Multi-Hazard Mitigation Plan

Macoupin County

The Polis Center
IUPUI
1200 Waterway Boulevard
Suite 100
Indianapolis, IN 46202

Macoupin County EMA
215 South East Street
Carlinville, Illinois 62626

Southern Illinois University
Carbondale
Department of Geology
206 Parkinson Laboratory
Carbondale, IL 62901

Multi-Hazard Mitigation Plan

Macoupin County, Illinois

Adoption Date: -- _____ --

Primary Point of Contact

James W. Pitchford
Coordinator
Macoupin County Emergency Management Agency
215 South East Street
Carlinville, Illinois 62626
Phone: 217-854-3352
ema@macoupincoutyil.gov

Secondary Point of Contact

Aaron Bishop
Macoupin County Emergency Telephone System Director
215 S. East Street
Carlinville, IL 62626
Phone: 217-854-5459
Fax: 217-854-4764

Prepared by:

Department of Geology
Southern Illinois University
Carbondale, IL 62901

and

The Polis Center
1200 Waterway Boulevard, Suite 100
Indianapolis, IN 46202
317-274-2455

Table of Contents

Section 1 - Public Planning Process

1.1 Narrative Description

Hazard mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals; hazard mitigation planning and the subsequent implementation of resulting projects, measures, and policies is a primary mechanism in achieving FEMA's goal.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt an MHMP.

In recognition of the importance of planning in mitigation activities, FEMA created **Haz**ards **US**A **M**ulti-**H**azard (HAZUS-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. Southern Illinois University at Carbondale (SIUC) and The Polis Center (Polis) at Indiana University Purdue University Indianapolis (IUPUI) are assisting Macoupin County planning staff with performing the hazard risk assessment.

1.2 Planning Team Information

The Macoupin County Multi-Hazard Mitigation Planning Team is headed by James W. Pitchford, who is the primary point of contact. Members of the planning team include representatives from various county departments, cities and towns, and public and private utilities. Table 1-1 identifies the planning team individuals and the organizations they represent.

Table 1-1: Multi Hazard Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Jim Pitchford	Coordinator	Emergency Management Agency	Macoupin County
Aaron Bishop	Emergency Telephone System Director	Emergence Telephone System Board	Macoupin County
Brad Targhetta	Macoupin County Coroner	Macoupin County	Macoupin County
David Hopper	Emergency Preparedness and Medical Reserve Corps Coordinator	Health Department	Macoupin County
John Bresnan	Supervisor of Assessments	Assessment Office	Macoupin County
Kent Tarro	Administrator	County Public Health	Macoupin County
Tom Reinhart	County Engineer	Highway Department	Macoupin County
Raymond Chapman	Mayor	City of Bunker Hill	City of Bunker Hill
Gerald W. Emshousen	Chief	Bunker Hill PD	City of Bunker Hill

Name	Title	Organization	Jurisdiction
Aaron Shipley	Coordinator	Emergency Management Agency	City of Carlinville
Gerald W. Emshousen	Chief	Bunker Hill PD	City of Bunker Hill
Don Downing	Chairman	LEPC	City of Carlinville
Mary Beth Bellm	City Engineer	City of Carlinville	City of Carlinville
George Holesko			City of Gillespie
Dean Plovich	Police Chief	Gillespie Police Department	City of Gillespie
John M. Lutz	Mayor	Girard City Council	City of Girard
John Willmon	Mayor	City of Staunton	City of Staunton
Rick Haase	Chief	Staunton Fire Protection District	City of Staunton
Robert Mertz	Police Chief	Staunton Police Department	City of Staunton
Wayne Joplin	Mayor	City of Virden	City of Virden
London Simmons	Mayor	Village of Royal Lake	Village of Royal Lakes
Dan Harvill	Mayor	Village of Wilsonville	Village of Wilsonville
Larry Pfeiffer	Regional Superintendent	Regional Office of Education	Calhoun, Jersey, Greene and Macoupin Counties
Michael Cavanaugh	Deputy Director	West Central Development Council, Inc.	Regional

The Disaster Mitigation Act (DMA) planning regulations stress that planning team members must be active participants. The Macoupin County MHMP committee members were actively involved on the following components:

- Attending the MHMP meetings
- Providing available GIS data and historical hazard information
- Reviewing and providing comments on the draft plans
- Coordinating and participating in the public input process
- Coordinating the formal adoption of the plan by the county

An MHMP kickoff meeting was held at the Macoupin County Board Room on February 11, 2010. Representatives from SIU explained the rationale behind the MHMP program and answered questions from the participants. Representatives from SIU also provided an overview of HAZUS-MH, described the timeline and the process of the mitigation planning project, and presented Macoupin County with a Memorandum of Understanding (MOU) for sharing data and information.

The Macoupin County Multi-Hazard Mitigation Planning Committee met on February 11, 2010, March 24, 2010, May 19th 2010, July 13, 2010, and September 14, 2010. Each meeting was approximately two hours in length. The meeting minutes are included in Appendix A. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

1.3 Public Involvement in Planning Process

An effort was made to solicit public input during the planning process, and a public meeting was held on May 19th 2010 to review the county's risk assessment. Appendix A contains the minutes

from the public meeting. Appendix B contains articles published by the local newspaper throughout the public input process.

1.4 Neighboring Community Involvement

The Macoupin County planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The team also invited participation from adjacent counties to obtain their involvement in the planning process. Details of neighboring stakeholders' involvement are summarized in Table 1-2.

Table 1-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Cale Hoesman	Sangamon County	Sangamon County Office of Emergency Management	Invited to participate in public meeting, reviewed the plan and provide comments.
Cale Hoesman	Greene County	Green County Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Larry Mead	Jersey County	Jersey County Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Larry Ringe Ring.	Madison County	Madison County Emergency Management Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Dina Holmes	Montgomery County	Montgomery County Emergency Service and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.
Robert Fitzsimmons	Morgan County	Morgan County Emergency Services and Disaster Agency	Invited to participate in public meeting, reviewed the plan and provide comments.

1.5 Review of Technical and Fiscal Resources

The MHMP planning team has identified representatives from key agencies to assist in the planning process. Technical data, reports, and studies were obtained from these agencies. The organizations and their contributions are summarized in Table 1-3.

Table 1-3: Key Agency Resources Provided

Agency Name	Resources Provided
Macoupin County Supervisor of Assessments	Parcel Map, Tax and Structure Data
Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps
U.S. Census	County Profile Information, e.g. Population and Physical Characteristics
Department of Commerce and Economic Opportunity	Community Profiles
Illinois Department of Employment Security	Industrial Employment by Sector
NOAA National Climatic Data Center	Climate Data
Illinois Emergency Management Agency	2007 Illinois Natural Hazard Mitigation Plan
Illinois Water Survey (State Climatologist Office)	Climate Data
United States Geological Survey	Physiographic/Hill Shade Map, Earthquake Information,

	Hydrology
Illinois State Geological Survey	Geologic, Karst Train, Physiographic Division and Coal Mining Maps

1.6 Review of Existing Plans

Macoupin County and its local communities utilized a variety of planning documents to direct community development. These documents include land use plans, comprehensive plans, emergency response plans, municipal ordinances, and building codes. The planning process also incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 1-4 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 1-4: Planning Documents Used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
FEMA		Macoupin County Flood Insurance Study	Describes the NFIP program, which communities participates; provide flood maps	Sections 4 and 5
Supervisor of Assessments	2009	GIS Database	Parcel and Assessor Data for Christian County.	Section 4
State of Illinois Emergency Management Plan	2007	2007 Illinois Natural Hazard Mitigation Plan	This plan provides an overview of the process for identifying and mitigating natural hazards in Illinois as require by the Disaster Mitigation Act of 2000.	Guidance on hazards and mitigation measures and background on historical disasters in Illinois.
Macoupin County	2006	Macoupin County Comprehensive Plan	The comprehensive plan provides detailed goals and strategies for planning issues within Macoupin County.	Section 5, Table 5-2

Section 2 - Jurisdiction Participation Information

The incorporated communities included in this multi-jurisdictional plan are listed in Table 2-1.

Table 2-1: Participating Jurisdictions

Jurisdiction Name
Macoupin County
City of Bunker Hill
City of Carlinville
City of Gillespie
City of Girard
City of Staunton
City of Virden
Village of Royal Lakes
Village of Wilsonville

2.1 Adoption by Local Governing Body

The draft plan was made available on September 14, 2010 to the planning team for review. Comments were then accepted. The Macoupin County hazard mitigation planning team presented and recommended the plan to the County Commissioners, who adopted it on <date adopted>. Resolution adoptions are included in Appendix C of this plan.

2.2 Jurisdiction Participation

It is required that each jurisdiction participates in the planning process. Table 2-2 lists each jurisdiction and describes its participation in the construction of this plan.

Table 2-2: Jurisdiction Participation

Jurisdiction Name	Participating Member	Participation Description
Macoupin County	Jim Pitchford	MHMP planning team member
City of Bunker Hill	Raymond Chapman	MHMP planning team member
City of Carlinville	Aaron Shipley	MHMP planning team member
City of Gillespie	Dean Plovich	MHMP planning team member
City of Girard	John M. Lutz	MHMP planning team member
City of Virden	Wayne Joplin	MHMP planning team member
Village of Royal Lakes	London Simmons	MHMP planning team member
Village of Wilsonville	Don Harvill	MHMP planning team member

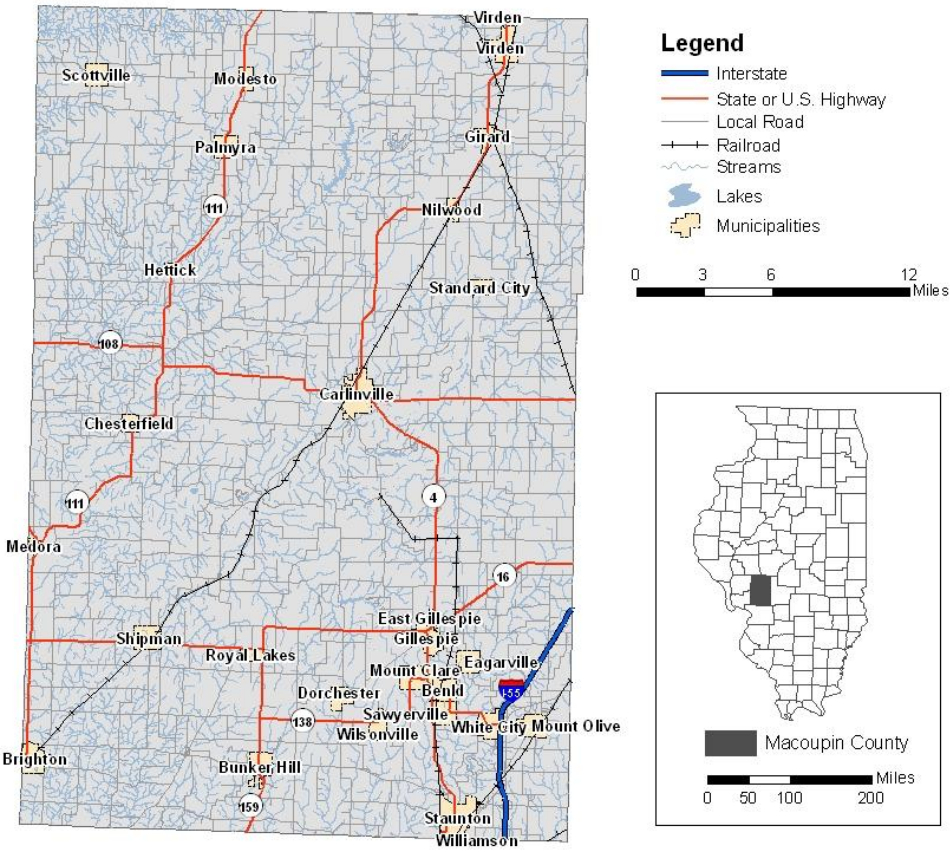
All members of the MHMP planning committee were actively involved in attending the MHMP meetings, providing available Geographic Information Systems (GIS) data and historical hazard information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and coordinating the county's formal adoption of the plan.

Section 3 - Jurisdiction Information

Macoupin County was formed from Greene and Madison Counties on January 17, 1829. It was named after Macoupin Creek, which runs near Carlinville and meanders towards the Illinois River. The City of Carlinville is the county seat.

Macoupin County is located in the south-central portion of Illinois. The county has total land area of 868 square miles. It is bordered by Sangamon County in the northeast, Montgomery County in the east, Madison County in the south, Greene County in the west, Jersey County in the west, and Morgan County in the northwest. Figure 3-1 depicts Macoupin County's location.

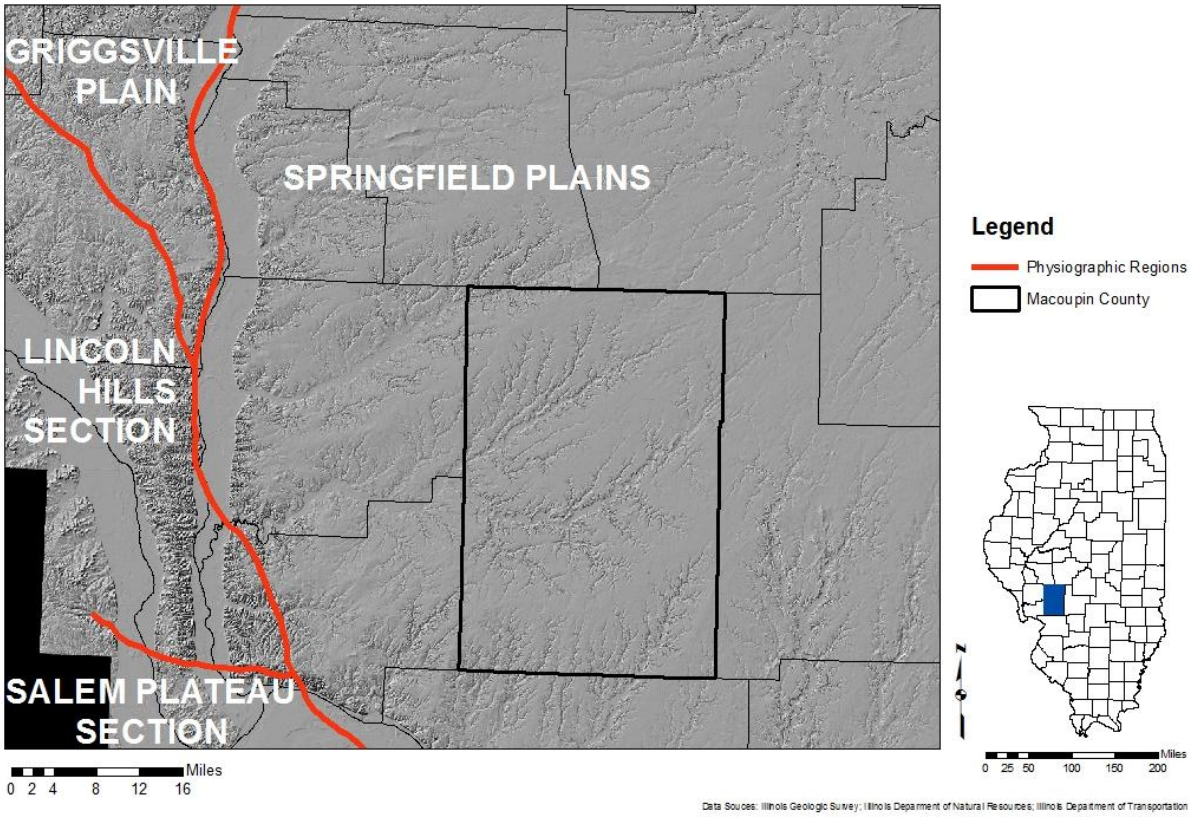
Figure 3-1: Macoupin County, Illinois



Sources:http://www.cyberdriveillinois.com/departments/archives/irad/Macoupin.html; http://www.fedstats.gov/qf/states/17000.html; http://factfinder.census.gov; http://www.genealogytrails.com

3.1 Topography

Macoupin County is situated in the Central Lowland Province of the Till Plains Section and lies within the Springfield Plain physiographic division. The Springfield Plain includes the level portion of the Illinois drift sheet in central and southern Illinois. It is characterized mainly by its flatness and by its relatively shallow entrenchment of drainage.



3.2 Climate

Macoupin County climate is typical of Central Illinois. The variables of temperature, precipitation, and snowfall can vary greatly from one year to the next. Winter temperatures can fall below freezing starting as early as September and extending as late as May. Based on National Climatic Data Center (NCDC) data from 1971 to 2000, the average winter low is 17.4° F and the average winter high is 41.2° F. In summer, the average low is 62.1° F and average high is 87.3° F. Average annual precipitation is 38.59 inches throughout the year.

3.3 Demographics

In 2000, Macoupin County had a population of 49,019. According to American FactFinder (2008), Macoupin County experienced a population decline of 1.83% from 2000 to 2008. The population is spread throughout 26 townships: Barr, Bird, Brighton, Brushy Mound, Bunker Hill, Cahokia, Carlinville, Chesterfield, Dorchester, Gillespie, Girard, Hillyard, Honey Point, Mt. Olive, Nilwood, North Otter, North Palmyra, Polk, Scottville, Shaws Point, Shipman, South Otter, South Palmyra, Staunton, Virden, and Western Mound. The largest community in Macoupin County is Carlinville, which has a population of approximately 5,685. The breakdown of population by township is included in Table 3-1. Townships containing incorporated communities are marked with an asterisk (*).

Table 3-1: Population by Community

Community	2000 Population	% of County
Barr*	351	0.72
Bird	279	0.57
Brighton*	4,149	8.46
Brushy Mound	751	1.53
Bunker Hill*	3,352	6.84
Cahokia*	3,389	6.91
Carlinville*	6,910	14.10
Chesterfield*	943	1.92
Dorchester*	1,546	3.15
Gillespie*	4,114	8.39
Girard*	2,582	5.27
Hillyard*	733	1.50
Honey Point	225	0.46
Mt. Olive*	3,379	6.89
Nilwood*	699	1.43
North Otter	840	1.71
North Palmyra*	974	1.99
Polk	514	1.05
Scottville*	356	0.73
Shaws Point*	490	1.00
Shipman*	1,507	3.07
South Otter*	395	0.81
South Palmyra*	819	1.67
Staunton*	5,731	11.69
Virden*	3,689	7.53
Western Mound	3,378	6.89

Source: American FactFinder, 2000

3.4 Economy

American FactFinder reported for 2000 that 79.0% of the workforce in Macoupin County was employed in the private sector. The breakdown is included in Table 3-2. Educational services, health care, and social assistance represents the largest sector, employing approximately 25.4% of the workforce. The 2000 annual per capita income in Macoupin County is $23,600.

Table 3-2: Industrial Employment by Sector

Industrial Sector	% Dist. In County (2000)
Agriculture, forestry, fishing, hunting, and mining	4.5
Construction	8.6
Manufacturing	11.4
Wholesale trade	2.5
Retail trade	12.5
Transportation, warehousing and utilities	5.9
Information	1.4

Industrial Sector	% Dist. In County (2000)
Finance, insurance, real estate, and rental/leasing	4.9
Professional, technical services	6.1
Educational services, health care, and social assistance	25.4
Arts, entertainment, recreation	6.5
Public administration	5.8

Source: American FactFinder, 2000

3.5 Industry

Macoupin County's major employers and number of employees are listed in Table 3-3.

Table 3-3: Major Employers

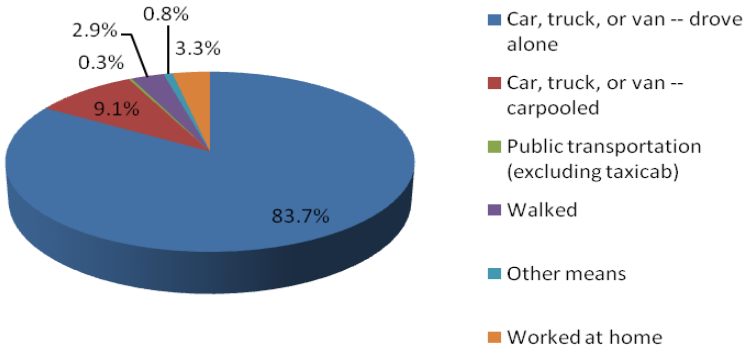
Company Name	City/Town	Year Established	# of Employees	Type of Business
Manufacturing				
Prairie Farms Dairy, Inc.	Carlinville	1900	100	Dairy
M&M Service Company	Carlinville	1950	200	Farm Service
Transportation				
Cavallo Bus Line, Inc.	Gillespie		100	Private Bus
Health Care				
Carlinville Area Hospital	Carlinville	1952	2000	Hospital
Community Memorial Hospital	Staunton	1950	80	Hospital
Pleasant Hill Village	Girard	1976	50	Nursing Home
Sunrise Manor	Virden	1965	50	Nursing Home
Heritage Manor	Carlinville			Nursing Home
Heritage Manor	Gillespie	1970	50	Nursing Home
Heritage Manor	Staunton			Nursing Home
Carlinville Rehab	Carlinville			Rehabilitation Center
Friendship Home	Carlinville			Nursing Home
Robings Manor	Brighton	1970	45	Nursing Home
Other				
Lake Williamson	Carlinville	1960	50	State Headquarters
Shay Mine No. 1	Carlinville	2009	75	Coal Mine
Crown III	Girard	2009	100	Coal Mine
Karmak, Inc.	Carlinville	1981	210	Computer Software
Macoupin County Government	Carlinville	1829	200	Government

Source: Macoupin County Planning Team

Commuter Patterns

According to American FactFinder information from 2000, approximately 22,601 of Macoupin County's population are in the work force. The average travel time from home to work is 27.8 minutes. Figure 3-2 depicts the commuting patterns for Macoupin County's labor force.

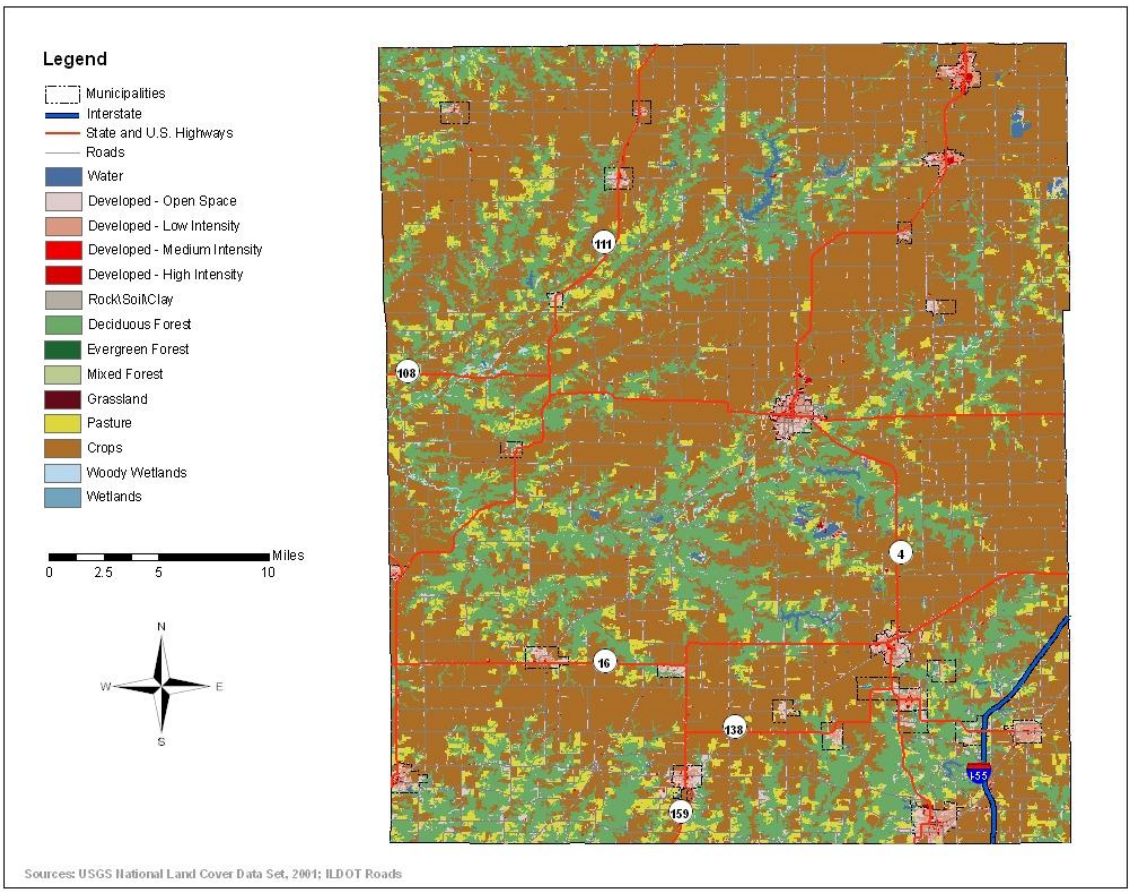
Figure 3-2: Commuter Patterns for Macoupin County



3.6 Land Use and Development Trends

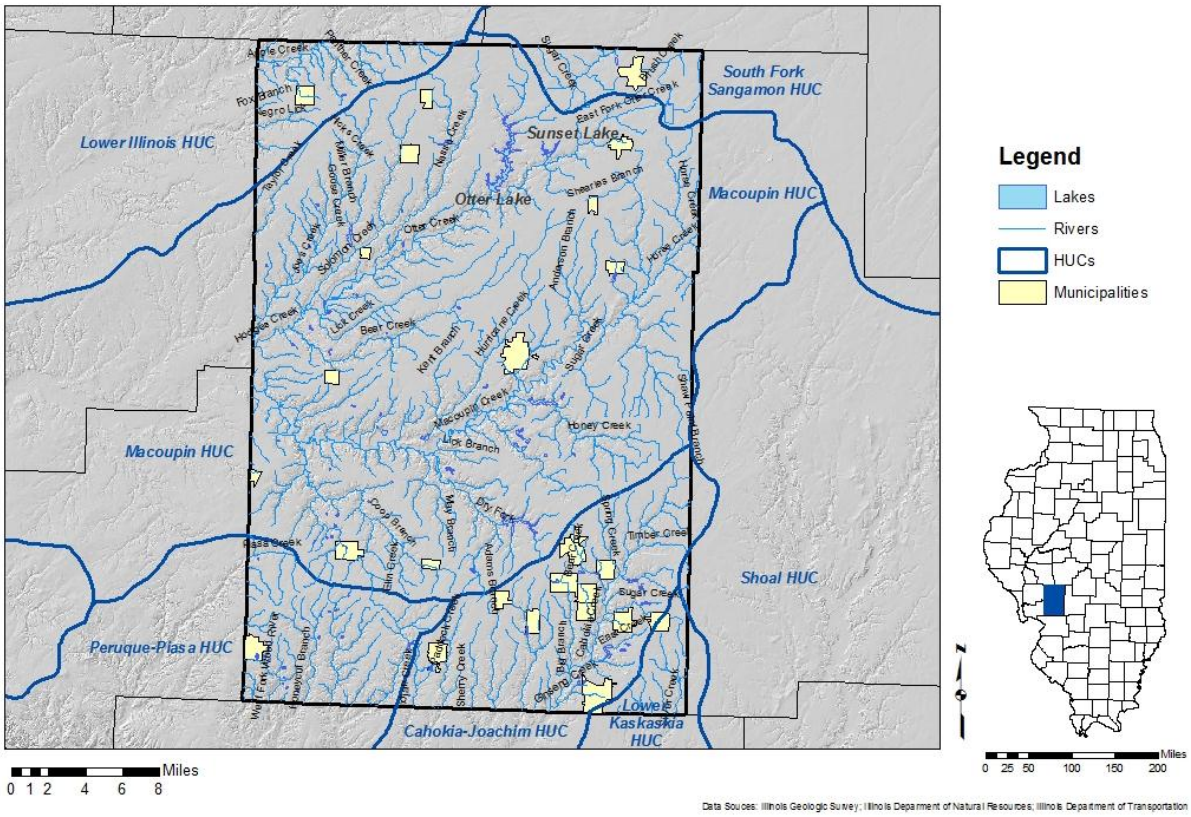
Agriculture is the predominant land use in Macoupin County with over 60% of the land used for growing crops. Other significant land uses include manufacturing, residential, and tourism. Macoupin County is home to several spacious parks for fishing, camping, hiking, and water sports. The parks include Denby Prairie Nature Preserve, Beaver Dam State Park, Goodes Woods Nature Preserve, Terry Park, and VFW Park. Figure 3-3 shows the land use throughout Macoupin County.

Figure 3-3: Land Use in Macoupin County



3.7 Major Lakes, Rivers, and Watersheds

Macoupin County has a number of bodies of water including Otter Lake, Bunker Hill Lake, Staunton, Lake, Sunset Lake, Bullard Lake, Evergreen Lake, Mowens Lake, Lake Carlinville, and Standard City Lake. According to the USGS, Macoupin County consists of five drainage basins: Macoupin (HUC 7130012), South Fork Sangamon (HUC 7130007), Peruque-Piasa (HUC 7110009), Cahokia-Joachim (HUC 7140101), and the Lower Kaskaskia (HUC 7140204).



Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on sound risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people. This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of three components—hazard identification, vulnerability analysis, and risk analysis.

4.1 Hazard Identification/Profile

4.1.1 Existing Plans

The plans identified in Table 1-3 did not contain a risk analysis. These local planning documents were reviewed to identify historical hazards and help identify risk. To facilitate the planning process, a digital version of the Macoupin County FIRM was used for the flood analysis.

4.1.2 National Hazard Records

4.1.2.1 National Climatic Data Center (NCDC) Records

To assist the planning team, historical storm event data was compiled from the National Climatic Data Center (NCDC). NCDC records are estimates of damage reported to the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to given weather events.

The NCDC data included 149 reported events in Macoupin County between December 2, 1950 and the October 31, 2009 (the most updated information as of the date of this plan). A summary table of events related to each hazard type is included in the hazard profile sections that follow. A full table listing all events, including additional details, is included as Appendix D. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC recorded latitude and longitude. These events are plotted and included as Appendix E. The list of NCDC hazards is included in Table 4-1.

Table 4-1: Climatic Data Center Historical Hazards

Hazard
Tornadoes
Severe Thunderstorms
Drought/Extreme Heat
Winter Storms
Flood/Flash flood

4.1.2.2 FEMA Disaster Information

Since 1965 there have been 55 Federal Disaster Declarations for the state of Illinois. Emergency declarations allow states access to FEMA funds for Public Assistance (PA); disaster declarations allow for even more PA funding including Individual Assistance (IA) and the Hazard Mitigation Grant Program (HMGP). Macoupin County has received federal aid for both PA and IA funding for five declared disasters since 1965. Figure 4-1 depicts the disasters and emergencies that have been declared for Macoupin County since 1965. Table 4-2 lists more specific information for each declaration.

Figure 4-1: FEMA-Declared Emergencies and Disasters in Macoupin County (1965-present)

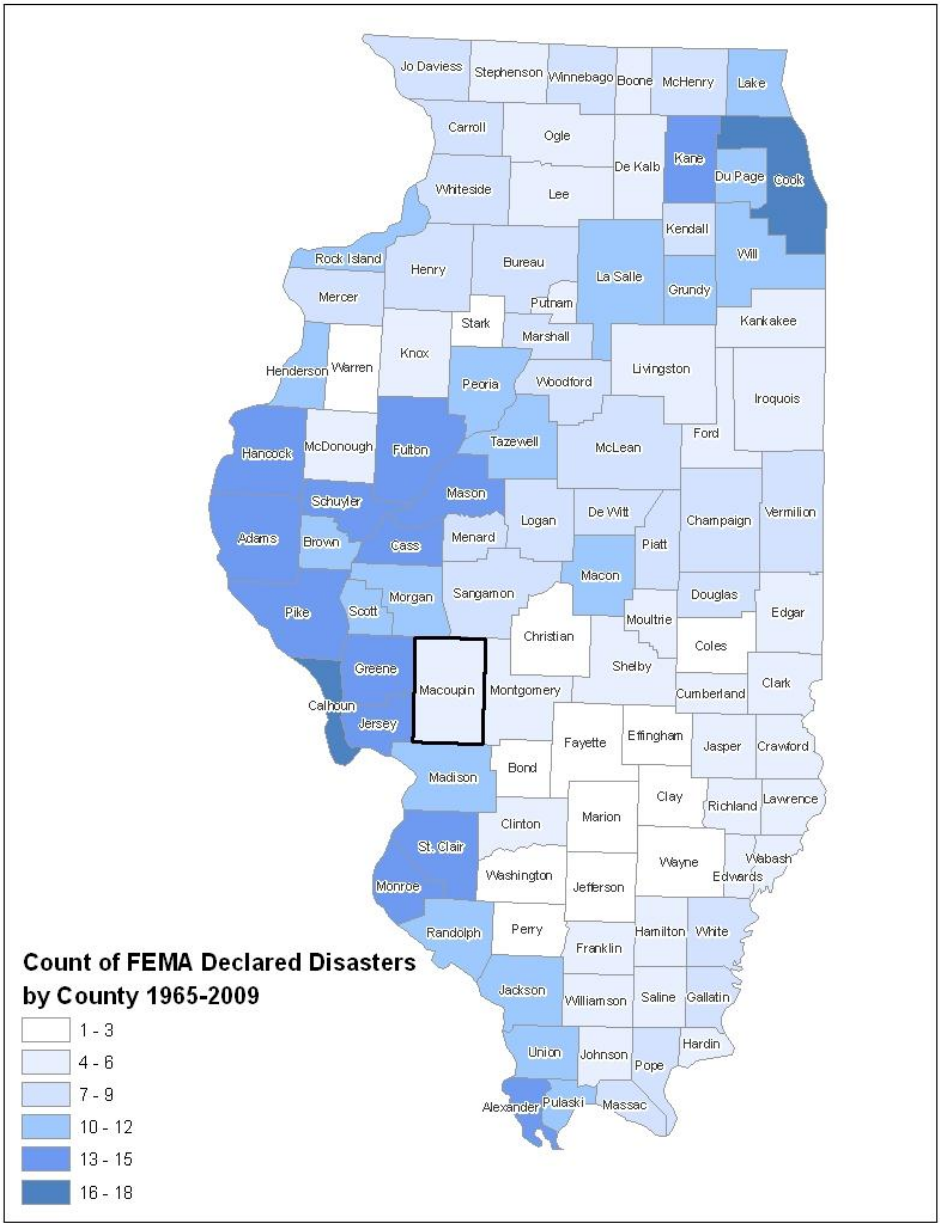


Table 4-2: FEMA-Declared Emergencies in Macoupin County (1965-present)

Date of Incident	Declaration Number	Date of Declaration	Disaster Description	Type of Assistance
12/2/1982	674	12/17/1982	Flooding	
5/1/1983	684	5/3/1983	Tornado, Severe Thunderstorms, and Flooding	
5/7/2002	1416	6/6/2002	Flooding	Public and Individual Assistance
12/1/2006	1681	2/9/2007	Severe Winter Storm	Public Assistance
9/13/2008	1800	10/3/2008	Severe Thunderstorms & Flooding	Public and Individual Assistance

4.1.3 Hazard Ranking Methodology

Based on planning team input, national datasets, and existing plans, Table 4-3 lists the hazards Macoupin County will address in this multi-hazard mitigation plan. In addition, these hazards ranked the highest based on the Risk Priority Index discussed in section 4.1.4.

Table 4-3: Planning Team Hazard List

Hazard
Flooding
Tornado
Earthquakes
Dam or Levee Failure
Thunderstorms/ High Winds/Hail/ Lightning
Winter Storms
Transportation Hazardous Material Release

4.1.4 Calculating the Risk Priority Index

The first step in determining the Risk Priority Index (RPI) was to have the planning team members generate a list of hazards which have befallen or could potentially befall their community. Next, the planning team members were asked to assign a likelihood rating based on the criteria and methods described in the following table. Table 4-4 displays the probability of the future occurrence ranking. This ranking was based upon previous history and the definition of hazard. Using the definitions given, the likelihood of future events is "Quantified" which results in the classification within one of the four "Ranges" of likelihood.

Table 4-4: Future Occurrence Ranking

Probability	Characteristics
4 - *Highly Likely*	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring. (1/1=100%) History of events is greater than 33% likely per year.
3 - *Likely*	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring. (1/3=33%) History of events is greater than 20% but less than or equal to 33% likely per year.
2 - *Possible*	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring. (1/5=20%) History of events is greater than 10% but less than or equal to 20% likely per year.
1 - *Unlikely*	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring. (1/10=10%) History of events is less than or equal to 10% likely per year.

Next, planning team members were asked to consider the potential magnitude/severity of the hazard according to the severity associated with past events of the hazard. Table 4-5 gives four classifications of magnitude/severity.

Table 4-5: Hazard Magnitude

Magnitude/Severity	Characteristics
8 - *Catastrophic*	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 - *Critical*	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 - *Limited*	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property is severely damaged.
1 - *Negligible*	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Finally, the RPI was calculated by multiplying the probability by the magnitude/severity of the hazard. Using these values, the planning team member where then asked to rank the hazards. Table 4-6 identifies the RPI and ranking for each hazard facing Macoupin County.

Table 4-6: Macoupin County Hazards (RPI)

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornado	3 - Likely	8 - Catastrophic	24	1
Transportation Hazardous Material Release	3 - Likely	4 - Critical	12	2
Thunderstorms/ High Winds/Hail/ Lightning	4 - Highly Likely	2 - Limited	8	3
Winter Storms	4 - Highly Likely	2 - Limited	8	4
Subsidence	3 - Likely	4 - Critical	12	5
Flooding	4 - Highly Likely	2 - Limited	8	6
Earthquake	2 - Possible	4 - Critical	8	7
Fire/Explosion	3 - Likely	2 - Limited	6	8
Dam/Levee Failure	2 - Possible	1 - Negligible	2	9

4.1.5 Jurisdictional Hazard Ranking

Because the jurisdictions in Macoupin County differ in their susceptibilities to certain hazards—for example, the village of Wilsonville is located above underground mine areas and is more likely to experience subsidence than the village of Palmyra which is not located near any underground mining—the hazards identified by the planning team were ranked by SIU for each individual jurisdiction using the methodology outlined in Section 4.1.4. The SIU rankings were based on input from the planning team members, available historical data, and the hazard modeling results described within this hazard mitigation plan. During the five-year review of the plan this table will be updated by the planning team to ensure these jurisdictional rankings accurately reflect each community's assessment of these hazards. Table 4-7 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern).

Table 4-7: Hazard Rankings by Jurisdiction

Jurisdiction	Hazard								
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Winter Storms	Fire or Explosion	Subsidence	Levee/Dam Failure
City of Benld*	1	2	6	3	8	4	7	5	NA
City of Bunker Hill	3	6	7	1	4	2	8	5	9
City of Carlinville	1	4	6	2	8	3	5	7	9
City of Girard*	1	2	6	3	8	4	7	5	NA
City of Mount Olive*	1	2	6	3	8	4	7	5	NA
City of Staunton	1	2	7	3	5	6	8	4	NA
City of Virden	1	3	7	2	6	4	8	5	NA
Town of Nilwood*	1	2	6	3	8	4	7	5	NA
Town of Shipman*	1	2	5	3	7	4	6	8	NA
Village of Brighton*	1	2	5	3	7	4	6	NA	NA
Village of Chesterfield*	1	2	6	3	8	4	7	5	NA
Village of Dorchester*	1	2	5	3	7	4	6	NA	NA
Village of Eagarville*	1	2	6	3	8	4	7	5	NA
Village of East Gillespie*	1	2	6	3	8	4	7	5	NA
Village of Gillespie	1	2	6	3	8	4	7	5	NA
Village of Hettick*	1	2	5	3	7	4	6	NA	NA
Village of Medora*	1	2	5	3	7	4	6	8	NA
Village of Mount Clare*	1	2	6	3	8	4	7	5	NA
Village of Palmyra*	1	2	6	3	8	4	7	5	NA
Village of Royal Lakes*	1	2	5	3	7	4	6	NA	NA
Village of Sawyerville*	1	2	6	3	8	4	7	5	NA
Village of Scottville*	1	2	5	3	7	4	6	NA	NA

Jurisdiction	Hazard								
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Winter Storms	Fire or Explosion	Subsidence	Levee/Dam Failure
Village of Standard City*	1	2	6	3	8	4	7	5	NA
Village of White City*	1	2	6	3	8	4	7	5	NA
Village of Wilsonville	3	4	6	2	N/A	1	5	N/A	NA

N/A = Not Applicable
*Hazards for this jurisdiction were ranked by SIU

4.1.6 GIS and HAZUS-MH

The third step in this assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. Where possible, the hazards were quantified using GIS analyses and HAZUS-MH. This process reflects a Level 2 approach to analyzing hazards as defined for HAZUS-MH. The approach includes substitution of selected default data with local data. This process improved the accuracy of the model predictions.

HAZUS-MH generates a combination of site-specific and aggregated loss estimates depending upon the analysis options that are selected and the input that is provided by the user. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across census blocks/tracts. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks/tracts. It is important to note that HAZUS-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project. It is only intended to highlight the major steps that were followed during the project.

Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures takes into account the depth of water in relation to the structure. HAZUS-MH also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure will fall into a structural class, and structures in each class will respond in a similar fashion to a specific depth of flooding or ground shaking. Site-specific analysis is also based upon a point location rather than a polygon, therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site-specific structures as well as for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

The following events were analyzed. The parameters for these scenarios were created through GIS, HAZUS-MH, and historical information to predict which communities would be at risk.

Using HAZUS-MH

1. 100-year overbank flooding
2. Earthquake scenarios

Using GIS

1. Tornado
2. Hazardous material release
3. Subsidence

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

4.2.1.1 Processes and Sources for Identifying Assets

The HAZUS-MH data is based on best available national data sources. The initial step involved updating the default HAZUS-MH data using State of Illinois data sources. At Meeting #1, the planning team members were provided with a plot and report of all HAZUS-MH critical facilities. The planning team took GIS data provided by SIU; verified the datasets using local knowledge, and allowed SIU to use their local GIS data for additional verification. SIU GIS analysts made these updates and corrections to the HAZUS-MH data tables prior to performing the risk assessment. These changes to the HAZUS-MH inventory reflect a Level 2 analysis. This update process improved the accuracy of the model predictions.

The default HAZUS-MH data has been updated as follows:

- The HAZUS-MH defaults, critical facilities, and essential facilities have been updated based on the most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts at each county.
- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) have been applied to the HAZUS-MH model data. HAZUS-MH reports of essential facility losses reflect updated data.

Macoupin County provided parcel boundaries with assessed values. The assessors data did not contain building replacement cost information and other building characteristics, and thus could not be used for the census block aggregated HAZUS-MH analysis. The parcel data was used to estimate the number of buildings within the flood-prone areas. The parcel data identified parcels with building improvements, which were then converted into centroid point locations. The parcels with improvements are summarized by occupancy class in Table 4-8.

- The aggregate building inventory tables used in this analysis have not been updated. Default HAZUS-MH model data was used for the earthquake.
- Parcels with assessment improvements (buildings) values were used to estimate the number of buildings in the flood-prone areas and number of structures over undermined areas.

Table 4-8: Parcel with Improvements by Occupancy Class for Macoupin County

Occupancy Class	Count
Residential	17,865
Commercial	1,762
Industrial	54
Agriculture	3,845
Exempt	917
Total	**24,443**

The following assumptions were made during the analysis:

- The building exposure for flooding, tornado, and HAZMAT is determined from the HAZUS default data. It is assumed that the population and the buildings are located at the centroid of the parcel.
- The building exposure for earthquake used HAZUS-MH default data.
- Population counts are based upon 2.5 persons per household. Only residential occupancy classes are used to determine the impact on the local population. If the event were to occur at night, it would be assumed that people are at home (not school, work, or church).
- The analysis is restricted to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.

4.2.1.2 Essential Facilities List

Table 4-9 identifies the essential facilities that were added or updated for the analysis. Essential facilities are a subset of critical facilities. A map and list of all critical facilities is included as Appendix F.

Table 4-9: Essential Facilities List

Facility	Number of Facilities
Care Facilities	11
Emergency Operations Centers	4
Fire Stations	15
Police Stations	16
Schools	33

4.2.1.3 Facility Replacement Costs

Facility replacement costs and total building exposure are identified in Table 4-10. The replacement costs have not been updated by local data. Table 4-10 also includes the estimated number of buildings within each occupancy class.

Table 4-10: Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Agricultural	283	$49,770
Commercial	1,028	$438,117
Education	40	$70,885
Government	54	$27,491
Industrial	283	$90,082
Religious/Non-Profit	119	$77,055
Residential	24,309	$2,447,153
Total	**26,116**	**$3,200,553**

4.3 Future Development

As the county's population continues to grow, the residential and urban areas will extend further into the county, placing more pressure on existing transportation and utility infrastructure while increasing the rate of farmland conversion; Macoupin County will address specific mitigation strategies in Section 5 to alleviate such issues.

Because Macoupin County is vulnerable to a variety of natural and technological threats, the county government—in partnership with state government—must make a commitment to prepare for the management of these types of events. Macoupin County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition for Tornado Hazard

Tornadoes pose a great risk to Illinois and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of the state's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 miles per hour, but higher and lower values can occur. A wind velocity of 200 miles per hour will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently-rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. The tornado scale ranges from low intensity F0 with effective wind speeds of 40 to 70 miles per hour to F5 tornadoes with effective wind speeds of over 260 miles per hour. The Fujita intensity scale is described in Table 4-11.

Table 4-11: Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
0 *Gale*	40-72 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
1 *Moderate*	73-112 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
2 *Significant*	113-157 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
3 *Severe*	158-206 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
4 *Devastating*	207-260 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
5 *Incredible*	261-318 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Source: NOAA Storm Prediction Center

Previous Occurrences for Tornado Hazard

There have been several occurrences of tornadoes within Macoupin County during the past few decades. The NCDC database reported 31 tornadoes/funnel clouds in Macoupin County since December 1950. The most recent recorded event occurred on May 13, 2009 during a chain of severe thunderstorms which produced several tornadoes, large hail, and damaging winds. One of the tornadoes touched down one mile west of Gillespie, Illinois.

Macoupin County NCDC recorded tornadoes are identified in Table 4-12. Additional details for NCDC events are included in Appendix D.

Table 4-12: Macoupin County Tornadoes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macoupin County	12/2/1950	Tornado	F2	1	3	25K	0
Macoupin County	8/4/1959	Tornado	F2	0	0	25K	0
Macoupin County	3/29/1960	Tornado	F2	0	0	3K	0
Macoupin County	8/9/1966	Tornado	F0	0	0	0	0
Macoupin County	1/24/1967	Tornado	F2	0	0	250K	0
Macoupin County	5/12/1978	Tornado	F2	0	1	250K	0
Macoupin County	5/9/1990	Tornado	F2	0	0	250K	0
Macoupin County	5/16/1990	Tornado	F0	0	0	0	0
Atwater	8/19/1993	Tornado	F0	0	0	0	0
Carlinville	5/25/1996	Tornado	F1	0	0	250K	0
Palmyra	5/12/1998	Tornado	F1	0	0	50K	0
Carlinville	6/1/1999	Tornado	F1	0	0	0	0
Shipman	4/20/2000	Tornado	F1	0	0	25K	0
Medora	7/18/2000	Tornado	F0	0	0	0	0
Piasa	7/18/2000	Tornado	F0	0	0	0	0
Palmyra	5/1/2002	Tornado	F0	0	0	0	0
Staunton	5/8/2003	Tornado	F0	0	0	0	0
Palmyra	5/9/2003	Funnel Cloud	N/A	0	0	0	0
Bunker Hill	6/13/2005	Tornado	F0	0	0	0	0
Bunker Hill	6/13/2005	Tornado	F0	0	0	0	0
Bunker Hill	6/13/2005	Tornado	F1	0	0	0	0
Wilsonville	6/13/2005	Tornado	F1	0	0	0	0
Piasa	4/2/2006	Tornado	F0	0	0	0	0
Piasa	4/2/2006	Tornado	F0	0	0	0	0
Staunton	4/2/2006	Tornado	F0	0	0	0	0
Gillespie	4/2/2006	Tornado	F0	0	0	0	0
Bunker Hill	7/19/2006	Tornado	F0	0	0	0	0
Gillespie	5/4/2007	Tornado	F0	0	0	0	0
Shipman	5/4/2007	Tornado	F0	0	0	0	0
Enos	3/8/2009	Tornado	F1	0	0	0	0
Gillespie	5/13/2009	Tornado	F0	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Tornado Hazard

The entire county has the same risk for occurrence of tornadoes. They can occur at any location within the county.

Hazard Extent for Tornado Hazard

The historical tornadoes generally moved from southwest to northeast across the county. The extent of the hazard varies both in terms of the extent of the path and the wind speed.

Risk Identification for Tornado Hazard

Based on historical information, the probability of future tornadoes in Macoupin County is likely. Tornadoes with varying magnitudes are expected to happen. According to the RPI, tornadoes ranked as the number one hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	8	=	**24**

Vulnerability Analysis for Tornado Hazard

Tornadoes can occur within any area in the county; therefore, the entire county population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan will consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Macoupin County are discussed in Table 4-9.

Critical Facilities

All critical facilities are vulnerable to tornadoes. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado but can include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

The building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or

limbs), roofs blown off or windows broken by hail or high winds, and loss of building function (e.g. damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a tornado the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a tornado. The impacts to these items include broken, failed, or impassable roadways, broken or failed utility lines (e.g. loss of power or gas to community), and railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

An example scenario is described as follows to gauge the anticipated impacts of tornadoes in the county, in terms of numbers and types of buildings and infrastructure.

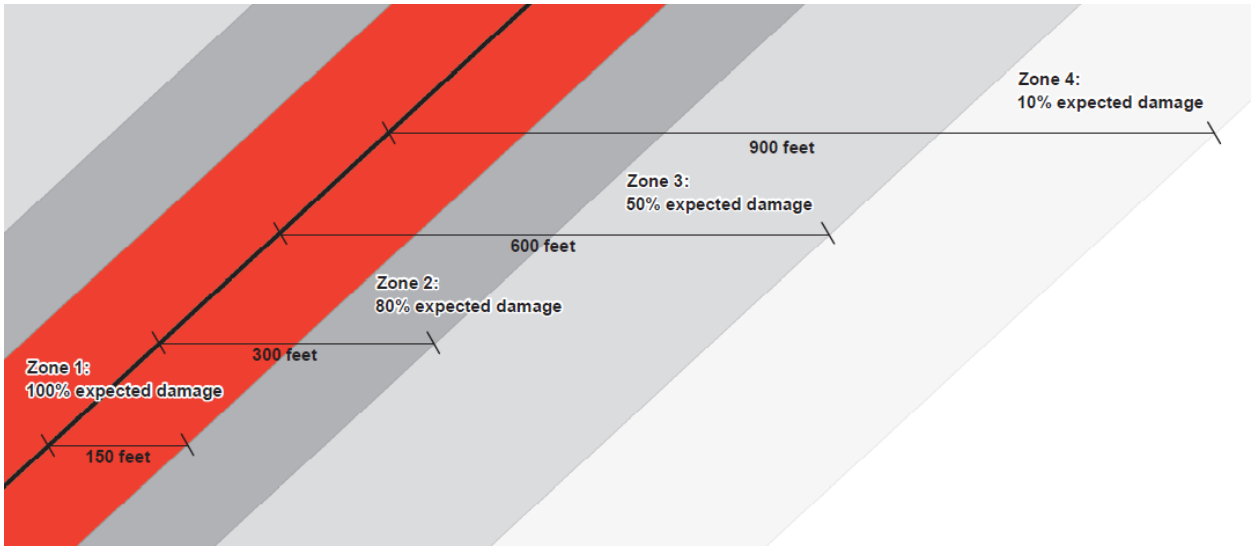
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based upon the F4 tornado event that ran for 29 miles northwest to southeast through Shipman, Dorchester, Sawyerville, White City, and Mount Olive. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 4-13 depicts tornado damage curves as well as path widths.

Table 4-13: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
5	2,400	100%
4	1,800	100%
3	1,200	80%
2	600	50%
1	300	10%
0	150	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 4-2 and Table 4-14 describe the zone analysis. The selected hypothetical tornado path is depicted in Figure 4-3, and the damage curve buffers are shown in Figure 4-4.

Figure 4-2: F4 Tornado Analysis Using GIS Buffers



An F4 tornado has four damage zones, depicted in Table 4-11. Total devastation is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will experience 10% damage.

Table 4-14: F4 Tornado Zones and Damage Curves

Zone	Buffer (feet)	Damage Curve
1	0-150	100%
2	150-300	80%
3	300-600	50%
4	600-900	10%

Figure 4-3: Hypothetical F4 Tornado Path in Macoupin County

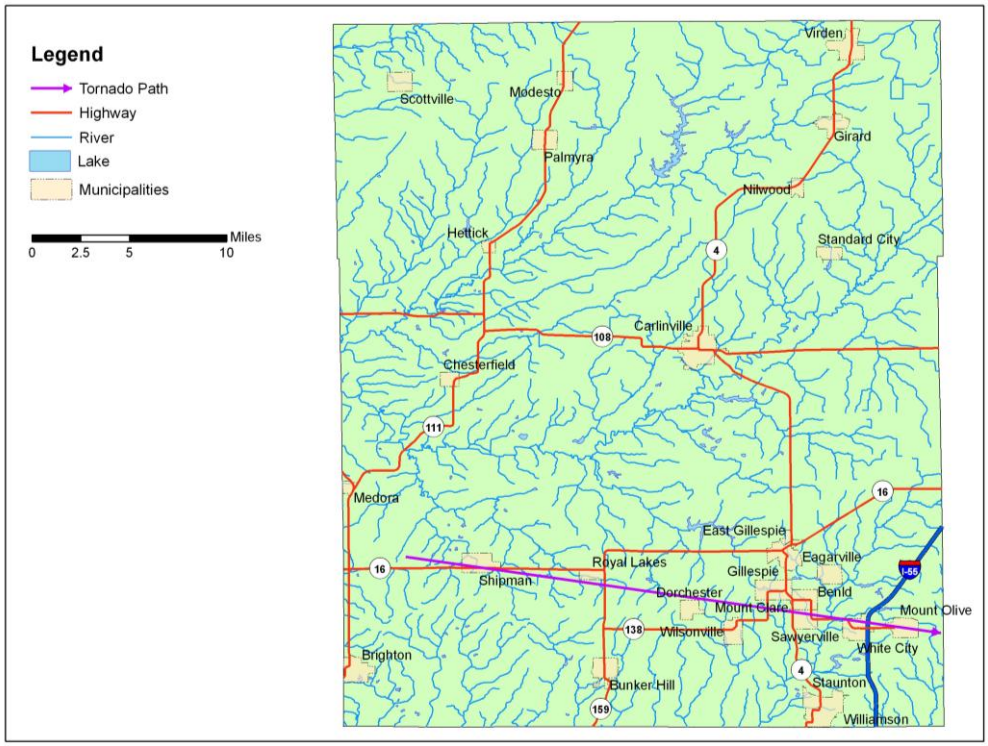
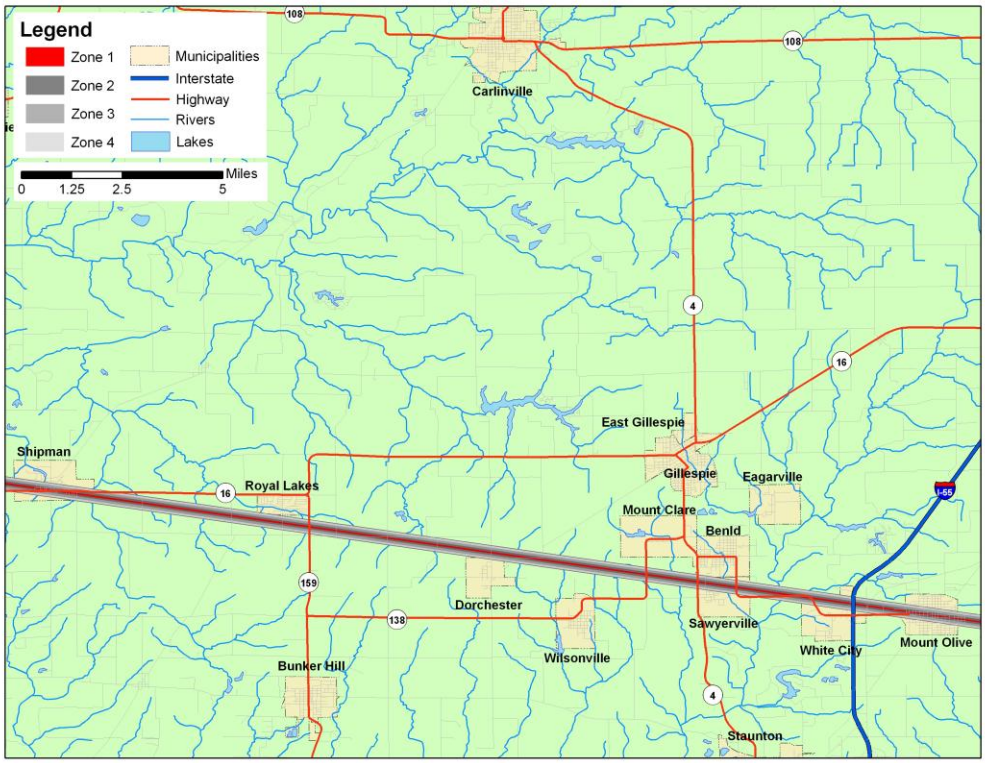


Figure 4-4: Modeled F4 Tornado Damage Buffers in Macoupin County



Analysis

The results of the analysis are depicted in Tables 4-15 and 4-16. The GIS analysis estimates that 764 buildings will be damaged. The estimated building losses were $85.8 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Macoupin County that were overlaid with HAZUS aggregated data. Figure 4-5 shows the location of damaged structures in and near Shipman, Dorchester, Sawyerville and Mt. Olive.

The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable. For purposes of analysis, the total number of buildings and the building replacement costs for government, religious/non-profit, and education should be lumped together.

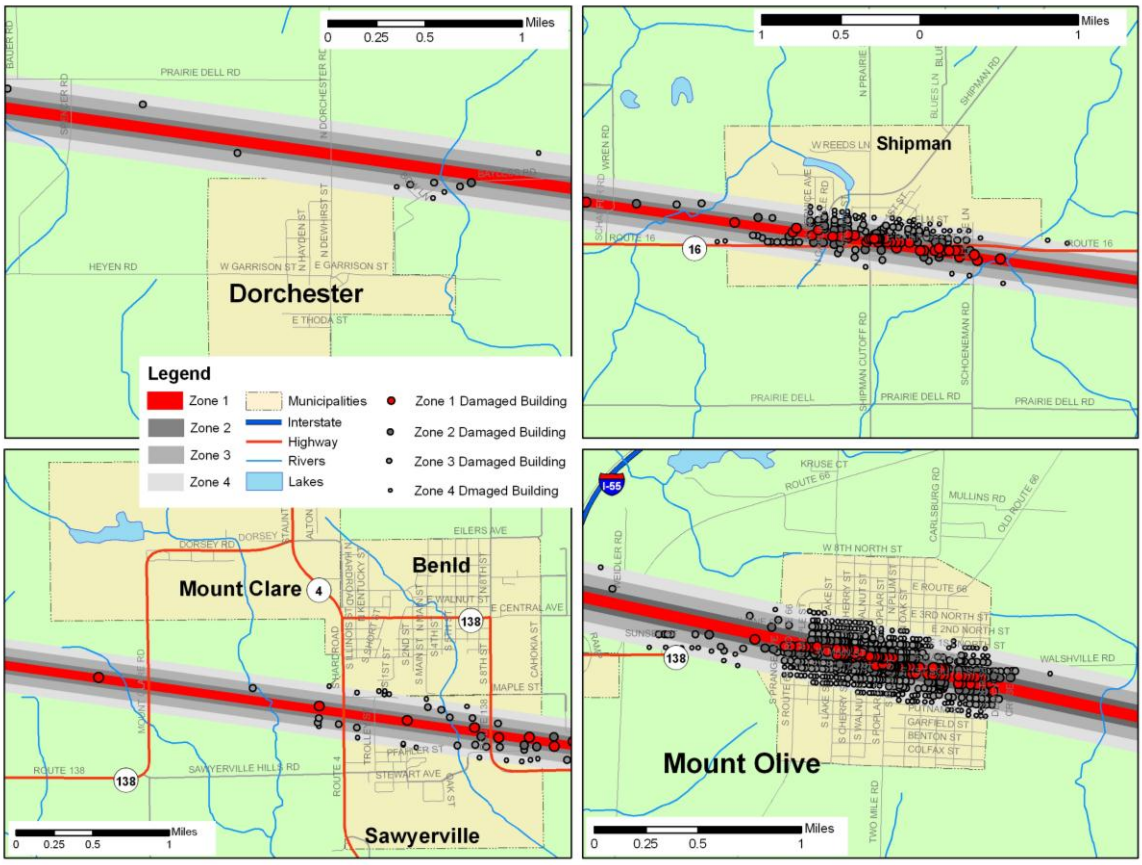
Table 4-15: Estimated Numbers of Buildings Damaged by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	79	90	207	204
Commercial	41	25	23	12
Industrial	0	0	0	1
Agriculture	8	5	13	8
Religious	1	4	6	5
Government	8	6	5	10
Education	0	0	1	2
Total	**137**	**130**	**255**	**242**

Table 4-16: Estimated Building Losses by Occupancy Type (X 1000)

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$18,922	$14,628	$17,238	$3,233
Commercial	$9,120	$5,703	$3,304	$159
Industrial	$387	$590	$949	$178
Agriculture	$106	$122	$290	$38
Religious	$1,482	$970	$1,532	$283
Government	$1,247	$539	$11	$0
Education	$0	$0	$3,799	$1,007
Total	**$31,264**	**$22,551**	**$27,122**	**$4,899**

Figure 4-5: Modeled F4 Tornado Damage Buffers and Damaged Buildings in Dorchester, Shipman, Sawyerville and Mount Olive.



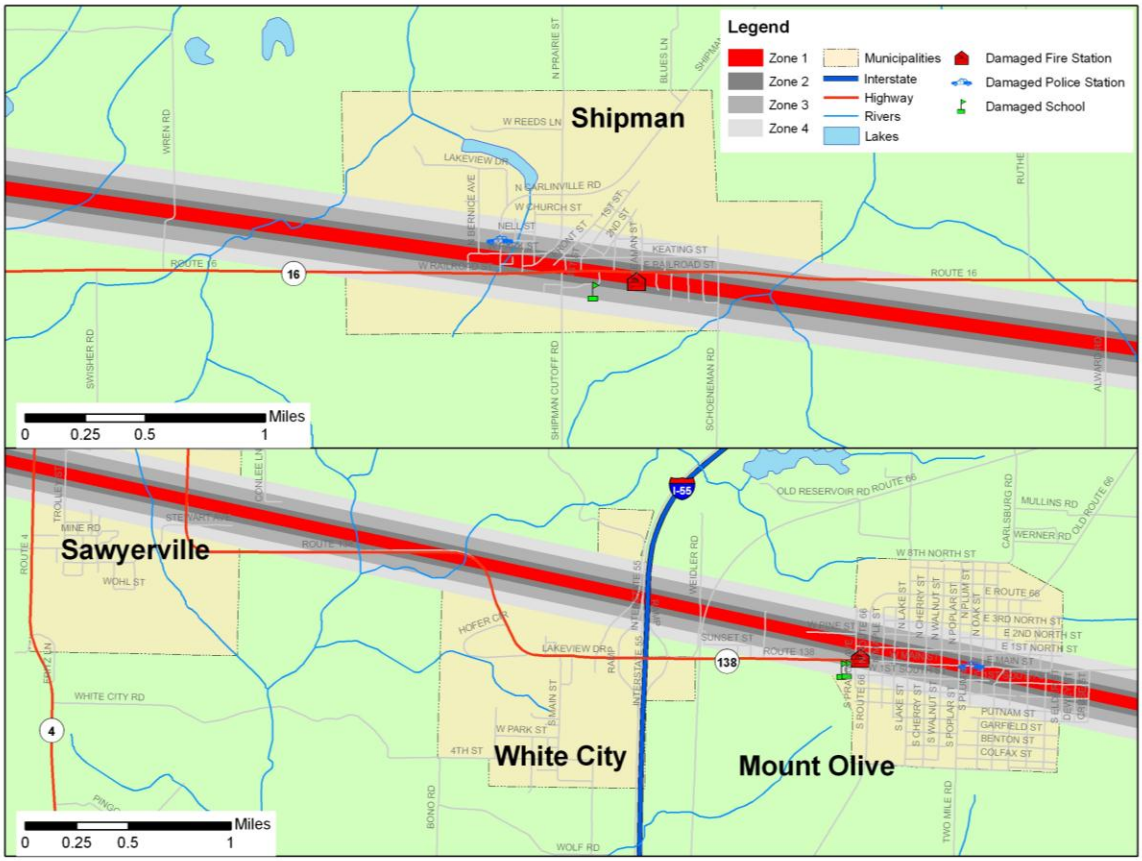
Critical Facilities Damage

There are seven critical facilities located within 900 feet of the hypothetical tornado path. The affected facilities are identified in Table 4-17, and their geographic locations are shown in Figures 4-6.

Table 4-17: Estimated Essential Facilities Affected

Name
Fire Stations
Mt. Olive Fire Protection District
Shipman Fire Department
Police Stations
Mt. Olive Police Department
Shipman Police Department
School Facilities
Mt. Olive Elementary School
Mt. Olive High School
Shipman Elementary School

Figure 4-6: Essential Facilities within Tornado Path in Shipman and Mount Olive



Vulnerability to Future Assets/Infrastructure for Tornado Hazard

The entire population and buildings have been identified as at risk because tornadoes can occur anywhere within the state, at any time of the day, and during any month of the year. Furthermore, any future development in terms of new construction within the county will be at risk. The building exposure for Macoupin County is included in Table 4-10.

All critical facilities in the county and communities within the county are at risk. A map and list of all critical facilities is included as Appendix F.

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warnings of approaching storms are also vital to preventing the loss of property and ensuring the safety of Macoupin County residents.

4.4.2 Flood Hazard

Hazard Definition for Flooding

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of two types: upstream floods or downstream floods. Both types of floods are common in Illinois.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas in which they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at anytime of the year in Illinois, but they are most common in the spring and summer months.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage. Riverine flooding on the large rivers of Illinois generally occurs during either the spring or summer.

Hazard Definition for Dam and Levee Failure

Dams are structures that retain or detain water behind a large barrier. When full or partially full, the difference in elevation between the water above the dam and below creates large amounts of potential energy, creating the potential for failure. The same potential exists for levees when they serve their purpose, which is to confine flood waters within the channel area of a river and exclude that water from land or communities land-ward of the levee. Dams and levees can fail due to either 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam or levee fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (of concern would be transportation routes and utility lines required to maintain or protect life), and environmental damage.

Many communities view both dams and levees as permanent and infinitely safe structures. This sense of security may well be false, leading to significantly increased risks. Both downstream of dams and on floodplains protected by levees, security leads to new construction, added

infrastructure, and increased population over time. Levees in particular are built to hold back flood waters only up to some maximum level, often the 100-year (1% annual probability) flood event. When that maximum is exceeded by more than the design safety margin, the levee will be overtopped or otherwise fail, inundating communities in the land previously protected by that levee. It has been suggested that climate change, land-use shifts, and some forms of river engineering may be increasing the magnitude of large floods and the frequency of levee failure situations.

In addition to failure that results from extreme floods above the design capacity, levees and dams can fail due to structural deficiencies. Both dams and levees require constant monitoring and regular maintenance to assure their integrity. Many structures across the U.S. have been under-funded or otherwise neglected, leading to an eventual day of reckoning in the form either of realization that the structure is unsafe or, sometimes, an actual failure. The threat of dam or levee failure may require substantial commitment of time, personnel, and resources. Since dams and levees deteriorate with age, minor issues become larger compounding problems, and the risk of failure increases.

Previous Occurrences for Flooding

The NCDC database reported 18 flood events in Macoupin County since 1994. The most recent event was a flash flood that occurred on July 15, 2009. A large thunderstorm complex moved through the southern half of Illinois producing heavy rainfall of up to four inches. Several roads in Staunton were flooded due to the heavy rain, and water was flowing over Illinois Route 111.

Macoupin County NCDC recorded floods are identified in Table 4-18. Additional details for NCDC events are included in Appendix D.

Table 4-18: Macoupin County Previous Occurrences of Flooding*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Central Illinois	4/11/1994	Flash Flooding	N/A	2	0	50.0M	0
Brighton	4/29/1998	Urban/Small Stream Flood	N/A	0	0	0	0
South Portion	6/13/1999	Flash Flood	N/A	0	0	0	0
South Portion	7/28/2000	Flash Flood	N/A	0	0	0	0
Countywide	6/6/2001	Flash Flood	N/A	0	0	0	0
Countywide	5/7/2002	Flash Flood	N/A	0	0	0	0
Countywide	5/12/2002	Flash Flood	N/A	0	0	0	0
Countywide	5/12/2002	Flash Flood	N/A	0	0	0	0
North Portion	5/9/2003	Flash Flood	N/A	0	0	0	0
Countywide	5/27/2004	Flash Flood	N/A	0	0	0	0
South Portion	8/27/2006	Flash Flood	N/A	0	0	0	0
Staunton	6/24/2007	Flash Flood	N/A	0	0	0	0
Nilwood	2/5/2008	Flash Flood	N/A	0	0	0	0
Piasa	5/25/2008	Flash Flood	N/A	0	0	5K	5K
Brighton	8/5/2008	Flash Flood	N/A	0	0	0	0
Shipman	12/27/2008	Flash Flood	N/A	0	0	0	0
Woodburn	5/25/2009	Flash Flood	N/A	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Medora	7/15/2009	Flash Flood	N/A	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Previous Occurrences for Dam and Levee Failure

According to the Macoupin County planning team, one dam, Virden Recreational Club Lake Dam failed on September 7, 2010. This dam was a low hazard dam and its failure caused significant damage. There are no records or local knowledge of certified levee failures in the county.

Repetitive Loss Properties

FEMA defines a repetitive loss structure as a structure covered by a contract of flood insurance issued under the NFIP, which has suffered flood loss damage on two occasions during a 10-year period that ends on the date of the second loss, in which the cost to repair the flood damage is 25% of the market value of the structure at the time of each flood loss.

The Illinois Emergency Management Agency (IEMA) was contacted to determine the location of repetitive loss structures. Table 4-19 lists 2009 data for damages to these repetitive loss structures.

Table 4-19: Macoupin County Repetitive Loss Structures

Jurisdiction	Occupancy Type	Number of Structures	Number of Losses
City of Gillespie	Single Family	1	3

Geographic Location for Flooding

Most river flooding occurs in early spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Severe thunderstorms may cause flooding during the summer or fall, but tend to be localized. The primary source of river flooding in Macoupin County is the Wabash River.

Flash floods, brief heavy flows in small streams or normally dry creek beds, also occur within the county. Flash flooding is typically characterized by high-velocity water, often carrying large amounts of debris. Urban flooding involves the overflow of storm drain systems and is typically the result of inadequate drainage following heavy rainfall or rapid snowmelt.

A digital file of the FIRM maps was used to identify specific stream reaches for analysis. The areas of riverine flooding are depicted on the map in Appendix E.

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers

across the United States. For Macoupin County, only historical data for Otter Creek where available. The peak flows for Otter Creek are presented in Appendix H.

Geographic Location for Dam and Levee Failure

HAZUS-MH identified 58 dams in Macoupin County. Of these 58 dams, one dam was ranked as a high hazard dam, 15 were ranked as a significant hazard dam, and the remaining 42 dams were ranked as low hazard dams. Six of these dams had an emergency action plan. An EAP is not required by the State of Illinois but is strongly recommended by the Illinois Department of Natural Resources. The maps in Appendix F illustrate the locations of Macoupin County dams. Table 4-20 summarizes the dam information.

Table 4-20: National Inventory of Dams

Dam Name	River	Hazard	EAP
Otter Lake Dam	West Fork Otter Creek	S	Y
Bunker Hill Old Lake Dam	East Fork Wood River	L	N
Staunton County Club Lake Dam	Tributary Big Branch	L	N
Lake KA-HO 2 Dam	Tributary Panther Creek	S	N
Macoupin Lake Dam	Tributary Hurricane Creek	L	N
Gillespie Lake Dam	Tributary Honey Creek	L	N
New Gillespie Lake Dam	Dry Fork Macoupin Creek	S	Y
Smith Reservoir Dam	Tributary Spanish Needle Creek	L	N
Beaver Lake Dam	Tributary Macoupin Creek	L	N
Old Gillespie Lake Dam	Dry Fork	L	N
Lake Williamson Dam	Tributary Honey Creek	L	N
Evergreen Lake Dam	Tributary West Fork Wood River	L	N
Palmyra-modesto City Lake Dam	Tributary Nassa Creek	S	Y
Girard Sunset Lake Dam	Tributary East Fork Otter Creek	S	N
Standard City Lake Dam	Tributary Macoupin Creek	L	N
Virden Recreation Club Lake Dam**	Sugar Creek-Offstream	L	N
Tall Timbers Lake East Dam	Tributary East Creek	L	N
Staunton Reservoir Dam	East Creek	L	Y
Lake Carlinville Dam	Honey Creek	L	N
Old Mt. Olive City Lake Dam	Sugar Creek	S	N
Forest Lake Club Lake Dam	Tributary Cahokia Creek	L	N
Lake Catatoga Dam	Tributary Dry Fork Macoupin Creek	L	N
Monterey/Mine 1/Pond 5 Dam	Spanish Needle Creek	L	N
Freeman United/Crown 2/Coarse Refuse Dam	Tributary Brush Creek	L	N
Superior 4 Dam	West Fork Cahokia Creek	L	N
Carlinville Lake II Dam	Tributary Honey Creek	S	Y
City of Staunton/Old Mine Refuse Dam	Tributary Sugar Creek	L	N
Tall Timbers Lake West Dam	Tributary East Creek	L	N
Madison Coal Recirculation Pond Dam	Tributary Spanish Needle Creek	L	N
Barths Lake Dam	Tributary Paddock Creek	L	N
Columbia Quarry Lake Dam	Tributary Bear Creek	L	N
Ilnoname 2042	Honey Cut Branch	S	N

Dam Name	River	Hazard	EAP
Shad Lake Dam	Coop Branch	L	N
Royal Lake 1 Dam	Tributary Coop Branch	L	N
Mt. Olive City Lake Dam	Panther Creek	L	N
Bunker Hill Reservoir 2 Dam	Tributary East Fork Wood River	L	N
Lake Ka-Ho 1 Dam	Tributary Panther Creek	L	N
Lake Edward Dam	Tributary Spring Creek	L	N
Shipman Reservoir Dam	Tributary Coop Branch	S	Y
Sunset Lake Dredge Disposal Pond Dam	Tributary Sunset Lake	L	N
Freeman United/Crown 3/Fine Refuse Pond	Tributary Horse Creek	L	N
Freeman United/Crown 2/Coarse Refuse ext.	Tributary Brush Creek	L	N
Monterey/Mine 1/Refuse Area 6	Perched	H	N
Crown ii Mine		L	N
Crown ii Mine		L	N
Crown iii Mine		S	N
Crown iii Mine		S	N
Crown ii Mine		L	N
Crown iii Mine		L	N
Crown iii Mine		S	N
No.1 Mine		S	N
No.1 Mine		S	N
No.1 Mine		L	N
No.1 Mine		S	N
Hamman Pond Dam #1	South Tributary Honey Creek	B	N
Gillham Pond Dam #1	South Tributary Otter Creek	B	N
Denby Pond Dam #1	South Tributary Macoupin Creek	B	N
French Lake Dam	South Tributary Honey Creek	L	NR
Austiff Pond Dam #1	North. Tributary North Stream Otter Creek	B	N

* The dams listed in this multi-hazard mitigation plan are recorded from default HAZUS-MH data. Their physical presences were not confirmed; therefore, new or unrecorded structures may exist. A more complete list of locations and attributes is included in Appendix F. L= Low Hazard Dam, S = Significant Hazard Dam, Y = Yes, N = No, NR = not required.
**The Virden Recreation Club Lake blew-out on September 7, 2010. Information from EMA Coordinator, Jim Pitchford.

A review of the United States Army Corps of Engineers and local records revealed no certified levees within Macoupin County.

Hazard Extent for Flooding

The HAZUS-MH flood model is designed to generate a flood depth grid and flood boundary polygon by deriving hydrologic and hydraulic information based on user-provided elevation data or by incorporating selected output from other flood models. HAZUS-MH also has the ability to clip a Digital Elevation Model (DEM) with a user-provided flood boundary, thus creating a flood depth grid. For Macoupin County, HAZUS-MH was used to extract flood depth by clipping the DEM with the FEMA FIRMs Base Flood Elevation (BFE) boundary. The BFE is defined as the area that has a 1% chance of flooding in any given year.

Flood hazard scenarios were modeled using GIS analysis and HAZUS-MH. The flood hazard modeling was based on historical occurrences and current threats. Existing flood maps were used

to identify the areas of study. These digital files, although not official FIRMs, provided the boundary which was the basis for this analysis. Planning team input and a review of historical information provided additional information on specific flood events.

Hazard Extent for Dam and Levee Failure

When dams are assigned the low (L) hazard potential classification, it means that failure or incorrect operation of the dam will result in no human life losses and no economic or environmental losses. Losses are principally limited to the owner's property. Dams assigned the significant (S) hazard classification are those dams in which failure or incorrect operation results in no probable loss of human life; however it can cause economic loss, environment damage, and disruption of lifeline facilities. Dams classified as significant hazard potential dams are often located in predominantly rural or agricultural areas, but could be located in populated areas with a significant amount of infrastructure. Dams assigned the high (H) hazard potential classification are those dams in which failure or incorrect operation has the highest risk to cause loss of human life and significant damage to buildings and infrastructure.

Accurate mapping of the risks of flooding behind levees depends on knowing the condition and level of protection the levees actually provide. FEMA and the U.S. Army Corps of Engineers are working together to make sure that flood hazard maps clearly reflect the flood protection capabilities of levees, and that the maps accurately represent the flood risks posed to areas situated behind them. Levee owners—usually states, communities, or in some cases private individuals or organizations—are responsible for ensuring that the levees they own are maintained according to their design. In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove the levee meets design, operation, and maintenance standards for protection against the one-percent-annual chance flood.

Risk Identification for Flood Hazard

Based on historical information and the HAZUS-MH flooding analysis results, future occurrence of flooding in Macoupin County is highly likely. According to the Risk Priority Index (RPI), flooding is ranked as the number six hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	2	=	8

Risk Identification for Dam/Levee Failure

Based on operation and maintenance requirements and local knowledge of the dams in Macoupin County, the occurrence of a dam or levee failure is possible. However, if a high hazard dam were to fail, the magnitude and severity of the damage could be significant. The warning time and duration of the dam failure event would be very short. According to the RPI, dam and levee failure ranked as the number nine hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	1	=	2

HAZUS-MH Analysis Using 100-Year Flood Boundary and County Parcels

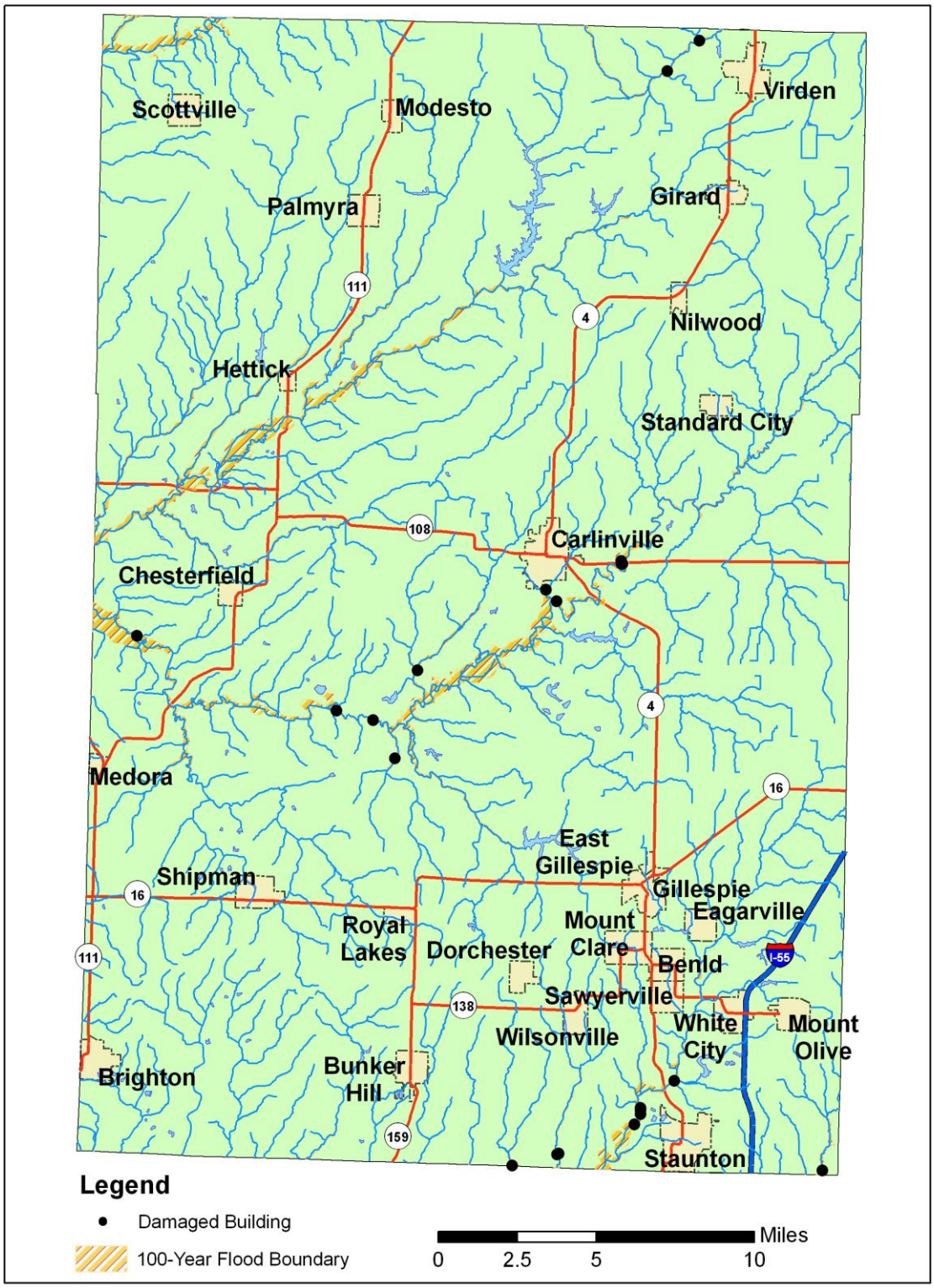
HAZUS-MH generated the flood depth grid for a 100-year return period by clipping the USGS 1/3 ArcSecond (approximately 10 meters) Digital Elevation Model (DEM) to the Macoupin County flood boundary. Next, HAZUS-MH utilized a user-defined analysis of Macoupin County with site-specific parcel data provided by the county.

Table 4-21 and Figure 4-7 depicts the HAZUS-MH analysis. HAZUS-MH estimates the 100-year flood would damage 24 buildings, totaling $14.38 million in building losses and $14.4 million in economic losses. The reported building counts were determined from assessor records. However, the building and economic losses are aggregated to the census block and should be interpreted as degrees of loss rather than exact flood related losses. The flood loss estimates were derived from aggregate building inventories, which were assumed to be dispersed evenly across census blocks. HAZUS-MH requires that a predetermined amount of square footage of a typical building sustains damage in order to produce a damaged building count. If only a minimal amount of building damage is predicted, it is possible to see zero damaged building counts while also seeing economic losses.

Table 4-21: Macoupin County HAZUS-MH Analysis Total Economic Loss (100-Year Flood)

General Occupancy	Total Damaged Buildings	Building Loss (X 1000)	Total Economic Loss (X 1000)
Agricultural	0	$0	$0
Commercial	0	$0	$0
Education	0	$0	$0
Government	4	$1,650	$1,670
Industrial	0	$0	$0
Religious/Non-Profit	0	$0	$0
Residential	20	$12,730	$12,730
Total	**24**	**$14,380**	**$14,400**

Figure 4-7: Macoupin County Buildings in Floodplain (100-Year Flood)



Critical Facilities

A critical facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). A map and list of all critical facilities is included as Appendix F.

The analysis identified no essential facilities subject to flooding.

Infrastructure

The types of infrastructure that could be impacted by a flood include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of a flood. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could also fail or become impassable, causing traffic risks.

Vulnerability Analysis for Flash Flooding

Flash flooding could affect any low lying location within this jurisdiction; therefore, the a significant portion of the county's population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

A map and list of all critical facilities is included as Appendix F.

Vulnerability Analysis for Dam and Levee Failure

An EAP is required to assess the effect of dam failure on these communities. In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove the levee meets design, operation, and maintenance standards for protection against the "one-percent-annual chance" flood.

Vulnerability to Future Assets/Infrastructure for Flooding

Flash flooding can affect any low lying location within the county; therefore many buildings and infrastructure are vulnerable to flash flooding. Currently, the Macoupin County planning commission reviews new development for compliance with the local zoning ordinance. At this time no construction is planned within the area of the 100-year floodplain. Therefore, there is no new construction which will be vulnerable to a 100-year flood.

Vulnerability to Future Assets/Infrastructure for Dam and Levee Failure

The Macoupin County planning commission reviews new development for compliance with the local zoning ordinance.

Analysis of Community Development Trends

Controlling floodplain development is the key to reducing flood-related damages. Areas with recent development within the county may be more vulnerable to drainage issues. Storm drains and sewer systems are usually most susceptible. Damage to these can cause the back up of water, sewage, and debris into homes and basements, causing structural and mechanical damage as well as creating public health hazards and unsanitary conditions.

4.4.3 Earthquake Hazard

Hazard Definition for Earthquake Hazard

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped Earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake.

Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area in the Midwest is the New Madrid Seismic Zone. Scientists have learned that the New Madrid fault system may not be the only fault system in the Central U.S. capable of producing damaging earthquakes. The Wabash Valley fault system in Illinois and Indiana shows evidence of large earthquakes in its geologic history, and there may be other, as yet unidentified, faults that could produce strong earthquakes.

Ground shaking from strong earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area it may cause deaths, injuries, and extensive property damage.

The possibility of the occurrence of a catastrophic earthquake in the central and eastern United States is real as evidenced by history and described throughout this section. The impacts of significant earthquakes affect large areas, terminating public services and systems needed to aid the suffering and displaced. These impaired systems are interrelated in the hardest struck zones. Power lines, water and sanitary lines, and public communication may be lost; and highways, railways, rivers, and ports may not allow transportation to the affected region. Furthermore, essential facilities, such as fire and police departments and hospitals, may be disrupted if not previously improved to resist earthquakes.

As with hurricanes, mass relocation may be necessary, but the residents who are suffering from the earthquake can neither leave the heavily impacted areas nor receive aid or even communication in the aftermath of a significant event.

Magnitude, which is determined from measurements on seismographs, measures the energy released at the source of the earthquake. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. Earthquake magnitudes and their corresponding intensities are listed in Tables 4-22 and 4-23.

Source: http://earthquake.usgs.gov/learning/topics/mag_vs_int.php

Table 4-22: Abbreviated Modified Mercalli Intensity Scale

Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Table 4-23: Earthquake Magnitude vs. Modified Mercalli Intensity Scale

Earthquake Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	I
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - IX
7.0 and higher	VIII or higher

Previous Occurrences for Earthquake Hazard

Numerous instrumentally measured earthquakes have occurred in Illinois. In the past few decades, with many precise seismographs positioned across Illinois, measured earthquakes have varied in magnitude from very low microseismic events of M=1−3 to larger events up to M=5.4. Microseismic events are usually only detectable by seismographs and rarely felt by anyone. The most recent earthquake in central Illinois—as of the date of this report—occurred on February 10, 2010 at 3:59:35 local time about 3.0 km (2 miles) east-northeast of Virgil, IL and measured 3.8 in magnitude.

The consensus of opinion among seismologists working in the Midwest is that a magnitude 5.0 to 5.5 event could occur virtually anywhere at any time throughout the region. Earthquakes occur in Illinois all the time, although damaging quakes are very infrequent. Illinois earthquakes causing minor damage occur on average every 20 years, although the actual timing is extremely variable. Most recently, a magnitude 5.2 earthquake shook southeastern Illinois on April 18,

2008, causing minor damage in the Mt Carmel, IL area. Earthquakes resulting in more serious damage have occurred about every 70 to 90 years mainly in southern Illinois.

Seismic activity on the New Madrid Seismic Zone of southeastern Missouri is very significant both historically and at present. On December 16, 1811 and January 23 and February 7 of 1812, three earthquakes struck the central U.S. with magnitudes estimated to be 7.5-8.0. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment *(sand blows)* over an area of >10,500 km^2, and uplift of a 50 km by 23 km zone (the Lake County uplift). The shaking collapsed scaffolding on the Capitol in Washington, D.C., and was felt over a total area of over 10 million km^2 (the largest felt area of any historical earthquake). Of all the historical earthquakes that have struck the U.S., an 1811-style event would do the most damage if it recurred today.

The New Madrid earthquakes are especially noteworthy because the seismic zone is in the center of the North American Plate. Such intraplate earthquakes are felt, and do damage, over much broader areas than comparable earthquakes at plate boundaries. The precise driving force responsible for activity on the New Madrid seismic zone is not known, but most scientists infer that it is compression transmitted across the North American Plate. That compression is focused on New Madrid because it is the site of a Paleozoic structure—the Reelfoot Rift—which is a zone of weakness in the crust.

The United States Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimate the probability of a repeat of the 1811–1812 type earthquakes (magnitude 7.5–8.0) is 7%–10% over the next 50 years (*USGS Fact Sheet 2006-3125*.) Frequent large earthquakes on the New Madrid seismic zone are geologically puzzling because the region shows relatively little deformation. Three explanations have been proposed: 1) recent seismological and geodetic activity is still a short-term response to the 1811–12 earthquakes; 2) activity is irregular or cyclic; or 3) activity began only in the recent geologic past. There is some dispute over how often earthquakes like the 1811–12 sequence occur. Many researchers estimate a recurrence interval of between 550 and 1100 years; other researchers suggest that either the magnitude of the 1811–12 earthquakes have been over-stated, or else the actual frequency of these events is less. It is fair to say, however, that even if the 1811–12 shocks were just magnitude ~7 events, they nonetheless caused widespread damage and would do the same if another such earthquake or earthquake sequence were to strike today.

[Above: New Madrid earthquakes and seismic zone modified from N. Pinter, 1993, Exercises in Active Tectonic history adapted from *Earthquake Information Bulletin*, 4(3), May-June 1972. *http://earthquake.usgs.gov/regional/states/illinois/history.php*]

The earliest reported earthquake in Illinois was in **1795**. This event was felt at Kaskaskia, IL for a minute and a half and was also felt in Kentucky. At Kaskaskia, subterranean noises were heard. Due to the sparse frontier population, an accurate location is not possible, and the shock may have actually originated outside the state.

An intensity VI-VII earthquake occurred on **April 12, 1883**, awakening several people in Cairo, IL. One old frame house was significantly damaged, resulting in minor injuries to the inhabitants. This is the only record of injury in the state due to earthquakes.

On **October 31, 1895** a large M6.8 occurred at Charleston, Missouri, just south of Cairo. Strong shaking caused eruptions of sand and water at many places along a line roughly 30 km (20 mi) long. Damage occurred in six states, but most severely at Charleston, with cracked walls, windows shattered, broken plaster, and chimneys fallen. Shaking was felt in 23 states from Washington, D.C. to Kansas and from southernmost Canada to New Orleans, LA.

A Missouri earthquake on **November 4, 1905**, cracked walls in Cairo. Aftershocks were felt over an area of 100,000 square miles in nine states. In Illinois, it cracked the wall of the new education building in Cairo and a wall at Carbondale, IL.

Among the largest earthquakes occurring in Illinois was the **May 26, 1909** shock, which knocked over many chimneys at Aurora. It was felt over 500,000 square miles and strongly felt in Iowa and Wisconsin. Buildings swayed in Chicago where there was fear that the walls would collapse. Just under two months later, a second Intensity VII earthquake occurred on **July 18, 1909**, damaged chimneys in Petersburg, IL, Hannibal, MO, and Davenport, IA. Over twenty windows were broken, bricks loosened and plaster cracked in the Petersburg area. This event was felt over 40,000 square miles.

On **November 7, 1958**, a shock along the Indiana border resulted in damage at Bartelso, Dale and Maunie, IL. Plaster cracked and fell, and a basement wall and floor were cracked.

On **August 14, 1965**, a sharp but local shock occurred at Tamms, IL, a town of about 600 people. The magnitude 5 quake damaged chimneys, cracked walls, knocked groceries from the shelves, and muddied the water supply. Thunderous earth noises were heard. This earthquake was only felt within a 10 mile radius of Tamms, in communities such as Elco, Unity, Olive Branch, and Olmsted, IL. Six aftershocks were felt.

An earthquake of Intensity VII occurred on **November 9, 1968**. This magnitude 5.3 shock was felt over an area of 580,000 square miles in 23 states. There were reports of people in tall buildings in Ontario and Boston feeling the shock. Damage consisted of bricks being knocked from chimneys, broken windows, toppled television antenna, and cracked plaster. There were scattered reports of cracked foundations, fallen parapets, and overturned tombstones. Chimney damage was limited to buildings 30 to 50 years old. Many people were frightened. Church bells rang at Broughton and several other towns. Loud rumbling earthquake noise was reported in many communities.

Dozens of other shocks originating in Missouri, Arkansas, Kansas, Nebraska, Tennessee, Indiana, Ohio, Michigan, Kentucky, and Canada have been felt in Illinois without causing damage. There have been three earthquakes slightly greater than magnitude 5.0 and Intensity level VII which occurred in 1968, 1987 and 2008 and that were widely felt throughout southern Illinois and the midcontinent.

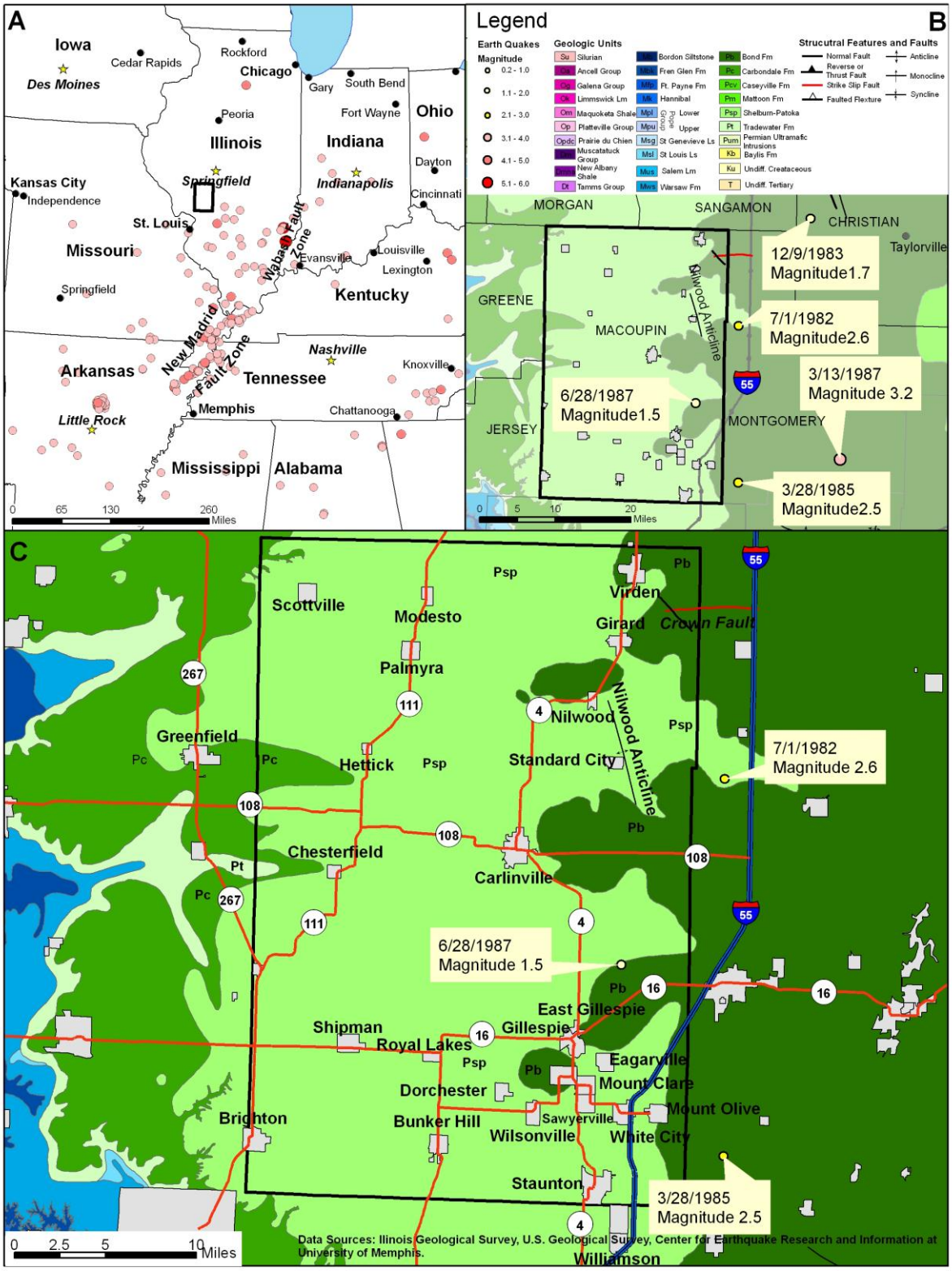
Above text adapted from *http://earthquake.usgs.gov/regional/states/illinois/history.php* and from *Seismicity of the United States, 1568-1989 (Revised), C.W. Stover and J.L. Coffman, U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington: 1993.*

Geographic Location for Earthquake Hazard

Macoupin County occupies a region susceptible to earthquakes. Regionally, the two most significant zones of seismic activity are the New Madrid Seismic Zone and the Wabash Valley Fault System. The epicenters of one small earthquakes (M1.5) was recorded in Macoupin County on June, 26 1987 (Figure 4-8). In addition, there have been numerous small earthquakes (micro-seismic events) ranging in size from (1.7M to 3.2M) just east of Macoupin County in Montgomery County. The geologic mechanism related to the minor earthquakes is poorly understood. Return periods for large earthquakes within the New Madrid System are estimated to be ~500–1000 years; moderate quakes between magnitude 5.5 and 6.0 can recur within approximately 150 years or less. The Wabash Valley Fault System extends nearly the entire length of southern Illinois and has the potential to generate an earthquake of sufficient strength to cause damage between St. Louis, MO and Indianapolis, IN.

Figure 4-8 depicts the following: a) Location of notable earthquakes in the Illinois region with inset of Macoupin County; b) Generalized geologic bedrock map with earthquake epicenters, geologic structures, and inset of Macoupin County; c) Geologic and earthquake epicenter map of Macoupin County.

Figure 4-8 a, b, c: Macoupin County Earthquakes



Hazard Extent for Earthquake Hazard

The extent of the earthquake is countywide. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. A National Earthquake Hazards Reduction Program (NEHRP) compliant soils map was used for the analysis which was provided by ISGS. The map identifies the soils most susceptible to failure.

Risk Identification for Earthquake Hazard

Based on historical information as well as current USGS and SIU research and studies, future earthquakes in Macoupin County are possible. According to the RPI, earthquake is ranked as the number seven hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	4	=	8

Vulnerability Analysis for Earthquake Hazard

This hazard could impact the entire jurisdiction equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake and can expect the same impacts within the affected area. To accommodate this risk, this plan will consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities are vulnerable to earthquakes. A critical facility would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure and loss of building function which could result in indirect impacts (e.g. damaged homes will no longer be habitable causing residents to seek shelter).

Infrastructure

During an earthquake, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to this plan, it is important to emphasize that any number of these items could become damaged in the event of an earthquake. The impacts to these items include broken, failed, or impassable roadways, broken or failed utility lines (e.g. loss of power or gas to community), and

railway failure from broken or impassable railways. Bridges could also fail or become impassable causing traffic risks. Typical scenarios are described to gauge the anticipated impacts of earthquakes in the county in terms of numbers and types of buildings and infrastructure.

The SIU-Polis team reviewed existing geological information and recommendations for earthquake scenarios. A deterministic and a probabilistic earthquake scenario were developed to provide a reasonable basis for earthquake planning in Macoupin County. The deterministic scenario was a moment magnitude of 5.5 with the just southwest of Carlinville. This represents a realistic scenario for planning purposes.

Additionally, the earthquake loss analysis included a probabilistic scenario based on ground shaking parameters derived from U.S. Geological Survey probabilistic seismic hazard curves for the earthquake with the 500-year return period. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500-year return period.

The following earthquake hazard modeling scenarios were performed:

- 5.5 magnitude earthquake local epicenter
- 500-year return period event

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. Fortunately, a National Earthquake Hazards Reduction Program (NEHRP) soil classification map exists for Illinois. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking. FEMA provided a soils map and liquefaction potential map that was used by HAZUS-MH.

Earthquake hypocenter depths in Illinois range from less than 1.0 to ~25.0 km. The average hypocenter depth, ~10.0 km, was used for the deterministic earthquake scenario. For this scenario type HAZUS-MH also requires the user to define an attenuation function. To maintain consistency with the USGS's (2006) modeling of strong ground motion in the central United States, the Toro et al. (1997) attenuation function was used for the deterministic earthquake scenario.

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

Results for 5.5 Magnitude Earthquake in Macoupin County

The results of the initial analysis, the 5.5 magnitude earthquake with an epicenter just southwest of the City of Carlinville, are depicted in Tables 4-24 and 4-25 and Figure 4-9. HAZUS estimates that approximately 1,450 buildings will be at least moderately damaged. This is more than 6% of

the total number of buildings in the region. It is estimated that 39 buildings will be damaged beyond repair.

The total building related losses totaled $94.0 million; 18% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which comprised more than 57% of the total loss.

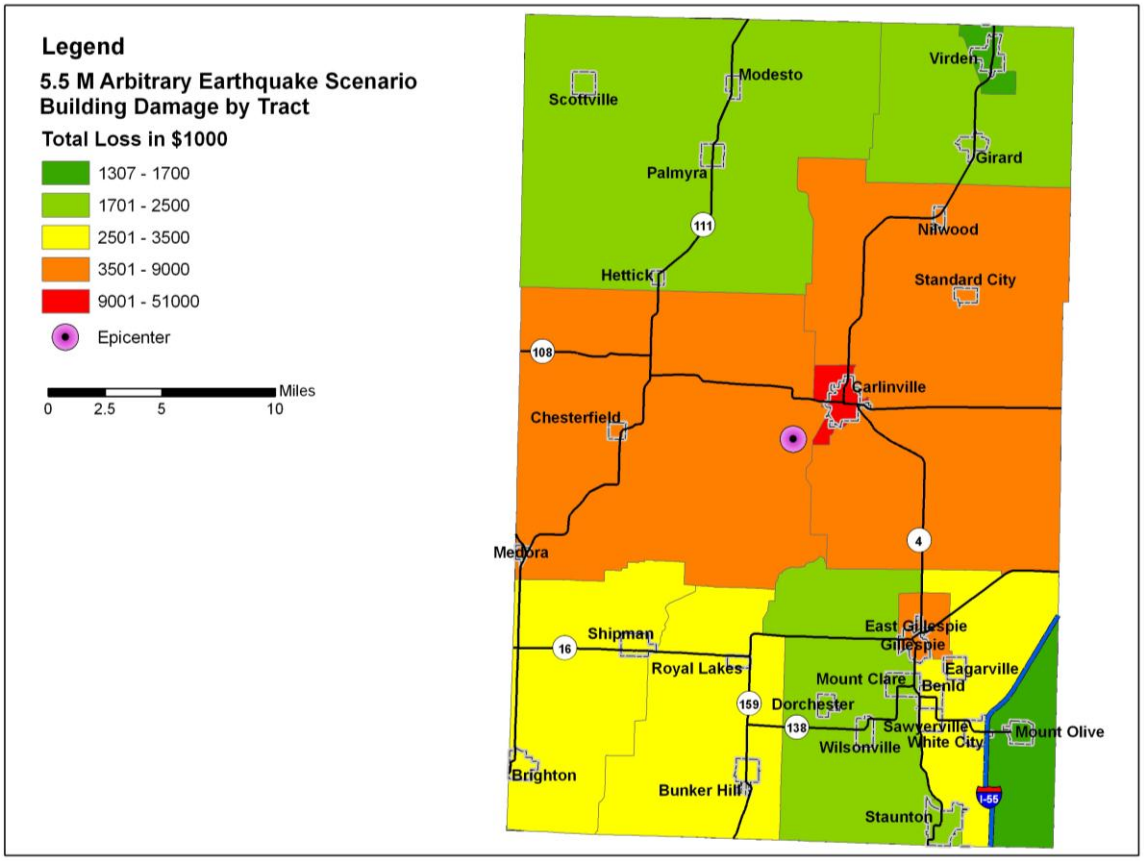
Table 4-24: Macoupin County 5.5M Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	213	0.97	37	1.31	25	2.14	7	3.01	1	2.03
Commercial	782	3.58	134	4.80	84	7.15	24	10.24	4	9.11
Education	30	0.14	5	0.19	4	0.30	1	0.42	0	0.54
Government	42	0.19	7	0.23	4	0.35	1	0.42	0	0.50
Industrial	223	1.02	33	1.20	20	1.73	5	2.32	1	1.69
Other Residential	5,690	26.02	805	28.84	405	34.36	64	27.28	9	22.97
Religion	93	0.43	14	0.51	9	0.73	2	1.06	0	1.13
Single Family	14,799	67.66	1,757	62.92	627	53.22	129	55.25	24	62.02
Total	**21,873**		**2,793**		**1,178**		**234**		**39**	

Table 4-25: Macoupin County 5.5M Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.34	2.72	0.06	0.28	3.41
	Capital-Related	0.00	0.15	2.20	0.04	0.08	2.46
	Rental	0.98	0.66	1.36	0.02	0.11	3.14
	Relocation	3.61	0.62	2.24	0.12	1.05	7.63
	Subtotal	**4.59**	**1.77**	**8.52**	**0.24**	**1.52**	**16.63**
Capital Stock Loses							
	Structural	5.19	1.36	2.95	0.29	1.39	11.18
	Non_Structural	21.84	6.60	9.33	1.38	3.68	42.84
	Content	9.96	2.27	6.78	1.00	2.78	22.78
	Inventory	0.00	0.00	0.27	0.22	0.10	0.59
	Subtotal	**36.99**	**10.24**	**19.33**	**2.89**	**7.95**	**77.39**
	Total	**41.57**	**12.00**	**27.85**	**3.13**	**9.47**	**94.03**

Figure 4-9: Macoupin County 5.5M Scenario-Building Economic Losses in Thousands of Dollars



Macoupin County 5.5M Scenario—Essential Facility Losses

Before the earthquake, the region had 447 care beds available for use. On the day of the earthquake, the model estimates that only 93 care beds (21%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 77% of the beds will be back in service. By day 30, 93% will be operational.

Results 500-Year Probabilistic Scenario

The results of the 500-year probabilistic analysis are depicted in Tables 4-26 and 4-27. HAZUS-MH estimates that approximately 744 buildings will be at least moderately damaged. This is more than 3% of the total number of buildings in the region. It is estimated that nine buildings will be damaged beyond repair. The total building-related losses totaled $24.7 million; 27% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up more than 59% of the total loss.

Table 4-26: 500-Year Probabilistic Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	242	1.03	25	1.40	13	2.06	3	2.74	0	1.66
Commercial	882	3.74	94	5.20	43	6.69	8	8.77	1	6.26
Education	34	0.15	4	0.20	2	0.28	0	0.34	0	0.39
Government	47	0.20	5	0.25	2	0.32	0	0.34	0	0.39
Industrial	243	1.03	26	1.42	12	1.90	2	2.48	0	1.53
Other Residential	6,100	25.89	593	32.72	254	39.61	25	26.74	2	22.60
Religion	103	0.44	10	0.56	5	0.76	1	1.03	0	0.97
Single Family	15,912	67.53	1,055	58.25	310	48.38	53	57.56	6	66.21
Total	**23,562**		**1,811**		**641**		**92**		**10**	

Table 4-27: 500-Year Probabilistic Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.06	0.94	0.03	0.15	1.18
	Capital-Related	0.00	0.03	0.79	0.02	0.03	0.87
	Rental	0.44	0.22	0.53	0.01	0.04	1.25
	Relocation	1.62	0.32	0.81	0.06	0.44	3.26
	Subtotal	**2.06**	**0.63**	**3.07**	**0.13**	**0.67**	**6.56**
Capital Stock Loses							
	Structural	2.40	0.56	1.01	0.15	0.59	4.71
	Non_Structural	5.94	1.37	1.70	0.31	0.87	10.19
	Content	1.45	0.25	0.80	0.19	0.41	3.10
	Inventory	0.00	0.00	0.03	0.04	0.01	0.09
	Subtotal	**9.79**	**2.18**	**3.54**	**0.69**	**1.89**	**18.10**
	Total	**11.85**	**2.82**	**6.61**	**0.82**	**2.57**	**24.66**

500-Year Probabilistic Scenario—Essential Facility Losses

Before the earthquake, the region had 447 care beds available for use. On the day of the earthquake, the model estimates that only 134 care beds (30%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 91% of the beds will be back in service. By day 30, 99% will be operational.

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

New construction, especially critical facilities, will accommodate earthquake mitigation design standards.

Analysis of Community Development Trends

Community development will occur outside of the low-lying areas in floodplains with a water table within five feet of grade that is susceptible to liquefaction.

In Meeting #4, the MHMP team discussed specific mitigation strategies for potential earthquake hazards. The discussion included strategies to harden and protect future, as well as existing, structures against the possible termination of public services and systems including power lines, water and sanitary lines, and public communication.

4.4.4 Thunderstorm Hazard

Hazard Definition for Thunderstorm Hazard

Severe thunderstorms are defined as thunderstorms with one or more of the following characteristics: strong winds, large damaging hail, or frequent lightning. Severe thunderstorms most frequently occur in Illinois during the spring and summer months, but can occur any month of the year at any time of day. A severe thunderstorm's impacts can be localized or can be widespread in nature. A thunderstorm is classified as severe when it meets one or more of the following criteria.

- Hail of diameter 0.75 inches or higher
- Frequent and dangerous lightning
- Wind speeds equal to or greater than 58 miles per hour

Hail

Hail is a product of a strong thunderstorm. Hail usually falls near the center of a storm, however strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, resulting in damage in other areas near the storm. Hailstones range from pea-sized to baseball-sized, but hailstones larger than softballs have been reported on rare occasions.

Lightning

Lightning is a discharge of electricity from a thunderstorm. Lightning is often perceived as a minor hazard, but in reality lightning causes damage to many structures and kills or severely injures numerous people in the United States each year.

Severe Winds (Straight-Line Winds)

Straight-line winds from thunderstorms are a fairly common occurrence across Illinois. Straight-line winds can cause damage to homes, businesses, power lines, and agricultural areas, and may require temporary sheltering of individuals who are without power for extended periods of time.

Previous Occurrences for Thunderstorm Hazard

The NCDC database reported 156 hail storms in Macoupin County since 1955. Hail storms occur nearly every year in the late spring and early summer months. The most recent reported occurrence was in June 2009 when a strong front triggered showers and thunderstorms producing damaging winds and hail.

Macoupin County hail storms are identified in Table 4-28. Additional details for NCDC events are included in Appendix D.

Table 4-28: Macoupin County Hail Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macoupin County	3/3/1955	Hail	2.50 in.	0	0	0	0
Macoupin County	6/10/1963	Hail	1.00 in.	0	0	0	0
Macoupin County	6/10/1963	Hail	1.00 in.	0	0	0	0
Macoupin County	3/29/1968	Hail	1.00 in.	0	0	0	0
Macoupin County	5/28/1977	Hail	1.75 in.	0	0	0	0
Macoupin County	6/28/1980	Hail	1.75 in.	0	0	0	0
Macoupin County	4/13/1983	Hail	0.75 in.	0	0	0	0
Macoupin County	4/13/1983	Hail	0.75 in.	0	0	0	0
Macoupin County	4/27/1984	Hail	1.00 in.	0	0	0	0
Macoupin County	4/27/1984	Hail	1.75 in.	0	0	0	0
Macoupin County	7/10/1986	Hail	1.25 in.	0	0	0	0
Macoupin County	7/6/1987	Hail	1.50 in.	0	0	0	0
Macoupin County	4/22/1988	Hail	0.75 in.	0	0	0	0
Macoupin County	5/25/1989	Hail	1.75 in.	0	6	0	0
Macoupin County	5/25/1989	Hail	2.50 in.	0	0	0	0
Macoupin County	6/5/1990	Hail	0.75 in.	0	0	0	0
Macoupin County	3/6/1992	Hail	0.75 in.	0	0	0	0
Macoupin County	4/15/1992	Hail	0.75 in.	0	0	0	0
Brighton	4/14/1993	Hail	0.75 in.	0	0	0	0
Womac	6/16/1994	Hail	1.75 in.	0	0	0	0
Brighton	5/9/1995	Hail	0.75 in.	0	0	0	0
Carlinville	5/9/1995	Hail	1.75 in.	0	0	0	0
Virden	7/19/1996	Hail	2.75 in.	0	0	0	0
Staunton	3/28/1997	Hail	0.75 in.	0	0	0	0
Girard	4/18/1997	Hail	0.75 in.	0	0	0	0
Medora	4/30/1997	Hail	0.75 in.	0	0	0	0
Girard	4/7/1998	Hail	0.75 in.	0	0	0	0
Brighton	4/29/1998	Hail	0.75 in.	0	0	0	0
Brighton	4/29/1998	Hail	0.75 in.	0	0	0	0
Carlinville	5/1/1998	Hail	0.75 in.	0	0	0	0
Carlinville	5/1/1998	Hail	1.00 in.	0	0	0	0
Modesto	5/12/1998	Hail	1.75 in.	0	0	0	0
Palmyra	5/12/1998	Hail	1.25 in.	0	0	0	0
Palmyra	5/12/1998	Hail	1.75 in.	0	0	0	0
Girard	5/12/1998	Hail	0.75 in.	0	0	0	0
Standard City	5/12/1998	Hail	0.75 in.	0	0	0	0
Bunker Hill	5/12/1998	Hail	0.75 in.	0	0	0	0
Hornsby	5/12/1998	Hail	1.75 in.	0	0	0	0
Bunker Hill	5/12/1998	Hail	1.75 in.	0	0	0	0
Bunker Hill	5/12/1998	Hail	1.75 in.	0	0	0	0
Mt Olive	5/22/1998	Hail	1.50 in.	0	0	0	0
Bunker Hill	6/12/1998	Hail	1.00 in.	0	0	0	0
Bunker Hill	6/12/1998	Hail	1.75 in.	0	0	0	0
Brighton	6/12/1998	Hail	1.00 in.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Bunker Hill	6/12/1998	Hail	2.00 in.	0	0	0	0
Dorchester	6/12/1998	Hail	1.75 in.	0	0	0	0
Gillespie	6/12/1998	Hail	1.75 in.	0	0	0	0
Bunker Hill	6/14/1998	Hail	0.75 in.	0	0	0	0
Bunker Hill	6/14/1998	Hail	0.75 in.	0	0	0	0
Mt Clare	6/14/1998	Hail	1.00 in.	0	0	0	0
Staunton	6/14/1998	Hail	1.75 in.	0	0	0	0
Scottville	6/18/1998	Hail	0.75 in.	0	0	0	0
Bunker Hill	6/4/1999	Hail	1.00 in.	0	0	0	0
Bunker Hill	6/4/1999	Hail	1.75 in.	0	0	0	0
Palmyra	8/19/1999	Hail	0.75 in.	0	0	0	0
Medora	5/12/2000	Hail	1.00 in.	0	0	160K	0
Brighton	5/12/2000	Hail	1.00 in.	0	0	160K	0
Shipman	5/12/2000	Hail	1.00 in.	0	0	160K	0
Woodburn	5/12/2000	Hail	2.00 in.	0	0	160K	0
Bunker Hill	5/12/2000	Hail	2.00 in.	0	0	160K	0
Brighton	5/18/2000	Hail	1.00 in.	0	0	0	0
Carlinville	5/22/2000	Hail	0.75 in.	0	0	0	0
Brighton	6/23/2000	Hail	0.88 in.	0	0	0	0
Bunker Hill	6/23/2000	Hail	0.75 in.	0	0	0	0
Carlinville	7/5/2000	Hail	1.00 in.	0	0	0	0
Gillespie	7/5/2000	Hail	1.75 in.	0	0	0	0
Gillespie	8/22/2000	Hail	0.75 in.	0	0	0	0
Carlinville	4/10/2001	Hail	0.75 in.	0	0	0	0
Atwater	7/17/2001	Hail	1.25 in.	0	0	0	0
Brighton	7/17/2001	Hail	0.75 in.	0	0	0	0
Hettick	10/24/2001	Hail	0.75 in.	0	0	0	0
Shipman	10/24/2001	Hail	0.75 in.	0	0	0	0
Palmyra	4/19/2002	Hail	1.00 in.	0	0	0	0
Carlinville	4/19/2002	Hail	0.88 in.	0	0	0	0
Carlinville	4/19/2002	Hail	0.88 in.	0	0	0	0
Carlinville	4/19/2002	Hail	0.88 in.	0	0	0	0
Hettick	4/24/2002	Hail	0.75 in.	0	0	0	0
Palmyra	4/24/2002	Hail	0.75 in.	0	0	0	0
Carlinville	4/24/2002	Hail	1.75 in.	0	0	0	0
Carlinville	4/24/2002	Hail	1.75 in.	0	0	1.0M	0
Medora	4/24/2002	Hail	1.75 in.	0	0	0	0
Shipman	4/24/2002	Hail	1.75 in.	0	0	0	0
Gillespie	4/24/2002	Hail	2.00 in.	0	0	2.0M	0
Bunker Hill	4/24/2002	Hail	1.75 in.	0	0	0	0
Gillespie	4/24/2002	Hail	0.75 in.	0	0	0	0
Gillespie	4/24/2002	Hail	1.25 in.	0	0	0	0
Gillespie	4/24/2002	Hail	1.75 in.	0	0	0	0
Scottville	4/24/2002	Hail	1.75 in.	0	0	0	0
Benld	5/1/2002	Hail	1.75 in.	0	0	0	0
Bunker Hill	5/1/2002	Hail	1.75 in.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Mt Olive	5/1/2002	Hail	1.75 in.	0	0	2.0M	0
Bunker Hill	5/7/2002	Hail	0.88 in.	0	0	0	0
Bunker Hill	3/13/2003	Hail	1.75 in.	0	0	0	0
Bunker Hill	3/13/2003	Hail	0.75 in.	0	0	0	0
Brighton	4/4/2003	Hail	1.25 in.	0	0	0	0
Bunker Hill	4/4/2003	Hail	1.75 in.	0	0	0	0
Shipman	4/4/2003	Hail	0.75 in.	0	0	0	0
Bunker Hill	4/4/2003	Hail	1.75 in.	0	0	0	0
Modesto	4/4/2003	Hail	0.75 in.	0	0	0	0
Brighton	4/4/2003	Hail	0.88 in.	0	0	0	0
Palmyra	4/24/2003	Hail	1.75 in.	0	0	0	0
Bunker Hill	5/1/2003	Hail	0.75 in.	0	0	0	0
Brighton	5/8/2003	Hail	0.88 in.	0	0	0	0
Scottville	5/9/2003	Hail	2.00 in.	0	0	0	0
Modesto	5/9/2003	Hail	2.00 in.	0	0	0	0
Virden	5/9/2003	Hail	0.88 in.	0	0	0	0
Girard	5/9/2003	Hail	1.75 in.	0	0	0	0
Palmyra	5/9/2003	Hail	1.75 in.	0	0	0	0
Virden	5/9/2003	Hail	1.75 in.	0	0	0	0
Virden	5/9/2003	Hail	1.25 in.	0	0	0	0
Woodburn	8/2/2003	Hail	1.75 in.	0	0	0	0
Brighton	5/18/2004	Hail	1.00 in.	0	0	0	0
Brighton	5/26/2004	Hail	0.75 in.	0	0	0	0
Bunker Hill	7/5/2004	Hail	1.00 in.	0	0	0	0
Bunker Hill	7/5/2004	Hail	0.88 in.	0	0	0	0
Benld	10/18/2004	Hail	0.88 in.	0	0	0	0
Bunker Hill	10/18/2004	Hail	0.75 in.	0	0	0	0
Girard	4/12/2005	Hail	0.88 in.	0	0	0	0
Carlinville	4/21/2005	Hail	1.00 in.	0	0	0	0
Carlinville	4/21/2005	Hail	1.75 in.	0	0	0	0
Carlinville	4/21/2005	Hail	0.88 in.	0	0	0	0
Palmyra	5/11/2005	Hail	0.88 in.	0	0	0	0
Bunker Hill	5/11/2005	Hail	0.88 in.	0	0	0	0
Carlinville	5/19/2005	Hail	0.88 in.	0	0	0	0
Wilsonville	5/19/2005	Hail	1.00 in.	0	0	0	0
Benld	5/19/2005	Hail	0.75 in.	0	0	0	0
Staunton	5/19/2005	Hail	0.75 in.	0	0	0	0
Medora	6/13/2005	Hail	1.00 in.	0	0	0	0
Carlinville	6/13/2005	Hail	0.75 in.	0	0	0	0
Girard	6/13/2005	Hail	0.75 in.	0	0	0	0
Girard	6/13/2005	Hail	0.88 in.	0	0	0	0
Brighton	11/5/2005	Hail	0.75 in.	0	0	0	0
Chesterfield	4/6/2006	Hail	0.75 in.	0	0	0	0
Chesterfield	5/24/2006	Hail	1.00 in.	0	0	0	0
Girard	5/24/2006	Hail	0.75 in.	0	0	0	0
Mt Olive	5/24/2006	Hail	0.88 in.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Shipman	5/24/2006	Hail	1.00 in.	0	0	0	0
Carlinville	6/6/2006	Hail	0.75 in.	0	0	0	0
Virden	7/19/2006	Hail	0.88 in.	0	0	0	0
Palmyra	7/19/2006	Hail	0.88 in.	0	0	0	0
Gillespie	7/19/2006	Hail	0.88 in.	0	0	0	0
Bunker Hill	7/19/2006	Hail	1.00 in.	0	0	0	0
Carlinville	3/1/2007	Hail	0.75 in.	0	0	0	0
Carlinville	8/16/2007	Hail	0.88 in.	0	0	0	0
Palmyra	2/3/2008	Hail	0.75 in.	0	0	0	0
Staunton	4/25/2008	Hail	0.75 in.	0	0	0	0
Gillespie	5/2/2008	Hail	0.75 in.	0	0	0	0
Brighton	5/30/2008	Hail	0.75 in.	0	0	0	0
Shipman	5/30/2008	Hail	1.00 in.	0	0	0	0
Brighton	5/31/2008	Hail	1.75 in.	0	0	0	0
Gillespie	6/27/2008	Hail	0.75 in.	0	0	0	0
Carlinville	7/12/2008	Hail	0.88 in.	0	0	0	0
Brighton	5/13/2009	Hail	0.75 in.	0	0	0	0
Carlinville	6/2/2009	Hail	0.75 in.	0	0	0	0
Staunton	6/8/2009	Hail	0.75 in.	0	0	0	0
Bunker Hill	6/19/2009	Hail	1.00 in.	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

The NCDC database reported six lightning strikes in Macoupin County since 1958, the most recent of which occurred on September 19, 2005. Lightning strikes have been responsible for two deaths and $100,000 worth of property damage in Macoupin County since 1958.

The NCDC database identified 142 wind storms reported since 1958, the most recent of which was reported in August 2009 when storms produced wind gusts between 60 and 70 miles per hour.

As shown in Table 4-29, wind storms have historically occurred year-round with the greatest frequency and damage between May and July. The following table includes available top wind speeds for Macoupin County.

Table 4-29: Macoupin County Wind Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macoupin County	6/10/1958	Tstm Wind	70 kts.	0	0	0	0
Macoupin County	6/10/1958	Tstm Wind	70 kts.	0	0	0	0
Macoupin County	6/20/1970	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	3/14/1971	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	11/15/1973	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	4/18/1975	Tstm Wind	56 kts.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Macoupin County	3/26/1976	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	3/28/1977	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	4/7/1980	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/5/1980	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	8/20/1980	Tstm Wind	52 kts.	0	0	0	0
Macoupin County	9/16/1980	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	6/7/1982	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	8/5/1983	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	4/29/1984	Tstm Wind	50 kts.	0	0	0	0
Macoupin County	4/29/1984	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	4/23/1985	Tstm Wind	52 kts.	0	0	0	0
Macoupin County	7/28/1986	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/6/1987	Tstm Wind	56 kts.	0	0	0	0
Macoupin County	7/6/1987	Tstm Wind	70 kts.	0	0	0	0
Macoupin County	5/8/1988	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	10/17/1988	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	5/25/1989	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	5/25/1990	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	12/14/1990	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	10/4/1991	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	52 kts.	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/2/1992	Tstm Wind	Not Measured	0	0	0	0
Macoupin County	7/11/1992	Tstm Wind	Not Measured	0	0	0	0
Mt Olive	6/16/1994	Tstm Wind	Not Measured	0	0	0	0
Staunton	6/23/1994	Tstm Wind	Not Measured	0	0	0	0
Beaver Dam St.park	11/20/1994	Tstm Wind	Not Measured	0	0	1K	0
Central Illinois	4/18/1995	High Winds	Not Measured	0	0	400K	0
Brighton	6/8/1995	Tstm Wind	52 kts.	0	0	0	0
Brighton	6/8/1995	Tstm Wind	Not Measured	0	0	4K	0
Girard	6/8/1995	Tstm Wind	65 kts.	0	0	0	0
Mount Olive	6/8/1995	Tstm Wind	Not Measured	0	0	3K	0
Girard	6/20/1995	Tstm Wind	Not Measured	0	0	125K	0
Palmyra	7/25/1995	Tstm Wind	Not Measured	0	0	0	0
Womac	7/25/1995	Tstm Wind	Not Measured	0	0	0	0
Virden	5/8/1996	Tstm Wind	45 kts.	0	0	15K	0
Central Illinois	4/30/1997	High Wind	45 kts.	0	0	0	0
Medora	4/30/1997	Tstm Wind	52 kts.	0	0	0	0
Carlinville	3/27/1998	Tstm Wind	55 kts.	0	0	0	0
Girard	4/13/1998	Tstm Wind	68 kts.	0	0	20K	0
Carlinville	5/22/1998	Tstm Wind	55 kts.	0	0	0	0
Gillespie	5/22/1998	Tstm Wind	56 kts.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Staunton	5/22/1998	Tstm Wind	56 kts.	0	0	0	0
Carlinville	5/22/1998	Tstm Wind	55 kts.	0	0	0	0
Palmyra	5/22/1998	Tstm Wind	55 kts.	0	0	0	0
Brighton	6/12/1998	Tstm Wind	52 kts.	0	0	0	0
Bunker Hill	6/12/1998	Tstm Wind	52 kts.	0	0	0	0
Girard	6/18/1998	Tstm Wind	51 kts.	0	0	0	0
Girard	6/18/1998	Tstm Wind	53 kts.	0	0	0	0
Atwater	7/22/1998	Tstm Wind	56 kts.	0	0	0	0
Carlinville	11/10/1998	Tstm Wind	56 kts.	0	0	0	0
Nilwood	11/10/1998	Tstm Wind	58 kts.	0	0	50K	0
Bunker Hill	6/1/1999	Tstm Wind	60 kts.	0	0	0	0
Palmyra	8/23/1999	Tstm Wind	55 kts.	0	0	0	0
Modesto	4/20/2000	Tstm Wind	60 kts.	0	0	0	0
Staunton	6/20/2000	Tstm Wind	52 kts.	0	0	0	0
Virden	6/23/2000	Tstm Wind	56 kts.	0	0	0	0
Carlinville	6/24/2000	Tstm Wind	56 kts.	0	0	0	0
Carlinville	7/5/2000	Tstm Wind	52 kts.	0	0	0	0
Bunker Hill	7/18/2000	Tstm Wind	51 kts.	0	0	0	0
Brighton	8/7/2000	Tstm Wind	51 kts.	0	0	0	0
Modesto	8/22/2000	Tstm Wind	55 kts.	0	0	0	0
Virden	8/22/2000	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	8/23/2000	Tstm Wind	55 kts.	0	0	0	0
Central Illinois	2/25/2001	High Wind	40 kts.	0	0	0	0
Central Illinois	3/13/2001	High Wind	45 kts.	0	0	0	0
Shipman	9/6/2001	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	9/6/2001	Tstm Wind	55 kts.	0	0	0	0
Carlinville	9/6/2001	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	10/24/2001	Tstm Wind	51 kts.	0	0	0	0
Benld	10/24/2001	Tstm Wind	55 kts.	0	0	0	0
Mt Olive	10/24/2001	Tstm Wind	55 kts.	0	0	0	0
Central Illinois	3/9/2002	High Wind	43 kts.	0	0	0	0
Carlinville	4/19/2002	Tstm Wind	52 kts.	0	0	0	0
Carlinville	4/19/2002	Tstm Wind	52 kts.	0	0	0	0
Gillespie	4/19/2002	Tstm Wind	52 kts.	0	0	0	0
Carlinville	6/11/2002	Tstm Wind	60 kts.	0	0	0	0
Brighton	6/11/2002	Tstm Wind	55 kts.	0	0	0	0
Carlinville	6/11/2002	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	5/18/2004	Tstm Wind	55 kts.	0	0	0	0
Scottville	5/24/2004	Tstm Wind	60 kts.	0	0	0	0
Modesto	5/24/2004	Tstm Wind	60 kts.	0	0	0	0
Modesto	5/24/2004	Tstm Wind	60 kts.	0	0	0	0
Staunton	5/24/2004	Tstm Wind	55 kts.	0	0	0	0
Virden	5/24/2004	Tstm Wind	55 kts.	0	0	0	0
Shipman	5/27/2004	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	5/30/2004	Tstm Wind	55 kts.	0	0	0	0
Modesto	5/31/2004	Tstm Wind	55 kts.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Modesto	5/31/2004	Tstm Wind	55 kts.	0	0	0	0
Palmyra	5/31/2004	Tstm Wind	55 kts.	0	0	0	0
Virden	5/31/2004	Tstm Wind	55 kts.	0	0	0	0
Gillespie	5/31/2004	Tstm Wind	55 kts.	0	0	0	0
Brighton	7/5/2004	Tstm Wind	52 kts.	0	0	0	0
Carlinville	8/25/2004	Tstm Wind	55 kts.	0	0	0	0
Carlinville	8/25/2004	Tstm Wind	55 kts.	0	0	0	0
Medora	6/8/2005	Tstm Wind	54 kts.	0	0	0	0
Sawyerville	6/8/2005	Tstm Wind	54 kts.	0	0	0	0
Gillespie	6/10/2005	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	6/13/2005	Tstm Wind	60 kts.	0	0	0	0
Wilsonville	6/13/2005	Tstm Wind	60 kts.	0	0	0	0
Benld	6/13/2005	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	8/13/2005	Tstm Wind	55 kts.	0	0	0	0
Benld	8/13/2005	Tstm Wind	55 kts.	0	0	0	0
Nilwood	9/19/2005	Tstm Wind	57 kts.	0	0	0	0
Medora	4/2/2006	Tstm Wind	55 kts.	0	0	0	0
Brighton	4/2/2006	Tstm Wind	55 kts.	0	0	0	0
Virden	5/24/2006	Tstm Wind	61 kts.	0	0	0	0
Shipman	5/24/2006	Tstm Wind	52 kts.	0	0	0	0
Staunton	6/22/2006	Tstm Wind	55 kts.	0	0	0	0
Medora	7/19/2006	Tstm Wind	55 kts.	0	0	0	0
Carlinville	7/19/2006	Tstm Wind	55 kts.	0	0	0	0
Bunker Hill	7/19/2006	Tstm Wind	80 kts.	0	0	0	0
Brighton	7/19/2006	Tstm Wind	52 kts.	0	0	0	0
Bunker Hill	7/19/2006	Tstm Wind	77 kts.	0	0	0	0
Wilsonville	6/1/2007	Tstm Wind	56 kts.	0	0	0	0
Carlinville	8/16/2007	Tstm Wind	52 kts.	0	0	0	0
Staunton	5/2/2008	Tstm Wind	56 kts.	0	0	50K	0
Central Illinois	5/11/2008	Strong Wind	43 kts.	0	0	0	2K
Wilsonville	5/31/2008	Tstm Wind	52 kts.	0	0	10K	0
Mt Clare	6/27/2008	Tstm Wind	56 kts.	0	0	0	0
Carlinville	6/27/2008	Tstm Wind	56 kts.	0	0	0	0
Carlinville	7/12/2008	Tstm Wind	52 kts.	0	0	0	0
Piasa	8/5/2008	Tstm Wind	65 kts.	0	0	0	0
Woodburn	8/5/2008	Tstm Wind	65 kts.	0	0	0	0
Gillespie	8/5/2008	Tstm Wind	61 kts.	0	0	0	0
Girard	12/27/2008	Tstm Wind	61 kts.	0	0	0	0
Enos	3/8/2009	Tstm Wind	52 kts.	0	0	0	0
Standard City	3/8/2009	Tstm Wind	56 kts.	0	0	0	0
Gillespie	5/13/2009	Tstm Wind	70 kts.	0	0	0	0
Carlinville	6/2/2009	Tstm Wind	52 kts.	0	0	0	0
Brighton	6/19/2009	Tstm Wind	52 kts.	0	0	0	0
Girard	8/19/2009	Tstm Wind	52 kts.	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Thunderstorm Hazard

The entire county has the same risk for occurrence of thunderstorms. They can occur at any location within the county.

Hazard Extent for Thunderstorm Hazard

The extent of the historical thunderstorms varies in terms of the extent of the storm, the wind speed, and the size of hail stones. Thunderstorms can occur at any location within the county.

Risk Identification for Thunderstorm Hazard

Based on historical information, the occurrence of future high winds, hail, and lightning is highly likely. High winds with widely varying magnitudes are expected to happen. According to the RPI, thunderstorms and high wind damage ranked as the number three hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	2	=	8

Vulnerability Analysis for Thunderstorm Hazard

Severe thunderstorms are an equally distributed threat across the entire jurisdiction; therefore, the entire county's population and all buildings are vulnerable to a severe thunderstorm and can expect the same impacts within the affected area. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Macoupin County are discussed in Table 4-10.

Critical Facilities

All critical facilities are vulnerable to severe thunderstorms. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g. a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-10. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g. a damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a severe thunderstorm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable it is important to emphasize that any number of these items could become damaged during a severe thunderstorm. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

Potential Dollar Losses for Thunderstorm Hazard

A HAZUS-MH analysis was not completed for thunderstorms because the widespread extent of such a hazard makes it difficult to accurately model outcomes.

To determine dollar losses for a thunderstorm hazard, the available NCDC hazard information was condensed to include only thunderstorm hazards that occurred within the past ten years. Macoupin County's MHMP team then reviewed the property damages reported to NCDC and made any applicable updates.

It was determined that since 1999, Macoupin County has incurred $5,960,000 in damages relating to thunderstorms, including hail, lightning, and high winds. The resulting information is listed in Table 4-30.

Table 4-30: Macoupin County Property Damage (1999–Present)

Location or County	Date	Type	Property Damage
		1999 Subtotal	$ -
Medora	5/12/2000	Hail	$ 160,000
Brighton	5/12/2000	Hail	$ 160,000
Shipman	5/12/2000	Hail	$ 160,000
Woodburn	5/12/2000	Hail	$ 160,000
Bunker Hill	5/12/2000	Hail	$ 160,000
		2000 Subtotal	$ 800,000
Chesterfield	7/23/2001	Lightning	$ 100,000
		2001 Subtotal	$ -
Carlinville	4/24/2002	Hail	$ 1,000,000
Gillespie	4/24/2002	Hail	$ 2,000,000
Mt Olive	5/1/2002	Hail	$ 2,000,000
		2002 Subtotal	$ 5,000,000
		2003-2007 Subtotal	$ -
Staunton	5/2/2008	Tstm Wind	$ 50,000
Wilsonville	5/31/2008	Tstm Wind	$ 10,000
		2008 Subtotal	$ 60,000
		2009 Subtotal	$ -
		Total Property Damage	**$ 5,960,000**

The historical data is erratic and not wholly documented or confirmed. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based on averages in the last decade, it can be determined that Macoupin County incurs an annual risk of approximately $596,000 per year.

Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

All future development within the county and all communities will remain vulnerable to these events.

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warning of approaching storms are also vital to preventing the loss of property and ensuring the safety of Macoupin County residents.

4.4.5 Drought and Extreme Heat Hazard

Hazard Definition for Drought Hazard

Drought is a climatic phenomenon that occurs in Macoupin County. The meteorological condition that creates a drought is below normal rainfall. However, excessive heat can lead to increased evaporation, which will enhance drought conditions. Droughts can occur in any month. Drought differs from normal arid conditions found in low rainfall areas. Drought is the consequence of a reduction in the amount of precipitation over an undetermined length of time (usually a growing season or more).

The severity of a drought depends on location, duration, and geographical extent. Additionally, drought severity depends on the water supply, usage demands made by human activities, vegetation, and agricultural operations. Drought brings several different problems that must be addressed. The quality and quantity of crops, livestock, and other agricultural assets will be affected during a drought. Drought can adversely impact forested areas leading to an increased potential for extremely destructive forest and woodland fires that could threaten residential, commercial, and recreational structures.

Hazard Definition for Extreme Heat Hazard

Drought conditions are often accompanied by extreme heat, which is defined as temperatures that hover 10°F or more above the average high for the area and last for several weeks. Extreme heat can occur in humid conditions when high atmospheric pressure traps the damp air near the ground or in dry conditions, which often provoke dust storms.

Common Terms Associated with Extreme Heat

Heat Wave: Prolonged period of excessive heat, often combined with excessive humidity

Heat Index: A number in degrees Fahrenheit that tells how hot it feels when relative humidity is added to air temperature. Exposure to full sunshine can increase the heat index by 15°F.

Heat Cramps: Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are often the first signal that the body is having trouble with heat.

Heat Exhaustion: Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs, resulting in a form of mild shock. If left untreated, the victim's condition will worsen. Body temperature will continue to rise and the victim may suffer heat stroke.

Heat and Sun Stroke: A life-threatening condition. The victim's temperature control system, which produces sweat to cool the body, stops working. The body's temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

Source: FEMA

Previous Occurrences for Drought and Extreme Heat Hazard

The NCDC database reported 26 drought/heat wave events in Macoupin County since 1995. The most recent reported event occurred in June 2009. High temperatures in the middle to upper 90s lasted from June 21 through June 27. Average heat index values during the seven day period reached 105 degrees.

NCDC records of droughts/heat waves are identified in Table 4-31. Additional details for NCDC events are included in Appendix D.

Table 4-31: Macoupin County Drought/Heat Wave Events*

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
West and Central IL	7/11/1995	Heat	2	95	50K	200K
West and Central IL	7/28/1995	Heat	0	30	5K	10K
Southwest IL	8/9/1995	Heat	2	97	0	200K
Statewide	7/18/1999	Excessive Heat	8	119	0	0
Statewide	7/7/2001	Excessive Heat	0	0	0	0
Statewide	7/17/2001	Excessive Heat	0	0	0	0
Statewide	7/29/2001	Excessive Heat	0	0	0	0
Statewide	8/1/2001	Excessive Heat	0	0	0	0
Statewide	8/7/2001	Excessive Heat	0	0	0	0
Statewide	8/21/2001	Excessive Heat	0	0	0	0
Statewide	7/8/2002	Excessive Heat	0	0	0	0
Statewide	7/20/2002	Excessive Heat	0	0	0	0
Statewide	7/26/2002	Excessive Heat	0	0	0	0
Statewide	8/1/2002	Excessive Heat	0	0	0	0
Statewide	8/15/2003	Excessive Heat	0	0	0	0
Statewide	8/24/2003	Excessive Heat	1	0	0	0
Statewide	7/20/2004	Excessive Heat	0	0	0	0
Statewide	7/20/2005	Excessive Heat	1	0	0	0
Statewide	8/1/2005	Drought	0	0	0	0
Statewide	9/1/2005	Drought	0	0	0	0
Statewide	10/1/2005	Drought	0	0	0	0
Statewide	7/17/2006	Excessive Heat	0	0	0	0
Statewide	7/30/2006	Excessive Heat	0	0	0	0
Statewide	8/1/2006	Excessive Heat	1	0	0	0
Statewide	8/5/2007	Excessive Heat	0	0	0	0
Statewide	6/21/2009	Excessive Heat	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Drought and Extreme Heat Hazard

Droughts are regional in nature. All areas of the United States are vulnerable to the risk of drought and extreme heat.

Hazard Extent for Drought and Extreme Heat Hazard

Droughts and extreme heat can be widespread or localized events. The extent of the droughts varies both in terms of the extent of the heat and the range of precipitation.

Risk Identification for Drought/Extreme Heat Hazard

Based input from the planning team, the occurrence of future drought and extreme heat is of negligible concern. Drought and extreme heat was not ranked as a hazard.

Vulnerability Analysis for Drought and Extreme Heat Hazard

Drought and extreme heat impacts are an equally distributed threat across the entire jurisdiction; therefore, the county is vulnerable to this hazard and can expect the same impacts within the affected area. According to FEMA, approximately 175 Americans die each year from extreme heat. Young children, elderly, and infirmed populations have the greatest risk.

The entire population and all buildings have been identified as at risk. The building exposure for Macoupin County, as determined from the building inventory is included in Table 4-9.

Critical Facilities

All critical facilities are vulnerable to drought. A critical facility will encounter many of the same impacts as any other building within the jurisdiction, which should involve only minor damage. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather. Table 4-9 lists the types and numbers of all of the essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts similar to those discussed for critical facilities. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather.

Infrastructure

During a drought the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with a fire that could result from the hot, dry conditions. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a heat wave. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Drought/Extreme Heat Hazard

Future development will remain vulnerable to these events. Typically, some urban and rural areas are more susceptible than others. For example, urban areas are subject to water shortages during periods of drought. Excessive demands of the populated area place a limit on water resources. In rural areas, crops and livestock may suffer from extended periods of heat and drought. Dry conditions can lead to the ignition of wildfires that could threaten residential, commercial, and recreational areas.

Analysis of Community Development Trends

Because droughts and extreme heat are regional in nature, future development will be impacted across the county. Although urban and rural areas are equally vulnerable to this hazard, those living in urban areas may have a greater risk from the effects of a prolonged heat wave. The atmospheric conditions that create extreme heat tend to trap pollutants in urban areas, adding contaminated air to the excessively hot temperatures and creating increased health problems. Furthermore, asphalt and concrete store heat longer, gradually releasing it at night and producing high nighttime temperatures. This phenomenon is known as the "urban heat island effect."

Source: FEMA

Local officials should address drought and extreme heat hazards by educating the public on steps to take before and during the event—for example, temporary window reflectors to direct heat back outside, staying indoors as much as possible, and avoiding strenuous work during the warmest part of the day.

4.4.6 Winter Storm Hazard

Hazard Definition for Winter Storm Hazard

Severe winter weather consists of various forms of precipitation and strong weather conditions. This may include one or more of the following: freezing rain, sleet, heavy snow, blizzards, icy roadways, extreme low temperatures, and strong winds. These conditions can cause human health risks such as frostbite, hypothermia, and death.

Ice (glazing) and Sleet Storms

Ice or sleet, even in small quantities, can result in hazardous driving conditions and can cause property damage. Sleet involves frozen raindrops that bounce when they hit the ground or other objects. Sleet does not stick to trees and wires. Ice storms, on the other hand, involve liquid rain that falls through subfreezing air and/or onto sub-freezing surfaces, freezing on contact with those surfaces. The ice coats trees, buildings, overhead wires, and roadways, sometimes causing extensive damage.

The most damaging winter storms in Illinois have been ice storms. Ice storms occur when moisture-laden gulf air converges with the northern jet stream causing strong winds and heavy precipitation. This precipitation takes the form of freezing rain coating power and communication lines and trees with heavy ice. The winds will then cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication. In the past few decades, including the winter of 2007–09, numerous snow and ice storm events have occurred in Illinois.

Snowstorms

Significant snowstorms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. A blizzard is categorized as a snowstorm with winds of 35 miles per hour or greater and/or visibility of less than one-quarter mile for three or more hours. The strong winds during a blizzard blow about falling and already existing snow, creating poor visibility and impassable roadways. Blizzards have the potential to result in property damage.

Illinois has repeatedly been struck by blizzards. Blizzard conditions cannot only cause power outages and loss of communication, but also make transportation difficult. The blowing of snow can reduce visibility to less than one-quarter mile, and the resulting disorientation makes even travel by foot dangerous if not deadly.

Severe Cold

Severe cold is characterized by the ambient air temperature dropping to around 0°F or below. These extreme temperatures can increase the likelihood of frostbite and hypothermia. High winds during severe cold events can enhance the air temperature's effects. Fast winds during cold weather events can lower the wind chill factor (how cold the air feels on your skin). As a result, the time it takes for frostbite and hypothermia to affect a person's body will decrease.

Previous Occurrences for Winter Storm Hazard

The NCDC database identified 32 winter storm and extreme cold events for Macoupin County since 1995. The most recent event occurred in January 2009. A powerful winter storm swept through central and southeast Illinois, bringing heavy snow accumulation of approximately 8-12 inches.

The NCDC winter storms are listed in Table 4-32. Additional details for NCDC events are included in Appendix D.

Table 4-32: Winter Storm Events*

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
Southwest Illinois	1/6/1995	Glaze Ice	0	0	5K	0
Statewide	1/8/1997	Winter Storm	0	0	0	0
Statewide	1/15/1997	Winter Storm	0	0	0	0
Statewide	4/10/1997	Winter Storm	0	0	0	0
Statewide	1/12/1998	Winter Storm	0	0	0	0
Statewide	3/8/1998	Winter Storm	0	0	0	0
Statewide	12/21/1998	Winter Storm	0	0	0	0
Statewide	1/1/1999	Winter Storm	0	0	0	0
Statewide	1/13/1999	Ice Storm	0	0	0	0
Statewide	1/28/2000	Winter Storm	0	0	0	0
Statewide	3/11/2000	Winter Storm	0	0	0	0
Statewide	12/13/2000	Heavy Snow	0	0	0	0
Statewide	12/16/2000	Extreme Wind-chill	1	0	0	0
Statewide	1/26/2001	Winter Storm	0	0	0	0
Statewide	2/25/2002	Winter Storm	0	0	0	0
Statewide	3/25/2002	Winter Storm	0	0	0	0
Statewide	12/24/2002	Winter Storm	0	0	0	0
Statewide	2/23/2003	Winter Storm	0	0	0	0
Statewide	12/13/2003	Winter Storm	0	0	0	0
Statewide	1/25/2004	Winter Storm	0	0	0	0
Statewide	12/8/2005	Winter Storm	0	0	0	0
Statewide	11/29/2006	Winter Storm	0	0	0	0
Statewide	12/1/2006	Winter Storm	0	0	0	0
Statewide	1/12/2007	Ice Storm	0	0	0	0
Statewide	2/13/2007	Heavy Snow	0	0	0	0
Statewide	4/4/2007	Frost/freeze	0	0	0	0
Statewide	12/6/2007	Winter Weather	0	0	0	0
Statewide	12/15/2007	Heavy Snow	0	0	0	0
Statewide	1/31/2008	Heavy Snow	0	0	0	0
Statewide	2/1/2008	Heavy Snow	0	0	0	0
Statewide	2/21/2008	Sleet	0	0	0	0
Statewide	1/26/2009	Winter Storm	0	0	0	0

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Winter Storm Hazard

Severe winter storms are regional in nature. Most of the NCDC data is calculated regionally or in some cases statewide.

Hazard Extent for Winter Storm Hazard

The extent of the historical winter storms varies in terms of storm location, temperature, and ice or snowfall. A severe winter storm can occur anywhere in the jurisdiction.

Risk Identification for Winter Storm Hazard

Based on historical information and input from the planning team, the occurrence of future winter storms is likely. Winter storms of varying magnitudes are expected to happen. According to the RPI, winter storms were ranked as the number four hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	**2**	=	8

Vulnerability Analysis for Winter Storm Hazard

Winter storm impacts are equally distributed across the entire jurisdiction; therefore, the entire county is vulnerable to a winter storm and can expect the same impacts within the affected area. The building exposure for Macoupin County, as determined from the building inventory, is included in Table 4-10.

Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as other buildings within the jurisdiction. These impacts include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow. Table 4-9 lists the types and numbers of the essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow.

Infrastructure

During a winter storm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable it is important to emphasize that any number of these items could become damaged during a winter storm. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads and railways, and broken water pipes.

Potential Dollar Losses for Winter Storm Hazard

A HAZUS-MH analysis was not completed for winter storms because the widespread extent of such a hazard makes it difficult to accurately model outcomes.

To determine dollar losses for a winter storm hazard, the available NCDC hazard information was condensed to include only winter storm hazards that occurred within the past ten years. Macoupin County's MHMP team then reviewed the property damages reported to NCDC and made any applicable updates.

It was determined that since 1999, Macoupin County has not incurred significant property damages from winter storms, including sleet/ice and heavy snow.

Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

Any new development within the county will remain vulnerable to these events.

Analysis of Community Development Trends

Because the winter storm events are regional in nature future development will be equally impacted across the county.

4.4.7 Hazardous Materials Storage and Transport Hazard

Hazard Definition for Hazardous Materials Storage and Transport Hazard

Illinois has numerous active transportation lines that run through many of its counties. Active railways transport harmful and volatile substances between our borders every day. The transportation of chemicals and substances along interstate routes is commonplace in Illinois. The rural areas of Illinois have considerable agricultural commerce creating a demand for fertilizers, herbicides, and pesticides to be transported along rural roads. These factors increase the chance of hazardous material releases and spills throughout the state of Illinois.

The release or spill of certain substances can cause an explosion. Explosions result from the ignition of volatile products such as petroleum products, natural and other flammable gases, hazardous materials/chemicals, dust, and bombs. An explosion can potentially cause death, injury, and property damage. In addition, a fire routinely follows an explosion which may cause further damage and inhibit emergency response. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials units.

Previous Occurrences for Hazardous Materials Storage and Transport Hazard

Macoupin County has not experienced a significantly large-scale hazardous material incident at a fixed site or during transport resulting in multiple deaths or serious injuries, although there have been many minor releases that have put local firefighters, hazardous materials teams, emergency management, and local law enforcement into action to try to stabilize these incidents and prevent or lessen harm to Macoupin County residents.

Geographic Location for Hazardous Materials Storage and Transport Hazard

The hazardous material hazards are countywide and are primarily associated with the transport of materials via highway and railroad.

Hazard Extent for Hazardous Materials Storage and Transport Hazard

The extent of the hazardous material hazard varies both in terms of the quantity of material being transported as well as the specific content of the container.

Risk Identification for Hazardous Materials Release

Based on input from the planning team, the occurrence of a hazardous materials accident is likely. According to the RPI, Hazardous Materials Storage and Transport ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	4	=	12

Vulnerability Analysis for Hazardous Materials Storage and Transport Hazard

Hazardous material impacts are an equally distributed threat across the entire jurisdiction; therefore, the entire county is vulnerable to a hazardous material release and can expect the same impacts within the affected area. The main concern during a release or spill is the population affected. The building exposure for Macoupin County, as determined from building inventory, is included in Table 4-10. This plan will therefore consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities and communities within the county are at risk. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-10. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g. a damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a hazardous material release the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to this plan it is important to emphasize that any number of these items could become damaged in the event of a hazardous material release. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); and railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

In terms of numbers and types of buildings and infrastructure, typical scenarios are described to gauge the anticipated impacts of hazardous material release events in the county.

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for an anhydrous ammonia release related to a transportation accident at intersection of Illinois State Route 108 (West Main Street) and the Union Pacific Railroad trail line on the west side of Carlinville (Figure 4-10). The target area was selected for three primary reasons: 1) the high volume traffic, 2) the area is highly populated and 3) proximity to several critical facilities.

Chlorine is a greenish yellow gas with a pungent suffocating odor. The gas liquefies at -35°C and room pressure or will liquefy from pressure applied at room temperature. Contact with

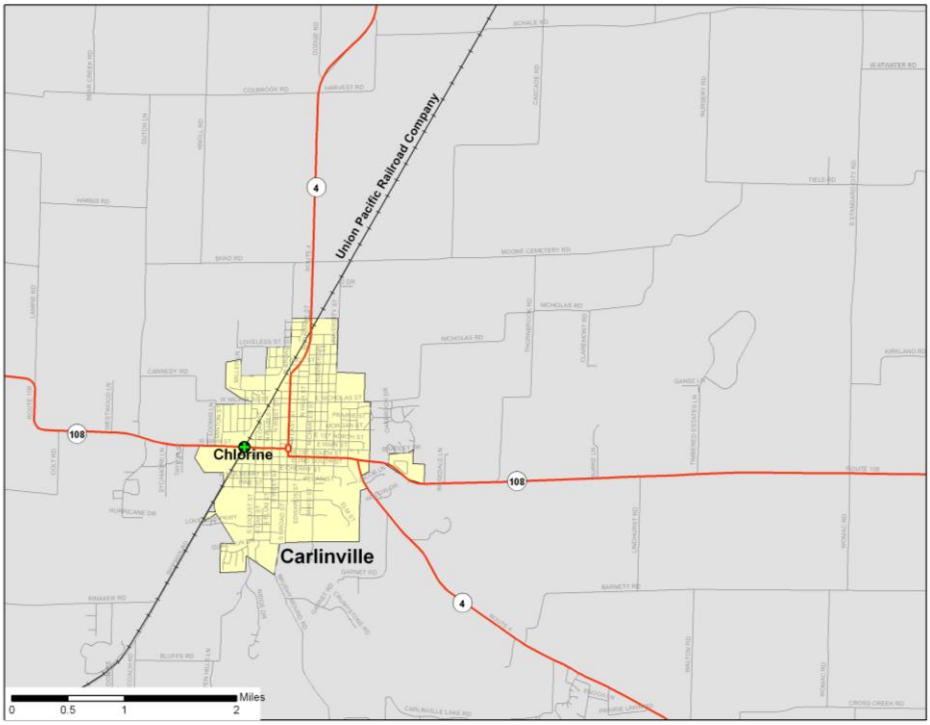
unconfined liquid chlorine can cause frostbite from evaporative cooling. Chlorine does not burn, but, like oxygen, supports combustion. The toxic gas can have adverse health effects from either long-term inhalation of low concentrations of vapors or short-term inhalation of high concentrations. Chlorine vapors are much heavier than air and tend to settle in low areas. Chlorine is commonly used to purify water, bleach wood pulp, and make other chemicals (NOAA Reactivity 2007).

Source: http://cameochemicals.noaa.gov/chemical/2862

ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Chlorine is a common chemical used in industrial operations and can be found in either liquid or gas form. Rail and truck tankers commonly haul anhydrous ammonia to and from facilities.

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west-southwest was assumed. The target area was chosen due to its proximity to the residential, commercial, and essential facility locations. The geographic area covered in this analysis is depicted in Figure 4-10.

Figure 4-10: Location of Chemical Release



Analysis

The ALOHA atmospheric modeling parameters, depicted in Figure 4-11, were based upon a southwesterly wind speed of five miles per hour. The temperature was 70°F with 50% humidity and a cloud cover of five-tenths skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 10.4 feet and the length set to 53 feet (33,700 gallons). At the time of its release, it was estimated that the tank was 85% full. The anhydrous ammonia in this tank is in its liquid state.

This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to the ALOHA parameters, approximately 10,600 pounds of material would be released per minute. The image in Figure 4-12 depicts the plume footprint generated by ALOHA.

Figure 4-11: ALOHA Plume Modeling Parameters

SITE DATA:
Location: CARLINVILLE, ILLINOIS
Building Air Exchanges Per Hour: 0.37 (sheltered single storied)
Time: May 15, 2010 0924 hours CDT (using computer's clock)

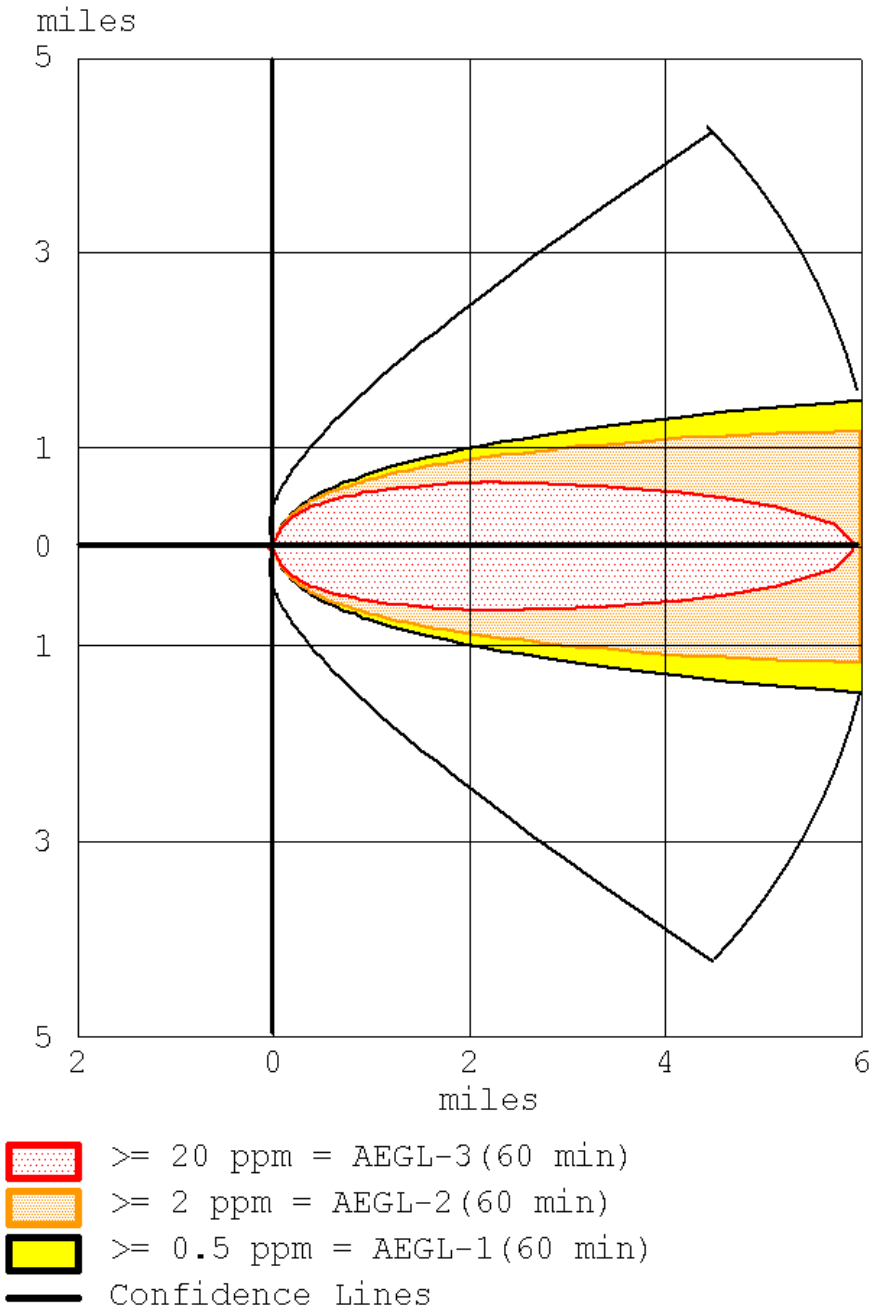
CHEMICAL DATA:
Chemical Name: CHLORINE Molecular Weight: 70.91 g/mol
AEGL-1(60 min): 0.5 ppm AEGL-2(60 min): 2 ppm AEGL-3(60 min): 20 ppm
IDLH: 10 ppm
Ambient Boiling Point: -30.1° F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 5 miles/hour from wsw at 10 feet
Ground Roughness: open country Cloud Cover: 5 tenths
Air Temperature: 70° F Stability Class: C
No Inversion Height Relative Humidity: 50%

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Non-flammable chemical is escaping from tank
Tank Diameter: 10.4 feet Tank Length: 53 feet
Tank Volume: 33,679 gallons
Tank contains liquid Internal Temperature: 70° F
Chemical Mass in Tank: 168 tons Tank is 85% full
Circular Opening Diameter: 2.5 inches
Opening is 12 inches from tank bottom
Release Duration: ALOHA limited the duration to 1 hour
Max Average Sustained Release Rate: 10,600 pounds/min
(averaged over a minute or more)
Total Amount Released: 322,397 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:
Model Run: Heavy Gas
Red : 5.9 miles --- (20 ppm = AEGL-3(60 min))
Orange: greater than 6 miles --- (2 ppm = AEGL-2(60 min))
Yellow: greater than 6 miles --- (0.5 ppm = AEGL-1(60 min))

Figure 4-12: Plume Footprint Generated by ALOHA



Acute Exposure Guideline Levels (AEGLs) are intended to describe the health effects on humans due to once-in-a-lifetime or rare exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). The image in Figure 4-13 depicts the plume footprint generated by ALOHA in ArcGIS.

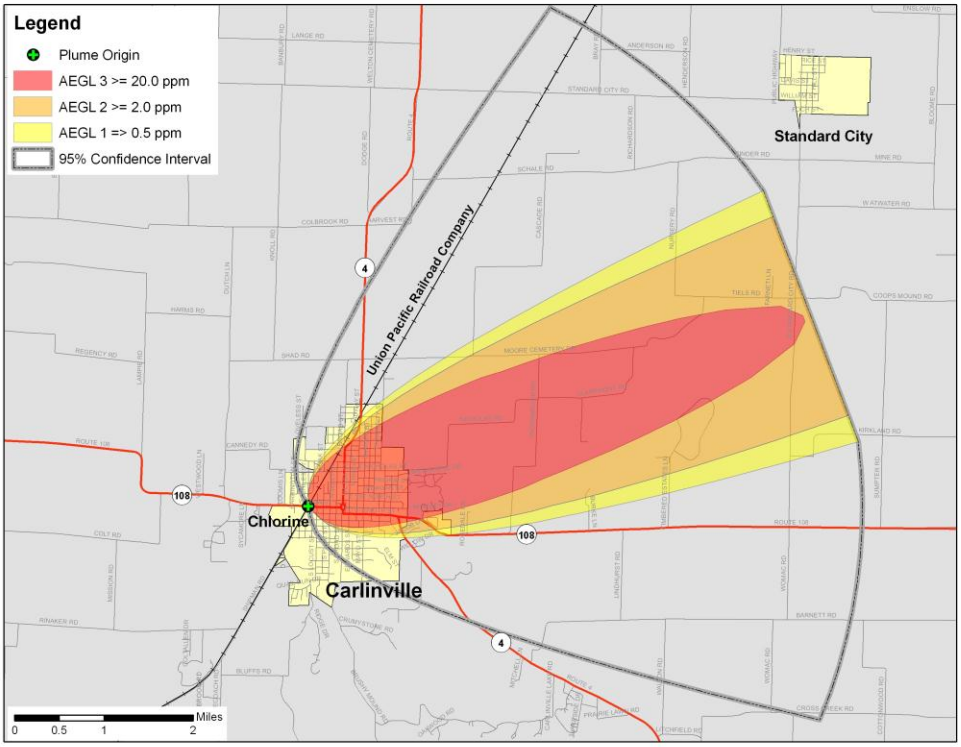
- **AEGL 3:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death. The red buffer (≥ 20.0 ppm) extends no more than six miles from the point of release after one hour.

- **AEGL 2:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape. The orange buffer (≥ 2.0 ppm) extends no more than six miles from the point of release after one hour.

- **AEGL 1:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. The yellow buffer (≥ 0.5 ppm) extends more than six miles from the point of release after one hour.

- **Confidence Lines**: The dashed lines depict the level of confidence in which the exposure level will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

Figure 4-13: ALOHA Plume Footprint Overlaid in ArcGIS

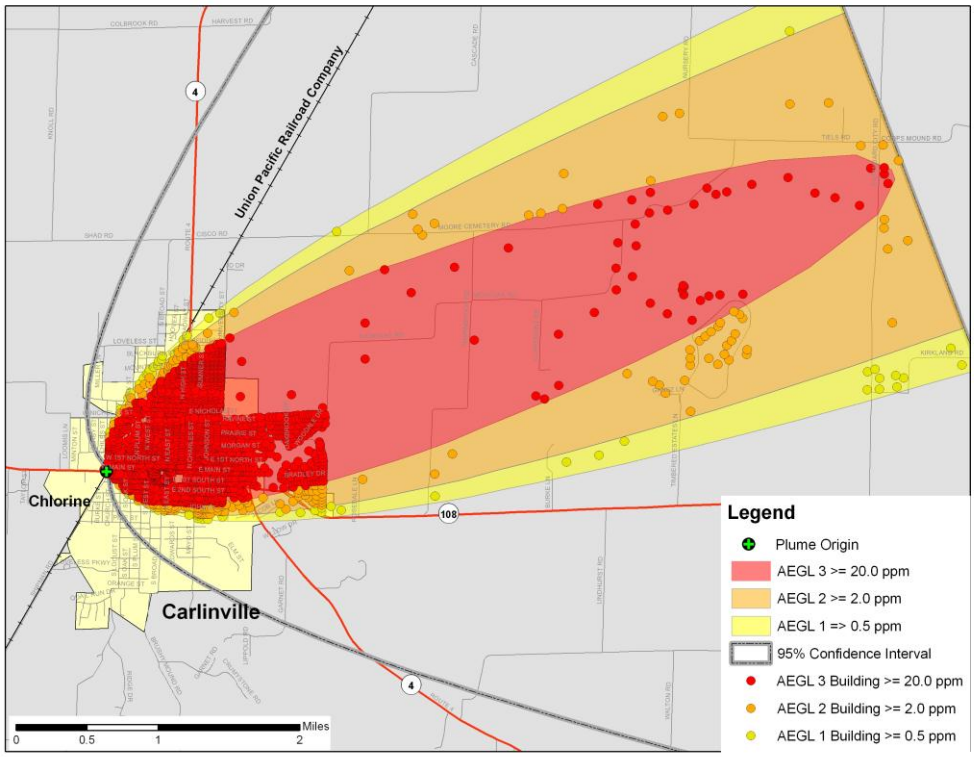


Results

By summing the building inventory within all AEGL levels (AEGL 3: ≥ 20.0 ppm, AEGL 2: ≥ 2.0 ppm and Level 1: ≥ 0.5 ppm.), the GIS overlay analysis predicts that as many as 1,256 buildings could be exposed at a replacement cost of $382.7 million. If this event were to occur, approximately 2,100 people would be affected. The results are depicted in Figure 4-14.

The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings for government, religious/non-profit, and education may be underestimated.

Figure 4-14: Macoupin County Building Inventory Classified By Plume Footprint



Building Inventory Damage

The results of the analysis against the building inventory points are depicted in Tables 4-33 through 4-36. Table 4-36 summarizes the results of the chemical spill by combining all AEGL level. Tables 4-34 through 4-36 summarize the results of the chemical spill for each level separately.

Table 4-33: Estimated Exposure for all Level (all ppm)

Occupancy	Population	Building Counts	Building Exposure (x $1,000)
Residential	2,134	917	$228,508
Commercial	0	268	$101,660

Industrial	0	1	$11,372
Agriculture	0	9	$4,541
Religious	0	30	$15,312
Government	0	8	$3,816
Education	0	5	$17,528
Total	**2,134**	**1,256**	**$382,737**

Table 4-34: Estimated Exposure for Level 3 (≥ 20.0 ppm)

Occupancy	Population	Building Counts	Building Exposure (x $1,000)
Residential	1,774	773	$184087
Commercial	0	231	$88635
Industrial	0	0	$8593
Agriculture	0	0	$3542
Religious	0	21	$14452
Government	0	20	$2956
Education	0	3	$17100
Total	**1,615**	**1,048**	**$319,365**

Table 4-35: Estimated Exposure for Level 2 (≥ 2.0 ppm)

Occupancy	Population	Building Counts	Building Exposure (x $1,000)
Residential	190	104	$13497
Commercial	0	27	$2555
Industrial	0	0	$525
Agriculture	0	4	$269
Religious	0	5	$316
Government	0	2	$218
Education	0	2	$428
Total	**190**	**144**	**$17,808**

Table 4-36: Estimated Exposure for Level 1 (≥ 0.5 ppm)

Occupancy	Population	Building Counts	Building Exposure (x $1,000)
Residential	100	40	$30924
Commercial	0	10	$10470
Industrial	0	1	$2254
Agriculture	0	5	$730
Religious	0	4	$544
Government	0	4	$642
Education	0	0	$0
Total	**100**	**64**	**$45,564**

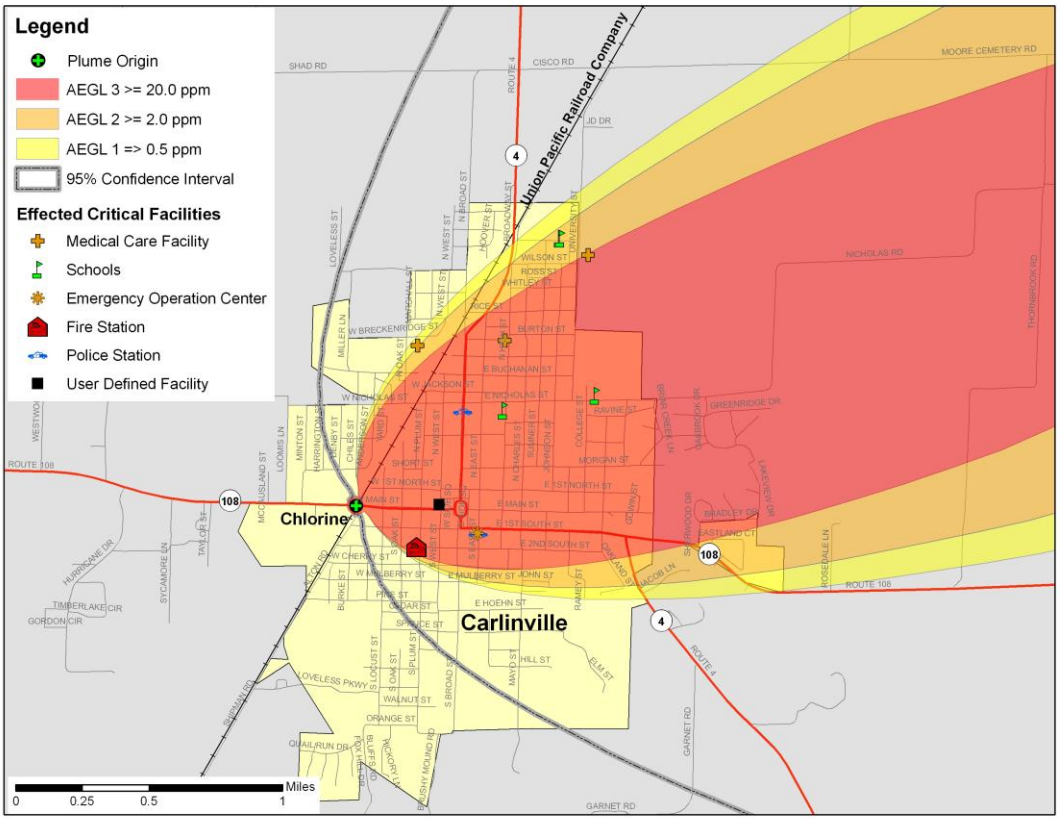
Critical Facilities Damage

There are 12 critical facilities within the limits of the chemical spill plume. The affected facilities are identified in Table 4-37. Their geographic locations are depicted in Figure 4-15.

Table 4-37: Essential Facilities within Plume Footprint

Name
Emergency Operations Center
Macoupin County Emergency Operations Center
Fire Stations
Carlinville Fire Department
Medical Care Facilities
Carlinville Rehabilitation
Friendship Home
Heritage Manor
Police Departments
Macoupin County Sheriff
Carlinville Police Department
Schools
Carlinville Early Childhood Center
ROE Adult Learning Center
ROE Safe School Macoupin
Black Burn College
User Defined (Shelters)
Carlinville Elks Lodge

Figure 4-15: Essential Facilities within Plume Footprint



Vulnerability to Future Assets/Infrastructure for Hazardous Materials Storage and Transport Hazard

Any new development within the county will be vulnerable to these events, especially development along major roadways.

Analysis of Community Development Trends

Because the hazardous material hazard events may occur anywhere within the county, future development will be impacted. The major transportation routes and the industries located in Macoupin County pose a threat of dangerous chemicals and hazardous materials release.

4.4.8 Fire Hazard

Hazard Definition for Fire Hazard

This plan will address three major categories of fires for Macoupin County: 1) tire/scrap fires; 2) structural fires; and 3) wildfires.

Tire Fires

The state of Illinois generates thousands of scrap tires annually. Many of those scrap tires end up in approved storage sites that are carefully regulated and controlled by federal and state officials. However, scrap tires are sometimes intentionally dumped in unapproved locations throughout the state. The number of unapproved locations cannot be readily determined. These illegal sites are owned by private residents who have been continually dumping waste and refuse, including scrap tires, at those locations for many years.

Tire disposal sites can be fire hazards, in large part, because of the enormous number of scrap tires typically present at one site. This large amount of fuel renders standard firefighting practices nearly useless. Flowing and burning oil released by the scrap tires can spread the fire to adjacent areas. Tire fires differ from conventional fires in the following ways:

- Relatively small tire fires can require significant fire resources to control and extinguish.
- Those resources often cost much more than Macoupin County government can absorb compared to standard fire responses.
- There may be significant environmental consequences of a major tire fire. Extreme heat can convert a standard vehicle tire into approximately two gallons of oily residue that may leak into the soil or migrate to streams and waterways.

Structural Fires

Lightning strikes, poor building construction, and building condition are the main causes for most structural fires in Illinois. Macoupin County has a few structural fires each year countywide.

Wildfires

When hot and dry conditions develop, forests may become vulnerable to devastating wildfires. In the past few decades an increased commercial and residential development near forested areas has dramatically changed the nature and scope of the wildfire hazard. In addition, the increase in structures resulting from new development strains the effectiveness of the fire service personnel in the county.

Previous Occurrences for Fire Hazard

Macoupin County has not experienced a significant or large-scale explosion at a fixed site or transportation route that has resulted in multiple deaths or serious injuries.

Geographic Location for Fire Hazard

Fire hazards occur countywide and therefore affect the entire county. The forested areas in the county have a higher chance of widespread fire hazard.

Hazard Extent for Fire Hazard

The extent of the fire hazard varies both in terms of the severity of the fire and the type of material being ignited. All communities in Macoupin County are affected by fire equally.

Risk Identification for Fire Hazard

Based on input from the planning team, the occurrence of a fire is likely. According to the RPI, fire/explosion is ranked as the number eight hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	2	=	6

Vulnerability Analysis for Fire Hazard

This hazard impacts the entire jurisdiction equally; therefore, the entire population and all buildings within the county are vulnerable to fires and can expect the same impacts within the affected area.

Table 4-9 lists the types and numbers of all essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

The building exposure for Macoupin County, as determined from the building inventory, is included in Table 4-10. Because of the difficulty predicting which communities are at risk, the entire population and all buildings have been identified at risk.

Critical Facilities

All critical facilities are vulnerable to fire hazards. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural damage from fire and water damage from efforts extinguishing fire. Table 4-9 lists the types and numbers of essential facilities in the area. A map and list of all critical facilities is included as Appendix F.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-10. Impacts to the general buildings within the county are similar to the

damages expected to the critical facilities. These impacts include structural damage from fire and water damage from efforts to extinguish the fire.

Infrastructure

During a fire the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a fire. Potential impacts include structural damage resulting in impassable roadways and power outages.

Vulnerability to Future Assets/Infrastructure for Fire Hazard

Any future development will be vulnerable to these events.

Analysis of Community Development Trends

Fire hazard events may occur anywhere within the county, because of this future development will be impacted.

4.4.9 Ground Failure Hazard

Subsidence

Subsidence in Illinois is a sinking of the land surface, usually associated with either underground mining or collapse of soil into crevices in underling soluble bedrock. Areas at risk for subsidence can be determined from detailed mapping of geologic conditions or detailed mine maps. Data sources were compiled from the Illinois Geologic Survey and Illinois Department of Natural Resources to assess the risk of subsidence in Macoupin County. This section provides an overview of the subsidence hazards in Illinois in general and a discussion of the potential subsidence risk for Macoupin County.

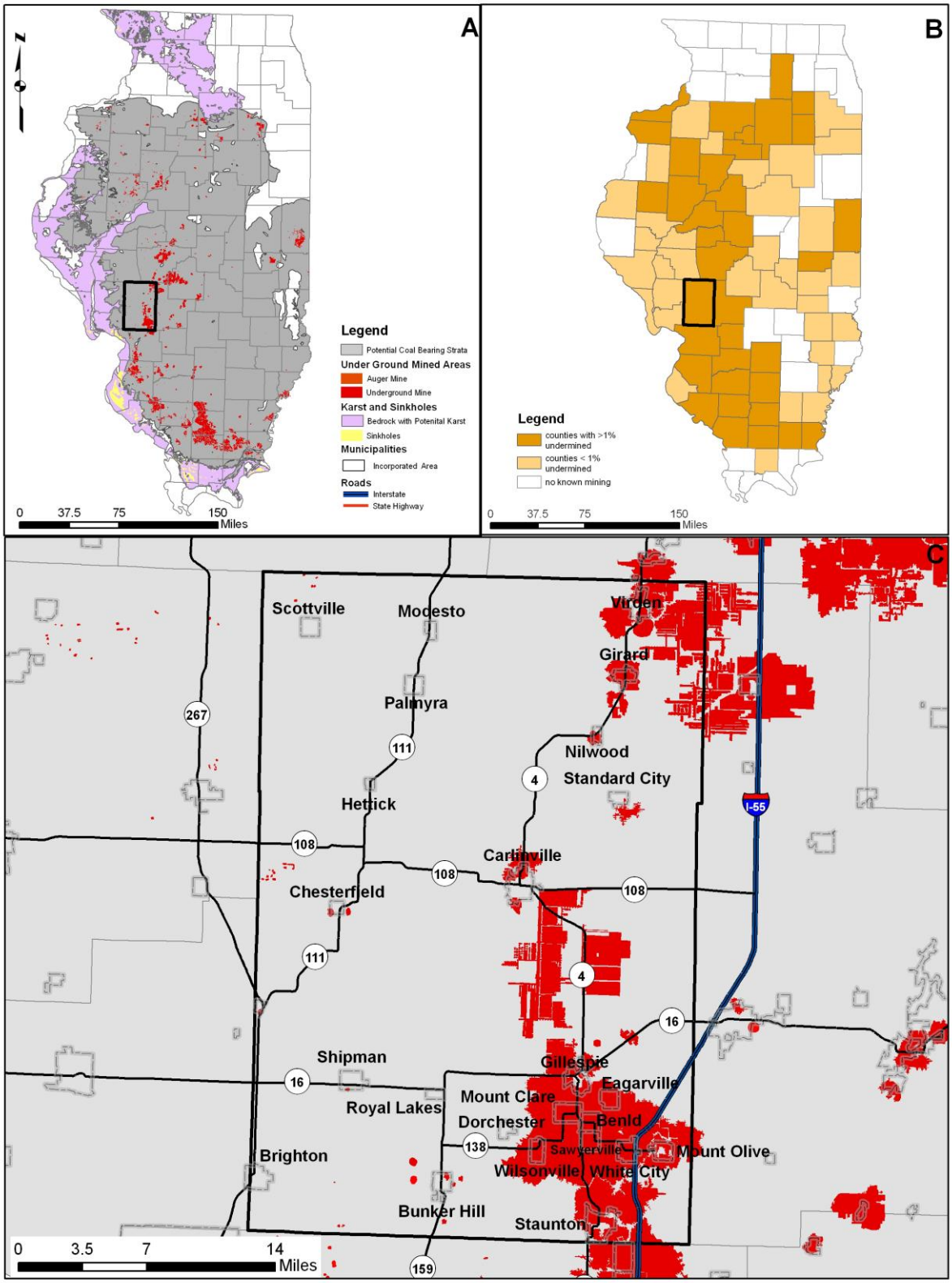
Underground Mining and Subsidence

Underground mines have been used extensively in Illinois to extract coal, lead, zinc, fluorites, shale, clay stones, limestone, and dolomite. When mining first began in Illinois, land over mined areas was sparsely populated. If the ground subsided, homes or other structures were seldom damaged. As towns and cities expanded over mined-out areas, subsidence damage to structures became increasingly more common. The most common underground mines in Illinois are coal mines. A recent study in Illinois has found that approximately 333,100 housing units were located over or adjacent to 839,000 acres mined for coal (Bauer, 2008).

Illinois has abundant coal resources. All or parts of 86 of 102 counties in the state have coal-bearing strata. As of 2007, approximately 1,050,400 acres (2.8% of the state) were mined. Of that total, 836,655 acres are underground mines (Bauer, 2008). Illinois ranks first among all U.S. states for reserves of bituminous coal (Illinois Coal Association, 1992).

Figure 4-16a shows the statewide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines. Figure 4-16b shows the counties which are 0, < 1%, and >1% undermined; Figure 4-16c shows the countywide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines.

Figures 4-16a, 4-15b, and 4-15c: Maps of Statewide and Countywide Areas with Subsidence Hazard Potential



Mining Methods

There are two fundamental underground mining methods used in Illinois: high-extraction methods, such as long-wall and low-extraction room, and pillar mining. High-extraction methods remove almost all of the coal in localized areas. For modern mining practices, subsidence associated with high-extraction methods is planned and regulated by state and federal authorities. The subsurface subsides above the mine within several days or weeks after the coal has been removed. Subsidence of the overburden above the mined-out area can continue up to seven years after subsurface removal, depending on the local geologic conditions (Bauer, 2008). The initial ground movements associated with this mining, which tend to be the largest, diminish rapidly after a few months. After subsidence has decreased to a level that no longer causes damage to structures, the land may be suitable for development. The maximum amount of subsidence is proportional to the amount of material extract and the depth between the mining and the surface. In general, over the centerline of the mine panel, subsidence can be 60% to 70% of the extract material (e.g., 10 ft of material extracted would cause a maximum subsidence of six to seven feet; Bauer, 2006).

For low-extraction techniques such as room-and-pillar mining, miners create openings (rooms) as they work. Enough of the coal layer is left behind in the pillars to support the ground surface. In Illinois, this system of mining extracts 40% to 55% of the coal resources in modern mines and up to 75% is some older mines. Based on current state regulations, room-and-pillar mines in operation after 1983 that do not include planned subsidence must show that they have a stable design. Although these permitting requirements have improved overall mine stability, there are no guarantees that subsidence will not occur above a room-and-pillar mine in the future. In general, if coal or other mined resources has been removed from an area, subsidence of the overlying material is always a possibility (Bauer, 2006).

Types of Mine Subsidence

In Illinois, subsidence of the land surface related to underground mining undertakes two forms: pit subsidence or trough (sag) subsidence. Pit subsidence structures are generally six to eight feet deep and range from two to 40 feet in diameter. Pit subsidence mostly occurs over shallow mines that are <100 feet deep where the overlying bedrock is <50 feet thick and composed of weak rock materials, such as shale. The pit is produced when the mine roof collapses and the roof fall void works its way to the surface. These structures form rapidly. If the bedrock is only a few feet thick and the surface materials are unconsolidated (loose), these materials may fall into adjacent mine voids, producing a surface hole deeper than the height of the collapse mine void. Pit subsidence can cause damage to a structure if it develops under the corner of a building, under a support post of a foundation, or in another critical location. Subsidence pits should be filled to ensure that people or animals do not fall into these structures (Bauer, 2006).

Trough subsidence forms a gentle depression over a broad area. Some trough subsidence may be as large as a whole mine panel (i.e. several hundred feet long and a few hundred feet wide). Several acres of land may be affected by a single trough event or feature. As previously discussed, the maximum vertical settlement is 60% to 70% of the height of material removed (e.g., two to six feet). Significant troughs may develop suddenly, within a few hours or days, or gradually over a period of years. Troughs originate over places in mines where pillars have collapsed, producing downward movement at the ground surface. These failures can develop

over mines of any depth. Trough subsidence produces an orderly pattern of tensile features (tension cracks) surrounding a central area of possible compression features. The type and extent of damage to surface structures relates to their orientation and position within a trough. In the tension zone, the downward-bending movements that develop in the ground may damage buildings, roads, sewer and water pipes, and other utilities. The downward bending of the ground surface causes the soil to crack, forming the tension cracks that pull structures apart. In the relatively smaller compression zone, roads may buckle and foundation walls may be pushed inward. Buildings damaged by compressional forces typically need their foundations rebuilt and may also need to be leveled due to differential settling (Bauer, 2006).

Mine Subsidence Insurance

The Mine Subsidence Insurance, as of 1979, created subsidence insurance as part of an Illinois homeowner's policy. Homeowners in any of the Illinois counties undermined by approximately 1% or more automatically have mine subsidence insurance as a part of their policy, unless coverage is waived in writing. Mine subsidence insurance is especially important for homes located near or over mines that operated before the 1977 Surface Mine Control and Reclamation Act. The companies that operated these mines may no longer be in business (Bauer, 2006).

Mine Subsidence in Macoupin County

All of Macoupin County is underlain by rock units which potentially contain coal. Analysis of the GIS data layer of active and abandoned coal mines in Illinois obtained from the Illinois Department of Natural Resources (ILDNR) revealed that 106 mi^2 out of Macoupin County's total 868 mi^2 (~ 12%) area have been undermined. The undermined areas are mainly located in the eastern half of the county along and east of Illinois State Route 4. However, there are localize areas which have been undermined on the west half of the county. The incorporated municipalities in Macoupin County which are at least partially under mined include Benld, Bunker Hill, Carlinville, Chesterfield, Eagarville, East Gillespie, Gillespie, Girard, Mount Claire, Mount Olive, Nilwood, Sawyerville, Standard City, Staunton, White City, Virden, and Wilsonville. Comparison of the GIS layer of parcels with structures attained from Macoupin County with IDNR GIS layer of active and abandoned underground-coal mines was performed. This analysis revealed that 9,989 out of the 24,450 or ~41% of the buildings in the county were above undermined areas.

Subsidence Related to Karst Features

Subsidence can also occur on land located over soluble bedrock. The land over such bedrock often has topography characteristics of past subsidence events. This topography is termed "karst." Karst terrain has unique landforms and hydrology found only in these areas. Bedrock in karst areas are typically limestone, dolomite, or gypsum. In Illinois, limestone and dolomite (carbonate rocks) are the principle karst rock types; 9% of Illinois has carbonate rock types close enough to the ground surface to have a well-developed karst terrain. The area in Illinois in which the karst terrain is most developed is the southern and southwestern part of the state (Panno, et al., 1997).

Sinkhole Formation

The karst feature most associated with subsidence is the sinkhole. A sinkhole is an area of ground with no natural external surface drainage—when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres, and from less than one to more than 100 feet deep. Typically, sinkholes form slowly, so that little change is seen during a lifetime, but they also can form suddenly when a collapse occurs. Such a collapse can have a dramatic effect if it occurs in a populated setting.

Sinkholes form where rainwater moves through the soil and encounters soluble bedrock. The bedrock begins to dissolve along horizontal and vertical cracks and joints in the rock. Eventually, these cracks become large enough to start transporting small soil particles. As these small particles of soil are carried off, the surface of the soil above the conduit slump down gradually, and a small depression forms on the ground surface. This depression acts like a funnel and gathers more water, which makes the conduit still larger and washes more soil into it.

Sinkhole Collapse

Sudden collapse of a sinkhole occurs when the soil close to the ground surface does not initially slump down, but instead forms a bridge. Beneath that surface cover, a void forms where the soil continues to wash into the conduit. These voids are essentially shallow caves. Over time, the void enlarges enough that the weight of the overlying bridge can no longer be supported. The surface layer then suddenly collapses into the void, forming a sinkhole.

The process of forming a conduit and a soil bridge usually takes years to decades to form. However this natural process can be aggravated and expedited by human activates. Since the process of forming a sinkhole depends on water to carry soil particle down into the karst bedrock, anything that increases the amount of water flowing into the subsurface can accelerate sinkhole formation process. Parking lots, streets, altered drainage from construction, and roof drainage are a few of the things that can increase runoff.

Collapses are more frequent after intense rainstorms. However, drought and altering of the water table can also contribute to sinkhole collapse. Areas where the water table fluctuates or has suddenly been lowered are more susceptible to sinkhole collapse. It is also possible for construction activity to induce the collapse of near-surface voids or caves. In areas of karst bedrock, it is imperative that a proper geotechnical assessment be completed prior to construction of any significant structures. Solutions to foundation problems in karst terrain generally are expensive (White, 1988).

Sinkhole Subsidence or Collapse Potential for Macoupin County

Nearly all of Macoupin County is underlain by insoluble bedrock, and therefore subsidence related to karstic bedrock should not be a concern.

Hazard Extent for Subsidence

The extent of subsidence hazard in Macoupin County is a function of where current development is located relative to areas of past and present underground mining and the occurrence of near-surface soluble bedrock.

Calculated Risk Priority Index for Ground Failure

Based on historical, geological, mine information, future ground failure in undermined regions of Macoupin County is possible. According to the RPI, ground failure ranked as the number nine hazard in the county.

RPI = Probability x Magnitude/Severity.

Probability	X	Magnitude /Severity	=	RPI
3	X	4	=	12

Vulnerability Analysis for Ground Failure

The existing buildings and infrastructure of Macoupin County are discussed in types and numbers in Table 4-9.

Vulnerability Analysis for Ground Failure

The existing buildings and infrastructure of Macoupin County are discussed in types and numbers in Table 4-10.

Critical Facilities

Any critical facility built above highly soluble bedrock or an underground mine could be vulnerable to land subsidence. A critical facility will encounter the same impacts as any other building within the affected area. These impacts include damages ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations can cause cracking of critical structural elements. Table 4-9 lists the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-10 lists the building exposure in terms of types and numbers of buildings for the entire county. The buildings within this area can anticipate impacts similar to those discussed for critical facilities, ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations causes cracking of critical structural elements.

Infrastructure

Ground subsidence areas within Macoupin County could impact the roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with land collapsing directly beneath them in a way that undermines their structural integrity. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); and railway failure from broken or impassable railways. In addition bridges could fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Ground Failure

New buildings and infrastructure placed on undermined land or on highly soluble bedrock will be vulnerable to ground failure.

Analysis of Community Development Trends

Abandoned underground mine subsidence may affect several locations within the county; therefore buildings and infrastructure are vulnerable to subsidence. Continued development will occur in many of these areas. Currently, Macoupin County reviews new development for compliance with the local zoning ordinance. Newly planned construction should be reviewed with the historical mining maps to minimize potential subsidence structural damage.

References:

Bauer, R.A., Su, W., 2007, Soil Site Class Map Production for Comprehensive Seismic Loss Modeling for the State of Illinois. Illinois Geologic Survey.

Bauer, R.A. 2008. Planned Coal Mine Subsidence in Illinois: A Public Information Booklet, Circular 569, Illinois Department of Natural Resources and Illinois Geologic Survey, Springfield, Illinois. http://www.isgs.uiuc.edu/education/pdf-files/c569.pdff, last accessed, July 16, 2008.

Bauer, R.A. 2006. Mine Subsidence in Illinois: Facts for Homeowners, Circular 573, Illinois Department of Natural Resources and Illinois Geologic Survey, Springfield, Illinois. http://www.isgs.uiuc.edu/education/pdf-files/c573.pdf, last accessed, July 16, 2008.

Homan, J.D. 2001, Where did that come from? Sudden sinkhole causes several accidents on U.S. Route 51. http://thesouthern.com/articles/2001/12/26/top/export6747.prt, last accessed, July, 3, 2008.

Illinois Coal Association. 1992. Illinois coal facts: Springfield, Illinois, 64p.

National Climatic Data Center (NCDC). 2008. The Storm Events Database. http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms, last accessed August, 21, 2008.

Panno, S.V., Weibel, C.P., Li, W. 1997, Karst Regions of Illinois, Open File Series 1997-2. Illinois Geologic Survey, Champaign, Illinois, 42 p.

Pinter, N. 1993. Exercises in Active Tectonics: An Introduction to Earthquakes and Tectonic Geomorphology. Prentice Hall: Upper Saddle River, NJ.

Stover, C.W., Coffman J.L. 1993, Seismicity of the United States, 1568-1989 (Revised), U.S. Geological Survey Professional Paper 1527. United States Government Printing Office, Washington.

United States Geologic Survey (USGS). 2008. Earthquake Hazards Program, Magnitude / Intensity Comparison. http://earthquake.usgs.gov/learning/topics/mag_vs_int.php, last accessed, July 10, 2008.

United States Geologic Survey (USGS). 2008. Earthquake Hazards Program, Illinois Earthquake History. http://earthquake.usgs.gov/regional/states/illinois/history.php, last accessed, July 10, 2008.

United States Geologic Survey (USGS). 2007. Earthquake Hazard in the Heart of America. http://pubs.usgs.gov/fs/2006/3125/pdf/FS06-3125_508.pdf, last accessed July 10, 2008.

White, B.W. 1988. Geomorphology and Hydrology of Karst Terrains. Oxford University Press, 463p.

Section 5 - Mitigation Strategy

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. The goal of mitigation is to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment, provided in Section 4 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community's needs.

5.1 Community Capability Assessment

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities listed in Section 2 of this plan.

5.1.1 National Flood Insurance Program (NFIP)

Macoupin County, Brighton, Carlinville, Gillespie, Staunton, and Virden are members of the NFIP. Blend, Bunker Hill, Girard, Mount Olive, Nilwood, Shipman, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, and Wilsonville do not have an identified flood hazard boundary, and therefore chooses not to participate in the program.

HAZUS-MH identified approximately 24 households located within the Macoupin County Special Flood Hazard Area; 16 households paid flood insurance, insuring $1,907,700 in property value. The total premiums collected amounted to $6,823, which on average was $235 annually. From 1978 through 2007, 12 claims were filed totaling $64,247. The average claim was $5,354.

The county and incorporated areas do not participate in the NFIP'S Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: 1) reduce flood losses; 2) facilitate accurate insurance rating; and 3) promote the awareness of flood insurance.

Table 5-1 identifies each community and the date each participant joined the NFIP.

Table 5-1: Additional Information on Communities Participating in the NFIP

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Floodplain Ordinance
Macoupin County	9/18/1986	1/6/1978	N/A	N/A	9/18/1986
City of Benld	N/A	N/A	N/A	N/A	N/A
City of Bunker Hill	N/A	N/A	N/A	N/A	N/A
City of Carlinville	9/4/1986	9/4/1986	N/A	N/A	1996
City of Gillespie	8/4/1987	8/4/1987	N/A	N/A	8/4/1987
City of Girard	N/A	N/A	N/A	N/A	N/A
City of Mount Olive	N/A	N/A	N/A	N/A	N/A
City of Staunton	7/17/1981	7/17/1981	N/A	N/A	9/28/2003
City of Virden	5/25/1978	5/3/2004	N/A	N/A	5/3/2004
Town of Nilwood	N/A	N/A	N/A	N/A	N/A
Town of Shipman	N/A	N/A	N/A	N/A	N/A
Village of Brighton	5/13/2009	4/2/2009	N/A	N/A	5/13/2009
Village of Chesterfield	N/A	N/A	N/A	N/A	N/A
Village of Dorchester	N/A	N/A	N/A	N/A	N/A
Village of Eagarville	N/A	N/A	N/A	N/A	N/A
Village of East Gillespie	N/A	N/A	N/A	N/A	N/A
Village of Hettick	N/A	N/A	N/A	N/A	N/A
Village of Medora	N/A	N/A	N/A	N/A	N/A
Village of Modesto	N/A	N/A	N/A	N/A	N/A
Village of Mount Clare	N/A	N/A	N/A	N/A	N/A
Village of Palmyra	N/A	N/A	N/A	N/A	N/A
Village of Royal Lakes	N/A	N/A	N/A	N/A	N/A
Village of Sawyerville	N/A	N/A	N/A	N/A	N/A
Village of Scottville	N/A	N/A	N/A	N/A	N/A
Village of Standard City	N/A	N/A	N/A	N/A	N/A
Village of White City	N/A	N/A	N/A	N/A	N/A
Village of Wilsonville	N/A	N/A	N/A	N/A	N/A

5.1.2 Stormwater Management Stream Maintenance Ordinance

There is no stormwater management ordinance for Macoupin County or any of its municipalities.

5.1.3 Zoning Management Ordinance

Unincorporated Macoupin County does not have zoning regulations, but the City of Carlinville and Staunton regulate all aspects of zoning including types of land use, building regulations, and procedures for construction approval within their municipality. Table 5-2 lists the adoption dates of plans and ordinances within the county.

Table 5-2: Description of Zoning Plans/Ordinances

Community	Comprehensive Plan	Zoning Ord.	Subdivision Control Ord.	Erosion Control	Storm Water Mgmt	Burning Ord.	Seismic Ord.	Bldg. Standards
Macoupin County	2009	N/A	11-8-2005	N/A	N/A	N/A	N/A	N/A
City of Benld	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Bunker Hill	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Carlinville	N/A	4-3-2006	N/A	4-3-2006*	N/A	N/A	N/A	N/A
City of Gillespie	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Girard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Mount Olive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
City of Staunton	N/A	4-27-2009	12-5-2005	N/A	N/A	7-12-1999	N/A	N/A
City of Virden	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Town of Nilwood	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Town of Shipman	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Brighton	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Chesterfield	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Dorchester	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Eagarville	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of East Gillespie	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Hettick	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Medora	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Modesto	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Mount Clare	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Palmyra	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Royal Lakes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Sawyerville	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Scottville	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Standard City	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of White City	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Village of Wilsonville	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*The date given is the most recent updated version of that ordinance. *The issue is addressed within another ordinance within that jurisdiction.*

5.1.4 Erosion Management Program/ Policy

Macoupin County does not have an erosion management program.

5.1.5 Fire Insurance Rating Programs/ Policy

Table 5-3 lists Macoupin County's fire departments and respective information.

Table 5-3: Macoupin County Fire Departments, Ratings, and Number of Firefighters

Fire Department	Fire Insurance Rating	Number of Firefighters
Benld Volunteer Fire Department	6	25
Brighton Betsey Ann Fire Protection District	1.5	42
Bunker Hill Fire Protection District	8	15
Carlinville Fire Department	5	24
Dorchester Volunteer Fire Department	6	20
Gillespie Volunteer Fire Department	6	75
Girard Fire Protection District	8	25
Hettick Fire Department	10	15
Medora Community Fire Protection District	7-8	20
Mt. Olive Fire Protection District	5/9	30
Palmyra Fire Dept	10	10
Scottville-Modesto Rural Fire Protection	8/9	15
Shipman Fire Department	8	25
Staunton Fire Protection District	5	45
Virden Fire Department	5	30

5.1.6 Land Use Plan

Macoupin County does not have a land use plan; the City of Carlinville and Staunton address land use within its zoning ordinance.

5.1.7 Building Codes

Macoupin County uses the Illinois State Building Code as their guide for building standards.

5.2 Mitigation goals

In Section 4 of this plan, the risk assessment identified Macoupin County as prone to eight hazards. The MHMP planning team members understand that although hazards cannot be eliminated altogether, Macoupin County can work toward building disaster-resistant communities. Following are a list of goals, objectives, and actions. The goals represent long-term, broad visions of the overall vision the county would like to achieve for mitigation. The objectives are strategies and steps that will assist the communities in attaining the listed goals.

Goal 1: Lessen the impacts of hazards to new and existing infrastructure

(a) Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.

(b) Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.

(c) Objective: Minimize the amount of infrastructure exposed to hazards.

(d) Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.

(e) Objective: Improve emergency sheltering in Macoupin County.

Goal 2: Create new or revise existing plans/maps for Macoupin County

(a) Objective: Support compliance with the NFIP for each jurisdiction in Macoupin County.

(b) Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.

(c) Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.

Goal 3: Develop long-term strategies to educate Macoupin County residents on the hazards affecting their county

(a) Objective: Raise public awareness on hazard mitigation.

(b) Objective: Improve education and training of emergency personnel and public officials.

5.3 Mitigation Actions/Projects

Upon completion of the risk assessment and development of the goals and objectives, the planning committee was provided a list of the six mitigation measure categories from the *FEMA State and Local Mitigation Planning How to Guides*. The measures are listed as follows:

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and

erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held May 19, 2010, MHMP members were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The MHMP members brought their mitigation ideas to Meeting #4 which was held July 13, 2010. The evaluation criteria (STAPLE+E) involved the following categories and questions.

Social:
- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Technical:
- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

Administrative:
- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

Political:
- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

Legal:
- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolution in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation strategy address continued compliance with the NFIP?

Economic:

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be "tabled" for implementation until outside sources of funding are available?

Environmental:

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

5.4 Implementation Strategy and Analysis of Mitigation Projects

Implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step is to decide, based upon many factors, which action will be undertaken first. In order to pursue the top priority first, an analysis and prioritization of the actions is important. Some actions may occur before the top priority due to financial, engineering, environmental, permitting, and site control issues. Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

In Meeting #4, the planning team prioritized mitigation actions based on a number of factors. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 5-4. A rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 5-5.

Table 5-4: STAPLE+E planning factors

S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review,

	and possible to fund.
E – Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

For each mitigation action related to infrastructure, new and existing infrastructure was considered. Additionally, the mitigation strategies address continued compliance with the NFIP. While an official cost benefit review was not conducted for any of the mitigation actions, the estimated costs were discussed. The overall benefits were considered when prioritizing mitigation items from high to low. An official cost benefit review will be conducted prior to the implementations of any mitigation actions. Table 5-5 presents mitigation projects developed by the planning committee, as well as actions that are ongoing or already completed. Since this is the first mitigation plan developed for Macoupin County, there are no deleted or deferred mitigation items.

Table 5-5: Mitigation Strategies

Mitigation Item	Goals and Objectives	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Purchase and install new warning sirens within the county	Goal: Improve hazard communication with the public Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Thunderstorm	Burden, Carlinville, Girard, Staunton	Complete	A number of communities in the county are well equipped with sirens.
Implement Nixle for mass media release via e-mail, telephone and text messages	Goal: Improve hazard communication with the public Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence, Fire, Drought	Carlinville	Complete	Carlinville has implemented and advertised Nixle within the community.
Conduct a commodity flow study	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	Macoupin County	Complete	The County recently completed a commodity flow study.
Establish an active LEPC	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Fire, Drought, Subsidence	Macoupin County	Complete	Macoupin County has an active LEPC.
Distribute weather radios to critical facilities	Goal: Improve hazard communication with the public Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Thunderstorm, Flood, Earthquake, Drought, Winter Storm	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Complete	Critical facilities throughout the county are equipped with weather radios.
Conduct a drainage study and make necessary improvements	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Staunton	Complete	Staunton has successfully completed its study and has begun to mitigate the flooding issues.
Create a database for identification of special needs population and institute a plan for rescue and recovery	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Subsidence	Macoupin County	In Progress	The development of the database is in progress.

Mitigation Item	Goals and Objectives	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Participate in MABUS	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat	Bunker Hill, Brighten, Staunton, Viren	Ongoing	Some of the communities have an ongoing relationship with MABUS.
Trim trees to minimize the amount/duration of power outages	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Winter Storm	Macoupin County	Ongoing	This is an ongoing practice in Macoupin County.
Enforce codes requiring mobile homes to have tie-downs	Goal: Create new or revise existing plans for the community Objective: Review and update existing community plans and ordinances to support hazard mitigation.	Tornado, Thunderstorm	Macoupin County	Ongoing	The county has established and enforces this ordinance.
Conduct a new flood study (DFIRM)	Goal: Create new or revise existing plans/maps for the community Objective: Support compliance with the NFIP for each jurisdiction.	Flood	Macoupin County	High	The County Floodplain Manager will oversee this project. FEMA will be approached for funding and assistance with the study. If funding is available, implementation will begin within one year.
Improve emergency radio coverage throughout the county	Goal: Improve communications amongst first responders Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	High	The County EMA Coordinator oversees the implementation of the project. Funding for new equipment/towers will be sought from local, state, and federal resources. Implementation, if funding is available, is forecasted to begin within one year.
Implement new plans for public education including distribution of first aid kits and weather radios and pamphlets that address the importance of retrofitting infrastructure	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Drought, Fire, Subsidence	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	High	The County EMA Coordinator will work with area schools, healthcare facilities, and businesses to implement this project. Funding will be sought from local sources. Implementation, if funding is available, will begin within one year.
Purchase new transfer switches for all critical facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Earthquake, Thunderstorm, Winter Storm	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	High	The County EMA Coordinator will oversee the implementation of this project. Local resources will be used to determine which facilities should receive transfer switches. The pre-disaster mitigation program and community development grants are possible funding sources. If funding is available, this project is forecasted to begin within one year.

Mitigation Item	Goals and Objectives	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct a sewer upgrade to separate stormwater and sanitary sewer lines	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Carlinville, Staunton	High	Some communities in the county have CSO or plans in place but many require additional funding to complete the projects. Funding will be sought from IEPA, IEMA, and FEMA. Implementation will begin within one year if funding is available.
Develop a debris management plan that includes roles and responsibilities of the LEPC and other county departments	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Flood, Tornado, Thunderstorm, Winter Storm	Macoupin County	High	The County LPEC will work with other County planning departments to develop the debris management plan. Local resources will be used to update and maintain the plan.
Institute Reverse 911 or similar mass notification system	Goal: Improve the hazard awareness communication to the public Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Fire, Subsidence	Macoupin County	High	The County E?A Coordinator oversees the implementation of the project. Local resources will be used to maintain the system. Funding to implement the new system will be sought from the PDM program and state and federal resources. Implementation, if funding is available, is forecasted to begin within one year.
Strengthen mutual aid response agreements	Goal: Improve coordination between first responders Objective: Improve education and training of emergency personnel and public officials	Hazmat	Macoupin County	High	The County EMA Coordinator director will work with neighboring counties to establish and/or strengthen the agreements. If resources are available, implementation will begin within one year.
Conduct a study to evaluate the strength of the county's critical facilities infrastructure. Harden critical facilities as necessary	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Tornado, Flood, Thunderstorm, Earthquake, Winter Storm, Fire	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Medium	The County Engineer will oversee this project. FEMA, IEMA, and community grants may help to fund the study, document the findings, and determine funding sources for hardening the structures. Implementation, if funding is available, will begin within three years.
Create maps of undermined areas in the county	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Subsidence	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Medium	The County Engineer will oversee this project. The county will seek assistance from FEMA , IEMA, and IDMR. If funding is available, implementation will begin within three years.

Mitigation Item	Goals and Objectives	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct a study to evaluate bridge infrastructure strength	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Medium	The County Engineer will oversee the implementation of this project with assistance from IEMA and ILDOT. IEMA and ILDOT grants will be used to procure funds for the study, which is forecasted to begin within three years.
Establish shelters/warming centers/cooling centers in mobile home parks and recreational parks and within each incorporated community	Goal: Lessen the impacts of hazards to at risk populations Objective: Improve emergency sheltering in the community.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Drought, Hazmat, Subsidence	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Medium	The County Floodplain Manager will oversee this project. A shelter study will be used to identify shelter areas. Funding has not been secured as of 2010, but the PDM program and community development grants are possible sources. Implementation will begin within three years.
Assess and upgrade drainage systems throughout the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Medium	The County will work with the ILDOT to implement this project. Funding as not been secured as of 2010, but ILDOT and IDNR are potential sources. Implementation, if funding is available, will begin within three years.
Conduct a study to determine areas throughout the county that need new sirens. Purchase and install new warning sirens within the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Thunderstorm	Macoupin County, Benld, Bunker Hill, Gillespie, Mount Olive, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville,	Medium	The County Floodplain Manager oversees the implementation of the project. Local resources will be used to maintain the warning systems. Additional funding for the study and implementation will be sought from the PDM program and FEMA. Implementation, if funding is available, is forecasted to begin within one year.
Develop or adapt guidelines or ordinances which require higher building and safety standards for new public and governmental buildings	Goal: Improve resilience of local government to disasters Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire, Subsidence	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Low	The local planning commission will develop the guidelines working with outside engineers. Funding sources will include local, state, and federal agencies and community grant opportunities. Implementation will begin within one year.
Conduct a study to determine availability of 4WD vehicles	Goal: Improve first responder coordination Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Winter Storm	Macoupin County, Benld, Bunker Hill, Carlinville, Gillespie, Girard, Mount Olive, Staunton, Virden, Nilwood, Shipman, Brighton, Chesterfield, Dorchester, Eagarville, East Gillespie, Hettick, Medora, Modesto, Mount Clare, Palmyra, Royal Lakes, Sawyerville, Scottville, Standard City, White City, Wilsonville	Low	The EMA Director will coordinate this project. Local resources will be used to survey the availability and create a database. Implementation will begin within five years.

Mitigation Item	Goals and Objectives	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Re-route raile line through Carlinville	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Hazmat, Fire	Carlinville	Low	Carlinville government officials and first responders will oversee this project. Local resources, e.g. rail companies, will be approached to implement this project, and funding will be sought from local, state, and federal resources and community grants. If funding and resources are available, the project will begin within five years.
Develop ordinances to bury new power lines in subdivisions	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Tornado, Earthquake, Thunderstorm, Winter Storm	Macoupin County	Low	Although there is not a formal ordinance in place, new subdivisions typically bury power lines. The county will propose development of ordinances to require this practice for all future infrastructure. Local resources will be used to develop the ordinances.
Increase training and equipment for the Community Emergency Response Team (CERT)	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	Tornado, Thunderstorm, Flood, Earthquake, Drought, Winter Storm, Hazmat, Subsidence, Fire	Macoupin County	Low	The County EMA and other local officials will oversee this project. Local resources and community grants will be used to implement and fund this project. If funding and resources are available, the project will begin within five years.

The EMA Director will be the local champion for the mitigation actions. The County Commissioners and the city and town councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions.

5.5 Multi-Jurisdictional Mitigation Strategy

As a part of the multi-hazard mitigation planning requirements, at least two identifiable mitigation action items have been addressed for each hazard listed in the risk assessment and for each jurisdiction covered under this plan.

Each of the twenty-seven incorporated communities within and including Macoupin County were invited to participate in brainstorming sessions in which goals, objectives, and strategies were discussed and prioritized. Each participant in these sessions was armed with possible mitigation goals and strategies provided by FEMA, as well as information about mitigation projects discussed in neighboring communities and counties. All potential strategies and goals that arose through this process are included in this plan. The county planning team used FEMA's evaluation criteria to gauge the priority of all items. A final draft of the disaster mitigation plan was presented to all members to allow for final edits and approval of the priorities.

Section 6 - Plan Maintenance

6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Macoupin County Emergency Management Agency will reconvene the MHMP planning committee to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during January 2016 to address the five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the county goals and objectives to determine their relevance to changing situations in the county. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by the county commissioners.

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. This updated HAZUS-MH GIS data has been returned to the county for use and maintenance in the county's system. As newer data becomes available, this updated data will be used for future risk assessments and vulnerability analyses.

6.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts since many of the mitigation projects identified as part of this planning process are ongoing. Macoupin County and its incorporated jurisdictions will update the zoning plans and ordinances listed in Table 5-2 as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the EMA director and forwarded to the MHMP planning committee for discussion. Education efforts for hazard mitigation will be ongoing through the EMA. The public will be notified of periodic planning meetings through notices in the local newspaper. Once adopted, a copy of this plan will be maintained in each jurisdiction and in the County EMA Office.

APPENDICES

Glossary of Terms

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

AEGL – Acute Exposure Guideline Levels
ALOHA – Areal Locations of Hazardous Atmospheres

B

BFE – Base Flood Elevation

C

CAMEO – Computer-Aided Management of Emergency Operations
CEMA – County Emergency Management Agency
CEMP – Comprehensive Emergency Management Plan
CERI – Center for Earthquake Research and Information
CRS – Community Rating System

D

DEM – Digital Elevation Model
DFIRM – Digital Flood Insurance Rate Map
DMA – Disaster Mitigation Act

E

EAP – Emergency Action Plan
ERPG – Emergency Response Planning Guidelines
EMA – Emergency Management Agency
EPA – Environmental Protection Agency

F

FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Maps
FIS – Flood Information Study

G

GIS – Geographic Information System

H

HAZUS-MH – **Ha**zards **US**A **M**ulti-**H**azard
HUC – Hydrologic Unit Code

I

IDNR – Illinois Department of Natural Resources
IEMA – Illinois Emergency Management Agency
IDOT - Illinois Department of Transportation

M

MHMP – Multi-Hazard Mitigation Plan

N

NCDC – National Climatic Data Center
NEHRP – National Earthquake Hazards Reduction Program
NFIP – National Flood Insurance Program
NOAA – National Oceanic and Atmospheric Administration

P

PPM – Parts Per Million

R

RPI – Risk Priority Index

S

SPC – Storm Prediction Center
SWPPP – Storm water Pollution Prevention Plan

U

USGS – United States Geological Survey

Appendix A: Multi-Hazard Mitigation Plan Meeting Minutes

IEMA Pre-Disaster Mitigation Plan

Assembly of the Macoupin County Planning Team Meeting 1:
Chairman: James Pitchford, Macoupin County EMA
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: Thursday, February 11, 2010

Meeting Time: 10 a.m.

Place: County Board Room 215 S. East Street Carlinville, IL 62626

Planning Team/Attendance:

Jonathan Remo	SIUC Geology
Megan Carlson	SIU Geology
Jim Pitchford	Macoupin County EMA
Wayne Joplin	City of Virden
London Simmons	Royal Lakes
Dean Plovich	City of Gillespie
Don Harvill	Wilsonville
Michael Cabanaugh	WCDC
John Bresnan	Macoupin County
John M. Lutz	City of Girard
Robert Mertz	Staunton
John Willmon	Staunton
Aaron Shipley	Carlinville
Don Downing	Carlinville LEPC
Raymond Chapman	Bunker Hill City
Aaron Bishop	Macoupin County ETSD
Kent Tarro	Macoupin County Public Health
David Hopper	Macoupin County Health Department
Mary Beth Bellm	City of Carlinville
Tom Reinhart	Macoupin County Hwy Department
Brad Targhetta	Macoupin County Coroner

Introduction to the Pre-Disaster Mitigation Planning Process

The meeting is called to order

Narrative: A power-point presentation was given by Jonathan Remo. He explained that this project is in response to the Disaster Mitigation Act of 2000. The project is funded by a grant awarded by FEMA. A twenty-five percent match will be required from the county to fund this project. The county match will be met by sweat equity and GIS data acquired from the County Assessor's Office. The sweat equity will be an accumulation of time spent at the meetings, on research assignments, surveys, along with the time spent reviewing and producing the planning document.

Jonathan Remo introduced the Pre-Disaster Mitigation Website to the planning team. A username and password was given to the planning team, which will grant them access to the web site. The web site is used to schedule meetings, post contact information and download material pertaining to the planning process.

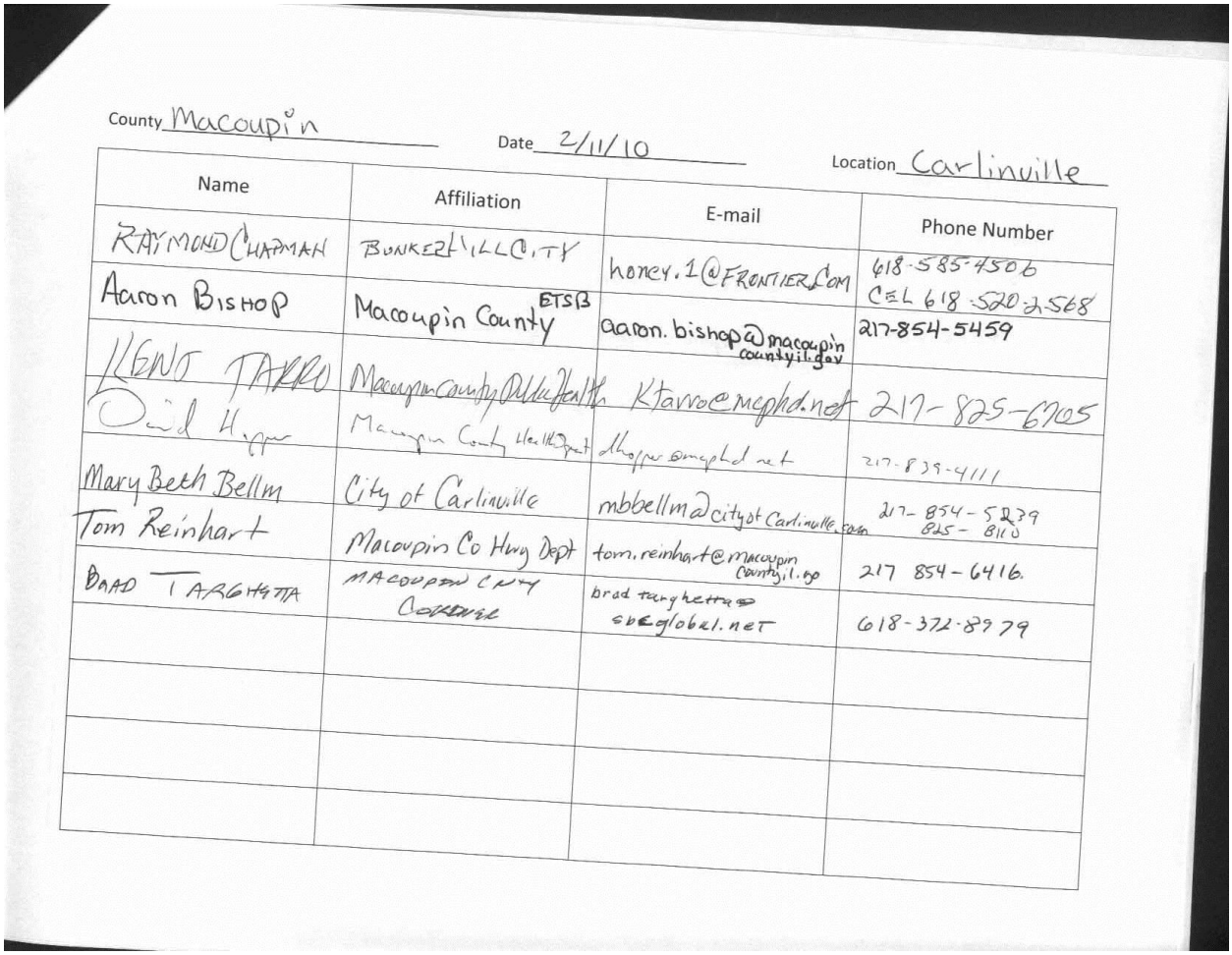
Jonathan Remo divided the planning project into five to six meetings. At the 1st meeting, the planning team will review critical facility maps. The planning team will be asked to research and verify the location of all critical facilities within the county. Jonathan stated that public participation is very important throughout the planning process. He explained that all of the meetings are open to the public but there will be a particular effort made to invite the public to the 3rd meeting. At that meeting, the SIU Geology Department will present historic accounts of natural disasters that have affected this area. At the 2nd meeting the discussion will focus on natural disasters that are relevant to this area. These hazards will be given a probability rating and ranked by their occurrence and potential level of risk. Polis and SIU Geology will research these hazards and present them to the planning team. The 3rd meeting is publicized in order to encourage public participation. Polis and SIU Geology will produce a risk assessment in draft form; each planning team member will get a copy. Also they will present strategies and projects that FEMA and other counties have undertaken for the planning team to review. The 4th meeting consists of a brain storming session focused on disasters that were analyzed in the risk assessment report. The Planning Team will list strategies and projects that could be implemented to mitigate the potential hazards that threaten the county. FEMA requires that for every identified hazard, a strategy to mitigate the loss and damage must be in place. The strategies may range from educational awareness to hardening a building or building a levee. After the 4th meeting the plan will be in its final draft form. At the 5th meeting the planning team will need to review the plan prior to sending it to IEMA. IEMA will review the plan and will make recommendation to it as they see fit, then it is submitted to FEMA for review and approval. Once the plan has been submitted to FEMA, local governments are eligible to apply for grants to mitigate these established hazards. After FEMA approves the plan, it is sent back to the Planning Team. At the 6th meeting the Planning Team will present the Pre-Disaster Mitigation Plan to the County Board for adoption. Incorporated communities must either adopt the county plan or prepare its own plan, in order to access mitigation assistance from FEMA. The communities are encouraged to participate and contribute to development of the plan. Once the County Board has adopted the plan, each incorporated community will have the opportunity to adopt the plan as well.

Jonathan Remo then introduced Megan Carlson of SIU. Megan Carlson presented three maps that identified critical facilities in the county. She asked the planning team to come up to review the maps to identify any corrections that need to be made to the maps. She assigned research homework arranged by categories to individual planning team members to locate missing or incorrect critical facilities.

Meeting was adjourned.

County Macoupin Date 2/10/10 Location Carlinville

Name	Affiliation	E-mail	Phone Number
Wayne Joplin	City of Virden	wjoplin@royell.net	217-883-3232
London Simmons	Royal Lakes	LSimmo7@yahoo.com	217-825-7489
Dean Plovich	City of Gillespie	dplovich@yahoo.com	(618) 980-0021
Don Harvill	Wilsonville		217-835-2498
Michael Cavanaugh	MCOC	mjcavso@hotmail.com	217-854-9642
John Bresnan	Macoupin Co.	jbresnan@macoupincountyil.gov	854-8281
John M. Lutz	City of Girard		217-627-3771
Robert Mertz	Staunton	Stauntonpolice@yahoo.com	618-635-3333
John Willmon	Staunton	NCCMUSN9@MADISONTELCO.COM	217-827-0860
Aaron Shipley	Carlinville	ASHIPLEY@KARMAK.COM	217-473-2486
Don Downing	Carlinville LEPC	ddowning@mmservice.com	217-854-4516



County Macoupin Date 2/11/10 Location Carlinville

Name	Affiliation	E-mail	Phone Number
RAYMOND CHAPMAN	BUNKER HILL CITY	honey.1@FRONTIER.COM	618-585-4506 CEL 618-520-2568
Aaron Bishop	Macoupin County ETSB	aaron.bishop@macoupincountyil.gov	217-854-5459
KENT TARRO	Macoupin County Public Health	Ktarro@mcphd.net	217-825-6705
Chad Hoppe	Macoupin County Health Dept	choppe@mcphd.net	217-839-4111
Mary Beth Bellm	City of Carlinville	mbbellm@cityofcarlinville.com	217-854-5279 825-8110
Tom Reinhart	Macoupin Co Hwy Dept	tom.reinhart@macoupincounty.il.gov	217 854-6416
BRAD TARGHETTA	MACOUPIN CNTY COMMISS	bradtarghetta@sbcglobal.net	618-372-8979

IEMA Pre-Disaster Mitigation Plan

Assembly of the Macoupin County Planning Team Meeting 2:
Chairman: James Pitchford, Macoupin County EMA
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: Wednesday, March 24, 2010

Meeting Time: 7 p.m.

Place: County Board Room, 215 South East Street, Carlinville

Planning Team/Attendance:

Jonathan Remo	SIU Geology
Megan Carlson	SIU Geology
Jim Pitchford	Macoupin County EMA
Wayne Joplin	City of Virden
Aaron Bishop	Macoupin County ETSD
Michael Cabanaugh	WCTC
Don Harvill	Wilsonville
Don Downing	LEPC
Larry Pfeiffer	Reg. Office of Education
Kent Tarro	Macoupin County Public Health
David Hopper	Macoupin County Public Health
Mary Beth Bellm	City of Carlinville
Tom Reinhart	Macoupin County HWY Department
Aaron Shipley	Carlinville EMA
Rick Haast	Staunton Fire Protection Department
John Willmon	Mayor-Staunton
Bob Mertz	Police Chief-Staunton
Ray Chapman	Mayor-Bunker Hill
Gerald W. Emshousen	Chief Bunker Hill/PD

The meeting was called to order.

Jonathan Remo began the meeting by re-introducing the objectives of the PDM Planning document. The planning document is mandated as a result of the "Disaster Mitigation Act of 2000". Jonathan stated that the objective of the meeting was to prioritize a list of disasters that are relevant to Macoupin County.

Jonathan Remo provided the planning team with a handout to direct the focus of the meeting discussion. As Jonathan began to conduct the prioritizing process, he described the risk assessment ranking that FEMA has established.

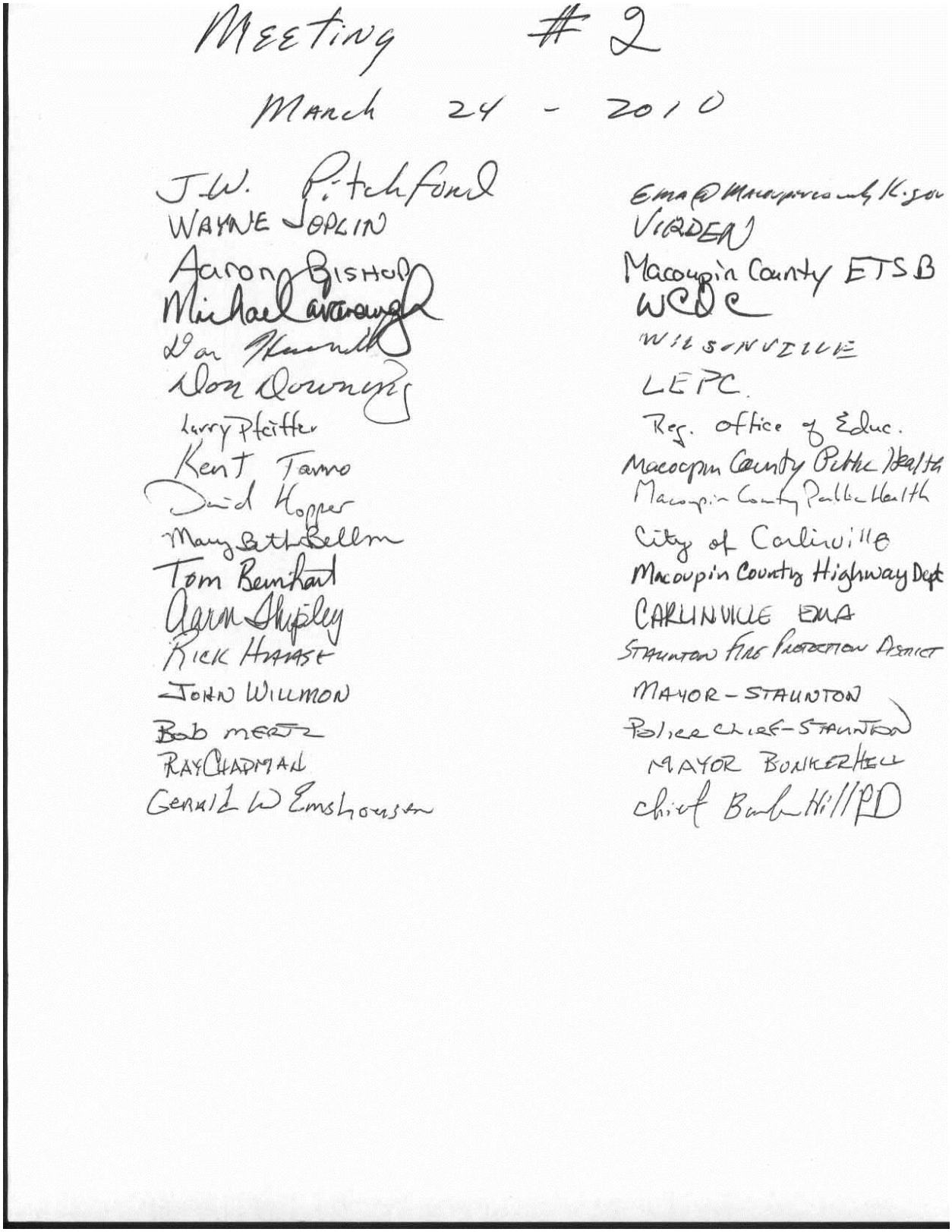
Narrative: The Planning Team was then asked to assess and rank the hazards that could potentially befall Macoupin County using the risk priority index (RPI). The identified hazards were ranked as followed for Macoupin County:

#1: Tornado
#2: Transportation Hazardous Material Release
#3: Thunderstorms/High Winds/Hail/Lightning
#4: Winter Storms
#5: Subsidence
#6: Flooding
#7: Earthquake
#8: Fire/Explosion
#9: Dam/Levee Failure

Narrative: The planning team was then asked to analyze the historical weather events that have been plotted on a map of the county and communities therein. No corrections were noted by the planning team.

The planning team agreed to complete any missing information pertaining to critical facilities by the next meeting.

Meeting was adjourned.



MEETING #2

MARCH 24 - 2010

J.W. Pitchford	EMA @ Macoupin County K-9 Unit
WAYNE JOPLIN	VIRDEN
Aaron Bishop	Macoupin County ETSB
Michael Cavanaugh	WCDC
Dan Kennedy	WILSONVILLE
Don Downing	LEPC.
Larry Pfeiffer	Reg. office of Educ.
Kent Tanno	Macoupin County Public Health
David Hopper	Macoupin County Public Health
Mary Beth Bellm	City of Carlinville
Tom Reinhard	Macoupin County Highway Dept
Aaron Shipley	CARLINVILLE EMA
Rick Haase	STAUNTON FIRE PROTECTION DISTRICT
JOHN WILLMON	MAYOR - STAUNTON
Bob Mertz	Police Chief - STAUNTON
RAY CHAPMAN	MAYOR BUNKER HILL
Gerald W Emshousen	Chief Bunker Hill PD

IEMA Pre-Disaster Mitigation Plan

Assembly of the Macoupin County Planning Team Meeting 3:
Chairman: James Pitchford, Macoupin County EMA
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: May 19, 2010

Meeting Time: 7 p.m.

Place: County Board Room

Planning Team/Attendance:

Jonathan Remo	SIU Geology
Megan Carlson	SIU Geology
Jim Pitchford	Macoupin County EMA
Aaron Bishop	Macoupin County ETSD
Robert Mertz	Staunton
Wayne Joplin	City of Virden

The meeting was called to order.

Jonathan Remo opened the meeting with an overview of the planning process and the roles of SIU and the Polis Center. Then he went on to explain the topics and objectives of the current meeting. Jonathan first presented the planning team with the list of hazards that the team had ranked by their level of risk from the previous meeting. He also presented a power point presentation of the history of Macoupin County's past disasters. This included covering each hazard that the County had focused on, the history of each and then the mitigation strategies. He defined mitigation as the act of avoidance and preparedness.

A draft of the Macoupin County Mitigation Plan and a copy of Mitigation Ideas, produced by FEMA Region 5 in July 2002, were given to each of the planning team members for review. It was explained by Jonathan the contents of the booklet and that each of the planning team members should return to meeting 4 with three mitigation strategies for each of the hazards identified by the planning team.

Jonathan Remo then asked the audience for questions or comment. After some discussion about the plan and how it would affect the community and its residents, he thanked those who came and a closed the presentation.

Meeting was adjourned.

MEETING 3 SIGN-IN

NAME	AFFILIATION	EMAIL
Jim Ritchford	EMA	
Aann Bishop	ETSB	
Robert Mertz	Staunton	
Wayne Joplin	Virden	

IEMA Pre-Disaster Mitigation Plan

Assembly of the Macoupin County Planning Team Meeting 4:
Chairman: James Pitchford, Macoupin County EMA
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: July 13, 2010

Meeting Time: 7 p.m.

Place: County Board Room 215 S. East Street, Carlinville, IL 62626

Planning Team/Attendance:

Jonathan Remo	SIU Geology
Beth Elision	SIU Geology
George Holesko	City of Gillespie
Jim Pitchford	Macoupin County EMA
Wayne Joplin	City of Virden
David Haley	Carlinville PD
David Hopper	Macoupin County Public Health
Rick Haase	Staunton Fire District
John Lutz	City of Girard
John Willmon	Staunton
Robert Mertz	Staunton
John Bresna	Macoupin County
Aaron Shipley	Carlinville EMA

The meeting was called to order.

Jonathan Remo thanked everyone for attending the meeting and stated that if the planning team members needed extra mitigation strategy handbooks that they were available upon request. He introduced John Buechler and Laura Danielson from the Polis Center that were also in attendance that day.

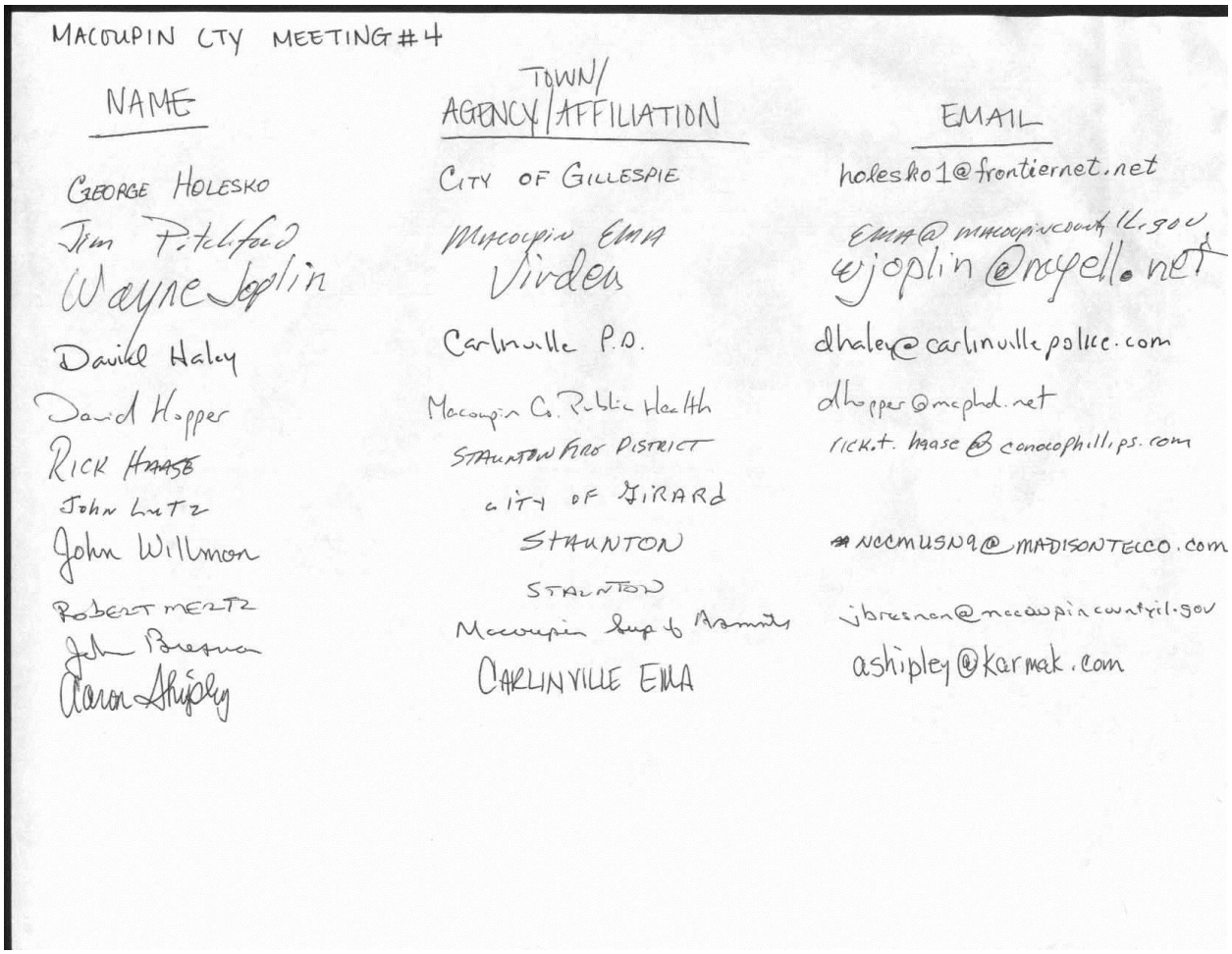
Laura Danielson began by explaining that today's meeting would cover mitigation strategies that the planning team believed would prevent or eliminate the loss of life and property. She explained that the planning team should not make any reservations in the form of money or resources when developing this list. Also whenever possible, the planning team was directed to be specific about the location or focus area of a strategy, in respect to being within a municipality or county wide. Each hazard was addressed one at a time. The planning team listed new and current on-going mitigation strategies in respect to each hazard. The planning team prioritized mitigation actions based on a number of factors. A rating of High, Medium, or Low was assessed for each mitigation item. Listed below are the New Mitigation Strategies that the Planning Team came up with:

Mitigation Item	Goals and Objects Satisfied	Priority	Comments
Purchase and install new warning sirens within the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Complete	A number of communities in the county are well equipped with sirens.
Implement Nixle for mass media release via e-mail and text messages	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Complete	Carlinville has implemented and advertised Nixle within the community.
Conduct a commodity flow study	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Complete	The County recently completed a commodity flow study.
Establish an active LEPC	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	Complete	Macoupin County has an active LEPC.
Distribute weather radios to critical facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Complete	Critical facilities throughout the county are equipped with weather radios.
Conduct a drainage study and make necessary improvements	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Complete	Staunton has successfully completed its study and has begun to mitigate the flooding issues.
Create a database for identification of special needs population and institute a plan for rescue and recovery	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	In Progress	The development of the database is in progress.
Participate in MABUS	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Ongoing	Some of the communities have an ongoing relationship with MABUS.
Trim trees to minimize the amount/duration of power outages	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Ongoing	This is an ongoing practice in Macoupin County.
Enforce codes requiring mobile homes to have tie-downs	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing community plans and ordinances to support hazard mitigation.	Ongoing	The county has established and enforces this ordinance.
Conduct a new flood study (DFIRM)	Goal: Create new or revise existing plans/maps for the community Objective: Support compliance with the NFIP for each jurisdiction.	High	The County EMA will oversee this project. FEMA will be approached for funding and assistance with the study. If funding is available, implementation will begin within one year.

Mitigation Item	Goals and Objects Satisfied	Priority	Comments
Improve emergency radio coverage throughout the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	High	The County EMA oversees the implementation of the project. Funding for new equipment/towers will be sought from local, state, and federal resources. Implementation, if funding is available, is forecasted to begin within one year.
Implement new plans for public education including distribution of first aid kits and weather radios and pamphlets that address the importance of retrofitting infrastructure	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	High	The County EMA will work with area schools, healthcare facilities, and businesses to implement this project. Funding will be sought from local sources. Implementation, if funding is available, will begin within one year.
Purchase new transfer switches for all critical facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	High	The County EMA will oversee the implementation of this project. Local resources will be used to determine which facilities should receive transfer switches. The pre-disaster mitigation program and community development grants are possible funding sources. If funding is available, this project is forecasted to begin within one year.
Conduct a sewer upgrade to separate storm water and sanitary sewer lines	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	High	Some communities in the county have CSO or plans in place but many require additional funding to complete the projects. Funding will be sought from IEPA, IEMA, and FEMA. Implementation will begin within one year if funding is available.
Develop a debris management plan that includes roles and responsibilities of the LEPC and other county departments	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	High	The County LEPC will work with other County planning departments to develop the debris management plan. Local resources will be used to update and maintain the plan.
Institute Reverse 911 or similar mass notification system	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	High	The County EMA oversees the implementation of the project. Local resources will be used to maintain the system. Funding to implement the new system will be sought from the PDM program and state and federal resources. Implementation, if funding is available, is forecasted to begin within one year.
Strengthen mutual aid response agreements	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	High	The EMA director will work with neighboring counties to establish and/or strengthen the agreements. If resources are available, implementation will begin within one year.
Conduct a study to evaluate the strength of the county's critical facilities infrastructure. Harden critical facilities as necessary	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Medium	The County EMA will oversee this project. FEMA, IEMA, and community grants may help to fund the study, document the findings, and determine funding sources for hardening the structures. Implementation, if funding is available, will begin within three years.
Create maps of undermined areas in the county	Goal: Create new or revise existing plans/maps for the community Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Medium	The County EMA will oversee this project. The county will seek assistance from FEMA and IEMA. If funding is available, implementation will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Priority	Comments
Conduct a study to evaluate bridge infrastructure strength	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Medium	The County EMA and the LEPC will oversee the implementation of this project with assistance from IEMA and ILDOT. IEMA and ILDOT grants will be used to procure funds for the study, which is forecasted to begin within three years.
Establish shelters/warming centers/cooling centers in mobile home parks and recreational parks and within each incorporated community	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the community.	Medium	The County EMA will oversee this project. A shelter study will be used to identify shelter areas. Funding has not been secured as of 2010, but the PDM program and community development grants are possible sources. Implementation will begin within three years.
Assess and upgrade drainage systems throughout the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Medium	The County will work with the ILDOT to implement this project. Funding as not been secured as of 2010, but ILDOT and DNR are potential sources. Implementation, if funding is available, will begin within three years.
Conduct a study to determine areas throughout the county that need new sirens. Purchase and install new warning sirens within the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Medium	The County EMA oversees the implementation of the project. Local resources will be used to maintain the warning systems. Additional funding for the study and implementation will be sought from the PDM program and FEMA. Implementation, if funding is available, is forecasted to begin within one year.
Develop or adapt guidelines or ordinances which require higher building and safety standards for new public and governmental buildings	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Low	The EMA director will oversee this project. The local planning commission will develop the guidelines working with outside engineers. Funding sources will include local, state, and federal agencies and community grant opportunities. Implementation will begin within one year.
Conduct a study to determine availability of 4WD vehicles	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Low	The County EMA will coordinate this project. Local resources will be used to survey the availability and create a database. Implementation will begin within five years.
Re-route rail line through Carlinville	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Low	Carlinville government officials and first responders will oversee this project. Local resources, e.g. rail companies, will be approached to implement this project, and funding will be sought from local, state, and federal resources and community grants. If funding and resources are available, the project will begin within five years.
Develop ordinances to bury new power lines in subdivisions	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Low	Although there is not a formal ordinance in place, new subdivisions typically bury power lines. The county will propose development of ordinances to require this practice for all future infrastructure. Local resources will be used to develop the ordinances.

Mitigation Item	Goals and Objects Satisfied	Priority	Comments
Increase training and equipment for the Community Emergency Response Team (CERT)	Goal: Develop long-term strategies to educate the community residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials.	Low	The County EMA and other local officials will oversee this project. Local resources and community grants will be used to implement and fund this project. If funding and resources are available, the project will begin within five years.



MACOUPIN CTY MEETING #4

NAME	TOWN/ AGENCY/AFFILIATION	EMAIL
GEORGE HOLESKO	CITY OF GILLESPIE	holesko1@frontiernet.net
Jim Pitchford	Macoupin EMA	EMA@macoupincounty.il.gov
Wayne Joplin	Virden	wjoplin@royell.net
David Haley	Carlinville P.D.	dhaley@carlinvillepolice.com
David Hopper	Macoupin Co. Public Health	dhopper@mcphd.net
RICK HAASE	STAUNTON FIRE DISTRICT	rick.t.haase@conocophillips.com
John Lutz	CITY OF GIRARD	
John Willmon	STAUNTON	NCCMUSN9@MADISONTECCO.com
ROBERT MERTZ	STAUNTON	
John Brennan	Macoupin Sup & Assmts	jbrennan@maccoupincountyil.gov
Aaron Shipley	CARLINVILLE EMA	ashipley@karmak.com

IEMA Pre-Disaster Mitigation Plan

Assembly of the Macoupin County Planning Team Meeting 5:
Chairman: James Pitchford, Macoupin County EMA
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: September 14, 2010

Meeting Time: 7 pm

Place: County Board Room 215 S. East Street, Carlinville, IL 62626

Planning Team/Attendance:

Jim Pitchford	Macoupin County EMA
Michael Cavanaough	WCDC
Aaron Shipley	Carlinville EMA
Brad Targhetta	Macoupin County Coroner
Wayne Joplin	City of Virden
Larry Pfeiffer	Regional Office of Education
Scott Mayeda	Virden Police Department
David Hopper	Macoupin County Public Health
Issac Pizbo	Macoupin County Public Health
Rick Haase	Staunton Fire Protection District

The meeting was called to order.

Jim Pitchford opened the meeting with an overview of what was to happen from this point on with the plan. He stated that the plan could be reviewed by the Planning Team members for about 2 weeks so everyone would have ample amount of time look at and review the plan for any discrepancies. He also stated that in approximately 3 weeks the plan would be sent to IEMA/FEMA. They would then review it and if everything is OK with the plan, then we should hear back from IEMA/FEMA hopefully by October for their approval.

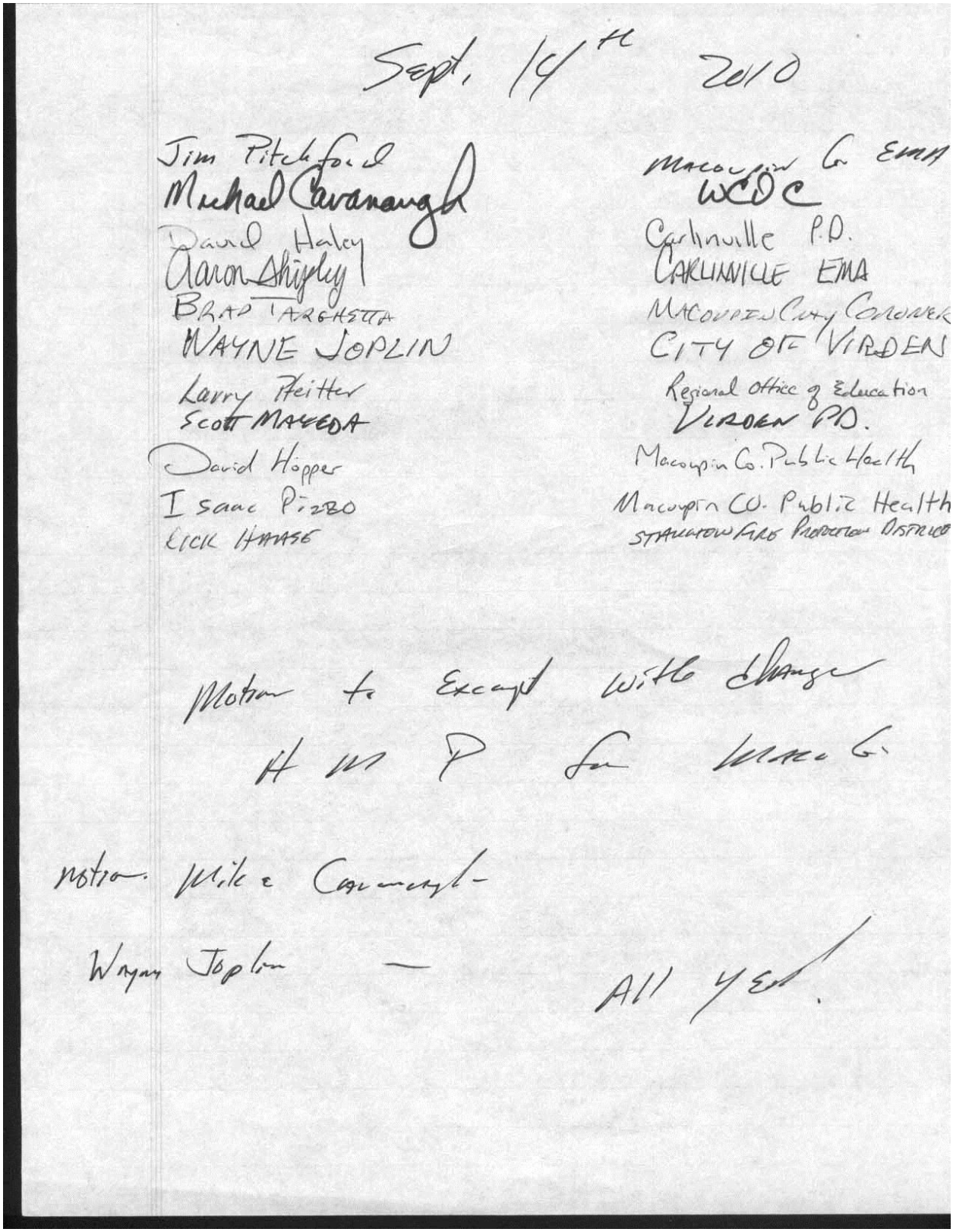
Jim then explained that once it comes back approved, then a Resolution will have to be passed by all municipalities. After they are passed, they needed to be returned Jim and he will forward them on to FEMA. Once FEMA gets the Resolutions, they will send notification that the municipality has a completed and approved plan.

He also explained that once the plan is submitted to IEMA/FEMA for their review, the municipalities can begin formulating and putting together their projects for funding.

It was also explained to the planning team that FEMA will require a five-year update to the plan. Jim told the planning team that in another five years, the members should come together again, most likely under the direction of the ESDA Director, to review the plan and make any necessary changes to it. He explained that FEMA will probably send out a reminder as to when this is supposed to take place.

After Jim explained the above process, he pointed out specific tables and places in the plan that needed clarification from the team members. After discussing a few changes, the planning team members looked at the plan for a while longer.

Since there were no more comments about the plan, the meeting was adjourned.



Sept. 14th 2010

Jim Pitchford
Michael Cavanaugh
David Haley
Aaron Shipley
BRAD TARGHETTA
WAYNE JOPLIN
Larry Reitter
SCOTT MAGEDA
David Hopper
Isaac Pizzo
ERIK HAASE

Macoupin Co EMA
WCDC
Carlinville P.D.
CARLINVILLE EMA
MACOUPIN City Coroner
CITY OF VIRDEN
Regional office of Education
VIRDEN P.D.
Macoupin Co. Public Health
Macoupin CO. Public Health
STAUNTON FIRE PROTECTION DISTRICT

Motion to Except with Change
H M P for Macoupin Co.

motion Mike Cavanaugh -
Wayne Joplin —
All yes.

Appendix B: Local Newspaper Articles and Photographs

PUBLIC MEETING ANNOUNCEMENT
"The Konnection"
May 19, 2010

E KONNECTION • MAY 19, 2010

Public information, strategy planning session set for Multi-Hazard Mitigation

CARLINVILLE- The Macoupin County Multi-Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7 p.m. on Wednesday May 19, at the Macoupin County Jail / Board Room 215 South East Street here.

Through a grant, Macoupin County EMA has formed an alliance with The Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) and Southern Illinois University-Carbondale to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for Macoupin County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Over the last several months the steering committee has been working with The Polis Center and staff from the SIU-Carbondale Geology Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency for approval.

The Federal Emergency Management Agency (FEMA) now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the Macoupin County plan is critical. The MHMP's will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities and unincorporated areas of the county. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The steering committee has identified the following hazards: tornados, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, and severe winter storms. The committee then selected hazards for The Polis Center to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others.

Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

The public is invited to attend tonight's meeting and the steering committee is interested in receiving public input on the plan. Anyone with questions should call Jim Pitchford, Macoupin County EMA - 217-854-3352

"THE MACOUPIN COUNTY ENQUIRER & DEMOCRAT"

Thursday, May 27, 2010

County analyzes hazard planning efforts

Jonathan Remo, project manager and post doctoral researcher for Southern Illinois University Carbondale's Department of Geology gave a PowerPoint presentation to the county's Multi-Hazard Mitigation Planning Team at the Macoupin County Sheriff's office May 19, regarding planning for multi-hazard threats.

Jim Pitchford, Macoupin County's Emergency Management Agency director, said federal law requires every government entity to have an emergency disaster plan in place. Pitchford secured a $75,000 grant providing funds for researchers at The Polis Center of Indiana University Purdue University of Indianapolis and Southern Illinois University Carbondale to compile a hazard mitigation plan for the county, as well as its 16 villages, eight cities and two towns. Staff from both The Polis Center and SIUC are assisting Pitchford and the rest of the county's staff with performing a hazard risk assessment.

Hazards considered in the mitigation plan included tornadoes, chemical release, thunderstorms with high winds and hail or lightning, winter storms, subsidence, flooding, earthquakes, fires or explosions and dam or levee failure.

Mine subsidence

While the mitigation plan listed probabilities for every possible disaster, the likelihood of certain hazards, such as mine subsidence, carries a larger risk in this area. "It's a threat, it's a risk," Pitchford said, adding mine subsidence could lead to ruptured gas and water lines. "It's more of a risk for us than earthquakes."

An estimated 106 of the county's 868 square miles, approximately 12 percent, are undermined, and analysis has shown 9,989 of 24,450 buildings, 41 percent, are above undermined areas.

The undermined areas include much of the southeastern parts of the county in places like Benld, Gillespie, Mt. Clare, Mt. Olive, Staunton and Wilsonville. Carlinville, and portions of land along Route 4 between Gillespie and Carlinville, and the Girard and Virden areas are also heavily undermined portions of the county.

Thunderstorms, winter storms and flooding were given a probability of Highly Likely with a limited magnitude or severity, which means the injuries sustained do not result in permanent disability and more than 10 percent of property is severely damaged.

Hazards included in the Likely category included tornadoes, a hazardous material release, subsidence and fire or explosion. Earthquakes and dam or levee failure were each listed as possible for Probability.

Tornadoes were the only hazard given the potential for a catastrophic magnitude, which have characteristics of multiple deaths, the complete shutdown of facilities for 30 or more days and more than 50 percent of property is severely damaged.

The benefit of having the hazard projections, whether it's a tornado, chemical spill, flooding or other threat, is "to show the magnitude of the loss so people understand the threats economically and in life," Pitchford said.

The National Climate Data Center has reported tornadoes or funnel clouds since 1950. Of those, six were F2 or "significant" storms with an estimated wind speed of 113-157 mph, a path width of 56-175 yards and a path length of 3.2 to 9.9 miles, according to mitigation research.

No tornado since 1950 has reached F3 or "severe" status, which means recorded wind speeds of 158-206 mph, a path width of 176 to 566 yards and a path length of 10-31 miles.

Between 1860 and 2009 tornadoes in Macoupin County killed 52, injured 135 and caused an estimated $580,000 in damage. The only death from a tornado in the past 60 years took place Dec. 2, 1950.

The county had one historic earthquake in 1987, with a recorded magnitude of 1.5 on the Richter scale. Remo said quakes need to be 2.0 or higher to be felt. Montgomery County had two earthquakes with a magnitude of at least 2.5 in the 1980s.

In the event of an earthquake with a 5.5 magnitude or higher in Macoupin County, it is estimated it could cause up to $94 million in property or building losses with 57 percent of residential property being totally damaged.

Grant funding available

Federal grant money is available for local municipalities to purchase updated equipment to help in the case of multi-hazards in the county. One way to alert residents is through a city-wide warning system. Carlinville has had an outdoor warning siren system in place for the past several years. Pitchford said Gillespie, Girard, Staunton and Virden may soon have similar warning sirens to alert residents in the event of a potential threat.

The planning team will meet again in June to go over possible multhazard mitigation plans.

Hazard planning team

The Multi-Hazard Mitigation Planning Team includes Pitchford, Aaron Bishop, Brad Targhetta, David Hopper, John Bresnan, Kent Tarro and Tom Reinhart of Macoupin County; Mayor Raymond Chapman of Bunker Hill; Aaron Shipley, Don Downing and Mary Beth Bellm of the city of Carlinville; Dean Plovich of Gillespie; John Lutz of Girard; Mayor John Willmon, Police Chief Robert Mertz and Rick Haast of Staunton; Wayne Joplin of Virden; London Simmons of the village of Royal Lakes; Dan Harville of the village of Wilsonville; Regional Superintendent of Schools Larry Pfeiffer; and Michael Cavanaugh of the West Central Development Council.

Appendix C: Adopting Resolutions

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, Macoupin County recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, Macoupin County participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Macoupin County Commissioners hereby adopt the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
County Commissioner Chairman

_____
County Commissioner

_____
County Commissioner

_____
Attested by: County Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Bunker Hill recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the City of Marshall participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Marshall hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Indiana Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Carlinville recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the City of Martinsville participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Martinsville hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
City Mayor

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
City Council Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Gillespie recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Girard recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Staunton recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the City of Virden recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Royal Lakes recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE MACOUPIN COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Wilsonville recognizes the threat that natural hazards pose to people and property; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Westfield participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Westfield hereby adopts the Macoupin County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Macoupin County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2010.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Appendix D: NCDC Historical Hazards

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Macoupin County	06/16/70	2203	Tornado	F	0	0	3K	0	None reported
Macoupin County	04/01/74	1550	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	03/20/76	1530	Tornado	F1	0	0	25K	0	None reported
Macoupin County	06/20/79	1700	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	08/20/79	1710	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	04/08/80	954	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	08/31/80	1335	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	05/20/82	1724	Tstm Wind	56 kts.	0	0	0	0	None reported
Macoupin County	06/15/82	1600	Hail	1.00 in.	0	0	0	0	None reported
Macoupin County	06/15/82	1600	Hail	1.00 in.	0	0	0	0	None reported
Macoupin County	06/15/82	1600	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	06/15/82	1600	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	07/10/82	1700	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	07/10/82	1705	Tornado	F0	0	0	0K	0	None reported
Macoupin County	07/10/82	1715	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	05/01/83	1423	Hail	1.00 in.	0	0	0	0	None reported
Macoupin County	05/01/83	1445	Hail	1.00 in.	0	0	0	0	None reported
Macoupin County	05/01/83	1541	Hail	1.00 in.	0	0	0	0	None reported
Macoupin County	05/01/83	2205	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	05/01/83	2305	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	03/15/84	2015	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	04/27/84	2030	Hail	1.75 in.	0	0	0	0	None reported
Macoupin County	06/24/85	1540	Tornado	F0	0	0	3K	0	None reported
Macoupin County	06/13/87	1415	Tornado	F0	0	0	0K	0	None reported
Macoupin County	06/13/87	1435	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	07/06/87	1855	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	04/22/88	1939	Hail	1.75 in.	0	0	0	0	None reported
Macoupin County	04/26/89	2230	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	05/25/89	1451	Hail	1.75 in.	0	0	0	0	None reported
Macoupin County	05/12/90	2015	Tstm Wind	0 kts.	0	0	0	0	None reported
Macoupin County	06/02/90	1605	Tornado	F1	0	0	25K	0	None reported
Macoupin County	07/09/92	1403	Tstm Wind	0 kts.	0	0	0	0	None reported

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Macoupin County	07/16/92	1520	Tstm Wind	61 kts.	0	0	0	0	None reported
Martinsville	05/14/94	1915	Tornado	F0	0	0	0	0	A tornado briefly touched down in a field six miles south of Martinsville. No damage was reported.
Marshall	06/21/95	1615	Tstm Winds	0 kts.	0	0	0	0	Numerous large tree limbs were blown down throughout the eastern half of Macoupin County.
Central Illinois	12/08/95	700	Winter Storm	N/A	1	0	0	0	A winter storm brought one to five inches of snow to Central Illinois during the day and evening of the 8th. A sharp cold front moved through during the evening of the 8th dropping temperatures as much as 25 degrees in three hours. Strong winds developed behind the front at 20 to 30 mph overnight and during the day on the 9th, causing considerable blowing and drifting of the snow, especially in open areas. The brisk winds and temperatures near zero created wind chills as low as 45 degrees below zero. One woman was killed in a traffic accident after sliding on an ice-covered road into on-coming traffic.
Central Illinois	12/18/95	1900	Winter Storm	N/A	1	0	0	0	A winter storm brought heavy rains the evening of the 18th, which changed to freezing rain overnight before changing to all snow by 0700 on the 19th. Snowfall ranged from one inch in Mason County to six inches in Edgar County. Numerous accidents were reported, though only one fatality occurred when a five-month-old boy was killed when his mother lost control of the vehicle and spun into the path of an on-coming tractor-semitrailer. Numerous power lines were knocked down throughout Central Illinois, due to the freezing rain and strong winds of 20 to 30 mph. The strong winds also caused considerable blowing and drifting of snow closing some roads in Central Illinois until the winds subsided in the evening on the 19th.
Statewide	01/02/96	2:00 AM	Winter Storm	N/A	0	4	0	0	The second major winter storm of the season moved through Central Illinois January 2nd and 3rd. The storm dumped up to 8 inches of snow across the area. Also, gusty northwest winds from 30 to 40 mph accompanied the storm, creating near whiteout conditions, making travel hazardous, and closing numerous roads. There were numerous minor accidents, though only two accidents resulted in 4 serious injuries.
Statewide	01/04/96	3:00 AM	Winter Storm	N/A	0	0	0	0	Following on the heels of the January 2nd/3rd storm, another winter storm moved through Central Illinois on January 4th. Snowfall ranged from 2 to 7 inches. Numerous minor accidents were reported across the area, though no major injuries were reported.
Statewide	01/18/96	10:00 AM	Winter Storm	N/A	0	2	0	0	A major winter storm moved through Central Illinois January 18th and 19th. Severe thunderstorms moved through the area during the late morning and early afternoon hours. Afterward, temperatures began to drop quickly. Most locations recorded a 60 degree drop over a 12 hour period. The rain changed to ice than snow causing numerous power outages and minor accidents. Two people were injured when the driver of the RV lost control of the vehicle when a strong gust of wind moved through the Farmer City area in DeWitt county. Gusty winds of 25 to 35 mph created winds chills near 40 below zero across most of Central Illinois.
Statewide	02/02/96	12:00 AM	Extreme Cold	N/A	2	0	0	0	Bitterly cold weather took hold of Central Illinois on the 2nd, 3rd, and 4th of this month. New record low temperatures were made with a low of minus 19 in both Peoria and Springfield on February 3rd. Also, new record low high temperatures were made when the temperatures at Peoria and Springfield never went above zero on the 2nd and 3rd. Many people experienced problems with cars and frozen pipes. However, two deaths were reported due to the extreme cold. A 78 year old man in Springfield froze to death within a few feet of his own front door. He reportedly could not find his house keys and fell. His wife could not help him and they were not found for several hours. She was treated for exposure and released. In Peoria, a 79-year-old woman froze to death on her front porch. Apparently she mistakenly thought she was locked out of her home.
Statewide	03/19/96	12:00 AM	Winter	N/A	1	0	0	0	A winter storm moved into southeastern Illinois early on March 19th. The storm dumped up to 11

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
			Storm						inches of snow across the area. There was considerable blow and drifting of snow which temporarily closed some roads in the area. One man was killed, near Casey in Macoupin County, when he lost control of his semi-truck and slammed into a concrete overpass and burst into flames. Several schools, a nursing home, and several businesses in the area were evacuated because the truck was carrying some type of chlorine compound, which emitted dense smoke and a bleach-like smell through the area. The buildings were evacuated as a precaution. Otherwise, there were numerous minor accidents which did not result in any serious injuries.
Statewide	03/25/96	4:00 AM	High Wind	0 kts.	1	0	0	0	Strong gradient winds caused minor damage across Central Illinois and caused a bizarre accident which killed one person. Winds gusting to between 40 and 55 mph caused a bedliner and a concrete block to be blown from the bed of the pickup truck. The concrete block was thrown through the windshield of a car travelling in the opposite direction. The block hit the driver's chest killing him. The winds blew down numerous power lines, tore off the roof of a building in Rushville, and metal sheathing and insulation from the roof of a mobile home was blown off in Bloomington.
Statewide	04/28/96	9:15 AM	High Wind	53 kts.	0	0	0	0	Strong gradient winds between 40 and 50 mph, with gusts to 61 mph, caused damage over a large area of Central Illinois. Numerous trees, tree limbs, and power lines were blown down. Also, a part of the roof and guttering on the Charleston High School, in Coles County, was blown off. Several barns and machine sheds sustained minor damage and one grain bin was blown over onto a car. No injuries were reported. A window in a business in Pana, Christian County, was blown out and the roof of the building sustained some damage. One tree fell onto a car in Forsyth, Macon County, though fortunately no one was in it at the time. Numerous houses throughout Central Illinois sustained some minor roof and siding damage as well. No damage estimate was available.
Walnut Prairie	05/08/96	1:10 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down numerous power poles and power lines in Walnut Prairie.
Martinsville	06/17/96	6:22 PM	Tstm Wind	0 kts.	0	0	0	0	A one foot in diameter tree was blown over 1 mile east of Martinsville.
Dennison	07/02/96	1:35 PM	Hail	1.75 in.	0	0	0	0	Hail up to golf ball size fell in Dennison causing some corn and soybean damage. Also, the hail damaged the siding and windows on one home and the roof of a tool shed. No injuries were reported and no damage estimate was available.
Macoupin County	07/29/96	1:00 AM	Hail	1.75 in.	0	0	0	0	None reported
Casey	10/17/96	6:15 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down a large tree in Casey, as well as, numerous tree limbs. No injuries or damage were reported.
Statewide	01/08/97	9:00 PM	Heavy Snow	N/A	0	6	0	0	A winter storm developed over the southern Plains and tracked to the northeast across southern Illinois. The storm dumped between 3 and 11 inches of snow over central Illinois. The heaviest snow fell in a corridor just north of I-70. Charleston in Coles County reported the most snow with 11 inches. Numerous accidents were reported throughout central Illinois. However, only 6 minor injuries were reported.
Statewide	01/15/97	3:00 AM	Winter Storm	N/A	1	7	0	0	A winter storm developed over the central Rockies and moved east into the Midwest. The storm brought between 4 and 6 inches of snow to a large part of central Illinois north of I-70. South of I-70 a mixture of freezing rain, sleet, and snow occurred with snow totals of 1 to 3 inches. After the snow stopped, the winds picked up to between 20 and 30 mph with higher gusts, causing near whiteout conditions. Also, temperatures fell below zero across the entire area, so with the strong winds and cold temperatures, wind chill readings dipped well below minus 40 degrees in many locations. Numerous accidents were reported though only 6 minor injuries and one person with serious injuries was reported. A 78 year old man died of exposure after apparently trying to walk a short distance to his brother's house and his body was not discovered for over 24 hours.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Statewide	01/26/97	5:00 AM	Winter Storm	N/A	0	9	0	0	A winter storm developed over the southern Plains and moved east, to the south of Illinois. One area of snow moved through central Illinois on the 26th with snow amounts ranging from 1 to 4 inches. Then the snow let up around 4 pm on the 26th. A mixed bag of precipitation began to fall over the southern areas of central Illinois around 4 am on the 27th and spread north into the rest of central Illinois. By the time the precipitation ended in the evening of the 27th, another 1 to 5 inches of snow had fallen. Numerous accidents were reported, especially in the morning hours on the 27th. Nine minor injuries were reported.
Statewide	04/06/97	9:15 AM	High Wind	56 kts.	0	0	0	0	The combination of a strong area of low pressure over Lake Superior and a strong area of high pressure over Texas created very high gradient winds over Central Illinois. Sustained winds averaged between 25 and 40 mph with higher gusts to 65 mph in some areas. These gradient winds blew down numerous trees, tree limbs, and power lines throughout Central Illinois. In Lincoln (Logan County), one tree fell onto a house damaging a porch and deck. No injuries were reported in this incident. Meanwhile, in Galesburg (Knox County) another tree fell onto a house causing extensive roof damage and broke a window in the home, though no injuries were reported. Two miles northeast of Castleton (Stark County), the winds destroyed a two story barn and in Woodford County near El Paso a semi was blown over on US 24, but no injuries were reported. No damage estimates were available for this event.
Statewide	04/30/97	2:00 PM	High Wind	61 kts.	0	1	38K	0	Strong gradient winds in excess of 50 mph with gusts to around 70 mph followed behind a line of severe thunderstorms as they marched across Central Illinois. The gradient winds lagged behind the thunderstorms by about 20 to 30 minutes and continued during the night finally letting up the next day, May 1st. Thousands of people across Central Illinois lost power for a time as hundreds of power lines were blown down. Several semis were blown over, with one trucker sustaining minor injuries when his semi was overturned near Jacksonville. Also, numerous trees and tree limbs were blown down and widespread structural damage was reported. The gradient winds blew down a 150 foot communications tower in Princeville (Peoria County). No injuries were reported. Homes in Manito (Mason County), Leroy (McLean County), Georgetown (Vermilion County), Effingham (Effingham County), and Olney (Richland County) sustained some damage due to trees falling on them. The gradient winds blew part of the roof off of a grade school gymnasium one mile west of De Land (Piatt County). Damage was estimated around $32,000 and no injuries were reported. Also, the winds blew the roof off of an apartment building in Towanda (McLean County), though no injuries were reported. Numerous sheds, grain bins, and machine sheds were either blown over, damaged, or destroyed by the gradient winds. No deaths or serious injuries were reported.
Westfield	04/30/97	3:45 PM	Tstm Wind	0 kts.	0	0	8K	0	Thunderstorm winds blew down numerous trees and power lines in Westfield. Two trees fell onto homes causing minor damage. Also, the winds damaged the roof of a mobile home. No injuries were reported but damage was estimated around $7,800. As a strong area of low pressure moved into the Midwest, severe thunderstorms developed along and ahead of a cold front which moved through Central Illinois during the afternoon and early evening hours. There were numerous reports of trees, tree limbs, and power lines knocked down. Also, 6 tornadoes were reported across the area. Only a few minor injuries were reported and no deaths occurred with these tornadoes.
Westfield	06/21/97	5:05 PM	Hail	1.75 in.	0	0	0	0	None reported
Marshall	06/21/97	5:20 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down a large tree onto a home in Marshall. No injuries were reported and no damage estimate was available.
Statewide	07/26/97	9:00 AM	Excessive Heat	N/A	2	0	0	0	A brief heat wave hit Central Illinois persisting for a little less than 48 hours from July 26the to July 27th. Temperatures ranged from 95 to 100 degrees both days with heat index values ranging from 105 to 115 degrees. One man died while working in farm fields near Danville (Vermilion County)

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									and an elderly woman died in her home in Bloomington (McLean County). There were numerous reports of heat related injuries in most area hospitals. Also, there were numerous reports of roads buckling due to the high temperatures.
Statewide	11/13/97	3:30 PM	Winter Storm	N/A	0	1	0	0	A mixture of snow, sleet and freezing rain moved into portions of southeast Illinois late in the afternoon on November 13. Some glazing was reported in Lawrence County at the onset of the event. The activity changed over to all snow soon after the event began. A band of 3 to 5 inch snowfall occurred across this entire area. The event tapered off by early morning on November 14.
Countywide	06/12/98	5:26 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down numerous trees, tree limbs, and power lines throughout the county.
Martinsville	06/18/98	9:25 PM	Tstm Wind	0 kts.	0	0	0	0	A large tree was blown down across North Creek Road about one mile south of Martinsville.
Statewide	06/26/98	3:00 AM	Excessive Heat	N/A	1	0	0	0	A hot and humid airmass built in across Central Illinois late in June. High temperatures on June 26th and 27th climbed into the middle and upper 90s. This combined with the high humidity values produced heat indicies of 105 to 110 degrees at times. Several heat related illnesses were reported in area hospitals due to the heat. One death was reported in Peoria and was confirmed to be heat related as a woman died in her home on June 27th. Also, several highways in the area had sections of roadway buckle due to the excessive heat.
Melrose	06/28/98	9:30 PM	Tstm Wind	0 kts.	0	0	0	0	Numerous large trees were blown down, which caused damage to several homes and vehicles in Melrose. Also, several mobile homes were destroyed. No injuries were reported and no damage estimate was available.
Countywide	06/29/98	5:23 PM	Tstm Wind	0 kts.	0	0	0	0	A large bow echo system developed over eastern Iowa and moved rapidly to the southeast into Illinois. It moved into Central Illinois's County Warning Area (CWA) around 4 pm in Knox County and exited the CWA (Lawrence County) around 830 pm. Damage was reported in all 35 counties with this system. Wind speeds were measured or estimated to be between 60 to 80 mph, blowing down or uprooting thousands of trees, tree limbs, power poles, and power lines. Hundreds of trees fell onto structures causing damage ranging from just torn guttering to major roof and structural damage. Also, hundreds of vehicles sustained damage from fallen trees and numerous outbuildings, sheds, and silos were either damaged or destroyed. Considerable crop damage was sustained in most areas. Speeds were measured or estimated in these areas at 100 to 110 mph. These areas of damage were apparently "microbursts" produced by a series of mesocyclones that formed on the forward edges of the bow echo. These microbursts, or swaths of more intense wind damage were generally about 1/2 a mile in width. In these areas significant structural damage occurred, such as peeling off roofs, blowing over freight railroad cars, bending steel power poles, and other structural damage. A third phenomena that occurred with this event were spin-up tornadoes along the leading edge of the bow echo structure. These tornadoes caused significant damage in narrow swaths along the bow echo's path and were often masked by the microburst damage occurring adjacent to them. Based on valid spotter observations and mesocyclone signatures on doppler radar, the existence of these tornadoes was validated. Approximately twelve people sustained injuries and damage was estimated around $16 million.
Macoupinsville	07/22/98	3:17 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down several trees and power lines 2.5 miles northeast of Macoupinsville. Also, an old school house was moved three feet off its foundation. No injuries were reported.
Casey	07/22/98	4:48 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down several trees and power lines in the Casey and Martinsville areas.
West Union	08/04/98	8:00 PM	Flash Flood	N/A	0	0	0	0	A series of thunderstorms moved across western portions of Macoupin County dumping up to 6 inches of rain in the West Union area in less than three hours. Numerous roads were flooded.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									However, no structural damage or injuries were reported.
Statewide	11/10/98	4:30 AM	High Wind	57 kts.	0	1	60K	0	A strong storm system moved across the Midwest which ushered in a line of severe thunderstorms. About an hour after the storms passed strong gradient winds developed and continued until the late afternoon hours. Winds gusted to over 50 mph at times with sustained winds well over 35 mph. Thousands of power lines and tree limbs were blown down throughout Central Illinois and hundreds of trees were blown over. High winds ripped sheet metal from a storage tank containing ammonia near Creve Coeur (Tazewell County). Some pieces of sheet metal sheared open two relief valves, releasing gas fumes into the air. Homes in the area were evacuated. No one was injured and the leak was soon fixed. The high winds prevented the gas fumes from stagnating over the area. The winds destroyed a shed just south of Galesburg (Knox County) causing $60,000 in damage. Also, a semi was blown over. The driver received minor injuries but refused treatment. In St. David (Macoupin County) the winds ripped off the roof of a home. Also, a large tree limb fell causing minor damage to a back porch and a car.
Marshall	11/10/98	7:56 AM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew some roofing off of a building in Marshall and several power lines were blown down. Also, several trees were uprooted. No damage estimate was available.
Statewide	01/01/99	12:00 PM	Heavy Snow	N/A	1	1	0	0	A major winter storm paralyzed much of the region during the first few days of 1999. Snow began falling across portions of Central Illinois before noon on New Year's Day and continued to fall, moderate to heavy at times for most of the following 24-hour period. Locations near and south of Charleston/Mattoon saw periods of mixed precipitation, including freezing rain, while farther north snow was predominate. After the snowfall and precipitation diminished, winds increased from the northwest and temperatures dropped, causing dangerous wind chills and treacherous driving conditions with extensive blowing and drifting snow through the third day of the year. Total snow accumulations topped 6 inches mainly along and north of Interstate 70. Lesser amounts fell to the south, where more freezing precipitation was reported. The heaviest snow band in Central Illinois was found west and north of a line from Quincy to Virginia (Cass County) to Peoria to Bloomington to Champaign where reports of 14 or more inches of snow were common. The weight of the heavy snow and ice caused many roofs and porches to collapse, resulting in one death and an injury. An overhang attached to a garage at a Dalton City (Moultrie County) residence collapsed, killing a 47-year old woman and injuring her husband. In Pekin (Tazewell County), a storage building roof collapsed. A garage roof collapsed onto a station wagon in Winchester (Scott County). In Sullivan (Moultrie County), another roof collapsed. In Chesterville (Moultrie County), the roof caved in on the Bourbon Township Shed. Structural damage was sustained at the Farm and Fleet just west of Bloomington on Route 9 (McLean County). Part of the roof collapsed on the TCI building in Decatur (Macon County). The roof caved in and fell onto a service truck and two cars at Walker's Tire and Muffler Shop in Farmer City (Dewitt County). A private airplane was totaled when the roof of one of the main hangers at Kermit Patchett Airport in Marshall (Macoupin County) collapsed. Several homes in town also reported collapsed porches.
Statewide	01/05/99	5:00 AM	Extreme Cold	N/A	0	0	0	0	A clear sky, light winds and thick snowcover set the stage for record cold morning temperatures across the region. A new state record low was set at Congerville, where the mercury plunged to 36 degrees below zero. Other bitterly cold record readings came from: Champaign and Lincoln both with 25 degrees below zero, Springfield with 21 below and Peoria with 19 degrees below zero.
Darwin	04/08/99	11:00 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds destroyed a machine shed and a barn 4 miles west of Darwin. Two cars in the machine shed were damaged. In Darwin, numerous trees were blown down. No injuries were reported.
Westfield	06/01/99	8:45 PM	Tornado	F0	0	0	350K	0	A tornado touched down 4 miles southeast of Westfield. It destroyed 3 machine sheds, a barn, and

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									several trees. The nearby house did not sustain any damage. As it travelled to the northeast, another farm was hit. Two sheds, a brooder house, and half a barn were destroyed. The house sustained major damage with a large hole in the roof and almost every window was shattered. Debris was found up to two miles away. The house was shifted on its foundation which caused the concrete porch to split in half. A 2x4 flew through the house and was embedded into a wall. The tornado then lifted and dissipated 3 miles west of Macoupinsville. No injuries were reported and damage was estimated around $350,000.
Martinsville	06/01/99	8:50 PM	Tstm Wind	0 kts.	0	0	0	0	As severe storms moved through Macoupin County, numerous trees were blown down. One of the trees fell onto a house in rural Martinsville causing moderate damage. In Marshall, eight homes sustained minor damage and several power lines were blown down. Also, 3 miles southeast of Marshall, a machine shed was destroyed and a residence sustained minor damage. No injuries were reported.
Countywide	06/04/99	6:05 PM	Tstm Wind	0 kts.	0	0	0	0	Several trees and power lines were blown down countywide.
Statewide	07/20/99	10:00 AM	Excessive Heat	N/A	4	0	0	0	The excessive heat wave began on the 20th of July and continued for most of the area through the 26th. Temperatures were in the lower to middle 90s with heat index values in the 105 to 110 degree range each day. Northern sections of the area did cool down some by the 25th as a front moved through the area...so the heat advisory was cancelled in those areas. During this time period four heat related deaths were reported in Central Illinois. In Atlanta (Logan County), two young boys (2 1/2 and 1 1/2 years old) wandered away on the afternoon of the 20th and were found about an hour later in their parents' car. Both were reported dead shortly thereafter. In West Peoria (Peoria County), an elderly woman was found in her apartment on the 24th. All of the windows were closed and the air conditioner was broken. In Springfield (Sangamon County), a 62 year old woman was found in her home on the 25th. Again all of the windows were closed and there were no fans or air conditioning. M3VE, M2VE, F82PH, F62PH
Statewide	07/28/99	10:00 AM	Excessive Heat	N/A	1	0	0	0	The heat returned to Central Illinois after a two day break. Temperatures rose into the lower to middle 90s again with heat index values in the 105 to 110 degree range. One heat related death occurred during this time. A 50 year old woman in Danville (Vermilion County) died on the 30th. She was found in her apartment. By the 30th a cold front began to move through the area, so the heat advisory was cancelled for northern sections of the area, but the excessive heat persisted in the rest of Central Illinois through the 31st. F50PH
Statewide	03/11/00	4:00 AM	Heavy Snow	N/A	1	9	0	0	Heavy snowfall of 6 to 10 inches, accompanied by blowing and drifting, occurred in parts of central and southeast Illinois from the morning into the early evening of March 11, 2000. Several weather related traffic accidents resulted in nine serious injuries and one fatality. A 16 year old male was killed in a one car accident near the town of Oakland in Coles County. Four people were injured in a traffic accident near Neoga in Cumberland county, three people were injured in an accident near Assumption in Christian county, and two people were injured in an accident near Windsor in Shelby county. A second, but smaller band of heavy snow, occurred from eastern Morgan county into northern Sangamon county, where 6 to 8 inches was reported. M16VE
Countywide	05/09/00	2:35 PM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down numerous power lines, especially across the southern half of Macoupin County.
Martinsville	05/09/00	2:45 PM	Hail	1.00 in.	0	0	0	0	None Reported
Marshall	06/20/00	11:30 PM	Tstm Wind	0 kts.	0	0	0	0	A couple of trees were blown down.
Countywide	07/11/00	1:30 AM	Flash Flood	N/A	0	0	0	0	An area of thunderstorms moved through the county during the early morning hours of the 11th.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									Recently saturated ground allowed for the rainfall, totaling over 2 inches in some areas, to cause flash flooding in Macoupin County. IL Routes 40 and 1 were reported underwater in spots, as well as other county roads, with Marshall and Martinsville being the hardest hit. A vehicle was reported stuck in high water in the area, but no specific location was provided. No injuries were reported and no damage estimates were available.
West Union	07/28/00	4:20 AM	Tstm Wind	0 kts.	0	0	0	0	Thunderstorm winds blew down several large trees in West Union.
Countywide	10/04/00	9:55 PM	Flash Flood	N/A	0	0	0	0	A stationary boundary just south of the area provided a focus for widespread thunderstorms producing heavy rainfall. Radar estimates and surface reports indicated anywhere from 2 to over 6 inches of rain falling during the evening and overnight hours across the area. Numerous roads were reported to have either ponding of water on them, or were completely covered in water for a period of time. The following reports were from Cumberland county, the hardest hit area in this event. North of Greenup, in Union township, a road around a bridge was washed out, causing over $90,000 in damage. One car had to be pulled out of high water along County Highway 6. The vehicle was three-quarters submerged, but there were no injuries. In Sumpter Township, the flood water scoured a hole along a culvert and under a roadway, which caved in when a truck passed over it. There were no injuries with this as well and no evacuations were needed.
Statewide	12/13/00	5:00 PM	Winter Storm	N/A	1	1	0	0	Between 6 and 8 inches of snow accumulated along and east of a Bloomington to Decatur to Taylorville line with a light ice coating on top of the heavy snow. The snow started between 8 and 10 am, with 6 inches accumulating by 5 pm, and ending by 10 pm. Freezing rain and sleet mixed in with the snow after 3 PM. This was the second winter storm to strike Central IL during the 2000-2001 winter season with the first one occurring just 2 days prior.
Casey	02/09/01	1:45 PM	Flash Flood	N/A	0	0	0	0	State Route 49, south of Casey, was reported to be flooded in spots
Marshall	05/17/01	7:00 AM	Hail	0.75 in.	0	0	0	0	None Reported
Martinsville	06/05/01	3:50 PM	Flash Flood	N/A	0	0	0	0	Water was reported over US Route 40, near Martinsville
Countywide	07/08/01	10:57 PM	Flash Flood	N/A	0	0	0	0	Radar estimated over 5 inches of rainfall across the county overnight, with the heaviest rain falling between Marshall and Casey. A cooperative observer in Marshall reported 4 inches of rain during the period, with the Casey observer reporting 3.2 inches. Numerous county roads were reported to be flooded as well as streets in both Casey and Marshall. A portion of Cork Road at 1950th (4 miles northeast of Marshall) was reported to have been washed out. The Little Creek in Martinsville was reported to be out of its banks and water covering many of the bridges going over the creek. No injuries were reported and no damage figures were available.
Casey	09/07/01	12:30 PM	Tstm Wind	50 kts.	0	0	0	0	Thunderstorm winds blew down several large trees in Casey. One car was trapped by the fallen trees. None of the car's occupants were injured.
Marshall	10/24/01	2:30 PM	Tstm Wind	50 kts.	0	0	0	0	Several trees and power lines were blown down.
Statewide	03/25/02	9:00 PM	Winter Storm	N/A	0	0	0	0	Freezing rain late in the evening of the 25th into the early morning hours of the 26th produced one-quarter to one-half inch of ice in the counties between I-72 and I-70. The freezing rain changed to sleet, then snow before daybreak. Snowfall amounts ranging from 4 to 7 inches, with significant blowing and drifting, occurred along a line from Pana through Monticello to Danville. The combination of ice and snow resulted in downed power lines and tree limbs, along with dozens of traffic accidents the morning of the 26th.
Countywide	05/07/02	5:00 AM	Flash Flood	N/A	0	0	0	0	Over 2.5 inches of rain fell in a short amount of time. It caused numerous roads to become flooded countywide, including Illinois Route 1 between Marshall and West Union. In Marshall, so much rain

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									fell that a gas station canopy collapsed due to the weight of the water. No injuries were reported.
Statewide	05/07/02	9:00 AM	Flood	N/A	0	0	0	0	Even though the rains had ended, the flooding continued on numerous county roads into the afternoon hours.
Marshall	05/08/02	5:30 PM	Flash Flood	N/A	0	0	0	0	Over 2 inches of rain fell on already saturated ground in a short amount of time. Numerous roads in and around Marshall were flooded, including Illinois Route 1. Part of 11th Street at Vine in Marshall was washed away.
Marshall	05/08/02	5:30 PM	Hail	1.00 in.	0	0	0	0	None Reported
Marshall	05/09/02	2:40 AM	Tstm Wind	50 kts.	0	0	0	0	Several power lines were blown down in town.
Statewide	05/12/02	9:00 AM	Flood	N/A	0	1	0	0	Although the rain had ended, runoff from the storms continued to aggravate the flooding situation across Central Illinois. The runoff continued to cause flooding problems on numerous county roads and basements. In Macoupin County, Illinois Route 1 was flooded south of Martinsville, as well as Old Route 40 between Martinsville and Casey.
Countywide	05/12/02	10:15 AM	Flash Flood	N/A	0	0	0	0	Over 4 inches of rain fell causing flash flooding. Illinois Route 49 north of Casey was flooded.
West Union	05/27/02	6:20 PM	Flash Flood	N/A	0	0	0	0	Illinois Route 1 was flooded at several locations near West Union due to heavy rains.
Casey	06/04/02	7:30 PM	Tstm Wind	55 kts.	0	0	0	0	Several trees and tree limbs were blown down. One fallen limb in Martinsville pulled power lines down. Three miles north of Casey, part of the roof of a hog containment building was blown off.
Casey	06/04/02	7:35 PM	Hail	0.75 in.	0	0	0	0	None Reported
Marshall	07/09/02	5:03 PM	Tstm Wind	50 kts.	0	0	0	0	Two trees blown down. One west of Marshall and another northeast of Marshall.
Martinsville	07/22/02	8:30 PM	Tstm Wind	50 kts.	0	0	0	0	A tree was blown over onto an unoccupied car, damaging it.
Marshall	08/02/02	5:05 PM	Hail	0.75 in.	0	0	0	0	None Reported
Statewide	12/24/02	12:00 PM	Heavy Snow	N/A	0	0	0	0	Heavy snow accumulations between 6 and 8 inches fell across a large part of Central and Southeast IL between noon on 12/24/02 and 4 AM on 12/25/02. The Christmas Eve snow caused numerous vehicle related accidents, especially during the afternoon and early evening of 12/24/02 when 35 to 40 accidents occurred in Champaign county. There were no deaths in Central and Southeast IL, but there were two minor vehicle related injuries in Springfield where snowfall amounts averaged 5 inches. There was only minor blowing and drifting snow with this winter storm. With the exception of Lawrence County, this was the first heavy snow of the season across Central and Southeast IL.
Martinsville	05/06/03	10:00 PM	Tstm Wind	55 kts.	0	0	0	0	Several power poles were blown down.
Marshall	05/10/03	9:30 AM	Flash Flood	N/A	0	0	0	0	Very heavy rain fell on already saturated ground...especially south of Marshall. Illinois Route 1 was briefly flooded south of Marshall as well as some secondary roads in the area.
Marshall	05/10/03	10:07 AM	Tstm Wind	60 kts.	0	0	0	0	Numerous trees were blown down
Casey	05/14/03	9:30 PM	Hail	1.00 in.	0	0	0	0	None Reported
Martinsville	08/02/03	7:00 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm winds blew down several trees and power lines. A couple of the trees fell onto homes causing damage. Also, one home had several windows blown out. No injuries were reported.
West Union	08/31/03	4:22 PM	Tstm Wind	52 kts.	0	0	0	0	Several trees were blown down.
Statewide	01/25/04	12:00 PM	Ice Storm	N/A	0	0	0	0	A strong winter storm moved out of Southern Plains and into the Ohio River Valley. This system

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									brought significant icing to the southeastern portions of Central Illinois on January 25th. Also, significant sleet accumulation was reported in numerous locations along and south of Interstate 70. There were numerous reports of power outages, downed tree limbs and traffic accidents in all of these counties. There were no reports of serious injuries or fatalities.
Macoupinsville	05/30/04	5:13 PM	Tstm Wind	55 kts.	0	0	0	0	Numerous trees and tree branches were blown down at the Mill Creek Park campground. One unoccupied truck was destroyed when a tree fell on it. Several campers had windows broken on them. No injuries were reported.
Macoupinsville	05/30/04	5:40 PM	Hail	1.75 in.	0	0	0	0	None Reported
Countywide	05/30/04	6:15 PM	Flash Flood	N/A	0	0	0	0	Several roads were flooded after very heavy rains fell, including IL Route 1 south of Marshall.
Marshall	07/03/04	1:00 PM	Tstm Wind	55 kts.	0	0	0	0	Ten trees were blown down in Marshall.
Casey	07/22/04	2:10 PM	Tstm Wind	55 kts.	0	0	0	0	Numerous tree limbs were blown down. Also, in Casey the roof was blown off of a restaurant.
Marshall	08/18/04	5:35 PM	Hail	0.75 in.	0	0	0	0	None Reported
Statewide	12/22/04	7:00 AM	Winter Storm	N/A	0	0	0	0	A major winter storm developed over the southern plains early on December 22nd and lifted into the eastern Great Lakes region by the morning of December 23rd. This storm brought heavy snow to much of southeast Illinois, with 8 to 12 inch snowfall totals common across Macoupin, Jasper, Crawford, Clay, Richland and Lawrence counties. The heaviest snowfall came in two bursts, the first during the early morning hours of the 22nd and the second during late evening hours on the 22nd and early morning hours of the 23rd. In addition to the heavy snowfall, winds gusting to 25 mph late on the 22nd and early on the 23rd caused considerable blowing and drifting snow. Snow drifts in excess of 3 feet were reported in spots. No fatalities or major injuries were reported, though there were numerous automobile accidents due to snow covered and slippery roads.
Statewide	01/15/05	2:00 PM	Flood	N/A	0	0	0	0	The Wabash River climbed to record or near record levels in many locations along the Illinois/Indiana border. On the afternoon of the 15th, a levee breach was observed just north of Darwin, in eastern Macoupin County. Water from the Wabash River surrounded the towns of York and Darwin, and the only way to get to these towns was by boat. A major levee failure on the Indiana side of the Wabash River caused the flooding on the Illinois side of the river to be less severe than it may have been. Damage estimates across the region totaled $335,000.
Marshall	05/13/05	6:30 PM	Tstm Wind	50 kts.	0	0	0	0	A few trees blown down.
Marshall	07/21/05	9:00 PM	Tstm Wind	50 kts.	0	0	0	0	Numerous large tree limbs blown down.
Statewide	07/22/05	12:00 PM	Excessive Heat	N/A	1	0	0	0	A period of excessive heat and humidity developed across all of central and southeast Illinois from July 22nd through the 25th. Daytime high temperatures ranged from the middle 90s to around 100 degrees daily, with overnight low temperatures only falling into the middle and upper 70s. The high humidity values pushed afternoon and early evening heat indices into the 105 to 115 degree range. The heat wave resulted in one direct fatality. An elderly woman was found dead in Springfield in her mobile home with malfunctioning air conditioning. F77MH
Marshall	07/26/05	8:30 PM	Tstm Wind	50 kts.	0	0	0	0	Several large tree limbs blown down.
Martinsville	11/15/05	3:50 PM	Tstm Wind	50 kts.	0	0	0	0	A swath of wind damage extended along the Interstate 70 corridor from Martinsville to Marshall to the Indiana state line. Numerous trees, tree limbs and power lines were blown down. Siding was torn off a house in Marshall.
Statewide	03/21/06	5:50 AM	Winter	N/A	0	0	0	0	A major winter storm impacted central Illinois on the 21st. A swath of heavy snow fell across much

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
			Storm						of the region with 6 to 10 inch snowfall totals common. No major injuries or fatalities were reported
Casey	04/02/06	6:08 PM	Tstm Wind	73 kts.	0	0	0	0	Many out buildings were damage and a machine shed was destroyed. Widespread tree, power pole and power line damage was reported. No injuries were reported.
Martinsville	05/17/06	7:55 PM	Hail	1.00 in.	0	0	0	0	None Reported
Statewide	07/30/06	11:00 AM	Heat	N/A	1	0	0	0	An extended period of heat and humidity occurred across central and southeast Illinois from July 30th to August 2nd. Afternoon high temperatures ranged from 94 to 100 degrees most afternoons, with afternoon heat indices ranging from 105 to 110. Overnight lows only fell into the mid 70s.
Statewide	08/01/06	12:00 AM	Heat	N/A	0	0	0	0	An extended period of heat and humidity occurred across central and southeast Illinois from July 30th to August 2nd. Afternoon high temperatures ranged from 94 to 100 degrees most afternoons, with afternoon heat indices ranging from 105 to 110. Overnight lows only fell into the mid 70s.
Statewide	04/05/07	12:00 AM	Frost/freeze	N/A	0	0	0K	0K	An extended period of cold weather occurred across central and southeast Illinois during the first two weeks of April. Several hard freezes occurred at night during this time. The cold snap occurred after a period of unseasonably mild weather in late March which resulted in plants and flowers leafing out and blooming earlier than normal. The hard freeze caused considerable damage to the plants that started their growth early due to the warm conditions in late March. The most significant agricultural damage occurred to winter wheat, mainly in locations along and south of I-72. Damage estimates will be unknown until late summer.
Moriah	04/11/07	14:30 PM	Hail	0.75 in.	0	0	0K	0K	Thunderstorms developed ahead of a strong area of low pressure that moved through central Illinois on April 11th. These storms produced a few reports of severe hail.
Casey	05/25/07	13:53 PM	Tornado	F0	0	0	0K	0K	Thunderstorms fired along a nearly stationary frontal boundary during peak afternoon heating. One of these storms produced a tornado.
Martinsville	10/18/07	3:55 AM	Tstm Wind	52 kts.	0	0	5K	0K	A thunderstorm complex moved across portions of central Illinois, during the overnight hours, to the north of a warm front. These storms produced numerous reports of tree and power line damage.
Statewide	02/04/08	2:00 AM	Dense Fog	N/A	0	0	0K	0K	A period of rain and mild temperatures over melting snow cause an extended period of dense fog across much of central and southeast Illinois. Numerous school closures and vehicular accidents occurred as a result of the dense fog. One accident resulted in a fatality in Vermilion county.
Martinsville	02/05/08	19:00 PM	Tstm Wind	61 kts.	0	0	20K	0K	Thunderstorms developed in the vicinity of a warm front over east central and southeast Illinois during the afternoon hours of February 5th. Many of the thunderstorms on either side of the front produced heavy rains and flooding. The storms to the south of the warm front also produced damaging winds and hail, especially along and south of the I-70 corridor. The flooding produced numerous road closures across the region, while the winds produced primarily tree, power line and power pole damage. However, several structures received minor, mainly roofing damage and one mobile home was destroyed.
Casey	06/04/08	13:45 PM	Tstm Wind	61 kts.	0	0	20K	0K	Scattered thunderstorms developed during the afternoon hours of the 4th. A few of these storms produced damaging winds and large hail.
Westfield	06/06/08	16:01 PM	Tstm Wind	56 kts.	0	0	15K	0K	An area of strong to severe thunderstorms with very heavy rain moved across east central Illinois during the afternoon and evening hours of the 6th. Widespread flooding occurred in the wake of the storms.
Casey Muni Arpt	06/06/08	19:00 PM	Flash Flood	N/A	0	0	0K	0K	An area of strong to severe thunderstorms with very heavy rain moved across east central Illinois during the afternoon and evening hours of the 6th. Widespread flooding occurred in the wake of the storms.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Westfield	06/06/08	22:45 PM	Flood	N/A	0	0	500K	0K	Several episodes of heavy rain from June 2nd through the 4th, and again on the 6th, produced copious amounts of rain and extensive flooding in eastern Illinois which persisted for two weeks. Rainfall totals ranged from 5 to 11 inches between June 2nd and June 6th, with the majority of the rain falling on June 6th. Hundreds of homes and businesses were flooded, and six counties were declared disaster areas with total damages estimated around $3 Million.
Darwin	06/09/08	12:47 PM	Hail	1.75 in.	0	0	0K	0K	Two rounds of scattered thunderstorms moved through southeast Illinois on the 9th. The first round occurred during the early afternoon hours, while the second round occurred during the evening hours. Several of the thunderstorms produced severe hail, ranging up to golf ball size.
Casey	06/27/08	16:17 PM	Hail	0.88 in.	0	0	0K	0K	A line of strong to severe thunderstorms moved across east central and southeast Illinois during the afternoon and early evening hours of the 27th. The storms blew down numerous trees and power lines. Several structures, mainly outbuildings, also sustained wind damage.
West Union	06/27/08	17:15 PM	Tstm Wind	56 kts.	0	0	1K	0K	A line of strong to severe thunderstorms moved across east central and southeast Illinois during the afternoon and early evening hours of the 27th. The storms blew down numerous trees and power lines. Several structures, mainly outbuildings, also sustained wind damage.
Marshall	07/08/08	17:50 PM	Tstm Wind	52 kts.	0	0	2K	0K	A strong cold front pushed into central Illinois on 7/8/08, triggering strong to severe thunderstorms. The storms produced wind gusts as high as 70 mph and widespread wind damage, particularly across east-central Illinois along and east of I-57.
Statewide	01/26/09	20:00 PM	Heavy Snow	N/A	0	0	0K	0K	A powerful winter storm brought periods of snow to portions of central and southeast Illinois from late on January 26th through the morning of January 28th. The first wave of precipitation deposited between 2 and 4 inches of snow along and south of the I-70 corridor by the morning of January 27th. The second wave brought additional heavy accumulations of snow, mainly along and south of I-72 during the evening of January 27th into the morning of the 28th.
Oilfield	02/11/09	12:00 PM	Flood	N/A	0	0	0K	0K	An area of low pressure tracked through the region on February 11th, bringing widespread rain and thunderstorms. As a result of the rainfall, localized flooding of low-lying rural roads and poor drainage areas occurred. The Little Wabash River rose out of its banks, flooding a few nearby roads. In addition, a few strong thunderstorms developed and produced gusty winds and small hail.
Marshall	02/11/09	14:10 PM	Tstm Wind	52 kts.	0	0	0K	0K	An area of low pressure tracked through the region on February 11th, bringing widespread rain and thunderstorms. As a result of the rainfall, localized flooding of low-lying rural roads and poor drainage areas occurred. The Little Wabash River rose out of its banks, flooding a few nearby roads. In addition, a few strong thunderstorms developed and produced gusty winds and small hail.
Ernst	02/11/09	14:15 PM	Tstm Wind	52 kts.	0	0	0K	0K	An area of low pressure tracked through the region on February 11th, bringing widespread rain and thunderstorms. As a result of the rainfall, localized flooding of low-lying rural roads and poor drainage areas occurred. The Little Wabash River rose out of its banks, flooding a few nearby roads. In addition, a few strong thunderstorms developed and produced gusty winds and small hail.
Casey	05/13/09	16:00 PM	Tstm Wind	52 kts.	0	0	12K	0K	An impressive upper-level wave tracking across the Northern Plains helped push a strong cold front toward the Mississippi River by the evening of May 13th. An increasingly unstable and sheared airmass across central Illinois allowed severe thunderstorms to develop in advance of the front. Widespread wind damage occurred with the storms, with 4 tornadoes touching down around the area as well. The thunderstorms also produced torrential rainfall, with widespread 2 to 4 inch amounts reported. This produced flash flooding in much of central and southeast Illinois from the evening of the 13th until the morning of the 14th.
Westfield	05/14/09	1:30 AM	Flash Flood	N/A	0	0	0K	0K	An impressive upper-level wave tracking across the Northern Plains helped push a strong cold front toward the Mississippi River by the evening of May 13th. An increasingly unstable and sheared

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									airmass across central Illinois allowed severe thunderstorms to develop in advance of the front. Widespread wind damage occurred with the storms, with 4 tornadoes touching down around the area as well. The thunderstorms also produced torrential rainfall, with widespread 2 to 4 inch amounts reported. This produced flash flooding in much of central and southeast Illinois from the evening of the 13th until the morning of the 14th.
Dennison	05/25/09	12:00 PM	Flash Flood	N/A	0	0	0K	0K	Low pressure moving along a stationary frontal boundary draped along the Ohio River brought locally heavy rainfall to southeast Illinois on May 25th. Rain amounts of 3.00 to 5.00 inches fell in many locations south of I-70, with flash flooding reported mainly east of a line from Marshall, IL to Olney, IL.
Martinsville	08/04/09	9:15 AM	Tstm Wind	52 kts.	0	0	0K	0K	A large bow echo developed in advance of a front across southern Iowa and northern Missouri during the early morning hours of August 4th. The storms then raced eastward across central and southeast Illinois, producing wind gusts of between 60 and 70 mph. Numerous trees and power lines were blown down in a wide swath from the Mississippi River eastward to the Indiana border.
Martinsville	08/04/09	9:16 AM	Tstm Wind	52 kts.	0	0	5K	0K	A large bow echo developed in advance of a front across southern Iowa and northern Missouri during the early morning hours of August 4th. The storms then raced eastward across central and southeast Illinois, producing wind gusts of between 60 and 70 mph. Numerous trees and power lines were blown down in a wide swath from the Mississippi River eastward to the Indiana border.
Marshall	08/04/09	9:20 AM	Tstm Wind	52 kts.	0	0	15K	0K	A large bow echo developed in advance of a front across southern Iowa and northern Missouri during the early morning hours of August 4th. The storms then raced eastward across central and southeast Illinois, producing wind gusts of between 60 and 70 mph. Numerous trees and power lines were blown down in a wide swath from the Mississippi River eastward to the Indiana border.
Oilfield	08/19/09	19:00 PM	Flash Flood	N/A	0	0	0K	0K	A vigorous upper-level disturbance in conjunction with a warm front lifting northward through central Illinois triggered strong to severe thunderstorms during the afternoon and evening of August 19th. Embedded supercells within a long line of storms produced enhanced wind damage and tornadoes. Total damages to crops and property from the 7 tornadoes were estimated to be more than $25M.

Macoupin County Picture Index

TORNADO

File Name:Tornado_1948_Bunker_Hill
Event: Tornado
Date:1948
Description: A view of the business district of Bunker Hill, Illinois after the 1948 tornado.
Source: From the Bunker Hill Historical Society archives
http://en.wikipedia.org/wiki/File:Business_District.jpg

File Name:Tornado_1948_Bunker_Hill_2
Event: Tornado
Date: March 19, 1948
Description: Delmar "D.D." Truesdale retrieves furniture from what was left of his radio shop after the tornado passed through. Archive/The State Journal-Register
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=2&set=0&page=0#ph2

File Name:Tornado_1948_Bunker_Hill_3
Event: Tornado
Date: March 19, 1948
Description: Washington Street in the Bunker Hill business district resembled the set of a Hollywood disaster film after a tornado struck on March 19, 1948. Nineteen people were killed and almost every building in town was damaged or destroyed. The State Journal-Register/archive
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=3&set=0&page=0#ph3

File Name:Tornado_1948_Bunker_Hill_4
Event: Tornado
Date: March 19, 1948
Description: Bunker Hill physician George Hess pauses at the former entrance to the James Vroman home on March 15, 1949, almost one year after the tornado struck the community. Mr. and Mrs. Vroman and two of their children were among the 19 killed in the Macoupin County commuity. A third child survived and lives today in Omaha, Ill. The State Journal-Register/archive
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=4&set=0&page=0#ph4

File Name:Tornado_1948_Bunker_Hill_5
Event: Tornado
Date: March 19, 1948
Description: H.F. Lund of Springfield set up a ham radio in the middle of Bunker Hill and relayed information to radio stations around the state. The State Journal-Register/archive
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=5&set=0&page=0#ph5

File Name:Tornado_1948_Bunker_Hill_6
Event: Tornado
Date: March 19, 1948
Description: A truck parked in front of businesses on the east side of Washington Street was crushed by bricks. The State Journal-Register/archive
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=6&set=0&page=0#ph6

File Name:Tornado_1948_Bunker_Hill_7
Event: Tornado
Date: March 19, 1948
Description: The Bunker Hill school was not damaged and was set up as an aid station and morgue after the 1948 tornado. The Red Cross set up tents in the yard, where the injured were treated
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=7&set=0&page=0#ph7

File Name:Tornado_1948_Bunker_Hill_8
Event: Tornado
Date: March 19, 1948
Description: A tornado that stuck Bunker Hill, Ill., in Macoupin County, March 19, 1948, destroyed three of the community's four churches, including the Methodist Church. The Baptist Church, which survived, invited the Methodist congregation to hold services in their church. The State Journal-Register/archive
Source: Archive/The State Journal-Register
http://www.sj-r.com/photo_galleries/x673427431/Bunker-Hill-tornado-of-1948?photo=8&set=0&page=0#ph8

THUNDERSTORM/WIND/ HAIL

File Name: Tornado_2009_March
Event: Thunderstorm
Date: March 8th 2009
Description:
A fast moving line of supercell thunderstorms brought hail, damaging winds, and tornadoes to eastern Missouri and southwest Illinois. A total of 10 tornadoes have been documented with the severe thunderstorm event that occurred during the late morning and early afternoon hours of Sunday March 8th 2009. After the line of thunderstorms moved across the area, strong gradient (non-thunderstorm) winds caused additional minor damage and power outages to the area.

EF1 Tornado Confirmed near Carlinville in Macoupin County, Illinois
Event Time: 11:30-11:35 a.m.
Path Length= 4-5 miles
Max Width= N/A
Max Damage Rating=EF1
Damage: A lumber shed was destoyed, two grain bins sustained damage, one was blown off its foundation and the other had its anchor bolts sheared off. A small shed and outbuilding was also destroyed.
Source: NOAA
http://www.crh.noaa.gov/lsx/?n=03_08_2009

Description: Wall cloud near Medora, IL

Description: over western Macoupin County, the mesocyclone intensified again, with roation visible at the time
File Name:Tornado_2005_June_1 or 2
Event: Tornado
Date: June 13, 2005
Source: http://www.siue.edu/~jfarley/weaphoto.htm

File Name: Thunderstorm_1998
Event: Thunderstorm
Date: May 1, 1998
Description: CG lightning zapped down in front of a small wall cloud on this hail-producing storm in southern Macoupin Co., IL on May 1, 1998.
Source: http://www.siue.edu/~jfarley/weaphoto.htm

FIRE

File Name: Fire_1979_Palmyer
Event: Fire
Date: January 7, 1979
Description: Palmyra fire, on January 7, 1979, that destroyed Mahan R P Shoe & Clothing Store, Rich's Grocery Store, and Petals & Kettles Flowers & Antiques shop. All the businesses are planning to reopen.
Source: The Story of Macoupin County 1829-1979

File Name: Fire_1974
Event: Fire
Date: December 1974
Description: A scene from the big fire in December 1974, when almost the entire 100 block on the west side of South Macoupin Street was destroyed.
Source: The Story of Macoupin County 1829-1979

OTHER

File Name: Train_Girard_1907
Event: Train Crash
Date: June 1907
Description: The "St. Louis-Springfield Limited" Illinois Terminal R.R. Passenger train was derailed in Girard during June 1907. (Wyman P. Robert L. Deck)
Source: Macoupin County Memories: A pictorial history of Macoupin County, Illinois

Appendix E: Historical Hazard Maps

See Attached

Appendix F: Critical Facilities List

Airport Facilities Report

ID	Name	Address	City	Class	Function	Capacity	YearBuilt	ReplaCost
1	ZELMER MEMORIAL AIRPARK INC	8458 Zelmer Airport Rd	PALMYRA	ADFLT	PUBLIC			10651

Bus Facilities Report

ID	Name	Address	City	Class	Function	Owner	DailyTraffic	YearBuilt	ReplaCost
1	Cavallo Bus Line Co	509 Illinois Ave	Gillespie	BDFLT					1209.9

Communication Facilities Report

ID	Name	Address	City	Class	Owner	Function	ReplaCost
1	WHF209	815 W. DEAN STREET	VIRDEN	CDFLT			0
2	WHI586	12178 HEYEN RD	DORCH	CDFLT	Ameren Services	E911	0
3	WNTW416	VARIOUS LOCATIONS	MOUNT	CDFLT	Ameren Services		0
4	WQIU879	15069 Allen Rd	CARLIN	CDFLT	Ameren Services	ISP	0
5	KNKS240	2.8 MI NNE OF	MOUNT	CDFLT	AMS Spectrum		0
6	WPKN817	106 MACOUPIN STREET	SHIPMA	CDFLT	AREA		0
7	WPKN817		SHIPMA	CDFLT	AREA		0
8	WPLP588	1.6 K S & .5 K E OF HWY	HETTICK	CDFLT	ARNETT, BRETT A		0
9	WPLP588		HETTICK	CDFLT	ARNETT, BRETT A		0
10	KNAM811	.5 MI E OF HWY 4 1.2 MI S	VIRDEN	CDFLT	Atmos Energy		0
11	KNAM811		VIRDEN	CDFLT	Atmos Energy		0
12	WPKP901			CDFLT	BAKER, DENNIS		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
13	KNIF605	RR 2	BUNKER	CDFLT	BAKER, TERRY		0
14	KNHU491	1 MI SE OF PIASA	SHIPMA	CDFLT	BARNETT,		0
15	KNHU491		SHIPMA	CDFLT	BARNETT,		0
16	KBG966	3 MI N DORCHESTER	GILLESP	CDFLT	BAUER, GARY		0
17	KNGQ578	115 W CENTRAL	BENLD	CDFLT	BENLD, CITY OF	Fire	0
18	KNGQ578		BENLD	CDFLT	BENLD, CITY OF		0
19	WPGV418	106 E CENTRAL	BENLD	CDFLT	BENLD, CITY OF	Police	0
20	WPGV418		BENLD	CDFLT	BENLD, CITY OF		0
21	WPXC967		Benld	CDFLT	Benld, City of		0
22	KNEK464	RT 4 1/2 MI NW	CARLIN	CDFLT	BILL RANGER &		0
23	WQDK780	700 COLLEGE AVE	CARLIN	CDFLT	BLACKBURN		0
24	WQDK780	700 COLLEGE AVE, DEMUZIO	CARLIN	CDFLT	BLACKBURN		0
25	WQDK780		CARLIN	CDFLT	BLACKBURN		0
26	WPXV836	Crown Mine Hwy 4S	Virden	CDFLT	BNSF Railway Co		0
270	WQKL777	22863 SOUTH ST	ATWATER		CDFLT		BNSF RAILWAY
28	KMK779	CROWN MINE HWY 4 S	VIRDEN	CDFLT	BNSF Railway		0
29	KSS776	AT BNRR MP42 & HWY 4 1.5 MI S	VIRDEN	CDFLT	BNSF Railway		0
30	KSS776		VIRDEN	CDFLT	BNSF Railway		0
31	KNEU301	2 MI W R4 1 1/2 MI N RT 108	CARLIN	CDFLT	BOEHM, JOHN		0
32	WQIX240		CARLIN	CDFLT	BOUILLON,		0
33	WNSD930	3 MI E	PLAINVI	CDFLT	BOUILLON,		0
34	WNSD930		PLAINVI	CDFLT	BOUILLON,		0
35	WPKI784	206 S MAIN ST	BRIGHT	CDFLT	BRIGHTON		0
36	WPKI784		BRIGHT	CDFLT	BRIGHTON		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
37	WPVY315	206 SOUTH MAIN STREET	BRIGHT	CDFLT	BRIGHTON,		0
38	WPVY315	.3 KM NW OF GRIGHTON	BRIGHT	CDFLT	BRIGHTON,		0
39	KBM215	NEW TOWN HALL	BRIGHT	CDFLT	BRIGHTON,		0
40	WNLG734	206 S MAIN ST	BRIGHT	CDFLT	BRIGHTON,	Fire	0
41	WNLG734		BRIGHT	CDFLT	BRIGHTON,	Fire	0
42	WPHI690	206 S HICKORY	BUNKER	CDFLT	BUNKER HILL		0
43	WPHI690		BUNKER	CDFLT	BUNKER HILL		0
44	KAN769	110 W WARREN	BUNKER	CDFLT	BUNKER HILL	Fire	0
45	KAN769	BUNKER	CDFLT	BUNKER HILL	0		
46	WPMK832	RR 16	SHIPMA	CDFLT	BUNKER HILL	Fire	0
47	WPMK832		SHIPMA	CDFLT	BUNKER HILL		0
48	WNUJ872	114 E WARREN ST	BUNKER	CDFLT	BUNKER HILL,		0
49	WPGY220	801 S FRANKLIN ST	BUNKER	CDFLT	BUNKER HILL,	Police	0
50	WPGY220		BUNKER	CDFLT	BUNKER HILL,		0
51	WQV966	801 S FRANKLIN ST	BUNKER	CDFLT	BUNKER Hill,	Police	0
52	WPFW484	1001 E MORGAN ST	CARLIN	CDFLT	CARLINVILLE		0
53	WPWB994	12488 Route 4	Carlinville	CDFLT	CARLINVILLE		0
54	WPWB994		Carlinville	CDFLT	CARLINVILLE		0
55	WPWB994	9934 WATER PLANT ROAD	PALMYRA		CDFLT		CARLINVILLE 0
56	WPWB994	2 M WSW	DORCH	CDFLT	CARLINVILLE		0
57	WPYJ341	115 W CENTRAL AVE	BENLD	CDFLT	CARLINVILLE		0
58	WPYJ341	105 MURTLE LANE	BRIGHT	CDFLT	CARLINVILLE		0
59	WPYJ341	801 S FRANKLIN STREET	BUNKER	CDFLT	CARLINVILLE		0
60	WPYJ341	215 S EAST STREET	CARLIN	CDFLT	CARLINVILLE		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
61	WPYJ341	115 N MACOUPIN STREET	GILLESP	CDFLT	CARLINVILLE	0	
62	WPYJ341	SO. SIDE CITY SQUARE/W MADISON	GIRARD	CDFLT	CARLINVILLE		0
63	WPYJ341		BENLD	CDFLT	CARLINVILLE		0
64	WPYJ341		BRIGHT	CDFLT	CARLINVILLE		0
65	WPYJ341		BUNKER	CDFLT	CARLINVILLE		0
66	WPYJ341		CARLIN	CDFLT	CARLINVILLE		0
67	WPYJ341		GILLESP	CDFLT	CARLINVILLE		0
68	WPYJ341		GIRARD	CDFLT	CARLINVILLE	0	
69	WPYJ344	RAILROAD AND LOCUST ST'S	MEDORA	CDFLT	CARLINVILLE		0
70	WPYJ344	120 W WATER STREET	DORCH	CDFLT	CARLINVILLE		0
71	WPYJ344	106 MACOUPIN STREET	SHIPMA	CDFLT	CARLINVILLE		0
72	WPYJ344	304 W MAIN STREET	STAUNT	CDFLT	CARLINVILLE		0
73	WPYJ344	139 N DYE STREET	VIRDEN	CDFLT	CARLINVILLE		0
74	WPYJ344		MEDORA	CDFLT	CARLINVILLE		0
75	WPYJ344		DORCH	CDFLT	CARLINVILLE		0
76	WPYJ344		SHIPMA	CDFLT	CARLINVILLE		0
77	WPYJ344		STAUNT	CDFLT	CARLINVILLE		0
78	WPYJ344		VIRDEN	CDFLT	CARLINVILLE		0
79	WQAY890	1001 MORGAN STREET	CARLIN	CDFLT	CARLINVILLE		0
80	WQAY890		CARLIN	CDFLT	CARLINVILLE		0
81	WRU920	640 W BUCHANAN	CARLIN	CDFLT	CARLINVILLE		0
82	WRU920		CARLIN	CDFLT	CARLINVILLE		0
83	WPRI415	829 W MAIN	CARLIN	CDFLT	CARLINVILLE		0
84	WPRI415		CARLIN	CDFLT	CARLINVILLE		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
85	KQW366	125 N WEST ST	CARLIN	CDFLT	CARLINVILLE,	0	
86	KQW366		CARLIN	CDFLT	CARLINVILLE,		0
87	WPFU614			CDFLT	CARLINVILLE,		0
88	WPMA668	215 SOUTH EAST	CARLIN	CDFLT	CARLINVILLE,	Police	0
89	WPMA668		CARLIN	CDFLT	CARLINVILLE,		0
90	WQKE956	CEDAR AND S PLUM ST	CARLIN	CDFLT	CARLINVILLE,		0
91	WQKE956		CARLIN	CDFLT	CARLINVILLE,		0
92	KNEU779	1/2 MI E OF RT 4 1 MI N	CARLIN	CDFLT	CARLINVILLE,		0
93	WQM545	RT 4 1MI N OF CARLINVILLE TWN SQ	CARLIN	CDFLT	CENTRAL		0
94	WPPP312	LAKE RINAKER RD	CARLIN	CDFLT	CENTRAL		0
95	WPPP312	SPANISH NEEDLE RD	CARLIN	CDFLT	CENTRAL		0
96	WPAP872	1/2 MI W	SHIPMA	CDFLT	CHRISTOPHER,		0
97	WPAP872		SHIPMA	CDFLT	CHRISTOPHER,		0
98	KNIR709	RR 1 BOX C35	VIRDEN	CDFLT	COLE, KENDALL		0
99	KNIR709		VIRDEN	CDFLT	COLE, KENDALL		0
100	KOM996	400 CALDWELL ST	STAUNT	CDFLT	COMMUNITY	Hospital	0
101	WQBH282		STAUNT	CDFLT	COMMUNITY		0
102	WXP425	400 CALDWELL ST	STAUNT	CDFLT	COMMUNITY	Hospital	0
103	KC24275		CARLIN	CDFLT	COVENANT		0
104	WQJG842	2644 E Frontage Rd (Mt. Olive, IL	Staunton,	CDFLT	Cricket Licensee		0
105	KNAQ385	W DEAN ST	VIRDEN	CDFLT	CROP		0
106	KNAQ385		VIRDEN	CDFLT	CROP		0
107	WPME712			CDFLT	DALE L WILSON		0
108	KJO795	1/2 MI NW ON ROUTE 4	CARLIN	CDFLT	DELAURENT		0

ID	Name	Address	City	Class	Owner	Function	ReplaCost
109	WCR635	1/2 MI SW OF ROUTE 138	WILSON	CDFLT	DELAURENT		0
110	KNDT912	120 W WATER ST	DORCH	CDFLT	DORCHESTER,	Fire	0
111	WQIT800		CARLIN	CDFLT	DUNNS	Ambulance	0
112	WQAK426	Water Twr at Jefferson St & Edwardsville	Woodbur	CDFLT	Fosterburg Water		0
113	KNEM667	8.9 KM SE ON GIRARD RD	VIRDEN	CDFLT	FREEMAN		0
114	KNEM667	2.4 KM E AT CHURCH ON RT 4 S	VIRDEN	CDFLT	FREEMAN		0
115	KNEM667		VIRDEN	CDFLT	FREEMAN		0
116	KNEM667		VIRDEN	CDFLT	FREEMAN		0
117	WQEW908		Mt. Oliva	CDFLT	GEORGIA-		0
118	KNEY216	2 MI W 1 MI N ON CHARITY RD	CARLIN	CDFLT	GIBBS, LARRY L		0
119	KNEY216	1 1/2 MI S 2 MI E	MODESTOCDFLT		GIBBS, LARRY L		0
120	WNLH782	107 E WALNUT ST	GILLESP	CDFLT	GILLESPIE	Police	0
121	WNLH782	208 W CHARLES ST	GILLESP	CDFLT	GILLESPIE	Ambulance	0
122	WNLH782	511 S MACOUPIN ST	GILLESP	CDFLT	GILLESPIE	Ambulance	0
123	WNLH782		GILLESP	CDFLT	GILLESPIE	Ambulance	0
124	KST242		GILLESP	CDFLT	GILLESPIE		0
125	KST242	510 WEST ELM STREET	GILLESP	CDFLT	GILLESPIE		
126	KCS543	115 N MACOUPIN ST	GILLESP	CDFLT	GILLESPIE, CITY	Police	
127	KCS543	511 S MACOUPIN ST	GILLESP	CDFLT	GILLESPIE, CITY	Police	
128	KCS543		GILLESP	CDFLT	GILLESPIE, CITY	Police	
129	KCS543		GILLESP	CDFLT	GILLESPIE, CITY	Police	
130	WPSP974	400 Pear St	Gillespie	CDFLT	GILLESPIE, CITY		
131	WPSP974	1550 E County Road 1000	Gillespie	CDFLT	GILLESPIE, CITY		
132	KQG671	6 MI W AT OTTER LAKE	GIRARD	CDFLT	GIRARD FIRE		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
133	KQG671	115 N 1ST ST	GIRARD	CDFLT	GIRARD FIRE	Fire	
134	WPVB584	5 WALNUT ST	CHESTE	CDFLT	GRAHAM		
135	WPVB584		CHESTE	CDFLT	GRAHAM		
136	KTC246	1 MI S	PLAINVI	CDFLT	GROTHAUS,		
137	WNPA851	4 MI SW HWY I55 ON 100N	LITCHFI	CDFLT	HARTKE,		
138	WNPA851		LITCHFI	CDFLT	HARTKE,		
139	KNNG831	RR 2	BUNKER	CDFLT	HEAL, WAYNE		
140	KNNG831		BUNKER	CDFLT	HEAL, WAYNE		
141	WPWL327	100 W CENTRAL AVE	BELD	CDFLT	HEGEL, RITA		
142	WPWL327		BELD	CDFLT	HEGEL, RITA		
143	WPQI630	TOWER 4KM SOUTH ON CR20	STANDA	CDFLT	HENDERSON		
144	WPQI630	ALLEN BOOSTER STATION	NILWOOD		CDFLT HENDERSON		
145	KNFP510	.8 MI N OF HWY 16 & .6 MI W OF RT	GILLESP	CDFLT	HEYEN,		
146	WYU770	1 1/2 MI SW	GILLESP	CDFLT	HEYEN, LARRY		
147	WPUT912	3 MI S ON SHIPMAN HWY	CARLIN	CDFLT	HUYEAR		
148	WPUT912		CARLIN	CDFLT	HUYEAR		
149	WQBB433	27 Reid Street	Carlinville	CDFLT	I-WARN, Inc. /		
150	WQBB433		Carlinville	CDFLT	I-WARN, Inc. /		
151	WBB423	2.5 MILES SE OF Carlinville S of St	CARLIN	CDFLT	ILLINOIS BIBLE		
152	WPNG813	2.5 MI SE CARLINVILLE S OF ST HWY	CARLIN	CDFLT	ILLINOIS BIBLE		
153	WNSX924	RT 1 BOX 61 4.16 MI SW	MOUNT	CDFLT	Illinois		
154	WNSX924		MOUNT	CDFLT	Illinois		
155	WPPF665	1500 E OF 155 1 MI S OF EXIT 52	MOUNT	CDFLT	Illinois		
156	WPPF665		MOUNT	CDFLT	Illinois		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
157	KNKQ278	ROUTE 4 SOUTH & GEORGE STREET	VIRDEN	CDFLT	Illinois SMSA		
158	KNKQ278	200' NORTH STATE ROUTE 138	MT. OLIVE		CDFLT	Illinois SMSA	
159	KET406	1 BLK E RT 111	CHESTE	CDFLT	ILLINOIS		
160	KYW825	BEAVER DAM ST PARK 11KM SW	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
161	WEG717	LOCATED WITHIN BEAVER DAM	Carlinville	CDFLT	ILLINOIS, STATE	ISP	
162	WQAX855	BEAVER DAM STATE PARK	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
163	WQAX857	7 MI N OF CARLINVILLE ON IL RTE 4	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
164	WQDC312	8515 PARKSIDE LANE	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
165	WQDC312		CARLIN	CDFLT	ILLINOIS, STATE	ISP	
166	WQFH221	BEAVER DAM STATE PARK 7 MI SW OF	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
167	WQFH221		CARLIN	CDFLT	ILLINOIS, STATE	ISP	
168	WQFH227	BEAVER DAM STATE PARK 7 MI SW OF	CARLIN	CDFLT	Illinois, State of	ISP	
169	WQI376	BEAVER DAM STATE PARK 7 MI SW	CARLIN	CDFLT	ILLINOIS, STATE	ISP	
170	WPME211	RT 1	CHESTE	CDFLT	J & B TRUCKING		
171	WPME211		CHESTE	CDFLT	J & B TRUCKING		
172	WPVY883	2 MI W AND 1/2 MI S	VIRDEN	CDFLT	JOHN G MILLER		
173	WPVY883		VIRDEN	CDFLT	JOHN G MILLER		
174	WPJT559	2.5 MI S 4.6 MI E	GREENF	CDFLT	JOHNSON, JEFF		
175	WPJT559		GREENF	CDFLT	JOHNSON, JEFF		
176	WPED915	KAHO PUBLIC WATER DIST RR 1	MOUNT	CDFLT	KA HO PUBLIC		
177	WNLW675	IL RT 4 1/2 MI N	CARLIN	CDFLT	KALLAL,		
178	WNLW675		CARLIN	CDFLT	KALLAL,		
179	WPLS624			CDFLT	KLL		
180	KNHV844	116 HENRIETTA ST	STAUNT	CDFLT	KLL Wireless, Inc		

ID	Name		Address	City	Class	Owner	Function	ReplaCost
181	KNHV844		STAUNT	CDFLT	KLL Wireless, Inc			
182	KNHV844		STAUNT	CDFLT	KLL Wireless, Inc			
183	WPFX795	RT 4 S BOX 620	CARLIN	CDFLT	LAKE			
184	WPFX795		CARLIN	CDFLT	LAKE			
185	WPFM416	2 MI S ON HETTICK BLACKTOP	SCOTTVI	CDFLT	LANDES FARMS			
186	WPFM416		SCOTTVI	CDFLT	LANDES FARMS			
187	WPBK940	1 MI S ST RT 4	VIRDEN	CDFLT	LAUNER FARMS			
188	WPBK940		VIRDEN	CDFLT	LAUNER FARMS			
189	KDX993	201 E CENTER ST	GIRARD	CDFLT	M & M SERVICE			
190	KDX993	309 N CLINTON	BUNKER	CDFLT	M & M SERVICE			
191	KDX993	WEST OF VILLAGE LIMITS	CHESTE	CDFLT	M & M SERVICE			
192	KDX993	F S ELVATOR	PALMYRA		CDFLT	M & M SERVICE		
193	KDX993	S BISSEL ST	VIRDEN	CDFLT	M & M SERVICE			
194	KDX993	606 W FIRST N	CARLIN	CDFLT	M & M SERVICE			
195	KSB488	262-268 N EAST ST	CARLIN	CDFLT	M J M ELECTRIC			
196	WPTG278	264 N. EAST ST.	CARLIN	CDFLT	M J M Electric			
197	WPXM864	12488 Route 4	Carlinville	CDFLT	MACOUPIN		E911	
198	WPXM864	9934 WATERPLANT ROAD	PALMYRA		CDFLT		MACOUPIN	E911
199	WPXM864	1.2 MI S .5 MI E OF HWY 4	VIRDEN	CDFLT	MACOUPIN		E911	
200	WPXM864	LOCUST & NORTH 2ND	BENLD	CDFLT	MACOUPIN		E911	
201	WPXM864	2 M WSW	DORCH	CDFLT	MACOUPIN		E911	
202	WPXM864	209 1ST STREET	SHIPMA	CDFLT	MACOUPIN		E911	
203	WQAA720	7.8 KM SE OF BRIGHTON 206 SOUTH	BRIGHT	CDFLT	MACOUPIN		E911	
204	WQAA720	12488 Route 4	Carlinville	CDFLT	MACOUPIN		E911	

ID	Name	Address	City	Class	Owner	Function	ReplaCost
205	WQAA720	801 S FRANKLIN ST	BUNKER	CDFLT	MACOUPIN		
206	WQFZ373	100 EAST SIXTH ST	STAUNT	CDFLT	MACOUPIN	E911	
207	WPYD797	12488 Route 4	Carlinville	CDFLT	MACOUPIN	E911	
208	KNCK926	EXXON MONTEREY MINE 1 6 MI S	CARLIN	CDFLT	Macoupin Energy		
209	KNNR558	EXXON MONTEREY MINE 1 9.68 KM S	CARLIN	CDFLT	Macoupin Energy		
210	KNNR558	EXXON MONTEREY MINE 1 FIELD S	CARLIN	CDFLT	Macoupin Energy		
211	KNNR558		CARLIN	CDFLT	Macoupin Energy		
212	KNNR558	MONTEREY MINE	CARLIN	CDFLT	Macoupin Energy		
213	WNSO566	EXXON MONTEREY MINE 1 6 MI S	CARLIN	CDFLT	Macoupin Energy		
214	KNGA953	129 E FIRST S	CARLIN	CDFLT	MACOUPIN,		
215	KNGA953	RR 1 BOX 26	HETTICK	CDFLT	MACOUPIN,		
216	WPFS699	215 S EAST ST	CARLIN	CDFLT	MACOUPIN,	Sheriff	
217	WPFS699		CARLIN	CDFLT	MACOUPIN,	Sheriff	
218	WPFS699	12488 ROUTE 4	CARLIN	CDFLT	MACOUPIN,	Sheriff	
219	WPXT232	12488 ROUTE 4	CARLIN	CDFLT	MACOUPIN,	E911	
220	WPXT232		CARLIN	CDFLT	MACOUPIN,	E911	
221	WPXT232	2 M WSW	DORCH	CDFLT	MACOUPIN,	E911	
222	WPXT232	1.2 MI S .5 MI E OF HWY 4	VIRDEN	CDFLT	MACOUPIN,	E911	
223	WPXT232	LOCUST AND 2ND ST	BENLD	CDFLT	MACOUPIN,	E911	
224	WPXT232	100 EAST 6TH ST	STAUTO	CDFLT	MACOUPIN,	E911	
225	WPXT232	209 1ST STREET	SHIPMA	CDFLT	MACOUPIN,	E911	
226	WPZR684	12488 ROUTE 4	CARLIN	CDFLT	MACOUPIN,	Highway	
227	WPZR684		CARLIN	CDFLT	MACOUPIN,	Highway	
228	WQJV865	12488 RTE 4	CARLIN	CDFLT	MACOUPIN,	Sheriff	

ID	Name	Address	City	Class	Owner	Function	ReplaCost
229	WQJV865		CARLIN	CDFLT	MACOUPIN,	Sheriff	
230	WNJX684	RR 1 OFF RT 4 .5 MI N	STAUNT	CDFLT	MADISON		
231	WNJX684		STAUNT	CDFLT	MADISON		
232	WPUH784	RAILROAD ST AND LOCUST ST	MEDORA	CDFLT	MEDORA		
233	WPUH784		MEDORA	CDFLT	MEDORA		
234	WPPC392	.5 MI E HWY 4 1.2 MI S	VIRDEN	CDFLT	MELVIN ROVEY		
235	WPPC392		VIRDEN	CDFLT	MELVIN ROVEY		
236	KRI940	116 HENRIETTA ST	STAUNT	CDFLT	MENGLEKAMP,		
237	KRI940		STAUNT	CDFLT	MENGLEKAMP,		
238	WPAC319	625 N OAK	CARLIN	CDFLT	MITCHELL		
239	WPAC319		CARLIN	CDFLT	MITCHELL		
240	WNWD426	264 N EAST ST	CARLIN	CDFLT	MJM ELECTRIC		
241	KNNM523	804 W MAIN ST	MOUNT	CDFLT	MOUNT OLIVE	Fire	
242	KNNM523		MOUNT	CDFLT	MOUNT OLIVE	Fire	
243	WPBE723			CDFLT	MURPHY,		
244	KNKN635	SITE - GILLESPIE STATE ROUTE 4, 1-	GILLESP	CDFLT	NEW CINGULAR		
245	KNKN635	CARLINVILLE CELL SITE: CR1000 N &	Carlinville	CDFLT	NEW CINGULAR		
246	WPLB938	13.8 MI WNW OF ST 48 & I55	CARLIN	CDFLT	NEXTEL		
247	WPLB938		CARLIN	CDFLT	NEXTEL		
248	KNRU612	13.8 M WNW OF ST-48 & I-55	CARLIN	CDFLT	Nextel License		
249	KNRU612		CARLIN	CDFLT	Nextel License		
250	WPYJ678	ROUTE 16 RR CROSSING @ MP	E.	CDFLT	Norfolk Southern		
251	WPYJ678	WHITE CITY RD. RR CROSSING @	SAWYE	CDFLT	Norfolk Southern		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
252	WQBA720	Third North St RR crossing at MP	Mt. Olive	CDFLT	Norfolk Southern		
253	WQBA720	South St RR crossing at MP D444.86	Mt. Olive	CDFLT	Norfolk Southern		
254	WQBA720	Poplar St RR crossing at MP D445.09	Mt. Olive	CDFLT	Norfolk Southern		
255	WQBA720	Eight South St RR crossing at MP	Mt. Olive	CDFLT	Norfolk Southern		
256	WQBA720	TR-457 RR crossing at MP D447.13	Mt. Olive	CDFLT	Norfolk Southern		
257	WQFX913	MAIN STREET ROAD RR CROSSING	STAUNT	CDFLT	Norfolk Southern		
258	KNAX364	1301 STAUNTON RD	GILLESP	CDFLT	NORVILLE,		
259	KNAX364		GILLESP	CDFLT	NORVILLE,		
260	KUQ499	EDGE OF OTTER LAKE 10.5 KM W	GIRARD	CDFLT	Otter Lake Water		
261	KUQ499	119 W MADISON	GIRARD	CDFLT	Otter Lake Water		
262	KUQ499		GIRARD	CDFLT	Otter Lake Water		
263	WPJQ330	119 W MADISON ST	GIRARD	CDFLT	Otter Lake Water		
264	WPJR856	119 W MADISON ST	GIRARD	CDFLT	Otter Lake Water		
265	WPMD636	JCT OF E MAIN ST AND E STATE ST	PALMYRA		CDFLT	PALMYRA	Fire
266	WPMD636		PALMYRA		CDFLT	PALMYRA	Fire
267	KVG509	1 BLK E OF MAIN ST ON STATE ST	PALMYRA		CDFLT	PASSALACQUA,	
268	KNGR285	RT 2 3/4 MI N	CARLIN	CDFLT	PLEASANT VIEW		
269	WPGC873	2.6 MI W OF WILSONVILLE ON IL RT	BUNKER	CDFLT	POLO		
270	WPGC873		BUNKER	CDFLT	POLO		
271	WPNR610	1100 N BROADWAY	CARLIN	CDFLT	PRAIRIE FARMS		
272	WPNR610		CARLIN	CDFLT	PRAIRIE FARMS		
273	KSV972	1500' EAST OF I-55	MOUNT	CDFLT	RCC, Inc. d/b/a		
274	KSV972	0.8 Miles East of Hwy 4, 6 Miles SE of	CARLIN	CDFLT	RCC, Inc. d/b/a		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
275	WPJW346	2400 N 829 E	HETTICK	CDFLT	RELEFORD,		
276	WPJW346		HETTICK	CDFLT	RELEFORD,		
277	KNDB625	1 MI SE OF DOWNTOWN BUNKER	BUNKER	CDFLT	ROBINSON,		
278	WQDG706	85 CARLINVILLE PLAZA	CARLIN	CDFLT	ROE 40 ADULT		
279	WQDG706		CARLIN	CDFLT	ROE 40 ADULT		
280	WQKD633	417 W. Dean St.	Virden	CDFLT	Royell		
281	WQKS822		Girard	CDFLT	Royell		
282	WQKS822		Girard	CDFLT	Royell		
283	WQKS822		Girard	CDFLT	Royell		
284	WPRV215			CDFLT	SCOTTVILLE		
285	WPJH459	PRAIRIE & KEATING	SHIPMA	CDFLT	SHIPMAN		
286	WPJH459		SHIPMA	CDFLT	SHIPMAN		
287	WPXG333	7.3 Mi SE	Carlinville	CDFLT	Sinclair,		
288	WPXG333		Carlinville	CDFLT	Sinclair,		
289	KQI733	HWY 4 S	VIRDEN	CDFLT	SNELL		
290	KQI733		VIRDEN	CDFLT	SNELL		
291	KGV533	2 MI N RT 1	HETTICK	CDFLT	SONNEBORN,		
292	WPHW803	2 KM N OF RT 67 & RT 16	PIASA	CDFLT	SOUTHWESTER		
293	WPHW803		PIASA	CDFLT	SOUTHWESTER		
294	WNPV490	500 N PLUM ST	CARLIN	CDFLT	State of Illinois,		
295	KST241	801 N DENEEN ST	STAUNT	CDFLT	STAUNTON		
296	KST241		STAUNT	CDFLT	STAUNTON		
297	WPXE998		STAUNT	CDFLT	STAUNTON FIRE		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
298	WPXE998	215 S WOOD STREET	STAUNT	CDFLT	STAUNTON FIRE	Fire	
299	WPEH410	105 S WOOD ST	STAUNT	CDFLT	STAUNTON,	Police	
300	WPEH410		STAUNT	CDFLT	STAUNTON,	Police	
301	WPEH410	100 E 6TH ST	STAUNT	CDFLT	STAUNTON,	Police	
302	WPEH410		STAUNT	CDFLT	STAUNTON,	Police	
303	KMG340	3 MI W & 1 MI N	GIRARD	CDFLT	STEWART, ED		
304	WYJ933	RT 1 4 MI NW	CHESTE	CDFLT	STRUBLE,		
305	WNZW284	123 E CENTER	BRIGHT	CDFLT	TARGHETTA		
306	WNZW284		BRIGHT	CDFLT	TARGHETTA		
307	WPPA344	116 HENRIETTA STREET	STAUNT	CDFLT	TROY READY MIX		
308	WPPA344		STAUNT	CDFLT	TROY READY MIX		
309	WNTI705	RAILROAD RIGHT OF WAY 1.5 MI S	SHIPMA	CDFLT	UNION PACIFIC		
310	KSD706	UP R O W 2 KM S	SHIPMA	CDFLT	UNION PACIFIC		
311	KSD706	100 S OF RR XING AT MOREAN ST	NILWOOD	CDFLT	UNION PACIFIC		
312	WNCL887	NINE MILE LAKE 2 MI W	VIRDEN	CDFLT	UNION PACIFIC		
313	WNDJ934	102 W CENTRAL AVE	BENLD	CDFLT	UNION PACIFIC		
314	WNJR409	MP 91.0 CR28 & RR TRKS 1 MI ESE	NILWOOD	CDFLT	UNION PACIFIC		
315	WPMJ445	MP 229.9 SFD SUB 360 S OF CR 7	MACOUP	CDFLT	UNION PACIFIC		
316	WPMR632	MP 245.4 SFD AEI 626 BRIGHTON E	BRIGHT	CDFLT	UNION PACIFIC		
317	WQIK327	MP 214.5, SPRINGFIELD SUB, HBD	NILWOOD	CDFLT	Union Pacific		
318	WQIK327	MP 239.8, SPRINGFIELD SUB, HBD	SHIPMA	CDFLT	Union Pacific		
319	WNQS515	.5 MI E HWY4 1.2 MIS	VIRDEN	CDFLT	UNITED		
320	WNQS515	3 MI S ON SHIPMAN HWY	CARLIN	CDFLT	UNITED		

ID	Name	Address	City	Class	Owner	Function	ReplaCost
321	WNQS515		VIRDEN	CDFLT	UNITED		
322	WNQS515		CARLIN	CDFLT	UNITED		
323	WNUP747	100 S MAIN ST	HETTICK	CDFLT	UNITED	Fire	
324	WNUP747		HETTICK	CDFLT	UNITED	Fire	
325	WNUP747	801 S FRANKLIN STREET	BUNKER	CDFLT	UNITED		
326	KNKN879	Chesterfield Cell Site 2.5 Miles North E	Chesterfi	CDFLT	USCOC OF		
327	WMG804	2.5 MI NE	CHESTE	CDFLT	USCOC OF		
328	WQJU978	3041 DORCHESTER RD	BUNKER	CDFLT	USCOC OF		
329	WQJU979	290 ALICE ST	SAWYE	CDFLT	USCOC OF		
330	WQKD843	301 W. WARREN ST.	BUNKER	CDFLT	USCOC OF		
331	WQKD844	71 WILSON ST	GILLESP	CDFLT	USCOC OF		
332	WQKC642	2644 E Frontage Road	White City	CDFLT	USCOC OF		
333	KSZ425	213 W FORTUNE ST	VIRDEN	CDFLT	VIRDEN		
334	KQS784	135 N DYE ST	VIRDEN	CDFLT	VIRDEN FIRE	Fire	
335	KQS784	317 SPRINGFIELD ST	VIRDEN	CDFLT	VIRDEN FIRE	Fire	
336	KQS784		VIRDEN	CDFLT	VIRDEN FIRE	Fire	
337	WPYG247	Intersect. of Hobson St. and Jackson	Virden	CDFLT	Virden Water		
338	WPYG247		VIRDEN	CDFLT	Virden Water		
339	KNFQ468	101 W JACKSON ST	VIRDEN	CDFLT	VIRDEN, CITY OF		
340	KNFQ468		VIRDEN	CDFLT	VIRDEN, CITY OF		
341	WNPD702	N SIDE ON CEMETERY RD	VIRDEN	CDFLT	VIRDEN, CITY OF		
342	WNPD702		VIRDEN	CDFLT	VIRDEN, CITY OF		
343	WPQB848	139 N DYE ST	VIRDEN	CDFLT	VIRDEN, CITY OF	Police	

ID	Name	Address	City	Class	Owner	Function	ReplaCost
344	WPQB848		VIRDEN	CDFLT	VIRDEN, CITY OF	Police	
345	WNBZ963	W SIDE OF IL RT 159 2 MI N	BUNKER	CDFLT	WEIDNER,		
346	WNBZ963		BUNKER	CDFLT	WEIDNER,		
347	KSF243	1.5 MI W .5 MI S RT 16	GILLESP	CDFLT	WILLIAM R		
348	WNWE208	S 8 1/2 MI BUNKER HILL BLACKTOP	CARLIN	CDFLT	YOUNG,		
349	WNWE208		CARLIN	CDFLT	YOUNG,		
350	E020023	WIBI studios, just south of Carlinville	Carlinville	CDFLT	ILLINOIS BIBLE		

Dams Report

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
1	OTTER LAKE DAM	WEST FORK OTTER CREEK	ROCKRIDGE	ADGPTV Water	SR	71	
2	BUNKER HILL OLD LAKE DAM	EAST FORK WOOD RIVER	FOREST	City of Bunker Hill	R	22	
3	STAUNTON COUNTRY CLUB	TRIB BIG BRANCH	STAUNTON-	Staunton Country	R	35	
4	LAKE KA-HO 2 DAM	TRIB PANTHER CREEK	BENLD-	J. C. Smith	R	36	
5	MACOUPIN LAKE DAM	TRIB HURRICANE CREEK	HARDIN	Macoupin Lake Club	R	23	
6	GILLESPIE COUNTRY CLUB	TRIB HONEY CREEK	HARDIN	Gillespie Country	R	20	
7	NEW GILLESPIE LAKE DAM	DRY FORK MACOUPIN	MACOUPIN	City of Gillespie	S	41	
8	SMITH RESERVOIR DAM	TRIB SPANISH NEEDLE	HARDIN	Monterey Coal	RS	58	
9	BEAVER LAKE DAM	TRIB MACOUPIN CREEK	HARDIN	Illinois Department	R	16	
10	OLD GILLESPIE LAKE DAM	DRY FORK	HARDIN	City of Gillespie	S	35	
11	LAKE WILLIAMSON DAM	TRIB HONEY CREEK	HARDIN	Lake Williamson	R	39	
12	EVERGREEN LAKE DAM	TRIB WEST FORK WOOD	FOREST	Jack Reihl	R	34	
13	PALMYRA-MODESTO CITY	TRIB NASSA CREEK	HETTICK-	Palmyra-Modesto	S	50	
14	GIRARD SUNSET LAKE DAM	TRIB EAST FORK OTTER	HETTICK-	Sunset Lake	R	47	

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
15	STANDARD CITY LAKE DAM	TRIB MACOUPIN CREEK	CARLINVILLE	Mobil Oil Corp.	R	33	
16	VIRDEN RECREATION CLUB	SUGAR CREEK-OFFSTREAM	THAYER	Virden Recreation	R	21	
17	TALL TIMBERS LAKE EAST DAM	TRIB EAST CREEK	STAUNTON	Lakes of the Tall	R	14	
18	STAUNTON RESERVOIR DAM	EAST CREEK	STAUNTON-	City of Staunton	SR	43	
19	LAKE CARLINVILLE DAM	HONEY CREEK	MEDORA-	City of Carlinville	SR	34	
20	OLD MT. OLIVE CITY LAKE	SUGAR CREEK	STAUNTON-	City of Mount Olive	SR	37	
21	FOREST LAKE CLUB LAKE	TRIB CAHOKIA CREEK	STAUNTON-	Forest Lake Fishing	R	30	
22	LAKE CATATOGA DAM	TRIB DRY FORK MACOUPIN	CARLINVILLE	Lake Catatoga	R	52	
23	MONTEREY/MINE 1/POND 5	SPANISH NEEDLE CREEK	PLAINVIEW	Monterey Coal	O	95	
24	FREEMAN UNITED/CROWN	TRIB BRUSH CREEK	RAYMOND	Freeman United	O	43	
25	SUPERIOR 4 DAM	WEST FORK CAHOKIA	WILSONVILL	Unknown	O	20	
26	CARLINVILLE LAKE II DAM	TRIB HONEY CREEK	CARLINVILLE	City of Carlinville	S	50	
27	CITY OF STAUNTON/OLD MINE	TRIB SUGAR CREEK	STAUNTON	City of Staunton	R	45	
28	TALL TIMBERS LAKE WEST	TRIB EAST CREEK	STAUNTON	Lakes of the Tall	R	24	
29	MADISON COAL	TRIB SPANISH NEEDLE	HARDIN	Monterey Coal	S	43	
30	BARTHS LAKE DAM	TRIB PADDOCK CREEK	EDWARDSVI	Arno Barth	R	29	
31	COLUMBIA QUARRY LAKE	TRIB BEAR CREEK	BENLD-	Columbia Quarry	R	18	
32	ILNONAME 2042	HONEY CUT BRANCH	ALTON	Unknown	R	36	
33	SHAD LAKE DAM	COOP BRANCH		Village of Royal	R	20	
34	ROYAL LAKE 1 DAM	TRIB COOP BRANCH	HARDIN	Royal Lake Resort	R	28	
35	MT. OLIVE CITY LAKE DAM	PANTHER CREEK	EAGERVILLE-	City of Mount Olive	S	31	
36	BUNKER HILL RESERVOIR 2	TRIB EAST FORK WOOD	FOREST	City of Bunker Hill	R	35	
37	LAKE KA-HO 1 DAM	TRIB PANTHER CREEK	BENLD	J. C. Smith	R	32	
38	LAKE EDWARD DAM	TRIB SPRING CREEK	GILLESPIE-	Lake Edward Club	R	20	

ID	Name	River	City	Owner	Purpose	Height (ft)	ReplaCost
39	SHIPMAN RESERVOIR DAM	TRIB COOP BRANCH	MEDORA	Village of Shipman	S	36	
40	SUNSET LAKE DREDGE	TRIB SUNSET LAKE	GIRARD	Sunset Lake	D	12	
41	FREEMAN UNITED/CROWN	TRIB HORSE CREEK		Freeman United	O	30	
42	FREEMAN UNITED/CROWN	TRIB BRUSH CREEK	THOMASVILL	Freeman United	O	21	
43	MONTEREY/MINE 1/REFUSE	PERCHED	BRUSHY	Monterey Coal	O	87	
44	CROWN II MINE		VIRDEN	FREEMAN UNITED	S	11	
45	CROWN II MINE		FARMERVILL	FREEMAN UNITED	T	23	
46	CROWN III MINE		FARMERVILL	FREEMAN UNITED	S	15	
47	CROWN III MINE		FARMERVILL	FREEMAN UNITED	S	28	
48	CROWN III MINE		FARMERVILL	FREEMAN UNITED	T	25	
49	CROWN III MINE		FARMERVILL	FREEMAN UNITED	T	54	
50	CROWN II MINE		FARMERSVIL	FREEMAN UNITED	T	25	
51	NO.1 MINE		CARLINVILLE	MONTEREY COAL	S	50	
52	NO.1 MINE		CARLINVILLE	MONTEREY COAL	T	80	
53	NO.1 MINE		CARLINVILLE	MONTEREY COAL	S	50	
54	NO.1 MINE		CARLINVILLE	MONTEREY COAL	T	51	
55	HAMMAN POND DAM #1	S. TRIB-HONEY CREEK	MAACOUPIN	LEONARD	O	26	
56	GILLHAM POND DAM #1	S. TRIB-OTTER CREEK	HAGAMAN	FRED GILLHAM	O	28	
57	DENBY POND DAM #1	S. TRIB-MACOUPIN CREEK	MACOUPIN	PETE DENBY	CO	30	
58	FRENCH LAKE DAM	S. TRIB-HONEY CREEK	MACOUPIN	A.O. FRENCH	R	25	
59	AUSTIFF POND DAM #1	N. TRIB-N.STREAM-OTTER	HAGAMAN	MELVIN AUSTIFF	O	28	

Electric Power Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
1	DYNEGY MIDWEST	STATE HIGHWAY 162	GRANITE CITY	EDFLT				122100

EOC Facilities Report

ID	Name	Address	City	Class	YearBuilt	ShelterCap	Stories	ReplaCost
1	Staunton City Civil	129 Madison St	Staunton	EFEO				$1,110
2	Girard City Civil Defense	S Side Sq	Girard	EFEO				$1,110
3	Girard Disaster Agency	111 W Madison St	Girard	EFEO				$1,110
4	Macoupin County EOC	215 S East St	Carlinville	EFEO				$1,110

FireStation Facilities Report

ID	Name	Address	City	Class	Stories	YearBuilt	ReplaCost
1	Mt. Olive Fire Protection	815 W Main ST	Mt. Olive	EFFS			
2	Staunton Fire Protection	215 S Wood ST	Staunton	EFFS			
3	Virden Fire Department	317 N Springfield ST	Virden	EFFS			
4	Girard Fire Protection District	115 N 1st ST	Girard	EFFS			
5	Hettick Fire Department	213 N Williams ST	Hettick	EFFS			
6	Palmyra Fire Dept	Rt 111 & Main ST	Palmyra	EFFS			
7	Carlinville Fire Department	317 W 2nd South ST	Carlinville	EFFS			
8	Medora Community Fire	316 E Washington ST	Medora	EFFS			
9	Brighton Betsey Ann Fire	105 Myrtle ST	Brighton	EFFS			
10	Bunker Hill Fire Protection	123 West Warren Street	Bunker Hill	EFFS			
11	Dorchester VFD	102 W Water ST	Dorchester	EFFS			

ID	Name	Address	City	Class	Stories	YearBuilt	ReplaCost
12	Gillespie Volunteer Fire	115 N Macoupin ST	Gillespie	EFFS			
13	Benld Vol. F.D	115 W Central AVE	Benld	EFFS			
14	Scottville-Modesto Rural Fire	911 Frontier St.	Modesto	EFFS			
21	Shipman Fire Department	329 E Railroad St. PO Box 49	Shipman				

Hazardous Materials

ID	Name	Address	City	Class	EPAID	ChemicalName
1	MENNEL MILLING CO. OF	415 E. MAIN ST.	MOUNT OLIVE	HDFLT	ILD984798272	CHLORINE
2	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	ARSENIC
3	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	BARIUM
4	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	COPPER
5	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	LEAD
6	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	MANGANESE
7	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	NICKEL
8	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	SELENIUM
9	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	ZINC COMPOUNDS
10	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	CHROMIUM
11	FREEMAN UNITED COAL	3 MILES W. OF FARMERSVILLE	FARMERSVILLE	HDFLT	ILD981187735	COBALT
12	PRAIRIE FARMS DAIRY INC.	1100 N. BROADWAY	CARLINVILLE	HDFLT		NITRIC ACID
13	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		BENZENE
14	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		ETHYLBENZENE
15	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		N-HEXANE
16	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		TOLUENE
17	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		"1,2,4-

ID	Name	Address	City	Class	EPAID	ChemicalName
18	SHIPMAN ELEVATOR CO.	3620 HWY. 16 W.	SHIPMAN	HDFLT		XYLENE (MIXED
19	M&M FS #10561	Route 138	BUNKER HILL	HDFLT		Diesel Fuel
20	M&M FS #10562	309 CLINTON ST	BUNKER HILL	HDFLT		
21	BLACKBURN COLLEGE POOL	700 COLLEGE AVE	CARLINVILLE	HDFLT		CHLORINE
22	M&M FS ATWATER	RR 1	ATWATER	HDFLT		
23	RULL BROTHERS PROPANE	1032 S WASHINGTON ST	BUNKER HILL	HDFLT		PROPANE
24	CARLINVILLE CITY POOL	RAMEY ST	CARLINVILLE	HDFLT		CHLORINE
25	FRONTIER COMMUNICATIONS	225 N BROAD ST	CARLINVILLE	HDFLT		
26	M&M FS #10564	130 CHILES ST	CARLINVILLE	HDFLT		DIESEL FUEL
27	DIAMOND MEAT PACKER	HWY 108 W	CARLINVILLE	HDFLT		
28	BENT-E-GAS	543 W MAIN ST	CARLINVILLE	HDFLT		DIESEL FUEL
29	M&M FS CHESTERFIELD	RR 1 BOX 92	CHESTERFIEL	HDFLT		DIESEL FUEL
30	MACOUPIN ENERGY LLC	14300 BRUSHY MOUND RD	CARLINVILLE	HDFLT		
32	M&M FS #10571	122 E CENTER ST	GIRARD	HDFLT		DIESEL FUEL
33	THERMAL CERAMICS	115 E MOUND ST	GIRARD	HDFLT		
34	GEORGIA PACIFIC	SOUTH RT 66	MT OLIVE	HDFLT		
36	M&M FS	392 E STATE ST	PALMYRA	HDFLT		DIESEL FUEL
37	WHEELER & ROSS HD	30510 ROUTE 111	PALMYRA	HDFLT		PROPANE
38	CROP PRODUCTION SERVICES	1100 W DEAN ST	VIRDEN	HDFLT		
39	M&M FS VIRDEN	311 E JACKSON ST	VIRDEN	HDFLT		DIESEL FUEL

Medical Care Facilities Report

ID	Name	Address	City	Class	Function	Beds	Stories	ReplaCost
1	CARLINVILLE AREA	1001 EAST MORGAN STREET	CARLINVILL	EFHS	Hospital	33		3885
2	COMMUNITY	400 CALDWELL STREET	STAUNTON	EFHS	Hospital	44		3885
3	NEW CARLINVILLE	N BROAD ST	CARLINVILL	EFHS	Hospital	50	1	12000
4	PLEASANT HILL VILLAGE	1010 W NORTH ST	GIRARD	EFHS	NursHome	40	1	
5	SUNRISE MANOR	333 WRIGHTSMAN ST	VIRDEN	EFHS	NursHome	40	1	
6	HERITAGE MANOR	1200 UNIVERSITY ST	CARLINVILL	EFHS	NursHome	50	1	
7	HERITAGE MANOR	7588 STAUNTON RD	GILLESPIE	EFHS	NursHome	50		
8	HERITAGE MANOR	215 W PENNSYLVANIA ST	STAUNTON	EFHS	NursHome	50	1	
9	SOUTH LAWN	312 S FRANKLIN ST	BUNKER HILL	EFHS	SHELTER	30		
10	CARLINVILLE REHAB	751 N OAK ST	CARLINVILL	EFHS	Rehab	30		
11	FRIENDSHIP HOME	826 N HIGH ST	CARLINVILL	EFHS	NursHome	30		

Police Station Facilities Report

ID	Name	Address	City	Class	Stories	ShelterCap	YearBuilt	ReplaCost
1	Staunton Police Dept	105 S Wood St	Staunton	EFPS				1554
2	Gillespie Police Dept	107 E Walnut St	Gillespie	EFPS				1554
3	Benld Police Dept	203 N Central Ave	Benld	EFPS				1554
4	Mount Olive Police Dept	200 E Main St	Mt Olive	EFPS				1554
5	Medora Police Dept	202 E Locust	Medora	EFPS				1554
6	Brighton Village Police Dept	206 S Main St	Brighton	EFPS				1554
7	Macoupin County Sheriff	215 S East St	Carlinville	EFPS				1554
8	Virden City Chief Of Police	139 N Dye St	Virden	EFPS				1554

ID	Name	Address	City	Class	Stories	ShelterCap	YearBuilt	ReplaCost
9	Shipman Police Dept	402 Carlinville Rd	Shipman	EFPS				1554
10	Carlinville Police Dept	570 N Broad St	Carlinville	EFPS				1554
11	Bunker Hill Police Station	801 S Franklin St	Bunker Hill	EFPS				1554
12	Palmyra Police Dept	110 E State St	Palmyra	EFPS				1554
13	Wilsonville Police Dept	PO Box 404	Wilsonville	EFPS				1554
14	Girard Police Dept	111 W Madison St	Girard					
15	Royal Lakes Police Dept	549 W Shipman Rd	Shipman					
16	Chesterfield Police Dept	115 E Depot St	Chesterfield					

Potable Water Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
1	CARLINVILLE WTP	15003 CARLINVILLE LAKE RD	CARLINVILL				1963	12000
2	GILLESPIE WTP	400 PEAR STREET	GILLESPIE				1984	10000
3	OTTER LAKE WTR	13722 EMMERSON AIRLINE	GIRARD				1969	20000
4	STAUNTON WTP	926 N EASTON	STAUNTON				2011	9300
5	PALMYRA MODESTO	9934 WATER PLANT ROAD	PALMYRA					
6	MT OLIVE WTP	OLD RESERVOIR ROAD	M OLIVE				1937	5000

Rail Facilities Report

ID	Name	Address	City	Class	Function	DailyTraffic	YearBuilt	ReplaCost
4	Carlineville Amtrak							

School Facilities Report

ID	Name	Address	City	Class	Students	Stories	YearBuilt	ReplaCost
1	GIRARD MIDDLE SCHOOL	525 N 3RD ST	GIRARD	EFS1	106	1	2004	1563.2252
2	GIRARD HIGH SCHOOL	525 N 3RD ST	GIRARD	EFS1	222	2	1918	3819.5785
4	GILLESPIE MIDDLE SCHOOL	412 OREGON ST	GILLESPIE	EFS1	394	1	1981	4365.2326
5	GILLESPIE HIGH SCHOOL	612 BROADWAY ST	GILLESPIE	EFS1	357	2		6142.2951
6	BENLD ELEMENTARY	100 E DORSEY ST	BENLD	EFS1	659	1	1961	12321.213
7	MT OLIVE HIGH SCHOOL	804 W MAIN ST	MOUNT OLIVE	EFS1	181	1	1990	3114.1608
8	MT OLIVE ELEMENTARY	804 W MAIN ST	MOUNT OLIVE	EFS1	419	1	2006	6953.1568
9	CARLINVILLE HIGH	829 W MAIN ST	CARLINVILLE	EFS1	475	3	1906	8172.5216
10	CARLINVILLE MIDDLE	110 ILLINOIS ST	CARLINVILLE	EFS1	322	2	1906	4748.6652
11	CARLINVILLE EARLY	506 N HIGH ST	CARLINVILLE	EFS1	159	1		1954.0315
36	Blackburn College	Nicholas Stree	Carlinville	EFS2			1913	
12	CARLINVILLE PRIMARY	18456 SHIPMAN RD	CARLINVILLE	EFS1	337	1	2002	5119.0709
13	CARLINVILLE	450 W BUCHANAN ST	CARLINVILLE	EFS1	218	1		3214.9348
14	BUNKER HILL HIGH	314 S MEISSNER	BUNKER HILL	EFS1	230	1	1963	3957.221
15	WOLF RIDGE	700 W ORANGE	BUNKER HILL	EFS1	308	1	2003	4470.4307
17	ROE ADULT LEARNING	85 CARLINVILLE PLZ	CARLINVILLE	EFS1	56	1	1973	963.4973
18	ROE SAFE SCH MACOUPIN	85 CARLINVILLE PLZ	CARLINVILLE	EFS1	17	1	1973	292.4902
19	STAUNTON HIGH SCHOOL	801 N DENEEN ST	STAUNTON	EFS1	485	1	1924	8344.5746
20	STAUNTON ELEM SCHOOL	801 N DENEEN ST	STAUNTON	EFS1	467	3	2003	8026.768
21	STAUNTON JR HIGH	801 N DENEEN ST	STAUNTON	EFS1	277	1	1954	4085.0318
22	ST MICHAEL SCHOOL	419 E MAIN ST	STAUNTON	EFS1	74	3	1904	1091.3081

ID	Name	Address	City	Class	Students	Stories	YearBuilt	ReplaCost
23	ZION LUTHERAN SCHOOL	220 W HENRY ST	STAUNTON	EFS1	95	2	1988	1401.0037
24	MEDORA ELEM SCHOOL	124 SOUTH ELM ST	MEDORA	EFS1	146	1	1991	1794.2679
25	VIRDEN MIDDLE SCHOOL	231 W FORTUNE ST	VIRDEN	EFS1	200	1	1998	2949.4815
26	VIRDEN ELEMENTARY	231 W FORTUNE ST	VIRDEN	EFS1	481	2	1981	8339.9046
27	VIRDEN HIGH SCHOOL	231 W FORTUNE ST	VIRDEN	EFS1	294	3	1923	5058.3607
28	NORTHWESTERN JR HIGH	30889 RTE 111	PALMYRA	EFS1	49	1	1957	722.623
29	NORTHWESTERN HIGH	30889 RTE 111	PALMYRA	EFS1	113	1	1957	1944.1999
30	NORTHWESTERN ELEM	30953 RTE 111	PALMYRA	EFS1	235	1	1972	2888.0339
31	BRIGHTON NORTH ELEM	BUNKER HILL RD	BRIGHTON	EFS1	411	1	1967	6774.2216
32	BRIGHTON WEST ELEM	305 N MAPLE ST	BRIGHTON	EFS1	250	1	1938	3173.1505
33	SHIPMAN ELEM SCHOOL	DORA RENO WHITE ST	SHIPMAN	EFS1	125	1	1938	1536.1883
34	SOUTHWESTERN HIGH	8226 ILLINOIS 111	PIASA	EFS1	582	1		10013.4896
35	SOUTHWESTERN MIDDLE	8226 ILLINOIS 111	PIASA	EFS1	275	2		4055.537

User Defined Facilities Report

ID	Name	Address	City	Class	Function	Stories	YearBuilt	ReplaCost
27	Virden KC Hall	101 W Jackson St	Virden	GOV	shelter	1		
28	Carlinville Elks Lodge	201 W Main St	Carlinville	REL1	shelter	2		
29	Brighton City Hall	206 S Main St	Brighton	GOV	shelter	1	1969	
30	Benld City Hall	205 E Central Ave	Benld	GOV	shelter	1	2002	
31	Gillespie City Hall	115 N Macoupin St	Gillespie	GOV	shelter	1		
26	St. Patrick's Catholic Church	742 W Madison	Girard	REL1	shelter	1	1976	

WasteWater Facilities Report

ID	Name	Address	City	Function	Class	Stories	YearBuilt	ReplaCost
1	BENLD STP	201 EAST CENTRAL	BENLD		WDF			73926
2	BRIGHTON STP	SOUTH PARK DRIVE	BRIGHTON		WDF			73926
3	BUNKER HILL STP	815 W ALTON STREET	BUNKER HILL		WDF		1965	73926
4	CARLINVILLE STP	1305 SOUTH MAYO STREET	CARLINVILLE		WDF		1965	6000
5	GILLESPIE STP	115 NORTH MACOUPIN STREET	GILLESPIE		WDF			73926
6	GIRARD WWTP	R.R. #2	GIRARD		WDF			73926
7	HETTICK STP	191 BUTLER STREET	HETTICK		WDF			73926
8	MT. CLARE STP	410 BERRY	GILLESPIE		WDF			73926
9	MT. OLIVE WWTP	901 PINE ST	MOUNT OLIVE		WDF		1926	73926
10	NILWOOD STP	P.O. BOX 33	NILWOOD		WDF			73926
11	PALMYRA STP	SOUTH MAIN AND LOCUST	PALMYRA		WDF			73926
12	ROYAL LAKES STP	549 WEST SHIPMAN ROAD	ROYAL LAKES		WDF			73926
13	SHIPMAN STP	P.O. BOX 169	SHIPMAN		WDF			73926
14	STAUNTON WWTP	926 N Easton	STAUNTON		WDF			73926
16	VIRDEN SD EAST STP	115 CEMETERY ROAD	VIRDEN		WDF		1966	73926
17	WHITE CITY STP	RURAL ROUTE #1	MOUNT OLIVE		WDF			73926
18	WILSONVILLE STP	SOUTH CITY LIMITS	WILSONVILLE		WDF			73926

Appendix G: Critical Facilities Map

See Attached

Appendix H: Macoupin County Flow Data

Annual Peak Flows for USGS Gauging Stations in Macoupin County

USGS No.	05586800	
River	Otter Creek	
Period of Record	1959-1980	
Latitude	39.379444	
Longitude	89.9475	
Rank	Year	Discharge (cfs)
1	1943	15,000
2	1966	11,900
3	1978	8,940
4	1979	8,210
5	1962	7,300
6	1973	6,250
7	1970	5,600
8	1977	4,340
9	1975	4,320
10	1969	3,130