating jurisdictions found in Section 4.7.

What is the probability of future flood events occurring?

General Floods

Edgar County has had 12 verified occurrences of general flooding between 2008 and 2021. With 80 occurrences over the past 14 years, the probability or likelihood of a general flood event occurring in the County in any given year is 86%. There were three years over the past 12 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the County is 25%.

Flash Floods

There have been 64 verified flash flood events between 1990 and 2021. With 64 occurrences over the past 32 years, the County should expect at least two flash flood events in any given year. There were 16 years over the past 32 years where two or more flash flood events occurred. This indicates

that the probability that more than one flash flood event may occur during any given year within the County is approximately 50%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from floods.

Several factors including topography, precipitation and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation which has led to increased flood peaks on Illinois rivers.

Are the participating jurisdictions vulnerable to flooding?

Yes. Edgar County and the participating jurisdictions are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire County susceptible to some form of flooding. Flooding occurs along the floodplains of all the rivers, streams and creeks within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2011, Edgar County has experienced 24 flash flood events and nine general flood events.

Of the 64 flash flood events, 54 have impacted either a large portion or the entire County and were not location specific. Of the 10 remaining events, seven took place in Paris, three took place in Kansas, one took place in Chrisman, and one took place near unincorporated Scottland.

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding.

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open and agricultural land to residential, commercial and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

Do any of the participating jurisdictions consider flooding to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents considered flooding to be among their jurisdiction's greatest vulnerabilities.

- *Edgar County:* The road to the EOC floods during heavy rain events which makes it hard for participants to make it out and impacts service to residents.

- *Brocton:* Houses in the Village are flooded on a regular basis due to heavy rain. Yards, garages, sheds, etc. are damaged by flooding.
- *Chrisman:* The intersection of Illinois Route 1 and Lincoln Street floods during heavy rain events impacting travel. The east end of Monroe street also floods during heavy rain events.
- *Hume:* Center, West and West First Street flood during heavy rain events impeding travel.
- *Kansas CUSD #3:* Heavy rains cause flooding in and around the school and parking lot, impeding travel.
- *Metcalf FPD:* The main county road through the Village floods during heavy rain events restricting travel including that of emergency responders.
- *Paris:* The main road through the City floods during heavy rain events adversely impacting travel.
- *Paris CUSD #4:* Flooding occurs in the boiler room basement and Pre-K basement which has the potential to impact students.
- *Paris Union SD #95:* The school basement floods during heavy rain events.
- *Shiloh CUSD #1:* Heavy rain can cause water to stand and flow across the road leading to the school impeding travel. In addition, the parking lot and playground have flood.
- *Shiloh Township:* Flooding impacts township roads, causing washouts.

What impacts resulted from the recorded floods?

Floods as a whole have caused a *minimum* of $1.9 million in property damages. The following provides a breakdown by category.

In comparison, the State of Illinois has averaged an estimated $257 million annually in property damage losses, making flooding the single most financially damaging natural hazard in Illinois.

Flood Fast Facts – Impacts/Risk

General Flood Impacts:
- Total Property Damage(1 event): ***$1,188,598***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flash Flood Impacts:
- Total Property Damage(2 events): ***$758,798***
- Total Crop Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Flood Risk/Vulnerability to:
- Public Health & Safety – General Flooding: ***Low***
- Public Health & Safety – Flash Flooding: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Medium/High***

General Floods

Data obtained from NOAA's Storm Events Database and IEMA's Public Assistance records indicates that between 2008 and 2021, one of the 12 general flood events caused $1,188,598 in property damages. Damage information was either unavailable or none was recorded for the remaining 11 reported occurrences. No injuries or fatalities were reported as a result of any of the recorded events.

Flash Floods

Data obtained from NOAA's Storm Events Database and IEMA's Public Assistance indicates that between 1990 and 2021, two of the 64 flash flood events caused $758,798 in property damages. Damage information was either unavailable or none was recorded for the remaining 62 reported occurrences. No injuries or fatalities were reported as a result of any of the recorded events.

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a regular basis within the County, the number of injuries and fatalities is low. In terms of the risk or vulnerability to public health and safety from *general floods*, the risk is seen as ***low***. However, over three-quarters of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from *flash floods* is elevated to ***medium***.

Are there any repetitive loss structures/properties within Edgar County?

No. According to information obtained from IEMA, there are no repetitive loss structures located in Edgar County. As described previously, FEMA defines a "repetitive loss structure" as an NFIP-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978.

Are existing buildings, infrastructure and critical facilities vulnerable to flooding?

Yes. **Figure F-6** identifies the *estimated number* of existing residential structures by participating jurisdiction located within a floodplain. These counts were prepared by the Consultant using the

effective DFIRMs. It should be noted that while the identified residential structures are located in a floodplain, the actual number of structures impacted may differ during an actual event.

Figure F-6
Existing Residential Structures Located within a Floodplain by Participating Jurisdiction

Participating Jurisdiction	Number of Residential Structures	Participating Jurisdiction	Number of Residential Structures
Brocton[a]	0	Metcalf[3,a]	0
Chrisman[1,b]	15	Paris[d,e,§]	0
Hume[2,a]	1	Redmon[a]	0
Kansas[c]	0	Unincorp. County	2

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[§] Horizon Health
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris Union SD #95
[e] Paris CUSD #4

Source: FEMA DFIRMs

Aside from key roads and bridges and buried power and communication lines, Chrisman and Paris are the only participating jurisdictions that have specific infrastructure/critical facilities located within or adjacent to a floodplain. Chrisman's drinking water treatment facility is located in the base floodplain of an unnamed tributary of Crab Apple Creek while its wastewater treatment plant is located adjacent to the same base floodplain. Paris's wastewater treatment plant is located adjacent to the Sugar Creek base floodplain while its drinking water treatment facility is located adjacent to the Twin Lakes base floodplain.

While only 3.0% of the land area in Edgar County lies within the base floodplain and is susceptible to riverine flooding, ***almost the entire County is vulnerable to flash flooding***. As a result, ***a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of the base floodplain and are not easily identifiable.***

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be ***medium to high*** based on: (a) the frequency and severity of recorded flood events within the County; (b) the fact that most of the County is vulnerable to flash flooding; and (c) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of the base floodplain.

Are future buildings, infrastructure and critical facilities vulnerable to flooding?

The answer to this question depends on the type of flooding being discussed.

Riverine Flooding

In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

Flash Flooding

In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

What are the potential dollar losses to vulnerable structures from flooding?

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Edgar County.

The purpose of providing an estimate is to help residents and local officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur from a flood event in each of the participating municipalities.

Assumptions

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

Type of Flood Event. The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding has occurred more frequently, riverine floods have caused the greatest amount of recorded damages in the County. In addition, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the base floodplain and the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Assumption #1

A riverine flood event will impact vulnerable residential structures within each municipality.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each municipality (i.e., those structures located within the base floodplain or Special Flood Hazard Areas of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event within each municipality must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along base floodplains for each river, stream and creek.

Assumption #2

All base floodplains within a municipality will flood and experience the same degree of flooding.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

- ❖ all rivers, streams and creeks with base floodplains would overflow their banks, and
- ❖ the base floodplains of each river, stream and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

This assumption results in the following conditions for each municipality:

- ➢ Brocton, Kansas and Redmon would not experience any residential flooding since there are no river, stream or creek base floodplains located within their municipal limits; and
- ➢ *Chrisman*: the unnamed tributary of Crab Apple Creek would overflow its banks and flood small portions on the north side of the City;
- ➢ *Hume:* Shiloh No. 2 Drain would overflow its banks and flood a small portion on the southwest edge of the Village;
- ➢ *Metcalf*: Brouilletts Creek would overflow its banks and flood a small portion on the southeast edge of the Village; and
- ➢ *Paris*: Twin Lakes and Sugar Creek River would overflood their banks and flood small areas on the north and east sides of the City.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the base floodplains within a municipality will experience the same degree of flooding, the number of existing residential structures located within the base floodplain(s) of each municipality can be used to determine the number of potentially-damaged housing units. **Figure F-6** identifies the total number of existing residential structures located within the base floodplains(s) of each municipality. These counts were prepared by the Consultant.

Assumption #3

The number of existing residential structures located within the base floodplain(s) in each municipality will be used to determine the number of potentially-damaged housing units.

While base floodplains are present within Metcalf and Paris, there are no residential structures located within their limits.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in each municipality will be used.

Assumption #4

The average market value for a residential structure in each municipality will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in Edgar County is approximately one-third of the market value). **Figure F-7** provides a sample calculation. The total assessed value is based on 2020 tax assessment information provided by the Edgar County Clerk. **Figure F-8** provides the average assessed value and average market value for each participating municipality.

Figure F-7
Sample Calculation of Average Assessed Value & Average Market Value – Chrisman

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Chrisman: $9,726,430 ÷ 687 housing units = $14,157.83

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Chrisman: $14,157.83 x 3 = $42,473.49
($42,473)

Damage Scenario. The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a) the type of residential structure flooded (i.e., manufactured home, one story home without a basement, one- or two-story home with a basement, etc.) and (b) the flood depth. **Figure F-9** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet.
Structural Damage = 20%
Content Damage = 30%

Figure F-8
Average Market Value of Housing Units by Participating Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2021)	Total Housing Units (2015-2019)	Average Assessed Values	Average Market Value (2021)
Brocton	$1,492,630	178	$8,386	$25,157
Chrisman	$9,726,430	687	$14,158	$42,473
Hume	$2,645,980	183	$14,459	$43,377
Kansas	$4,505,230	424	$10,626	$31,877
Metcalf	$572,010	92	$6,218	$18,653
Paris	$63,227,670	4,459	$14,180	$42,539
Redmon	$1,138,080	101	$11,268	$33,804

Source: Edgar County Clerk.

Figure F-9
FEMA Flood Loss Estimation Tables

Flood Building Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Building Damage)	Two Story No Basement (% Building damage)	One or Two Story With Basement (% Building damage)	Manufactured Home (% Building damage)
-2	0	0	4	0
-1	0	0	8	0
0	9	5	11	8
1	14	9	15	44
2	22	13	20	63
3	27	18	23	73
4	29	20	28	78
5	30	22	33	80
6	40	24	38	81
7	43	26	44	82
8	44	29	49	82
>8	45	33	51	82

Flood Content Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Contents Damage)	Two Story No Basement (% Contents damage)	One or Two Story With Basement (% Contents damage)	Manufactured Home (% Contents damage)
-2	0	0	6	0
-1	0	0	12	0
0	13.5	7.5	16.5	12
1	21	13.5	22.5	66
2	33	19.5	30	90
3	40.5	27	34.5	90
4	43.5	30	42	90
5	45	33	49.5	90
6	60	36	57	90
7	64.5	39	66	90
8	66	43.5	73.5	90
>8	67.5	49.5	76.5	90

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage 20% to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure F-10** provides a sample calculation.

Figure F-10
***Structure:* Potential Dollar Loss Sample Calculation – Chrisman**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit

Chrisman: $42,473 x 20% = $8,494.60 per housing unit

Average Structural Damage x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)

Chrisman: $8,494.60 per housing unit x 15 housing units = $127,419

($127,419)

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage 30% to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure F-11** provides a sample calculation.

Figure F-11
***Content:* Potential Dollar Loss Sample Calculation – Chrisman**

½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit

Chrisman: ½ ($42,473) x 30% = $6,370.95 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

Chrisman: $6,370.95 per housing unit x 15 housing unit = $95,564.25

($95,564)

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure F-12** provides a breakdown of the total potential dollar losses by municipality.

This assessment illustrates the *potential residential dollar losses* that should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within the participating municipalities would be expected to ***range from $15,182 in Hume to $222,983 in Chrisman***. There are five participating municipalities in this scenario who do not have any residences considered vulnerable to riverine flooding.

Figure F-12
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Municipality

Participating Jurisdiction	Average Market Value (2021)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Brocton	$25,157	0	$ 0	$ 0	$ 0
Chrisman	$42,473	15	$127,419	$95,564	$222,983
Hume	$43,377	1	$8,675	$6,507	$15,182
Kansas	$31,877	0	$ 0	$ 0	$ 0
Metcalf	$18,653	0	$ 0	$ 0	$ 0
Paris	$42,539	0	$ 0	$ 0	$ 0
Redmon	$33,804	0	$ 0	$ 0	$ 0

Vulnerability of Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, ***the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences.*** While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, Chrisman's drinking water treatment facility is located in the base floodplain of an unnamed tributary of Crab Apple Creek. No other above-ground infrastructure within the participating jurisdictions, other than key roads and bridges, were identified as being vulnerable to riverine flooding.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. Edgar County has experienced multiple events over the last 20 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

3.4 EXCESSIVE HEAT

HAZARD IDENTIFICATION

What is the definition of excessive heat?

Excessive heat is generally characterized by a prolonged period of summertime weather that is substantially hotter and more humid than the average for a location at that time of year. Excessive heat criteria typically shift by location and time of year. As a result, reliable fixed absolute criteria are not generally specified (i.e., a summer day with a maximum temperature of at least 90°F).

Excessive heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures.

On hot days the human body relies on the evaporation of perspiration or sweat to cool and regulate the body's internal temperature. Sweating does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.

Excessive heat is a leading cause of weather-related fatalities in the United States. According to the Centers for Disease Control and Prevention, a total of 7,415 people died from heat-related illnesses between 1999 and 2010, an average of 618 fatalities a year.

What is the Heat Index?

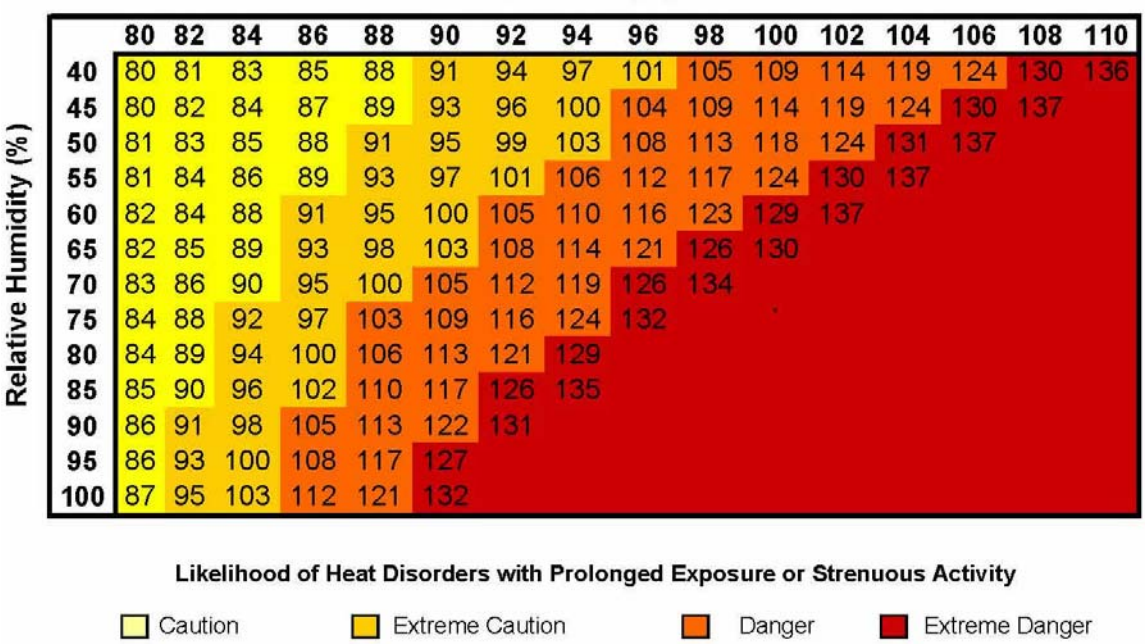
In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **Figure EH-1** shows the Heat Index as it corresponds to various air temperatures and relative humidity.

As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also, strong winds, particularly with very hot, very dry air, can be extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders.

What are heat disorders?

Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

Figure EH-1
Heat Index



Source: NOAA, National Weather Service.

- **Heat Rash.** Heat rash is a skin irritation caused by excessive sweating during hot, humid weather and is characterized by red clusters of small blisters on the skin. It usually occurs on the neck, chest, groin or in elbow creases.
- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches and can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and muscle pains or spasms, usually in the abdomen, arms or legs that during intense exercise. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, muscle cramps, tiredness, weakness, dizziness, headache, nausea or vomiting and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. If not treated, heat exhaustion may progress to heat stroke.
- **Heat Stroke (Sunstroke).** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be red, hot and dry with very little perspiration present. Other symptoms include a rapid and strong pulse, throbbing headache, dizziness, nausea and confusion. There is a possibility that the individual will become unconsciousness. If the body is not cooled quickly, then brain damage and death may result.

Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

Figure EH-2 below indicates the heat index at which individuals, particularly those in higher risk groups, might experience heat-related disorders. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate excessive heat alert procedures.

Figure EH-2
Relationship between Heat Index and Heat Disorders

Heat Index (°F)	Heat Disorders
80°F – 90°F	Fatigue is possible with prolonged exposure and/or physical activity
90°F – 105°F	Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity
105°F – 130°F	Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity
130°F or Higher	Heat stroke highly likely with continued exposure

Source: NOAA, Heat Wave: A Major Summer Killer.

What is an excessive heat alert?

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an excessive heat event. The following provides a brief description of each type of alert based on the ***excessive heat advisory/warning criteria*** established by NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Edgar County.

- **Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to develop over the next three (3) to seven (7) days.
- **Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 24 to 72 hours.
- **Advisory.** An excessive heat advisory is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1994 – 2021): ***76***

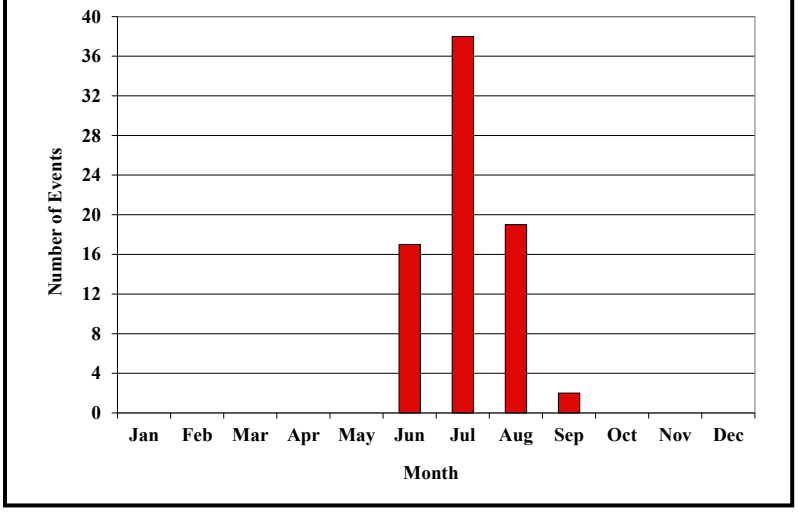
Hottest Temperature Recorded in the County: ***109°F (July 14, 1954)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

Table 7, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Edgar County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database and NWS's COOP Data records were used to document 76 occurrences of excessive heat in Edgar County between 1994 and 2021.

Figure EH-3 charts the reported occurrences of excessive heat by month. Thirty-eight of the 76 events (50%) began in July making this the peak month for excessive heat events in Edgar County. There were five events that spanned two months; however, for illustration purposes only the month the event started is graphed.

Figure EH-3
Excessive Heat by Month
1994 – 2021



According to the Midwestern Regional Climate Center, almost continuous temperature records for Edgar County were kept from 183 to the present by the Paris NWS COOP Observation Station. **Figure EH-4** lists the hottest days recorded at this station. Based on the available records, the

hottest temperature recorded in Edgar County was 109°F at the Paris COOP observation station on July 14, 1954.

Figure EH-4
Hottest Days Recorded at the Morrison NWS COOP Observation Station

	Date	Temperature		Date	Temperature
1	07/14/1936	112°F	7	07/30/1913	106°F
2	07/21/1901	111°F	8	06/01/1934	106°F
3	07/12/1936	108°F	9	06/28/1934	106°F
4	07/29/1916	107°F	10	07/24/1934	106°F
5	07/30/1916	107°F	11	07/11/1936	106°F
6	07/13/1936	107°F			

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat affects the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Whiteside County's hazard rating for excessive heat as "medium."

Do any of the participating jurisdictions have designated cooling centers?

Yes. Six of the ten participating municipalities and fire protection districts have designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events.

Figure EH-5 identifies the location of each cooling center by jurisdiction. At this time Redmon, Chrisman FPD, Hume FPD and Metcalf FPD do not have any cooling centers designated. In addition, there are no State of Illinois-designated cooling centers in Edgar County.

Figure EH-5
Designated Cooling Centers by Participating Jurisdiction

Name/Address	Name/Address
Brocton	*Kansas*
Otho Henn Community Center, 200 S. Howard St.	Kansas Christian Church, 207 E. Jefferson St.
Chrisman	*Metcalf*
Chrisman Public Library, 108 N. Illinois St.	Metcalf Fire Department, 121 Crawford St.
City Office, 222 W. Madison St.	*Paris*
Fire Station 2, 102 S. Indiana St.	Hartley-Taylor Training Facility, 11200 Cherry Point St.
Hume	
Hume Community Center, 101 Front St.	

What is the probability of future excessive heat events occurring?

Edgar County has experienced 76 verified occurrences of excessive heat between 1994 and 202`. With 75 occurrences over the past 28 years, Edgar County should expect to experience approximately three excessive heat events a year. It is important to keep in mind that there are almost certainly gaps in the excessive heat data. More events have almost certainly occurred than

are documented in this section, which means that the probability is almost certainly higher than reported.

There were 18 years over the last 28 years where multiple (three or more) excessive heat events occurred. This indicates that the probability that multiple excessive heat events may occur during any given year within the County is 64%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Edgar County, including the participating jurisdictions, is vulnerable to the dangers presented by excessive heat. Since 2012, the County has experienced 20 excessive heat events.

Do any of the participating jurisdictions consider excessive heat to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered excessive heat to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded for any of the excessive heat events. One fatality was reported as a result of a July 3, 2019 excessive heat event. A 66 year-old man dies of heatstroke while sitting in his car outside his home in Paris. He lived in the non-air conditioning attic of the home.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Impacts:

- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities (1 event): ***1***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability:

- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Sensitive Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, Illinois averages 74 heat-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

No other injuries or fatalities were reported as a result of excessive heat in Edgar County. This does not mean more didn't occur; it simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually, heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for all the excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Edgar County, excessive heat has the ability to impact Brocton and Hume's drinking water supplies as well as those residents in unincorporated Whiteside County who rely on shallow private wells for their drinking water.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Edgar County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be ***low***. This assessment is based on the fact that all but one of the participating municipalities have designated cooling centers and the County does not have many large urban areas where living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) tend to contribute to heat-related injuries and fatalities.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *sensitive populations* is considered to be ***medium***. Sensitive populations such as older adults (those 75 years of age and older) and small children (those younger than 5 years of age) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure EH-6** identifies the percent of sensitive populations by participating municipality and the County based on the U.S. Census Bureau's 2015-2019 American Community Survey data.

Figure EH-6
Sensitive Populations by Participating Jurisdictions

Participating Jurisdiction	% of Population 75 year of age & Older	% of Population Younger than 5 years of age	Total % of Sensitive Population
Brocton	13.5%	2.1%	15.6%
Chrisman	17.4%	3.5%	20.9%
Hume	11.4%	3.4%	14.8%
Kansas	8.4%	7.1%	15.5%
Metcalf	4.2%	2.4%	6.5%
Paris	8.7%	6.0%	14.7%
Redmon	7.8%	2.3%	10.1%
Unincorp. Edgar County	9.1%	4.5%	13.6%
Edgar County	9.7%	5.1%	14.8%
State of Illinois	6.5%	6.0%	12.5%

Source: U.S. Census Bureau.

In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure, and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating jurisdictions are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Edgar County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans, and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Edgar County, there is the potential for this to occur. The potential may increase over the next two decades if new power sources are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered ***low***, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure, and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating jurisdictions are no more vulnerable to excessive heat events than the existing building, infrastructure, and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be extreme. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially sensitive populations such as the elderly, infants, young children, and those with medical conditions.

3.5 EXTREME COLD

HAZARD IDENTIFICATION

What is the definition of extreme cold?

Extreme cold is generally characterized by temperatures well below what is considered normal for an area during the winter months and is often accompanied or is left in the wake of a severe winter storm. Extreme cold criteria vary from region to region. As a result, reliable fixed absolute criteria are not generally specified (i.e., a winter day with a maximum temperature of 0°F).

Whenever the temperature drops below normal and the wind speeds increase, heat can leave the body more rapidly. This can lead to dangerous situations for susceptible individuals, such as those without shelter or who are stranded, or those who live in a home that is poorly insulated or without heat.

Extreme cold is a leading cause of weather-related fatalities in Illinois. According to a 2020 study published by the University of Illinois Chicago, 1,935 individuals died from cold-related illnesses between 2011 and 2018. This is 94% of all temperature-related fatalities recorded in the State during that time period.

Extreme cold can also cause infrastructure damage, especially to residential water pipes and water distribution lines and mains. According to State Farm, in 2020 Illinois was once again the national leader in losses related to frozen pipes.

What is wind chill?

Wind chill, or wind chill factor, is a measure of the rate of heat loss from exposed skin resulting from the combined effects of wind and temperature. As the wind increases, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The unit of measurement used to describe the wind chill factor is known as the wind chill temperature. The wind chill temperature is calculated using a formula. **Figure EC-1** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

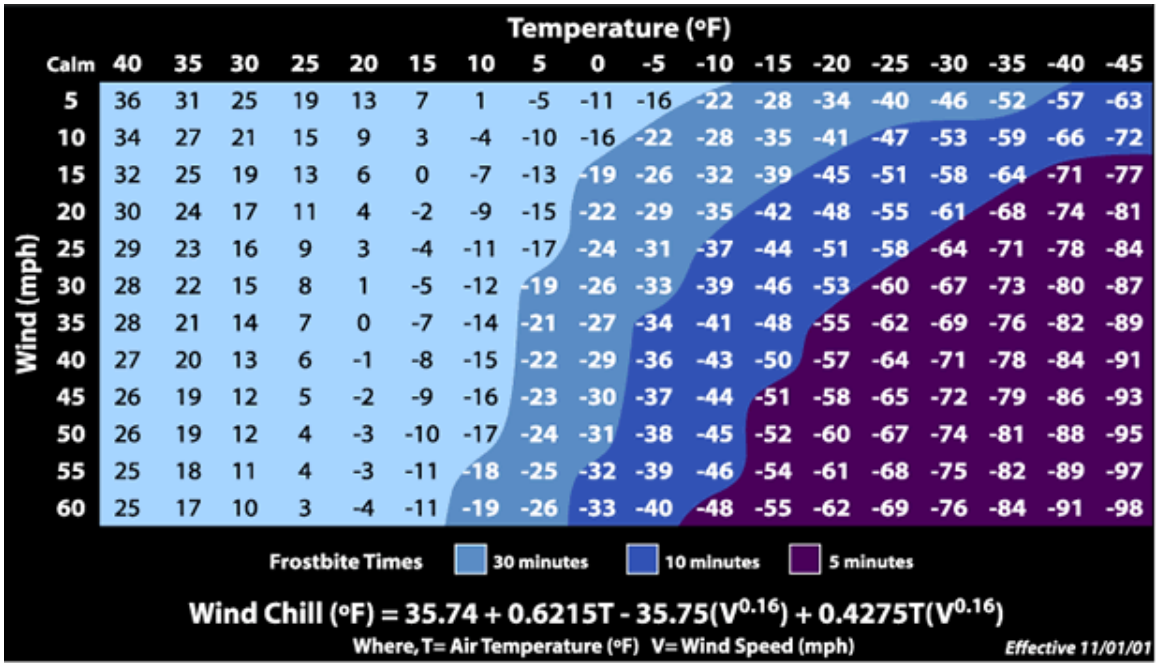
As an example, if the air temperature is 5°F and the wind speed is 20 miles per hour, then the wind chill temperature would be -15°F. The wind chill temperature is only defined for air temperatures at or below 50°F and wind speeds above three miles per hour. In addition, the wind chill temperature does not take into consideration the effects of bright sunlight which may increase the wind chill temperature by 10°F to 18°F.

Use of the current Wind Chill Temperature (WCT) index was implemented by the NWS on November 1, 2001. The new WCT index was designed to more accurately calculate how cold air feels on human skin. The new index uses advances in science, technology and computer modeling to provide an accurate, understandable and useful formula for calculating the dangers from winter

winds and freezing temperatures. The former index was based on research done in 1945 by Antarctic researchers Siple and Passel.

Exposure to extreme wind chills can be life threatening. As wind chills edge toward -19°F and below, there is an increased likelihood that exposure will lead to individuals developing cold-related illnesses.

Figure EC-1
Wind Chill Chart



Source: NOAA, National Weather Service.

What cold-related illnesses are associated with extreme cold?

Frostbite and hypothermia are both cold-related illnesses that can result when individuals are exposed to dangerously low temperatures and wind chills. The following provides a brief description of the symptoms associated with each.

- **Frostbite.** During exposure to extremely cold weather the body reduces circulation to the extremities (i.e., feet, hands, nose, cheeks, ears, etc.) in order to maintain its core temperature. If the extremities are exposed, then this reduction in circulation coupled with the cold temperatures can cause the tissue to freeze.

  Frostbite is characterized by a loss of feeling and a white or pale appearance. At a wind chill of -19°F, exposed skin can freeze in as little as 30 minutes. Seek medical attention immediately if frostbite is suspected. It can permanently damage tissue and in severe cases can lead to amputation.

- **Hypothermia.** Hypothermia occurs when the body's temperature begins to fall because it is losing heat faster than it can produce it. If an individual's body temperature falls below 95°F, then hypothermia has set in, and immediate medical attention should be sought.

  Hypothermia is characterized by uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and exhaustion. Left untreated, hypothermia will lead to death. Hypothermia occurs most commonly at very cold temperatures but can occur at cool temperatures (above 40°F) if an individual isn't properly clothed or becomes chilled.

What is a wind chill alert?

A wind chill alert is an advisory or warning issued by the NWS when the wind chill is expected to have a significant impact on public safety. The expected severity of cold temperatures and wind speed determines the type of alert issued. There are three types of alerts that can be issued for an extreme cold event. The following provides a brief description of each type of alert based on the ***wind chill criteria*** established by the NWS Weather Forecast Office in Lincoln, Illinois. The Lincoln Office is responsible for issuing alerts for Edgar County.

Yes. The NWS Weather Forecast Office in Lincoln, Illinois is responsible for issuing ***wind chill advisories*** and ***warnings*** for Edgar County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Wind Chill Watch.** A wind chill watch may be issued if conditions are favorable for wind chill temperatures to meet or exceed warning criteria but are not occurring or imminent.
- **Wind Chill Advisory.** A wind chill advisory is issued when wind chill values are expected to be between -15°F and -24°F.
- **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -25°F or below.

HAZARD PROFILE

The following identifies past occurrences of extreme cold events; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have extreme cold events occurred previously? What is the extent of these events?

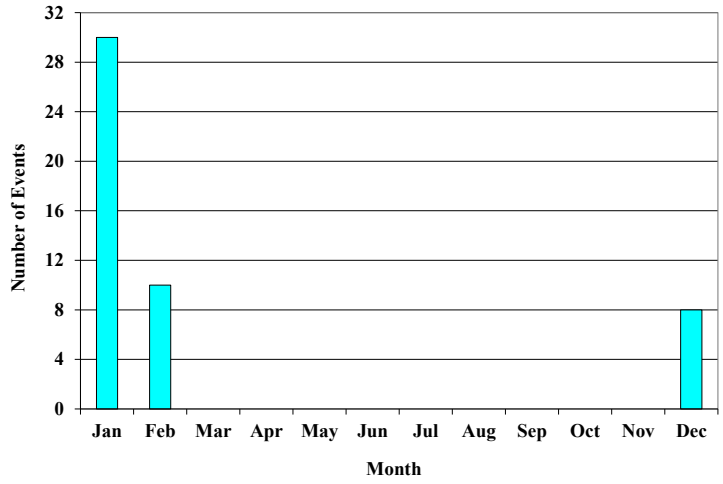
Table 8, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of extreme cold events recorded in Edgar County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database and NWS's COOP Data records were used to document 48 occurrences of extreme cold in Edgar County between 1994 and 2021.

Extreme Cold Fast Facts – Occurrences

Number of Extreme Cold Events Reported (1994 - 2021): ***48***
Coldest Temperature Recorded in the County: ***-23°F (January 18, 1930)***
Most Likely Months for Extreme Cold Events to Occur: ***January***

Figure EC-2 charts the reported occurrences of extreme cold by month. Thirty of the 48 events (63%) took place in January, making this the peak month for extreme cold events. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed. Of the two events with recorded times, both began in the a.m. hours.

Figure EC-2
Extreme Cold by Month
1994 - 2021



According to the Midwestern Regional Climate Center, almost continuous temperature records for Edgar County were kept from 183 to the present by the Paris NWS COOP Observation Station. **Figure EC-3** lists the coldest days recorded at this station. Based on the available records, the coldest temperature recorded in Whiteside County was -23°F at the Paris COOP observation station on January 18, 1930.

Figure EC-3
Coldest Days Recorded at the Paris
NWS COOP Observation Station

	Date	Temperature			Date	Temperature
1	1/18/1930	-23°F		7	2/08/1895	-20°F
2	12/22/1989	-22°F		8	2/14/1905	-20°F
3	1/19/1994	-22°F		9	1/7/1912	-20°F
4	2/13/1905	-21°F		10	1/12/1918	-20°F
5	1/17/1977	-21°F		11	12/16/1951	-20°F
6	1/20/1985	-21°F		12	1/16/1977	-20°F

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by extreme cold?
Extreme cold affects the entire County. All communities in Edgar County have been affected by extreme cold. Extreme cold generally extend across the entire County and affects multiple locations.

Do any of the participating jurisdictions have designated warming centers?

Yes. Seven of the ten participating municipalities and fire protection districts have designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during severe winter storms and extreme cold events.

Figure EC-4 identifies the location of each warming center by jurisdiction. At this time Redmon, Hume FPD and Metcalf FPD do not have any warming centers designated. In addition, there are no State of Illinois-designated warming centers in Edgar County.

Figure EC-4
Designated Warming Centers by Participating Jurisdiction

Name/Address	Name/Address
Brocton	*Hume*
Otho Henn Community Center, 200 S. Howard St.	Hume Community Center, 101 Front St.
Chrisman	*Kansas*
Chrisman Public Library, 108 N. Illinois St.	Kansas Christian Church, 207 E. Jefferson St.
City Office, 222 W. Madison St.	*Metcalf*
Fire Station 2, 102 S. Indiana St.	Metcalf Fire Department, 121 Crawford St.
Chrisman Fire Protection District	*Paris*
Fire Station 2, 102 S. Indiana St.	Hartley-Taylor Training Facility, 11200 Cherry Point St.

What is the probability of future extreme cold events occurring?

Edgar County has experienced 48 verified occurrences of excessive heat between 1994 and 2021. With 48 occurrences over the past 28 years, Edgar County should expect to experience approximately two extreme cold events in any given year. It is important to keep in mind that there are almost certainly gaps in the early extreme cold data. More events have almost certainly occurred than are documented in this section, which means that the probability is almost certainly higher than reported.

There were 15 years over the last 28 years where multiple (two or more) extreme cold events occurred. This indicates that the probability that multiple excessive heat events may occur during any given year within the County is 54%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from extreme cold.

Are the participating jurisdictions vulnerable to extreme cold?

Yes. All of Edgar County, including the participating jurisdictions, is vulnerable to the dangers presented by extreme cold. Since 2012, Edgar County has experienced 20 extreme cold events.

Do Any of the participating jurisdictions consider extreme cold to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered extreme cold to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded extreme cold events?

Damage information was either unavailable or none was recorded, and no injuries or fatalities were reported as a result of any of the extreme cold events. In comparison, the State of Illinois averages 18 cold-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

Extreme Cold Fast Facts – Impacts/Risk

Extreme Cold Impacts:

- Total Property Damage: ***n/a***
- Injuries: ***1***
- Fatalities: ***n/a***

Extreme Cold Risk/Vulnerability:

- Public Health & Safety: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

What other impacts can result from extreme cold events?

Other impacts of extreme cold include early school dismissals and school closing, power outages and frozen and ruptured water pipes and water mains. Individuals who are outdoors during and immediately following extreme cold events can experience health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries.

What is the level of risk/vulnerability to public health and safety from severe winter storms and extreme cold?

For Edgar County the level of risk or vulnerability posed by extreme cold to public health and safety is considered to be ***low to medium.*** This assessment is based on the fact that while extreme cold events occur regularly, the number of injuries and fatalities reported is low and all but three of the participating municipalities and fire protection districts have designated warming centers.

Are existing buildings, infrastructure, and critical facilities vulnerable to extreme cold?

Yes. All existing buildings, infrastructure and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from extreme cold. Individual water pipes and distribution lines and mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated, and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

Based on the frequency with which extreme cold events have occurred in Edgar County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from extreme cold events is ***low***.

Are future buildings, infrastructure, and critical facilities vulnerable to extreme cold?

Yes. While Paris has building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from extreme cold, the County and the six remaining participating municipalities do not. Infrastructure such as residential water pipes will continue to be vulnerable as long as they are located in areas such as outside walls, attics and crawl spaces that do not contain proper insulation.

What are the potential dollar losses to vulnerable structures from extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for extreme cold events. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from extreme cold. However, since all existing structures within Edgar County are vulnerable to damage, it is likely that there will be future dollar losses from extreme cold.

3.6 TORNADOES

HAZARD IDENTIFICATION

What is the definition of a tornado?

A tornado is a narrow violently rotating column of air, often visible as a funnel-shaped cloud that extends from the base of a thunderstorm cloud formation to the ground. The most violent tornadoes can have wind speeds of more than 300 miles per hour and can create damage paths in excess of one mile wide and 50 miles long.

Not all tornadoes have a visible funnel cloud. Some may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. Generally, tornadoes move from southwest to northeast, but they have been known to travel in any direction, even backtracking. A typical tornado travels at around 10 to 20 mile per hour, but this may vary from almost stationary to 60 miles per hour. Tornadoes can occur at any time of the year and happen at any time of the day or night, although most occur between 4 p.m. and 9 p.m.

About 1,200 tornadoes hit the United States yearly, with an average 52 tornadoes occurring annually in Illinois. The destruction caused by a tornado may range from light to catastrophic depending on the intensity, size and duration of the storm. Tornadoes cause crop and property damage, power outages, environmental degradation, injuries and fatalities. Tornadoes are known to blow roofs off buildings, flip vehicles and demolish homes. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes. On average, tornadoes cause 60 to 65 facilities and 1,500 injuries in the United States annually.

How are tornadoes rated?

Originally tornadoes were rated using the Fujita Scale (F-Scale), which related the degree of damage caused by a tornado to the intensity of the tornado's wind speed. The Scale identified six categories of damage, F0 through F5. **Figure T-1** gives a brief description of each category.

Use of the original Fujita Scale was discontinued on February 1, 2007 in favor of the Enhanced Fujita Scale. The original scale had several flaws including basing a tornado's intensity and damages on wind speeds that were never scientifically tested and proven. It also did not take into consideration that a multitude of factors (i.e., structure construction, wind direction and duration, flying debris, etc.) affect the damage caused by a tornado. In addition, the process of rating the damage itself was based on the judgment of the damage assessor. In many cases, meteorologists and engineers highly experienced in damage survey techniques often came up with different F-scale ratings for the same damage.

The Enhanced Fujita Scale (EF-Scale) was created to remedy the flaws in the original scale. It continues to use the F0 through F5 categories, but it incorporates 28 different damage indicators (mainly various building types, towers/poles and trees) as calibrated by engineers and meteorologists. For each damage indicator there are eight degrees of damage ranging from barely visible damage to complete destruction of the damage indicator. The wind speeds assigned to each category are estimates, not measurements, based on the damage assessment. **Figure T-1** identifies the Enhanced Fujita Scale.

Figure T-1 Fujita & Enhanced Fujita Tornado Measurement Scales				
F-Scale		**EF-Scale**		**Description**
Category	**Wind Speed (mph)**	**Category**	**Wind Speed (mph)**	
F0	40 – 72	EF0	65 – 85	Light damage – some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damage to sign boards
F1	73 – 112	EF1	86 – 110	Moderate damage – peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
F2	113 – 157	EF2	111 – 135	Considerable damage – roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
F3	158 – 207	EF3	136 – 165	Severe damage – roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown
F4	208 – 260	EF4	166 – 200	Devastating damage – well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated
F5	261 – 318	EF5	Over 200	Incredible damage – strong frame houses lifted off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur

Source: NOAA, Storm Prediction Center.

The idea behind the EF-Scale is that a tornado scale needs to take into account the typical strengths and weaknesses of different types of construction, instead of applying a "one size fits all" approach. This is due to the fact that the same wind speed can cause different degrees of damage to different kinds of structures. In a real-life application, the degree of damage to each of the 28 indicators can be mapped together to create a comprehensive damage analysis. As with the original scale, the EF-Scale rates the tornado as a whole based on the most intense damage within the tornado's path.

While the EF-Scale is currently in use, ***the historical data presented in this report is based on the original F-Scale***. None of the tornadoes rated before February 1, 2007 will be re-evaluated using the EF-Scale.

Are alerts issued for tornadoes?

Yes. The National Weather Service Weather Forecast Office in Quad Cities Iowa/Illinois is responsible for issuing ***tornado watches*** and ***warnings*** for Edgar County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A tornado watch is issued when tornadoes are possible in the area. Individuals need to be alert and prepared. Watches are typically large, covering numerous counties or even states.

- **Warning.** A tornado warning is issued when a tornado has been sighted or indicated by weather radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should see shelter immediately. Typically, warnings encompass a much smaller area, such as a city or small county.

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Table 9, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Edgar County. NOAA's Storm Events Database, Storm Data Publications, and Storm Prediction Center have documented 30 occurrences of tornadoes in Edgar County between 1950 and 2021. In comparison, there have been 2,443 tornadoes statewide between 1950 and 2017 according to NOAA's Storm Prediction Center.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2021): ***30***

Highest F-Scale Rating Recorded: ***F3 (April 22, 1963)***

Most Likely Month for Tornadoes to Occur: ***April & May***

Average Length of a Tornado: ***2.6 miles***

Average Width of a Tornado: ***120 yards***

Average Damage Pathway of a Tornado: ***0.18 sq. mi.***

Longest Tornado Path in the County: ***20.2 miles (April 22, 1963)***

Widest Tornado Path in the County: ***1,600 yards (April 22, 1963)***

Figure T-2 charts the reported occurrences of tornadoes by magnitude. Of the 30 reported occurrences there were: 1– F3, 4 – F2s, 6 – F1s, 12 – F0s, 1 – EF2, 2 – EF1s, and 4 – EF0s.

Figure T-2
Tornadoes by Magnitude
1950 – 2021

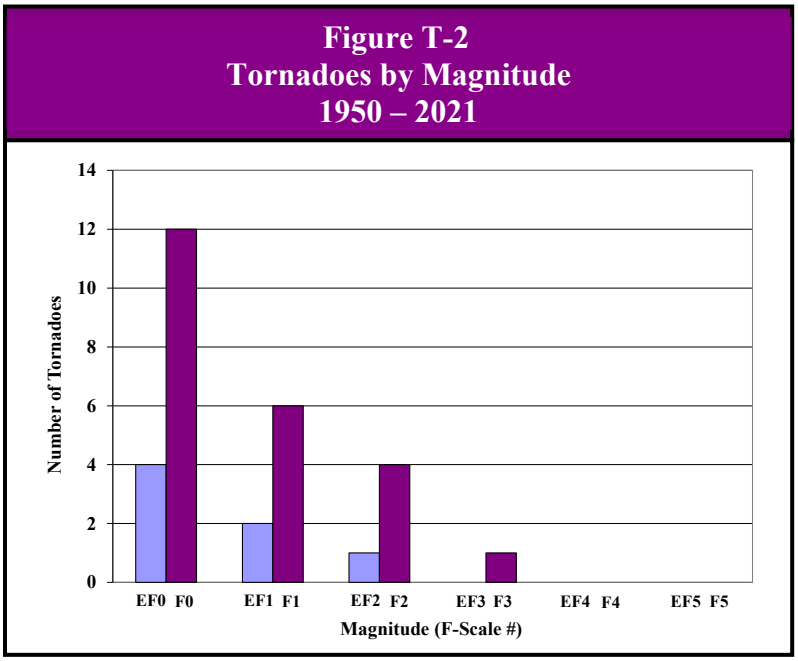
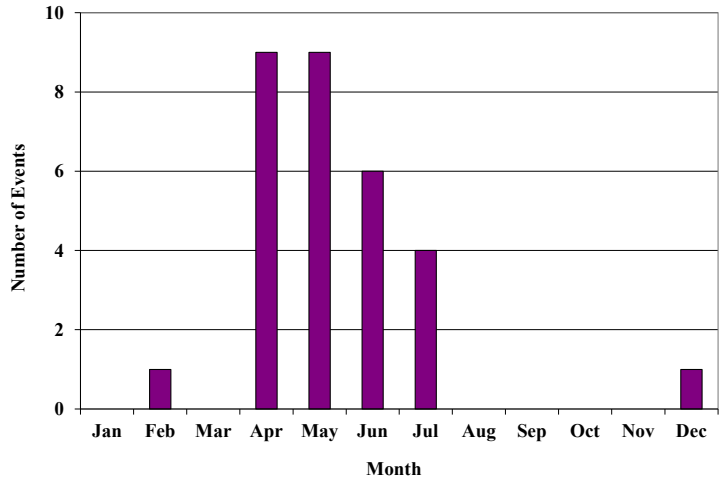


Figure T-3 charts the reported tornadoes by month. Of the 30 events, 24 (80%) took place in April, May, and June making this the peak period for tornadoes in Edgar County. Of those 24 events, 9 (38%) occurred during April and 9 (38%) occurred during May, making these the peak months for tornadoes. In comparison, 1,584 of the 2,443 tornadoes (65%) recorded in Illinois from 1950 through 2017 took place in April, May, and June.

Figure T-3
Tornadoes by Month
1950 – 2021



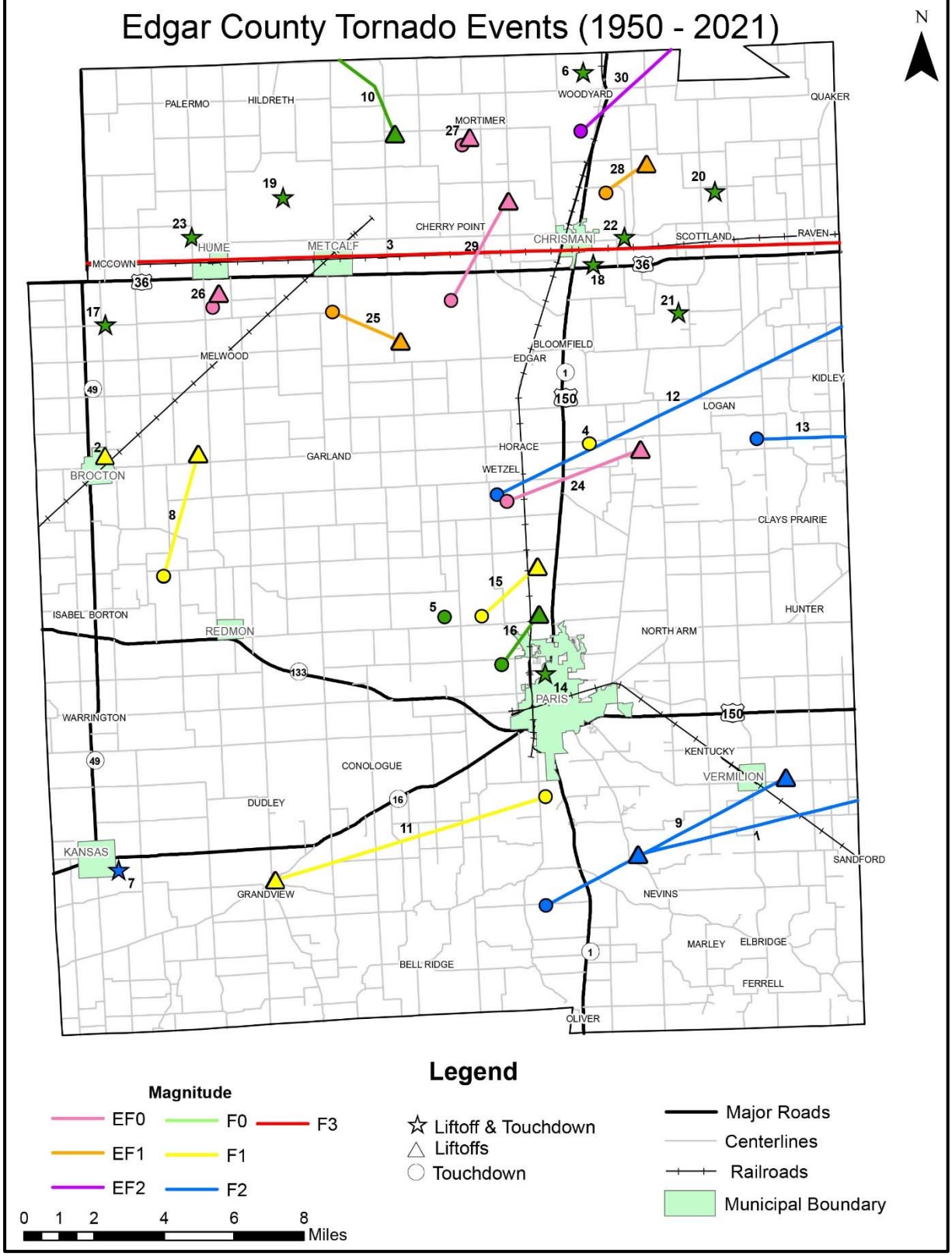
Approximately 93% of all tornadoes in the County occurred during the p.m. hours, with 22 of the p.m. events (79%) taking place between 4 p.m. and 8 p.m. In comparison, more than half of all Illinois tornadoes occur between 2 p.m. and 8 p.m.

The tornadoes that have impacted Edgar County have varied from 0.1 miles (176 yards) to 20.2 miles in length and from 10 yards to 1,600 yards in width. The average length of a tornado in Edgar County is 2.6 miles and the average width is 120 yards (0.07 miles).

Figures T-4 shows the pathway of each reported tornado. Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought, and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Edgar County, the average damage pathway or area impacted by a tornado is 0.18 square miles.

The longest and widest tornado recorded in Edgar County occurred on April 22, 1963. This F3 tornado, measuring 1,600 yards in width and 38.7 miles in length, touched down in Douglas County just east of Tuscola and traveled east through Edgar County before lifting off east of Dana in Vermillion County, Indiana. This tornado was on the ground for 20.2 miles in Edgar County. The damage pathway of this tornado covered approximately 35.2 square miles, with 18.4 square miles occurring in Edgar County.

Figure T-4
Tornado Pathways in Edgar County



What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. Of the seven participating municipalities, four have had reported occurrences of tornadoes within their corporate limits. The *2018 Illinois Natural Hazard Mitigation Plan* prepared by IEMA classifies Edgar County's hazard rating for tornadoes as "medium."

What is the probability of future tornadoes occurring?

Edgar County has had 30 verified occurrences of tornadoes between 1950 and 2021. With 30 tornadoes over the past 72 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is 41.7%. There were seven years over the last 72 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is 9.7%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Edgar County, including the participating jurisdictions, is vulnerable to the dangers presented by tornadoes. Since 2012, two tornadoes have been recorded in Edgar County.

Of the participating municipalities, all except Redmon have had a tornado touch down or pass through their municipal boundaries. **Figure T-5** lists the verified tornadoes that have touched down in or near or passed through each participating municipality.

Figure T-5
Verified Tornadoes In or Near Participating Municipalities

Participating Municipality	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality	Touched Down/Passed Near Municipality
Brocton[a]	2	1958	1986
Chrisman[1,b]	9	1963, 1998	1982, 1990, 1998, 2010, 2011, 2014, 2021
Hume[2,a]	2	1936, 2003	1998, 2010
Kansas[c]	1	1984	---
Metcalf [3,a]	4	1963	1987, 1998, 2008
Paris[d,e,§]	8	1992, 1996, 1996	1979, 1986, 1990, 1990, 2008
Redmon[a]	0	---	---

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

In terms of unincorporated areas vulnerable to tornadoes, Scottland has had three tornadoes touch down in or near its vicinity while Edgar has had two tornadoes. **Figure T-6** details the verified tornadoes that have touched down in or near unincorporated areas in Edgar County.

Figure T-6
Verified Tornadoes In or Near Unincorporated Areas of Edgar County

Unincorporated Area	Number of Verified Tornadoes	Year	
		Touched Down/Passed ***Through*** Unincorporated Area	Touched Down/Passed ***Near*** Unincorporated Area
Edgar	2	---	1970, 1990
Edgar County Airport	1	---	2008
Grandview	1	1990	---
Isabel	1	1986	---
Scottland	3	1963	1998, 1998

Do Any of the participating jurisdictions consider tornadoes to be among their community's greatest vulnerabilities?

Yes. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, the following respondents consider tornadoes to be among their community's greatest vulnerabilities.

- *Chrisman FPD:* The District does not have a warning system in place to alert residents of tornadoes. Right now, we use a fire whistle which only warns a small portion of our residents.
- *Hume FPD:* The District does not have tornado sirens to alert residents of an impending tornado.
- *Paris Union SD #95:* None of the schools have community safe rooms that can be used by students and staff during a tornado event.

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, Storm Data Publications and Storm Prediction Center indicates that between 1950 and 2021, 14 of the 30 tornadoes caused $937,560 in property damages. Two of the tornadoes have property damage totals of at least $250,000. Property damage information was either unavailable or none was recorded for the remaining 17 reported occurrences.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts:
- Total Property Damage (14 events): ***$937,560***
- Total Crop Damage: ***n/a***
- Injuries (1 event): ***20***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability:
- Public Health & Safety – Rural Areas: ***Low to Medium***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

NOAA's Storm Events Database documented 20 injuries as a result the April 22, 1963 F3 tornado event. Detailed information was not available for this event. In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers, and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

What is the level of risk/vulnerability to public health and safety from tornadoes?

According to the 2018 Illinois Natural Hazard Mitigation Plan, Edgar County ***ranks in the top third of all counties in Illinois in terms of tornado frequency***. This fact alone suggests that the overall risk posed by tornadoes to public health and safety is medium to low. While frequency is important, other factors must be examined when assessing vulnerability including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.) and adequate access to health care for those injured following a tornado.

Edgar County

For Edgar County, including the townships and fire protection districts, the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be ***low*** *to* ***medium.*** This assessment is based on the fact that tornadoes do not occur frequently in the County and a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. This has contributed to a relatively low number of injuries and fatalities. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.

In terms of adequate access to health care, Horizon Health (formerly Paris Community Hospital) is equipped to provide continuous care to persons injured by a tornado assuming that it is not directly impacted. In addition, there are hospitals in Champaign (Champaign County), Danville (Vermilion County), Mattoon (Coles County), Terre Haute, Indiana (Vigo County) and Clinton, Indiana (Vermillion County) that are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Participating Municipalities

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered ***high***. This is based on the fact that five of the seven of the participating jurisdictions are small in size (less than one square miless) and have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Do any participating jurisdictions have community safe rooms?

Yes. Shiloh CUSD #1 identified the weight room as a community safe room. As a result, if a tornado were to touch down or pass through any of the population centers in the County, then there would be a greater likelihood of injuries and fatalities due to the lack of structures specifically designed and constructed to provide life-safety protection. Each jurisdiction should consider whether the potential impacts to public health and safety from a tornado are considered great enough to warrant the consideration of community safe rooms as a mitigation action.

Are existing buildings, infrastructure, and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure, and critical facilities located within the County and participating municipalities are vulnerable to tornado damage. Buildings, infrastructure, and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding, and windows. In addition, mobile homes, homes on crawlspaces and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication, and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures

One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touch down or pass through any of the participating municipalities or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) by the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1: Size of Tornado. To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) by the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis, the area impacted by an average-sized tornado in Edgar County will be used since it has a higher probability of recurring. In Edgar County the area impacted by an average-sized tornado is 0.18 square miles. This average is based on more than 70 years of data.

Assumption #1

Size of Tornado = 0.18 sq. miles

Assumption #2: Method for Estimating the Area Impacted. Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

This method is quicker, easier, and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3: Method for Estimating Potentially-Damaged Housing Units. With the size of the tornado selected and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

Assumption #3

The average housing unit density for each municipality will be used to determine the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

Calculating Average Housing Unit Density

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure T-7** provides a sample calculation.

Figure T-7
Calculation of Average Housing Unit Density – Edgar County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction = Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Edgar County: 8,839 housing units ÷ 623.374 sq. miles = 14.179 housing units/sq. miles
(15 housing units)

Figure T-8 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

Figure T-8
Average Housing Unit Density by Participating Jurisdiction

Participating Jurisdiction	Township Location	Total Housing Units (2015-2019)*	Mobile Homes (2015-2019)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Brocton[a]	Embarrass	178	21	0.578	---
Chrisman[1,b]	Ross	687	47	0.747	---
Hume[2,a]	Young America	183	11	0.535	---
Kansas[c]	Kansas	424	16	1.025	413.659
Metcalf[3,a]	Young America	92	12	0.686	---
Paris[d,e,§]	Paris	4,459	289	5.506	809.844
Redmon[a]	Buck/Embarrass	101	11	0.148	---
Unincorp. County		2,715	127	614.149	4.421
County		8,839	534	623.374	14.179

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead, the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The (2015-2019) 5-year estimate is the most recent year for which estimates were available.

Source: U.S. Census Bureau.

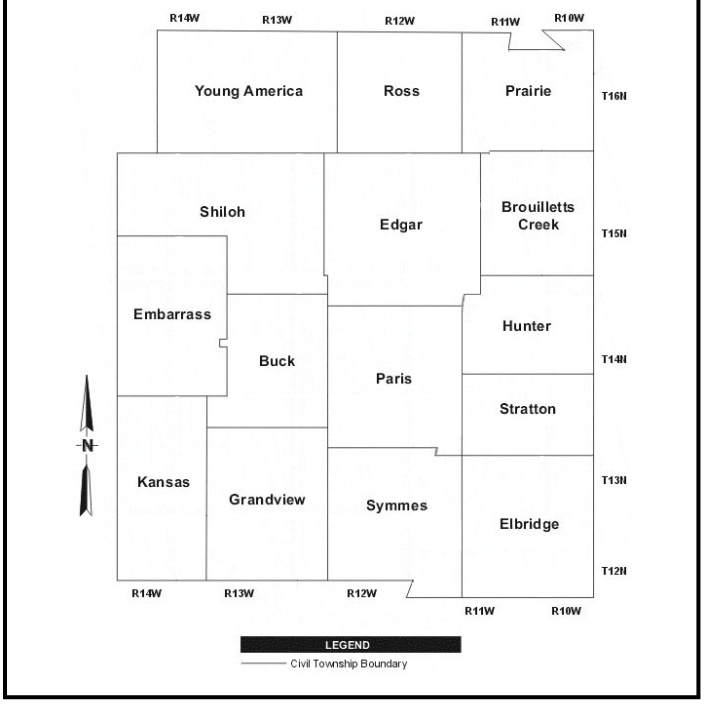
While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Edgar County.

In Edgar County, as well as many other east-central Illinois counties, there are pronounced differences in housing unit densities. Approximately 76% of all housing units are located in four of the County's 15 townships (Kansas, Paris, Ross, and Symmes) while approximately 82% of all mobile homes are located in five of the County's 15 townships (Embarrass, Kansas, Paris, Ross, and Young America). **Figure T-9** identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely populated townships is likely to be greater than in the rest of the County.

This substantial difference in density skews the average *county* housing unit density in Edgar County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure T-10** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

For 13 of the 15 townships, the ***average county*** housing unit density is greater (in some cases considerably greater) than the ***average township*** housing unit densities. However, the ***average county*** housing unit density is considerably less than the housing unit densities for one of the two most populated townships.

Figure T-9
Township Boundaries Edgar County



Source: Illinois Secretary of State

Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in these more densely population townships is likely to be greater than in the rest of the County. While Kansas, Metcalf, Paris and Redmon have ordinances that require anchoring systems for mobile homes that should help limit the damage from lower rated tornadoes, the County does not.

Estimating the Number of Potentially-Damaged Housing Units

Before an estimate of the number of potentially-damaged housing units can be calculated for the participating municipalities, an additional factor needs to be taken into consideration: the presence of commercial/industrial developments and/or large tracts of undeveloped land. Occasionally villages and cities will annex large tracts of undeveloped land or have commercial/industrial parks/development located within their corporate limits. In many cases these large tracts of land include very few residential structures. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these undeveloped areas need to be subtracted from the land area figures obtained from the U.S. Census Bureau.

Figure T-10
Average Housing Unit Density by Township

Township	Incorporated Municipalities Located in Township	Total Housing Units (2015-2019)*	Mobile Homes (2015-2019)*	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Brouilletts Creek[1,b,e]		62	0	32.021	1.936
Buck[a,e]	Redmon	169	11	34.292	4.928
Edgar[1,3,a,b,e]		204	16	55.309	3.688
Elbridge[e]	Vermilion	303	17	43.421	6.978
Embarrass[a,c]	Brocton/Redmon	347	32	44.144	7.861
Grandview[c,e]		228	14	45.081	5.058
Hunter[b,e]		70	12	30.213	2.317
Kansas[c]	Kansas	525	23	40.526	12.955
Paris[d,e,§]	Paris	4,851	299	44.985	107.836
Prairie[1,e]		156	4	35.979	4.336
Ross[1,3,e]	Chrisman	778	53	36.564	21.278
Shiloh[2,3,a,e]		39	0	58.362	0.668
Stratton[e]	Vermilion	245	15	24.800	9.879
Symmes [d,e]		524	9	42.385	12.363
Young America[2,3,a]	Hume & Metcalf	338	29	55.292	6.113
Townships - 4 most populated		6,678	384	164.460	40.606
Townships - 11 least populated		2,161	150	458.914	4.709

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

* Information on additional housing characteristics, such as mobile homes, was not covered by the 2010 Census. Instead, the U.S. Census Bureau has chosen to generate 5-year estimates from American Community Survey data. The 2015-2019 5-year estimate is the most recent year for which estimates were available.

Source: U.S. Census Bureau.

In Edgar County, almost all of the municipalities have large sparsely populated open areas within their municipal boundaries. These areas account for approximately one-quarter to four-fifths of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. **Figure T-11** provides a breakdown of the refined land area figures for select municipalities. These refined land area figures will be used to update the average housing unit density calculations for these municipalities.

Figure T-11
Refined Land Area Figures for Participating Municipalities with Large Tracts of Undeveloped Land

Participating Jurisdiction	Land Area (Sq. Miles) (2010)	Estimated Open Land Area & Commercial/ Industrial Tracts (Sq. Miles)	Refined Land Area (Sq. Miles)
Brocton	0.578	0.360	0.218
Chrisman	0.747	0.014	0.733
Hume	0.535	0.300	0.235
Kansas	1.025	0.590	0.435
Metcalf	0.686	0.540	0.146
Paris	5.506	1.680	3.826
Redmon	0.148	0.020	0.128

With updated average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized Edgar County tornado. **Figure T-12** provides a sample calculation.

Figure T-12
Sample Calculation of Potentially-Damaged Housing Units – Edgar County

Average Housing Unit Density x Area Impacted by the Average-Sized Edgar County Tornado = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)

Edgar County: 14.179 housing units/sq. mile x 0.18 sq. miles = 2.55 housing units
(3 housing units)

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

To calculate the number of potentially-damaged housing units for these municipalities, the area impacted by the averaged-sized Edgar County tornado is divided by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure T-13** provides a sample calculation. Since the refined land areas in Metcalf and Redmon are less than or equal to the average area impacted, it is assumed that all of the housing units within these villages will be potentially damaged.

Figure T-13
Sample Calculation of Potentially-Damaged Housing Units for Municipalities Covering Less Than One Square Mile – Brocton

Area Impacted by the Average-Sized Edgar County Tornado ÷ Land Area within the Jurisdiction x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units
(Rounded Up to the Nearest Whole Number)
Brocton: 0.18 sq. mile ÷ 0.218 sq. miles x 178 housing units = 146.97
(147 housing units)

Figures T-14 and **T-15** provide a breakdown of the number of potentially-damaged housing units by participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure T-14
Estimated Number of Housing Units by Participating Jurisdiction Potentially Damaged by a Tornado

Participating Jurisdiction	Total Housing Units (2015-2019)	Land Area/Refined Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.18 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.18 Sq. Mi.) (Rounded Up)
Brocton[a]	178	0.218	---	146.97	147
Chrisman[1,b]	687	0.733	---	168.70	169
Hume[2,a]	183	0.235	---	140.17	141
Kansas[c]	424	0.435	---	175.45	176
Metcalf[3,a]	92	0.146	---	92.00	92
Paris[d,e,§]	4,459	3.826	1,165.447	209.78	210
Redmon[a]	101	0.128	---	101.00	101
Unincorp. County	2,715	614.149	4.421	0.66	1
County	8,839	623.374	14.179	2.13	3

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

Figure T-15
Estimated Number of Housing Units by Township Potentially Damaged by a Tornado

Township	Total Housing Units (2015-2019)	Land Area (Sq. Miles) (2010)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.18 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.18 Sq. Mi.) (Rounded Up)
Brouilletts Creek[1,b,e]	62	32.021	1.936	0.35	1
Buck[a,e]	169	34.292	4.928	0.89	1
Edgar[1,3,a,b,e]	204	55.309	3.688	0.66	1
Elbridge[e]	303	43.421	6.978	1.26	2
Embarrass[a,c]	347	44.144	7.861	1.41	2
Grandview[c,e]	228	45.081	5.058	0.91	1
Hunter[b,e]	70	30.213	2.317	0.42	1
Kansas[c]	525	40.526	12.955	2.33	3
Paris[d,e]	4,851	44.985	107.836	19.41	20
Prairie[1,e,§]	156	35.979	4.336	0.78	1
Ross[1,3,e]	778	36.564	21.278	3.83	4
Shiloh[2,3,a,e]	39	58.362	0.668	0.12	1
Stratton[e]	245	24.800	9.879	1.78	2
Symmes [d,e]	524	42.385	12.363	2.23	3
Young America[2,3,a]	338	55.292	6.113	1.10	2
Townships - 4 most populated	6,678	164.460	40.606	7.31	8
Townships - 11 least populated	2,161	458.914	4.709	0.85	1

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

What is the level of risk/vulnerability to existing buildings, infrastructure, and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure, and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.)

Unincorporated Edgar County/Townships/Fire Protection Districts

For Edgar County the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is considered to be ***low***. This assessment is based on the frequency with which tornadoes have occurred in the County as well as the amount of damage that has been sustained tempered by the low population density throughout most the County and the relative absence of high-risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

Participating Municipalities (including Schools & Healthcare Facilities)
In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure, and critical facilities would be considered ***high***. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it will have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure, and critical facilities vulnerable to tornadoes?

Yes and No. While Paris has building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes, the County and six remaining municipalities do not. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a higher rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a rough estimate of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- the value of the potentially-damaged housing units; and
- the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Edgar County. The purpose of providing a rough estimate is to help residents and municipal/county officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Assumption #4: Value of Potentially-Damaged Housing Units. In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each municipality will be used.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Edgar County is approximately one-third of the market value). **Figure T-16** provides a sample calculation. The total assessed value is based on 2021 tax assessment information provided by the Edgar County Chief County Assessment Officer.

Figure T-16
Sample Calculation of Average Assessed Value & Average Market Value – Paris

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Paris: $63,227,670 ÷ 4,459 housing units = $14,179.79

Average Market Value

Average Assessed Value x 3 = Average Market Value
(Rounded to the Nearest Dollar)

Paris: $14,179.79 x 3 = $42,539.36
($42,539)

Figures T-17 and **T-18** provide the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Figure T-17
Average Market Value of Housing Units by Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2021)	Total Housing Units (2015-2019)	Average Assessed Values	Average Market Value (2021)
Brocton[a]	$1,492,630	178	$8,386	$25,157
Chrisman[1,b]	$9,726,430	687	$14,158	$42,473
Hume[2,a]	$2,645,980	183	$14,459	$43,377
Kansas[c]	$4,505,230	424	$10,626	$31,877
Metcalf[3,a]	$572,010	92	$6,218	$18,653
Paris[d,e,§]	$63,227,670	4,459	$14,180	$42,539
Redmon[a]	$1,138,080	101	$11,268	$33,804
Unincorp. County	$46,045,750	2,715	$16,960	$50,879
County	$129,353,780	8,839	$14,634	$43,903

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

Source: Edgar County Chief County Assessment Officer.

Figure T-18
Average Market Value of Housing Units by Township

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2021)	Total Housing Units (2015-2019)	Average Assessed Values	Average Market Value (2021)
Brouilletts Creek[1,b,e]	$1,021,450	62	$16,475	$49,425
Buck[a,e]	$1,797,450	169	$10,636	$31,907
Edgar[1,3,a,b,e]	$2,428,280	204	$11,903	$35,710
Elbridge[e]	$4,380,910	303	$14,458	$43,375
Embarrass[a,c]	$3,011,900	347	$8,680	$26,039
Grandview[c,e]	$2,848,640	228	$12,494	$37,482
Hunter[b,e]	$2,045,050	70	$29,215	$87,645
Kansas[c]	$5,707,660	525	$10,872	$32,615
Paris[d,e,§]	$76,813,880	4,851	$15,835	$47,504
Prairie[1,e]	$1,512,080	156	$9,693	$29,078
Ross[1,3,e]	$11,294,980	778	$14,518	$43,554
Shiloh[2,3,a,e]	$859,160	39	$22,030	$66,089
Stratton[e]	$2,704,370	245	$11,038	$33,115
Symmes[d,e]	$8,539,260	524	$16,296	$48,889
Young America[2,4,a]	$4,388,710	338	$12,984	$38,953
Townships - 4 most populated	$102,355,780	6,678	$15,327	$45,982
Townships - 11 least populated	$26,998,000	2,161	$12,493	$37,480

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

Source: Edgar County Chief County Assessment Officer.

Assumption #5: Damage Scenario. Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted is complex and provides an additional complication when updating the Plan.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Calculating Potential Dollar Losses

With all the decisions and assumptions made, the potential dollar losses can now be calculated. First, the potential dollar losses to the ***structure*** of a potentially-damaged housing unit must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next

the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-19** provides a sample calculation.

Figure T-19
***Structure:* Potential Dollar Loss Sample Calculation – Paris**

Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit

Paris: $42,539 x 100% = $42,539 per housing unit

Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)

Paris: $42,539 per housing unit x 210 housing units = $8,933,190
($8,933,190)

Next, the potential dollar losses to the ***content*** of a potentially-damaged housing unit must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-20** provides a sample calculation.

Figure T-20
***Content:* Potential Dollar Loss Sample Calculation - Paris**

½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit

Paris: ½ $42,539 x 100% = $21,269.50 per housing unit

Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)

Paris: $21,269.50 per housing unit x 210 housing units = $4,466,595
($4,466,595)

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures T-21** and **T-22** give a breakdown of the total potential dollar losses by municipality and township.

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Edgar County would be expected to exceed at least $5.1 million in any of the participating municipalities, with the exception of Metcalf.***

Figure T-21
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Jurisdiction

Participating Jurisdiction	Average Market Value (2021)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Brocton[a]	$25,157	147	$3,698,079	$1,849,040	$5,547,119
Chrisman[1,b]	$42,473	169	$7,177,937	$3,588,969	$10,766,906
Hume[2,a]	$43,377	141	$6,116,157	$3,058,079	$9,174,236
Kansas[c]	$31,877	176	$5,610,352	$2,805,176	$8,415,528
Metcalf[3,a]	$18,653	92	$1,716,076	$858,038	$2,574,114
Paris[d,e,§]	$42,539	210	$8,933,190	$4,466,595	$13,399,785
Redmon[a]	$33,804	101	$3,414,204	$1,707,102	$5,121,306
Unincorp. County	$51,419	1	$50,879	$25,440	$76,319
County	$43,903	3	$131,709	$65,855	$197,564

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

For comparison, an estimate of potential dollar losses was calculated for the entire County, the unincorporated portions of the County, the four most populated townships and the 11 least populated townships. As discussed previously, the estimate for the entire County is skewed because it does not take into consideration the differences in the housing density.

Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water, and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

Figure T-22
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township

Participating Jurisdiction	Average Market Value (2021)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Brouilletts Creek[1,b,e]	$49,425	1	$49,425	$24,713	$74,138
Buck[a,e]	$31,907	1	$31,907	$15,954	$47,861
Edgar[1,3,a,b,e]	$35,710	1	$35,710	$17,855	$53,565
Elbridge[e]	$43,375	2	$86,750	$43,375	$130,125
Embarrass[a,c]	$26,039	2	$52,078	$26,039	$78,117
Grandview[c,e]	$37,482	1	$37,482	$18,741	$56,223
Hunter[b,e]	$87,645	1	$87,645	$43,823	$131,468
Kansas[c]	$32,615	3	$97,845	$48,923	$146,768
Paris[d,e,§]	$47,504	20	$950,080	$475,040	$1,425,120
Prairie[1,e]	$29,078	1	$29,078	$14,539	$43,617
Ross[1,3,e]	$43,554	4	$174,216	$87,108	$261,324
Shiloh[2,3,a,e]	$66,089	1	$66,089	$33,045	$99,134
Stratton[e]	$33,115	2	$66,230	$33,115	$99,345
Symmes[d,e]	$48,889	3	$146,667	$73,334	$220,001
Young America[2,3,a]	$38,953	2	$77,906	$38,953	$116,859
Townships - 4 most populated	$45,982	8	$367,856	$183,928	$551,784
Townships - 11 least populated	$37,480	1	$37,480	$18,740	$56,220

[1] Chrisman FPD
[2] Hume FPD
[3] Metcalf FPD
[4] Shiloh Township
[a] Shiloh CUSD #1
[b] Edgar County CUSD #6
[c] Kansas CUSD #3
[d] Paris-Union SD #95
[e] Paris CUSD #4
[§] Horizon Health

3.7 DROUGHTS

HAZARD IDENTIFICATION

What is the definition of a drought?

While difficult to define, the National Drought Mitigation Center (NDMC) considers "drought" in its most general sense to be a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage.

Drought is a normal and recurrent feature of climate and can occur in all climate zones, though its characteristics and impacts vary significantly from one region to another. Unlike other natural hazards, drought does not have a clearly defined beginning or end. Droughts can be short, lasting just a few months, or they can persist for several years. There have been 26 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the United States between 1980 and 2018. This is due in part to the sheer size of the areas affected.

What types of drought occur?

There are four main types of drought that occur: meteorological, agricultural, hydrological, and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

How are droughts measured?

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the United States was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective

measuring drought impacts on agriculture. For many years it was the only operational drought index, and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009 the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the United States was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the County. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

U.S. Drought Monitor (USDM)

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the United States. It is unique in that it combines a variety of numeric-based drought indices and indicators with local expert input to create a single composite drought indicator, the results of which are illustrated via a weekly map that depicts the current drought conditions across the United States. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

The USDM has a scale of five intensity categories, D0 through D4, that are utilized to identify areas of drought. **Figure DR-1** provides a brief description of each category.

Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what a majority of the indictors show and on local observations. The authors also weight the indices according to how well they perform in various parts of the country and at different times of the year. It is the combination of the best available data, location observations and experts' best judgment that make the U.S. Drought Monitor more versatile than other drought indices.

In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure DR-2** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture

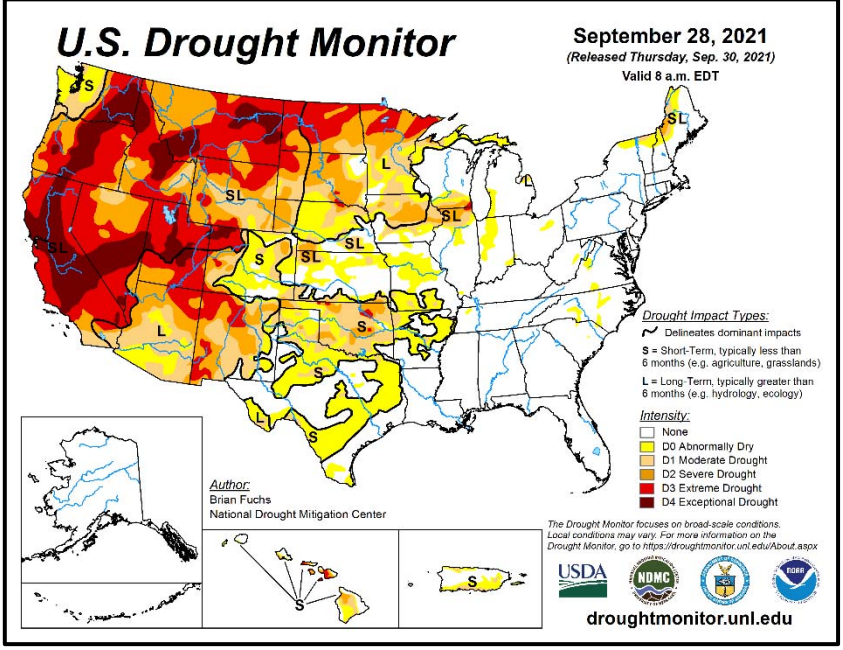
look at drought conditions in the United States. It is not designed to infer specifics about local conditions.

Figure DR-1
U.S. Drought Monitor – Drought Intensity Categories

Category	Possible Impacts
D0 (Abnormally Dry)	• Going into drought: - short-term dryness slowing planting, growth of crops or pastures. • Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered
D1 (Moderate Drought)	• Some damage to crops, pastures • Streams, reservoirs, or wells low; some water shortages developing or imminent • Voluntary water-use restrictions requested
D2 (Severe Drought)	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3 (Extreme Drought)	• Major crop/pasture losses • Widespread water shortages or restrictions
D4 (Exceptional Drought)	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor.

Figure DR-2
U. S. Drought Monitor



The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map Courtesy of NDMC.

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

Drought Fast Facts – Occurrences

Number of Drought Events Reported (1980 – 2021): ***5***

Table 10, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of the drought events recorded in Edgar County. NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency (IEMA) and the USDA have documented five official droughts for Edgar County between 1980 and 2021.

The recorded drought events ranged in length from three to 16 months, with two of the five events (40%) beginning in May and two of the five events (40%) beginning in June. Of the three drought events that were assigned drought intensity category ratings by the USDM, the 2012 drought reached D4, exceptional drought.

The State of Illinois Drought Preparedness and Response Plan identified seven additional outstanding statewide droughts since 1900 based on statewide summer values of the PDSI provided by NOAA's National Center for Environmental Information. Those seven droughts occurred in 1902, 1915, 1931, 1934, 1936, 1954 and 1964; however, the extent to which Edgar County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Edgar County's hazard rating for drought as "medium."

What is the probability of future drought events occurring?

Edgar County, including the participating jurisdictions, has experienced five droughts between 1980 and 2021. With five occurrences over 42 years, the probability or likelihood that the County may experience a drought in any given year is 11.9%. However, if earlier recorded droughts are factored in, then the probability that Edgar County may experience a drought in any given year decreases to 9.8%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Edgar County, including the participating jurisdictions, is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provides protection for any area within the County. Since 2012, Edgar County has experienced one drought.

Do any of the participating jurisdictions consider drought to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered drought to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded drought events?

Damage information was only available for one of the five drought events experienced between 1980 and 2021. According to NOAA's Storm Events Database, the 2012 drought caused an estimated $42.8 million in corn crop damages in Edgar County. Damage information was either unavailable or none was recorded for the remaining four reported occurrences.

Drought Fast Facts – Impacts/Risk

Drought Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***$ 42.8 million (2012 drought)***

Drought Risk/Vulnerability:
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

Of the five drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

Crop Yield Reductions

Agriculture is a mainstay of Edgar County's economy. Farmland accounts for approximately 79.7% of all the land in the County. According to the 2017 Census of Agriculture, there were 673 farms in in the County occupying 318,164 acres. Of the land in farms, approximately 91.4% or 290,671 acres is in crop production. Less than 1% of the land in crop production is irrigated.

According to the 2017 Census of Agriculture, there were 637 farms in Edgar County occupying approximately 79.7% (318,164 acres) of the total land area in the County. In comparison, there were 673 farms occupying 88.2% (351,684 acres) of the total land area in the County in 2012. The major crops include corn and soybeans while the major livestock includes cattle, goats, and chickens. The County ranks 24th in the State for crop cash receipts.

According to the 2017 Census of Agriculture, total crop and livestock sales accounted for $223 million in revenue. Edgar County ranks 24th in Illinois for crop cash receipts A severe drought would have a major financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005, 2011 and 2012 droughts. **Figure DR-3** illustrates the reduction yields seen for corn and soybeans during the five recorded drought events. The USDA's National Agricultural Statistics Service records show that yield reductions for corn and soybeans were most severe for the 2012 drought when there was a 37.4% reduction in corn yields and a 27.7% reduction in soybean yields.

Figure DR-3
Crop Yield Reductions Due to Drought in Edgar County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	139	---	40	---
1983	**90**	**35.3%**	**34.5**	**13.8%**
1984	128	---	34.5	---
1987	151	---	39.5	---
1988	**100**	**33.8%**	**31.5**	**20.3%**
1989	143	---	41	---
2004	188	---	56	---
2005	**160**	**14.9%**	**52**	**7.1%**
2006	167	---	53	---
2007	181	---	54	---
2010	163.3	---	53.9	---
2011	**154.5**	**5.4%**	**53.8**	**0.2%**
2012	**96.7**	**37.4%**	**38.9**	**27.7%**

Source: USDA, National Agricultural Statistics Service.

Drinking Water Shortages

Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Edgar County, ***none of the participating municipalities rely on surface water sources*** for their drinking water supply. All obtain drinking water from wells in unconfined sand and gravel aquifers ranging in depth from 38 feet to 110 feet in depth. Brocton and Hume have the shallowest wells with depths of 38 feet and 55 feet respectively, making them potentially vulnerable to the effects of a prolonged drought. Redmon purchases its water from the Clark-Edgar Rural Water District which obtains its water from wells in sand and gravel aquifers approximately 80 feet in depth.

While most of the participating municipalities are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is ***low***.

Are existing buildings, infrastructure, and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Edgar County and the participating jurisdictions are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling.

Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans, and other devices. This increase in demand places stress on the electrical grid, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in aquifer water levels can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought, or a series of droughts occur. Effective mitigation measures include drilling additional wells, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is ***low***, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure, and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure, and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a

majority of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers, etc.).

3.8 EARTHQUAKES

HAZARD IDENTIFICATION

What is the definition of an earthquake?

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

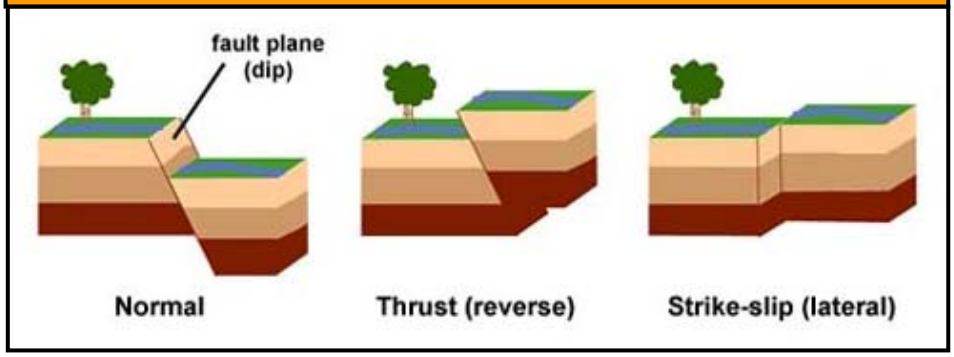
Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous United States are exposed to potentially damaging ground shaking from earthquakes. Over 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10th in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's Hazus analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central United States (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the pacific northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

What is a fault?

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, thrust (reverse) and strike-slip (lateral). **Figure EQ-1** provides an illustration of each type of fault.

Figure EQ-1
Fault Illustration



Source: U. S. Geological Survey.

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Thrust or reverse faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

What are tectonic plates?

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

How are earthquakes measured?

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

Magnitude

Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. A loose network of seismographs has been installed all over the world to help record and verify earthquake events.

There are several scales that measure the magnitude of an earthquake. The most well-known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground

vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number. It is important to note that the Richter Scale is used only to determine the magnitude of an earthquake, it does not assess the damage that results.

Once an earthquake's magnitude has been confirmed, it can be classified. **Figure EQ-2** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the United States since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

Figure EQ-2
Earthquake Magnitude Classes

Class	Magnitude (Richter Scale)
micro	smaller than 3.0
minor	3.0 – 3.9
light	4.0 – 4.9
moderate	5.0 – 5.9
strong	6.0 – 6.9
major	7.0 – 7.9
great	8.0 or larger

Source: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis

Intensity

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures and the environment. As a result, intensity does not have a mathematical basis; instead, it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Although numerous intensity scales have been developed over the years, the one currently used in the United States is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.).

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure EQ-3** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

Figure EQ-3
Comparison of Richter Scale and Modified Mercalli Intensity Scale

Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage.
4.0	IV	Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage.
4.1 – 4.9	V	Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage.
5.0 – 5.9	VI	Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage.
6.0	VII	Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall.
6.1 – 6.9	VIII	Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall.
7.0	IX	Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable.
7.1 – 7.9	X	Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides.
8.0	XI	Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction.
> 8.0	XII	Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air.

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

When and where do earthquakes occur?

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

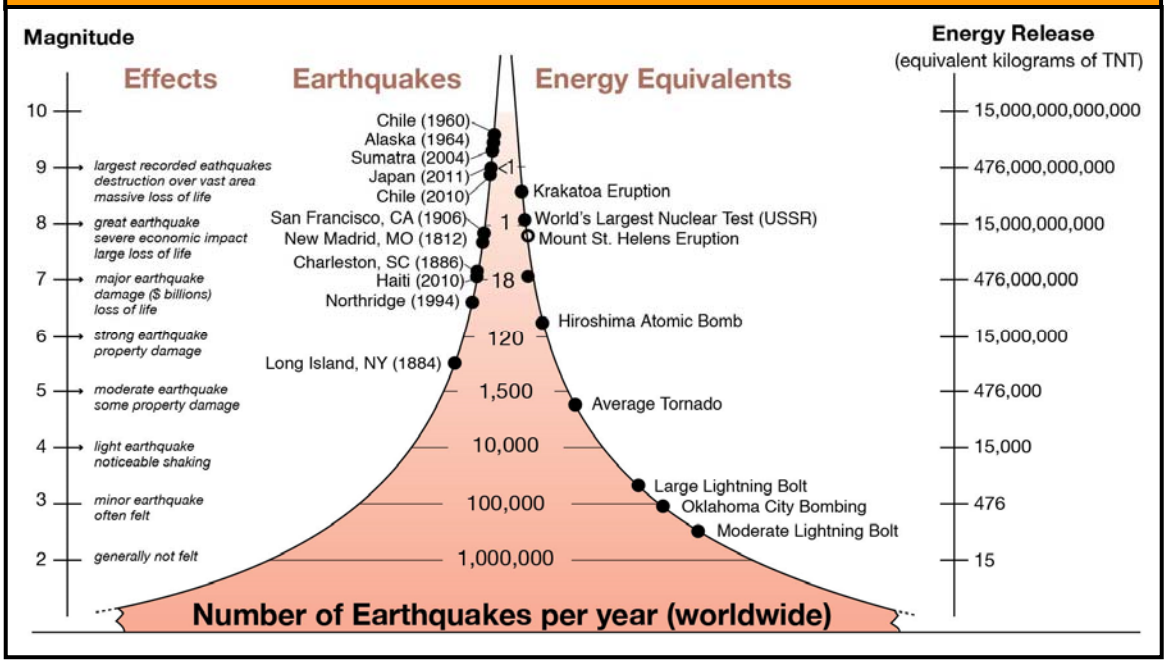
The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

How often do earthquakes occur?

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure EQ-4** illustrates the approximate number of earthquakes that occur worldwide per year based on magnitude. This figure also identifies manmade and natural events that release approximately the same amount of energy for comparison.

Figure EQ-4
Approximate Number of Earthquakes Recorded Annually



Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

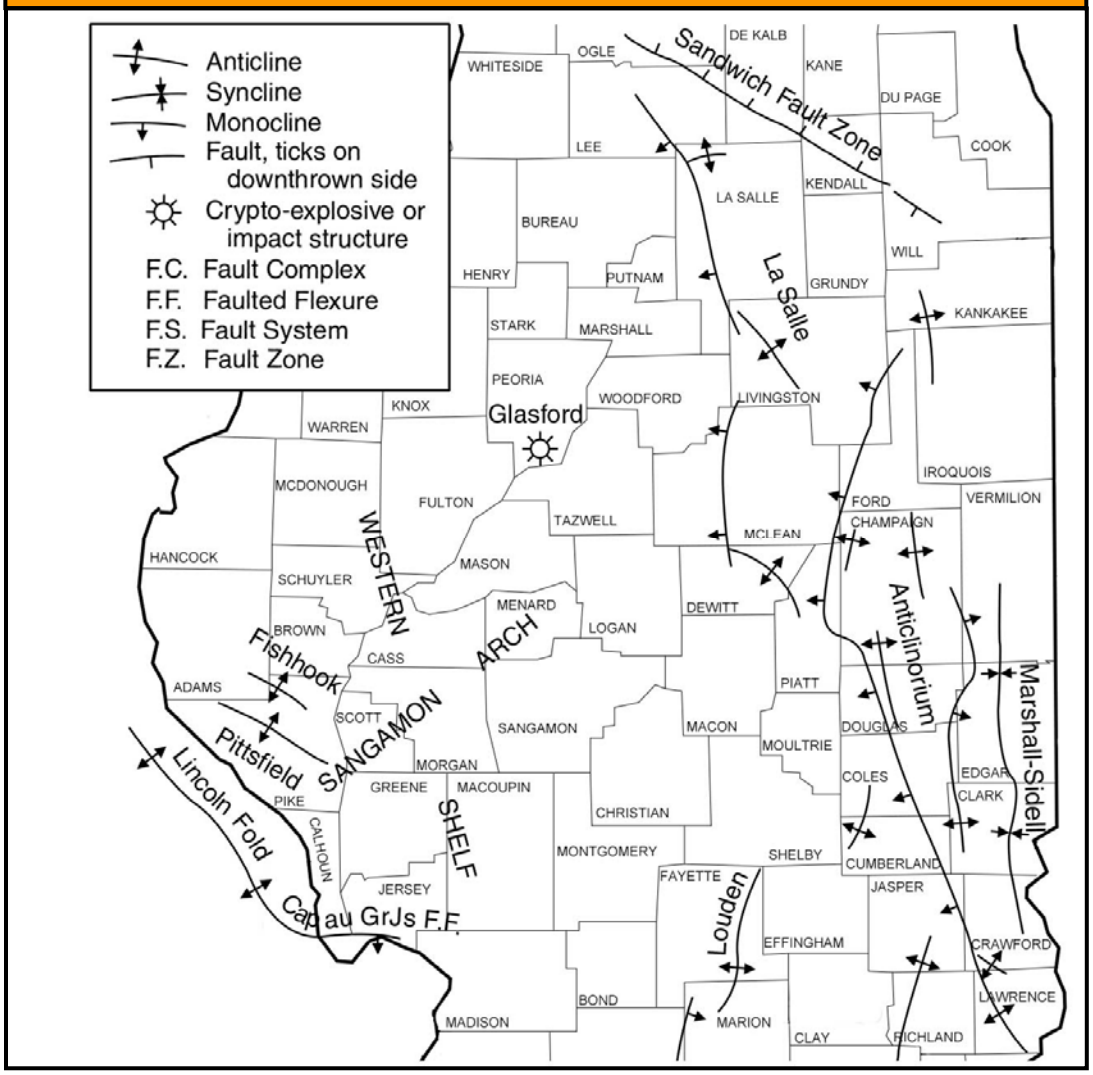
HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

No, there are no known faults located in Edgar County. However, there are two geological structures, the Marshall-Sidell Syncline and the Edgar Monocline, which run through the County. The following provides a brief description of each while **Figure EQ-5** illustrates the location of these geologic structures.

Figure EQ-5
Geological Structures in Central Illinois



Source: Illinois State Geological Survey.

❖ *Marshall-Sidell Syncline:* The Marshall-Sidell Syncline runs from north to south through the center of Edgar County. It is an elongated, north-trending depression between the La Salle Anticlinorium and the east flank of the Illinois Basin. This syncline begins in central Vermilion County and extends to east-central Crawford County. It has relatively steep but irregular dips on the west and gentle dips on the east.

- *Edgar Monocline:* The Edgar Monocline is a large monocline that defines the east margin of the La Salle Anticlinorium and separate the anticlinorium from the Marshall-Sidell Syncline on the east. This monocline begins in southwestern Vermilion County and runs mostly north to south along the western border of Edgar County extending into northwestern Crawford County and is approximately 60 miles in length. The La Salle Anticlinorium itself is more than 200 miles long and stretches from Lee County in northern Illinois to Lawrence County in southeastern Illinois. It is composed of a group of closely related anticlines, domes, monoclines, and synclines, several of which, like the Edgar Monocline, are individually named.

When have earthquakes occurred previously? What is the extent of these previous quakes?

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2021): ***None***
Fault Zones Located within the County: ***None***
Geological Structures Located within the County: ***2***
Earthquakes Originating in Adjacent Counties (1795-2021): ***4***
Fault Zones Located in Nearby Counties: ***None***
Geologic Structures Located in Adjacent Counties: ***1***

According to the Illinois State Geological Survey, the U.S. Geological Survey and Center for Earthquake Research and Information (CERI) at the University of Memphis, no earthquakes have originated in Edgar County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure EQ-6** illustrates the epicenters of the nearby earthquakes.

East-Central Illinois

Four earthquakes have originated in nearby Coles, Champaign, and Douglas Counties in Illinois and Vigo County, Indiana. The following provides a brief description of each.

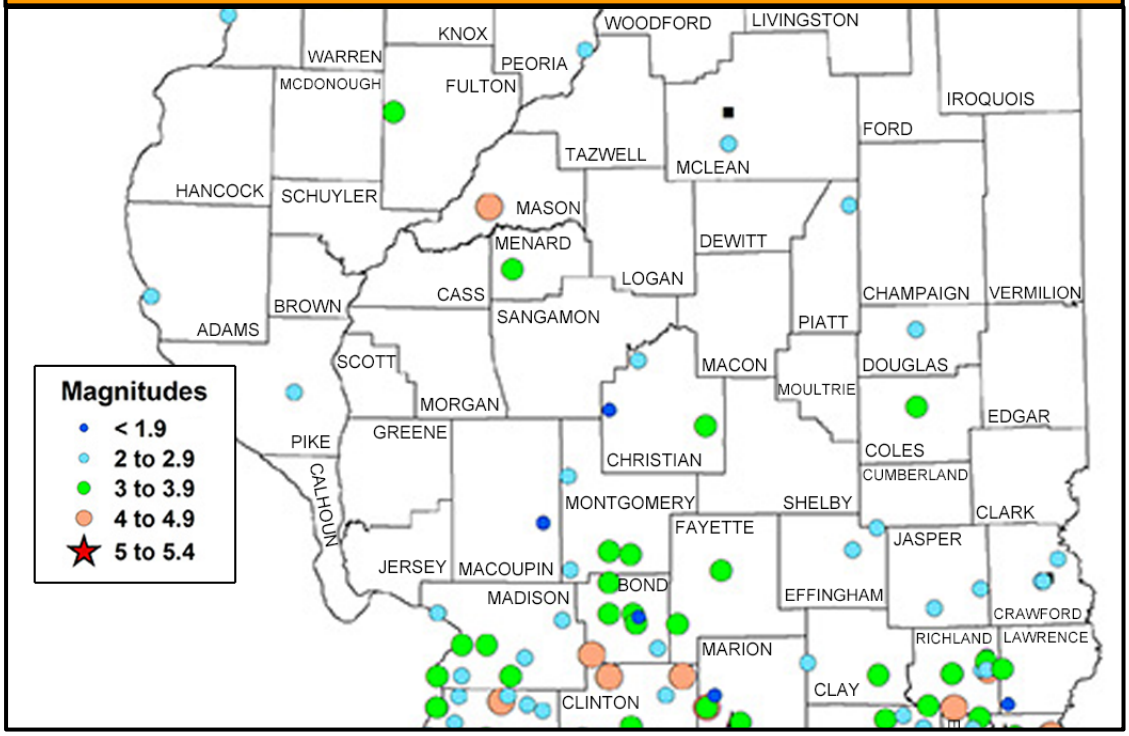
- A magnitude 2.9 earthquake took place on April 24, 1990 approximately eight miles northwest of Charleston in unincorporated Coles County.
- On November 6, 2020, a 2.4 magnitude earthquake originated in Champaign County near Pesotum.
- A magnitude 2.4 earthquake took place on February 16, 1978 in Douglas County approximately 2.5 miles east of Tuscola.
- On December 16, 1996 a magnitude 3.0 earthquake took place in Vigo County near Terre Haute, Indiana.

Southern Illinois

Edgar County residents also felt ground shaking caused by several earthquakes that have originated in southern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- On April 18, 2008, a magnitude 5.2 earthquake was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central U.S. and southern Ontario, Canada.

Figure EQ-6
Earthquakes Originating in Edgar Illinois



Source: Illinois State Geological Survey.

- A magnitude 5.2 earthquake took place on June 10, 1987, in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern U.S. and southern Ontario, Canada.
- The strongest earthquake in the central U.S. during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968, with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana, and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern U.S. and southern Ontario, Canada.

Three of the ten largest earthquakes ever recorded within the continental U.S. took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky, and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

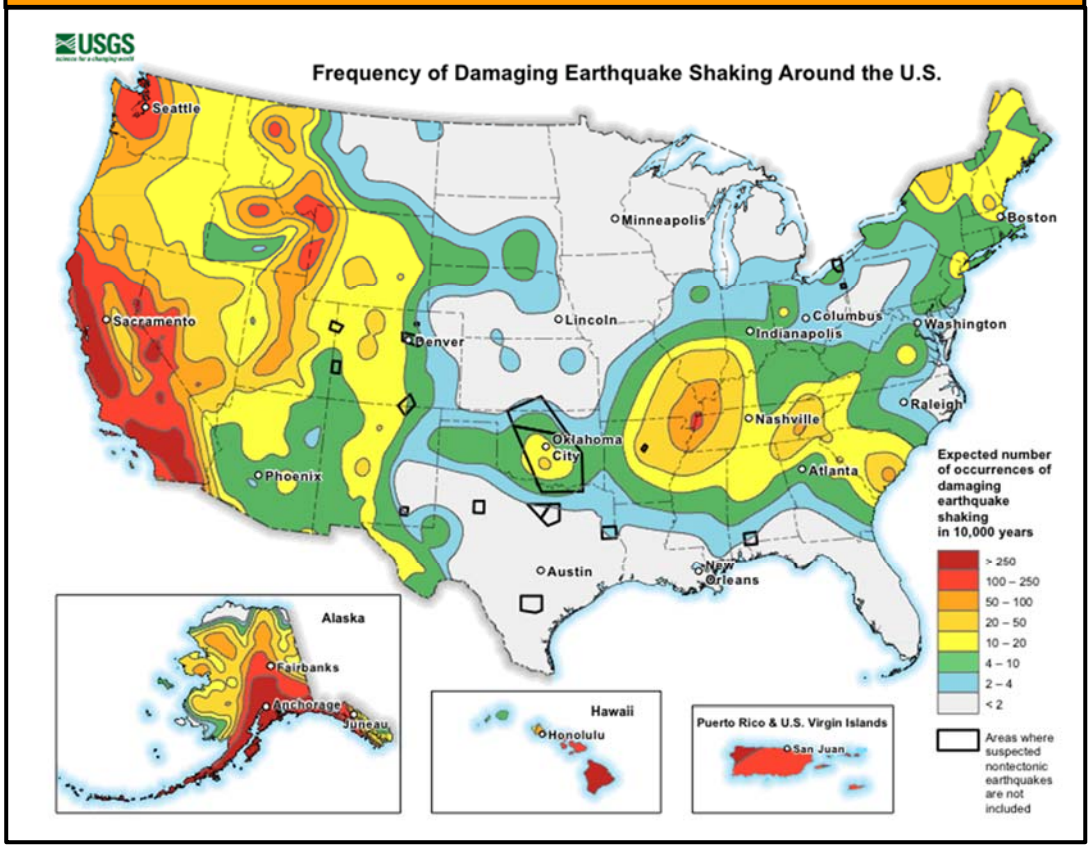
The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the U.S. east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes? What is the extent of future potential earthquakes?

Earthquake events generally affect the entire County. Earthquakes, like drought and excessive heat, impact large areas extending across an entire region and affecting multiple counties. Edgar County's proximity to multiple fault zones, both large and small, makes the entire area likely to be affected by an earthquake if these faults become seismically active. The *2018 Illinois Natural Hazard Mitigation Plan* classifies Edgar County's hazard rating for earthquakes as "medium."

According to the USGS, Edgar County can expect 4 and 20 occurrences of damaging earthquake shaking over a 10,000-year period. **Figure EQ-7** illustrates the frequency of damaging earthquake shaking around the U.S.

Figure EQ-7
Frequency of Damaging Earthquake Shaking Around the U.S.



Source: United State Geological Survey.

What is the probability of future earthquake events occurring?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central U.S. within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Edgar County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central U.S. conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability:

- Public Health & Safety – Light/Moderate Quake within the County or immediate region: ***Low***
- Public Health & Safety – Major Quake in the region: ***Medium***
- Buildings/Infrastructure/Critical Facilities – Light/ Moderate Quake within the County or immediate region: ***Low***
- Buildings/Infrastructure/Critical Facilities – Major Quake in the region: ***Medium***

This vulnerability, found throughout most of Illinois and all of Edgar County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines, and natural gas pipelines.

The *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Edgar County

would be a VII on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VIII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Edgar County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

Do any of the participating jurisdictions consider earthquakes to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered earthquakes to be among their community's greatest vulnerabilities.

What impacts resulted from the recorded earthquake events?

While Edgar County residents felt the earthquakes that have occurred in Illinois, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Edgar County felt those quakes; however, historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health, and public safety. **Figure EQ-8** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Edgar County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the structures in the immediate region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated to ***medium*** for a major earthquake originating along seismic zones in the region (i.e., Wabash Valley or New Madrid.)

Are existing buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from earthquakes. However, given the County's size (just over 17,400 individuals), its population density, the fact that there are very few buildings higher than two stories (with the exception of grain elevators and several multi-story buildings in Paris) tempered by the potential for magnitude 5.0 and above earthquakes to occur in the immediate region, the damage is anticipated to be slight to considerable for well-built ordinary structures and considerable to severe for poorly-built structures.

Figure EQ-8
Potential Earthquake Impacts

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools, and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools, and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on U.S. and State Routes as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the New Madrid Fault) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

If a strong earthquake (6.0 – 6.9) were to occur in the region then unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. **Figure EQ-9** identifies the number of unreinforced masonry buildings that serve as critical facilities within the participating jurisdictions.

If the epicenter of a magnitude 7.6 earthquake were to originate anywhere along the New Madrid seismic zone, the highest projected Modified Mercalli intensity felt in Edgar County would be a VII according to the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency.

An earthquake also has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a major earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways. **Figure R-4** lists the number of each type of critical infrastructure by jurisdiction.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities is considered to be ***low*** for a light to moderate earthquake that originates within the County or immediate region. This risk is elevated to ***medium*** for a major earthquake originating along seismic zones in the region (i.e., Wabash Valley or New Madrid.)

Are future buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from earthquakes. While Paris has building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure, and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure, and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes that impacted Edgar County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Edgar County Supervisor of Assessments the total equalized assessed values of buildings in the planning area is $129,353,780. Since all of the structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to earthquake events.

Given Edgar County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

Figure EQ-9
Number of Unreinforced Masonry Buildings Serving as Critical Facilities by Jurisdiction

Participating Jurisdiction	Government[1]	Law Enforcement	Fire Stations	Ambulance Service	Schools	Drinking Water	Wastewater Treatment	Medical[2]	Healthcare Facilities[3]
Edgar County	---	3	---	---	---	---	---	---	---
Brocton	---	---	1	---	---	---	---	---	---
Chrisman	---	---	---	---	---	---	---	---	---
Hume	---	---	1	---	---	1	---	---	---
Kansas	2	---	---	---	---	1	---	---	---
Metcalf	---	---	1	---	---	1	---	---	---
Paris	1	1	1	---	---	---	1	---	---
Redmon	---	---	1	---	---	---	---	---	---
Shiloh Township	---	---	---	---	---	---	---	---	---
Edgar County CUSD #6	---	---	---	---	---	---	---	---	---
Kansas CUSD #3	---	---	---	---	2	---	---	---	---
Paris CUSD#4	---	---	---	---	---	---	---	---	---
Paris-Union School Dist. #95	---	---	---	---	---	---	---	---	---
Shiloh CUSD #1	---	---	---	---	---	---	---	---	---
Chrisman FPD	---	---	2	1	---	---	---	---	1
Hume FPD	---	---	1	---	---	---	---	---	---
Metcalf FPD	---	---	---	---	---	---	---	---	---
Horizon Health	---	---	---	---	---	---	---	1	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Medical includes: public health departments, hospitals, urgent/prompt care, and medical clinics.
[3] Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.
--- Indicates jurisdiction does not own/maintain any critical facilities within that category.

3.9 WILDFIRES

HAZARD IDENTIFICATION

What is the definition of a wildfire?

A wildfire is an unplanned fire that spreads through vegetation and natural areas such as forests, grasslands, or prairies. They can happen anytime and anywhere. These dangerous fires spread quickly and can devastate not only wildlife and natural areas, but also communities.

What causes wildfires?

Between 2017 and 2021, approximately 89% of wildfires in the U.S. were caused by humans according to the Congressional Research Service. Human-caused fires result from campfires left unattended, burning debris, equipment use and malfunctions, negligently discarded cigarettes, and intentional acts of arson. Wildfires can also be caused by nature – mostly due to lightning strikes. Wildfires ignited by lightning tend to be slightly larger and burn more acreage than human-caused wildfires.

Wildfire behavior is influenced by many factors including terrain, climate, weather, and types of fuel. The terrain or topography of an area can help or hinder the spread of a wildfire. Fires burn faster up hillsides than they do on flat ground. Though wildfires can happen anytime conditions are right, the climate (time of year) influences the effects of fire. During some seasons more moisture is present than in others, thus reducing fire threat. Wildfire season in the western U.S. is June through October while March through May is wildfire season in the southeastern U.S. Weather conditions such as wind, temperature, and humidity can affect the severity and duration of a fire. Areas that have experienced prolonged droughts are at the highest risk of wildfires. In terms of fuel, the type and amount as well as its burning qualities and moisture level affect wildfire potential and behavior.

How big a threat are wildfires and where do they occur?

Every year, wildfires burn millions of acres across the country. In 2021, wildfires occurred in every state with the exception of Delaware according to the National Interagency Coordination Center (NICC). A total of 58,985 wildfires burned 7.1 million acres and nearly 6,000 structures in 2021. For comparison, between 2012 and 2021 there were an average of 61,289 wildfires annually and an average of 7.4 million acres impacted annually. While more wildfires occur in the eastern U.S. (including the central states), wildfires in the West are larger and burn more acreage. In 2021, just over 23,000 wildfires burned approximately 6.2 million acres in the West, compared with the over 35,000 wildfires that burned just under 1.0 million acres in the East. According to the National Interagency Fire Center, fire suppression costs on federal lands alone in 2021 totaled approximately $2.3 billion.

While only a small fraction of wildfires become catastrophic, that small percentage accounts for the vast majority of acres burned. In 2021, 2% (943 wildfires) were classified as large or significant with 38 exceeding 40,000 acres in size and 13 exceeding 100,000 acres. **Figures WF-1** and **WF-2** illustrate the total number of wildfires and acres impacted in the U.S. and Illinois between 2017 and 2021.

Figure WF-1
U.S. Wildfire Frequency & Acres Impacted
2017 – 2021

Year	# of Wildfires Human	Acres Impacted Human	# of Wildfires Lightning	Acres Impacted Lightning	Total # of Wildfires	Total Acres Impacted
2017	63,546	4,830,476	7,953	5,195,610	71,499	10,026,086
2018	51,576	5,640,489	6,507	3,127,003	58,083	8,767,492
2019	44,115	1,217,324	6,362	3,447,038	50,477	4,664,362
2020	53,563	5,998,813	5,387	4,123,523	58,950	10,122,336
2021	52,641	3,023,759	6,344	4,101,884	58,985	7,125,643
Total:	**265,441**	**20,710,861**	**32,553**	**19,995,058**	**297,994**	**40,705,919**

Source: National Interagency Coordination Center.

Figure WF-2
Illinois Wildfire Frequency & Acres Impacted
2017 – 2021

Year	# of Wildfires Human	Acres Impacted Human	# of Wildfires Lightning	Acres Impacted Lightning	Total # of Wildfires	Total Acres Impacted
2017	n/a	n/a	n/a	n/a	n/a	n/a
2018	6	120	0	0	6	120
2019	2	41	0	0	2	41
2020	19	240	0	0	19	240
2021	29	219	0	0	29	219
Total:	**56**	**620**	**0**	**0**	**56**	**620**

Source: National Interagency Coordination Center.

HAZARD PROFILE

The following identifies past occurrences of wildfires, details the severity or extent of each event (if known), identifies the locations potentially affected, and estimates the likelihood of future occurrences.

When have wildfires occurred previously? What is the extent of these previous wildfires?

Wildfire Fast Facts – Occurrences

Number of Wildfire Events Reported (2020): ***2***

No comprehensive, publicly-accessible database detailing wildfire occurrences currently exists in Illinois. A review of NOAA's Storm Events Database, local news articles and discussions with Planning Committee members documented two wildfire events in Edgar County in 2020. On October 14, 2020, a field fire started at Horace Brocton Road (CH 8) and Cherry Point Road (CH 9) in Edgar Township in unincorporated Edgar County burning 500 acres and damaging an additional 500 acres. On the same day another wildfire took place in Paris Township in unincorporated Edgar County. Fire departments from several counties responded to these two fires with more than 100 firefighters assisting in the response.

What locations are affected by wildfires?

Wildfire events have the potential to affect the entire County. According to the Multi-Resolution Land Characteristics (MRLC) Consortium approximately 94% of the County's land cover is vegetation, including cultivated crop land, pasture/hay and deciduous/mixed forest.

What is the probability of future wildfires occurring?

Given the limited amount of data available, it is difficult to specifically establish the probability of future wildfires. However, if factors such as weather conditions, ground cover (fuel sources), and severity of previous wildfires are taken into consideration then the probability is estimated to be ***low*** to ***medium***. For the purposes of this analysis "medium" is defined as having at least a 50% chance of occurring in any given year while "low" is defined as having less than a 10% change of occurring in any given year.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known), and estimates the potential impacts on public health and safety, as well as buildings, infrastructure, and critical facilities from wildfire.

Are the participating jurisdictions vulnerable to wildfires?

Yes. All of Edgar County is vulnerable to the dangers presented by wildfires.

Do any of the participating jurisdictions consider wildfires to be among their community's greatest vulnerabilities?

No. Based on responses to a Critical Facilities Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions considered wildfires to be among their community's greatest vulnerability.

What impacts resulted from the recorded wildfires?

According to the Chrisman Fire Protection District, the October 14, 2020 field fire caused $116,000 in crop and field damage.

Wildfire Fast Facts – Impacts/Risk

Wildfire Impacts
- Total Property/Crop Damage: ***n/a***
- Total Crop Damage (1 event): ***$116,000***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Wildfire Risk/Vulnerability:
- Public Health & Safety: ***Low/Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

What other impacts can result from wildfires?

Wildfires can disrupt transportation, communications and utility service. They can also lead to a deterioration in air quality and loss of property, crops, resources, animals, and people. Wildfires also simultaneously impact weather and the climate by releasing large quantities of carbon dioxide, carbon monoxide, and fine particulate matter into the atmosphere. The resulting air pollution can cause a range of health issues, ranging from eye and respiratory tract irritation to more serious disorders, including reduced lung function, bronchitis, exacerbation of asthma and heart failure, and premature death. Another significant health effect of wildfires is on the mental health of affected individuals.

What is the level of vulnerability to public health and safety from wildfires?

The risk or vulnerability to public health and safety from a wildfire is dependent on the intensity and location of the event. While wildfires have occurred previously, the number of injuries and fatalities is low. Taking into consideration the various conditions, the risk or vulnerability posed by wildfires to public health and safety of the *general population* is considered to be ***low***. The level of risk or vulnerability posed by wildfires to the public health and safety of *sensitive populations* is considered to be ***medium***. Sensitive populations such as very small children and individuals with chronic conditions are more susceptible to respiratory effects and there their risk is elevated. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure, and critical facilities vulnerable to wildfires?

Yes. All existing buildings, infrastructure, and critical facilities located in Edgar County and the participating jurisdictions are vulnerable to damage from wildfires. In addition to impacting structures, wildfires can damage infrastructure such as roads and utilities. Roadways, culverts, and bridges can be weakened by wildfire and overhead power and communication lines can be rendered inoperable by wildfires. None of the fire protection districts have burn ordinances in place that may lessen the number of events.

As with public health and safety, the risk or vulnerability to buildings, infrastructure, and critical facilities is dependent on several factors including the severity of the event and the extent and type of development and infrastructure located in the vicinity of the wildfire. When these factors are taken into consideration, the overall risk posed by a wildfire in Edgar County is considered to be ***low***.

Are future buildings, infrastructure, and critical facilities vulnerable to wildfires?

Yes. All future buildings, infrastructure and critical facilities located within the Edgar County are vulnerable to damage from wildfires. As a result, future buildings, infrastructure, and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure, and critical facilities described previously. **Figure R-4** lists the number of each type of critical infrastructure by jurisdiction.

What are the potential dollar losses to vulnerable structures from wildfires?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for wildfire events. Since damage information was only available for one recorded wildfire event, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Edgar County Supervisor of Assessments the total equalized assessed values of buildings in the planning area is $129,353,780. Since all of the structures in the planning area are susceptible to wildfire impacts to varying degrees, this total represents the countywide property exposure to wildfires.

3.10 MAN-MADE HAZARDS

While the focus of this Plan update is on natural hazards, an ***overview of selected man-made hazards*** has been included. The Planning Committee recognizes that man-made hazards can also pose risks to public health and property. The extent and magnitude of the impacts that result from man-made hazard events can be influenced by natural hazard events. For example, severe winter storms can cause accidents involving trucks transporting hazardous substances. These accidents may lead to the release of these substances which can result in injury and potential contamination of the natural environment.

Consequently, the Planning Committee decided to summarize the more prominent man-made hazards in Edgar County. The man-made hazards profiled in this Plan update include:

- Hazardous Substances
  - Generation
  - Transportation
  - Storage/Handling
- Waste Disposal
- Hazardous Material Incidents
- Hazardous Waste Remediation
- Terrorism

While the man-made hazards risk assessment does not have the same depth as the natural hazards risk assessment, it does provide useful information that places the various man-made hazards in perspective.

3.10.1 Hazardous Substances

Hazardous substances broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. For the purposes of this Plan, the term hazardous substance includes hazardous product and hazardous waste. A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity or toxicity and cannot be reused. A hazardous product is all other hazardous material.

Hazardous substances can pose a public health threat to individuals at their workplace and where they reside. The type and quantity of the substance, the pathway of exposure (inhalation, ingestion, dermal, etc.), and the frequency of exposure are factors that will determine the degree of adverse health effects experienced by individuals. Impacts can range from minor, short-term health issues to chronic, long-term illnesses.

In addition to impacting public health, hazardous substances can also cause damage to buildings, infrastructure, and the environment. Incidents involving hazardous substances can range from minor (scarring on building floors and walls) to catastrophic (i.e., destruction of entire buildings, structural damage to roadways, etc.) and lead to injuries and fatalities. The number of incidents involving hazardous substances in Illinois and across the U.S. every year underscores the need for trained and equipped emergency responders to minimize damages.

Since 1970, significant changes have occurred in regard to how hazardous substances are transported and disposed. Comprehensive regulations and improved safety and industrial hygiene practices have reduced the frequency of incidents involving hazardous substances. Based on the

small number of facilities in Edgar County that generate and use hazardous substances, the population size, transportation patterns, and land use, the probability of a release occurring in Edgar County should remain relatively higher compared to other counties in Illinois. The relatively low numbers of transportation incidents should not diminish municipal or county commitment to emergency management as it only takes a two-year sample.

HAZARD PROFILE – HAZARDOUS SUBSTANCES

The following subsections identify the general pathways – generation, transportation, and storage/handling – by which hazardous substances pose a risk to public health and the environment in Edgar County.

3.10.1.1 Generation

Edgar County has three facilities that generate reportable quantities of hazardous substances as a result of their operations according to the U.S. Environmental Protection Agency (USEPA) Toxic Release Inventory. **Figure MMH-1** identifies the hazardous substance generators located in Edgar County and summarizes the substances generated.

Hazardous Substances Fast Facts - Occurrences

Generation

Number of Facilities that Generate Reportable Quantities of Hazardous Substances (2020): ***3***

Transportation

Number of Roadway Incidents Involving Hazardous Substance Shipments (2011-2020): ***11***

Number of Railway Accidents/Incidents Involving Hazardous Substance Shipments (2011-2020): ***None***

Number of Pipeline Incidents Involving Hazardous Substances (2011-2020): ***1***

Storage/Handling

Number of Facilities that Store/Handle Hazardous Substances (2020): ***27***

Number of Facilities that Store/Handle Extremely Hazardous Substances (2020): ***8***

Figure MMH-1
Generators of Solid & Liquid Hazardous Substances – 2020

Name	Hazardous Substances Generated	Amount Generated (Pounds)
Paris		
Aerogen-Tek	Chromium compounds	250
	Nickel compounds	250
	Total:	*500*
North American Lighting	Diisocyanates	0
	Styrene	2,305
	Total:	*2,305*
The GSI Group LLC	Chromium	1,235
	Manganese	1,531
	Nickel	1,073
	Total:	*3,839*

Source: U.S. Environmental Protection Agency, TRI Explorer, Releases: Facility Report.

3.10.1.2 Transportation

Roadways

Illinois has the nation's third largest interstate system and third largest inventory of bridges. According to the Illinois Department of Transportation, there were just over 147,000 miles of highways and streets in Illinois in 2021. Most of the truck traffic in Edgar County is carried on U.S. Route 150 and Illinois Route 1. Other major roadways that carry truck traffic include Illinois U.S. Route 36 and Illinois Routes 16, 49 and 133. While this modern roadway system provides convenience and efficiency for commuters, it also aids in-state and intra-state commerce which includes the transportation of hazardous substances. A Commodity Flow Study to gauge chemical transport has not yet been conducted for Edgar County.

According to records obtained from the Illinois Emergency Management Agency (IEMA), there were three recorded roadway incidents involving the shipment of hazardous waste and/or products in Edgar County between 2011 through 2020. **Figure MMH-2** provides information on these incidents.

Figure MMH-2
Roadway Incidents* Involving Shipments of Hazardous Substances
2011 – 2020

Date	Area	Location	Hazardous Product Released	Quantity Released
9/1/2011	Brocton[^]	North of Illinois Route 133	Coal and diesel fuel	24 tons of coal and 10 gallons of diesel fuel
5/6/2012	Paris[^]	County Road 1225	Amaze Gold, Durango, Matador, Sharpen, and Methylated seed oil	3 gallons
11/10/2014	Kansas[^]	2305 North 460th St.	Hog manure	100 gallons
5/5/2015	Kansas[^]	300 North and 50th Road East	Diesel fuel	Unknown
6/9/2017	Chrisman[^]	Intersection of Illinois Route 1 and US 36	Hydraulic oil	Less than 5 gallons
4/5/2019	Kansas[^]	3240 Illinois Route 16	Anhydrous ammonia	Unknown
8/15/2019	Ridge Farm[^]	US Highway 150 at Crab Apple Bridge	Road oil	6 gallons
6/15/2020	Paris[^]	Illinois Route 1, half mile north of East 300th Road	Diesel fuel	Approximately 80 gallons
11/3/2020	Kansas[^]	1 mile east of 3240 Illinois Route 16	Diesel fuel	Approximately 40 gallons
11/6/2020	Paris[^]	12433 North 1900 St.	Anhydrous ammonia	200 gallons
11/9/2020	Paris[^]	North of 900 E and 1400 Road	Anhydrous ammonia	750 pounds

* For the purposes of this report a roadway incident is generally defined as an accident/incident that occurs while in the process of transporting a hazardous substance(s) on a highway, roadway, access drive, field entrance, rest area or parking lot. Vehicles that experience a release while refueling are not considered roadway incidents but are instead considered fixed facility incidents.

[^] Accident verified in the vicinity of this area.

Source: Illinois Emergency Management Agency, Hazardous Materials Incident Reports.

Railways

Illinois' rail system is the country's second largest, with the East St. Louis and Chicago terminals being two of the nation's busiest. In Edgar County there are one main rail line and two spur lines operated by Decatur & Eastern Illinois Railroad. The main line runs east-west across the northern portion of the County. One spur runs northeast to southwest in the eastern portion of the County. The other spur runs from north to southeast across the central and eastern portions of the County.

According to the Association of American Railroads, 3,796,300 carloads (125.9 million tons) of freight originated in Illinois in 2019 (the latest year for which data is available). Chemicals accounted for 101,100 carloads (9.7 million tons) or 2.8% of the total freight handled. In comparison, 27,549,000 carloads of freight originated in the U.S. in 2019 with approximately 2,014,000 carloads (7.1%) involved in the transport of chemicals.

The Illinois Commerce Commission (ICC) is required to maintain records on railway accidents/incidents that involve hazardous substances. Their records are divided into three categories. These three categories are described in **Figure MMH-3**.

Figure MMH-3
ICC Hazardous Substances Railroad Accident/Incidents Classification Categories

Category	Description
A	railroad derailments resulting in the release of the hazards substance(s) being transported
B	railroad derailments where hazards substance(s) were being transported but no release occurred
C	releases of hazardous substance(s)s from railroad equipment occurred; however, no railroad derailment was involved

Since 2011, there have been three rail accidents involving hazardous substances in Edgar County according to the ICC. In comparison, ICC records indicate that since 2011 the annual number of railway accidents in Illinois involving hazardous substances has ranged between 45 and 122. **Figure MMH-4** provides a breakdown by category of the ICC-recorded railway accidents/incidents involving hazardous substances. Included is a comparison of the number of accidents/incidents in Whiteside County to those in Cook and the Collar Counties as well as the rest of Illinois.

Figure MMH-4
ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances
2011 – 2020
(Sheet 1 of 2)

Year	Category	Accident/Incident Location			
		Illinois	Edgar County	Cook & Collar Counties	All Other Counties
2011	A	8	0	1	7
	B	10	0	9	1
	C	60	0	33	27
2012	A	4	0	2	2
	B	13	0	11	2
	C	73	0	42	31

Figure MMH-4
ICC Recorded Railway Accidents/Incidents Involving Hazardous Substances
2011 – 2020
(Sheet 2 of 2)

Year	Category	Accident/Incident Location			
		Illinois	Edgar County	Cook & Collar Counties	All Other Counties
2013	A	5	0	3	2
	B	23	0	16	7
	C	82	0	51	31
2014	A	2	0	2	0
	B	36	0	21	15
	C	84	0	40	44
2015	A	4	0	3	1
	B	27	0	15	12
	C	69	0	36	33
2016	A	4	0	1	3
	B	14	0	6	8
	C	65	0	33	32
2017	A	2	0	1	1
	B	14	0	9	5
	C	69	0	34	35
2018	A	1	0	0	1
	B	8	0	4	4
	C	55	0	24	31
2019	A	6	0	4	2
	B	6	0	4	2
	C	33	0	12	21
2020	A	4	0	2	2
	B	7	0	5	2
	C	46	0	30	16

Source: Illinois Commerce Commission.

The top 20 hazardous substances moved by rail through Illinois include: sodium hydroxide, petroleum gases (liquefied), sulfuric acid, anhydrous ammonia, chlorine, sulfur, vinyl chloride, propane, fuel oil, denatured alcohol, methanol, gasoline, phosphoric acid, hydrochloric acid, styrene monomer, carbon dioxide (refrigerated liquid), ammonium nitrate, sodium chlorate, and diesel fuel.

Pipelines

Energy gases (natural gas and liquefied petroleum gas), petroleum liquids (crude oil and gasoline), and liquid and gas products used in industrial processes are carried in above-ground and buried pipelines across Illinois. According to the U.S. Department of Transportation's National Pipeline Mapping System, there are five interstate hazardous liquids pipelines and eight intrastate natural gas pipeline systems in Edgar County. Two of the hazardous liquids pipelines are owned by Marathon (petroleum products), one is owned by NuStar (anhydrous ammonia), one is owned by Buckeye Partners (petroleum products), and another is owned by BP (petroleum products). Six natural gas pipeline systems are owned by Panhandle Eastern, one is owned by Rockies Express Pipeline, LLC, and one is owned by Midwestern Gas Transmission.

One pipeline release occurred in Edgar County during a 10-year period from 2011 through 2020. This incident took place about 2 miles south of Vermilion on February 23, 2013. According to the IEMA's incident record, faulty pipe fittings resulted in a release of anhydrous ammonia from the NuStar transmission pipeline. The release occurred in a rural farm field and was estimated to be about 350 pounds of anhydrous ammonia over a 24-hour period. No evacuations were ordered, and no damage estimates were available.

There have been several high-profile incidents across the U.S., including one in Illinois, that have raised public concerns about our aging pipeline infrastructure. The following provides a brief description of each incident.

- On July 26, 2010, a 30-inch liquid product pipeline rupture near Marshall, Michigan and released at least 840,000 gallons of oil into a creek that led to the Kalamazoo River, a tributary of Lake Michigan.
- On September 9, 2010, another pipeline release received national attention. A 34-inch liquid product pipeline in the Chicago suburb of Romeoville, Illinois released more than 360,000 gallons of crude oil that flowed through sewers and into a retention pond narrowly avoiding the Des Plaines River. This release triggered numerous odor complaints from residents in the adjacent municipalities of Lemont and Bolingbrook. The property damage/cleanup costs were estimated at $46.6 million.
- Also, on September 9, 2010, a 30-inch high pressure natural gas pipeline ruptured in the San Francisco suburb of San Bruno, California that resulted in an explosion that killed eight people, injured 51, destroyed over 30 homes and damaged an entire neighborhood. The property damage was estimated at around $55 million.
- On March 12, 2014, a gas main rupture in Manhattan, New York resulted in an explosion that killed eight people and leveled two multi-use, five story buildings.
- On May 19, 2015, a 24-inch liquid product pipeline ruptured near Refugio State Beach in Santa Barbara County, California and released approximately 100,000 gallons of crude oil. The release occurred along a rustic stretch of coastline that forms the northern boundary of the Santa Barbara Channel, home to a rich array of sea life. Oil ran down a ravine and entered the Pacific Ocean, blackening area beaches, creating a 9-mile oil slick and impacting birds, marine mammals, fish and coastal and subtidal habitats.

Continual monitoring and maintenance of these pipelines is necessary to prevent malfunctions from corrosion, aging, or other factors that could lead to a release. In addition to normal wear and tear experienced by pipelines, the possibility of sabotage and seismic activity triggering a release must be considered when contemplating emergency response scenarios.

3.10.1.3 Storage/Handling

Beyond knowing where hazardous substances are generated and the methods and routes used to transport them, it is important to identify where hazardous substances are handled and stored. This information will help government officials and emergency management professionals make informed choices on how to better protect human health, property and the environment and what resources are needed should an incident take place.

Records obtained from IEMA's Tier II database were used to gather information on the facilities that generate, use and store chemicals in excess of reportable threshold quantities within Edgar County. The Tier II information was then compared with USEPA's Toxic Release Inventory (TRI) and information from Illinois Environmental Protection Agency (IEPA) databases. This review identified 27 facilities within Edgar County in 2020 that store and handle hazardous substances.

Of these 27 facilities, eight reported the presence of Extremely Hazardous Substances (EHSs) at their facilities. An EHS is any USEPA-identified chemical that could cause serious, irreversible health effects from an accidental release. There are approximately 400 chemicals identified as EHSs. Stationary sources that possess one or more of these substances at or above threshold reporting quantities are required to notify IEMA.

Figure MMH-5 identifies the types of EHSs and the facilities that store and handle them. Aside from EHSs, there are other chemicals, such as water reactives, that can pose risks that are equal to or greater than the risks posed by EHSs. These risks can be identified through a Threat and Hazard Identification and Risk Assessment (THIRA).

Figure MMH-5
Extremely Hazardous Substances by Facility – 2020

Facility Name	Extremely Hazardous Substance(s)
Chrisman	
Effingham Equity	Anhydrous ammonia
Kansas	
CNT	Sulfuric acid
Nutrien Ag Solutions 1395	Anhydrous ammonia
Metcalf	
Nutrien Ag Solutions 727	Anhydrous ammonia
Paris	
AeroGen-TEK	Sulfuric acid
Illini FS	Anhydrous ammonia
Nutrien Ag Solutions 728	Anhydrous ammonia
Pretium Packaging	Sulfuric acid

Sources: Illinois Emergency Management Agency, Tier II Hazardous Chemical Reports.
U.S. Environmental Protection Agency, TRI Explorer.

3.10.2 Waste Disposal

Waste disposal has caused surface water and ground water contamination in Illinois and across the U.S. Beginning in the late 1970s substantial regulatory changes strengthened the design, operating and monitoring requirements for landfills where the majority of waste is disposed. These regulatory changes have helped reduce the public health threat posed by landfills.

HAZARD PROFILE – WASTE DISPOSAL

The following subsections identify the general pathways – solid, medical, and hazardous – by which waste disposal poses a risk to public health and the environment in Edgar County.

3.10.2.1 Solid Waste

While recycling activities have reduced the amount of solid waste (waste generated in households), the majority continues to be disposed of in landfills. As of 2019, the most recent year for which data was available, there were 37 landfills operating in Illinois.

According IEPA's Annual Landfill Capacity Report issued in October 2020, there are no commercial landfills currently operating in Edgar County.

Waste Disposal Fast Facts - Occurrences

Solid Waste
Number of Solid Waste Landfills Operating in Edgar County (2020): ***None***

Number of Landfills Serving Edgar and adjacent counties (2020): ***2***

Potentially-Infectious Medical Waste (PIMW)
Number of Facilities within the County Permitted to Handle PIMW: ***None***

Hazardous Waste
Number of Commercial Off-Site Hazardous Waste Treatment or Disposal Facilities located in the County: ***None***

There are currently two Illinois landfills that serve Edgar and the adjacent counties. These landfills include:

- Illinois Landfill (Vermilion County); and
- Brickyard Disposal and Recycling (Vermilion County).

3.10.2.2 Potentially- Infectious Medical Waste

Potentially-Infectious Medical Waste (PIMW) is generated in connection with medical research; biological testing; and the diagnosis, treatment or immunization of human beings or animals. PIMW is typically generated at hospitals, nursing homes, medical or veterinary clinics, dental offices, clinical or pharmaceutical laboratories, and research facilities.

According to IEPA's list of permitted PIMW Facilities, there are no facilities permitted to accept medical waste for disposal in Edgar County.

3.10.2.3 Hazardous Waste

A hazardous waste is defined as the byproduct of a manufacturing process that is either listed or has the characteristics of ignitability, corrosivity, reactivity, or toxicity and cannot be reused.

According to IEPA's Storage, Treatment, Recycling, Incinerating, Transfer Stations, and Processing list, there are currently no off-site hazardous waste treatment or disposal facilities located in Edgar County.

3.10.3 Hazardous Material Incidents

A hazardous material or hazmat incident refers to any accident involving the release of hazardous substances, which broadly include any flammable, explosive, biological, chemical, or physical material that has the potential to harm public health or the environment. These incidents can take place where the substances are used, generated or stored or while they are being transported. In addition, hazmat incidents also include the release of hazardous substances, such as fuel, used to operate vehicles. These releases can be the result of an accident or a leak.

HAZARD PROFILE – HAZARDOUS MATERIALS INCIDENTS

From 2011 to 2020, there were 28 hazmat incidents recorded in Edgar County. **Figure MMH-6** provides information on these hazmat incidents. Of these incidents, 12 (43%) involved transportation incidents/accidents while 16 (57%) occurred at fixed facilities. Five of the 12 (42%) transportation incidents/accidents involved petroleum-based products.

Hazmat Incident Fast Facts - Occurrences

Number of Hazardous Material Incidents in Edgar County (2011 - 2020): ***28***

Number of Transportation-Related Incidents/Accidents: ***12***

Number of Fixed Facility-Related Incidents/Accidents: ***16***

Average Number of Hazardous Material Incidents Experienced Annually: ***3***

Based on the recorded incidents, Edgar County experienced an average of three hazmat incidents annually between 2011 and 2020. The types of existing industries; the major transportation corridors through the County, which include interstate and Illinois highways, rail and pipeline; and chemical use within and adjacent to the County suggest that hazmat incidents are likely to continue to take place at the rate reflected in the 10-year study period. Constant vigilance, proper training and equipment, and prompt response are needed to minimize the potential impacts of each incident.

3.10.4 Waste Remediation

The improper disposal or containment of special and hazardous waste through the years has led to soil, groundwater, and surface water contamination of sites across the U.S. In order to safeguard human health and the environment, these contaminants must be removed or neutralized so they cannot cause harm. This process is known as waste remediation.

HAZARD PROFILE – WASTE REMEDIATION

In Illinois, waste remediation is handled through several programs including the federal Superfund program, the State Response Action Program, the state Site Remediation Program, and the Leaking Underground Storage Tanks Program. The following provides a brief description of each.

Superfund (CERLCA) Program/National Priorities List

Superfund is a USEPA-led program to clean up sites within the U.S. contaminated by hazardous waste that has been dumped, left out in the open, or otherwise improperly managed and which pose a risk to human health and/or the environment. Sites of national priority among the known or threatened releases of hazardous substances, pollutants or contaminants throughout the U.S. and its territories are identified on the National Priorities List (NPL). Those sites that pose the largest threat to public health and the environment are typically found on the NPL.

According to the NPL database, there are 45 Superfund sites in Illinois. However, there are no sites in Edgar County being managed through the Superfund program.

Figure MMH-6
Hazmat Incidents in Edgar County: 2011 - 2020

Date	Location	Hazardous Substances Released
2011		
09/01	Brocton^	Coal and diesel fuel†
2012		
03/18	Metcalf^	Anhydrous ammonia
05/06	Paris^	Amaze Gold, Durango, Matador, Methylated seed oil, Sharpen (pesticide mixture)†
2013		
02/23	Vermilion^	Anhydrous ammonia*
02/27	Paris	Diesel fuel
07/13	Paris	Mercury
11/19	Paris^	Jet fuel
2014		
04/19	Redmon^	Diesel fuel
11/10	Kansas^	Hog manure†
2015		
02/06	Paris	Phenanthrene
05/05	Kansas^	Diesel fuel†
05/20	Paris^	Anhydrous ammonia
2016		
04/29	Metcalf	Unknown petroleum product
05/23	Paris^	Halex GT, Atrazine (pesticides)
05/31	Chrisman^	Gasoline
2017		
03/27	Kansas^	Liquid hog waste
06/09	Chrisman^	Hydraulic oil†
08/31	Metcalf	Unknown, suspected petroleum product
2018		
04/14	Paris	Diesel fuel
2019		
01/16	Paris^	Unknown paint waste
01/25	Paris	Used oil
04/05	Kansas^	Anhydrous ammonia†
08/15	Ridge Farm^	Road oil†
10/02	Paris	Presumed kerosene
2020		
06/15	Paris^	Diesel Fuel†
11/03	Kansas^	Diesel Fuel†
11/06	Paris^	Anhydrous ammonia†
11/09	Paris^	Anhydrous ammonia†

^ Incident verified in the vicinity of this location.
† Incident involved the transportation of a hazardous substance by roadway.
* Incident involved the transportation for a hazardous substance by pipeline.

Waste Remediation Fast Facts - Occurrences

Superfund
Number of Superfund Sites in the County: ***None***

Illinois Site Response Action Program
Number of SRAP Sites in the County: ***3***

Illinois Site Remediation Program
Number of SRP Sites in the County: ***7***

Number of SRP Sites with NFR Letters: ***6***

Illinois Leaking Underground Storage Tanks Program
Number of LUST Sites in County: ***60***

Number of LUST Sites with NFR/Non-Lust/4Y Letters: ***53 (88%)***

State Response Action Program (SRAP)

The main objective of the State Response Action Program (SRAP) is to clean up hazardous substances at sites that present an imminent and substantial threat to human health and the environment, but which may not be addressed by other federal or state cleanup programs. The sites handled by the SRAP include abandoned landfills, old manufacturing plants, former waste oil recycling operations, contaminated agrichemical facilities, and other areas where surface water, groundwater, soil and air may be contaminated with hazardous substances. Since the mid-1980s, cleanup activities have been conducted at more than 500 sites in Illinois through this Program. Once the threat to human health and the environment has been mitigated, some sites are transferred to other state cleanup programs to complete remediation activities.

There are three SRAP sites in Edgar County. One of the sites has completed the Program.

Illinois Site Remediation Program (SRP)

The Site Remediation Program (SRP) is a voluntary cleanup program that provides applicants the opportunity to receive technical assistance in determining what course of action is needed to remediate sites where hazardous substances, pesticides, or petroleum may be present. The goal of the SRP is to receive a no further remediation determination from IEPA. Most site remediation in Illinois is handled through this Program. Since the mid-1980s, remediation activities have been conducted and monitored at approximately 5,800 sites in Illinois. Properties that satisfy respective IEPA laws and regulations can receive an NFR letter. They must demonstrate, through proper investigation and, when warranted, remedial action, that environmental conditions at their remediation site do not present a significant risk to human health or the environment. This letter describes what remediation activities have been taken and whether any portion of the property, based on future property use, might need additional remediation.

There are seven SRP sites in Edgar County. Six of the seven SRP sites have received NFR letters. The remaining site does not pose an immediate threat to public health or the environment.

Leaking Underground Storage Tank Program (LUST)

The Leaking Underground Storage Tanks Program (LUST) oversees remedial activities associated with petroleum product releases from underground storage tanks (UST). This program began in the late 1980s as a result of the threats posed by vapors in homes and businesses, contaminated groundwater, and contaminated soil. In Illinois, more than 14,500 acres of soil contaminated by leaking underground tanks have been remediated between 1988 and 2010 (the most recent year for which data was available).

In Edgar County there are 60 sites involving the remediation of petroleum product releases from underground storage tanks. Fifty-three of the 60 LUST sites (approximately 88%) have received NFR letters, other clearance letters, or remediation is virtually complete.

3.10.5 Terrorism

Terrorism has different definitions across the globe. For the purpose of this Plan, terrorism will be defined as any event that includes violent acts which threaten, or harm lives, health or property conducted by domestic or foreign individuals or groups aimed at civilians, the federal government or symbolic locations intended to cause widespread fear.

HAZARD PROFILE – TERRORISM

The attack on the World Trade Center and the Pentagon on September 11, 2001 by foreign terrorists galvanized national action against terrorism and resulted in the creation of the U.S. Department of Homeland Security. While the number of terrorist activities garnering national attention in the U.S. has been relatively small, approximately 201,183 terrorist events have occurred worldwide between 1970 and 2019, according to the National Consortium for the Study of Terrorism and Responses to Terrorism (the Consortium). During this same time span, the Consortium documented 3,004 terrorist events within the U.S.

Terrorism Fast Facts – Occurrences*

Number of Recorded Terrorism Events Worldwide (1970 – 2019): ***201,183***

Number of Recorded Terrorism Events in the U.S. (1970 – 2019): ***3,004***

Number of Recorded Terrorism Events in Illinois (1970 – 2019): ***117***

* Based on data from the National Consortium for the Study of Terrorism and Responses to Terrorism (START) Global Terrorism Database.

Acts of terrorism have resulted in fatalities and injuries as a result of kidnappings, hijackings, bombings, and the use of chemical and biological weapons. The Global Terrorism Database has documented 3,633 American fatalities in the U.S. between 1995 and 2019 from terrorist attacks. The attacks on September 11, 2001 account for 3,001of the 3,633 fatalities. A search of the Global Terrorism Database identified 117 incidents of terrorism in Illinois between 1970 and 2019. These incidents resulted in six fatalities and 38 injuries.

The Federal Bureau of Investigation's (FBI) provides supporting documentation on domestic terrorist attacks in a series of reports on terrorism. These reports provide a chronological summary of terrorist incidents in the U.S. with detailed information on attacks between 1980 and 2005. During this time period, 192 incidents were documented within the U.S. Six of these incidents occurred in Illinois; five in the Chicago area and one downstate.

On September 24, 2009, a single individual from Macon County sought to carry out his anger at the federal government by detonating a van filled with explosive outside of the Federal Courthouse in Springfield. This attempt was thwarted by the FBI.

More recently an active shooter incident occurred at the High School in Dixon. On May 16, 2018 at around 8:00 a.m. in the morning approximately 180 students were in the school's gymnasium practicing for graduation when a 19-year-old boy, armed with a 9-mm semi-automatic rifle, fired

several shots near the gymnasium. The school's resource officer confronted the shooter, who fled from the school on foot. The shooter fired several shots at the resource officer, who returned fire, wounding the shooter in the shoulder. The gunman suffered non-life threatening injuries. No students or staff were injured in the incident. Faculty and staff barricaded doors and took cover as the incident unfolded.

It is impossible to predict with any reasonable degree of accuracy how many terrorism events might be expected to occur in Edgar County or elsewhere in Illinois. Although targets for terrorist activity are more likely centered in larger urban areas, recruitment, training, and other support activities, such as the ones described above, have occurred in rural areas.

The economic resources available to some terrorist groups coupled with the combination of global tensions, economic uncertainty and frustration towards government appear to have recently raised the frequency of attempts. Enhanced efforts by law enforcement officials and civilian vigilance for unusual activity or behavior will be needed to repel terrorists whether they are domestic or foreign in origin.

4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce or eliminate the potential loss of life and property damage that results from the natural and man-made hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Reviewing and updating the mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in term of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural and man-made hazards.
- Evaluating the status of the existing mitigation actions and identifying a comprehensive range of jurisdiction-specific mitigation actions including those related to continued compliance with the National Flood Insurance Program (NFIP). Mitigation actions are projects, plans, activities, or programs that achieve at least one of the mitigation goals identified.
- Analyzing the existing and new mitigation actions identified for each jurisdiction. This analysis ensures each action will reduce or eliminate future losses associated with the hazards identified in the Risk Assessment section.
- Reviewing and updating the mitigation actions prioritization methodology. The prioritization methodology outlines the approach used to prioritize the implementation of each identified mitigation action.
- Identifying the entity(s) responsible for implementation and administration. For each mitigation action, the entity(s) responsible for implementing and administering that action is identified as well as the timeframes for completing the actions and potential funding sources.
- Conducting a preliminary cost/benefit analysis of each mitigation action. The qualitative cost/benefit analysis provides participants a general idea of which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

As part of the Plan update, the mitigation strategy was reviewed and revised. A detailed discussion of each aspect of the mitigation strategy and any updates made is provided below.

4.1 MITIGATION GOALS REVIEW

As part of the Plan update process, the mitigation goals developed in the original Plan were reviewed and re-evaluated. The Planning Committee chose to replace the three primary goals and list of objectives in order to simplify the mitigation strategy and address a more comprehensive range of mitigation activities and projects.

The original list of mitigation goals as well as potential updates to the list were distributed to the Planning Committee members at the first meeting on October 5, 2021. Members were asked to review the potential updates before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the Planning Committee's December 7, 2021 meeting the group discussed the updated goals and approved them with no changes. **Figure MIT-1** lists the approved mitigation goals.

Figure MIT-1 Mitigation Goals	
Goal 1	Lessen the impacts of hazards on new and existing infrastructure (buildings, roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) in order to promote hazard-resistant communities.
Goal 2	Incorporate hazard mitigation strategies into existing and new community plans and regulations.
Goal 3	Develop long-term strategies to educate residents and businesses on the hazards affecting Edgar County, the actions they can take before a hazard event occurs to protect themselves, their households, home and businesses and the resources available to implement identified actions in an effort to promote hazard resiliency.
Goal 4	Protect the lives, health, and safety of the individuals living in the County from the dangers caused by natural and man-made hazards.
Goal 5	Place a priority on protecting community lifelines (i.e., safety and security; food, water, and shelter; health and medical; energy; communication; and transportation), public services and schools.
Goal 6	Preserve and protect the creeks, streams, and floodplains in the County.
Goal 7	Ensure future development does not increase the vulnerability of hazard-prone areas within the County or create unintended exposures to natural and man-made hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural and man-made hazards.

4.2 EXISTING MITIGATION ACTIONS REVIEW

The Plan update process included a review and evaluation of the ***existing hazard mitigation actions*** listed in the original Plan. A copy of these original actions is included in **Appendix K**. A review of the existing hazard mitigation actions revealed the following shortcomings:

- ❖ Detailed descriptions of the actions to be implemented were not provided. Most of the actions identified did not have adequate project/activity descriptions and therefore failed to effectively communicate the solution to the problem of reducing future losses to those tasked with implementing the actions.
- ❖ Actions did not identify specific entities responsible for implementation. This created a situation in which the participating jurisdictions did not have a clear understanding of which department within their own jurisdiction was tasked with implementing the action and therefore no sense of responsibility or ownership of the action was taken.
- ❖ Actions already completed were included in the mitigation strategy. Several of the actions identified were already implemented prior to the completion and adoption of the Plan and therefore were eliminated.
- ❖ Actions focused on emergency preparedness or response and not mitigation. Several of the actions identified were aimed at addressing emergency preparedness or response and not mitigation needs and therefore were eliminated.

The remaining existing mitigation actions were evaluated, assigned to the appropriate participating jurisdiction(s), and presented to the Planning Committee members for their review and evaluation at the second meeting held on December 7, 2021. Each participating jurisdiction was asked to identify those actions that were either in progress or that had been completed since the original

Plan was prepared in 2014. They were also given the opportunity to eliminate any action on their specific list that they did not deem viable and/or practical for implementation.

Figure MIT-2 through **MIT-12** located at the end of this section, summarize the results of this evaluation by jurisdiction. Each action listed includes a reference number to the original mitigation action list found in **Appendix K**. Hume Fire Protection District, Kansas CUSD #3 and Metcalf Fire Protection District did not participate in the development of the original Plan and therefore are not included in the summary. Chrisman Fire Protection District, Edgar County CUSD #6, Horizon Health and Shiloh Township participated in the original Plan's development but did not include any mitigation actions in the Plan and are also not included in the summary. While Vermilion participated in the original Plan, they chose not to participate in the Plan update process and are not included in the summary.

4.3 NEW MITIGATION ACTION IDENTIFICATION

Following the review and evaluation of the existing mitigation actions, the Planning Committee members were asked to consult with their respective jurisdictions to identify ***new, jurisdiction-specific mitigation actions***.

Representatives of Edgar County, Chrisman, Metcalf and Paris were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program. The compiled lists of new mitigation actions were then reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated.

4.4 MITIGATION ACTION ANALYSIS

Next, those existing mitigation actions retained, and the new mitigation actions identified were assigned to one of four broad mitigation activity categories which allowed Planning Committee members to compare and consolidate similar actions. **Figure MIT-13** identifies each mitigation activity category and provides a brief description.

Each mitigation action was then analyzed to determine:

- the hazard or hazards being mitigated;
- the general size of the population affected (i.e., small, medium, or large);
- the goal or goals fulfilled;
- whether the action would reduce the effects on new or existing buildings and infrastructure; and
- whether the action would ensure continued compliance with the National Flood Insurance Program.

Each mitigation action was also evaluated to determine whether it would mitigate risk to one or more of FEMA's seven Community Lifelines. Community Lifelines are the most fundamental services in the community that, when stabilized, enable all aspects of society to function. These fundamental services enable the continuous operation of critical government and business functions essential to human health and safety or economic security. The Community Lifelines include Safety & Security; Food, Water, Shelter; Health & Medical; Energy (Power & Fuel);

Communications; Transportation; and Hazardous Materials. **Figure MIT-14** provides a brief description of each Community Lifeline.

Figure MIT-13
Types of Mitigation Activities

Category	Description
Local Plans & Regulations (LP&R)	Local Plans & Regulations include actions that influence the way land and buildings are being developed and built. Examples include stormwater management plans, floodplain regulations, capital improvement projects, participation in the NFIP Community Rating System, comprehensive plans, and local ordinances (i.e., building codes, etc.)
Structure & Infrastructure Projects (S&IP)	Structure & Infrastructure Projects include actions that protect infrastructure and structures from a hazard or remove them from a hazard area. Examples include acquisition and elevation of structures in flood prone areas, burying utility lines to critical facilities, construction of community safe rooms, install "hardening" materials (i.e., impact resistant window film, hail resistant shingles/doors, etc.) and detention/retention structures.
Natural System Protection (NSP)	Natural System Protection includes actions that minimize damage and losses and also preserve or restore natural systems. Examples include sediment and erosion control, stream restoration and watershed management.
Education & Awareness Programs (E&A)	Education & Awareness Programs include actions to inform and educate citizens, elected officials and property owners about hazards and the potential ways to mitigate them. Examples include outreach/school programs, brochures, and handout materials, becoming a StormReady community, evacuation planning and drills, and volunteer activities (i.e., culvert cleanout days, initiatives to check in on the elderly/disabled during hazard events such as storms and extreme heat events, etc.)

4.5 MITIGATION ACTION PRIORITIZATION METHODOLOGY REVIEW

The methodology developed to prioritize mitigation actions in the original Plan was reviewed by the Planning Committee as part of the Plan update process. The original prioritization methodology was based on the STAPLE+E planning factors (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) and applied a rating of high, medium, or low to each mitigation action.

Taking into account the number and types of factors assessed and the complexity associated with the STAPLE+E analysis, the Planning Committee decided to replace the original prioritization methodology with one focused on just two key factors: 1) the frequency of the hazard and 2) the degree of mitigation attained. This updated prioritization methodology was presented to the Planning Committee members at the third meeting held on February 15, 2022. The group reviewed and discussed the methodology and chose to approve it with no changes.

Figure MIT-15 identifies and describes the four-tiered prioritization methodology adopted by the Planning Committee. The methodology developed provides a means of objectively determining which actions have a greater likelihood of eliminating or reducing the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

Figure MIT-14 Community Lifelines	
Category	**Components/Subcomponents**
Safety & Security	- Law Enforcement/Security (police stations, law enforcement, site security, correctional facilities) - Fire Service (fire stations, firefighting resources) - Search & Rescue (local search & rescue) - Government Service (emergency operation centers, essential government functions, government offices, schools, public records, historic/cultural resources) - Community Safety (flood control, other hazards, protective actions)
Food, Water, Shelter	- Food [commercial food distribution, commercial food supply chain, food distribution programs (e.g., food banks)] - Water [drinking water utilities (intake, treatment, storage & distribution), wastewater systems, commercial water supply chain]; - Shelter [housing (e.g., homes, shelters), commercial facilities (e.g., hotels)]; - Agriculture (animals & agriculture)
Health & Medical	- Medical Care (hospitals, dialysis, pharmacies, long-term care facilities, VA health system, veterinary services, home care) - Patient Movement (emergency medical services) - Fatality Management (mortuary and post-mortuary services) - Public Health (epidemiological surveillance, laboratory, clinical guidance, assessment/interventions/treatments, human services, behavioral health) - Medical Supply Chain [blood/blood products, manufacturing (e.g., pharmaceutical, device, medical gases), distribution, critical clinical research, sterilization, raw materials]
Energy	- Power Grid (generation systems, transmission systems, distribution systems) - Fuel [refineries/fuel processing, fuel storage, pipelines, fuel distribution (e.g., gas stations, fuel points), off-shore oil platforms]
Communications	- Infrastructure [wireless, cable systems and wireline, broadcast (e.g., TV and radio), satellite, data centers/internet] - Alerts, Warnings, & Messages (local alert/warning ability, access to IPAWS, NAWAS terminals) - 911 & Dispatch (public safety answering points, dispatch) - Responder Communications (LMR networks) - Finance (banking services, electronic payment processing)
Transportation	- Highway/Roadway/Motor Vehicle (roads, bridges) - Mass Transit (bus, rail, ferry) - Railway (freight, passenger) - Aviation [commercial (e.g., cargo/passenger), general, military] - Maritime (waterways, ports and port facilities)
Hazardous Materials	- Facilities [oil/hazmat facilities (e.g., chemical, nuclear), oil/hazmat/toxic incidents from facilities] - Hazmat, Pollutants, Contaminants (oil/hazmat/toxic incidents from non-fixed facilities, radiological or nuclear incidents)

While prioritizing the actions is useful and provides participants with additional information, it is important to keep in mind that implementing any the mitigation actions is desirable regardless of which prioritization category an action falls under.

Figure MIT-15
Mitigation Action Prioritization Methodology

		Hazard	
		Most Frequent Hazard **(M)** (i.e., severe storms, severe winter storms, floods, excessive heat, extreme cold)	Less Frequent Hazard **(L)** (i.e., tornadoes, drought, wildfires, earthquakes)
Mitigation Action	Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)**	**HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of injuries and fatalities from the most frequently-occurring hazards	**HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of injuries and fatalities from less frequently-occurring hazards
	Mitigation Action with the Potential to Reduce Impacts **(L)**	**LM** mitigation action has the potential to reduce damages, fatalities and/or injuries from the most frequently-occurring hazards	**LL** mitigation action has the potential to reduce damages, fatalities and/or injuries from less frequently-occurring hazards

4.6 MITIGATION ACTION IMPLEMENTATION, ADMINISTRATION & COST/BENEFIT ANALYSIS

Finally, each participating jurisdiction was asked to identify how the mitigation actions will be implemented and administered. This included:

- identifying the party or parties responsible for oversight and administration;
- determining what funding source(s) are available or will be pursued;
- describing the time frame for completion; and
- conducting a preliminary cost/benefit analysis.

Oversight & Administration

It is important to keep in mind that many of the participating jurisdictions have extremely limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. Five of the Seven participating municipalities are small in size, with populations of less than 700 individuals. In most cases these jurisdictions have minimal staff who are only employed part-time. Their organizational structure is such that most have very few offices and/or departments, generally limited to public works and water/sewer. Those in charge of the offices/departments often lack the technical expertise needed to individually oversee and administer the identified mitigation actions. As a result, most of the participating jurisdictions identified their governing body (i.e., village board, city council or board of trustees) as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints. Other participants felt that oversight and administration fell under the purview of the entity's governing body (board/council) and not individual departments.

Funding Sources

While the Coles County Regional Planning and Development Commission has the ability to provide grant writing services to Edgar County, most of the participating jurisdictions do not have administrators with grant writing capabilities. As a result, assistance was needed in identifying possible funding sources for the identified mitigation actions. The consultant provided written information to the participants about FEMA and non-FEMA funding opportunities that have been used previously to finance mitigation actions. In addition, funding information was discussed with participants during planning committee meetings and in one-on-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person and application period among other key points. Specific grants from the following agencies were identified: United State Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued. However, if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by most, if not all, of the participants due to their size, projected population growth and limited revenue streams. It is important to remember that the population for the entire County is less than 17,500 individuals. Five of the seven participating municipalities have populations of less than 700 individuals. Most of the jurisdictions struggle to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

Time Frame for Completion

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In many cases, however, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

Cost/Benefit Analysis

A preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium, and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It was repeatedly communicated to the Planning Committee members that when a grant application is

submitted to IEMA/FEMA for a specific action, a detailed cost/benefit analysis will be required to receive funding.

4.7 RESULTS OF MITIGATION STRATEGY

Figures MIT-16 through **MIT-33** , located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by participating jurisdiction following the County and include both existing and new actions.

Figure MIT-2
Edgar County – Status of Existing Mitigation Actions
(Sheet 1 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Public Education/Awareness: Comments: Edgar County plans to raise public awareness of hazard risk to the county through a Facebook page, a local television channel, and a local radio frequency. This item is ongoing. (Mitigation Strategy No. 1)			✓		The County has created an ESDA Facebook page, subscribes to Nixle to provide emergency text alerts, and works with local newspapers and radio stations to raise awareness about the hazards that impact the County
Mutual Aid Agreements: Comments: Edgar County plans for each community to establish mutual aid agreements with surrounding communities by the end of 2015. (Mitigation Strategy No. 2)		✓			
Backup Generators: Comments: Edgar County plans to obtain back-up generators for each critical facility and county government building. They will contact FEMA or Commercial Contractor by the June of 2014 to inquire about funding. (Mitigation Strategy No. 3)	✓				
Enhance Communication Systems/Emergency Alert Systems – Sirens: Comments: Edgar County is currently looking into communications systems to improve communications between emergency operators as well as between emergency operators and the public. Edgar County is focusing on Wireless Emergency Notification System (WENS), StarCom, Motorola Turbo, and even social media to fulfill their needs. (Mitigation Strategy No. 4)			✓		Used WENS before changing to Nixle for emergency alerts in 2021.

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Edgar County has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. The County has one infrastructure improvement project in progress that has the potential to decrease vulnerability to Energy and Communications Communication Lifelines. This project however will not significantly change the vulnerability of hazard prone areas in the County. The County also has six administrative activities completed or in progress. Three of these activities have the potential to decrease the vulnerability to Safety & Security and Communications Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-2
Edgar County – Status of Existing Mitigation Actions
(Sheet 2 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Special Needs Population List: Comments: Edgar County is in the process of completing a special needs population list and will continue to maintain it. (Mitigation Strategy No. 5)		✓			
Procure Backup Water Supply: Comments: Edgar County is in the process of creating memorandums of understanding between generator companies and water companies in the county to ensure water treatment facilities do not shut down. (Mitigation Strategy No. 6)	✓				
Elevate Low-Lying Roads: Comments: The Edgar County Highway Department is planning to elevate several low-water crossings that significantly inhibit transportation, especially in Symmes Township, including those along 600 N, 450 N, E. 300th Rd., 1360 E, and N. 1600th St. The county Highway Department plans to obtain funding by 2015. (Mitigation Strategy No. 7)		✓			
Provide & Publicize Locations of Safe Rooms and/or Shelters: Comments: Edgar County is currently working on identifying all shelters in the county to provide this information to the public. (Mitigation Strategy No. 8)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Edgar County has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. The County has one infrastructure improvement project in progress that has the potential to decrease vulnerability to Energy and Communications Communication Lifelines. This project however will not significantly change the vulnerability of hazard prone areas in the County. The County also has six administrative activities completed or in progress. Three of these activities have the potential to decrease the vulnerability to Safety & Security and Communications Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-2
Edgar County – Status of Existing Mitigation Actions
(Sheet 3 of 3)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Tree Management: Comments: Edgar County already has a tree trimming and management program and will continue to maintain it. (Mitigation Strategy No. 9)		✓			
Cooling/Warming Shelters: Comments: Edgar County has a list of heating/cooling shelters in the county and plans to make this available to the public by the end of 2013. Edgar County would like to obtain back-up generators for the shelters by the end of 2014. (Mitigation Strategy No. 10)		✓			Information is made available about warming/cooling center locations. Not all locations have backup generators.
Burn Ordinance: Comments: Several municipalities have their own burn ordinance, but Edgar County will consider a county-wide burn ordinance in 2014. (Mitigation Strategy No. 11)	✓				
Install Snow Fences: Comments: Route 1 requires new snow fences for safe travel, and Edgar County plans to replace the snow fences by 2015. (Mitigation Strategy No. 13)	✓				
Earthquake Exercise: Comments: Encourage county wide participation in an earthquake mapping exercise like the Great American Shake Out. (Mitigation Strategy No. 14)		✓			
Adopt Seismic Building Codes: Comments: Edgar County will consider adoption an earthquake ordinance. (Mitigation Strategy No. 15)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Edgar County has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. The County has one infrastructure improvement project in progress that has the potential to decrease vulnerability to Energy and Communications Communication Lifelines. This project however will not significantly change the vulnerability of hazard prone areas in the County. The County also has six administrative activities completed or in progress. Three of these activities have the potential to decrease the vulnerability to Safety & Security and Communications Community Lifelines. These activities however will not significantly change the vulnerability of hazard prone areas within the County.

Figure MIT-3
Brocton – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Brocton has a back-up generator for its water treatment plant but needs an improved generator for the town's primary shelter. 2013 or 2014 is the desired period of completion. (Mitigation Strategy No. 16)					
Emergency Alert Systems: Comments: Brocton emergency services need enhanced radio communications, and each Brocton resident needs a NOAA weather radio. 2013 is the desired period of completion. Siren removal or disuse due to lack of funding is a possibility in Brocton. In 2013 or 2014, Brocton wishes to obtain funding for emergency siren maintenance. (Mitigation Strategy No. 17 & 18)					
Stormwater Management: Comments: Brocton is currently in the planning process of revising its storm water management ordinance. Storm water must exit the town more quickly. A possible solution considered for the ordinance include buying two twelve acre plots on the east and north side of Brocton to store and deter storm water. 2016 is the maximum projected date of completion. (Mitigation Strategy No. 23)					
Floodplain Ordinance: Comments: Brocton has passed a resolution for floodplain management and now must create an ordinance, which is projected to occur by the end of 2013. (Mitigation Strategy No. 24)					

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Brocton has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The Village also has one infrastructure improvement project and one administrative activity completed or in progress that have the potential to decrease the vulnerability to Communications and Energy Community Lifelines. These actions however will not significantly change the vulnerability of hazard prone areas within the Village.

Figure MIT-3
Brocton – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Improvement of Drainage Ditches: Comments: Brocton requires upgraded drainage ditches, so water exits the town more quickly during moderate rainfall. This will be addressed in the ordinance in planning and has a similar timeline, with a maximum expected completion date of 2016. (Mitigation Strategy No. 25)	✓				
Tree Management: Comments: Brocton infrastructure requires the equipment and personnel to begin and maintain a tree trimming plan and plans to complete this goal by 2015. (Mitigation Strategy No. 27)	✓				
Provide & Publicize Locations of Safe Rooms and/or Shelters: Comments: Brocton requires a shelter, and currently only has the basement of Brocton Christian Church as shelter from tornadoes and storms. 2014 is the expected date to receive funding for the project. (Mitigation Strategy No. 28)	✓				
Warming/Cooling Centers: Comments: Brocton has a cooling/warming shelter in the town's communications building but like to improve the generator. 2014 or 2015 is the expected completion date. (Mitigation Strategy No. 29)			✓		

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Brocton has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The Village also has one infrastructure improvement project and one administrative activity completed or in progress that have the potential to decrease the vulnerability to Communications and Energy Community Lifelines. These actions however will not significantly change the vulnerability of hazard prone areas within the Village.

Figure MIT-4
Chrisman – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Chrisman already has a back-up generator for its fire department but plans to obtain funding for generators for its schools and water treatment facilities in 2014 since Chrisman does not have a back-up water supply. (Mitigation Strategy No. 32)		✓			Currently purchasing water from Paris – our north pumping station is being phased out.
Family Disaster Plans & Kits: Comments: Chrisman would like obtain funding for family disaster plans & kits. They would advertise and demonstrate at local events in cooperation with Edgar County ESDA and Emergency Services. (Mitigation Strategy No. 33)	✓				
NOAA Weather Radios: Comments: Chrisman plans to obtain funding to provide NOAA weather radios to the public by 2015. (Mitigation Strategy No. 34)	✓				
Special Needs Population List: Comments: Chrisman plans to publicly appeal to its citizens and ask the special needs population or those caring for them to provide data for this list by 2015. (Mitigation Strategy No. 37)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chrisman has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The City also has one infrastructure improvement project and one administrative activity completed or in progress. The infrastructure improvement project has the potential to decrease the vulnerability to Food, Water, Shelter Community Lifelines. However, these projects and activities will not significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-4
Chrisman – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Improve Drainage Ditches & Stormwater Management: Comments: Chrisman plans to clean creek banks and replace old storm drains. (Mitigation Strategy No. 38)		✓			
Warming/Cooling Centers: Comments: Chrisman already has a list of heating/cooling shelters in the county and plans to make this available to the public. (Mitigation Strategy No. 46)			✓		

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Chrisman has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. It is still too early to tell the degree of reduction that will be experienced from the implementation of this project. The City also has one infrastructure improvement project and one administrative activity completed or in progress. The infrastructure improvement project has the potential to decrease the vulnerability to Food, Water, Shelter Community Lifelines. However, these projects and activities will not significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-5
Hume – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Hume requires a generator for the town's shelters, including the Hume FPD, the community center, and its three churches. 2014 is the planned completion date. (Mitigation Strategy No. 48)					
NOAA Weather Radios: Comments: Not all Hume residents have NOAA weather radios, and the town wishes to obtain funding so each Hume resident can have one. Hume plans to obtain this funding by 2014. (Mitigation Strategy No. 49)					
Family Disaster Plans & Kits: Comments: Hume would like to host a forum with its residents to discuss the importance of creating a family disaster plan and kit. This forum is planned to occur by 2014. (Mitigation Strategy No. 50)					
Establish Planning Committee: Comments: Hume would like to establish an emergency planning committee, especially to discuss, plan, and obtain funding for its flooding problem. Hume plans to assemble this committee by 2014. (Mitigation Strategy No. 51)					
Procure a Backup Water Supply Comments: Hume wishes to establish an emergency fund to obtain water from an outside source in the event a disaster disrupts their potable water supply. (Mitigation Strategy No. 52)					

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Hume was not able to complete any of the identified actions due to severe budgetary and personnel constraints experienced by a Village of this size (approx. 325 individuals.) The Village struggles to maintain even the most critical of services to its residents. As a result, there has been no changes in the vulnerability of hazard prone areas within the Village.

Figure MIT-5
Hume – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Improve Drainage Ditches & Stormwater Management: Comments: Hume wishes to obtain grants to repair or replace all collared storm drains and to remove debris from all drainage ditches. 2014 is the expected date of obtaining the grants. (Mitigation Strategy No. 54)					
Participate in the NFIP: Comments: The village board wishes to pass a resolution for the community to join the NFIP. Hume plans to pass the resolution in 2014. (Mitigation Strategy No. 55)					
Stormwater Management: Comments: Hume would like to establish a committee of board members to oversee the development of stormwater management ordinances. Funding for replacement and repairs to storm drains is high on the priority list. Hume plans to develop a committee by 2014. (Mitigation Strategy No. 56)					

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Hume was not able to complete any of the identified actions due to severe budgetary and personnel constraints experienced by a Village of this size (approx. 325 individuals.) The Village struggles to maintain even the most critical of services to its residents. As a result, there has been no changes in the vulnerability of hazard prone areas within the Village.

Figure MIT-6
Kansas – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Enhanced Communication System/NOAA Weather Radio: Purchase/subscribe to an automated emergency notification system (i.e., reverse 911) to notify residents/responders of natural and man-made hazard event information. (Mitigation Strategy No. 57)	✓				
Special Needs Population List: Develop a database that identifies access and functional needs populations within the Village and prepare mapping for emergency responders. (Mitigation Strategy No. 58)	✓				
Procure a Backup Water Supply: Secure agreement with neighboring water system(s) to provide an alternate/backup drinking water supply to the Village. (Mitigation Strategy No. 59)	✓				
Provide & Publicize Locations of Safe Rooms and/or Shelters: Identify community safe rooms and emergency shelters in the Village and make the information available to the public. (Mitigation Strategy No. 60)	✓				
Warming/Cooling Centers: Identify locations that can be used as warming and cooling centers with the Village. Designate warming and cooling centers within the Village for use by area residents and secure hosting agreements with each location. (Mitigation Strategy No. 61)			✓		In coordination with ESDA, review and publicize annually

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Kansas has completed one administrative activity that has the potential to decrease the vulnerability to Communications Community Lifeline. However, this activity will not significantly change the vulnerability of hazard prone areas within the Village.

Figure MIT-7
Metcalf – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Procure a Backup Water Supply Comments: Metcalf wishes to establish an emergency fund to obtain water from an outside source in the event that a disaster disrupts their potable water supply. (Mitigation Strategy No. 62)			✓		
Backup Generators: Comments: Metcalf requires a generator for the town's shelters and community center. (Mitigation Strategy No. 63)	✓				
Improvement of Drainage: Comments: Metcalf is drained by degraded drainage line that is becoming non-functional. Metcalf needs to replace the drainage pipe by 2015 and has already completed a DCEO-funded HWC study in 2000 and a legislator-funded mapping and conditional assessment in 2009. Metcalf would also like to remove all debris from drainages. In addition, Metcalf would like to update all tiles throughout the village (Mitigation Strategy No. 64)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Metcalf has completed one infrastructure improvement project that has the potential to decrease the vulnerability to a Food, Water, Shelter Community Lifeline. However, this project will not significantly change the vulnerability of hazard prone areas within the Village.

Figure MIT-8
Paris – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Public Education/Awareness: Comments: Provide public education of reverse 911 procedures for where shelters are located; this activity is currently in progress. (Mitigation Strategy No. 66)			✓		NIMS implemented and using Nixle for emergency alerts
Provide & Publicize Locations of Safe Rooms and/or Shelters Comments: Build underground disaster shelters and storm shelters in 2014, especially in trailer courts. Mandate all new commercial buildings to have disaster shelters; this activity is currently in progress. Upgrade supplies and provide kits containing first aid, lights, and food in each shelter. (Mitigation Strategy No. 67)	✓				
Stormwater Management & Floodplain Ordinances: Comments: Update floodplain and storm water management ordinances in 2014 with the goal to improve drainage problems, especially for runoff in downtown Paris. (Mitigation Strategy No. 68)	✓				
Installation of Pumping Stations: Comments: Obtain funding in 2014 to install a pumping station to address poor drainage in downtown Paris, especially Jasper St., Water St., and Madison St. (Mitigation Strategy No. 69)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Paris completed one administrative activity that will not significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-9
Paris CUSD #4 – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Shiloh, Paris High, and Crestwood schools (Paris CUSD #4) plan to install back-up generators by 2015 so those schools can serve as community shelters. (Mitigation Strategy No. 90)			✓		Purchased generator that runs the boiler, server room, fire alarm system, phone system and limited lights.
Improvement to Drainage Ditches: Comments: Crestwood (Paris CUSD #4) and Shiloh schools plan on installing drainage tile and roof and perimeter drains in 2013. (Mitigation Strategy No. 91)	✓				
Bury Power Lines: Comments: Crestwood school (Paris CUSD #4) plans to bury overhead power lines by 2015. (Mitigation Strategy No.)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the School District's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Paris CUSD #4 completed one infrastructure improvement that has the potential to decrease the vulnerability to a Safety & Security Community Lifeline. However, this project will not significantly change the vulnerability of hazard prone areas at any of the District's facilities.

Figure MIT-10
Paris Union SD #95 – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Shiloh, Paris High, and Crestwood schools (Paris CUSD #4) plan to install back-up generators by 2015 so those schools can serve as community shelters. (Mitigation Strategy No. 90)	✓				
Provide & Publicize Location of Safe Rooms and/or Shelters: Comments: Paris High School plans to work with county architects, schools, the county engineer, and the Edgar County ESDA to build a reinforced shelter adjacent to the high school. (Mitigation Strategy No. 93)	✓				
Harden Infrastructure: Comments: Paris High School plans to harden each structure on campus by 2015 so it can serve effectively as a shelter. (Mitigation Strategy No.94)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the School District's vulnerability since the original Plan was approved. In terms of changes in vulnerability associated with mitigation actions in progress or completed, Paris Union SD #95 did not begin or completed any of the identified mitigation actions due to the budgetary and personnel constraints experienced by small rural school districts. As a result, there has been no changes in the vulnerability of hazard prone areas at any of the District's facilities.

Figure MIT-11
Redmon – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Redmon would like a back-up generator as part of its heating/cooling shelter scheduled for 2014, as well as a back-up generator for the fire station and church, which also serve as shelters. (Mitigation Strategy No.73 & 81)	✓				
Special Needs Population List: Comments: Redmon plans to compile a special needs population list for the community during or shortly after its August 2013 town-wide meeting. (Mitigation Strategy No. 74)	✓				
Procure a Backup Water Supply Comments: Redmon currently does not have a back-up water supply in the event of a water-treatment plant failure during a hazard and would like to acquire a portable potable water tank in 2014. (Mitigation Strategy No. 75)	✓				No longer maintain a community public water supply. Purchase water from Clark-Edgar Rural Water District.
Culvert Replacement: Comments: Redmon plans to evaluate its culverts in 2014 to determine if any culverts are in danger of failure and need to be replaced. (Mitigation Strategy No. 77)		✓			Have replaced two culverts but there are more to do.

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Redmon has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. The Village also has completed one administrative activity that has the potential to decrease the vulnerability of hazard prone structures to tornadoes. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects/activities.

Figure MIT-11
Redmon – Status of Existing Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Anchoring of Manufactured Homes & Exterior Attachments: Comments: Redmon will review the county and local ordinances addressing this issue during the August 2013 town-wide meeting and discuss the possibility of requiring anchoring on manufactured homes. (Mitigation Strategy No. 80)			✓	2018	
Warming/Cooling Center: Comments: Redmon would like to build a community center for use as a heating/cooling shelter and plans to build it in 2014. (Mitigation Strategy No. 82)	✓				

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the original Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Redmon has one infrastructure improvement project in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding. The Village also has completed one administrative activity that has the potential to decrease the vulnerability of hazard prone structures to tornadoes. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects/activities.

Figure MIT-12
Shiloh CUSD #1 – Status of Existing Mitigation Actions

Activity/Project Description	Status			Year Completed	Summary/Details of Completed Activity/Project (i.e., location, scope, etc.)
	No Progress (✓)	In Progress (✓)	Completed (✓)		
Backup Generators: Comments: Shiloh, Paris High, and Crestwood schools (Paris CUSD #4) plan to install back-up generators by 2015 so those schools can serve as community shelters. (Mitigation Strategy No. 90)	✓				
Improvement to Drainage Ditches: Comments: Crestwood (Paris CUSD #4) and Shiloh schools plan on installing drainage tile and roof and perimeter drains in 2013. (Mitigation Strategy No. 91)			✓	2021	Installed drainage tile & roof drains.
Install Snow Fences: Comments: Shiloh School plans on installing snow fences snow for safe travel. (Mitigation Strategy No. 95)		✓			

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix K.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the School District's vulnerability since the original Plan was approved. In terms of changes in vulnerability associated with mitigation actions in progress or completed, Shiloh CUSD #1 has two infrastructure improvement projects completed or in progress that has the potential to decrease the vulnerability of hazard prone areas to flooding and severe winter storms. It is still too early to tell the degree of reduction that will be experienced from the implementation of these projects.

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 1 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Coroner													
HM	Purchase and install an automatic emergency backup generator at the Coroner's Office to establish a resilient and reliable power supply ensuring sustained functionality of the morgue cooler during extended power outages, maintain continuity of government/operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	H&M	S&IP	Small	1, 5	---	Yes	Coroner	2 years	County / USDA – RD Critical Facilities Programs	Medium/High	New
County Board													
HM	Purchase and install storm warning siren systems throughout the County to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Medium	4	---	---	County Board / Village Presidents & Mayors	2-4 years	County / Munis / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Install hardening materials at the Edgar County Courthouse to increase the building's resilience to natural and man-made hazards, maintain continuity of government/operations, and mitigate risk to a Community Lifeline. Measures to consider seismic retrofits, shatter-resistance/ shatter-proof windows , hail resistant shingles/doors, etc.	EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	--	Yes	County Board Chair / County Board	2-5 years	County / FEMA BRIC	High/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 2 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
County Board Continued…													
LM	Secure Memorandums of Agreement with area water suppliers and energy/generator suppliers to ensure water treatment facilities within the County remain operational following natural and man-made hazard events, thus safeguarding Community Lifelines essential to human health and safety.	DR, EC, EH, EQ, F, FR, MMH, SS, SWS, T	FWS	LP&R	Large	1, 4, 5	---	Yes	County Board Chair / County Board	1-5 years	County	Low/High	Existing (2014)
LL	Develop and adopt a county-wide burn ordinance.	DR, FR	---	LP&R	Large	1, 2, 3, 4	---	---	County Board Chair / County Board	2-5 years	County	Low/Medium	Existing (2014)
HM	Purchase and install automatic emergency backup generators at essential County-owned buildings, facilities, and infrastructure systems to establish resilient and reliable power supplies, ensure the continued operation of Community Lifelines and maintain continuity of government/operations during power outages.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	C H&M S&S	S&IP	Medium	1, 4, 5	---	Yes	County Board Chair / County Board	5-10 years	County / FEMA HMGP / USDA – RD Critical Facilities Programs	Medium/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 3 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
County Board Continued…													
HM	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	County Board Chair / County Board	1-5 years	County	Low/Medium	New
LM	Continue to make the most recent Flood Insurance Rate Maps available at the County Clerk's to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	County Board Chair / County Clerk & Recorder	1-3 years	County	Low/Medium	New
ESDA													
HM	Design and construct a community safe room equipped with an emergency backup generator and HVAC system that can also serve as a warming/cooling center as needed for County staff and area residents to establish a Community Lifeline essential to human health and safety.	EC, EH, SS, T	FWS	S&IP	Small	4	---	---	ESDA Coordinator / County Board	2-4 years	County / FEMA HMGP	High/High	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 4 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
ESDA Continued…													
HM	Design and construct a new multi-use Emergency Operations Center (built to high wind and seismic standards and equipped with an emergency backup generator) that serves as the County's central command and control facility for carrying out emergency management and ensuring continuity of operations/government during hazard events. This facility would mitigate the risk for multiple Community Lifelines enabling the continuous operation of critical government and business functions essential to human health and safety and economic security.	DR, EC, EH, EQ, F, FR, MMH, SS, SWS, T	C S&S	S&IP	Large	1, 4, 5	Yes	---	ESDA Coordinator / County Board	2-4 years	County / FEMA HMGP	High/High	New
HM	Retrofit/structurally harden the current Emergency Operations Center (EOC), including the installation of an automatic emergency backup generator, to serve as the backup EOC to maintain continuity of operations/government in the event the primary EOC is damaged by a natural or man-made hazard event and ensure continued functionality of a Community Lifeline.	DR, EC, EH, EQ, F, FR, MMH, SS, SWS, T	C S&S	S&IP	Large	1, 4, 5	Yes	---	ESDA Coordinator / County Board	2-4 years	County / FEMA HMGP	High/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 5 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
ESDA Continued…													
LM	Develop an emergency response/action plan detailing how the County/City will respond to natural and man-made hazard event at solar farm to mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	E	LP&R	Small	1, 2, 5	Yes	Yes	ESDA Coordinator / Paris Mayor City Council	1-2 years	County / City	Low/Medium	New
LM	Raise public awareness through Facebook, local television channel and local radio of the risks to life and property associated with the natural and man-made hazards that impact the County and the proactive actions that can be taken to reduce those risks.	DR, EC, EH, EQ, F, FR, MMH, SS, SWS, T	---	E&A	Large	3, 4	---	---	ESDA Coordinator	1-5 years	County	Low/Medium	Existing (2014)
LM	Work with each community to establish mutual aid agreements with surrounding jurisdictions to ensure continued operations of Community Lifelines and lessen the impacts of natural and man-made hazards on critical facilities and infrastructure within each community.	DR, EQ, F, FR, MMH, SS, SWS, T	C, E, FWS, H&M, S&S, T	LP&R	Large	1, 2, 4, 5	---	---	ESDA Coordinator	2-5 years	County	Low/Medium	Existing (2014)
LM	Develop a database of access and functional needs populations within the County in order to identify the best method(s) to alert these individuals to hazard events and develop a plan that identifies sheltering options/facilities for these populations.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	---	E&A	Small	4	---	---	ESDA Coordinator / Health Department Administrator	1-3 years	County	Low/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 6 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
ESDA Continued…													
LM	Identify all emergency shelters within the County and make the information available to community leaders and the public.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	---	E&A	Large	4	---	---	ESDA Coordinator	1-2 years	County	Low/Medium	Existing (2014)
HM	Obtain emergency backup generators for each designated warming/cooling center in the County to establish resilient and reliable power supplies to ensure sustained functionality during extended power outages and mitigate risk to a Community Lifeline.	EC, EH	FWS	S&IP	Small	1, 4, 5	---	Yes	ESDA Coordinator	3-5 years	County / USDA - RD Critical Facilities Programs	Medium/High	Existing (2014)
LM	Continue to make County officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	ESDA Coordinator	1-5 years	County	Low/Medium	New
LM	Develop a Memorandum of Understanding (MOU) designating Lake Ridge Church as an emergency shelter to establish another Food, Water, Shelter Community Lifeline essential to human health and safety within the County.	EQ, F, FR, MMH, SS, SWS, T	FWS	LP&R	Small	4	n/a	n/a	ESDA Coordinator	1 year	County	Low/Medium	New

* Mitigation action to ensure continued compliance with NFIP.

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Acronyms

Priority

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
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LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 7 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
ESDA Continued…													
HM	Obtain an emergency backup generator for Lake Ridge Church (a designated emergency shelter) to establish a resilient and reliable power supply to ensure continued functionality during extended power outages and mitigate risk to a Community Lifeline.	EQ, F, FR, MMH, SS, SWS, T	FWS	S&IP	Small	1, 4, 5	---	Yes	ESDA Coordinator	2-5 years	County / USDA - RD Critical Facilities Programs	Medium/High	New
Highway Department													
HM	Elevate low-water crossings including but not limited to those in Symmes Township (600 N, 450N, E. 300th Rd., 1360 E, and N. 1600th St.) that significantly inhibit transportation to ensure continued functionality of Transportation Community Lifelines.	F, SS	T	S&IP	Small	1, 4, 5	---	Yes	County Highway Engineer	2-5 years	County / IDOT Local Roads / FEMA HMGP	Medium/Medium	Existing (2014)
HM	Trim and manage trees to minimize the number and duration of service disruptions, improve community resilience and mitigate risk to Community Lifelines.	SS, SWS< T	C, E, T	S&IP	Medium	1, 4, 5	Yes	Yes	County Highway Engineer	1-5 years	County	Low/High	Existing (2014)
HM	Install snow fences along Illinois Route 1 to limit blowing and drifting of snow to ensure functionality of a Community Lifeline and ease hazardous driving conditions.	SWS	T	S&IP	Medium	1, 4, 5	---	Yes	County Highway Engineer	1-2 years	County	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-16
Edgar County Hazard Mitigation Actions
(Sheet 8 of 8)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
Housing Authority													
HM	Purchase and install automatic emergency backup generators at all Housing Authority developments (High Rise, Highland Court, Water Street & Cook Drive) to establish resilient and reliable power supplies, maintain continuity of operations and mitigate risk to Community Lifelines.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	---	Yes	Executive Director	2 years	County / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Install stormwater pump station at Cook Drive development to alleviate recurring flood/drainage problems caused by heavy rain events, better manage stormwater runoff, and ensure continued functionality of Community Lifeline.	F, SS	FWS	S&IP	Small	1, 4, 5	---	Yes	Executive Director	2-5 years	City / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approx. 17,500 individuals), projected population growth and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
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F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-17
Brocton Hazard Mitigation Actions
(Sheet 1 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install an automatic emergency backup generator at the Village's water treatment plant to establish a resilient and reliable power supply to ensure sustained functionality during extended power outages, maintain continuity of government/operations, and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	1, 4, 5	---	Yes	President / Village Board	1 year	Village / USDA – RD Critical Facilities Programs	High/High	New
HM	Purchase and install a storm warning siren to establish a Communications Community Lifeline essential to human health and safety.	SS, T	C	E&A	Large	4	---	---	President Village Board / Fire Chief Brocton FPD	1-2 years	Village / USDA – RD Critical Facilities Programs	High/High	Existing (2014)
LM	Develop and adopt a floodplain ordinance.	F	---	LP&R	Small	2, 3, 6, 7	---	---	President / Village Board	2-5 years	Village / FEMA BRIC	Low/Medium	Existing (2014)
LM	Update the Village's stormwater management ordinance.	F, SS	---	LP&R	Large	1, 2, 3, 4, 7	Yes	Yes	President / Village Board	1-2 years	Village / FEMA BRIC	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 350 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-17
Brocton Hazard Mitigation Actions
(Sheet 2 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Conduct a hydrologic/drainage study to identify design solutions to alleviate recurring flood/drainage problems experienced as a result of heavy rain events within/near the Village to maintain continuity of operations, ensure community resilience and mitigate risk to Transportation Community Lifelines. One potential design solution to consider involves purchasing two, 12-acre plots on the east and north sides of the Village to construct detention basins to control stormwater runoff.	F, SS	T	E&A	Large	1, 5	---	---	President / Village Board	2-5 years	Village / USDA – RD Water & Waste Disposal Program	Medium/Medium	Existing (2014)
HM	Upgrade the Village's drainage system (ditches, culverts, etc.) to alleviate recurring flood problems experienced as a result of moderate heavy rain events, better manage stormwater runoff, and increase system resilience.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	2-5 years	Village / FEMA HMGP / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	High/High	Existing (2014)

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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
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F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-17
Brocton Hazard Mitigation Actions
(Sheet 3 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Trim trees to minimize service disruptions, improve community resilience and mitigate risk to Community Lifelines.	SS, SWS, T	C, E, T	S&IP	Medium	1, 4, 5	Yes	Yes	President / Village Board	2-5 years	Village	Medium/High	Existing (2014)
HM	Retrofit an existing Village building to include a community safe room (equipped with an emergency backup generator & HVAC units) for use by Village staff and residents to establish a Community Lifeline essential to human health and safety.	SS, T	FWS	S&IP	Medium	4	---	Yes	President / Village Board	5 years	Village / FEMA HMGP	High/High	Existing (2014)
LL	Distribute brochures and public information materials that inform residents about the risks to life and property associated with natural and man-made hazards and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Large	3, 4	---	---	President / Village Board	5 years	Village	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 350 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-18
Chrisman Hazard Mitigation Actions
(Sheet 1 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install an emergency backup generator at the City's water treatment facilities to establish a resilient and reliable power supply to ensure sustained functionality during extended power outages, maintain continuity of government/operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	1, 4, 5	---	Yes	Mayor / City Council	1-3 year	City / USDA – RD Critical Facilities Programs	High/High	Existing (2014)
LM	Purchase and distribute NOAA weather radios to City residents to establish a Communications Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C	E&A	Medium	4	---	---	Mayor / City Council	2-5 years	City	Low/High	Existing (2014)
LM	Identify access and functional needs populations within the City in order to identify the best method(s) to alert these individuals to upcoming natural hazard events and provide assistance during events.	EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Small	4	---	---	Mayor / City Council	1-5 years	City	Low/High	Existing (2014)
LM	Remove brush and debris from culverts and catch basins to maximize flow/carrying capacity, reduce/prevent drainage problems and ensure system resilience and functionality.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	Mayor / City Council	1-5 years	City	Low/High	New
LM	Clean/remove vegetative overgrowth from creek banks within the City to maximize flow/carrying capacity, reduce drainage problems.	F, SS	---	S&IP	Small	1, 4, 5	---	Yes	Mayor / City Council	2 years	City	Low/High	Existing (2014)

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Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
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HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-18
Chrisman Hazard Mitigation Actions
(Sheet 2 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Upgrade storm sewer lines/system to alleviate flood/drainage problems, better manage stormwater runoff to ensure system resilience and functionality.	F, SS	---	S&IP	Medium	1, 4, 5	Yes	Yes	Mayor / City Council	3 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	High/High	New
HM	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	Mayor / City Council	1-5 years	City	Low/Medium	New
LM	Continue to make the most recent Flood Insurance Rate Maps available at the City Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	Mayor / City Clerk	1-3 years	City	Low/Low	New
LM	Continue to make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	Mayor / City Council	1-5 years	City	Low/Low	New

* Mitigation action to ensure continued compliance with NFIP.

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Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-19
Chrisman Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Construct a community safe room (equipped with an emergency backup generator & HVAC units and built to seismic standards) that can also serve as a warming/cooling center and emergency shelter for District residents to establish a Food, Water, Shelter Community Lifeline essential to human health and safety.	EC, EH, EQ, SS, T	S&S FWS	S&IP	Medium	4	Yes	---	Fire Chief / Board of Trustees	5-7 years	FPD / FEMA HMGP	High/High	New
HM	Purchase and install storm warning sirens in Chrisman, Scottland and Edgar to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Medium	3	---	---	Fire Chief / Board of Trustees	5 years	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
LM	Make public information materials available to District residents that inform them of the risks to life and property associated with the natural hazards that impact the District and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, FR, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

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HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
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Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-20
Edgar County CUSD #6 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install automatic emergency backup generators at the Chrisman Elementary School and Chrisman High School to establish a resilient and reliable power supply in order to maintain continuity of operations, ensure sustained functionality during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Superintendent / School Board	3 years	CUSD / USDA – RD Critical Facilities Programs	High/High	New
HM	Purchase and install LED digital message boards at Chrisman Elementary School and Chrisman High School to establish a Communications Community Lifeline that alerts the public of hazardous conditions associated with natural and man-made hazard events.	ED, EH, EQ, F, MMH, SS, SWS, T	C	E&A	Large	4	---	---	Superintendent / School Board	3 years	CUSD	Medium/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-21
Horizon Health Hazard Mitigation Actions
(Sheet 1 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Upgrade the existing automatic emergency backup generator at the main Hospital campus to ensure a resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline. A new, 38,000 square-foot Medical Office Building was recently completed at the main campus that would serve as an alternate care/triage site to treat a patient surge following a major hazard event resulting in mass casualties.	EC, EH, EQ, F, MMH, SS, SWS, T	H&M	S&IP	Large	1, 4, 5	---	Yes	Facilities Management / Board of Directors	2-5 years	Horizon Health / FEMA HMGP / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Due to campus growth, increased fuel storage capacity is needed to ensure continued compliance with the 96-hour sustainability requirements outlined in the Joint Commission's Emergency Management Standards for the Environment of Care. One of the minimum Resources and Assets categories required by the Joint Commission during an emergency is fuel.	EC, EH, EQ, F, MMH, SS, SWS, T	H&M	S&IP	Large	1, 4, 5	---	Yes	Facilities Management / Board of Directors	2-5 years	Horizon Health / USDA – RD Critical Facilities Programs	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural hospitals. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-21
Horizon Health Hazard Mitigation Actions
(Sheet 2 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Design and construct a new multi-use Emergency Operations Center (hardened to withstand multiple hazards and equipped with an emergency backup generator) that serves as the main Hospital campus's central command and control facility for carrying out emergency management and ensuring continuity of operations during hazard events. This facility would mitigate risk to multiple Community Lifelines enabling the continuous operation of critical government functions essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	C H&M S&S	S&IP	Large	---	Yes	Yes	Facilities Management / Board of Directors	2-5 years	Horizon Health / FEMA HMGP / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Retrofit/structurally harden the current Emergency Operations Center (EOC) located in the Life Center Building to serve as the backup EOC to maintain continuity of operations in the event the primary EOC is damaged by a natural or man-made hazard event and ensure continued functionality of multiple Community Lifelines.	EC, EH, EQ, F, MMH, SS, SWS, T	C H&M S&S	S&IP	Large	---	Yes	Yes	Facilities Management / Board of Directors	2-5 years	Horizon Health / FEMA HMGP / USDA – RD Critical Facilities Programs	Medium/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural hospitals. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-22
Hume Hazard Mitigation Actions
(Sheet 1 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop Memorandums of Agreement with designated shelters including the Hume Fire Protection District, Community Center and churches to install emergency backup generators to establish resilient and reliable power supplies and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Large	1, 4, 5	---	---	President / Village Board	1-3 years	Village	Low/Medium	New
HM	Purchase and install emergency backup generators at Village-designated shelters (Hume Fire Protection District, Community Center and churches) to establish resilient and reliable power supplies and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	1, 4, 5	---	Yes	President / Village Board	3-5 years	Village / USDA - RD Critical Facilities Programs	High/High	Existing (2014)
LM	Purchase and distribute NOAA weather radios to Village residents to establish a Communications Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C	E&A	Medium	4	---	---	President / Village Board	2-5 years	Village	Low/High	Existing (2014)
LM	Distribute brochures and public information materials that inform residents about the risks to life and property associated with natural and man-made hazards and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Large	3, 4	---	---	President / Village Board	5 years	Village	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 325 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-22
Hume Hazard Mitigation Actions
(Sheet 2 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Establish a planning committee to discuss the Village's infrastructure vulnerabilities related to natural hazards and identify measures that can be implemented to reduce hazard event impacts, especially related to flooding.	EC, EH, EQ, F, SS, SWS, T	---	LP&R	Medium	1, 2, 3, 4, 5	---	Yes	President / Village Board	5 years	Village	Low/High	Existing (2014)
LL	Establish a drinking water emergency fund to purchase water from an outside source in the event a natural or man-made hazard event disrupts the Village's drinking water supply.	DR, MMH	---	LP&R	Large	2, 4, 5	---	---	President / Village Board	5 years	Village	Low/Medium	Existing (2014)
LM	Clean brush and debris from drainage system to maximize carrying capacity, alleviate recurring drainage problems and mitigate risk to Community Lifelines.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	1-5 years	Village	Low/Medium	Existing (2014)
LM	Replace collared storm drains as needed to alleviate recurring flood/drainage problems, better manage stormwater runoff and ensure system resilience and functionality.	F, SS	T	S&IP	Medium	1, 4, 5	Yes	Yes	President / Village Board	5-10 years	Village / IEPA SRF – WPCLP / USDA – RD Water & Waste Disposal Program	Medium/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 325 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-22
Hume Hazard Mitigation Actions
(Sheet 3 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Research participation in the National Flood Insurance Program to explore the benefits and costs.	F	---	LP&R	Small	2, 3, 6, 7	---	---	President / Village Board	1-2 years	Village	Low/Medium	Existing (2014)
LM	Develop and adopt a stormwater management ordinance.	F, SS	---	LP&R	Large	1, 2, 3, 4, 7	Yes	Yes	President / Village Board	2-5 years	Village / FEMA BRIC	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 325 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-23
Hume Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install an automatic emergency backup generator at the Fire Station to establish a resilient and reliable power supply to ensure sustained functionality during extended power outages, maintain continuity of operations and ensure the continued operation of a Community Lifeline.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Fire Chief / Board of Trustees	2-5 years	FPD / FEMA HMGP / USDA – RD Critical Facilities Programs	High/High	New
HM	Purchase and install storm warning sirens in Hume and in unincorporated areas within the District without coverage to establish Communications Community Lifelines essential to human health and safety.	SS, T	C	E&A	Medium	3	---	---	Fire Chief / Board of Trustees	1 year	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
LM	Make public information materials available to District residents that inform them of the risks to life and property associated with the natural hazards that impact the District and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, FR, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-24
Kansas Hazard Mitigation Actions
(Sheet 1 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Conduct a hydrologic/drainage study to identify design solutions to alleviate recurring flood problems and drainage deficiencies experienced as a result of heavy rain events within the Village to maintain continuity of operations, ensure community resilience and mitigate risk to Transportation Community Lifelines.	F, SS	T	E&A	Large	1, 5	---	---	President / Village Board	5 years	Village / USDA – RD Water & Waste Disposal Program	Medium/Medium	New
HM	Upgrade the Village's drainage system (ditches, culverts, etc.) to alleviate recurring flood/drainage problems experienced as a result of heavy rain events, better manage stormwater runoff, and increase system resilience.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	5-10 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	High/High	New
HM	Acquire properties in flood-prone areas and remove existing structures.	F, SS	---	S&IP	Small	4	---	Yes	President / Village Board	5-10 years	Village / FEMA HMGP	High/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 700 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-24
Kansas Hazard Mitigation Actions
(Sheet 2 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install village-wide sanitary sewer system to mitigate groundwater contamination, alleviate septic runoff into nearby water bodies and establish a Food, Water, Shelter Community Lifeline.	F, SS, SWS	FWS	S&IP	Large	1, 4, 5	Yes	Yes	President / Village Board	5-10 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	High/High	New
HM	Upgrade/retrofit drinking system (water lines, mains, hydrants, etc.) within the Village to increase system resilience, ensure a constant supply of water for residents, and aid in fire suppression during natural hazard events.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	Yes	Yes	President / Village Board	5-10 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF – PWSLP	High/High	New
HM	Purchase and install emergency backup generators at select Village-owned facilities and infrastructure systems to establish resilient and reliable power supplies in order to maintain continuity of government/operations and ensure sustained functionality during extended power outages.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS S&S	S&IP	Large	1, 4, 5	---	Yes	President / Village Board	3-7 years	Village / FEMA HMGP / USDA - RD Critical Facilities Programs	High/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 700 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
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Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-24
Kansas Hazard Mitigation Actions
(Sheet 3 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install emergency backup generators at Village-designated warming/cooling centers and emergency shelters to establish resilient and reliable power supplies to ensure sustained functionality during extended power outages and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	3-5 years	Village / USDA - RD Critical Facilities Programs	High/High	New
LM	Establish digital data sets for all utilities (drainage, water, gas, electric, etc.) within the Village for use in GIS mapping applications. This information can be used to determine which utilities have the potential to be impacted by hazard events.	EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Large	1, 5	---	---	President / Village Board	1-5 years	Village	Medium/Medium	New
HM	Design and construct a community safe room equipped with an emergency backup generator and HVAC system that can also serve as an emergency shelter and warming/cooling center for Village residents to establish a Community Lifeline essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	4	---	---	President / Village Board	5-10 years	Village / FEMA HMGP	High/High	New
HM	Purchase/subscribe to an automated emergency notification system (i.e., reverse 911) to alert residents of natural and man-made hazard event conditions and information.	EC, EH, EQ, F, MMH, SS, SWS, T	C	E&A	Large	4	---	---	President / Village Board	1-5 years	Village	Medium/High	Existing (2014)

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Acronyms

Priority

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
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Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-24
Kansas Hazard Mitigation Actions
(Sheet 4 of 4)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify access and functional needs populations within the Village in order to identify the best method(s) to alert these individuals to upcoming natural hazard events and provide assistance during events.	EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Small	4	---	---	President / Village Board	1-5 years	Village	Low/High	Existing (2014)
LM	Secure agreement with neighboring water system(s) to provide an alternate/backup drinking water supply to the Village.	DR	FWS	LP&R	Large	1, 2, 4, 5	---	Yes	President / Village Board	2-5 years	Village	Low/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 700 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-25
Kansas CUSD #3 Hazard Mitigation Actions
(Sheet 1 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install automatic emergency backup generators at the Kansas School buildings and Kansas Treatment & Learning Center (TLC) to establish a resilient and reliable power supply in order to maintain continuity of operations, ensure sustained functionality during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / USDA – RD Critical Facilities Programs	High/High	New
HM	Install shatter-resistant/shatter-proof windows/glass in West Gym to increase building resilience to natural hazards, maintain continuity of operations, protect staff and students, and mitigate risk to a Community Lifeline.	EQ, MMH, SS, T	S&S	S&IP	Large	1, 4, 5	--	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / FEMA BRIC	Medium/High	New
HM	Floodproof Kansas School buildings to increase structure resilience to flood damage, maintain continuity of operations and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Medium	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / FEMA FMA / USDA – RD Critical Facilities Programs	Medium/High	New
LM	Conduct a drainage/hydraulic study to determine the cause(s) and identify design solution(s) to address recurring flood/drainage problems at Kansas school buildings and mitigate risk to a Community Lifeline.	F, SS	S&S	E&A	Large	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-25
Kansas CUSD #3 Hazard Mitigation Actions
(Sheet 2 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Install drainage tile and roof/perimeter drains at the Kansas School buildings to better manage stormwater runoff, increase building resilience and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Large	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / FEMA HMGP / IEPA SRF – WPCLP	High/Medium	New
HM	Improve drainage characteristics (re-grade/contour areas, landscape, etc.) around Kansas School buildings to alleviate surface water intrusion into the crawl spaces, better manage stormwater runoff and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Large	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / FEMA HMGP / IEPA SRF – WPCLP	Medium/Medium	New
HM	Construct a retention pond to alleviate recurring flood/drainage problems, better manage stormwater runoff and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Large	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / USDA – RD Water & Waste Disposal Program FEMA HMGP	High/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
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Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-25
Kansas CUSD #3 Hazard Mitigation Actions
(Sheet 3 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Bury power lines to Kansas School buildings to establish a resilient and reliable power supply, limit service disruptions and mitigate risk to a Community Lifeline.	EQ, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD / FEMA HMGP	Medium/High	New
HM	Purchase and install grounding systems at Kansas School buildings to protect critical infrastructure (i.e., computers, electrical systems, HVAC, etc.), improve infrastructure resilience and ensure continued operations of a Community Lifeline.	SS	S&S	S&IP	Large	1, 5	---	Yes	Maintenance Supervisor / School Board	2-5 years	CUSD	Medium/High	New
LL	Prepare evacuation plan/escape route materials for each classroom.	EQ, F, MMH, SS, T	S&S	E&A	Large	3, 4	---	---	Maintenance Supervisor / School Board	2-5 years	CUSD	Low/High	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-26
Metcalf Hazard Mitigation Actions
(Sheet 1 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Develop Memorandums of Agreement with designated shelters to install emergency backup generators to establish resilient and reliable power supplies to ensure sustained functionality during extended power outages and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Medium	1, 4, 5	---	---	President / Village Board	1-3 years	Village	Low/Medium	New
HM	Purchase and install emergency backup generators at the Community Center and Village-designated shelters to establish resilient and reliable power supplies to ensure sustained functionality during extended power outages and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	3-5 years	Village / USDA - RD Critical Facilities Programs	High/High	Existing (2014)
LM	Clean brush and debris from drainage system to maximize carrying capacity, alleviate recurring drainage problems and mitigate risk to Community Lifelines.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	3-5 years	Village	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 200 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-26
Metcalf Hazard Mitigation Actions
(Sheet 2 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Upgrade drainage system (pipes, tiles, etc.) to alleviate recurring flood/drainage problems, better manage stormwater runoff and ensure system resilience and functionality.	F, SS	T	S&IP	Medium	1, 4, 5	Yes	Yes	President / Village Board	5-10 years	Village / IEPA SRF – WPCLP / USDA – RD Water & Waste Disposal Program	High/High	Existing (2014)
HM	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	President / Village Board	1-5 years	Village	Low/Medium	New
LM	Continue to make the most recent Flood Insurance Rate Maps available at the Village Clerk's to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Board	1-3 years	Village	Low/Low	New
LM	Continue to make Village officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	President / Village Board	1-5 years	Village	Low/Low	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (less than 200 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-27
Metcalf Fire Protection District Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Establish a dedicated, stand-alone water well within the District that can be used to supply an uninterrupted flow of water to aid in fire suppression as necessary and ensure the continued functionality of a Community Lifeline during natural and man-made hazard events.	DR, EQ, FR, MMH, SS, T	S&S	S&IP	Large	1, 4, 5	---	---	Fire Chief / Board of Trustees	2-5 years	FPD / USDA – RD Critical Facilities Programs	Medium/High	New
LM	Make public information materials available to District residents that inform them of the risks to life and property associated with the natural hazards that impact the District and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, FR, SS, SWS, T	---	E&A	Large	3	---	---	Fire Chief / Board of Trustees	1-5 years	FPD	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a rural, all-volunteer fire protection district. Additional funding is necessary if implementation is to be achieved.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-28
Paris Hazard Mitigation Actions
(Sheet 1 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install storm warning sirens to establish Communications Community Lifelines essential to human health and safety. Currently there are no warning sirens located in the City.	SS, T	C	E&A	Large	4	---	---	Mayor / City Council	2-5 years	city / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Purchase and install an emergency backup generator at the City's emergency evacuation center to establish resilient and reliable power supply to ensure sustained functionality during extended power outages and ensure continued operations of a Community Lifeline essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	1, 4, 5	---	Yes	Mayor / City Council	2-5 years	Village / USDA - RD Critical Facilities Programs	Medium/High	New
LM	Develop an emergency response/action plan detailing how the City/County will respond to natural and man-made hazard event at solar farm to mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	E	LP&R	Small	1, 2, 5	Yes	Yes	Mayor City Council / ESDA Coordinator	1-2 years	City / County	Low/Medium	New
LM	Educate residents on electronic notification system (reverse 911) and locations of emergency shelters.	EQ, F, MMH, SS, SWS, T	---	E&A	Large	4	---	---	Mayor / City Council	1-2 years	City	Low/Medium	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 8,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
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Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-28
Paris Hazard Mitigation Actions
(Sheet 2 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Construct community safe rooms (equipped with emergency backup generator and HVAC system) at strategic locations within the City (including manufactured home parks) for use by area residents to establish Community Lifelines essential to human health and safety.	SS, T	FWS	S&IP	Small	4	Yes	---	Mayor / City Council	5 years	City / FEMA HMGP	Medium/High	Existing (2014)
LL	Develop and adopt an ordinance mandating that new commercial buildings include community safe rooms to establish Community Lifelines essential to human health and safety.	SS, T	FWS	LP&R	Small	4, 7	Yes	---	Mayor / City Council	5 years	City / FEMA BRIC	Low/Medium	Existing (2014)
LM	Develop and adopt a stormwater management ordinance.	F, SS	---	LP&R	Large	1, 2, 3, 4, 7	Yes	Yes	Mayor / City Council	2-5 years	City / FEMA BRIC	Low/Medium	Existing (2014)
HM	Install stormwater pump stations at strategic locations within the City, including but not limited to Jasper Street, Water Street and Madison Street to alleviate recurring flood/drainage problems, better manage stormwater runoff, improve system/community resilience and ensure continued functionality of Community Lifelines.	F, SS	T	S&IP	Small	1, 4, 5	---	Yes	Mayor / City Council	5 years	City / FEMA HMGP / IEPA SRF - WPCLP	Medium/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 8,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-28
Paris Hazard Mitigation Actions
(Sheet 3 of 3)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small	2, 3, 4, 6, 7	Yes	Yes	Mayor / City Council	1-5 years	City	Low/Medium	New
LM	Continue to make the most recent Flood Insurance Rate Maps available at the City Clerk's to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	City Administrator / City Clerk	1-3 years	City	Low/Low	New
LM	Continue to make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small	3, 4, 6, 7	Yes	n/a	City Administrator	1-5 years	City	Low/Low	New

* Mitigation action to ensure continued compliance with NFIP.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 8,300 individuals). The City works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

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LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-29
Paris CUSD #4 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install an additional automatic emergency backup generator at Crestwood School to ensure sustained functionality for all systems including lighting during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Director of Maintenance / School Board	2-5 years	CUSD / USDA – RD Critical Facilities Programs	High/High	New
HM	Install hardening materials (shatter-resistance/ shatter-proof windows , hail resistant shingles/doors, etc.) at Crestwood School to increase building resilience to natural hazards, maintain continuity of operations, protect staff and students, and mitigate risk to a Community Lifeline.	EQ, MMH, SS, T	S&S	S&IP	Large	1, 4, 5	--	Yes	Director of Maintenance / School Board	2-5 years	CUSD / FEMA BRIC	Medium/High	New
HM	Install drainage tile and roof/perimeter drains at Crestwood School to better manage stormwater runoff, increase building resilience and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Large	1, 5	---	Yes	Director of Maintenance / School Board	2-5 years	CUSD / FEMA HMGP / IEPA SRF – WPCLP	High/Medium	Existing (2014)
HM	Bury power lines to Crestwood School to establish a resilient and reliable power supply, limit service disruptions and mitigate risk to a Community Lifeline.	EQ, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Director of Maintenance / School Board	2-5 years	CUSD / FEMA HMGP	Medium/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-30
Paris Union SD #95 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install automatic emergency backup generators at Memorial Elementary School, Carolyn Wenz Elementary School, Mayo Middle School and Paris High School to establish a resilient and reliable power supply in order to maintain continuity of operations, ensure sustained functionality during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Director of Maintenance / School Board	2 years	CUSD / USDA – RD Critical Facilities Programs	High/High	New / Existing (2014)
HM	Floodproof Mayo Middle School to increase the structure's resilience to flood damage, maintain continuity of operations and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Medium	1, 5	---	Yes	Director of Maintenance / School Board	2 years	CUSD / FEMA FMA / USDA – RD Critical Facilities Programs	Medium/High	New
HM	Construct a community safe room at Allen Memorial Field equipped with an emergency backup generator for use by students, spectators and residents to establish a Community Lifeline essential to human health and safety.	SS, T	FWS	S&IP	Large	4, 5	Yes	---	Director of Maintenance / School Board	2 years	CUSD / FEMA HMGP	High/High	New
HM	Install hardening materials (shatter-resistance/ shatter-proof windows, hail resistant shingles/doors, etc.) at all school buildings to increase building resilience to natural hazards, maintain continuity of operations, protect staff and students, and mitigate risk to a Community Lifeline.	EQ, MMH, SS, T	S&S	S&IP	Large	1, 4, 5	--	Yes	Director of Maintenance / School Board	2 years	CUSD / FEMA BRIC	High/High	New / Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-31
Redmon Hazard Mitigation Actions
(Sheet 1 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Upgrade the Village's drainage system (ditches, culverts, etc.) to alleviate recurring flood/drainage problems experienced as a result of heavy rain events, better manage stormwater runoff, and increase system resilience.	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	5-10 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	High/High	New
LM	Develop Memorandums of Agreement with designated shelters and the warming/cooling center to install emergency backup generators to establish resilient and reliable power supplies and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	LP&R	Large	1, 4, 5	---	---	President / Village Board	1-3 years	Village	Low/Medium	New
HM	Purchase and install emergency backup generators at warming/cooling center and Village-designated shelters(fire station and church) to establish resilient and reliable power supplies and ensure continued operations of Community Lifelines essential to human health and safety.	EC, EH, EQ, F, MMH, SS, SWS, T	FWS	S&IP	Large	1, 4, 5	---	Yes	President / Village Board	3-5 years	Village / USDA - RD Critical Facilities Programs	High/High	Existing (2014)

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 130 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-31
Redmon Hazard Mitigation Actions
(Sheet 2 of 2)

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
LM	Identify access and functional needs populations within the Village in order to identify the best method(s) to alert these individuals to upcoming natural hazard events and provide assistance during events.	EC, EH, EQ, F, MMH, SS, SWS, T	---	E&A	Small	4	---	---	President / Village Board	1-5 years	Village	Low/High	Existing (2014)
HM	Evaluate culverts within the Village to identify locations that need to be upgraded/replaced to increase carrying capacity, ensure system resilience and functionality of Transportation Community Lifelines	F, SS	T	S&IP	Medium	1, 4, 5	---	Yes	President / Village Board	1-2 years	Village	Low/Medium	Existing (2014)
HM	Design and construct a community safe room equipped with an emergency backup generator and HVAC system that can also serve as an emergency shelter and warming/cooling center for Village residents to establish a Community Lifeline essential to human health and safety.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large	4	---	---	President / Village Board	5 years	Village / FEMA HMGP	High/High	New
LM	Designate a warming/cooling center within the Village for use by residents to establish a Community Lifeline essential to human health and safety.	EC, EH	FWS	LP&R	Medium	4	---	---	President / Village Board	1-2 years	Village	Low/High	Existing (2014)
HM	Distribute public information materials that inform residents about the risks to life and property associated with the natural hazards that impact the Village and the proactive actions they can take to reduce their risk.	EC, EH, EQ, F, SS, SWS, T	---	E&A	Large	4	---	---	President / Village Board	1-5 years	Village	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 130 individuals). The Village struggles to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-32
Shiloh CUSD #1 Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase a portable emergency backup generator to ensure a resilient and reliable power supply at the Transportation Center & Services building in order to maintain continuity of operations and ensure sustained functionality during extended power outages.	EC, EH, EQ, F, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Director of Maintenance & Transportation / School Board	3 years	CUSD / USDA – RD Critical Facilities Programs	High/High	New
HM	Install drainage tile and roof/perimeter drains at the Shiloh School buildings to better manage stormwater runoff, increase building resilience and mitigate risk to a Community Lifeline.	F, SS	S&S	S&IP	Large	1, 5	---	Yes	Director of Maintenance & Transportation / School Board	2-5 years	CUSD / FEMA HMGP / IEPA SRF – WPCLP	High/Medium	Existing (2014)
HM	Install snow fences around Shiloh School buildings to limit blowing and drifting of snow to ensure continued functionality of Community Lifelines and ease hazardous driving conditions.	SWS	S&S T	S&IP	Large	1, 4, 5	---	Yes	Director of Maintenance & Transportation / School Board	2-5 years	CUSD / County / IDOT Local Roads	Low/Medium	Existing (2014)
LL	Educate students and staff about the water conservation measures that can be taken to reduce drought impacts.	DR	---	E&A	Large	1, 4	---	---	Principal / School Board	2-5 years	CUSD	Low/Low	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural school districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	MMH	Man-Made Hazard
EC	Extreme Cold	SS	Severe Storms
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Figure MIT-33
Shiloh Township Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Cost/Benefit Analysis	Status
							New	Existing					
HM	Purchase and install an automatic emergency backup at the Township building which houses the Township's office and maintenance garage/equipment to establish a resilient and reliable power supply to ensure sustained functionality during extended power outages, ensure the continued operation of a Community Lifeline and maintain continuity of government/operations.	EC, EH, EQ, F, FR, MMH, SS, SWS, T	S&S	S&IP	Large	1, 4, 5	---	Yes	Road Commissioner / Board of Trustees	2-5 years	Township / FEMA HMGP / USDA – RD Critical Facilities Programs	High/High	New
LM	Purchase barricades with lights to alert the public to hazardous conditions, detours, etc. associated with natural and man-made hazard events.	EH, EQ, F, FR, MMH, SS, SWS, T	---	E&A	Medium	4	---	---	Road Commissioner / Board of Trustees	1-3 years	Township	Low/High	New
LM	Make public information materials available to township residents about the risks to life and property associated with the natural hazards that impact the Township and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, FR, SS, SWS, T	---	E&A	Large	3	---	---	Road Commissioner / Board of Trustees	1-3 years	Township	Low/Medium	New

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural townships of this size (less than 100 individuals). The Township works hard to maintain critical services to its residents but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Priority

HM	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the most frequent hazards
LM	Mitigation action with the potential to reduce impacts from the most frequent hazards
HL	Mitigation action with the potential to virtually eliminate or significantly reduce impacts from the less frequent hazards
LL	Mitigation action with the potential to reduce impacts from the less frequent hazards

Hazard(s) to be Mitigated:

DR	Drought	FR	Fire
EC	Extreme Cold	MMH	Man-Made Hazard
EH	Excessive Heat	SS	Severe Storms
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

5.0 PLAN MAINTENANCE

This section focuses on the Federal Emergency Management Agency (FEMA) requirements for maintaining and updating the Plan once it has been approved by FEMA and adopted by the participating jurisdictions. These requirements include:

- establishing the method and schedule for monitoring, evaluating and updating the Plan;
- describing how the mitigation strategy will be incorporated into existing planning processes; and
- detailing how continued public input will be obtained.

These requirements ensure that the Plan remains an effective and relevant document. The following provides a detailed discussion of each requirement.

5.1 MONITORING, EVALUATING & UPDATING THE PLAN

Outlined below is a method and schedule for monitoring, evaluating and updating the Plan. This method allows the participating jurisdictions to make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

5.1.1 Monitoring and Evaluating the Plan

The Plan update will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis. The Plan Maintenance Subcommittee will be composed of the participating jurisdictions who sought Plan approval and other key members of the Planning Committee. The Edgar County Emergency Services & Disaster Agency (ESDA) will chair the Plan Maintenance Subcommittee.

The Edgar County ESDA will assume lead responsibility for monitoring and tracking the implementation status of the mitigation actions identified in the Plan update. It will be the responsibility of each Plan participant to provide the Edgar County ESDA with an annual progress report on the status of their existing mitigation actions and identify whether any actions need to be modified. New mitigation actions may be added to the Plan during the annual monitoring and evaluation period or at any time during the plan maintenance cycle by contacting the Edgar County ESDA Coordinator and providing the appropriate information.

Monitoring & Evaluating

- A Plan Maintenance Subcommittee will be formed to monitor and evaluate the Plan update.
- The ***Plan update will be monitored and evaluated*** on an ***annual basis***.
- Each Plan participant will be responsible for providing an annual progress report on the status of their mitigation actions.
- Plan participants can add ***new mitigation actions*** to the Plan ***during the annual monitoring phase or by contacting*** the Edgar County ESDA Coordinator.

The Edgar County ESDA together with the Plan Maintenance Subcommittee will also evaluate the Plan update on an annual basis to determine the effectiveness of the plan at achieving its stated purpose and goals. In order to evaluate the effectiveness of the Plan update, the Subcommittee will review the mitigation actions that have been successfully implemented and determine whether the action achieved the identified goal(s) and had the intended result (i.e., were losses avoided or the vulnerability of hazard-prone areas reduced.)

The Subcommittee will also ask each Plan participant to identify any significant changes in development that have occurred within the previous 12 months; whether any new plans, policies, regulations, or reports have been adopted; and if any hazard-related damages to critical facilities and infrastructure have been sustained.

In order to streamline the plan maintenance process, the Edgar County ESDA will provide each Plan participant with a Plan Maintenance Checklist along with the necessary forms to complete and return. **Appendix L** contains a copy of Checklist and associated forms.

The Edgar County ESDA will then prepare a progress report detailing the results of the annual Plan monitoring and evaluation period and provide copies to the Subcommittee. The annual progress report will include:

- information on any hazard-related damages sustained by critical facilities and infrastructure within the planning area during the previous year.
- implementation status of the mitigation actions identified in the Mitigation Strategy.
- identification of any new mitigation actions proposed by the Plan participants.
- information on changes in development and planning and regulatory capabilities for the Plan participants.

If any existing mitigation actions are modified or new mitigation actions are identified for the Plan participants, then Section 4.7 of the Mitigation Strategy will be updated, and the Plan update resubmitted to the Illinois Emergency Management Agency (IEMA) and FEMA for reference.

5.1.2 Updating the Plan

The Plan must be updated within five years of the of the Plan approval date indicated on the signed FEMA final approval letter. (This date can be found in Section 6, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant funds to implement those mitigation actions identified in this Plan.

Updating the Plan

- The Edgar County ESDA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan.
- The Plan ***must be updated within 5 years*** of the ***date of the final approval letter*** provided by FEMA.
- Any jurisdictions that did not take part in the previous Plan may do so during the 5 year update.
- Once the Plan update has received FEMA/IEMA approval, each participating jurisdiction ***must adopt the Plan to remain eligible to receive federal mitigation funds.***

The Edgar County ESDA, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan. The update will incorporate all of the information gathered during the monitoring and evaluation phase and will also include:

- a review of the Mitigation Strategy, including potential updates to the mitigation goals;
- an assessment of whether other natural or man-made hazards need to be addressed or included in the Plan;
- a review of new hazard data that may affect the Risk Assessment Section; and

- ❖ identification of any changes in development that have occurred in hazard prone areas which would increase or decrease the participating jurisdictions' vulnerability.

In addition, any jurisdictions that did not take part in the previous Plan may do so at this time. It will be the responsibility of these jurisdictions to provide all of the information needed to be integrated into the Plan update.

A public forum will be held to present the Plan update to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the Plan update. The Plan update will then be submitted to IEMA and FEMA for review and approval. ***Once the Plan update has received state and federal approval, FEMA requires that each of the participating jurisdictions adopt the Plan to remain eligible to receive federal funds to implement identified mitigation actions.***

5.2 INCORPORATING THE MITIGATION STRATEGY INTO EXISTING PLANNING MECHANISMS

As part of the planning process, the Planning Committee identified each participating jurisdiction's existing capabilities (i.e., existing authorities, policies, programs, technical information, etc.) and resources available to support or accomplish mitigation and reduce long-term vulnerability. **Figures PP-3** through **PP-14** identify the existing authorities, policies, programs, technical information, and resources available by capability type by jurisdiction. ***It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the Plan update into the planning mechanisms identified for their jurisdiction.***

Adoption of this Plan update will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The Plan Maintenance Subcommittee's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage active integration of the Plan into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

Based on conversations with Planning Committee members, none of the jurisdictions who participated in the original Plan have incorporated it into other planning mechanisms within their jurisdictions. This is due in part to the size, fiscal and staffing situations, and technical capacity of the participants. While both Edgar County and Paris have comprehensive plans, both were completed prior to the adoption of the original hazard mitigation Plan and have not been updated since. There is no indication that the County or any of the participating jurisdictions will be adopting, reviewing, or strengthening current policies or programs in the near future.

Most of the participating jurisdictions (Brocton, Hume, Kansas, Metcalf and Redmon) have limited capabilities to integrate the mitigation strategy and other information contained in the Plan update into existing planning mechanisms. These jurisdictions are small in size and do not have the financial resources or trained personnel to develop planning mechanisms such as comprehensive plans or building and zoning ordinances.

5.3 CONTINUED PUBLIC INVOLVEMENT

The County and participating jurisdictions understand the importance of continued public involvement and will seek public input on the Plan update throughout the plan maintenance cycle. A copy of the approved Plan will be maintained and available for review at the Edgar County ESDA Office. Individuals will be encouraged to provide feedback and submit comments for the next Plan update to the Edgar County ESDA Coordinator.

The comments received will be compiled and included in the annual progress report and considered for incorporation into the next Plan update. Any meetings held by the Plan Maintenance Subcommittee will be noticed and open to the public. Separate committee meetings and a public forum will be held prior to the next Plan update submittal to provide the public an opportunity to comment on the proposed revision to the Plan update.

6.0 PLAN ADOPTION

The final step in the planning process is the adoption of the approved Plan update by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to remain eligible for federal grant funds to implement mitigation actions identified in this Plan.

6.1 PLAN ADOPTION PROCESS

Before the Plan update could be adopted by the participating jurisdictions, it was made available for public review and comment through a public forum and comment period. Comments received were incorporated into the Plan update and the Plan was then submitted to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) for their review and approval.

Upon receipt of the Approval Pending Adoption (APA) letter from FEMA, the Plan update was presented to the County and participating jurisdictions for adoption. ***Each participating jurisdiction was required to formally adopt*** the Plan to remain eligible to receive federal grant funds to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan update did not affect the eligibility of those who did.

Figure PA-1 identifies the participating jurisdictions and the date each formally adopted the Plan update. Signed copies of the adoption resolutions are located in **Appendix M**. FEMA signed the final approval letter on (Date) which began the five-year approval period and set the expiration date of (Date) for the Plan.

Figure PA-1
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date

7.0 REFERENCES

Provided below is a listing, by section, of the resources utilized to create this document.

1.0 INTRODUCTION

1. Federal Emergency Management Agency. Data Visualization: Disaster Declarations for States and Counties. Database. November 2021 <https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties>.
2. Federal Emergency Management Agency. OpenFEMA Dataset: Disaster Declarations Summaries – V1. Excel Dataset. 12 October 2020 <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1>.
3. Federal Emergency Management Agency. Getting Started: Building Support for Mitigation Planning. FEMA 386-1. September 2002.
4. Illinois Emergency Management Agency. Mitigation Planning. 2018 Illinois Natural Hazard Mitigation Plan. October 2018. 1 June 2022 <https://www2.illinois.gov/iema/Recovery/Documents/Plan_IllMitigationPlan.pdf>.

1.2 County Profile

1. Illinois Department of Commerce and Economic Opportunity. Community Profiles. Database. March 2022. <https://app.locationone.com/areas/communities?organization=59eaba35bec80e09b4bbf0df&buildings:filters=%5B%5B%22railServed%22%2C%5B%22Y%22%5D%5D%5D&buildings:sort=sqft:high&sites:filters=%5B%5D&sites:sort=acres:high>.
2. Illinois Department of Public Health. IDPH Population Projections, Illinois, Chicago, and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition). 8 February 2022. <https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/population-projections-report-2010-2030.pdf>.
3. United States Census Bureau. 2010 Census U.S. Gazetteer Files. 11 April 2019 <https://www.census.gov/geographies/reference-files/time-series/geo/gazetteer-files.html>.
4. United States Census Bureau. American Community Survey, 5-Year Data Profile. 10 January 2022 <https://www.census.gov/data/developers/data-sets/acs-5year/2019.html>.
5. United States Department of Agriculture. National Agricultural Statistics Service. Publications. Census of Agriculture. 2017 Census of Agriculture. State & County. Illinois. State and County Profiles. June 2021. <https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/>.
6. United States Department of Agriculture. Natural Resources Conservation Service. Published Soil Surveys for Illinois. March 2022. <https://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=IL>.

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4.0 MITIGATION STRATEGY

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