



MULTI-HAZARD MITIGATION PLAN

Prepared for:

**Steuben County, Indiana
City of Angola, Indiana
Town of Hamilton, Indiana
Town of Hudson, Indiana
Maumee River Basin Commission**

March 2008

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TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 PROJECT SCOPE AND PURPOSE..... 1

1.2 PLANNING PROCESS 2

1.3 PLANNING COMMITTEE 2

1.4 PUBLIC INVOLVEMENT IN THE PLANNING PROCESS..... 4

1.5 INVOLVEMENT OF OTHER INTERESTED PARTIES..... 4

2.0 COMMUNITY INFORMATION 5

2.1 NFIP PARTICIPATION..... 5

2.2 POPULATION & DEMOGRAPHICS 5

2.3 LAND USE & DEVELOPMENT TRENDS 5

2.4 EMPLOYMENT 6

2.5 CRITICAL & NON-CRITICAL FACILITIES..... 7

2.6 MAJOR WATERWAYS AND WATERSHEDS 7

2.7 TOPOGRAPHY 10

2.8 CLIMATE..... 10

3.0 RISK ASSESSMENT..... 11

3.1 HAZARD IDENTIFICATION 11

3.2 HAZARD PROFILES..... 14

 3.2.1 HAZARDOUS MATERIALS 15

 3.2.2 FLOODING..... 21

 3.2.3 HAILSTORMS, THUNDERSTORMS, & WINDSTORMS..... 29

 3.2.4 TORNADO 35

 3.2.5 SEVERE WINTER STORM / ICE..... 40

 3.2.6 DAM FAILURE 44

 3.2.7 EARTHQUAKE..... 48

3.3 HAZARD SUMMARY 51

4.0 MITIGATION GOALS & PRACTICES..... 53

4.1 MITIGATION GOALS 53

4.2 MITIGATION PRACTICES..... 54

5.0 IMPLEMENTATION PLAN..... 58

6.0 PLAN MAINTENANCE PROCEDURES 62

6.1 MAINTENANCE PROCESS..... 62

6.2 INCOPRORATION INTO EXISTING PLANS..... 62

6.3 CONTINUED PUBLIC INVOLVEMENT 62

LIST OF TABLES

Table 1-1: MHMP Planning Committee 3
 Table 1-2: Additional Local Leaders 3
 Table 2-1: NFIP Participation 5
 Table 2-2: Land Use 6
 Table 2-3: List of Major Employers 6
 Table 2-4: List of Major Waterways 8
 Table 2-5: List of 14-Digit HUC Watersheds 8
 Table 2-6: List of Major Lakes 9
 Table 3-1: Hazards Identification 11
 Table 3-2: Determination of Weighted Values for NFIP Communities 12
 Table 3-3: Combined CPRI for Steuben County, Angola, Hamilton, and Hudson 13
 Table 3-4: Comparative Hazard Analysis Score 14
 Table 3-5: US Hazardous Materials Incidents by Transportation Mode 16
 Table 3-6: CPRI for Hazardous Materials 17
 Table 3-7: Hazardous Materials Handlers, Neighboring Facilities, and Replacement Costs 18
 Table 3-8: Historic Flood Data 22
 Table 3-9: Repetitive Loss Properties, Claims, and Payments 23
 Table 3-10: Flood Insurance Premiums and Coverage 24
 Table 3-11: CPRI for Flooding 24
 Table 3-12: Residential Structures within the 100-year Floodplain 25
 Table 3-13: Structures within the 100-year Lake Levels 26
 Table 3-14: Historic Hailstorm, Thunderstorm, and Windstorm Data 31
 Table 3-15: CPRI for Hailstorm, Thunderstorm, and Windstorm 32
 Table 3-16: Fujita Scale of Tornado Intensity 36
 Table 3-17: Historic Tornado Events 36
 Table 3-18: CPRI for Tornado 37
 Table 3-19: Summary of Hypothetical Tornado Damages and Estimated Economic Costs 38
 Table 3-20: Historic Severe Winter Storm/Ice Data 41
 Table 3-21: CPRI for Severe Winter Storm/Ice 42
 Table 3-22: CPRI for Dam Failure 45
 Table 3-23: CPRI for Earthquake 49
 Table 3-24: Comparative Hazard Rankings, Steuben County 51
 Table 4-1: Summary of Mitigation Practices 55

LIST OF EXHIBITS

- 1 Steuben County Critical Facilities
- 1a Critical Facilities by NFIP Community
- 2 Flood Zones, USGS Stream Gages, and Dams
- 3 Historic Tornado Activity
- 4 Major Transportation Routes and Hazardous Materials Handlers

LIST OF APPENDICES

- 1 List of Acronyms
- 2 Planning Committee Meeting Agendas and Meeting Summaries
- 3 List of Critical Facilities by NFIP Community
- 4 Media Releases, Coverage, Public Survey, and Summary of Responses
- 5 Promulgation Authorities
- 6 Resolutions for Adoption
- 7 Potential Funding Sources for MHMP Mitigation Measures

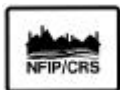
1.0**INTRODUCTION****1.1 PROJECT SCOPE AND PURPOSE**

The development of a Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). According to DMA 2000, the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

In order for National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP. The Indiana Department of Homeland Security (IDHS) and the U.S. Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA) Region V offices administer the MHMP program in Indiana. All future references in this plan to the DHS/FEMA will be denoted as FEMA.

The Steuben County MHMP is a multi-jurisdictional planning effort led jointly by the Maumee River Basin Commission (MRBC) and the Steuben County Emergency Management Agency (EMA). This Plan was prepared in partnership with Steuben County, the City of Angola, and the Towns of Hamilton and Hudson. Representatives from each of these communities attended Planning Committee meetings, provided valuable information about their community, reviewed and commented on the draft MHMP, and assisted with local adoption of the approved Plan. Since each of the communities participating had an equal opportunity for participation and representation in the planning process, the process used to develop the Steuben County MHMP satisfies the requirements of DMA 2000 in which multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the planning process.

The development of this MHMP is the necessary first step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in Steuben County. The intent of this planning effort was to identify the hazards and the extent that they affect Steuben County and its member communities and to formulate mitigation strategies or projects that could be undertaken to mitigate these hazards. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) Grant, Pre-Disaster Mitigation (PDM) Grant, Repetitive Flood Claims (RFC) Grant, as well as other FEMA programs including the NFIP Community Ratings System (CRS), additional detailed studies will need to be completed prior to applying for these grants or programs.



Throughout this Plan, activities that could count toward CRS points are identified with the NFIP/CRS logo. The CRS is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote education and awareness of flood insurance. Savings in flood insurance premiums are proportional to the points assigned to various activities. A minimum of 500 points are necessary to enter the CRS program and receive a 5% flood insurance premium discount. This Plan could contribute as many as 294

points toward participation in the CRS. At this time, there are no CRS eligible communities in Steuben County.

Funding to prepare this MHMP was made available through a Pre-Disaster Mitigation Planning (PDM) grant that the DHS/FEMA awarded to the Steuben County Commissioners. The local match contribution was provided by the MRBC in the form of a grant awarded to the Steuben County Commissioners. Christopher B. Burke Engineering, Ltd. (CBBEL) was hired to facilitate the planning process and prepare the Steuben County MHMP under the direction of an AICP Certified Planner.

1.2 PLANNING PROCESS

Preparation for the Steuben County MHMP began August of 2005 when the MRBC, in partnership with the Steuben County Commissioners, requested PDM funds from FEMA to prepare a MHMP for the County and NFIP communities. CBBEL was hired in July 2006.

In August 2006, the MRBC in cooperation with the Steuben County EMA Director compiled a list of Planning Committee members that would meet in August, March, April, and May. From August 2006 through January 2007, GIS databases were updated with the most recent information regarding critical facilities within Steuben County. January through March 2007, CBBEL researched and compiled historic hazard data necessary to prepare the MHMP. In April 2007, a media release describing the development of the MHMP was distributed to local media outlets. In August 2007, CBBEL provided the full draft Steuben County MHMP to the Planning Committee for their review and comment. A public meeting was scheduled for September 17, 2007 to present the draft Plan to the public and other interested parties. Draft copies of the MHMP were provided to the local library and public comments were accepted through the public meeting date. The Plan was then forwarded to IDHS and FEMA for their review and comment. Comments from IDHS and FEMA were incorporated into the draft Plan and reviewed by the Planning Committee. Local adoption of the MHMP by the Steuben County Commissioners was completed in [date] 2007.

1.3 PLANNING COMMITTEE

The Steuben County MHMP Planning Committee was a new committee specifically formed to develop this Plan. Members included representatives from Steuben County, the City of Angola, the Town of Hamilton, the City of Hudson, and the MRBC. These representatives were knowledgeable of local hazards; had been involved in hazard mitigation; and/or had the tools necessary to reduce the impact of future hazard events. The Planning Committee included representatives from NFIP communities and the offices of emergency management, fire, law enforcement, planning, zoning and code enforcement, public health, public utilities, and various elected officials. **Table 1-1** lists the individuals that participated on the Planning Committee and the entity they represented. **Table 1-2** lists the additional local leaders attending the Planning Committee meetings.

The Planning Committee convened at the Fire Department and the Steuben County Annex Building, both in Angola. Representatives from the NFIP communities attended the meetings and worked efficiently to discuss and make decisions on the information presented. During these meetings, the Planning Committee successfully identified critical facilities and local hazards; reviewed the State's mitigation goals and set local mitigation goals; reviewed local hazard data and maps; identified and assessed the effectiveness of existing mitigation measures; established mitigation projects; and reviewed materials for public participation. A sign-in sheet recorded those present at each meeting to document participation. Meeting

agendas and summaries are included in **Appendix 2**. Members of the Planning Committee attended the public meeting in September 2007 and assisted with adoption of the Steuben County MHMP.

Table 1-1: MHMP Planning Committee

Name	Title	Representing
Bill Brown	Director	Steuben County EMA
Julie Cole	Planner	City of Angola
Tom Friend	Chief Env. Specialist	Steuben County Health Department
Mark Gerardot	Superintendent	Town of Hamilton Street Department
Larry Gilbert	Surveyor	Steuben County Surveyor's Office
Larry Grantham	Zoning Administrator	Town of Hamilton Planning Department
Dick Hickman	Mayor	City of Angola
Alan Hile	Director	Steuben County REMC
Chad Hoover	GIS Coordinator	Steuben County GIS Department
Bob Howard	Town Manager	Town of Hamilton
Rick Lewis	Sheriff	Steuben County Sheriff's Office
Katherine Mac Aulay	Executive Director	American Red Cross
Mike Meek	Fire Chief	City of Angola Fire Department
Ward Odom	Town Manager	Town of Hudson
Dan Olis	Superintendent	City of Angola Water Department
Joe Patterson	Town Marshall	Town of Hamilton
Rodney Renkenberger	Executive Director	Maumee River Basin Commission
Sara Samuels		Steuben County Plan Commission
Charles Smith		Town of Orland Police Department
Ron Smith	Commissioner	Steuben County Commissioner's Office
Dave Sommerlott	Engineer	Steuben County Highway Department
Dean Twitchell	Building Commissioner	City of Angola
Craig Williams	Superintendent	City of Angola Wastewater Department

Several additional local leaders were in attendance for the Planning Committee meetings. These individuals are listed in **Table 1-2** below.

Table 1-2: Additional Local Leaders

Name	Title	Representing
Robert Berger		Univertical
Sharon Brown	Administrative Assistant	Steuben County EMA
John Gonya		Steuben County Sheriff's Department
Mike Lesnick		City of Angola Police Department
Kevin Mory		Angola Fire Department
Amy Oberlin	Reporter	Herald Republican
Bob Stoppenhagen	Steuben County Liaison	American Red Cross

1.4 PUBLIC INVOLVEMENT IN THE PLANNING PROCESS

In May 2007, a media release was distributed to local media in Steuben County and was titled, "How do tornados, floods, and severe winter storms affect you?" The article identified the communities participating in the MHMP effort, the requirements of DMA 2000, and 5 questions about hazard awareness to which interested residents could respond. **Appendix 4** includes a copy of the media release as well as copies of the resulting articles. Appendix 4 also contains summarized results from the surveys returned.

A draft of the Steuben County MHMP was placed in the Carnegie Public Library in Angola, Indiana. Press releases announcing the placement of the plan were provided to local media and the Planning Committee members were also provided with an information flyer to display in their respective offices. This was an attempt to provide the public with a copy of the MHMP and allow them to review and comment on the contents. Those in attendance for the public meeting held on September 17, 2007 were provided with information related to the development of the Steuben County MHMP, the hazards affecting Steuben County, as well as the proposed mitigation measures developed by the Planning Committee. Several members of the Planning Committee were present to describe details of the plan as well as to answer questions presented by attendees. Attendance was moderate; however, those in attendance were interested citizens and representatives of the public.

1.5 INVOLVEMENT OF OTHER INTERESTED PARTIES

Neighboring EMA Directors in Lagrange, Noble, and DeKalb Counties, Indiana; Defiance and Williams Counties, Ohio; and Monroe County, Michigan, as well as interested agencies, businesses, academia, and nonprofits were invited to review and comment on the draft Steuben County MHMP.



The CRS program credits NFIP communities a maximum of 100 points for organizing a planning committee composed of staff from various departments; involving the public in the planning process; and coordinating among other agencies and departments to resolve common problems relating to flooding and other known natural hazards.

2.0 COMMUNITY INFORMATION

Steuben County is a highly agricultural county with approximately 74% of land involved in agriculture from open fields and pastures to farmsteads, approximately 14% classified as deciduous forest, and an additional 5% as open water. Steuben County ranks 75th of 92 counties in Indiana regarding size with slightly more than 206,000 acres. The City of Angola is the county seat and the county’s largest urban center. Angola is the home of Tri-State University, a private university with approximately 1,450 students. The City of Angola is centrally situated in Steuben County approximately 40 miles north of the City of Ft. Wayne, directly east of Interstate 69.

2.1 NFIP PARTICIPATION

The City of Angola, the Towns of Hamilton and Hudson, and Steuben County are participants in the National Flood Insurance Program (NFIP). At the time of preparing this MHMP, none of the NFIP communities in Steuben County participates in the CRS program. **Table 2-1** lists the NFIP number and the date they joined the program for each community.

Table 2-1: NFIP Participation

NFIP Communities	NFIP Number	Join Date
Steuben County	180243	12/27/1974
City of Angola	180244B	08/23/1974
Town of Hamilton	180248	09/06/1974
Town of Hudson	180249	07/19/1974

(FEMA, 2006)

2.2 POPULATION & DEMOGRAPHICS

Steuben County has an above average population growth for Indiana, and ranks 8th among 92 counties with a growth rate of 21% between 1990 and 2000. The most recent census data for Steuben County estimates that the 2005 population was 33,773. Of the 92 counties in Indiana, Steuben County is the 75th largest in geographical size and 48th largest for population in Indiana. Approximately 23% of the population in Steuben County lives in the City of Angola.

In 2004, the median age of the population in Steuben County was 36.7 years. Similar to the rest of Indiana, the largest demographic age groups in the county were young adults (25 - 44 years), older adults (45 - 64 years), and school aged (5 -17 years) with a distribution within the county of 26.7%, 25.2%, and 18.4%, respectively. The ethnic majority in Steuben County is white which comprises 88.7% of the county population followed by a growing black ethnicity. Similar to the rest of Indiana, 24% of the population in Steuben County is married with children. The average household size is 2.53 persons. Homeownership is slightly lower in Steuben County than elsewhere in the state. Approximately 57.4% of the population owns their home compared to 65.9% statewide.

2.3 LAND USE AND DEVELOPMENT TRENDS

The most common land use classification is row crop, which covers roughly 55% of all land area in Steuben County. Following agricultural production areas in geographic extent is pasture and hay land classification, which covers approximately 19% of the County. Residential development, both low intensity and high intensity, covers approximately 1% of the total land use in the County and is concentrated primarily in the City of Angola and the smaller

incorporated areas of the Fremont and Hudson. **Table 2-2** displays the distribution of land-use types within Steuben County.

Table 2-2: Land Use

Description	Acres	% of County
Row Crops	113,319.5	54.9
Pasture/Hay	39,899.6	19.3
Deciduous Forest	28,356.5	13.7
Open Water	9,825.8	4.8
Woody Wetlands	6,373.8	3.1
Emergent Herbaceous Wetlands	3,368.6	1.6
Low Intensity Residential	1,941.7	0.9
Commercial/Industrial	1,625.7	0.8
Evergreen Forest	566.7	0.3
Urban/Recreational Grasses	318.9	0.2
Grasslands/Herbaceous	295.8	0.1
Mixed Forest	206.4	0.1
High Intensity Residential	202.8	0.1
Transitional	67.8	0.0
TOTAL	206,369.6	100%

(USGS, 2006)

2.4 EMPLOYMENT

Census data from 2004 shows that of the total labor force in Steuben County, 87.4% worked in the private sector that includes retail trade, construction, professional technical services, and health care and social services. The annual per capita personal income in 2004 was \$26,107 and the median household income in 2003 was \$41,930. The number of individuals commuting out of Steuben County for work was higher (4,148) than those commuting into Steuben County for work (2,798). In 2004, employment numbers were 19,809 individuals and conversely, in June 2006, the unemployment rate for Steuben County was 5.8%. **Table 2-3** provides a listing of the major employers within Steuben County.

Table 2-3: List of Major Employers

Amcast Automotive/Fremont Plant	Moore-Wallace, Inc.
Cardinal IG	Salga, Inc.
Dana Hose & Tubing Products	Tenneco Automotive
Dexter Axle	TI Group Automotive Systems
Eagle Pitcher Hillsdale Tool	Tyden Brammall
Meridian Automotive Systems	

(Steuben County Economic Development Corporation, 2007)

Manufacturing facilities in Steuben County employ 28.1% of the workforce, approximately 5,560 workers. Private facilities are the next largest employer with 14.7%, retail trade has approximately 13.9% of the county’s workforce, with an additional 9.2% local government and public administration positions.

2.5 CRITICAL AND NON-CRITICAL FACILITIES

Critical facilities are those that are vital to the health, safety, and welfare of the population. These facilities are vital to the community's ability to provide essential services and protect life and property, are critical to the community's response and recovery activities, and/or are the facilities the loss of which would have a severe economic or catastrophic impact. The operation of these facilities becomes especially important following a hazard event.

There were 328 critical facilities identified for the purpose of the Steuben County MHMP:

- **Governmental Facilities** – *21 facilities* – essential for the delivery of critical services and crisis management including data and communication centers and key government complexes.
- **Essential Facilities** – *32 schools, 30 day care centers, 2 emergency operations centers, 10 fire stations, 6 law enforcement facilities, and 10 medical care facilities* – vital to health and welfare of entire population including hospitals and other medical facilities, police and fire, emergency operations centers, evacuation shelters, and schools.
- **Transportation Systems** – *8 airports* – necessary for transport of people and resources including airports, highways, railways, and waterways.
- **Lifeline Utility Systems** – *13 wastewater treatment plants, 7 potable water facilities, 10 water towers, 2 telecommunication facilities, and 37 cell phone towers* – vital to public health and safety including potable water, wastewater, oil, natural gas, electric power, and communication systems.
- **High Potential Loss Facilities** – *14 County identified dams, 23 IDNR identified dams, and 1 military installation* – failure or misoperation may have significant physical, social, and/or economic impact to neighboring community including nuclear power plants, high hazard dams, and military installations.
- **Hazardous Material Facilities** – *102 facilities* – involved in the production, storage, and/or transport of corrosives, explosives, flammable materials, radioactive materials, and toxins.

The Steuben County Multi-Hazard Mitigation Plan (MHMP) Planning Committee identified types and locations of critical facilities to be incorporated into the County's Geographic Information System (GIS) databases. These databases included critical facilities such as hospitals, police and fire stations, emergency operations centers, shelters, and schools; transportation systems; utility lifelines; high potential loss facilities such as potable water, wastewater, oil, natural gas, electric power, communication systems, and hazardous material facilities. The Planning Committee reviewed and approved database information and maps for critical facilities in Steuben County.

Exhibit 1 illustrates the location of critical facilities and **Appendix 3** lists the critical facilities by NFIP community. Non-critical facilities include residential, industrial, commercial, and other structures not meeting the definition of a critical facility and are not required for a community to function. Approximately, 28,000 non-critical facilities were identified using the Steuben County GIS databases. The development of this MHMP focused on critical facilities; thus, non-critical facilities are not individually mapped or listed.

2.6 MAJOR WATERWAYS AND WATERSHEDS

According to the Steuben County Surveyor's Office, there are 63 waterways in Steuben County. **Table 2-4** lists the waterways identified. The most prominent waterway in the County is Pigeon Creek.

Table 2-4: List of Waterways

Allen Ditch	Crooked Creek	Goodale Ditch	Schaeffer Ditch
Baker Ditch	Davis Ditch	Greeno Ditch	Stoy Ditch
Bear Creek	De Gough Ditch	Gundrum Ditch	Stumpf Ditch
Berlien Ditch	De Witt Ditch	H Metz Ditch	Swiger Ditch
Black Creek	Deetz Ditch	Hammond Green Ditch	Teal Ditch
Brouse Ditch	Delancey Ditch	Hanselman Branch	Teegardin Ditch
Burch Ditch	Deller Ditch	ID Deller Ditch	Turkey Creek
Conrad Ditch	Eatinger Ditch	Johnson Ditch	Waller Ditch
Camp Ditch	Fawn River	Little Baker Ditch	Webb Ditch
Carver Ditch	Fellows Ditch	M Johnson Ditch	Weicht Ditch
Chard Ditch	Fish Creek	McKain Ditch	Weicht Ditch
Cheney Ditch	Follett Creek	Merrill Sanders Ditch	Weldin Ditch
Clay Deller Ditch	G Powers Ditch	Mud Creek	William Jack Ditch
Cole Ditch	Garn Ditch	Pigeon Creek	Wood Ditch
Covell Ditch	George Deller Ditch	Ryan Ditch	Zabst Ditch
Creel Ditch	Gleason Ditch	Saunders Ditch	

(Steuben County Surveyor’s Office, 2007)

According to the Indiana Department of Environmental Management (IDEM), there are 33 14-digit Hydrologic Unit Code (HUC) watersheds in Steuben County. The largest watershed is the Snow Lake – Crooked Creek/Otter Lake Watershed (16,523.0 acres) and the smallest is the Prairie River – Lake Lavine (MI) (8.1 acres). **Table 2-5** lists the 14-digit HUC watersheds in Steuben County.

Table 2-5: List of 14-Digit HUC Watersheds and Acres

14-Digit HUC #	14-Digit HUC NAME	Acres
04050001090020	Snow Lake – Crooked Creek/Otter Lakes	16523.0
04100003050050	Fish Creek – Myers Dt – Bull Lake/Baker Ditch	14261.5
04050001110020	Pigeon Creek – Pigeon Lake	13965.5
04050001110080	Pigeon Creek – Green Lake/Shallow Lake	13567.4
04050001110110	Little Turkey L – Big Long L/Lake of the Woods	13278.9
04050001090040	Tamarack – Lime – Gage – Crooked – Loon Lakes	12952.2
04050001110060	Pigeon Creek – Hogback Lake – Silver Lake	12947.4
04100003050060	Fish Creek – Cornell Ditch	11840.2
04050001110090	Turkey Creek – Headwaters (Helmer)	11805.1
04050001110030	Pigeon Creek – Mud Creek	11657.9
04050001090060	Fawn River – Lime Lake/Will-Mud Lake	11393.6
04050001090030	Crooked Creek – Lake James/Jimmerson Lake	11053.7
04050001110100	Turkey Creek – Big Turkey Lake/Mud Creek	11024.6
04100003050040	Hamilton Lake – Black Creek	10601.0

14-Digit HUC #	14-Digit HUC NAME	Acres
04050001110070	Pigeon Creek – Otter Lake	10500.2
04050001090050	Fawn River – Orland	10431.9
04100003050020	West Branch Fish Creek	10003.5
04050001110040	Pigeon Creek – Long Lake – Pleasant/Fox Lakes	9556.1
04050001110050	Mud lake – Johnson Ditch	9038.3
04100003050030	Fish Creek – Alvarado	8568.4
04050001110010	Pigeon Creek – Ryan Ditch	7985.7
04100003020010	Clear Lake (Steuben)	4419.1
04050001080010	South Trib Prairie River (MI) – Lake Pleasant	3911.2
04100003050010	Fish Creek Headwaters	3865.7
04050001090010	Lake George – Crooked Creek	2500.1
04100003030020	Nettle Creek – Mill Stream Drain – Long Lake	1318.4
04100003030060	Bear Creek (St. Joseph River, OH)	1317.4
04100003020020	West Branch West Fork St. Joseph River (MI)	1144.2
04050001090010	Lake George – Crooked Creek	1006.7
04050001020010	Tallahassee Drain – Ray (Coldwater River (MI))	123.4
04050001020010	Tallahassee Drain – Ray (Coldwater River (MI))	37.8
04050001090070	Himebaugh Drain (MI)	37.6
04050001080020	Prairie River – Lake Lavine (MI)	8.1

(IDEM, 2006)

Steuben County is also known for having over 100 natural lakes within the County boundaries. These lakes provide residents and visitors with numerous opportunities such as fishing, boating, and camping. Due to these opportunities, the lake population regularly doubles during the summer months. **Table 2-6** below indicates the largest lakes in Steuben County.

Table 2-6: List of Major Lakes

Ball Lake	Handy Lake	Meserve Lake
Barton Lake	Henry Lake	Michiana Lake
Bass Lake	Hogback Lake	Middle Center Lake
Beaver Dam Lake	Howard Lake	Milldam Lake
Bell Lake	Jimmerson Lake	Mink Lake
Big Otter Lake	Johnson Lake	Mirror Lake
Big Turkey Lake	Johnson Lake	Mud Lake
Black Lake	Lake Anne	Mud Lake
Booth Lake	Lake Arrowhead	Mud Lake
Bower Lake	Lake Charles East	Mud Lake
Buck Lake	Lake Charles West	Mud Lake
Cedar Lake	Lake Gage	Mud Lake
Cemetery Lake	Lake George	Perch Lake
Center Lake	Lake James	Perfect Lake

Chair Factory Lake	Lake Minifenokee	Pigeon Lake
Cheeseboro Lake	Lake Pleasant	Pine Canyon Lake
Clear Lake	Lake Syl-Van	Pleasant Lake
Crockett Lake	Lake Vogelbacher	Reed Lakes
Crooked Lake	Lake of the Woods	Rhodes Lake
Deep Lake	Lime Lake	Round Lake
Eaton Lake	Lime Lake	Round Lake
Failing Lake	Lime Kiln lake	Sally Owen Lake
Fish Lake	Little Bower Lake	Seven Sisters Lake
Fox Lake	Little Center lake	Shallow Lake
Gannon Lake	Little Otter Lake	Silver Lake
Golden Lake	Little Turkey Lake	Snow Lake
Gooseneck Lake	Long Beach Lake	Tamarak Lake
Grass lake	Long Lake	Tamarak Lake
Gravel Pit Lake	Long Lake	Terry Lake
Green Lake	Loon Lake	Walters Lake
Green Lake	Marsh Lake	Warner Lake
Hamilton Lake	McClish lake	West Otter Lake

(Steuben County Surveyor’s Office, 2007)

2.7 TOPOGRAPHY

The Steuben County landscape can be characterized as a high rolling topography with more hilly areas near the lakes. The difference in elevation for Steuben County is approximately 329 feet, with the highest elevation being 1,205 ft. in northeastern Steuben County. The lowest elevation in the county is located on the Steuben – DeKalb County Line near Fish Creek at 876 ft in elevation.

2.8 CLIMATE

The Midwestern Regional Climate Center (MRCC) provided climate data that includes information retrieved from a weather station located in Angola, and is identified as station 120334. The average annual mean temperature for Steuben County is 50.3 °F. Mean precipitation is 35.47 inches a year, with the wettest month being June with 4.17 inches mean total, and the driest month is February, with 1.42 inches mean total. The highest 1-day maximum precipitation was 3.65 inches on October 31, 1898. Mean snowfall is 32.4 inches per year. The highest monthly amount of snowfall recorded at this station is 30.0 inches for January 1982. On average, there are 118.5 days of rain greater than or equal to 0.01 inches, 23.6 days of rain greater than or equal to 0.5 inches, and 6.5 days of rain greater than or equal to 1.0 inches of depth. There are approximately 164 days in the growing season for Steuben County, based on a base temperature of 32 °F and falls between May 5 and October 8.

3.0 RISK ASSESSMENT

The goal of mitigation is to reduce the future social, physical, and economic impacts of a hazard. These include property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. To realize this goal, a comprehensive examination of natural hazard risk in a community is required. A risk assessment measures the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and people in a community. It identifies the characteristics and potential consequences of hazards, how much of the community will be affected by a hazard, and the impact on community assets.

3.1 HAZARD IDENTIFICATION

The MHMP Planning Committee reviewed the list of natural hazards prepared by Federal Emergency Management Agency (FEMA) Region V, identified those hazards that affected Steuben County, and agreed upon which hazards they would like to study in detail as part of this planning effort. Threats of terrorism, pipeline utility failure, and pandemic/epidemic outbreaks were also mentioned as potential hazards having a significant impact on Steuben County. However, due to the sensitive nature of the information and the fact that these events have been detailed in other non-public documents, the Planning Committee decided not to include them in this report.

As illustrated in **Table 3-1**, the Planning Committee decided to study dam failure, earthquake, flooding, hailstorms, thunderstorms, and windstorms, hazardous materials incidents, severe winter storms including ice storms, and tornados in detail as part of this planning effort. While the FEMA Region V listing included landslide and wildfire, the Planning Committee felt that these hazards had very little impact and would not study them as a part of this planning effort.

Table 3-1: Hazards Identification

List of Hazards	Hazards with Local Impact	Hazards for Detailed Study
Dam Failure	Yes	Yes
Earthquake	Yes	Yes
Flooding	Yes	Yes
Hailstorms, Thunderstorms, and Windstorms	Yes	Yes
<i>Hazardous Materials</i>	Yes	Yes
Landslide	No	No
Severe Winter Storm (Ice)	Yes	Yes
Tornado	Yes	Yes
Wildfire	No	No

Note: Hazards shown in bold are studied in detail. Hazards shown in Italics were added by the Planning Committee.

The Planning Committee then prioritized these hazards in terms of importance and potential for disruption to the community using the Calculated Priority Risk Index (CPRI). The CPRI, adopted from MitigationPlan.com, is a tool by which individual hazards are evaluated and ranked according to an indexing system. The CPRI value can be obtained by assigning varying degrees of risk to four categories (probability, magnitude/severity, warning time, and duration)

for each hazard, and then calculating an index value based on a weighting scheme. To determine the CPRI, a value of 1 through 4 is assigned to the categories for probability (unlikely – highly likely), magnitude/severity (negligible – catastrophic), warning time (more than 24 hours – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following is how the index values are weighted and the CPRI value is calculated.

$$\text{CPRI} = \text{Probability} \times 0.45 + \text{Magnitude/Severity} \times 0.30 + \text{Warning Time} \times 0.15 + \text{Duration of Event} \times 0.10.$$

Probability is defined as the likelihood of the hazard occurring over a given period of time.

- **Unlikely** – Event is possible within the next ten years.
- **Possible** – Event is probable within the next five years.
- **Likely** – Event is probable within the next three years.
- **Highly Likely** – Event is probable within the calendar year.

Magnitude/Severity is defined by the extent of injuries, shutdown of critical facilities, and the extent of property damage sustained.

- **Negligible** – Injuries and/or illnesses are treatable with first aid, minor quality of life is lost, shutdown of critical facilities and services for 24 hours or less, less than 10% property is severely damaged.
- **Limited** – Injuries and/or illnesses do not result in permanent disability, complete shutdown of critical facilities for more than one week, more than 10% property is severely damaged.
- **Critical** – Injuries and/or illnesses result in permanent disability, complete shutdown of critical facilities for at least 2 weeks, more than 25% property is severely damaged.
- **Catastrophic** – Multiple deaths, complete shutdown of facilities for 30 or more days, more than 50% property is severely damaged.

The CPRI value provides a means to assess the impact of one hazard relative to other hazards within the community. A CPRI value for each hazard was determined for each NFIP community in Steuben County, and then a weighted CPRI value was computed based on the population size of each community within Steuben County. **Table 3-2** presents each community, population, and the weight applied to individual CPRI values to arrive at a combined value for the entire County. Weight was calculated as that percentage of the population of the community of the total population of the County. Thus, the results reflect the relative population influence of each community on the overall priority rank.

Table 3-2: Determination of Weighted Value for NFIP Communities

NFIP Community	2005 Population	% of Total Population	Weighted Value
Steuben County (w/o other NFIP)	23,514	69.6%	0.696
City of Angola	7,890	23.4%	0.234
Town of Hamilton	1,544	4.6%	0.046
Town of Hudson	583	1.7%	0.017
TOTAL	33,773	100.0	1.000

Table 3-3 illustrates the combined CPRI values for Steuben County and NFIP communities. According to the combined CPRI, hazardous materials incidents ranked as the number one hazard (3.3), followed by hailstorms, thunderstorms, and windstorms as well as flooding (3.0), tornado (2.6), severe winter storms, including ice storms (2.1), dam failure (1.9), and earthquake

(1.5). In those cases where hazards received the same CPRI value, the Planning Committee discussed and selected that hazard considered a higher priority for Steuben County. **Section 3.2** includes a profile of the individual hazards as well as a CPRI value for both Steuben County as a whole, and the specific communities within the County.

Table 3-3: Combined CPRI for Steuben County, Angola, Hamilton, and Hudson

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly likely 	Magnitude/Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs 	Duration of Event <ul style="list-style-type: none"> • < 6 hrs • < 1 day • < 1 wk • > 1 wk 	Weighted Average CPRI
Hazardous Materials	Unlikely – Highly Likely	Negligible – Limited	< 6 hrs	< 1 wk	3.3
Hailstorm/ Thunderstorm/ Windstorm	Likely – Highly Likely	Limited	< 6 hrs	< 6 hrs	3.0
Flooding	Unlikely – Likely	Negligible – Limited	> 24 hrs	> 1 wk	3.0
Tornado	Possible	Critical – Catastrophic	< 6 hrs	< 6 hrs	2.6
Severe Winter Storm (Ice)	Possible	Limited	> 24 hrs	> 1 wk	2.1
Dam Failure	Unlikely	Negligible – Limited	> 24 hrs – < 6 hrs	> 1 wk	1.9
Earthquake	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.5

The hazards studied for this report are not equally threatening to all communities throughout Steuben County. While it would be difficult to focus the probability of an earthquake, hailstorm, thunderstorm, windstorm, tornado, or a severe winter storm affecting a specific community, it is much easier to predict where the most damage would occur in a known hazard area such as a floodplain or an area downstream of a dam. The magnitude and severity of the same hazard may cause varying levels of damages in different communities.

For example, as the City of Angola has the highest number of hazardous materials handlers, this community would be expected to have a higher risk for a spill or release than the Town of Hudson. This is primarily due to the size of the community, the amount of development in close proximity to the hazardous materials handlers, and the number of critical facilities located in the affected area. The same example can be used for flooding. As there are over 100 lakes in Steuben County, many of them in the unincorporated portion, a large percentage of the area is prone to flooding due to the rise in lake levels. Therefore, the unincorporated area has a higher risk and a higher individual CPRI for flooding. Detailed information regarding areas of concern will be provided within each hazard profile, along with the CPRI value for each of the NFIP communities.

Similar to the CPRI, the Steuben County Emergency Management Agency (EMA), along with other response and support agencies within the County developed the Steuben County Comprehensive Hazard Analysis in 2003. Many of the representatives involved in developing the Comprehensive Hazard Analysis were also involved in developing the Steuben County

MHMP. Within this analysis, the committee completed a Hazard Identification Worksheet by which each hazard was assigned a score of 1-5 to establish a probability and risk assessment for each hazard within major municipalities per township. As the Town of Hudson was not specifically assessed in the Comprehensive Hazard Analysis, the Salem Center values were utilized for the area, as they are both located in Salem Township.

1. Unlikely to occur
2. Slight chance that an incident such as this will occur
3. Hazard is possible in this area
4. Hazard has occurred here in the past and are likely to occur again
5. High impact and high probability that this event will occur in the area specified.

The scoring results are listed in **Table 3-4** and are compared with the CPRI values, historical losses, and estimated damages for each hazard in **Table 3-24** at the end of this chapter.

Table 3-4: Comprehensive Hazard Analysis Scores*

NFIP Community	Dam Failure	Earthquake	Flood	Hail, Thunder, Wind	Hazardous Materials	Severe Winter Storm (Ice)	Tornado
City of Angola	2	2	3	4	3	4	4
Town of Hamilton	3	2	4	4	3	4	4
Town of Hudson (Salem Center)	2	2	3	4	2	4	4

(Steuben County Comprehensive Hazard Analysis, 2003)

(*: Scores are listed only for those hazards studied in detail for the MHMP)

According to the 2003 Comprehensive Analysis scoring, hailstorms, flooding within the Town of Hamilton, thunderstorms, windstorms, severe winter storms (including ice storms), and tornados have occurred within the County, and will likely occur again. Dam failure is possible in the Town of Hamilton, while this hazard has a slight chance of affecting the other areas of Steuben County. Flooding is possible in the City of Angola and the Town of Hudson. It can be anticipated that a hazardous materials incident is possible in the City of Angola and the Town of Hamilton. Further, the Town of Hudson was determined to have only a slight chance of an incident such as this occurring. Throughout the NFIP communities, an earthquake was scored as having a slight chance of occurrence.

3.2 HAZARD PROFILES

The following sections describe in detail each of the hazards selected for additional investigation by the Planning Committee. The Committee examined each hazard in terms of the causes, effects, and characteristics that the hazard presents to the communities. Also provided was information on hazard extent, historic occurrence, and probable future event occurrence. A community vulnerability assessment follows the hazard profile and describes, in general terms, the current exposure, or risk, to the community regarding potential losses to critical facilities and infrastructure. Finally, the Planning Committee explored the future risks related to new development and land use for each hazard.

3.2.1 HAZARDOUS MATERIALS

Hazardous materials are substances that pose a potential threat to life, health, property, and the environment if they are released. Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers, and dangerous gases. Despite precautions taken to ensure careful handling during manufacture, transport, storages, use, and disposal, accidental releases are bound to occur. These releases create a serious hazard for workers, neighbors, and emergency response personnel. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials response teams.

As materials are mobilized for treatment, disposal, or transport to another facility, all infrastructure, facilities, and residences in close proximity to the transportation routes are at an elevated risk of being affected by a hazardous materials release. Often these releases can cause serious harm to Steuben County and its residents if proper and immediate actions are not taken. Most releases are the result of human error, and corrective actions to stabilize these incidents may not always be feasible or practical in nature.



Railways often transport materials that are classified as hazardous and preparations need to be made for the event of derailments, train/vehicle crashes, and/or general leaks and spills from transport cars. Additionally, there are several facilities located in Steuben County that utilize or produce materials listed as hazardous by the United States Environmental Protection Agency (US EPA). It is possible that other facilities in Steuben County also utilize or produce hazardous materials. However, these facilities may fall below the reporting limits.

Facilities are required to report if they meet the following criteria: 1) the facility is either a manufacturing facility or a federal facility, 2) the facility has the equivalent of 10 full-time employees, 3) the chemical produced or utilized is included on the list of 650 chemicals or chemical categories deemed hazardous, and 4) the facility must manufacture or process 25,000 pounds of the chemical or otherwise use greater than 10,000 pounds of the chemical per year.

Hazardous Materials: Historic Data

Historically, Steuben County has not experienced a large-scale hazardous materials incident from fixed locations or during transportation that have resulted in multiple injuries or loss of life. Likewise, even small-scale releases or events have not been the cause of serious injuries or death to those involved or responding to the incident. However, there have been many minor releases that have activated local firefighters, hazardous materials responders, emergency management, and local law enforcement into action to stabilize the event and reduce harm to Steuben County residents.

According to the Comprehensive Hazard Analysis, several events occurring the in early 1990's have affected Steuben County. The Fremont Wire facility experienced a roof fire resulting in oil released into the storm sewer system, eventually reaching local drainage ditches. A professional remediation company was utilized to properly clean the affected areas. A separate oil spill into Fish Creek occurred as a pipeline ruptured in DeKalb County. While clean up was

the responsibility of DeKalb County, assistance was requested from Hamilton Township Fire Department in Steuben County. Near the intersection of US 20 and County Road 750W, gasoline was spilled as a semi-truck was involved in a vehicular crash. No injuries were reported due to the local response personnel's ability to contain and stop the release. Mud Lake was the site where barrels of hazardous materials were discovered, requiring a professional remediation contractor to provide clean up and disposal of the materials. No monetary damages or response expenses were provided for any of the above incidents.

According to US Department of Transportation (DOT), Office of Hazardous Materials Safety (OHMS), there were 14,745 transportation related hazardous materials incidents nationally during the calendar year 2004. **Table 3-5**, identifies hazardous materials incidents in the United States by mode of transportation for the year of 2004.

Table 3-5: United States Hazardous Materials Incidents by Transportation Mode

Transportation Mode	Number of Accidents	Associated Deaths	Associated Injuries
Air	996	0	12
Highway	12,979	10	156
Railway	755	121	3
Water	15	0	0
Other	0	0	0
TOTAL	14,745	131	171

(OHMS, 2005)

Interstate 69 traverses Steuben County in a north/south direction, nearing the northwestern boundary of the City of Angola and the eastern border of the Town of Ashley on the Steuben-DeKalb County border. Additionally, Interstate 80 travels from the east central portion of Steuben County to the extreme northwestern area as it enters LaGrange County. Several State Routes also travel through Steuben County; SR 9, SR13, SR 28, SR 32, SR 36, SR 37, SR 38, SR 67, SR 109, SR 128, SR 132, and SR 236. Rail lines travel through the Town of Fremont, the City of Angola, the Town of Hamilton, the Town of Ashley, and the Town of Hudson, providing an increased risk for derailment or train-vehicle crashes within each of these municipalities.

According to the Planning Committee, the probability of a hazardous materials release or event ranges from highly likely within the unincorporated areas of Steuben County and the City of Angola, to likely within the Town of Hamilton and Town of Hudson. If this type of event were to occur within the County, it would be considered limited due to the unpredictable factors of location, substance involved, time of day, and weather conditions. The warning time for a hazardous materials incident can be significantly less than 6 hours while containment efforts may take up to one week. **Table 3-6** identifies the CPRI for a hazardous materials event within the County and the other NFIP Communities.

Table 3-6: CPRI for Hazardous Materials

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly Likely 	Magnitude / Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • > 24 hrs • 12-24 hrs • 6-12 hrs • <6 hrs 	Duration of Event <ul style="list-style-type: none"> • <6hrs • <1day • <1wk • >1wk 	CPRI
Steuben County	Highly Likely	Limited	< 6 hrs	< 1 wk	3.3
City of Angola	Highly Likely	Limited	< 6 hrs	< 1 wk	3.3
Town of Hamilton	Likely	Limited	< 6 hrs	< 1 wk	2.9
Town of Hudson	Likely	Limited	< 6 hrs	< 1 wk	2.9

As shown by the CPRI, the probability, severity, warning time, and duration for a hazardous materials incident vary throughout Steuben County. This information is based on the diffuse locations of hazardous materials handlers, and the proliferation of transportation routes such as rail lines and vehicle routes (such as Interstates 69 and 80, and numerous State Roads) traveling throughout all communities in Steuben County. Therefore, the City of Angola and the unincorporated portions of the County have a higher number of hazardous materials handlers than does the Town of Hamilton or the Town of Hudson.

Hazardous Materials: Vulnerability Assessment

According to IDEM’s Hazardous Waste Notifiers List, there are 105 hazardous waste handlers within Steuben County. Sixty-two (62) of those facilities are considered active generators. Of these facilities, only 5 are considered to be Large Quantity Generators (LQG). The LQGs are located in the City of Angola (3), the Town of Hamilton (1), and the Town of Fremont (1). These hazardous materials facilities, along with major transportation routes and rail lines are identified on **Exhibit 4**.



To estimate the physical and economic cost of a hazardous materials incident at any of the fixed site hazardous materials handlers, a 500-yard buffer zone was imposed around each facility. The number of critical and non-critical facilities within each NFIP community was determined utilizing digital aerial photography and GIS data analysis. Replacement costs were derived by assuming that 25% of all critical and non-critical structures in the buffer area would be completely damaged, 35% would be 50% damaged, and 40% would have only 25% damage. **Table 3-7** below indicates the critical and non-critical facilities located within the buffer areas for each National Floodplain Insurance Program (NFIP) Community and the graduated replacement costs.

Table 3-7: Hazardous Materials Handlers, Neighboring Facilities, and Replacement Costs

Facility	Critical Facilities		Non-critical Facilities	
	# Facilities	Est. Replacement Cost	# Facilities	Est. Replacement Cost
Steuben County	75	\$8.5M	121	\$9.7M
City of Angola	56	\$6.3M	417	\$33.1M
Town of Hamilton	11	\$1.2M	171	\$12.1M
Town of Hudson	2	\$0.8M	21	\$1.5M
Total	144	\$16.8M	730	\$56.4M

(M=1,000,000)

While the possibility of an incident occurring is real, the vulnerability of Steuben County has been lowered due to the enactment of Superfund Amendments and Reauthorization Act (SARA) Title III national, state, and local requirements. SARA Title III, also known as the Emergency Planning and Community Right to Know Act (EPCRA), establishes requirements for planning and training at all levels of government and industry. EPCRA also establishes provisions for citizens to have access to information related to the type and quantity of hazardous materials being utilized, stored, transported, or released within their communities.

One local result of SARA Title III is the formation of the Local Emergency Planning Commission (LEPC). This commission has the responsibility for preparing and implementing emergency response plans, cataloging Material Safety Data Sheets (MSDS), chemical inventories of local industries and businesses, and reporting materials necessary for compliance.



In 1990, Congress enacted a compliment to EPCRA, known as the Risk Management Program (RMP), which is found under Section 112(r) of the Clean Air Act (CAA). This program makes information available to the public on how accidental releases of hazardous chemical could affect communities. While EPCRA focuses on response once an emergency occurs, the RMP focuses on facility planning before an emergency occurs. The RMP seeks to reduce the risk of airborne chemical accidents by instituting measures to prevent hazardous chemical releases. The RMP addresses the

management of 77 acutely toxic chemicals and 63 flammable gasses and volatile liquids. According to the regulation, any facility producing, processing, handling, or storing these substances in amounts above threshold quantities is required to develop and implement a RMP. The RMP must include a hazard assessment as it relates to the release of a regulated substance, which includes off site consequences, programs to prevent accidental losses, emergency action in response to accidental releases, and communication with federal, state, and local governments and the public. There is 1 facility in Steuben County regulated under Section 112(r) of the CAA.

Predicting potential losses associated with hazardous materials incidents is subjective and difficult. However, based on a study conducted by the Federal Motor Carrier Safety Administration, the average cost per year per hazardous material transportation accident and

incident that results in the release of a hazardous material is \$536.0K. When hazardous material accidents and incidents result in fire, the average cost per event increases to \$1.2M, and when the accident or incident results in an explosion, the cost per event increases to \$2.1M. These costs are indicative of the economic impact that can result from hazardous materials incident in Steuben County.

While no historical losses were provided, the estimated losses for a hazardous materials incident as found in the study mentioned above ranges from \$536.0K to \$2.1M. Within the Steuben County Comprehensive Hazard Analysis, a hazardous materials incident was determined to be a hazard unlikely to occur within the Town of Hudson, and possible within the City of Angola and the Town of Hamilton. This type of hazardous event was scored as the highest during the CPRI exercise completed by the Planning Committee.

Hazardous Materials: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in **Section 4.0** of this Plan.

The Steuben County LEPC is the local entity responsible for planning, training, and implementing exercise activities within the county. Over 100 facilities in Steuben County are subject to SARA Title III provisions due to the presence of listed hazardous materials in quantities at or above the minimum threshold established by the Act. These facilities are also required to create and distribute emergency plans and facility maps to local emergency responders such as the LEPC, Fire Departments, and Police Departments. With this knowledge on hand, emergency responders and other local government officials can be better prepared to plan for an emergency, the response it would require, and prevent serious affects to the community involved. Exhibit 4 depicts the location of hazardous materials facilities in Steuben County, the critical management zones surrounding these facilities, and the major transportation routes in Steuben County.



The Steuben County Geographic Information System (GIS) Department has a well-developed GIS inventory that is actively used to aid in planning and land use decision-making. Available GIS information includes the location of the hazardous materials handlers, transportation routes, parcel data, and chemical information. These layers should be made available to Steuben County communities to create a comprehensive database to be utilized to develop “what if” scenarios regarding individual municipalities and collectively throughout the County. This information may also be beneficial when used in conjunction with the Comprehensive Land Use Plan to prohibit future construction of critical facilities within close proximity to a hazardous materials handler.

Steuben County EMA and fire departments currently utilize the Computer-Aided Management of Emergency Operations (CAMEO®) program developed by the EPA’s Chemical Emergency

Preparedness and Prevention Office (CEPPO) and the National Oceanic and Atmospheric Administration (NOAA). Response agencies can utilize the CAMEO program to access, store, and evaluate information critical for developing emergency plans. In addition, CAMEO supports regulatory compliance by helping users meet the chemical inventory reporting requirements.

In recognition of the risks associated with hazardous materials, the Steuben County Hazardous Materials Response Team (HMRT) was formed in 2002. Within Steuben County, 50 individuals are trained in compliance with Occupational Safety and Health Administration (OSHA) Level II Operations. This includes training on methods for identifying hazardous materials and securing the scene in response to a hazardous materials incident. Additionally, 18 individuals are trained in compliance with OSHA Level III Technician. This level of training provides in-depth practical experience with detection devices, personal protection equipment, and control, containment, and confinement of the hazardous material.

The mission of the HMRT is to provide high quality, comprehensive emergency response training to meet current standards and produce safe knowledgeable emergency responders. In order to increase preparedness within Steuben County, the number of full-time, paid positions for local fire departments and emergency response teams capable of responding to a hazardous materials incident needs to be increased. Currently all fire departments, with the exception of the City of Angola are volunteer staffed. Along with the increase in positions, realistic exercises and trainings for response to incidents needs to continue and adequate equipment for response efforts and personnel needs to be obtained and maintained for optimum use.

In addition to the HMRT, the Planning Committee discussed the importance of developing a Community Emergency Response Team (CERT). This program would provide training to volunteers throughout Steuben County and the communities in order to educate citizens about disaster preparedness for the hazards that may affect their areas. This training also focuses on basic disaster response skills such as fire safety, light search and rescue, team organization, and basic first aid. An immunization program designed to protect building inspectors and emergency responders would reduce the potential health risks associated with hazard response and recovery efforts. In order to best promote health, wellness, and safety of response personnel, immunizations should be completed for *Tetanus*, Hepatitis A & B, Rabies, Influenza, Measles, *Varicella*, Chicken pox, Whooping Cough, Typhoid, Cholera, and Yellow Fever.

To provide as much advance warning of impending hazardous weather as possible to the residents of Steuben County, the Steuben County Primary Warning Point was created, designating the Sheriff's Department/911 Central Dispatch as the Primary Warning Point for civil disturbances and severe weather situations. This information is imperative to hazardous materials facilities so that they may take appropriate precautions to reduce the risk of spills or releases caused by severe weather. The NOAA, the Law Enforcement Information Network, and the National Weather Service (NWS) are monitored and the warning center will warn the public when information has been received. This is in effort to protect the public and minimize damages to public and private properties in Steuben County.

One option to alert the residents of Steuben County of hazardous situations such as necessary evacuations, where to go for temporary shelter, or how to protect themselves in-home is a system designed to provide pre-recorded telephone messages to businesses or residents in a GIS identified area. These systems can generate thousands of calls per hour and can be updated as the situation progresses. Public alerts such as hazardous materials incidents,

impending severe weather conditions, community updates, and other public safety information can be quickly and efficiently delivered via telephone.



Depending on the significance of the hazardous material incident, safe havens and community shelters may be needed to provide evacuated residents with temporary shelter. Information regarding the location of these facilities should be well advertised for both residents and visitors to Steuben County as needed. The Northeast Indiana Red Cross, covering Steuben County, currently has agreements with facilities such as schools and community centers throughout the County for both temporary and long-term shelter.

Hazardous materials spills or releases may have serious effects on above ground utilities such as electricity or communication lines. To prevent a disruption of service, back-up power is essential and should be promoted for all critical facilities especially medical care, police, fire, and community shelter facilities. The Planning Committee agreed that it would be beneficial for Steuben County to pursue funding and purchase mobile generators.

Social, physical, and economic losses from hazardous materials incidents will most likely increase as more people choose to live, work, and visit Steuben County. The threat of exposure to dangerous chemicals and hazardous materials is increasingly at the forefront in much of the planning and risk management efforts currently underway. Through diligent training and strict adherence to State and Federal regulations, Steuben County will continue to provide a comprehensive means to mitigate against, prepare for, respond to, and recover from hazardous materials releases. Ensuring that residents and visitors are well informed about the potential impacts from hazardous materials and proper methods to protect themselves and their property will help reduce future losses and damage. Information related to hazardous materials incidents, the risks to vulnerable locations, and basic steps to protect themselves in emergencies should be provided to residents and visitors through community events and outreach programs.

3.2.2 FLOODING

Floods are the most common and widespread of all natural disasters. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws. A flood, as defined by the NFIP, is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waters and unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow. Floods can be slow or fast rising but generally develop over a period of days.

Riverine and lake flooding are the predominant types of flooding that occur in Steuben County. Flooding and associated flood damage is most likely to occur during the spring because of heavy rains combined with melting snow. However, provided the right saturated conditions, intense rainfall of short duration during summer rains storms are capable of producing damaging flash flood conditions.

The standard for flooding is a 1% annual chance of flooding or a 100-year flood. This is a benchmark used by the FEMA to establish a standard of flood protection in communities

throughout the country. The 100-year flood is referred to as the "regulatory" or "base" flood. The term 100-year flood is often incorrectly used and can be misleading. It does not mean that only one flood of that size will occur every 100 years. What it actually means is that there is a 1% chance of a flood of that intensity and elevation happening in any given year. In other words, the regulatory flood elevation has a 1% chance of being equaled, or exceeded, in any given year and it could occur more than once in a relatively short period.

Flooding: Historic Data

Flooding is a relatively common occurrence in Steuben County. The National Climatic Data Center (NCDC) has identified 7 significant floods in Steuben County between January 1993 and December 2006. Estimated total property and crop loss figures reported for all flood events is approximately \$5.0M in property damages and an additional \$10.0K in crop damages during the 13-year period. Of the total number of reported flood events, 3 were flash floods, 3 were floods, and 1 event was listed as urban or small stream flooding. No deaths or injuries were attributed to these flooding events. Further, according to the Steuben County Comprehensive Hazard Analysis, the low lying and floodplain areas within the County experience flooding on an annual basis. **Table 3-8** lists flood events listed by the NCDC resulting in death, injury, or damages for Steuben County. Historical flood data as identified by the NCDC is the best available flooding data specific to Steuben County and the NFIP communities.



The primary sources of riverine flooding in Steuben County are the Fawn River, Pigeon Creek, and various tributaries, as shown in **Exhibit 2**. In addition to these larger streams, many flat floodplain and lake shoreline areas also are prone to flooding. This type of flooding is becoming more prevalent in Steuben County as drainage is hindered by increasing development causing flooding throughout entire communities.

Table 3-8: Historic Flood Data*

Location	Date	Type	Death/Injury	Property/Crop Damage**
Steuben County + (9 counties affected)	01/01/1993	Flood	0/0	\$5M/\$0
Steuben County	08/20/1996	Flash Flood	0/0	\$30K/\$10.0K
Fremont	07/21/2001	Urban/Small Stream	0/0	\$9K/\$0
TOTALS			0/0	\$5M/\$10.0K

(NCDC, 2007)

(*: Only those events with reported deaths, injuries, or damages.)

(**: K=1,000; M=1,000,000)

According to the NCDC, flooding effects Steuben County and the surrounding area and can lead to extensive damages to property and crops. According to NCDC, the worst recorded event occurred in January 1993 leading to \$5.0M in property damages. This damage was spread among only 9 counties, including Steuben. Extensive flooding occurred due to the rapid

melting of up to 7 inches of snow soon followed by approximately 5 inches of rain within 5 days. Hardest hit during this event were the many lake communities within LaGrange, Steuben, and Noble Counties. Between 300 and 400 residences experienced damages due to rising lake levels and damages in these areas were estimated at nearly \$2.0M. No other information regarding flooding was available through the NCDC or the Comprehensive Hazard Analysis.



A repetitive loss property is defined as a property having received two insurance claim payments for flood damages totaling at least \$1,000, paid by the NFIP within any 10-year period since 1978. These properties are important to the NFIP because they account for one-third of the country’s flood insurance payments. Within Steuben County, there are 2 properties designated as repetitive loss properties, both of which are located in the City of Angola. While there does not appear to be a large number of repetitive loss properties, there have been numerous claims made for damages associated with flooding.

Within the unincorporated areas of Steuben County, there have been over 40 insurance claims for more than \$137.0K. In addition, there have been 5 claims throughout the City of Angola that have resulted in nearly \$7.0K in payments. Three claims totaling \$9.0K are attributed to the Town of Hamilton and an additional claim for over \$3.0K was made in the Town of Hudson. **Table 3-9** below, identifies the number of claims per NFIP community as well as the payments made.

Table 3-9: Repetitive Loss Properties, Claims, and Payments

NFIP Community	# of Repetitive Loss	Claims since 1978	\$\$ Paid
Steuben County	0	42	\$137.0K
City of Angola	2	5	\$7.0K
Town of Hamilton	0	3	\$8.0K
Town of Hudson	0	1	\$3.0K
TOTAL	2	51	\$155.0K

(IDNR, Division of Water, 2006)
(K=1,000)

Currently, the approximate flood insurance coverage required primarily for structures located in the A-zone is \$34.3M. The A-zone is the 100-year floodplain, or the area with a 1% annual chance of flooding. These areas are determined in the Flood Insurance Study (FIS) by either detailed or approximate methods of analysis. Mandatory flood insurance purchase requirements apply to structures in this delineated area. Of that total, \$30.0M is flood insurance coverage for the unincorporated portions of the County. **Table 3-10** further indicates the premiums and coverage totals for individual NFIP Communities and the unincorporated areas of Steuben County.

Table 3-10: Flood Insurance Premiums and Coverage

NFIP Community	Flood Insurance Premiums	Coverage
Steuben County	\$138.0K	\$29.4M
City of Angola	\$6.0K	\$1.7M
Town of Hamilton	\$10.0K	\$2.6M
Town of Hudson	\$1.0K	\$300.0K
TOTALS	\$155.0K	\$34.0M

(IDNR, Division of Water, 2006)

According to the Planning Committee, the probability of a flood in Steuben County is likely to unlikely. The magnitude or severity of flooding determines the extent to which there is substantial damage and/or disruption to homes, businesses, and transportation corridors. The magnitude or severity for flooding in Steuben County, as determined by the Planning Committee, is limited to negligible. Through the accuracy of the NWS Doppler radar, there can be as much as a 24-hour or greater warning time. However, the volume of water is often greater than prevention measures can withstand resulting in only 6-12 hours of warning time. In Steuben County, the duration of a rain event or snowmelt that results in a flood event has the potential to disrupt normal activities and businesses in the County for more than a week at a time. **Table 3-11** identifies the CPRI for a flood in the unincorporated areas of Steuben County and other NFIP communities within the County.

Table 3-11: CPRI for Flooding

	Probability • Unlikely • Possible • Likely • Highly likely	Magnitude/ Severity • Negligible • Limited • Critical • Catastrophic	Warning Time • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs	Duration of Event • < 6 hrs • < 1 day • < 1 wk • > 1 wk	CPRI
Steuben County	Highly Likely	Limited	>24 hrs	>1 wk	2.5
City of Angola	Unlikely	Limited	>24 hrs	>1 wk	1.6
Town of Hamilton	Unlikely	Limited	>24 hrs	>1 wk	1.6
Town of Hudson	Unlikely	Negligible	>24 hrs	>1 wk	1.3

As shown in the table, index values differ only for the unincorporated areas of Steuben County. The Planning Committee assessed the communities separately to arrive at the calculated index values. The County, in general, experiences more localized flooding in the regions surrounding the numerous lakes; whereas, the other communities have index values that reflect the fact that no major river system passes through the community. Negligible damages are anticipated for the Town of Hudson due in part to the low numbers of critical facilities within this municipality. The City of Angola, the Town of Hamilton, and the unincorporated Steuben County are anticipated by the Planning Committee to receive limited damages because of a future flooding event. These communities and areas have a higher number of critical facilities, higher populations, and are close in proximity to water bodies with the potential for flooding. These variations are reflected in the CPRI values for each community in Steuben County resulting in the unincorporated areas having the highest risk index, while the Town of Hudson has the lowest risk index.

Flooding: Vulnerability Assessment

Based on visual inspection of digital aerial photography, FEMA floodplain maps, and extensive GIS data analysis provided by the Steuben County GIS Department, there are 20 critical facilities located within the unnumbered Zone A floodplains of Steuben County. These include 3 seaplane bases, 4 county identified dams, 8 IDNR identified dams, 1 state fish hatchery, 3 hazardous materials facilities, and 1 utility substation. Additionally, there are approximately 2,600 other non-critical facilities that are identified as being within the unnumbered Zone A floodplain. Approximately 2,500 of the 2,600 non-critical facilities (96%) are residential and of those, approximately 2,300 or 93% are located in unincorporated Steuben County, primarily along the many lake shorelines. The remaining residences are located in the Town of Hamilton. This information is provided for reference in **Table 3-12**.

Table 3-12: Residential Structures within 100-year Floodplain

NFIP Community	Residences in 100-year Floodplain	Percentage of All Residences in 100-year Floodplain
Steuben County	2,300	93.0%
City of Angola	15	0.6%
Town of Hamilton	158	6.4%
Town of Hudson	0	0
TOTAL	2,473	100.0%

Of all identified structures in the unnumbered Zone A floodplain, it can be estimated for the purpose of this planning effort that during a 1% chance flood, 25% of all critical and non-critical structures are expected to be completely damaged, 35% would be 50% damaged, and 40% would have only 25% damage. Replacement and repair cost for critical facilities in the unnumbered Zone A floodplain, with the exception of the county identified and IDNR identified dams, is estimated to be as much as \$0.9M. Damage estimates for non-critical facilities, such as residential, commercial, and other structures is \$180.7M. Social losses are difficult to quantify, though interrupted services associated with critical facilities would cause hardship for many residents.

Information provided by IDNR indicated the established lake level as well as the 100-year flood levels for approximately 37 lakes within Steuben County. Based on visual inspection of digital aerial photography, FEMA floodplain maps, and extensive GIS data analysis provided by CBBEL, the number of structures and the estimated replacement values of those structures were determined. This information, for lakes with structures anticipated to be affected by a 100-year flood event, can be found in **Table 3-13**.

Table 3-13: Structures within 100-year Lake Levels

Lake	Critical Facilities		Non-critical Facilities	
	# Facilities	Est. Replacement Value	# Facilities	Est. Replacement Value
Ball Lake	0	0	31	\$2.2M
Bass Lake	0	0	6	\$0.4M
Big Turkey Lake	2	\$0.2M	323	\$22.8M
Big/Little Otter Lakes	0	0	27	\$1.9M
Bower Lake	0	0	30	\$2.1M
Clear Lake	0	0	27	\$1.9M
Crooked Lake	0	0	24	\$1.7M
Golden Lake	0	0	78	\$5.5M
Hogback Lake	0	0	73	\$5.2M
Jimmerson Lake	0	0	136	\$9.6M
Lake James	0	0	176	\$12.5M
Lake of the Woods/McClish Lake	0	0	124	\$8.8M
Long Lakes	0	0	15	\$1.1M
Snow Lake	0	0	130	\$9.2M
West Otter Lake	0	0	98	\$7.0M

When comparing historical losses reported by the NCDL for flood events affecting Steuben County, this hazard should be expected to result in the largest amount of monetary damages to Steuben County. Flooding events were assessed within the Steuben County Comprehensive Hazard Analysis as having the possibility of occurrence within the City of Angola and the Town of Hudson (Salem Center). The Hazard Analysis indicates that the Town of Hamilton has experienced a flood in the past and will likely experience future events. Further, the MHMP Planning Committee determined the CPRI of these events is the second highest concerning Steuben County. In order to better assess the community’s vulnerability, future property and crop damages caused by flooding should be carefully recorded and reported to the NCDL.

Flooding: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.

The Maumee River Basin Commission (MRBC) was established in 1986 by State Law (I.C. 36-7-6.1) to assist communities in the Indiana portion of the Maumee River Basin to reduce flood losses by exercising sound watershed management. Critical to the success of reducing flooding is the implementation of comprehensive structural and non-structural flood control measures basin wide. The MRBC is able to provide assistance in the areas of flood control project planning and administration, flood mitigation assistance grant writing, 319 water quality improvement grant writing, erosion and sediment control, flood insurance, floodplain ordinances, soil and water conservation, and public information programs.



Optional provisions have been established as part of the State of Indiana's Model Ordinance for Flood Hazard Areas. These provisions, when adopted, require that when any portion of the Special Flood Hazard Area (SFHA) is authorized for use, the volume of space that will be occupied by the authorized fill or structure below the Base Flood Elevation (BFE) shall be compensated for and balanced by an equivalent volume of excavation taken below the BFE. The excavation volume must be equal to the volume of storage lost (or a replacement ratio of 1 to 1) due to the fill or structure.

The MRBC Flood Control Masterplan recommends adoption of compensatory storage provisions by all communities in the Maumee River Basin. This additional language has been adopted by Steuben County and the Town of Hamilton. The City of Angola should be strongly encouraged to adopt this optional language or more restrictive language.

With the optional language added, these ordinances will be an effective method to control development activity within outlined floodplains by prohibiting development unless it has been deemed a permitted use, such as agriculture, parks or roadways, or the proposed development is considered a special use, such as a public well, golf course, or sewage treatment plant. These ordinances would require measures to be taken to prevent increased damages by outlining that no development activities within the flood hazard area may increase the flood height or velocity.

Detailed flood studies, including hydrology and hydraulic modeling, have been completed by the MRBC for Fish Creek near the Town of Hamilton. Detailed FIS studies typically include more accurate estimations of the 10-year, 50-year, 100-year, and 500-year flow rates; detailed hydraulic analyses; and delineation of floodway and floodway fringe areas based on best available topographic mapping. This type of studies should be completed as new development is proposed within the unstudied stream portions of Steuben County.

The MRBC is a Cooperative Technical Partner (CTP) with FEMA and as a result, has been continually performing needs assessment studies, detailed floodplain studies, and floodplain refinement studies throughout the Maumee River Basin. Steuben County has recently developed 2-foot interval topographical contours and this new information should become available in June of 2007. This provides an enhanced ability to determine areas prone to flooding as the previous contours were set at 10-foot intervals. The County and NFIP communities should prioritize streams and allocate additional funding so that a larger number of detailed studies can be conducted each year. In addition, these studies can provide the needed data to regulatory agencies to update the Flood Insurance Rate Maps (FIRMs). The process of updating the Steuben County digital FIRMs (DFIRMs) is scheduled to begin in 2007, with preliminary DFIRMs anticipated to be released in 2008.

The Steuben County Comprehensive Plan is a powerful planning tool for flood mitigation as it may define how and where a community should plan for development. Further, the goals and objectives identified in the Plan become the foundation for all development ordinances within the communities involved. As Steuben County continues to grow, the countywide plan will help prevent flood losses by restricting development, especially of critical facilities, in flood hazard areas. Opportunities should also be provided for relevant County and municipal staff to become

Certified Floodplain Managers (CFM). This extended knowledge of the importance of proper floodplain management will assist Steuben County, as well as the communities within.

As designated Stormwater Phase II community, the City of Angola is required to enforce erosion and sediment control practices during construction and post-construction activities. Without proper systems in place to trap soil carried by stormwater, soil will settle at the bottom of streams and detention basins restricting the volume of floodwaters held causing localized flooding. As floodwaters rise, the storm sewer system becomes infiltrated with sanitary sewer effluent and the combined waters are directed to an open stream or watercourse, posing a potential health risk to residents and visitors of the City of Angola and Steuben County.

Regulated drains and channels within Steuben County should continue to be routinely inspected, inventoried, and prioritized for maintenance to provide the optimum conveyance of stormwater. Regular maintenance may also alleviate damages to residences and structures located in areas outside of flood zones and within areas of poorly drained soils. The detention or diversion of stormwater on a regional scale may also serve useful in low-lying areas in Steuben County.



In 2006, the Indiana Department of Natural Resources (IDNR) Division of Water reported approximately \$157.0K in flood insurance premiums in Steuben County (\$138.0K in the unincorporated areas, \$7.0K in the City of Angola, \$8.0K in the Town of Hamilton, and \$3.0K in Town of Hudson). In order to reduce the premiums paid on flood insurance, the NFIP communities in Steuben County should consider joining FEMA's CRS. The CRS is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. At this time, no

communities in Steuben County participate in the CRS program.

There are several FEMA programs encouraging communities to identify and mitigate repetitive loss properties. While no properties within Steuben County were identified in the MRBC's Flood Control Masterplan for acquisition, a single-family residence and 12 mobile homes were acquired by the Town of Hamilton. This area, located east of State Road 1 and south of Fish Creek, has been developed into a park and will remain so in perpetuity. This project, totaling more than \$360.0K was made possible through a Hazard Mitigation Grant Program (HMGP) grant of more than \$270.0K and matched locally with approximately \$90.0K provided by the MRBC. Other structures, including the 2 repetitive loss properties in the City of Angola may benefit from participating in (or developing a similar program) the MRBC voluntary acquisition, relocation, elevation, and retrofitting program.

Flood monitoring systems such as the United States Geological Survey (USGS) stream gages, field observation, and vigilant attention to local weather systems are used in Steuben County to monitor continuous changes in water levels on local waterways. These monitoring systems, in partnership with local media weather warnings and advisories reduce potential losses by providing needed time to prepare and take action to remove persons and protect property and mobilize emergency response personnel. Currently there are 2 real-time stream gages for Steuben County. The locations of these stream gages are Fish Creek at Hamilton (downstream of Hamilton Lake Dam) and Pigeon River (US 20 east of Angola). As Steuben County continues to grow, there may be a need for additional stream gages to provide sufficient flood

warning for vulnerable areas, or to provide more accurate information regarding flood levels for enhanced floodplain management and protection.

Flood events may have serious effects on utilities such as electricity or communication lines. To prevent a disruption of service, back-up power is essential and should be encouraged for all critical facilities especially medical care, police, fire, and community shelter facilities.

Steuben County also participates in the Severe Weather Awareness Week created by the NWS. This week is a multi-agency education and awareness event focusing on severe weather, including flooding. Along with the County representatives, the Indiana State Police, the NWS, and the IDHS provide and distribute information to county schools, hospitals, community groups and facilities, and the public. This information is meant to provide citizens with information regarding what warnings to listen for, emergency supplies, sheltering in-place, and various important facts related to surviving severe weather events.

As discussed previously, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decisions making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. The MHMP Planning Committee has identified the local need for the development and continued training of a CERT program, the development of a voluntary emergency responder immunization program, the ability to provide automated public alerts via telephone or electronic communications, as well as the need to provide safe rooms in vulnerable locations to further protect and provide for the residents and visitors of Steuben County.



Social, physical, and economic losses from flooding could be significantly reduced with better land use planning, floodplain management, and stormwater management in Steuben County. The NCDRC data reports nearly \$5.0M in flood damages in Steuben County, while the GIS analysis estimates a potential of nearly \$180.7M, creating a vast range of potential damages. As the population of the County and individual communities continues to grow, the potential for damages to facilities, infrastructure, and human losses will also increase. Actions should be taken to ensure that critical and non-critical facilities alike are located beyond the 100-year floodplain. Ensuring that residents and business owners are well informed about the potential impacts from flooding and proper methods to protect themselves and their property will help reduce future losses and damage.

3.2.3 HAILSTORMS, THUNDERSTORMS & WINDSTORMS

Hail occurs when frozen water droplets form inside a thunderstorm cloud, then grow into ice formations held aloft by powerful thunderstorm updrafts, and when the weight of the ice formations becomes too heavy they fall as hail to the ground. Hail size ranges from smaller than a pea to as large as a softball, and can be very destructive to buildings, vehicles, and crops. Even small hail can cause significant damage to young and tender plants. Residents should take cover immediately in a hailstorm and protect pets and livestock, which are particularly vulnerable to hail, and should be under shelter as well.

Thunderstorms, defined as strong storm systems produced by a cumulonimbus cloud, are usually accompanied by thunder, lightening, gusty winds, and heavy rains. All thunderstorms are considered dangerous as lightening is one of the by products of the initial storm. In the United States, an average of 300 people are injured and 80 people are killed each year by lightning. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms. Other associated dangers of thunderstorms include tornados, strong winds, hail, and flash flooding.



Windstorms or high winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low-pressure systems). High winds are speeds reaching 50 mph (43.45 knots) or greater, either sustained or gusting. According to the NWS, winds reaching or exceeding 58 mph are classified as a windstorm.

Hailstorm, Thunderstorm, & Windstorm: Historic Data

According to the NCDC, which is the best available data specific to Steuben County and all NFIP communities, 41 hailstorms, 31 thunderstorms, and 32 windstorms have been reported August 1960 through October of 2006. The largest reported hailstone size was 1.75 inches in diameter and occurred several times throughout the period mentioned above. Significant windstorms are characterized by the top wind speeds achieved during the event, characteristically occur in conjunction with thunderstorms, and have historically occurred year round with the greatest frequency and damage occurring in May, June, and July.

Regarding hailstorms, thunderstorms, and windstorms, **Table 3-14** provides detailed information recorded by the NCDC that have resulted in injuries, deaths, or property damages. The NCDC did not indicate any crop damages in Steuben County because of a hailstorm, thunderstorm, or windstorm. Total NCDC recorded damages for hailstorms, thunderstorms, and windstorms in all of Steuben County between 1960 and 2006 is \$0.6M along with 8 injuries. It is possible that additional damages were experienced that were not reported to local officials, insurance companies, or the NCDC. While not all hailstorms, thunderstorms, or windstorms are specifically listed, they are included in the assessment of vulnerability and future risk to the communities.

Table 3-14: Historic Hailstorm, Thunderstorm, and Windstorm Events*

Location	Date	Type	Magnitude	Death/ Injury	Property Damage**
Steuben County	05/15/1988	Thndr/Wind	83 mph	0/4	0
Steuben+ (88 counties affected)	11/21/1994	High Wind	NA	0/0	\$50.0K
Steuben County+ (86 counties affected)	11/27/1994	High Wind	NA	0/0	\$120.0K
Steuben County	07/15/1995	Thndr/Wind	NA	0/0	\$4.0K
Fremont	04/01/1998	Thndr/Wind	0 mph	0/0	\$1.0K
Angola	07/21/1998	Thndr/Wind	57 mph	0/4	\$250.0K
Steuben County	11/10/1998	Thndr/Wind	NA	0/0	\$30.0K
Angola	08/04/1999	Thndr/Wind/ Hail	0 mph	0/0	\$1.0K
Angola	06/12/2001	Thndr/Wind	0 mph	0/0	\$1.0K
Crooked Lake	06/19/2001	Thndr/Wind	0 mph	0/0	\$10.0K
Fremont	07/22/2002	Thndr/Wind	0 mph	0/0	\$1.0K
Steuben County+ (25 counties affected)	11/23/2003	High Wind	60 mph	0/0	\$50.0K
Angola	06/05/2005	Thndr/Wind	63 mph	0/0	\$3.0K
Steuben County	07/21/2005	Thndr/Wind	63 mph	0/0	\$15.0K
Angola	07/26/2005	Thndr/Wind	58 mph	0/0	\$2.0K
Fremont	09/22/2005	Thndr/Wind	63 mph	0/0	\$40.0K
Steuben County	11/06/2005	Thndr/Wind	63 mph	0/0	\$15.0K
TOTAL				0/8	\$593.0K

(NCDC, 2006)

(*: Only those events showing deaths, injuries, or property damages.)

(**: K=1,000)

There have been several significant hailstorms, thunderstorms, and windstorms that have occurred throughout Steuben County resulting in injuries and several hundred thousand dollars in property damages. These events have been described in the NCDC data and in local news media reports.

On November 27, 1994, an intense low pressure area and cold front swept across nearly the entire state of Indiana with high winds both before and after the cold front. The cold front itself triggered a squall line that produced damage, resulting in \$120.0K in damages for the event. The July 1998 thunderstorm/windstorm event is recorded as causing \$250.0K in damages and 4 injuries as lightning struck the 4-H building in Angola. The roof of the building was also damaged by winds in excess of 57 mph. Another event occurring in Fremont in September of 2005 uprooted a 24-inch diameter tree. The same event reportedly caused a 12-inch tree to be uprooted, landing on a parked police cruiser, and an additional tree damaged a fence and storage shed near Snow Lake, resulting in total damages of approximately \$40.0K. Numerous other events resulted in downed power lines and utility poles, power outages, large tree limbs, and general debris sometimes causing road closures. As indicated in the table, damages from hailstorms, thunderstorms, and windstorms have varied from \$1.0K to approximately \$250.0K and the majority of the events have not resulted in death or injury.

The probability of a future hailstorm, thunderstorm, or windstorm occurring in Steuben County is highly likely and will typically affect broad portions of the County at one time. As advancements in technologies such as radar weather systems, broadcast alerts, and outdoor warning sirens, are continually made, the warning time for such events may increase. Currently, the typical warning provided for hailstorms, thunderstorms, and windstorms in Steuben County is less than 6 hours. **Table 3-15** provides the CPRI for hailstorms, thunderstorms, and windstorms and their effects on Steuben County and the communities within.

Table 3-15: CPRI for Hailstorms, Thunderstorms, & Windstorms

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly Likely 	Magnitude/Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • >24 hrs • 12-24 hrs • 6-12 hrs • <6 hrs 	Duration Of Event <ul style="list-style-type: none"> • <6hrs • <1day • <1wk • >1wk 	CPRI
Steuben County	Highly Likely	Limited	< 6 hrs	< 6 hrs	3.1
City of Angola	Likely	Limited	< 6 hrs	< 6 hrs	2.7
Town of Hamilton	Likely	Limited	< 6 hrs	< 6 hrs	2.7
Town of Hudson	Likely	Limited	< 6 hrs	< 6 hrs	2.7

Indicative of a regional hazard risk, the probability, magnitude/severity, warning time, and duration for hailstorm, thunderstorm, and windstorm events are nearly the same for all communities in Steuben County. As determined by the Planning Committee, the probability of a future hailstorm, thunderstorm, or windstorm occurring in the unincorporated areas of Steuben County is highly likely and likely for all other NFIP communities. The magnitude or severity of a hailstorm, thunderstorm, or windstorm in any area of Steuben County is anticipated to produce limited damages as many newer homes in the area are of better construction and should be able to withstand high winds. The warning time preceding the hailstorm, thunderstorm, or windstorm is expected to be less than 6 hours, while the duration of the event is also anticipated to be less than 6 hours. Hailstorms, thunderstorms, and windstorms are highly unpredictable and the occurrences are distributed throughout the county. Therefore, the CPRI values reflect the equally distributed risk and associated priority for a hailstorm, thunderstorm, or windstorm event.

Hailstorm, Thunderstorm & Windstorm: Vulnerability Assessment

Due to the unpredictability of this hazard, all 328 critical and 28,000 non-critical facilities in Steuben County are at risk of damage including temporary or permanent loss of function. Critical facilities include those associated with emergency services, transportation systems, lifeline utility systems, high potential loss facilities, and hazardous material handlers. Non-critical facilities include residential, industrial, commercial, and other structures not meeting the definition of critical facility and are not necessary for a community to function. For hailstorms, thunderstorms, and windstorms, it is not possible to isolate specific critical or non-critical facilities that would be more or less vulnerable to damages. However, based on the information obtained regarding previous events of this nature, future storms are likely to cause monetary damages to structures up to \$250.0K. It should also be noted that perhaps not all property owners reported damages caused by the events recorded by the NCDL. Therefore, damages to property should be expected to range from \$1.0K to \$250.0K per event.

When comparing historical losses reported by the NCDRC for hailstorms, thunderstorms, and windstorms as well as estimated future damages, this hazard should be expected to result in the least amount of monetary damages to Steuben County. With nearly the same considerations, hailstorms, thunderstorms, and windstorms for all areas of Steuben County were scored in the Comprehensive Hazard Analysis as a hazard that has occurred in the area and will likely occur again. In order to better assess community vulnerability, future property and crop damage caused by hailstorms, thunderstorms, and windstorms should be carefully recorded.

Hailstorm, Thunderstorm & Windstorm: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.

The warning time associated with hailstorms, thunderstorms, and windstorms is very short and advanced warning systems, such as outdoor warning sirens in conjunction with the NWS Emergency Alert Systems (EAS) is an effective mitigation practice to reduce loss of life and property. The outdoor warning sirens are currently activated for tornado warnings and are not activated for hailstorms, thunderstorms, or windstorms.



Residents and businesses, especially critical facilities, should stay abreast of current weather conditions with a weather radio. This radio continuously broadcasts NWS forecasts, warnings, and other crucial weather information and is the primary trigger for activating the EAS on commercial radio, television, and cable systems. Many of the critical facilities, including schools, hospitals, and government offices in Steuben County currently own and operate weather radios. NOAA has provided the schools in Steuben County with weather radios. However, to further reduce losses and protect citizens, they should be encouraged in all critical facilities. This type of comprehensive measure could help to ensure that all residents and visitors of Steuben County are fully aware of approaching and developing hailstorms, thunderstorms, and windstorms.

As required by the State of Indiana, all buildings in Steuben County are constructed to meet the standards set by the International Building Code. These codes specifically address anchoring and wind forces that structures must be able to withstand. In addition, mobile homes need to be certified that the minimum installation standards set forth by the State of Indiana specifically for these structures are being met to ensure the safety of those residents.

Safe rooms may be necessary during a hailstorm, thunderstorm, or windstorm (due to high winds and the potential for the development of tornados) especially for structures without basements or sound interior rooms. Information regarding the location of safe rooms and shelters should be well advertised for both residents and visitors to Steuben County as needed. Safe rooms should be incorporated into all new public facilities as these facilities are typically centrally located, are accessible for all levels of mobility, and regularly occupied by a large percentage of the population that may need to seek shelter. The Town of Hudson, while

developing plans for a new fire station, has incorporated a safe room approximately 45 feet in length and 30 feet in width with both an inside and outside staircase.

Currently, public buildings such as schools, hospitals, and government facilities in Steuben County may have designated safe areas such as hallways or interior rooms for occupants to gather during a hailstorm, thunderstorm, or windstorm. However, in areas such as mobile home parks, developments without basements, campgrounds, and community parks, there are no requirements for such facilities to be provided. To further protect the residents and visitors of Steuben County all public buildings, critical facilities, and other buildings with a high volume of employees or visitors should be equipped with safe rooms. Mobile home facilities, communities without basements, campgrounds, and community parks also need to have severe weather shelters in place and well marked for those not familiar with the area.



Much of the damage caused by hailstorms, thunderstorms, and windstorms is the result of fallen and broken limbs from trees. While even healthy trees may not be able to withstand high winds, maintaining trees in the road right-of-way, utility corridors, and public property will reduce the potential for dead and dying limbs from falling and injuring people, and damaging property and utility lines during a hailstorm, thunderstorm, or a windstorm. Electric providers in Steuben County have developed an extensive tree maintenance program to maintain necessary clearance around both high voltage and low voltage utility lines, to remove trees that interfere with utility lines, and to remove those that are diseased and/or dead near power lines. In order to complete tree maintenance prior to a hailstorm, thunderstorm, or windstorm, and to repair damaged areas following an event, many of the utility providers rely on professional subcontractors to assist with regular maintenance of the trees near to or under over-head power lines.

To further reduce the potential of future power outages, utility lines in areas of new development should be buried. Steuben County and the City of Angola, promote the burial of utility lines and many are doing so in conjunction with the installation of fiber optic lines. Although access to buried utility lines may be more difficult when the ground is frozen, they are less likely to be damaged by windstorms. The benefit to bury all existing above ground utility lines may not currently outweigh the associated cost. However, it may make sense for new development and reconstruction projects.

As discussed within previous hazard sections, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decision-making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. Several agencies and offices throughout Steuben County actively participate in the annual Severe Weather Awareness Week providing relevant information to the communities. The MHMP Planning Committee has identified the local need for development and continued training of a CERT program, the development of a voluntary program to immunize emergency responders, the ability to provide automated public alerts via telephone or electronic communications, as well as the need to provide safe rooms in vulnerable locations to further protect and provide for the residents and visitors of Steuben County. Placement of power back-up generators in critical facilities throughout the County will also be encouraged to prevent future damages and losses associated with hazardous weather events.

Social, physical, and economic losses from hailstorms, thunderstorms, and windstorms will most likely increase as more people choose to live, work, and visit Steuben County. Increases in damages, losses and injuries can be expected as the population and number of facilities continues to rise in Steuben County. Ensuring that residents and visitors are well informed about the potential impacts from these events as well as proper methods to protect themselves and their property will help to reduce future losses and damages. Information related to severe weather, the risks to vulnerable locations, and basic steps to protect themselves in emergencies should be provided to residents and visitors through community events and outreach programs.

3.2.4 TORNADO

Tornados 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 may reach the ground very quickly – becoming a tornado. If there is debris lifted and blown around by the “funnel cloud,” then it has reached the ground and it is a tornado event.



A tornado is generated when conditions in a strong thunderstorm cell are produced that exhibit a mass of cool air that overrides a layer of warm air. The underlying layer of warm air rapidly rises, while the layer of cool air drops –sparking the swirling action. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally April through June in Indiana, although tornados can occur at any time of year. They tend to occur in the afternoons and evenings: over 80 percent of all tornados strike between 3 and 9, but can occur at any time of day or night. Tornados occur most frequently in the United States east of the Rocky Mountains. Tornados in Indiana generally come from the south through the west and move to the north through the east. In Steuben County, the predominant tornado path seems to be from the southwest to the northeast.

While most tornados (69%) have winds of less than 100 miles per hour, they can be much stronger. Although violent tornados (winds greater than 205 mph) account for only 2% of all tornados, they cause 70% of all tornado deaths. In 1931, a tornado in Minnesota lifted an 83-ton railroad train with 117 passengers and carried it more than 80 feet. In another instance, a tornado in Oklahoma carried a motel sign 30 miles and dropped it in Arkansas. In 1975, a Mississippi tornado carried a home freezer more than a mile.

Tornado: Historic Data

Steuben County has experienced 12 tornados since May 1961. The classification of tornados utilizes the Fujita Scale of tornado intensity, described in **Table 3-16**. Tornado intensity ranges from low intensity (F0) tornados with effective wind speeds of 40-70 mph to high intensity (F5+) tornados with effective wind speeds of 261 to over 318 mph. Tornado intensities recorded for Steuben County include 3 - F1, 2 - F2, 3 - F3, and 1 - F4 tornados. An additional 3 recorded tornados were not classified. **Table 3-17** lists the historical tornado data available from the NCDC that have reported injuries, deaths, and/or property damages. Historical data identified by the NCDC is the best available data specific to Steuben County and the NFIP communities.

Exhibit 3 illustrates the historical tornado activity in Steuben County and the existing sites for outdoor warning sirens.

Table 3-16: Fujita Scale of Tornado Intensity

F-Scale	Winds	Character of Damage	Relative Freq.
F0 (weak)	40-72 mph	light damage	29%
F1 (weak)	73-112 mph	moderate damage	40%
F2 (strong)	113-157 mph	considerable damage	24%
F3 (strong)	158-206 mph	severe damage	6%
F4 (violent)	207-260 mph	devastating damage	2%
F5 (violent)	261-318 mph	incredible damage	< 1%

(NWS, Storm Prediction Center, 2007)

Table 3-17: Historic Tornado Data*

Location	Date	Magnitude	Death/Injury	Property/Crop Damage **
Steuben County	05/06/1961	F3	0/0	\$2.5M
Steuben County	08/25/1965	F1	0/0	\$25.0K
Steuben County	08/15/1969	F2	0/0	\$25.0K
Steuben County	09/06/1969	F2	0/0	\$25.0K
Steuben County	05/28/1973	F1	0/0	\$25.0K
Steuben County	04/03/1974	F3	2/15	0
Steuben County	03/27/1991	F3	1/6	\$25.0M
Angola Airport	05/18/1997	Not Classified	0/0	\$10.0M
Steubenville	10/24/2001	Not Classified	0/0	\$20.0K
Totals			3/21	\$37.6M

(NCDC, 2006)

(*: Only those events reporting deaths, injuries, or property damages.)

(**: K=1,000; M=1,000,000)

Table 3-17 above provides a comparative listing of the events affecting Steuben County. From here, it can be observed that tornados appear to be widespread throughout the County and can cause significant amounts of destruction and potential injuries and even deaths.

The most significant tornado in Steuben County with reported damages was an F3 event on March 27, 1991 and was responsible for 1 death and 6 injuries. Additionally, \$25.0M in property damages was reported to the NCDC. The unclassified tornado that touched down north of the Angola Airport on May 18, 1997, destroyed 21 aircraft and 3 hangars. While the reported length of the tornado was only 1 mile, numerous farm buildings, homes, businesses, and utility towers were also damaged because of this event.



The probability of a tornado touching down in Steuben County or any of the NFIP communities is possible. The magnitude and severity of the event is estimated to be catastrophic for any of the individual municipalities considered, while the unincorporated areas of the County are anticipated by the Planning Committee to receive critical damages. While it is difficult to predict precisely where the tornado will touch down, advancements in meteorological technologies may provide up to 6 hours of warning time for residents and visitors to

seek proper shelter. In most cases, tornados are short-lived hazards and may progress to other locations relatively quickly. **Table 3-18** identifies the CPRI for a tornado for all NFIP communities in Steuben County.

Table 3-18: CPRI for Tornado

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly likely 	Magnitude/Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs 	Duration of Event <ul style="list-style-type: none"> • < 6 hrs • < 1 day • < 1 wk • > 1 wk 	CPRI
Steuben County	Possible	Critical	< 6 hrs	< 6 hrs	2.5
City of Angola	Possible	Catastrophic	< 6 hrs	< 6 hrs	2.8
Town of Hamilton	Possible	Catastrophic	< 6 hrs	< 6 hrs	2.8
Town of Hudson	Possible	Catastrophic	< 6 hrs	< 6 hrs	2.8

Indicative of a regional hazard risk, the probability, magnitude/severity, warning time, and duration for tornado events are effectively the same for all communities in Steuben County. The magnitude or severity of a tornado varies only slightly between the unincorporated areas and the NFIP communities; from critical to catastrophic due to the number of people and businesses that could be affected. Tornados are unpredictable and could touch down in any area of the County. Thus, the CPRI values reflect the equally distributed risk and associated priority for a tornado event.

Tornado: Vulnerability Assessment

Due to the unpredictability of this hazard, all 328 critical and 28,000 non-critical facilities in Steuben County are at risk of future damage or loss of function. Critical facilities include those associated with emergency services, transportation systems, lifeline utility systems, high potential loss facilities, and hazardous materials handlers. Non-critical facilities include residential, industrial, commercial, and other structures not meeting the definition of a critical facility and are not required for a community to function. As the path of a tornado is not predefined, it is difficult to isolate specific critical or non-critical facilities that would be more or less vulnerable to a tornado.

Estimates of potential physical, economic, and/or social losses are determined through the following hypothetical exercises. One particular tornado scenario was developed based on reported historic tornado events and the dimensions of the impacted areas. This hypothetical

tornado touchdown traveled through the City of Angola and is intended to present a "what-if" scenario of a tornado event and associated damage.

The estimated physical and economic cost of the hypothetical tornado that was 300 yards wide was derived by assuming that 25% of all critical and non-critical structures in the path of the tornado would be completely destroyed, 35% would be 50% damaged, and 40% would have only 25% damage. **Table 3-19** provides summary data for the hypothetical tornado.

Table 3-19: Summary Hypothetical Tornado Damages and Estimated Economic Costs

	Number of Structures Damaged	Estimated Damage Cost*
Critical Facilities	25	\$2.7M
Non-Critical Facilities	697	\$51.3M
Total	722	\$54.0M

(*: M=1,000,000)

The City of Angola’s hypothetical tornado resulted in damages to 697 non-critical facilities, including 635 residential, 49 commercial, and 13 industrial structures. Estimated damages for this event are \$51.3M, while an additional \$2.7M in damages is estimated for 25 critical facilities (1 cell tower, 1 communication facility, 3 day care centers, 1 emergency operation center, 1 fire station, 3 government facilities, 5 hazardous materials handlers, 4 medical facilities, 1 law enforcement facility, 1 water tower, 2 potable water facilities, 1 utility substation, and 4 schools) affected by the tornado.

Estimated damages of \$54.0M provided by CBBEL place tornado as the second most potentially damaging hazard affecting Steuben County. Based on damages reported to the NCDC, tornado is anticipated to be the most damaging hazard and was scored in the Comprehensive Hazard Analysis as a hazard that has occurred in the area in the past and is likely to occur again throughout the County.

Tornado: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.



The warning time associated with tornados is very short and advanced warning systems, such as outdoor warning sirens in conjunction with the NWS-EAS is an effective mitigation practice to reduce loss of life and property. Outdoor warning sirens have adequately covered the City of Angola. However, according to the Steuben County EMA, the Town of Hudson and the Town of Ashley have small radius (1/2 mile) sirens. Further, large portions of the County, including the

Town of Fremont, Town of Orland, Jimmerson Lake, Lake George, Hamilton Lake, and Lake James are in need of outdoor warning sirens. Proposals have been developed and submitted to purchase and install an additional 10 sirens located in vulnerable areas. The locations and number of sirens is 6 surrounding developed lakes, 2 in the Town of Fremont, and 2 in the Town of Hamilton. It is important to note that outdoor warning sirens are only one method of alerting residents and visitors of impending weather situations. According to the Town of Hudson, a new outdoor warning siren has been obtained and will be installed next to the Town Hall, with expectations that this siren will provide coverage for the entire town.

The Planning Committee further discussed the possibility of developing and proposing ordinance language to set up a program for an outdoor warning siren fund. This program would be funded by local developers and would be utilized to purchase additional sirens as needed and to provide a funding base for long-term maintenance of the outdoor warning sirens.

The City of Angola has developed an action plan designed to inform City Hall employees of what actions need to be taken and where to seek shelter once the outdoor warning sirens have been activated. An internal warning system within City Hall alerts employees to evacuate to the vault that is enclosed in concrete, located on the first floor of City Hall. Per the Mayor of the City of Angola, similar plans are to be developed for all City buildings such as fire, police, street, and sewer departments.



As discussed previously, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decision-making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. Several agencies and offices throughout Steuben County actively participate in the annual Severe Weather Awareness Week providing relevant information to the communities. The MHMP Planning Committee has identified the local need for the

development and continued training of a CERT program, the development of a voluntary program to immunize emergency responders, the ability to provide automated public alerts via telephone or electronic communications, as well as the need to provide safe rooms in vulnerable locations to further protect and provide for the residents and visitors of Steuben County.

The MHMP Planning Committee agreed that owners and operators of critical facilities within Steuben County need to be encouraged to acquire power back-up generators and weather radios. Further, developers, municipal officials, and utility providers within the communities need to be encouraged to continue to adhere to the State of Indiana Building Codes, to continue to perform preventative tree maintenance, bury utility lines in areas of new or re-development, and evaluate and install outdoor warning sirens to provide increased coverage for new developments.

Social, physical, and economic losses from tornados will most likely increase as more people choose to live, work, and visit Steuben County. With the increased population an increase in number of critical and non-critical facilities, the potential for damage from a tornado also increases. Ensuring that residents and visitors are well informed about the potential impacts from tornados as well as proper methods to protect themselves and their property will help

reduce future losses and damage. Information related to severe weather, the risks to vulnerable locations, and basic steps to protect themselves in emergencies should be provided to residents and visitors through community events and outreach programs.

3.2.5 SEVERE WINTER STORM / ICE

A severe winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, ice storms, freezing rain or sleet, heavy snowfall with blinding wind-driven snow, and extremely cold temperatures that can last for several days. Some winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is one that drops 4 or more inches of snow during a 12-hour period, or 6 or more inches during a 24-hour span. An ice storm occurs when freezing rainfalls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can affect a community or region for days, weeks, and even months.

Storm effects such as extreme cold, flooding, and snow accumulation can cause hazardous conditions and hidden problems for people in the affected area. People can become stranded on the road or trapped at home, without utilities or other services, including food, water, and fuel supplies. The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they indirectly cause transportation accidents, and injury and death resulting from exhaustion/overexertion, hypothermia and frostbite from wind chill, and asphyxiation; house fires occur more frequently in the winter due to lack of proper safety precautions.



Wind chill is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the NWS implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index, which was based on the 1945 Siple and Passel Index. A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather

conditions are definitely on the way. A blizzard warning means that large amounts of falling or blowing snow and sustained winds of at least 35 miles-per-hour are expected for several hours. Severe winter storms are common during the winter months in Steuben County. Such conditions can result in substantial personal and property damage, even death.

Severe Winter Storm / Ice: Historic Data

The NCDC has recorded 12 heavy snow, 5 severe winter storms, and 3 ice events in Steuben County from February 1934. **Table 3-20** illustrates the historical severe winter storm data collected by NCDC. While information on the Blizzard of 1978 was not found through the NCDC, it was worst event on record for Indiana according to the NWS, Weather Forecast Office. This categorical event occurred from January 25 through January 27, 1978 when Steuben County, the State of Indiana, and other mid-western states experienced blizzard conditions as between 20 to 40 inches of snow fell throughout Indiana. In addition to the

extreme measurements of snow, wind gusts reached in excess of 55 mph and the wind chill dropped to a deadly low of -50°F. The deaths of 9 people were attributed to this disaster.

Table 3-20: Historic Severe Winter Storm / Ice Data*

Location	Date	Type	Death/ Injury	Property Damage**
Northern Indiana (5 Counties)	02/11/1993	Ice Storm	0/0	\$500.0K
Statewide	02/15/1993	Heavy Snow	0/0	\$50.0K
North Central and Northeast Indiana (10 Counties)	02/22/1993	Heavy Snow	0/0	\$100.0K
Steuben County + (14 Counties)	01/31/2002	Ice Storm	0/1	\$10.0K
TOTAL			0/1	\$660.0K

(NCDC, 2006)

(**): Only those events indicating death, injury, or property damages.)

(**): K=1,000; M=1,000,000)



A more recent severe winter storm event occurred in February of 1993 affecting 10 counties located in the far north central and far northeast Indiana. Approximately \$100.0K in damages has been attributed to this event as numerous roads businesses, and schools were closed throughout the region and the state. In many places between 7 and 11 inches of snow was reported to have fallen at a rate of 1-2 inches per hour. Similarly, in late December 1998, approximately 12-16 inches of snow accumulated in Steuben County along with sub-zero wind chill temperatures. Outside road clearing crews were hired to assist with

snow removal, while grocers were concerned about delivery trucks arriving in order to keep shelves full of food. Several businesses and schools in the County were closed due to impassable streets and drifting snow.

The probability of a severe winter storm causing disruption to residents and businesses in Steuben County is possible, and typically will affect the entire County, and possibly several surrounding counties, at one time. According to the Planning Committee, the damages associated with severe winter storms, including ice storms, are anticipated to be limited. With advancements in weather forecasting, the warning time associated with severe winter storms is usually greater than 24-hours with the duration of the event lasting for more than a week. **Table 3-21** identifies the CPRI for a severe winter storm for all NFIP communities in Steuben County.

Table 3-21: CPRI for Severe Winter Storm / Ice

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly likely 	Magnitude/Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs 	Duration of Event <ul style="list-style-type: none"> • < 6 hrs • < 1 day • < 1 wk • > 1 wk 	CPRI
Steuben County	Possible	Limited	> 24 hrs	> 1wk	2.1
City of Angola	Possible	Limited	> 24 hrs	> 1wk	2.1
Town of Hamilton	Possible	Limited	> 24 hrs	> 1wk	2.1
Town of Hudson	Possible	Limited	> 24 hrs	> 1wk	2.1

As shown by the CPRI, the probability, severity, warning time, and duration for severe winter storm and ice storm events are the same for all NFIP communities and the unincorporated areas within Steuben County due to the regional extent and diffuse severity of this hazard event.

Damages and losses specific to Steuben County were not provided by the NCDC. Multi-County damages were reported at approximately \$660.0K, but no indication was provided for the percentage of those damages realized within Steuben County. Severe winter weather was assessed in the Steuben County Comprehensive Hazard Analysis as a hazard that has occurred throughout the County and will likely occur again. However, the MHMP Planning Committee determined the CPRI of these events is the fourth highest concerning Steuben County. In order to better assess the community’s vulnerability, future property and crop damages caused by severe winter storms and ice storms should be carefully recorded and reported to the NCDC.

Severe Winter Storm / Ice: Vulnerability Assessment

A severe winter storm typically affects a large regional area with potential for physical, economic, and/or social losses. Given the nature and complexity of a regional hazard event such as a severe winter storm, it is difficult to quantify potential losses to property and infrastructure. Only 5 severe winter storms, as recorded by the NCDC, have losses associated with them; 1 death and \$660.0K in total property damages. Based on these events, Steuben County communities should expect similar losses as well as significant disruption to all community functions, and should anticipate that all functions will be affected simultaneously. Thus, mitigation measures should consider that the extent and severity of this hazard could render many, and possibly all, facilities non-functional during a severe winter storm event.

Around the nation, severe winter storms have resulted in substantial physical, social, and economic damages. For example, a March 2003 snowstorm in Denver, Colorado dropped approximately 31 inches of snow and caused an estimated \$34.0M in total damages. In addition, a February 2003 winter storm dropped an estimated 15 - 20 inches of snow in parts of Ohio. The Federal and Ohio Emergency Management Agencies and U.S. Small Business Administration surveyed damaged areas and issued a preliminary assessment of \$17.0M in disaster related costs. These costs included snow and debris removal, emergency loss prevention measures, and public utilities repair. The agencies found over 300 homes and businesses either damaged or destroyed in six counties.

The most recent Denver, Colorado area snowstorms from December 2006 through January 2007 surpassed the expenses and damages of the 2003 winter storms. In snow removal costs alone, it is estimated that over \$19.0M was spent throughout the area, with approximately \$6.4M of that spent clearing Denver International Airport. In addition to these expenses, economic revenues are realized when an event bringing up to 57 inches of snow and ice closes businesses and Denver International Airport for nearly 48 hours. Total estimates of damages, expenses, and losses are not expected to be reported until late 2007.

While the above examples indicated the wide-ranging and large-scale impact that severe winter storms can have on a community or region, in general, severe winter storms tend to result in less direct economic impacts than many other natural hazards. According to the *Workshop on the Social and Economic Impacts of Weather*, which was sponsored by the U.S. Weather Research Program, the American Meteorological Society, the White House Subcommittee on Natural Disaster Relief, and others, severe winter storms resulted in an average of 47 deaths and more than \$1.0B in economic losses per year between 1988 and 1995. However, these totals account for only 3% of the total weather-related economic loss and only 9% of fatalities associated with all weather related hazards over the same time.



However, severe winter storms can also result in substantial indirect costs. According to a report by the National Center for Environmental Predictions, cold and snowy winter in late 1977 and early 1978, which impacted several heavily populated regions of the country, was partially responsible for reducing the nations Gross Domestic Product (GDP) from an estimated growth rate of between 6% and 7% during the first three quarters of 1977 to approximately -1% in the last quarter of 1977 and 3% during the first quarter of 1978.

Severe Winter Storm / Ice: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.

The probability of at least one severe winter storm in Steuben County per year is possible. Fortunately, the warning time associated with severe winter storms is more than 24 hours, which should give residents, business owners, and visitors enough time to protect themselves and their property.

While no consistent levels of snow advisories or emergencies exist within Steuben County or the municipalities, it may be beneficial to develop consistent and tiered levels of advisory throughout the IDHS District 3, which includes Steuben County. A travel advisory, travel warning, and a snow emergency alert would restrict the amount and type of traffic throughout the city, thereby reducing the number of weather related crashes, injuries and even deaths during a severe winter storm. This system of restricting traffic flow would further ensure a clear roadway allowing snow removal and clean up crews to provide safe travel once the advisories have been lifted. Similarly, designated and properly marked snow routes could be established

highlighting primary streets and roads to be cleared as well as restrict parking along those routes during snow periods.

As discussed previously, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decision-making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. Several agencies and offices throughout Steuben County actively participate in the annual Severe Weather Awareness Week providing relevant information to the communities. The MHMP Planning Committee has identified the local need for the development and continued training of a CERT program, the development of a voluntary program to immunize emergency responders, and the ability to provide automated public alerts via telephone or electronic communications to further protect and provide for the residents and visitors of Steuben County.

Also discussed in previous hazard sections, the MHMP Planning Committee agreed that owners and operators of critical facilities within Steuben County need to be encouraged to acquire power back-up generators and weather radios. Further, developers, municipal officials, and utility providers within the communities need to be encouraged to continue to adhere to the State of Indiana Building Codes, to continue to perform preventative tree maintenance, and bury utility lines in areas of new or re-development.

Social, physical, and economic losses from severe winter storms will most likely increase as more people choose to live, work, and visit Steuben County. Ensuring that residents and visitors are well informed about the potential impacts from severe winter storms and proper methods to protect themselves and their property will help reduce future losses and damage. Information related to severe weather, the risks to vulnerable locations, and basic steps to protect themselves in emergencies should be provided to residents and visitors through community events and outreach programs.

3.2.6 DAM FAILURE

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is the collapse, breach, or other failure resulting in downstream flooding.

A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Of the approximately 80,000 dams identified nationwide in the National Inventory of Dams, the majority are privately owned. Federal agencies own 2,131; States own 3,627; local agencies own 12,078; public utilities own 1,626; and private entities or individuals own 43,656. Ownership of over 15,000 is undetermined. The Inventory categorizes the dams according to their primary function: Recreation (31%), Fire and farm ponds (17%), Flood control (15%), Irrigation (14%), Water supply (10%), Tailings and other (8%), Hydroelectric (3%), and Undetermined (2%).

Each dam in the National Inventory of Dams (NID) is assigned a downstream hazard classification based on the potential loss of life and damage to property should the dam fail. The three classifications are high, significant, and low. With changing demographics and land

development in downstream areas, hazard classifications are updated continually. The hazard classification is not an indicator of the adequacy of a dam or its physical integrity. Dam failures typically occur when spillway capacity is inadequate and excess flow overtops the dam, or when internal erosion (piping) through the dam or foundation occurs.

Dam Failure: Historic Data



According to the NID, there are 2 recorded high hazard dams in Steuben County as shown in Exhibit 2; the Lake George Dam and the Hamilton Lake (North & South) Dam. The Lake George Dam, approximately 30 feet in height, is located on Crooked Creek, near the northern border of Steuben County. As of the last dam inspection report in 2004, the Lake George Dam was given a rating of conditionally poor. This indicates that either a safety deficiency has been recognized during unusual loading conditions or uncertainties exist regarding critical analysis parameters. A recent dam inspection report for the Hamilton Lake

dams was not available from the IDNR, Division of Water. It has been reported that inspections have not been completed due to matters relating to ownership and responsibility of the dams.

While there have been no recorded dam failures in Steuben County, a significant event occurred in May of 1996 on Hamilton Lake Dam. Approximately 10 inches of rain fell in two days, caused the spillway to overflow, and destroyed a mobile home park. One death was attributed to this event and no monetary damages were reported.

The probability of a dam failure on either the Hamilton Lake Dam or the Lake George Dam, as determined by the Planning Committee is unlikely, but remains possible. If a failure of a dam were to occur within the unincorporated areas of Steuben County or the Town of Hamilton, the magnitude is anticipated by the Planning Committee to produce limited damages to the areas downstream of the dam. Warning times and durations for a dam failure are estimated to be less than 6 hours. **Table 3-22** identifies the CPRI for dam failure for all NFIP communities in Steuben County.

Table 3-22: CPRI for Dam Failure

	Probability • Unlikely • Possible • Likely • Highly likely	Magnitude/Severity • Negligible • Limited • Critical • Catastrophic	Warning Time • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs	Duration of Event • < 6 hrs • < 1 day • < 1 wk • > 1 wk	CPRI
Steuben County	Unlikely	Limited	< 6 hrs	> 1 wk	2.1
City of Angola	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Hamilton	Unlikely	Limited	< 6 hrs	> 1 wk	2.1
Town of Hudson	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3

The CPRI index for Steuben County and the Town of Hamilton are increased as the high hazard dams assessed are located upstream of these areas. The estimated inundation area if this dam

is breached will encompass a portion of the County as well as reach into the Town of Hamilton, thus putting those areas at a greater risk of damage due to a dam failure.

Dam Failure: Vulnerability Assessment

Due to conditions beyond the control of the dam owner or engineer, there are unforeseen structural problems, natural forces, mistakes in operation, negligence, or vandalism that may cause the dam to fail. Unfortunately, the high hazard dams in Steuben County do not have an EAP with a detailed dam failure inundation area identified. Therefore, for the purpose of this planning effort, very rough assumed inundation zones were delineated for the Hamilton Lake Dam and the Lake George Dam. The zones were overlaid onto recent aerial photography to estimate the number of critical and non-critical facilities that would be affected by a dam failure. The actual magnitude and extent of damage depend on the type of dam break, volume of water that is released, and width of the floodplain valley to accommodate the dam break flood wave.

Based on preliminary analysis of vulnerable facilities in approximate dam failure inundation zone for the Lake George Dam, 3 critical facilities (hazardous materials handlers) and approximately 471 non-critical facilities would be affected by a dam failure. These do not include bridges and roadways that are in the floodway and floodplains throughout the County that could be damaged or destroyed by a dam breach event. Regarding a failure of the Hamilton Lake Dam, approximately 3 critical (2 hazardous materials handlers and 1 water treatment plant) and 64 non-critical facilities are anticipated to be damaged.

Assuming that 25% of all critical and non-critical structures in the dam failure inundation zones would be destroyed, 35% would be 50% damaged, and 40% would have only 25% damage. The damage to the structure, content, and land value of the critical and non-critical facilities protected by the Lake George Dam is estimated to be \$350.0K and \$33.6M respectively. Damage estimates for those facilities in the dam failure inundation area estimated for the Hamilton Lake Dam are \$346.4K (critical facilities) and \$4.6M (non-critical facilities).

While no historic losses associated with dam failure were reported, the estimated losses for a failure place this hazard as having fourth highest potential damages. According to the Steuben County CEMP, dam failure is expected to have the greatest affect on the Town of Hamilton as a hazard that is possible in the area. For the City of Angola and Town of Hudson (Salem Center), a dam failure is scored as having a slight chance that an incident of this type will occur.

Social losses are difficult to quantify, though interrupted services associated with critical facilities would cause hardship for many residents. It is difficult to accurately estimate the potential social cost of a dam failure due to the complexity of the hazard. It is probable, though, that a dam break would occur during extreme rainfall or a flood event and would likely cause damages including structure loss, infrastructure loss, disruption to community function, and possibly injury and death.

Dam Failure: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.

The IDNR requires inspection and maintenance of a high hazard dam every 2 years throughout the State. The storage of water is a potentially hazardous activity. Under Indiana law, the owner of a dam is responsible for operating and maintaining the dam in a safe manner to prevent harm to others and their property. Dam inspection includes formal technical inspections, maintenance inspections, informal inspections, and special inspections. Based on the last inspection report for the Lake George Dam, it has been classified as Conditionally Poor indicating a potential safety deficiency is recognized or that uncertainties exist necessitating further investigations and studies.



The IDNR also encourages the development of an Emergency Action Plan (EAP) for high or significant hazard dams. These plans are very good planning tools to understand the impact that a dam failure could have people and property downstream with details about the volume and velocity of the water as well as accurately delineating the dam inundation zone. A good mitigation practice would be to encourage dam owners to develop an EAP/ERP for at least the high hazard dams in Steuben County, the Lake George Dam and the Hamilton Lake Dam, and any future high hazard dams constructed within Steuben County. The Planning Committee also discussed the need to have an EAP including a precise delineation of the dam failure inundation areas for the significant hazard dams: Jimmerson Lake Dam, Oberlin Lake Dam, and Oberlin-Ford Dam. The dam inundation zone delineated as part of the EAP could be used in conjunction with the Comprehensive Land Use Plan to prohibit future critical facilities downstream from a high or significant hazard dam. Dam owners should be encouraged to limit access to high hazard and significant hazard dams in order to avoid disruptions to the integrity of the structure.

As discussed previously, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decision-making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. Several agencies and offices throughout Steuben County actively participate in the annual Severe Weather Awareness Week providing relevant information to the communities. The MHMP Planning Committee has identified the local need for the development and continued training of a CERT program, the development of a voluntary program to immunize emergency responders, and the ability to provide automated public alerts via telephone or electronic communications further protect and provide for the residents and visitors of Steuben County. The MHMP Planning Committee agreed that owners and operators of critical facilities within Steuben County need to be encouraged to acquire power back-up generators and weather radios.

Social, physical, and economic losses from dam failures will most likely increase as more people choose to live, work, and visit Steuben County. Ensuring that residents and visitors are well informed about the potential impacts from a dam failure and proper methods to protect themselves and their property downstream of a high hazard dam will help reduce future losses and damage. If future measures were undertaken to protect those structures currently located in the inundation zones of the dam, and to prohibit new construction in those same areas, social, physical and economical losses could be reduced.

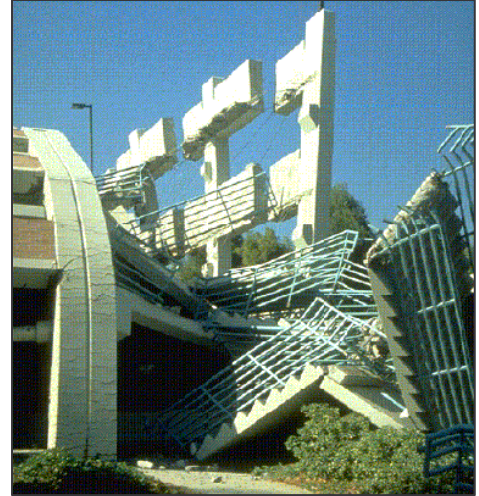
3.2.7 EARTHQUAKE

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 the 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.

Ground shaking from 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 move off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world.

Estimates of losses from a future earthquake in the United States approach \$200 billion.



There are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes—most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude of 8 on the Richter scale. These earthquakes occur over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Earthquake: Historical Data

According to the Steuben County Comprehensive Plan, Indiana as well as several other Midwestern states lie in the most seismically active region east of the Rocky Mountains. These zones are not made up of one fault line, but many geologic faults that are capable of producing earthquake. Steuben County is not expected to be directly affected by these potentially unstable faults.

Although there has not been a previous occurrence of an earthquake epicenter recorded for Steuben County, it is possible that the County could experience an earthquake or the aftershock of an earthquake at some point in the future. The most recent earthquake recorded in central Indiana was on September 12, 2004 in Shelbyville, IN, approximately 40 miles south of Anderson. The earthquake recorded 3.6 on the Richter scale of earthquake intensity.

Earthquake related damages might also be the result of earthquakes occurring in neighboring states. An earthquake centered near Dale, Illinois on November 9, 1968 was felt throughout Indiana and 22 other states. Damages ranged from groceries falling off shelves in Fort Branch, IN, toppled chimneys in Cynthiana, IN, and fish jumped out of the rivers, ponds and lakes.

The probability of an earthquake event according to the Planning Committee is unlikely for all areas of Steuben County. The magnitude and severity of the hazard is estimated to produce negligible damages due to the distance between Steuben County and the other NFIP communities and the nearest fault lines and historical epicenters. Warning time associated with an earthquake is minimal at best and realistically less than 6 hours, with the duration of the event lasting less than 6 hours as well. **Table 3-23** identifies the CPRI for an earthquake event for all NFIP communities in Steuben County.

Table 3-23: CPRI for Earthquake

	Probability <ul style="list-style-type: none"> • Unlikely • Possible • Likely • Highly likely 	Magnitude/Severity <ul style="list-style-type: none"> • Negligible • Limited • Critical • Catastrophic 	Warning Time <ul style="list-style-type: none"> • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs 	Duration of Event <ul style="list-style-type: none"> • < 6 hrs • < 1 day • < 1 wk • > 1 wk 	CPRI
Steuben County	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.5
City of Angola	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.5
Town of Hamilton	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.5
Town of Hudson	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.5

As shown in the CPRI table, all communities share the same value due to the large-scale regional impact of this hazard. With the complexity of this hazard, it is difficult to determine the probability and the magnitude and severity of the event. However, as Steuben County is some distance from the aforementioned fault lines, the probability of an earthquake occurring in the future is unlikely. The magnitude and severity of the earthquake in Steuben County would be far less than those communities located near to the epicenter or along the fault lines. Therefore, damages and related injuries are not expected to be more than negligible in nature for all communities in Steuben County.

Earthquake: Vulnerability Assessment

All structures in Steuben County, both critical and non-critical, are potentially vulnerable to an earthquake. There are 328 critical facilities and 28,000 non-critical facilities identified by the Planning Committee and the Steuben County GIS Department.

Scientists are currently studying the New Madrid fault area paying close attention to seismic activity and have predicted that the chances of another earthquake in the 8.0 range occurring within the next 50 years are approximately 7-10%. However, the chances of an event at 6.0 or greater are at 90% within the next 50 years. According to some scientists, this provides the needed justification for further structure protection, additions to building codes, and education and outreach for earthquake awareness in the Mid-west states.

Earthquakes were ranked by the Planning Committee through the CPRI exercise as the least potentially damaging of the 7 hazards affecting Steuben County. Likewise, through the completion of the Comprehensive Hazard Analysis earthquakes were considered a hazard that

has a slight possibility to occur in Steuben County. No losses associated with earthquake damages were reported by NCDRC and no damages were estimated for future events

Earthquake: Existing Mitigation Practices

Mitigation practices are projects, policies, or programs that reduce the social, physical, and economic impact of hazards. As part of this planning process, the Planning Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements as well as suggested new practices. The following is a summary of the mitigation practices discussed. A chart detailing all of the mitigation practices, hazards addressed, local priority, benefit-cost ratio, location, responsible entity, and funding can be found in Section 4.0 of this Plan.

There are few mitigation practices to reduce losses in the event of an earthquake. The State of Indiana requires all buildings in Steuben County to be constructed to meet the standards set by the International Building Code. These codes specifically address the seismic energy that each structure must be able to withstand in this region. While Steuben County has been delineated within the 5th wave zone of the New Madrid fault area, limited damages may still be realized.

The HAZUS-MH program combines current scientific and engineering knowledge with the latest GIS technology to produce estimates of hazard-related damage before, or after a disaster occurs. The HAZUS-MH Earthquake Model can be updated with local information regarding critical facilities, proximity to fault lines and rift zones, soil types, and property values to provide more accurate “what if” earthquake scenarios.

As discussed previously, officials in Steuben County have established a primary warning point to alert the public of emergencies, created a comprehensive GIS database utilized in land use planning and decision-making efforts, and developed agreements with several local facilities to provide temporary shelter as needed. Several agencies and offices throughout Steuben County actively participate in the annual Severe Weather Awareness Week providing relevant information to the communities. The MHMP Planning Committee has identified the local need for the development and continued training of a CERT program, the development of a voluntary program to immunize emergency responders, the ability to provide automated public alerts via telephone or electronic communications, as well as the need to provide safe rooms in vulnerable locations to further protect and provide for the residents and visitors of Steuben County.

The MHMP Planning Committee agreed that owners and operators of critical facilities within Steuben County need to be encouraged to acquire power back-up generators and weather radios. Further, developers, municipal officials, and utility providers within the communities need to be encouraged to continue to adhere to the State of Indiana Building Codes, to continue to perform preventative tree maintenance, bury utility lines in areas of new or re-development, and evaluate and install outdoor warning sirens to provide increased coverage for new developments.

Social, physical, and economic losses from earthquake will most likely increase as more people choose to live, work, and visit Steuben County. Ensuring that residents and visitors are well informed about the potential impacts from earthquake and proper methods to protect themselves and their property will help reduce future losses and damage. Information related to earthquakes, the risks to vulnerable locations, and basic steps to protect themselves in emergencies should be provided to residents and visitors through community events and outreach programs.

3.3 HAZARD SUMMARY

For the development of the MHMP, the Planning Committee utilized the CPRI method to prioritize the hazards that they felt affected Steuben County. Hazards were assigned values based on the probability or likelihood of occurrence, the magnitude or severity of the event, as well as warning time and duration of the event itself. A weighted CPRI was calculated based on the percent of the County’s population present in the individual NFIP communities. **Table 3-24** indicates the results of the CPRI values for each hazard affecting Steuben County.

Prior to developing the MHMP, the Steuben County EMA completed a similar process as part of the Comprehensive Emergency Management Plan (CEMP) to provide an overall assessment of hazards within the County. These rankings are also based on probability of the hazard occurring, although a different set of parameters were utilized throughout the process. Those results for the hazards studied in detail for the MHMP are also found in Table 3-24.

Furthermore, rankings based on historic losses as reported to the NCDC, as well as ranking according to the estimated potential damages determined for the purpose of this planning effort, for each of the hazards, are provided within the table for comparative purposes. These latter two ranking systems are considered more objective than the CPRI and CEMP methodology.

Table 3-24: Comparative Hazard Rankings, Steuben County

Hazard	MHMP			CEMP	NCDC
	Initial	CPRI	Est. Damages*	NFIP Average	Historic Losses*
Dam Failure	6	5	\$5.1M-\$33.9M	4	NA
Earthquake	7	6	0	5	NA
Flooding	4	2	\$181.6M	2	\$5.0M
Hail/Thunder/Windstorm	2	2	\$250.0K	1	\$4.0M
Hazardous Materials	3	1	\$2.1M	3	NA
Severe Winter Storm	5	4	NA	1	\$660.0K**
Tornado	1	3	\$54.0M	1	\$37.6M

(NA=Not Available)

(*: K=1,000; M=1,000,000)

(**: Values represent reported statewide damages)

Similar ranking procedures were utilized in the CPRI completed for the MHMP and the CEMP completed for the Steuben County Comprehensive Hazard Analysis, and the results are similar. For example according to the CPRI and the CEMP, flooding, hazardous materials, tornados, and hailstorms, thunderstorms, and windstorms are within the top hazards affecting Steuben County. Further, tornados have historically produced the most damages to property and crops specific to Steuben County; while flooding is the second most historically damaging. Damages and economic losses provided as statewide values were not included in the overall ranking based on historic losses. Estimated damages prepared as a part of this planning effort for flooding tops the hazards affecting the County, while a tornado has the potential to produce the next largest amount of damages in Steuben County. Concerning potential damages estimated for this planning effort (utilizing the high estimated values), the top 3 hazards affecting Steuben County are flooding, tornados, and a dam failure.

The total number of housing units in 2000 according to US Census data was reported at 17,337 and the 2006 estimates show an increase to 19,079. As Steuben County and the communities within continue to grow in population, structures, and infrastructure services, it can be expected

that future property and crop damages may be increased. However, due to programs such as those provide by the MRBC and increased protection efforts developed in ordinance and code updates, damages associated with properties in identified hazard areas such as floodplains, dam inundation areas, and close proximities to hazardous materials handlers can be reduced.



The CRS program credits NFIP communities a maximum of 55 points for mapping flooding as well as other known natural hazards; summarizing the impact of natural hazards; identifying the number, type, and estimated value of buildings subject to natural hazards; and development, the community.

4.0 MITIGATION GOAL & PRACTICES

This Section identifies the mitigation goals and a summary of the mitigation practices discussed in the Risk Assessment section of this Multi-Hazard Mitigation Plan (MHMP).

4.1 MITIGATION GOAL

The overall goal throughout the development of the Steuben County MHMP has been to protect the citizens, visitors, and properties within Steuben County from the impacts of hazards through actions associated with emergency services, natural resource protection, prevention, property protection, public information, and structural controls.

4.2 MITIGATION PRACTICES

In 2005, the Multi-Hazard Mitigation Council conducted a study about the benefits of hazard mitigation. This study examined grants over a 10-year period (1993-2003) aimed at reducing future damaged from earthquake, wind, and flood. It found that mitigation efforts were cost-effective at reducing future losses; resulted in significant benefits to society; and represented significant potential savings to the federal treasury in terms of reduced hazard-related expenditures. This study found that every \$1 spent on mitigation efforts resulted in an average of \$4 savings for the community. The study also found that the Federal Emergency Management Agency (FEMA) mitigation grants are cost-effective since they often lead to additional non-federally funded mitigation activities, and have the greatest benefits in communities that have institutionalized hazard mitigation programs. Six primary mitigation measures defined by FEMA are:

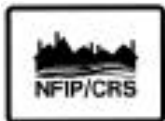
- **Emergency Services** - measures that protect people during and after a hazard.
- **Natural Resource Protection** - opportunities to preserve and restore natural areas and their function to reduce the impact of hazards.
- **Prevention** – measures that are designed to keep the problem from occurring or getting worse.
- **Property Protection** – measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away.
- **Public Information** – those activities that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards.
- **Structural Control** - physical measures used to prevent hazards from reaching a property.

The Steuben County Planning Committee reviewed the list of mitigation ideas from FEMA for each of the hazards studied as part of this planning effort and identified which of these they felt best met their needs as a community according to selected social, technical, administrative, political, and legal criteria. The following identifies the key considerations for each evaluation criteria:

- **Social** – the proposed mitigation projects will have community acceptance, they are compatible with present and future community values, and do not adversely affect one segment of the population.
- **Technical** – the proposed mitigation project will be technically feasible, reduce losses in the long-term, and will not create more problems than they solve.
- **Administrative** – the proposed mitigation projects may require additional staff time, alternative sources of funding, and have some maintenance requirements.
- **Political** – the proposed mitigation projects will have political and public support.
- **Legal** – the proposed mitigation projects will be implemented through the laws, ordinances, and resolutions that are in place.

Table 4-1 lists a summary of all existing mitigation practices identified for all hazards, as well as information on the local status, local priority, benefit-cost ratio, project location, responsible entity, and potential funding source, associated with each proposed practice. The proposed mitigation practices are listed in order of importance to the Steuben County National Floodplain Insurance Program (NFIP) communities for implementation. Projects identified by the Planning Committee to be of “high” local priority may be implemented within 2-3 years from final Plan adoption. Projects identified to be of “medium” local priority may be implemented within 4-5 years from final Plan adoption, and projects identified by the Planning Committee to be of “low” local priority may be implemented with 5+ years from final Plan adoptions. However, depending on availability of funding, some proposed mitigation projects may take longer to implement.

As part of the process to identify mitigation practices, the Planning Committee weighed the benefit derived from each mitigation practice with the estimated cost of that practice. The Planning Committee identified the mitigation practices as having a high, medium, or low benefit cost ratio based on their experience and professional judgment. Preparing detailed benefit cost ratios was beyond the scope of this planning effort and the intent of the MHMP. The development of this MHMP is the necessary first step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in Steuben County communities. The intent of this planning effort was to identify the hazards and the extent to which they affect Steuben County communities and to determine what type of mitigation strategies or practices may be undertaken to mitigate these hazards. Although this MHMP meets the requirements of Disaster Mitigation Act (DMA) 2000 and eligibility requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) Grant, Pre-Disaster Mitigation (PDM) Grant, as well as other FEMA programs including the NFIP’s Community Ratings System (CRS), additional detailed studies may need to be completed prior to applying for these grants or programs. **Section 5** of this plan includes an implementation plan for all high priority mitigation practices identified by the Planning Committee.



The CRS program credits NFIP communities a maximum of 72 points for setting goals to reduce the impact of flooding and other known natural hazards; identifying mitigation projects that include activities for prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.

Table 4-1: Summary of Mitigation Practices

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT -COST RATIO	PROJECT LOCATION	RESPONSIBLE ENTITY	FUNDING SOURCE
Safe Rooms <ul style="list-style-type: none"> Require safe rooms in Critical Facilities and areas where large populations congregate (baseball fields, seasonal lake communities, etc) Require safe rooms in mobile home parks, public parks, apartment complexes, and communities without basements. 	<input checked="" type="checkbox"/> Prevention <input type="checkbox"/> Property Protection <input type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing –Town of Hudson plans to incorporate safe room into new Fire Hall. Proposed Enhancement – add safe rooms to 48 mobile home parks, multi-family dwellings, public buildings	High	Low	48 mobile home parks, 13 campgrounds, public buildings, and areas of gathering in Steuben County.	Planning Departments: <i>Steuben County</i> <i>Angola</i> <i>Hamilton</i> <i>Hudson</i>	Developers FEMA
Management of High Hazard Dam <ul style="list-style-type: none"> Encourage dam owners to develop an EAP/ERP for Hamilton Lake Dam and the Lake George Dam. 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input type="checkbox"/> Hail, Thunder, Wind <input type="checkbox"/> Hazardous Materials <input type="checkbox"/> Severe Winter Storm <input type="checkbox"/> Tornado	Ongoing – Proposed Enhancement – Complete EAP/ERP for Hamilton Lake and Lake George Dams	High	High	Lake George Dam, Hamilton Lake Dam, and dam failure inundation areas	Dam Owner	Operational cost
Building Protection <ul style="list-style-type: none"> Prohibit development of critical facilities in known hazard areas Ensure mobile homes are anchored to meet State of Indiana’s specifications. Promote power back-up generators to all Critical Facilities Develop voluntary structure buyout/retrofit program to include all structures within 100-year floodplain Protect existing critical facilities structures within known hazard areas Promote areas of re-development to bury utility lines 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing – Proposed Enhancement – prohibit construction of future critical facilities and protect existing structures in known hazards areas	High <i>(new critical facilities, mobile homes)</i> Moderate <i>(generators, buyout/ retrofit, existing critical facilities in dam failure inundation areas, burial of utility lines)</i> Low <i>(existing critical facilities in floodplains)</i>	Medium	Throughout Steuben County and the municipalities within, the construction of Critical Facilities within a known hazard area should be prohibited. Steuben County’s 48 mobile home communities. Back-up generators in all critical facilities especially medical, police, fire, and community shelters. Target repetitive loss properties, areas prone to flooding, and properties within the dam failure inundation areas for buyout/retrofit program.	Planning Departments: <i>Steuben County</i> <i>Angola</i> <i>Hamilton</i> <i>Hudson</i> Building Departments: <i>Steuben County</i> <i>Angola</i> <i>Hamilton</i> <i>Hudson</i> MRBC EMA Floodplain Administrators <i>Steuben County</i> <i>Angola</i> <i>Hamilton</i> <i>Hudson</i>	Owner FEMA MRBC

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT -COST RATIO	PROJECT LOCATION	RESPONSIBLE ENTITY	FUNDING SOURCE
Public Education & Outreach <ul style="list-style-type: none"> Continue participation in community events and outreach opportunities. Become a certified StormReady Community (County) Provide information related to dam failure to property owners within the dam failure inundation areas. 	<input checked="" type="checkbox"/> Prevention <input type="checkbox"/> Property Protection <input type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing – literature, school and community programs, newspapers Proposed Enhancement – StormReady	High <i>(community events, StormReady)</i> Moderate <i>(dam failure information)</i>	High	Maintain hazard preparedness literature at municipal offices, community events, and outreach activities.	EMA Red Cross Floodplain Administrators: Steuben County Angola Hamilton Hudson Local Media Dam owners MRBC	Existing budget FEMA IDEM IDNR NWS MRBC
Hazardous Materials Response Teams <ul style="list-style-type: none"> Continued training and realistic exercises for emergency personnel Increase number of personnel certified OSHA Level III-Technician Pursue funding for full-time paid positions and equipment for emergency responders 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input type="checkbox"/> Public Information	<input type="checkbox"/> Dam Failure <input type="checkbox"/> Earthquake <input type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input type="checkbox"/> Severe Winter Storm <input type="checkbox"/> Tornado	Ongoing – Research funding opportunities to increase number of paid, full-time responders Proposed Enhancement – Add responders, continued training	High <i>(training and exercises)</i> Medium <i>(OSHA Level III, full-time positions, response equipment)</i>	High	Countywide throughout fire departments, EMS, and other response agencies.	EMA LEPC Fire Department Steuben County Angola Hamilton Hudson	Existing budget Operational cost
Emergency Operations Center <ul style="list-style-type: none"> Establish dedicated EOC Establish a mobile EOC 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Emergency Services <input checked="" type="checkbox"/> Structural Control <input type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing – IDHS District 3 is purchasing a mobile command unit, but will be kept in Ft. Wayne Proposed Enhancement – Establish a dedicated and/or mobile EOC within Steuben County	High <i>(dedicated EOC)</i> Moderate <i>(Mobile EOC)</i>	High	To be located in a central location within Steuben County.	EMA LEPC	Existing Budget FEMA IDHS
Flooding/Floodplain Management <ul style="list-style-type: none"> Prioritize and conduct detailed studies of “Approximate Study” (A-Zone) streams. Update FIRMs Provide the opportunity for staff members to become CFM Encourage City of Angola to adopt the optional provisions of the State of Indiana Model 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input type="checkbox"/> Public Information	<input type="checkbox"/> Dam Failure <input type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input type="checkbox"/> Hail, Thunder, Wind <input type="checkbox"/> Hazardous Materials <input type="checkbox"/> Severe Winter Storm <input type="checkbox"/> Tornado	Ongoing – Waterways are being maintained, FIRMs anticipated in 2009 Proposed Enhancement – Increased number of detailed studies, CFM certifications, City of Angola adopt optional provisions, CRS participation, buyout/retrofit program	High <i>(detailed studies, FIRMs, CFM, optional provisions, maintain waterways)</i> Moderate	High	FIRM update and stream studies to be completed throughout Steuben County as prioritized and funded. CFM Certifications for the City of Angola, Town of Hamilton, and Town of Hudson.	Steuben County Surveyor MRBC Planning Steuben County Angola Hamilton Hudson	Existing budget IDNR FEMA MRBC

MITIGATION PRACTICE	MITIGATION STRATEGY	HAZARD ADDRESSED	STATUS	PRIORITY	BENEFIT -COST RATIO	PROJECT LOCATION	RESPONSIBLE ENTITY	FUNDING SOURCE
Floodplain Ordinance language or a more restrictive standard. <ul style="list-style-type: none"> ▪ Continue to maintain waterways and regulated drains to prevent localized flooding. ▪ Participate in the CRS program. ▪ Develop a voluntary structure buyout/retrofitting program to include all structures within the 100-year floodplain 			initiated	<i>(CRS, buyout)</i>		City of Angola to adopt State of Indiana optional provisions of the Model Floodplain Ordinance.	Floodplain Administrators <i>Steuben County Angola Hamilton Hudson</i>	
Emergency Warning Systems <ul style="list-style-type: none"> ▪ Install outdoor warning sirens where pockets of development are not covered. ▪ Assure consistent tiered level of snow emergencies/advisories are adopted within the County and IDHS District 3. ▪ Designate and enforce snow routes to allow for snow removal activities ▪ Encourage placement of weather radios in all critical facilities ▪ Maintain and increase flood forecasting capabilities ▪ Propose and adopt an ordinance to require developers to pay toward a siren fund as part of new development ▪ Acquire reverse 9-1-1 warning system 	<input checked="" type="checkbox"/> Prevention <input type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing – test and maintain outdoor warning sirens ; NWS storm warnings; weather radios located in schools, 2 real-time USGS gaging stations Proposed Enhancement – Consistent snow emergencies, weather radios in all critical facilities, additional outdoor warning sirens, prioritize areas in need of additional gaging stations, outdoor warning siren fund, reverse 911	High <i>(warning sirens, snow levels and routes, weather radios, flood forecasting)</i> Moderate <i>(siren fund)</i> Low <i>(reverse 911)</i>	High	Warning sirens needed in Fremont, Orland, Jimmerson Lake, Lake George, Hamilton Lake, and Lake James DHS District 3 snow levels NOAA weather radios in all critical facilities County Communications Facility	EMA MRBC	Existing budget FEMA USGS MRBC
Geographic Information Systems <ul style="list-style-type: none"> ▪ Increase GIS usage between municipal agencies/offices and create one centralized system. ▪ Update HAZUS-MH Earthquake model to include local soils data, structure values, etc. to accurately predict damages and losses to Steuben County. 	<input checked="" type="checkbox"/> Prevention <input checked="" type="checkbox"/> Property Protection <input checked="" type="checkbox"/> Nat. Res. Protection <input checked="" type="checkbox"/> Emergency Services <input type="checkbox"/> Structural Control <input checked="" type="checkbox"/> Public Information	<input checked="" type="checkbox"/> Dam Failure <input checked="" type="checkbox"/> Earthquake <input checked="" type="checkbox"/> Flooding <input checked="" type="checkbox"/> Hail, Thunder, Wind <input checked="" type="checkbox"/> Hazardous Materials <input checked="" type="checkbox"/> Severe Winter Storm <input checked="" type="checkbox"/> Tornado	Ongoing – Steuben County GIS maintains layers used for planning Proposed Enhancement – Layers made more accessible to NFIP communities. Update with critical facility information	High Low <i>(earthquake model)</i>	Medium	Countywide	GIS Department	Existing budget FEMA

5.0 IMPLEMENTATION PLAN

The following is a proposed plan for implementing all high priority mitigation practices identified in this Plan. It should be noted that implementation of each of these proposed practices may involved several preparatory or intermediary steps. However, to maintain clarity, not all preparatory or intermediary steps are included.

Safe Rooms

Require safe rooms in vulnerable locations such as Critical Facilities, mobile home parks, communities without basements, areas where large populations gather, and public buildings.

- A. Inventory and prioritize areas in need of safe rooms.
- B. Pursue opportunities to provide assistance and/or incentive to existing facilities without safe rooms.
- C. Provide informational materials to facilities regarding the importance of safe rooms.

Management of High Hazard Dam

Failure or misoperation of a high hazard dam could result in significant losses for downstream communities. An Emergency Action Plan (EAP) is a very good planning tool to understand and mitigate the impact that a dam failure could have on people and property.

- A. Encourage dam owners to conduct a detailed study to determine the dam failure inundation area downstream of the Lake George and the Hamilton Lake Dams.
- B. Identify the communities, critical facilities, and non-critical facilities within the dam failure inundation area and determine potential damages associated with a dam failure through inundation mapping.
- C. Research and compile emergency contact information of local officials responding to a dam failure and protocol for dissemination of information to those potentially affected by a dam failure.
- D. Develop detailed dam failure response procedures and an evacuation plan and provide to local officials.
- E. Develop public education materials for those that live or work downstream of the Lake George Dam and the Hamilton Lake Dam of the potential risk and options to protect themselves or their property from damages.
- F. Summarize information gathered and developed into an EAP.
- G. Conduct annual informational updates, realistic exercises, or table top exercises of the EAP/ERP.

Building Protection

Prohibit construction of new critical facilities in known hazard areas such as the 100-year & 500-year floodplains and dam failure inundation areas.

- A. As Flood Insurance Study (FISs) are completed, provide information to Planning and Building Department to utilize in plan review.
- B. Develop and propose language to amend existing ordinances to prohibit construction of new critical facilities in known hazard areas.

Ensure that mobile homes are anchored to meet the State of Indiana's minimum installation standards.

- A. Ensure that staff are available and properly trained to perform and enforce installation inspections.
- B. Develop procedural protocols for enforcement of installation standards and make available to all current residents and owners of mobile home facilities, as well as new residents moving into Steuben County.

Public Education & Outreach

Continue participation in community events and outreach opportunities.

- A. Develop, maintain, and distribute hazard preparedness literature for all public facilities and community events.
- B. Continue to participate in community events
- C. Provide a multi-media outreach campaign for the potentials hazards in Steuben County and the proper response actions for residents and visitors if a hazard were to occur.
- D. Provide post disaster information relevant to safety and health concerns as residents re-enter affected areas.

Become certified as a StormReady Community

- A. Review requirements to become certified.
- B. Complete application process.
- C. Once certified, prepare education and outreach efforts to make the communities aware.

Hazardous Materials Response Team

Continue training and realistic exercise for emergency personnel.

- A. Identify types of training needed, venues, and personnel in need of training.
- B. Ensure exercises are realistic and comprehensive.
- C. Complete post exercise debriefing and review.

Emergency Operations Center

Establish a dedicated EOC

- A. Determine needs assessment for Emergency Operation Center (EOC) location and equipment.
- B. Pursue and secure funding for establishment of an EOC.
- C. Utilize EOC during hazardous events.
- D. Continue to update technologies and capabilities as funding is available.

Flooding/Floodplain Management

Prioritize and conduct detailed studies of "Approximate Study" (A-Zone) streams

- A. Identify and prioritize understudied streams for incorporation into FIRM/FIS restudy.
- B. Establish a template for these studies and distribute to developers to ensure a consistency from reach to reach.
- C. Conduct detailed studies.

Update Flood Insurance Rate Maps (FIRMs)

- A. Continue to provide support for the updated FIRM/FIS restudy to be completed in 2008.
- B. Adopt FIRM/FIS
- C. Dedicate annual funding to complete post FIRM floodplain studies after the FIS study according to FEMA.

Provide the opportunity for staff members to become a Certified Floodplain Manager (CFM).

- A. Initiate research to determine requirements for eligibility for certification.
- B. Develop listing of current staff members interested in the certification.
- C. Provide training and opportunities for certification.

Encourage the City of Angola to adopt the optional provisions of the State of Indiana Model Floodplain Ordinance language or a more restrictive standard.

- A. Review optional provisions and determine suitability.

- B. Incorporate provisional language into existing Floodplain Ordinance or consider language that is more restrictive.
- C. Adopt and enforce the updated Floodplain Ordinance.

Continue to maintain waterways and regulated drains to prevent localized flooding.

- A. Prioritize waterways and regulated drains requiring maintenance.
- B. Develop protocol for responding to complaints or investigations.
- C. Pursue and secure funding mechanism for maintenance.
- D. Institute a program to inspect and maintain regulated drains and waterways.
- E. Prepare and complete bidding/sub-contractual process.

Emergency Warning Systems

Install outdoor warning sirens where pockets of development are not covered.

- A. Prepare listing of all critical facilities currently not covered by outdoor warning sirens.
- B. Prioritize uncovered areas for future outdoor warning protection.
- C. Research various outdoor warning system funding mechanisms.
- D. Submit proposal to purchase/maintain appropriate warning systems.

Assure consistent tiered levels of snow emergencies/advisories are adopted within the County and Indiana Department of Homeland Security (IDHS) District 3.

- A. Develop protocols regarding specific situations in which snow emergencies are to be declared and distribute to all municipalities and local governmental agencies responsible for emergency response.
- B. Develop snow emergency routes for those areas to be cleared first, second, etc.
- C. Develop public outreach and educational component to inform residents and visitors of what conditions will prompt activation of snow emergencies and where to turn for more detailed information.
- D. Propose DHS District 3 protocol to ensure consistency among Counties and Municipalities within the District.

Designate and enforce snow routes to allow for snow removal.

- A. Review existing protocol for snow removal within NFIP Communities and Steuben County.
- B. Review neighboring communities' protocol for snow removal.
- C. Propose and adopt designated snow routes prioritized for snow removal.
- D. Install appropriate signage and information residents of snow routes, prioritization, and enforcement actions.

Encourage placement of weather alert radios in all Critical Facilities

- A. Provide outreach and education regarding the importance of weather alert radios in Critical Facilities.
- B. Provide training similar to the fire extinguisher training for proper use of weather alert radios.
- C. Pursue funding opportunities to provide critical facilities with weather alert radios.

Maintain and increase flood forecasting capabilities such as gaging stations, flood alerts, etc.

- A. Initiate research to determine various flood forecasting methods.
- B. Prioritize areas in need of real-time gaging stations.
- C. Partner with the United States Geological Survey (USGS) to determine funding opportunities for installation and maintenance of real time stream gaging stations.

- D. Integrate GIS information to determine areas at risk for various storm events and flood levels.

Geographic Information Systems

Increase GIS usage between municipal agencies/offices and create one centralized system.

- A. Develop portal with varied levels of access for agencies and County offices.
- B. Provide opportunities for appropriate staff members to become familiar with GIS.
- C. Update GIS information as new information becomes available for Steuben County.
- D. Utilize GIS to predict potential outcomes of various hazard situations within vulnerable communities.

6.0 PLAN MAINTENANCE PROCEDURES

6.1 MAINTENANCE PROCESS

Throughout the 5-year planning cycle, the Steuben County Emergency Management Agency (EMA) will reconvene the Multi-Hazard Mitigation Plan (MHMP) Planning Committee on an annual basis in order to monitor, evaluate, and update the Plan as needed. Members of the Planning Committee are readily available to engage in meet between annual meetings. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual National Floodplain Insurance Program (NFIP) communities or through local partnerships.

This is the first MHMP that Steuben County and the NFIP communities have prepared. The data used to prepare the Steuben County MHMP was based on “best available data” or data that was readily available during the development of this Plan. Because of this, there are limitations to the data. As more accurate data becomes available, updates should be made to the risk assessment and vulnerability analysis.

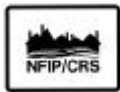
6.2 INCOPRORATION INTO EXISTING PLANS

Many of the mitigation projects identified as part of this planning process are on going with some enhancement needed. Where needed, modifications will be made to NFIP communities’ planning documents and ordinances during the regularly scheduled update. Among other things, local planning documents and ordinances may include comprehensive plans, floodplain management plans, capital improvement plans, zoning ordinances, building codes, site development regulations or permits.

6.3 CONTINUED PUBLIC INVOLVEMENT

Continued public involvement is critical to the successful implementation of the Steuben County 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 the focus of the annual Severe Weather Awareness Week as well as incorporated into existing stormwater planning, land use planning, and special projects/studies efforts. Once adopted, a copy of this Plan will be available for the public to review in the Steuben County EMA Office.

Updates or modifications to the Steuben County MHMP during the 5-year planning process will require a public notice and/or meeting prior to submitting revisions to the individual jurisdictions for approval.



The Community Rating System (CRS) program credits NFIP communities a maximum of 37 points for adopting the Plan; establishing a procedure for implementation, review, and updating the Plan; and submitting an annual evaluation report.

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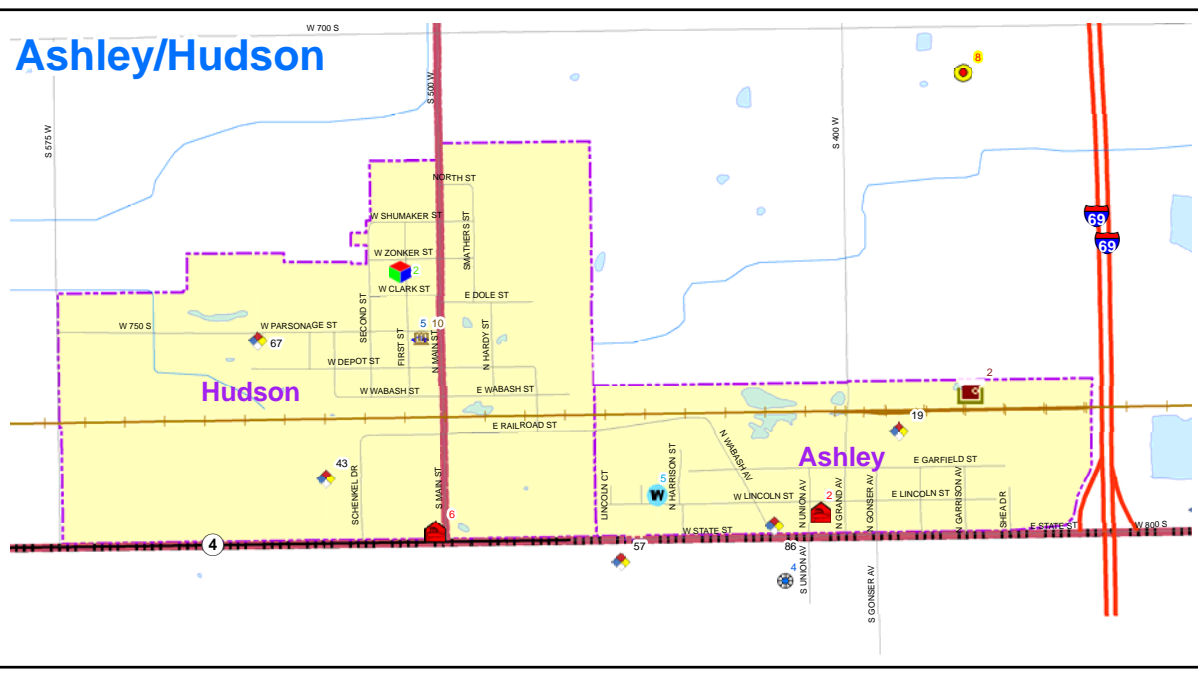
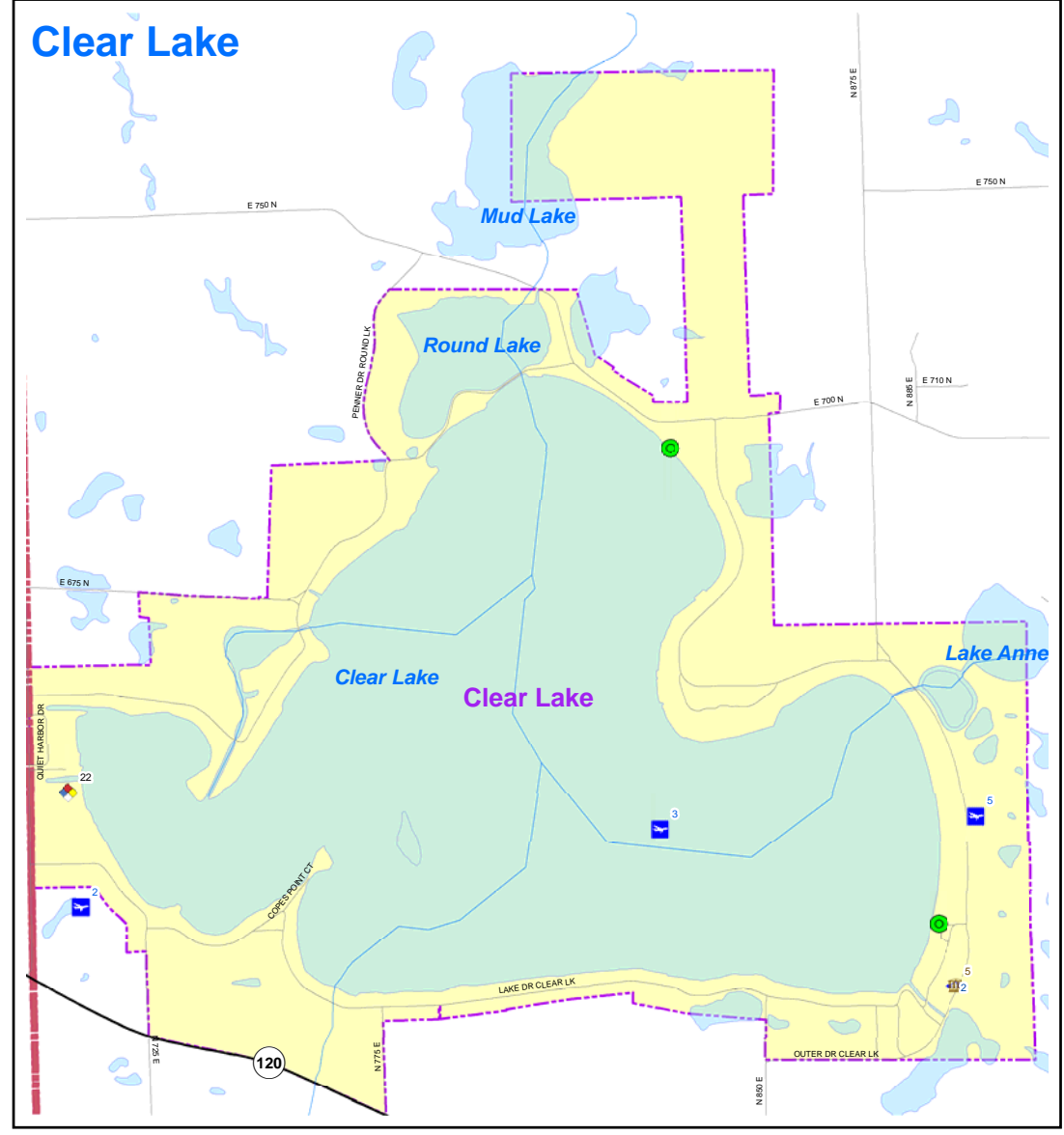
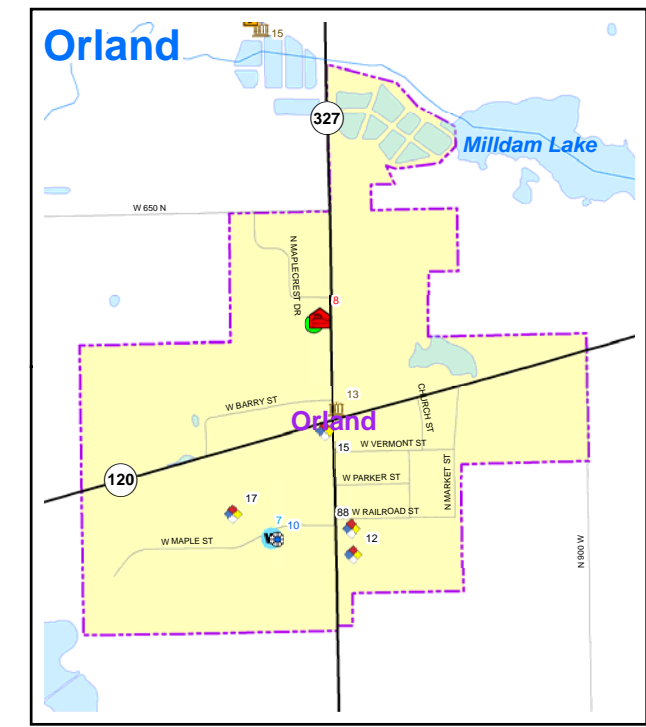
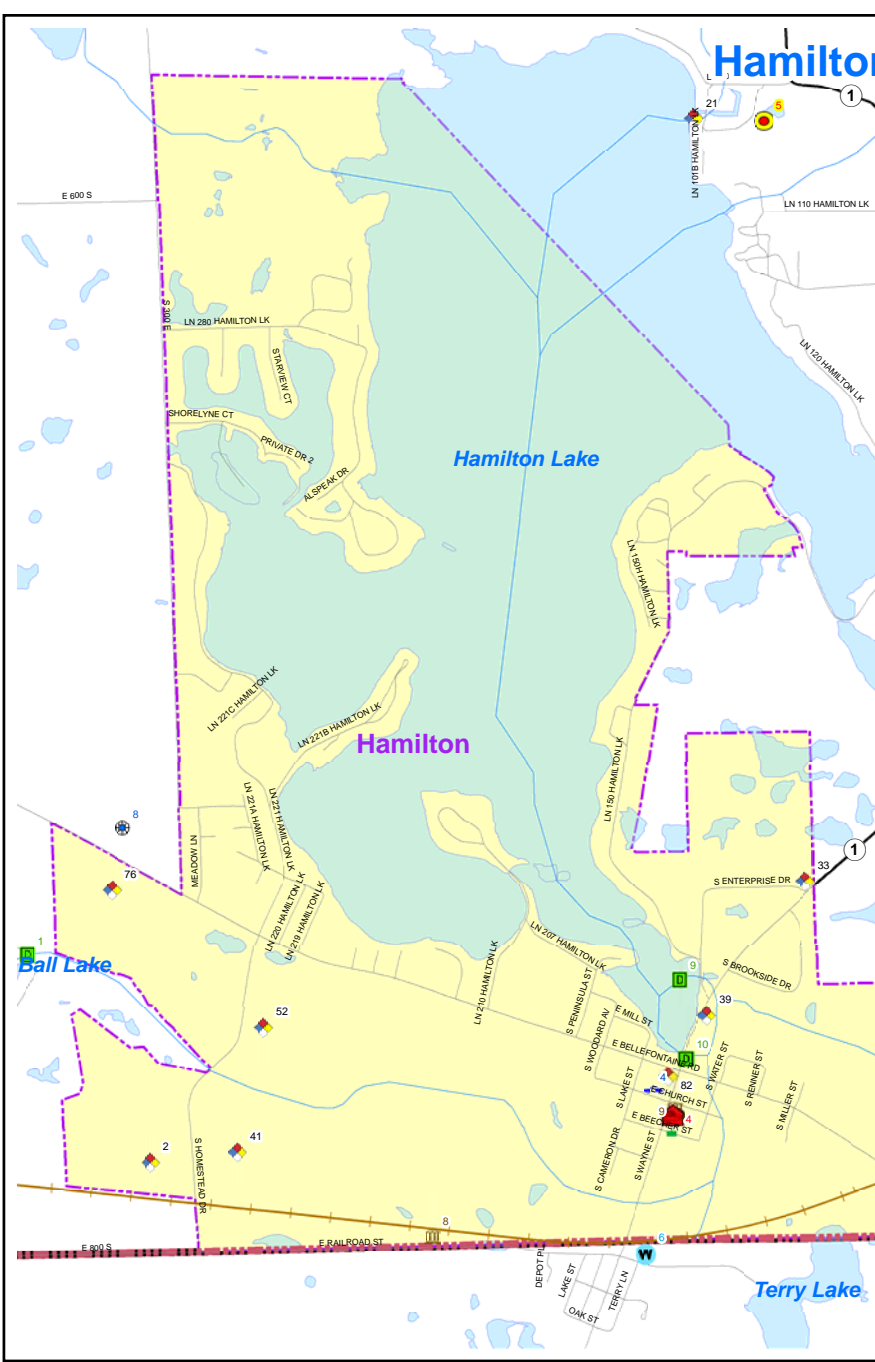
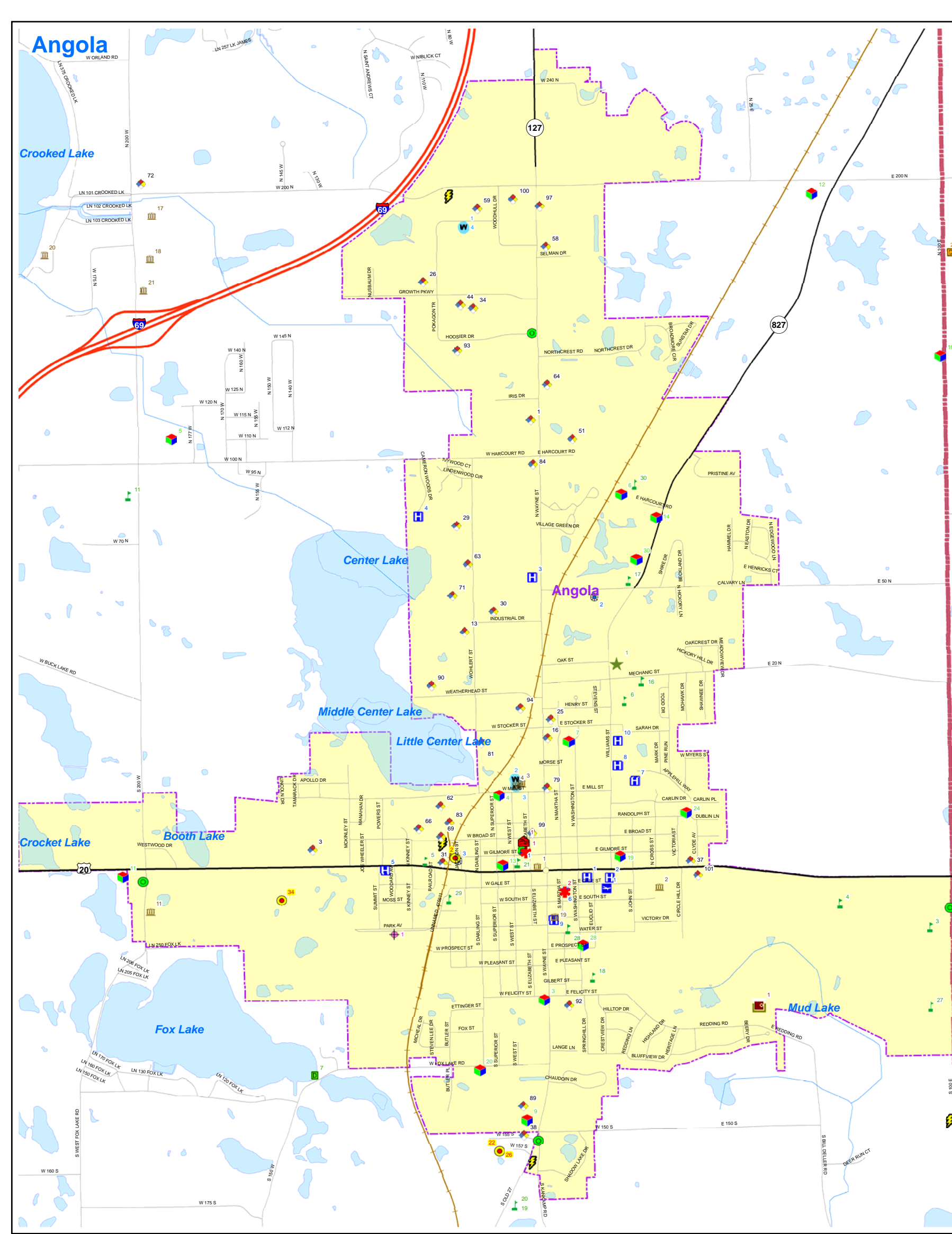
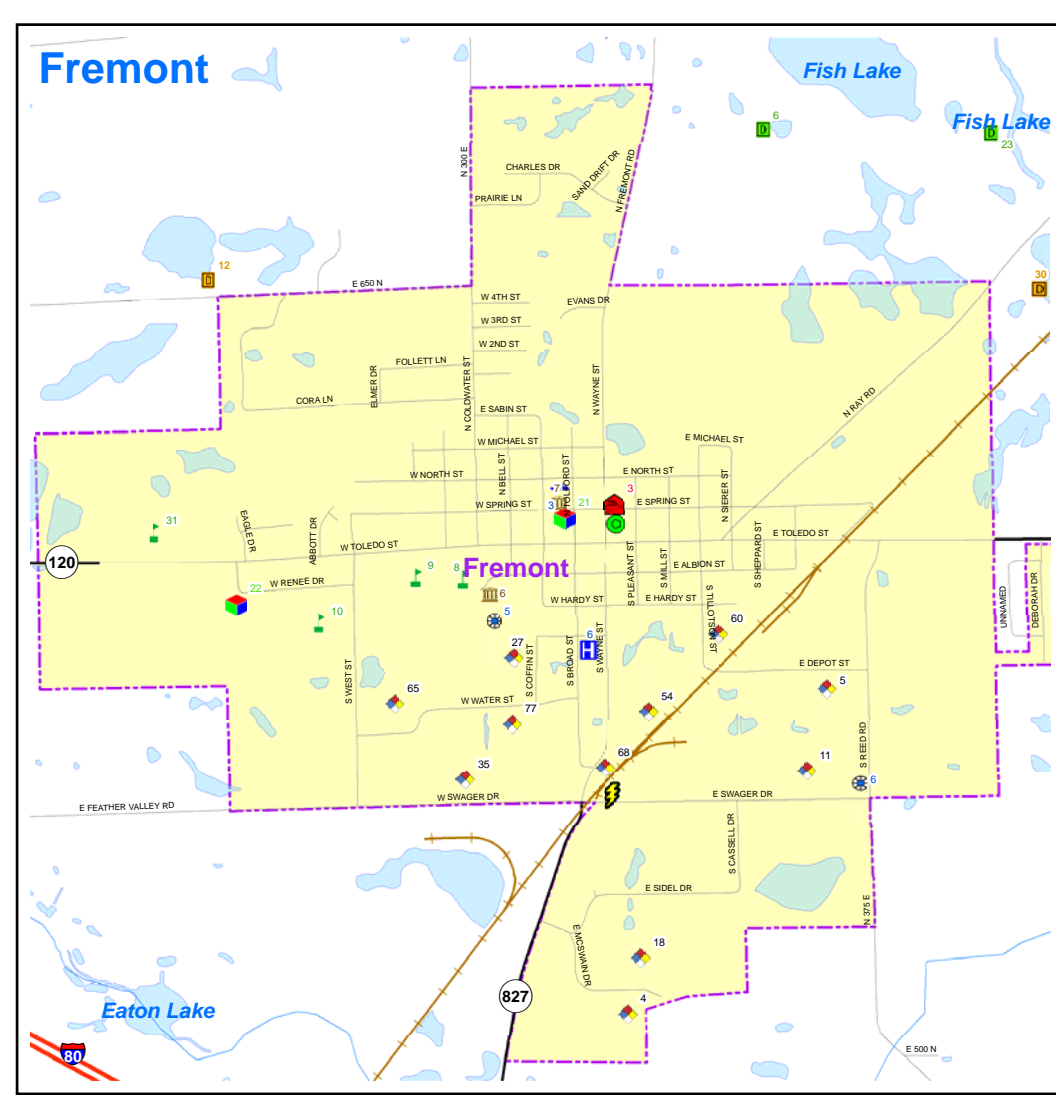
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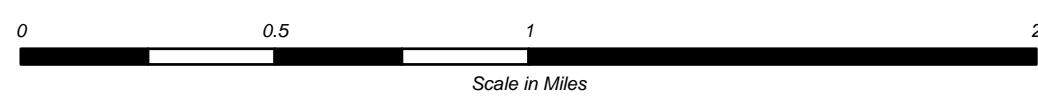


Critical Facilities

Stauben County, Indiana

- Airports**
- 1 Cameron Hospital Helipad
- 2 Clear Lake Helipad
- 3 Clear Lake Seaplane Base
- 4 Crooked Lake Seaplane Base
- 5 East Clear Lake Helipad
- 6 Lake James Seaplane Base
- 7 Lake Pleasant Seaplane Base
- 8 To-Go Steuben County
- Cell Towers**
- 1 1700 W 700 North Ln
- 2 109 Jackson Blvd
- 3 2200 W 82nd St
- 4 197 N 100A Hamilton Lk
- 5 4800 W Grand Blvd
- 6 6300 CR 4
- 7 405 W Foster Valley Rd
- 8 9005 W 50 N
- 9 1145 N 800 W
- 10 152 N Old State Hwy 1
- 11 2000 W 800 S
- 12 3300 S 300 W
- 13 845 W 27th N
- 14 7715 E 300 N
- 15 5800 N 50 W
- 16 7700 N 400 E
- 17 2000 S Greenleaf Road
- 18 705 W 100 S
- 19 595 N 100 E
- 20 2117 E 300 N
- 21 705 W 155 S
- 22 705 W 155 S
- 23 705 W 155 S
- 24 717 E 300 N
- 25 705 W 155 S
- 26 5015 E 580 North
- 27 100 N OLD STATE HWY 1
- 28 1400 W MAUMEE ST
- 29 7700 W 700 N
- 30 7700 S. STATE RD
- Communication Facilities**
- 1 WALK Radio
- 2 WALK Radio
- County Dams**
- 1 Little Lake
- 2 Cedar Swamp Control Dam
- 3 County Dam 1
- 4 County Dam 2
- 5 County Dam 3
- 6 County Dam 4
- 7 County Dam 5
- 8 County Dam 6
- 9 County Dam 7
- 10 County Dam 8
- 11 County Dam 9
- 12 Dam Spring Head
- 13 Ellettsville Dam
- 14 State Fish Hatchery Dam
- 15 Clear Lake
- 16 Clear Lake
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- Emergency Operations Centers**
- 1 Angola TTY Unit Emergency Services
- 2 Emergency Communications 911
- Fire Stations**
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- Government Facilities**
- 1 ANGLA City Offices
- 2 Angola Park Department
- 3 Angola Police Department
- 4 Angola Police Department
- 5 Clear Lake Office
- 6 Fremont Street Department
- 7 Fremont Street Court
- 8 Hamilton Street Department
- 9 Hamilton Street Office
- 10 Hamilton Street Fire Station
- 11 INDOT Office
- 12 INDOT Office Building
- 13 Orland City
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- Water Towers**
- 1 Angelo 300 T
- 2 Angelo Community Lk
- 3 Angelo Water Tower
- 4 Angelo Water Tower
- 5 Angelo Water Tower
- 6 Angelo Water Tower #2
- 7 Hamilton Water Tower #1
- 8 Hamilton Water Tower #2
- 9 Hamilton Water Tower #3
- 10 Orland Water Tower

Sources of Data:
 1. Facility Data adapted from HAZUS (FEMA, 2002), with input from Steering Committee, and edited by CBEL and Steuben County GIS Department
 2. Roads, Railroads, Lakes and Political Boundaries from Steuben County GIS Department, 2006
 3. Streams from USGS National Hydrography Dataset, 2006



CHRISTOPHER B. BURKE ENGINEERING, LTD.
 National City Center, Suite 1368 South
 115 West Washington Street
 Indianapolis, Indiana 46204
 (tel) 317.266.8000 (fax) 317.632.3306

PROJECT: **Steuben County, Indiana Multi-Hazard Mitigation Plan**

TITLE: **Critical Facilities Municipalities in Steuben County**

PROJECT NO: **05-0514**

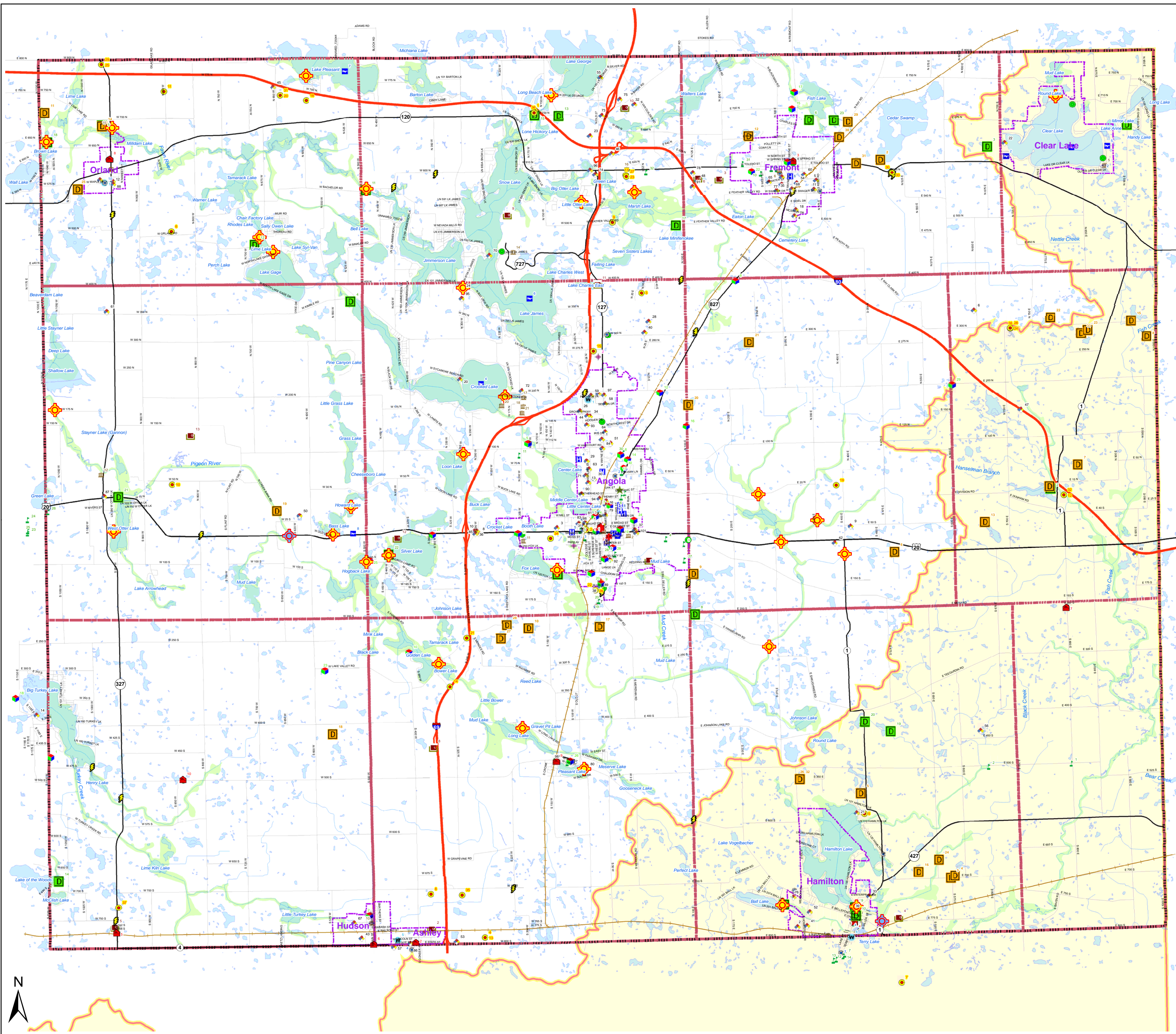
APPROX. SCALE: **1" = 2000'**

DATE: **03/08**

EXHIBIT: **1a**

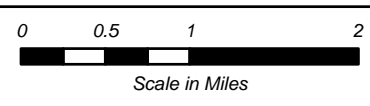
Flood Zones, USGS Stream Gages & Dams

Steuben County, Indiana



- USGS Stream Gage (Inactive)
- USGS Stream Gage (Active)
- Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Unnumbered Zone A Floodplain
- MRBC 8-Digit HUC Boundary
- Airport/Heliport
- Cell Tower
- Communication Facility
- Dams - County
- Dams - IDNR
- Day Care Facility
- Emergency Operation Center
- Fire Station
- Government Facility
- Hazardous Material Handler
- Medical Facility
- Military Installation
- Law Enforcement Facility
- Water Tower
- Potable Water Facility
- School
- Warning Siren
- Utility SubStation
- Wastewater Treatment Plant
- Townships

Sources of Data:
 1. Facility Data adapted from HAZUS (FEMA, 2002), with input from Steering Committee, and edited by CBCEI and Steuben County GIS Department
 2. Roads, Railroads, Lakes and Political Boundaries from Steuben County GIS Department, 2006
 3. Streams from USGS National Hydrography Dataset, 2006
 4. Flood Zones from FEMA, Preliminary DFIRM, 2004
 5. Stream Gages from USGS, 2006

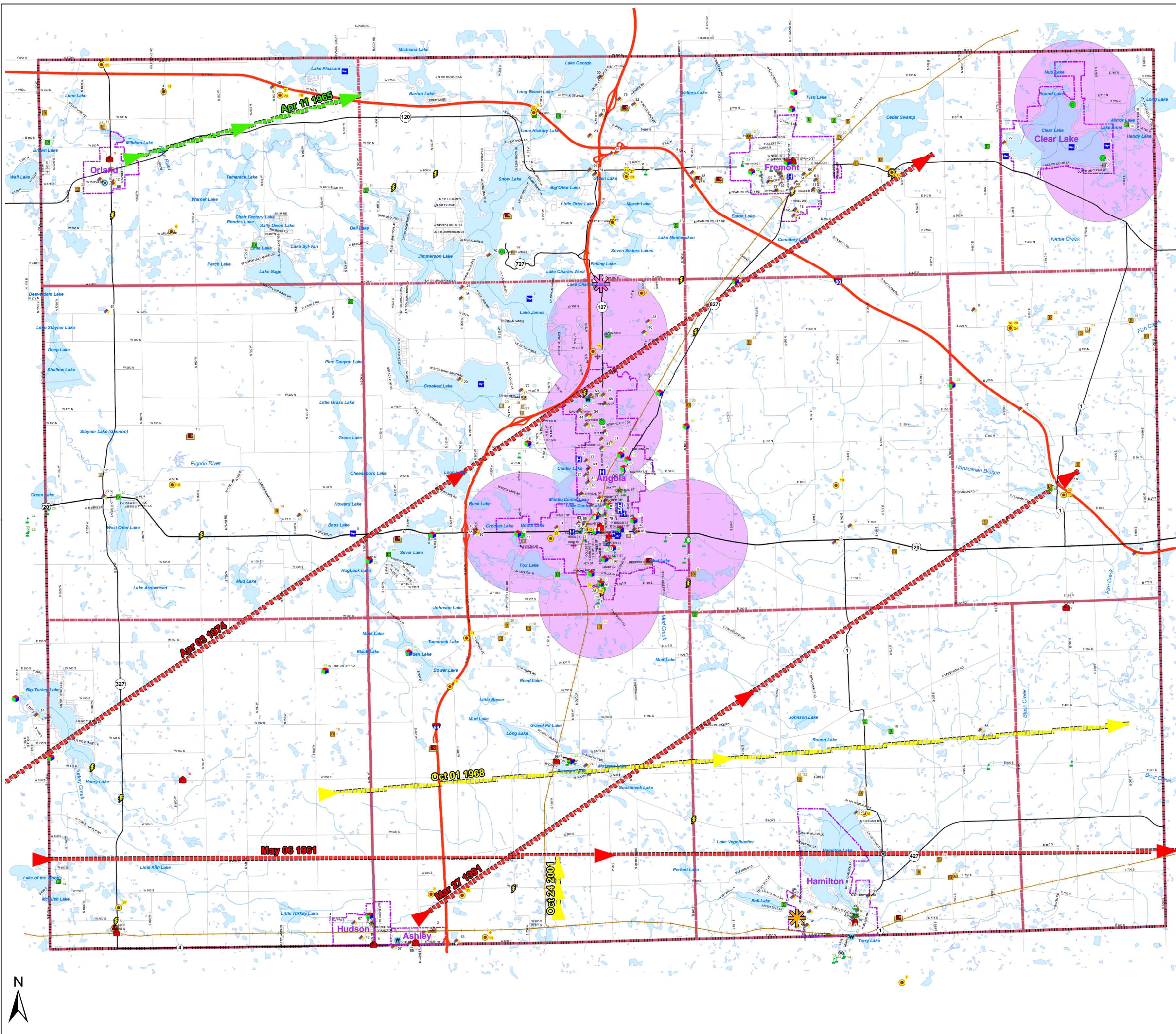


CB CHRISTOPHER B. BURKE ENGINEERING, LTD.
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 115 West Washington Street
 Indianapolis, Indiana 46204
 (tel) 317.266.8000 (fax) 317.632.3306

PROJECT: Steuben County, Indiana Multi-Hazard Mitigation Plan	PROJECT NO.: 05-0514	APPROX. SCALE: 1" = 6000'
TITLE: Flood Zones, USGS Stream Gages & Dams	DATE: 03/08	EXHIBIT: 2

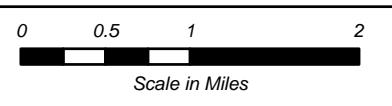
Historic Tornado Activity

Steuben County, Indiana



- F1 Magnitude
- F2 Magnitude
- Airport/Heliport
- Cell Tower
- Communication Facility
- Dams - County
- Dams - IDNR
- Day Care Facility
- Emergency Operation Center
- Fire Station
- Government Facility
- Hazardous Material Handler
- Medical Facility
- Military Installation
- Law Enforcement Facility
- Water Tower
- Potable Water Facility
- School
- Warning Siren
- Utility SubStation
- Wastewater Treatment Plant
- F0 Magnitude
- F3 Magnitude
- F4 Magnitude
- Townships
- Warning Siren Coverage

Sources of Data:
 1. Facility Data adapted from HAZUS (FEMA, 2002), with input from Steering Committee, and edited by CB&E and Steuben County GIS Department
 2. Roads, Railroads, Lakes and Political Boundaries from Steuben County GIS Department, 2006
 3. Streams from USGS National Hydrography Dataset, 2006
 4. Tornado Data from National Climatic Data Center, 2006

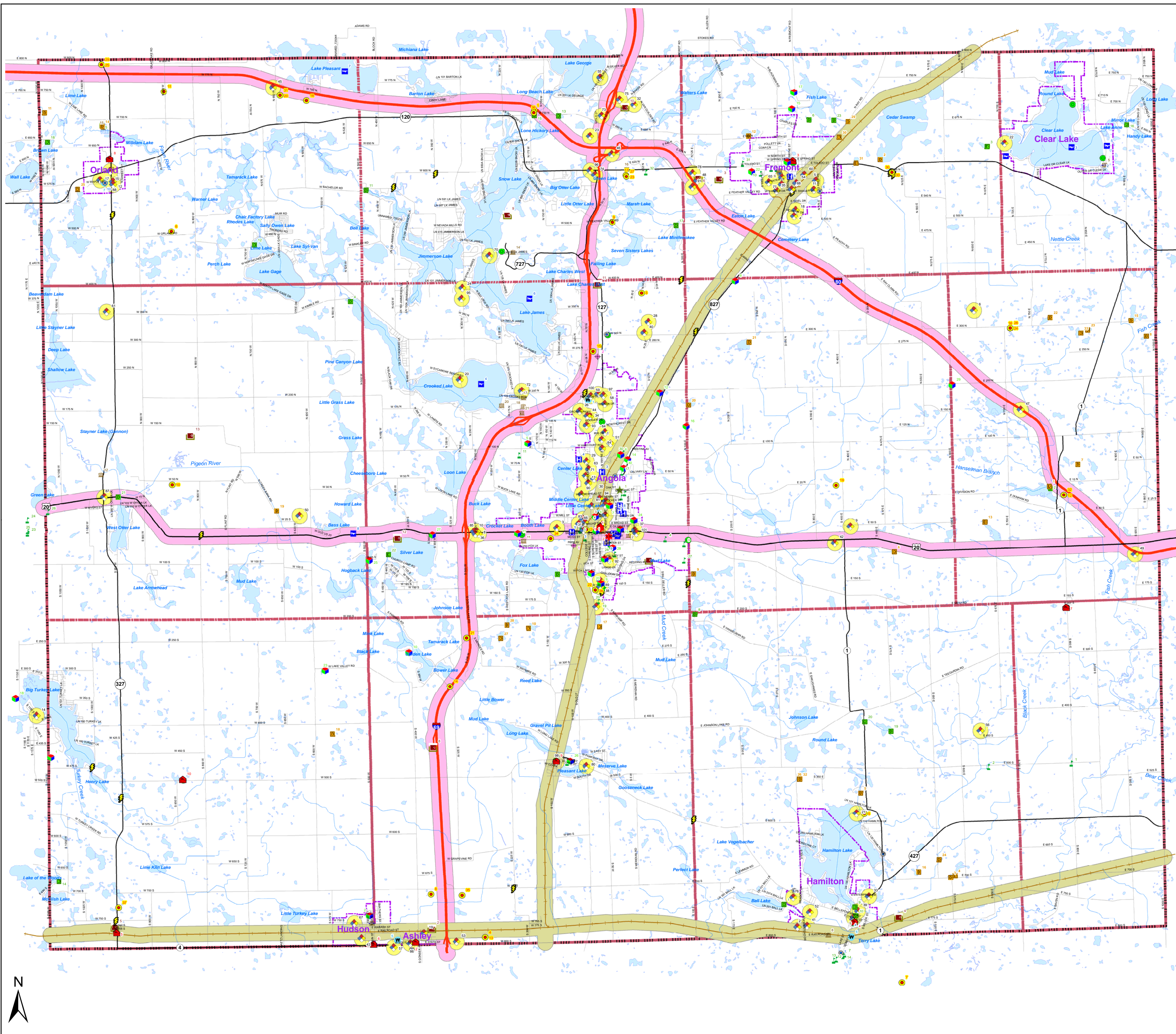


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PROJECT: Steuben County, Indiana Multi-Hazard Mitigation Plan	PROJECT NO.: 05-0514	APPROX. SCALE: 1" = 6000'
TITLE: Historic Tornado Activity	DATE: 03/08	EXHIBIT: 3

Major Transportation Routes and Hazardous Materials Handlers with Areas of Impact

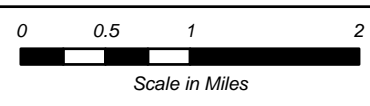
Steuben County, Indiana



ID	Name	Address	City
1	2001 76 Inc (Ctgo Gas Station)	2001 N Wayne St	Angola
2	AAA Galvanizing	7825 S Homestead Dr	Hamilton
3	Aggregate Industries - Angola Plant	1310 West Maumee St	Angola
4	Allegheny Castings	302 E McSwain Dr	Fremont
5	Amcast Automotive	706 E Depot St	Fremont
6	Amerigas-Bruce Moody	3285 N 650 E	Fremont
7	Amerigas Propane LP, Inc.	1870 South Old US Hwy 27	Angola
8	Angola Food Shop	2795 W US Highway 20	Angola
9	Angola LP Gas	4145 E 450 S	Angola
10	Angola Marathon Express	2850 W US Highway 20	Angola
11	Autiform Tool & Manufacturing	605 East Swager Dr	Angola
12	B & F Grain	5820 N State RD 327	Orland
13	Bates Technologies, Inc	1101 Wohrert St	Angola
14	Big Turkey Lake Marina	3855 N 1175 E	Lagrange
15	Bills Orland Marathon	6065 N State RD 327	Orland
16	BP Gas Station	620 N Wayne St	Angola
17	Camshalt Machine Co.	9670 Maple St	Orland
18	Cardinal IG Company	301 East McSwain	Fremont
19	Carper Farm Supply	300 N Grand Av	Ashley
20	Cassidy's Cove Marina	35 LN 345 Crooked LK	Angola
21	Clear Lake Marina	80 LN 101 B Hamilton LK	Hamilton
22	Clear Lake Marina	1210 Lake DR Clear LK	Fremont
23	CON-WAY Central Express	6755 N Old SR 27	Fremont
24	Corner Landing Boat & Tackle	3955 N 300 W	Angola
25	CVS #6494	700 N Wayne St	Angola
26	Datec Industries	319 Pokagon Trail	Angola
27	Deater Auto/Phlips Industries	301 W Pleasant	Angola
28	E & B Paving	260 E 300 N	Angola
29	Epic Technical Group, Inc	1501 Wohrert St	Angola
30	Fish-Gas	300 Industrial Dr	Angola
31	Fast Break	616 W Maumee	Angola
32	FedEx Am. Freightways	7306 N Baker Rd	Fremont
33	Four Corners Phillips 66	7305 S Wayne St	Hamilton
34	FreshNIC	401 Growth Pkwy	Angola
35	Fremont Wire	600 W Swager Dr	Fremont
36	Gas America Services	2855 W US Highway 20	Angola
37	GasAmerica #205	800 Maumee St	Angola
38	H&S Auto Machine Service	610 W 155 S	Angola
39	Hamilton Lake Marin	7580 S Wayne St	Hamilton
40	Hanson Aggregates Midwest Inc	260 E 300 N	Angola
41	Hillsdale Tool - Hamilton Plant	7790 South Homestead Dr	Hamilton
42	Hosier Propane	3825 US Highway 20	Angola
43	Hudson Industries	105 W State RD 4	Hudson
44	HMP Acquisition	400 Growth Pkwy	Angola
45	INDOT - Steuben Maint. Facility	7565 N 650 West	Orland
46	INDOT - Toll RD Angola Toll Plaza	280 W State Rd 120	Fremont
47	INDOT - Toll Road - Eastport Barrier	1550 North 700 East	Angola
48	INDOT - Booth Tarkington Plaza	1235 E State Road 120	Fremont
49	INDOT Toll RD Svc Maint. Storage	1022 S 935 E	Angola
50	Ingraham Gravel Co. Inc	222 S 600 W	Angola
51	ITW Automotive Finishing	1910 N Wayne St	Angola
52	Key Plastics	7540 S Homestead	Hamilton
53	Kirk Trucking	3320 West 800 South	Ashley
54	Lagrange Products	607 S Wayne St	Fremont
55	Lake George Marina	15 LN 130 B LK George	Fremont
56	Landfill		
57	Lime-O-Sol		Ashley
58	Meijer #190 Gas Station	2950 North Wayne St	Angola
59	Meridian Automotive Systems	3000 Woodhull	Angola
60	Messaline	307 S Tidwell St	Fremont
61	Miller Poultry	9622 W 350 N	Orland
62	Moore Wallace & RR Donnelly Co	611 W MILL ST	Angola
63	Moyer Spring Co	1311 Wohrert St	Angola
64	Murphy Oil (Wal-Mart Gas Station)	2018 N Wayne St	Angola
65	New Horizons Baking Company	700 W Water St	Fremont
66	NIPSCO	700 W Broad St	Angola
67	Noil Brothers Oil	W Parsonage St	Hudson
68	North Central Co-Op - Fremont Energy	707 South Wayne St	Fremont
69	North Central Co-Op - Fremont Energy	610 West Broad St	Angola
70	North West Land	515 LN 510 Lake James	Angola
71	Owens Corning	1211 Wohrert St	Angola
72	Patty's Pantry	2040 N 200 W	Angola
73	Pilot Travel Center #029	6900 North Old 27	Fremont
74	Prime Outlet Gas Station	5915 N SR 127	Fremont
75	Quadland Corp	7265 N Baker Rd	Fremont
76	Ralco Packaging Systems	2855 E Bellefontaine	Fremont
77	Rittal Electromate	301 W Water St	Fremont
78	Ryder Transportation Services	1182 East State Road	Fremont
79	S & S Gas Station	500 N Wayne St	Angola
80	S & S Gas Station	4840 S 042 27	Pleasant Lake
81	S & S Oil	635 Wohrert St	Angola
82	S & S Oil Company	3955 E Bellefontaine Rd	Hamilton
83	Sheels LP	610 W Broad St	Angola
84	Shell Spee-D-Mart #202	1811 N Wayne St	Angola
85	Speedway #8336	2820 West US 20	Angola
86	Spirit-United Telephone	225 West State St	Ashley
87	Stalhur's Phillips 66	9740 W US 20	Angola
88	Star Gas Propane LP	5890 N State Road 327	Orland
89	Steuben County REMC	1385 S Old 27	Angola
90	Tenneco Automotive	503 Weatherhead St	Angola
91	Toll Rd James W. Riley SRV Plaza	5800 N 100 E	Fremont
92	Trans Guard	903 S Wayne St	Angola
93	Tyden Biommatl	400 Hooper Drive	Angola
94	Univercal Corp.	203 Weatherhead	Angola
95	Verizon	3745 N 300 W	Angola
96	Verizon	665 W State Rd 120	Fremont
97	Verizon		
98	Verizon - Pleasant Lake	4745 South 150	Pleasant Lake
99	Verizon (Angola)	112 W Broad St	Angola
100	Vestil Manufacturing	2999 North Wayne St	Angola
101	WITel Communication	832 East US 20	Angola

- Railroad Impact Area
- Hazardous Material Handler Impact Area
- Interstate Impact Area
- Airport/Heliport
- Cell Tower
- Communication Facility
- Dams - County
- Dams - IDNR
- Day Care Facility
- Emergency Operation Center
- Fire Station
- Government Facility
- Hazardous Material Handler
- Medical Facility
- Military Installation
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- Potable Water Facility
- School
- Warning Siren
- Utility SubStation
- Wastewater Treatment Plant
- Townships

Sources of Data:
 1. Facility Data adapted from HAZUS (FEMA, 2002), with input from Steering Committee, and edited by CB&E and Steuben County GIS Department
 2. Roads, Railroads, Lakes and Political Boundaries from Steuben County GIS Department, 2006
 3. Streams from USGS National Hydrography Dataset, 2006



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 Indianapolis, Indiana 46204
 (tel) 317.266.8000 (fax) 317.632.3306

PROJECT:	Steuben County, Indiana Multi-Hazard Mitigation Plan	PROJECT NO.:	05-0514	APPROX. SCALE:	1" = 6000'
TITLE:	Major Transportation Routes and Hazardous Materials Handlers with Areas of Impact	DATE:	03/08	EXHIBIT:	4

STEUBEN COUNTY MHMP

APPENDIX 1

Acronyms

STEUBEN COUNTY MHMP LIST OF ACRONYMS

BMP	Best Management Practices
CAA	Clean Air Act
CBBEL	Christopher B. Burke Engineering, Ltd.
CEMP	Comprehensive Emergency Management Plan
CERT	Community Emergency Response Team
CPRI	Calculated Priority Risk Index
CRS	Community Rating System
CTP	Cooperative Technical Partner
DHS	Department of Homeland Security (US)
DOT	Department of Transportation
DMA	Disaster Mitigation Act
EAP	Emergency Action Plan
EAS	Emergency Alert System
EMA	Emergency Management Agency
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERP	Emergency Response Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Act
FSA	Farm Services Agency
GDP	Gross Domestic Product
GIS	Geographic Information System
HAZUS-MH	Hazard US – Multi-Hazard
HMGP	Hazard Mitigation Grant Program
HMRT	Hazardous Materials Response Team
HUC	Hydrologic Unit Code
IDEM	Indiana Department of Environmental Management
IDHS	Indiana Department of Homeland Security
IDNR	Indiana Department of Natural Resources
LEPC	Local Emergency Planning Commission
LQG	Large Quantity Generator
MHMP	Multi-Hazard Mitigation Plan
MPH	Miles Per Hour
MSDS	Material Safety Data Sheet
NCDC	National Climatic Data Center
NGVD	National Geodetic Vertical Datum
NID	National Inventory of Dams
NFIP	National Flood Insurance Program
NOAA	National Oceanic Atmospheric Administration
NWS	National Weather Service
OHMS	Office of Hazardous Materials Safety

OSHA	Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation
RMP	Risk Management Program
SARA	Superfund Amendment Reauthorization Act
SFHA	Special Flood Hazard Area
SWQMP	Storm Water Quality Management Plan
USDA	United States Department of Agriculture
USGS	United States Geological Service
WCT	Wind Chill Temperature



STEUBEN COUNTY MHMP

APPENDIX 2

Planning Committee Agendas and Meeting Summaries

Steuben County Multi-Hazard Mitigation Plan
Planning Committee Meeting

6:00 pm Wednesday, August 16, 2006
Angola Fire Department
202 W. Gilmore Street, Angola

AGENDA

1. Overview of the Multi-Hazard Mitigation Plan (MHMP) Requirements
2. Overview of the MHMP Planning Process and Project Timeline
3. Identify Local Hazards
4. Identify Critical Facilities
5. Schedule Next Planning Committee Meeting

Steuben County Multi-Hazard Mitigation Plan
Planning Committee Meeting

6:00 pm Wednesday, August 16, 2006

Angola Fire Department
202 W. Gilmore Street, Angola

MEETING SUMMARY

Planning Committee Members Present:

Bill Brown, Steuben County EMA
Larry Gilbert, Steuben County Surveyor
Larry Grantham, Town of Hamilton
Dick Hickman, City of Angola Mayor
Chad Hoover, Steuben County GIS
Dan Olis, City of Angola Water Department
Rodney Renkenberger, Maumee River Basin Commission
Charles Smith, Town of Orland Police Department
Ron Smith, Steuben County Commissioner
David Sommerlott, Steuben County Highway Department

Others Present:

Siavash Beik, Christopher B. Burke Engineering, Ltd. (CBBEL)
Rob Berger, Univertical
Sharon Brown, Steuben County EMA
Heather Buck, Christopher Burke Engineering, Ltd. (CBBEL)
John Gonya, Steuben County Sheriff's Department
Mike Lesiak, City of Angola Police Department
Sheila McKinley, Christopher Burke Engineering, Ltd. (CBBEL)
Kevin Mony, City of Angola Fire Department
Bob Stoppenhagen, American Red Cross

1. Overview of the Multi-Hazard Mitigation Plan (MHMP) Requirements

CBBEL staff explained that the Disaster Mitigation Act of 2000 (DMA 2000) requires both the state and local communities to prepare for disasters through pre and post disaster planning. This process reinforces the importance of mitigation planning and the need for communities to plan for a disaster before it occurs in order to reduce the physical, social, and economical impact.

In order for National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP. The development of a MHMP is the necessary first step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in Steuben County. The intent of this planning effort is to identify the hazards, the extent of damage, and to determine what type of mitigation strategies or projects may be undertaken to mitigate for these hazards. The MHMP prepared for Steuben County by CBBEL will meet the requirements of DMA 2000 and eligibility requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation Competitive (PDMC)



Grant, as well as other FEMA programs including the NFIP's Community Ratings System (CRS), however, additional detailed studies will need to be completed prior to applying for these grants or programs.

2. Overview of the MHMP Planning Process and Project Timeline

Planning Committee members introduced themselves. CBBEL staff explained that the MHMP Planning Committee is composed of a diverse group of local leaders and decision-makers. Members of the Planning Committee are knowledgeable about various hazards and/or have tools necessary to reduce the impact of the hazards. These members may include representation from:

- Planning/Community Development
- Engineering
- Red Cross
- Surveyor
- GIS
- Emergency Management
- Public Information/Community Relations
- Public Safety/Police/Fire
- Public Works/Streets/Highway
- Building/Zoning/Code Enforcement
- Parks/Recreation
- Residents/Business Owners/Stakeholders
- NFIP Communities:
 - Steuben County
 - City of Angola
 - Town of Clear Lake
 - Town of Hamilton
 - Town of Hudson

Those members of the Planning Committee present discussed the importance of comprehensive representation and created a list of others who may serve an integral role in the development of the MHMP. Those mentioned will be contacted prior to the next meeting.

A 15 month project timeline was distributed to the Planning Committee. This includes 9 months to prepare a draft MHMP, 3 months for IDHS and FEMA to review and comment, 1 month for local stakeholder review and comment, and 2 months for local adoption. The participation of the Planning Committee will be predominantly from August 2006 through February 2007.

As indicated in the projected timeline, the Planning Committee members will meet in August, October, November, and January. From August through December 2006, CBBEL will research and compile historic hazard data necessary to prepare the MHMP. In December 2006, a media release describing the development of the MHMP will be distributed to local media outlets. In March 2007, CBBEL will provide the draft Steuben County MHMP to the Planning Committee for their review and comment. A public meeting will be scheduled in May 2007 to present the draft Plan to the public and other interested parties. Public comments will be accepted through the end of May 2007 and then the Plan will be forwarded to IDHS and FEMA for their review and comment. Comments from IDHS and FEMA will then be incorporated into the draft Plan and reviewed by the Planning Committee. Local adoption of the MHMP by the Steuben County Commissioners is slated for in October 2007.

3. Identify Local Hazards



CBBEL staff presented a list of hazards that FEMA Region V has identified for potential study. The Planning Committee reviewed the list of hazards and determined which hazards affect Steuben County and which hazards they would like to study in detail as part of this MHMP effort. Additional hazards were added to FEMA's list and considered for detailed study. The Planning Committee agreed to study Dam Failure, Earthquake, Flooding, Ice Storm, Severe Winter Storm, Thunderstorm, Tornado, Windstorm, Hailstorm, Hazardous Materials (storage and transport), and Pipeline Utility Failure in detail as part of this planning effort.

List of Hazards	Hazards with Local Impact	Hazards for Detailed Study
Dam Failure	Yes	Yes
Earthquake	Yes	Yes
Flooding	Yes	Yes
Ice Storm	Yes	Yes
Landslide	No	No
Sever Winter Storm	Yes	Yes
Thunderstorm	Yes	Yes
Tornado	Yes	Yes
Wildfire	No	No
Windstorm	Yes	Yes
Hailstorm	Yes	Yes
<i>Hazardous Materials (storage & transport)</i>	Yes	Yes
<i>Pipeline Utility Failure</i>	Yes	Yes

Note: Hazards shown in bold will be studied in detail. Hazards shown in italics were added by the Planning Committee

4. Identify Critical Facilities

There are **175** critical facilities within Steuben County, further described in the Critical Facilities attachment. FEMA defines critical facilities as:

- Government Facilities (9)– essential services, data & communication, key government complexes
- Essential Facilities (46)– hospitals and other medical facilities, police and fire, emergency operations centers, evacuation shelters, and schools.
- Transportation Systems (13)– airports, highways, railways, and waterways.
- Lifeline Utility Systems (17)– potable water, wastewater, oil, natural gas, electric power, and communication systems.
- High Potential Loss Facilities (38)– nuclear power plants, dams, and military installations.
- Hazardous Material Facilities (52)– storage and/or transport of corrosives, explosives, flammable materials, radioactive materials, and toxins.

Others to consider:

- Local government services
- Vulnerable populations – non-English speaking, very young, elderly, restricted mobility, or incarcerated populations
- Economic elements – major employers or financial centers
- High density residential, commercial, or industrial developments
- Support facilities – grocery, hardware, gas stations
- Historic, cultural, and natural resource areas

Large 24" x 36" maps of critical facilities including emergency facilities, hospitals, schools, power facilities, airports, and dams in Steuben County were presented to the Planning Committee. The locations of these critical facilities came from a national database available through FEMA's HAZUS GIS program and The POLIS Center, and have been verified using aerial photography and local GIS data. The Planning Committee came up with several additions, deletions and corrections to the critical facilities that were identified on the maps.

5. Schedule Next Meeting

The next Planning Committee meeting will be held from 6:00 – 7:30 pm on Wednesday, October 11, 2006 at the City of Angola Fire Department.

Steuben County Multi-Hazard Mitigation Plan
Planning Committee Meeting
6:00 pm Wednesday, March 7, 2007
Steuben County Annex Bldg, Main Floor
205 S Martha Street, Angola

AGENDA

1. Finalize Critical Facilities List/Map
2. Review Historic Hazard Data, Inventory Assets, and Estimated Potential Losses
3. Rank Hazards based on Probability, Magnitude, Warning Time, and Duration of Event
4. Discuss Community Capability Assessment
5. Schedule Next Planning Committee Meeting

Steuben County Multi-Hazard Mitigation Plan
Planning Committee Meeting
6:00 pm Wednesday, March 7, 2007
Steuben County Annex Bldg, Main Floor
205 South Martha Street, Angola

MEETING SUMMARY

Planning Committee Members Present:

Bill Brown, Steuben County EMA
Dick Hickman, City of Angola Mayor
Chad Hoover, Steuben County GIS
Joe Patterson, Town of Hamilton
Rodney Renkenberger, Maumee River Basin Commission
Ron Smith, Steuben County Commissioner
David Sommerlott, Steuben County Highway Department

Others Present:

Rob Berger, Univertical
Sharon Brown, Steuben County EMA
Heather Buck, Christopher Burke Engineering, Ltd. (CBBEL)
John Gonya, Steuben County Sheriff's Department
Sheila McKinley, Christopher B. Burke Engineering, Ltd. (CBBEL)

1. Review of Critical Facilities (updated list and map)

An updated critical facilities map and list were reviewed by the Planning Committee. Changes to the critical facility list from the first committee meeting included the addition of several facilities as well as critical facility re-locations.

2. Review Hazards and Highlights from Research

CBBEL staff presented hazard research on each of the hazards studied in detail as part of this planning effort. The following summarizes this discussion.

Dam Failure

There are 3 dams classified by IDNR as high hazard dams – Hamilton Lake North, Hamilton Lake South, and the Lake George Dam. There have been no reports of a dam failure in Steuben County however failure or misoperation of a dam can pose a threat to structures immediately downstream. Additionally, there were 17 dams identified and located by the Steuben County GIS Department. In an effort to determine potential losses downstream of the Hamilton Lake Dam and Lake George Dam, CBBEL roughly delineated the dam inundation area using a very quick and simplified methodology. This delineation illustrates that there are approximately **5** critical (**\$0.6 M**) and **65** non-critical facilities (**\$4.6 M**) located within the Hamilton County inundation area. There are **3** critical (**\$0.4 M**) and **471** non-critical (**\$33.6 M**) facilities located in the Lake George inundation area.

Earthquakes

No earthquake information specific to Steuben County has been identified, although the possibility exists due to relative proximity to the Fort Wayne Rift Zone. All of the **346** critical facilities and **28,000** non-critical facilities are at risk of earthquake related damages. CBBEL used the GIS-based HAZUS-MH Earthquake Model to estimate losses from a 5.0 earthquake



near Steuben County. HAZUS-MH concluded that **22** buildings will sustain moderate damages, **0** critical facilities would lose functionality and few non-life threatening injuries would be realized. Economic losses for building and business interruption are estimated at **\$530,000** and an additional **\$200,000** in estimated losses for transportation, infrastructure, and utility losses.

Flooding

The National Data Climatic Center (NCDC) lists **7** flood events in Steuben County since January of 1993. The primary sources of flooding are Fawn River, Fish Creek, the Pigeon River, and various tributaries. The total combined damage estimates associated with these flood events resulted in **\$5.0 M** in property damage and **\$10,000** in crop damage. In order to determine potential losses, CBBEL used information provided by the Steuben County GIS Department, aerial photography, and the most recently drafted digital flood insurance rate maps. Using this method, it has been estimated that **20** critical facilities (**\$0.9 M**) and **2,550** non-critical facilities (**\$180.7 M**) are within the 100-year floodplain.

Hailstorm/Thunderstorm/Windstorm

Since 1960, the NCDC has reported **63** thunderstorms/high wind events and **32** of those windstorms had wind speeds in excess of 50 mph. Since 1985, there have been **41** hailstorms, with the largest recorded diameter of 1.75". These storms have resulted in as much as **\$250,000** in total damages for one event. Overall, damages have been estimated at \$644,000 with 8 injuries. All **346** critical and **28,000** non-critical facilities are vulnerable to damages associated with hail/thunder/windstorms.

Hazardous Materials Transport & Storage

According to the Steuben County CEMP there have been 5 significant hazardous materials events. Property damages, injuries, and deaths associated with these events were not reported. A hazardous materials event is most likely to occur where the material is stored or where it may be transported. The Steuben County GIS Department has identified **101** hazardous materials handlers in Steuben County. Thus, major transportation routes are at a higher risk than secondary roads in Steuben County. Within Steuben County Interstates 69 and 80, and US 20, are considered the main transportation routes. All infrastructure and facilities nearby to storage and transportation routes are at risk. All fixed sites who store, utilize in production, or transport hazardous materials or hazardous wastes are at risk for a spill or release of such materials or wastes. Based on a Federal Motor Carrier Safety Administration study, the average cost per hazardous materials incident is **\$0.5 M** and if the incident results in a fire or explosion, the cost can increase to **\$1.2 M** and **\$2.1 M** respectively.

Severe Winter Storms

The NCDC has documented **12** heavy snow storms, **3** ice storms, and **5** winter storms since February 1993 that have affected Steuben County. A severe winter storm could put all **346** critical facilities and **28,000** non-critical facilities at risk for related damages, close major transportation corridors, and cause residents, employees, and visitors to Steuben County to become stranded. The December 2004 snow storm caused three deaths and approximately \$3 million in damages statewide. Previous winter storms have shut down all economic activity in large regions for as long as 7-13 days.

Tornado

The NCDC has documented **12** tornadoes in Steuben County since May 1961. Of these tornadoes, 3 are classified as F0 (weak with light damage), 3 as F1 (weak with moderate damage), 2 as F2 (strong with considerable damage), 3 as F3 (strong with severe damage), and 1 as F4 (violent with devastating damage). All tornadoes in Steuben County have produced a

reported **\$37.6 M** in property damages. To estimate potential losses, CBBEL overlaid a hypothetical tornado (F2, 600-yd wide and nearly 7.5 miles in length) path through the City of Angola and neighboring portions of Steuben County. It was estimated that damages to **25** critical facilities (**\$2.7 M**) and **697** non-critical facilities (**\$51.3 M**) could be realized.

3. Calculated Priority Risk Index

The Planning Committee prioritized these hazards in terms of importance and potential for disruption to the community using the Calculated Priority Risk Index (CPRI). The CPRI value can be obtained by assigning varying degrees of risk to four categories (probability, magnitude/severity, warning time, and duration) for each hazard, and then calculating an index value based on a weighting scheme. The following is how the index values are weighted and the CPRI value is calculated: $CPRI = Probability \times 0.45 + Magnitude/Severity \times 0.30 + Warning\ Time \times 0.15 + Duration\ of\ Event \times 0.10$

The following table illustrates the combined ranking for the aforementioned hazards in DeKalb County and NFIP communities.

	Probability Unlikely Possible Likely Highly likely	Magnitude/ Severity Negligible Limited Critical Catastrophic	Warning Time > 24 hrs 12-24 hrs 6-12 hrs < 6 hrs	Duration of Event < 6 hrs < 1 day < 1 wk > 1 wk	Combined CPRI
Hazardous Materials	Unlikely – Highly Likely	Negligible - Limited	< 6 hrs	< <1 day	3.26
Flooding	Unlikely – Highly Likely	Negligible – Critical	>24 hrs – 6-12 hrs	< 6 hrs - > 1 wk	2.96
Hail/Thunder/Windstorm	Highly Likely	Limited	< 6 hrs	< 6 hrs	2.96
Tornado	Possible – Highly Likely	Negligible - Catastrophic	<6hrs	< 6hrs	2.59
Severe Winter Storm	Highly Likely	Negligible	6-12 hrs	< 1 wk	2.05
Dam Failure	Unlikely	Negligible - Limited	< 6 - > 24 hrs	> 1 wk	1.86
Earthquake	Unlikely	Negligible – Limited	< 6 hrs	< 1 day	1.45

According to the CPRI exercise, the Planning Committee ranked hazardous materials incidents as the hazard that poses the greatest threat to Steuben County followed by flooding and hail, thunder, and windstorms. Dam failures and earthquakes are the hazards that are least probable to occur within Steuben County.

To further document hazard ranking perceptions within Steuben County, the MHMP Planning Committee was asked to prioritize the same hazards prior to completing the CPRI exercise. The results of the “gut” exercise followed closely to CPRI results. The Committee felt that tornado would be the primary hazard with hail, thunder, and windstorms second, followed by hazardous materials as the third priority.

4. Discuss the Community Capability Assessment

CBBEL explained that the Community Capability Assessment (CCA) is a review of existing programs, policies, and projects in each of the NFIP communities in Steuben County. Committee members who do not submit their CCA electronically will be contacted prior to the next Planning Committee meeting to discuss the measures taken by their representative offices and/or individual communities to reduce the risk associated with the studied hazards. The Community Capability Assessment is the foundation for the mitigation practices proposed as part of this planning effort.

5. Schedule Next Planning Committee Meeting

The next Planning Committee meeting will be held on Wednesday, April 11, 2007, at the Steuben County Annex Building, Main floor meeting room to begin at 6:00 pm.

Steuben County Multi-Hazard Mitigation Plan
Planning Committee Meeting

6:00 pm Wednesday, April 11, 2007

Steuben County Annex Building, Main Floor Meeting Room
205 S Martha Street, Angola

AGENDA

1. Discuss completed sections of DRAFT MHMP
2. Review Media Release and Distribution of Hazard Survey
3. Identify and Prioritize Proposed Mitigation Practices
4. Schedule Next Planning Committee Meeting

Steuben County Multi-Hazard Mitigation Plan
PLANNING COMMITTEE MEETING

6:00 pm Wednesday, April 11, 2007
Steuben County Annex Building, Main Flood Meeting Room
205 S. Martha St., Angola

MEETING SUMMARY

Planning Committee Members Present:

Jason Arney for Kathrine MacAulay, Northeast Indiana Red Cross
Bill Brown, Steuben County EMA
Sharon Brown, Steuben County EMA
Rodney Renkenberger, MRBC

Others Present:

Siavash Beik, Christopher Burke Engineering, Ltd. (CBBEL)
Sheila McKinley, Christopher B. Burke Engineering, Ltd. (CBBEL)

1. Discuss Completed Sections of DRAFT MHMP

Two completed sections of the DRAFT MHMP (Section 1: Introduction and Section 2: Community Information) have been posted on CBBEL's ftp site for the Planning Committee to review. CBBEL staff anticipates having Section 3: Risk Assessment and Section 4: Mitigation Goals & Practices ready for review by the next Planning Committee meeting. A full DRAFT MHMP should be available to the Planning Committee early July. Instructions for accessing the documents were provided to those in attendance.

2. Review Media Release and Distribution of Hazard Survey

The Planning Committee reviewed a media release intended for The Herald-Republic to be released immediately. The Hazard Survey was also discussed and approved as is by the Planning Committee. CBBEL offered to email the Hazard Survey to the Planning Committee for them to distribute to colleagues and the general public. Completed surveys are to be sent to Rodney Renkenberger for CBBEL to include in the MHMP.

3. Identify and Prioritize Proposed Mitigation Practices

The Planning Committee participated in an exercise to identify and prioritize mitigation practices to mitigate the social, physical, and economic impacts from flooding, dam failure, hailstorm/thunderstorm/windstorm/tornado, severe winter storm/ice, hazardous materials, and earthquake. Many of the mitigation practices identified are on-going and would benefit from continued support or additional resources. Each mitigation practice was discussed and evaluated based on its overall priority. Projects identified by the MHMP Planning Committee to be of "high" local priority should be implemented within 5 years from final Plan adoption. Projects identified to be of "medium" local priority may be implemented within 5-10 years from final Plan adoption, and projects identified by the Planning Committee to be of "low" local priority may be implemented within 10+ years from final Plan adoptions. The successful implementation of these projects is dependent on grant opportunities and available fiscal



resources. Implementation of high priority projects will be discussed at the next Planning Committee meeting. The following is a summary of mitigation practices discussed.

FLOODING

Priority	Proposed Mitigation Project
HIGH	<p>Prioritize and conduct detailed studies of “Approximate Study” (A-Zone) streams</p> <ul style="list-style-type: none"> • <i>Streams where flood elevations have not been determined and the floodway, 100-year, and 500-year floodplain boundaries have not been delineated</i> • <i>Fish Creek only studied waterway in County</i> • <i>Surveyor and MRBC responsible for implementation</i>
MEDIUM	<p>Participate in the Community Ratings System (CRS) program</p> <ul style="list-style-type: none"> • <i>Program allows for flood insurance premium reductions for National Insurance Flood Program (NFIP) communities that go above and beyond federal minimums</i> • <i>Steuben County, City of Angola, Town of Clear Lake, Town of Hamilton, Town of Hudson, and Town of Orland eligible to participate</i> • <i>270 flood insurance premiums (234 County, 20 Hudson, 12 Angola, and 4 Hudson)</i> • <i>Floodplain Administrators (each community) responsible for implementation</i>
LOW	<p>Protect existing Critical Facilities in 100 & 500-year floodplains</p> <ul style="list-style-type: none"> • <i>8 privately owned Critical Facilities (not including 12 dams) in floodplains (3 airports, 3 hazardous material facilities, 1 fish hatchery, and 1 utility substation) in A-Zone</i> • <i>Building owners responsible for implementation</i>
HIGH	<p>Prohibit development of new Critical Facilities in 100 & 500-year floodplains</p> <ul style="list-style-type: none"> • <i>Reduce potential for physical, social, and economic losses by prohibiting development of Critical Facilities in know hazard areas</i> • <i>Planning (each community) responsible for implementation</i>
HIGH	<p>Maintain and increase flood forecasting capabilities (gaging stations, flood alerts, etc.)</p> <ul style="list-style-type: none"> • <i>Current flood forecasting system depends on alerts from NWS, stream gages monitoring, and visual inspection of river and lake levels</i> • <i>2 active stream gages in Steuben County (Fish Creek @ Hamilton and Pigeon Creek @ Angola)</i> • <i>Surveyor, EMA, and MRBC responsible for implementation</i>
HIGH	<p>Update Flood Insurance Rate Maps (FIRMs)</p> <ul style="list-style-type: none"> • <i>New digital FIRMs anticipated through FEMA Map Modernization program in 2008</i> • <i>Planning, Surveyor, and GIS responsible for implementation</i>

- HIGH Provide the opportunity for staff members to become a Certified Floodplain Manager (CFM)
- *Nationally recognized certification for floodplain managers*
 - *Floodplain Administrator responsible for implementation*
- HIGH Encourage City of Angola to adopt the State of Indiana model Comprehensive Floodplain Storage Floodplain Ordinance language
- *Optional language in State Model Floodplain Management Ordinance*
 - *Result in consistency floodplain management throughout County*
 - *City of Angola Floodplain Administrator responsible for implementation*
- MEDIUM Develop a voluntary structure buyout/retrofitting program to include all structures within the 100-year floodplain
- *Possible to adopt/incorporate the existing MRBC buyout/retrofitting program*
 - *8 Critical Facilities and 2547 non-Critical Facilities in A-Zone*
 - *Floodplain Administrator (each community) responsible for implementation*

DAM FAILURE

Priority	Proposed Mitigation Project
-----------------	------------------------------------

- | | |
|--------|---|
| HIGH | Encourage dam owners to prepare an Emergency Action Plan (EAP)/ Emergency Response Plan (ERP) for each High Hazard and Significant Hazard dam |
| | <ul style="list-style-type: none"> • <i>Inspection and maintenance is enforced by IDNR however EAPs and ERPs are not required at this time</i> • <i>Plans identify dam failure inundation zone and emergency response procedures</i> • <i>3 High Hazard dams (Hamilton Lake North, Hamilton Lake South, and Lake George); 3 Significant Hazard dams (Jimmerson Lake, Oberlin Lake, and Oberlin-Ford Lake)</i> • <i>Dam owner responsible for implementation</i> |
| MEDIUM | Protect existing Critical Facilities located in IDNR High Hazard dam failure inundation areas. |
| | <ul style="list-style-type: none"> • <i>Based on rough rule of thumb dam failure inundation mapping: 5 Critical Facilities (2 hazardous material facilities, 1 potable water, 1 fire station, and 1 government building) within the estimated Hamilton Lake North/South dam failure inundation zone</i> • <i>3 Critical Facilities (hazardous material facilities) within the estimated Lake George dam failure inundation zone</i> • <i>Building owner responsible for implementation</i> |
| MEDIUM | Prohibit construction of new Critical Facilities in High Hazard and Significant Hazard dam failure inundation areas |
| | <ul style="list-style-type: none"> • <i>Reduce potential for physical, social, and economic losses by prohibiting development of Critical Facilities in know hazard areas</i> • <i>Planning (each community) responsible for implementation</i> |

- MEDIUM Provide information related to dam failure to property owners within the dam inundation areas
- *People living or working downstream of a High Hazard or Significant Hazard dam maybe unaware of the potential danger if that dam failed*
 - *5 Critical Facilities and 65 non-Critical Facilities in the estimated Hamilton Lake North/South dam failure inundation zones*
 - *3 Critical Facilities and 471 non-Critical Facilities in the estimated Lake George dam failure inundation zone*
 - *Dam owner responsible for implementation*

HAILSTORM / THUNDERSTORM / WINDSTORM / TORNADO

Priority	Proposed Mitigation Project
HIGH	<p>Install outdoor warning sirens where pockets of development are not covered</p> <ul style="list-style-type: none"> • <i>Developed areas of the Town of Fremont, Town of Orland, Jimmerson Lake, Lake George, Hamilton Lake, and Lake James are not adequate covered; the Town of Hudson and Town of Ashley have small ½-mile radius sirens only</i> • <i>Proposal submitted (4th time EMA Director submitted proposal) to purchase and install 10 new 1-mile radius sirens in County (2 in Fremont, 2 in Hamilton, 6 lake areas)</i> • <i>EMA responsible for implementation</i>
MEDIUM	<p>Propose and adopt an ordinance to require developers to pay into an outdoor siren warning fund as part of new development</p> <ul style="list-style-type: none"> • <i>A new fund that would ensure that new sirens are installed where needed and that existing sirens are properly maintained or replaced when needed</i> • <i>EMA responsible for implementation</i>
HIGH	<p>Require safe rooms in mobile home parks, public parks, and communities without basements</p> <ul style="list-style-type: none"> • <i>Create safe places for people to quickly take refuge</i> • <i>48 mobile home parks, 13 campgrounds</i> • <i>The total number of communities without basements is unknown at this time</i> • <i>Planning (each community) responsible for implementation</i>
HIGH	<p>Require safe rooms in Critical Facilities and areas where large populations congregate (baseball fields, seasonal lake communities, etc.)</p> <ul style="list-style-type: none"> • <i>Create safe places for people to quickly take refuge</i> • <i>Planning (each community) responsible for implementation</i>
HIGH	<p>Ensure mobile homes are anchored to meet manufacturers' specifications</p> <ul style="list-style-type: none"> • <i>Anchoring may vary from manufacturer to manufacturer</i> • <i>Planning (each community) responsible for implementation</i>

SEVERE WINTER STORM

Priority	Proposed Mitigation Project
HIGH	Designate and enforce snow routes to allow for snow removal activities <ul style="list-style-type: none">• <i>Allows Highway/Public Works Departments to efficiently move snow from main thoroughfares and emergency access routes without interference from parked vehicles</i>• <i>City of Angola enforces no parking zones for snow removal</i>• <i>Highway/Public Works Department (each community) responsible for implementation</i>
HIGH	Assure consistent tiered level of snow emergencies/advisories are adopted within the County and IDHS District 3 <ul style="list-style-type: none">• <i>Consistent message across neighboring entities allows for coordinated response</i>• <i>Only the City of Angola has adopted a Snow Emergency Ordinance</i>• <i>EMA responsible for implementation</i>

HAZARDOUS MATERIALS

Priority	Proposed Mitigation Project
MEDIUM	Increase number of personnel certified to OSHA III Technician level <ul style="list-style-type: none">• <i>Enhanced level of training for Hazardous Material Response Team (HMRT) personnel to minimize impact of a release and reduce the potential exposure to nearby people, property, and environment.</i>• <i>Currently 50 Level II, 18 Level III</i>• <i>Ideally 40 (4/Fire Department)</i>• <i>EMA and Fire Department (each community) responsible for implementation</i>
MEDIUM	Pursue funding for full-time paid positions and equipment for emergency responders <ul style="list-style-type: none">• <i>Funding for full-time paid staff as well as to purchase and maintain necessary response equipment</i>• <i>All emergency responders volunteer staff except for Angola and Fremont</i>• <i>Fire Department (each community) responsible for implementation</i>
HIGH	Continued training and realistic exercises for emergency personnel <ul style="list-style-type: none">• <i>Realistic training and exercises can improve emergency personnel readiness as well as the success of emergency response and recovery efforts</i>• <i>EMA (via LEPC) responsible for implementation</i>

EARTHQUAKE

Priority	Proposed Mitigation Project
LOW	<p>Update HAZUS – MH Earthquake model to include local soils data, structure values, etc to accurately predict damages and losses to Steuben County</p> <ul style="list-style-type: none">• <i>HAZUS-MH free GIS software available from FEMA but needs local data to produce the best results – unless readily available this could be time-consuming</i>• <i>GIS responsible for implementation</i>

ALL HAZARDS

Priority	Proposed Mitigation Project
HIGH	<p>Encourage placement of weather radios in all Critical Facilities</p> <ul style="list-style-type: none">• <i>Weather alert radios broadcast NWS warnings, watches, forecasts, and post-event information for all types of hazards (natural and manmade) 24 hours a day</i>• <i>NOAA has provided weather radios to all the schools in Steuben County</i>• <i>Several Critical Facilities have weather radios (number unknown)</i>• <i>EMA responsible for implementation</i>
MEDIUM	<p>Promote power back-up generators to all Critical Facilities</p> <ul style="list-style-type: none">• <i>Back-up power generators allow Critical Facilities to remain somewhat functional during a power outage</i>• <i>Several Critical Facilities have back-up generators (number unknown)</i>• <i>EMA has access to 3 mobile power back-up generators</i>• <i>EMA responsible for implementation</i>
MEDIUM	<p>Promote areas of re-development to bury utility lines</p> <ul style="list-style-type: none">• <i>Overhead lines are susceptible to wind, snow, ice</i>• <i>New development is required to bury utility lines (for lines that can be safely buried)</i>• <i>Planning (all communities) responsible for implementation</i>
LOW	<p>Acquire a Reverse 911 warning system</p> <ul style="list-style-type: none">• <i>Reverse 911 is an outbound emergency notification system that utilizes phone lines (cell and land) and GIS to quickly alert people in a precise geographic area or individuals with common characteristics about an emergency situation</i>• <i>EMA responsible for implementation</i>
HIGH	<p>Continue participation in community events and outreach opportunities</p> <ul style="list-style-type: none">• <i>Education of the general public, decision-makers, and community leaders can be very effective to reduce physical, social, and economic losses</i>• <i>All municipal offices and agencies (each community) responsible for implementation</i>

- HIGH Become certified as StormReady Community (County)
- *NWS program that results in improved preparedness, response, and recovery efforts*
 - *EMA responsibility for implementation*
- HIGH Increase GIS usage between municipal agencies/offices and create one centralized system
- *Provides for consistent data throughout County*
 - *GIS responsible for implementation*
- HIGH Establish dedicated Emergency Operations Center (EOC)
- *An EOC is the physical location where law enforcement, fire, public works, medical, communications, etc. come together during an emergency to coordinate response and recovery actions and resources*
 - *EMA responsible for implementation*
- MEDIUM Establish a mobile Emergency Operations Center (EOC)
- *Mobile EOC allows for on-site command of an emergency situation*
 - *District 3 purchasing a mobile command unit but it will be kept in Fort Wayne*
 - *EMA responsible for implementation*

4. Schedule Next Planning Committee Meeting

The next Steuben County MHMP Planning Committee meeting is to be held on Wednesday, Thursday, May 23, 2007 at 6:00 pm in the Sheriff's Conference Room of the Steuben County Annex Building (205 S. Martha St., Angola).

Steuben County Multi-Hazard Mitigation Plan
PLANNING COMMITTEE MEETING

6:00 pm Wednesday, May 23, 2007

Steuben County Annex Building, Sheriff's Conference Room
205 S Martha Street, Angola

AGENDA

1. Discuss Completed Sections of DRAFT MHMP
2. Discuss Implementation of High Priority Mitigation Projects
3. Discuss Long-term Maintenance and Evaluation of Plan
4. Discuss Next Steps in Planning Process

Steuben County Multi-Hazard Mitigation Plan
PLANNING COMMITTEE MEETING
6:00 pm Wednesday, May 23, 2007
Steuben County Annex Building, Sheriff's Conference Room
205 S Martha Street, Angola

MEETING SUMMARY

Planning Committee Members Present:

Jason Armev for Katherine MacAulay, Northeast Indiana Red Cross
Rob Berger, Univertical
Bill Brown, Steuben County EMA
Dick Hickman, City of Angola
Rodney Renkenberger, MRBC
Jonathan Ringel, Steuben County Plan Commission
Ron Smith, Steuben County Commissioner

Others Present:

Siavash Beik, Christopher Burke Engineering, Ltd. (CBBEL)
Sharon Brown, Steuben County EMA
Sheila McKinley, Christopher B. Burke Engineering, Ltd. (CBBEL)
Paul Sparks, Steuben County Council

1. Discuss Completed Sections of DRAFT MHMP

CBBEL staff will continue to complete the remaining sections of the MHMP and following an internal review and approval, the full DRAFT of the MHMP posted on CBBEL's ftp site for the Planning Committee to review. The Planning Committee will be given time to review the document and provide their individual comments and suggestions for incorporation into the plan.

2. Discuss Implementation of High Priority Mitigation Projects

The Planning Committee discussed mitigation measures that were identified as high priorities during the previous Planning Committee meeting. Details were developed to determine responsible entities for implementation of high priority mitigation measures and the initial steps to be taken to implement those mitigation measures. During the discussion, additional information was provided by those in attendance on activities occurring within the County and NFIP Communities.

3. Discuss Long-term Maintenance and Evaluation of Plan

The Planning Committee discussed which entity would be responsible for the regular update and maintenance of the MHMP and the Steuben County EMA agreed to that undertaking. Throughout the 5-year planning cycle, the Steuben County EMA will reconvene the MHMP Planning Committee on an annual basis in order to monitor, evaluate, and update the Plan as needed. Members of the Planning Committee will be readily available to engage in meetings for annual review. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual NFIP communities or through local partnerships.

4. Discuss Next Steps in Planning Process

Planning Committee members discussed the estimated timeline for the review and comment period prior to the public meeting. It is anticipated that the Planning Committee will receive the



full draft to review in and comments will be accepted for several weeks. When individual comments have been incorporated into the plan, a public meeting will be scheduled to present the MHMP to the residents of Steuben County. Following the public meeting, comments will be accepted from the public for several weeks. Once the comments have been incorporated into the plan, a final DRAFT will be submitted to FEMA for review and comment.

STEUBEN COUNTY MHMP

APPENDIX 3

Critical Facilities & NFIP Community



STEBEN COUNTY MHMP
Critical Facilities & NFIP Community

Government Facilities	
Angola City Offices	Angola
Angola Park Department	Angola
Angola Street Department	Angola
Angola Water Department	Angola
Clear Lake Offices	Fremont
Fremont Street Department	Fremont
Fremont Town Court	Fremont
Hamilton Street Department	Hamilton
Hamilton Town Offices	Hamilton
Hudson Clerk Treasurer	Hudson
INDOT Office	Angola
INDOT Service Building	Orland
Orland Clerk	Orland
Pokageon State Park	Angola
State Fish Hatchery	Orland
Steuben County EMS North Building	Fremont
Steuben County Highway Barn	Angola
Steuben County Humane Shelter	Angola
Steuben County Offices	Angola
Steuben County Park Office	Angola
Steuben County Work Release	Angola

Essential Facilities	
SCHOOLS	
Alvarado Amish School	Hamilton
Amish School	Hamilton
Angola High School	Angola
Angola Middle School	Angola
Bright Beginnings Preschool	Angola
Carlin Park Elem School	Angola
Four County Vocational Coop	Hamilton
Fremont Elem School	Fremont
Fremont High School	Fremont
Fremont Middle School	Fremont
Grace Baptist	Angola
Hamilton Community Elem School	Hamilton
Hamilton Community High School	Hamilton
Hamilton Head Start	Hamilton
Hamilton Rainbow Academy	Hamilton
Headstart& Pre-School	Angola
Heaven Sent Preschool	Angola
Hendry Park Elem	Angola
MSD of Steuben County Bus Barn	Angola
MSD of Steuben County Transportation	Angola
New Beginnings Preschool	Angola
Pleasant Lake Elem	Pleasant Lake

Prairie Heights Elem	Lagrange
Prairie Heights High School	Lagrange
Prairie Heights Middle School	Lagrange
Prairie Heights School Farm	Angola
Ryan Park Elem	Angola
Steuben County Ed. Opportunity Center	Angola
TRI STATE University	Angola
TSU Plastics Technology Center	Angola
Vistula Headstart & Preschool	Fremont
Wee Creations Preschool	Fremont
DAY CARE CENTERS	
AGAPE Day Care	Stroh
All Ages Day Care	Hudson
Angola Child Care Center	Angola
Angola Family Day Care	Angola
Barbara's Play Care Center	Angola
Breeden YMCA	Angola
Cameron Play Care Center	Angola
Chick-A-Dee Lane Day Care	Fremont
Christ's Tykes Day Care	Angola
Dawn Robinett	Pleasant Lake
Debra Jones	Angola
Fairview Missionary Church	Angola
His Kids Play Care	Angola
Jean Headley	Angola
Jeanne's Back 40 Day Care	Fremont
Jennifer Temple	Angola
Jode Lyn Feller	Fremont
Kelly Myers	Lagrange
Little Critters Day Care	Angola
Little Fox Day Care	Angola
Little Lambs Day Care	Fremont
Little Lambs Day Care	Fremont
Lori Melchi	Pleasant Lake
Martha Crooks	Angola
Nancy's Daycare	Angola
PLUM Child Care Ministry	Pleasant Lake
The Next Generation Day Care	Angola
Tiny Tots Day Care	Angola
Treasures of the Heart	Angola
We Friends Day Care	Angola
EOC	
Angola Tty Unit Emergency Service	Angola
Emergency Communications 911	Angola
FIRE STATIONS	
Angola Fire Dept	Angola
Ashley Fire Dept	Ashley
Fremont Fire Dept	Fremont
Hamilton Fire Dept	Hamilton
Helmer Fire Dept	Helmer
Hudson Fire Dept	Hudson

Metz Fire Dept	Metz
Orland Fire Dept	Orland
Pleasant Lake Fire Dept	Pleasant Lake
Salem Center Fire Dept	Pleasant Lake
LAW ENFORCEMENT	
Angola Police Dept	Angola
Clear Lake Police Dept	Fremont
Fremont Police Dept	Fremont
Hamilton Police Dept	Hamilton
Hudson Police Dept	Hudson
Steuben County Sheriff Dept	Angola
MEDICAL CARE	
Cameron Med. Ofc. Bld. Specialty Clinic	Angola
Cameron Memorial Hospital Poison Center	Angola
Cameron Memorial Hospital Urgent Care	Angola
Cameron Woods Retirement Community	Angola
Elmhurst Clinic	Angola
Fremont Medical Center	Fremont
Lakeland Nursing Center	Angola
Northern Lakes Nursing and Rehab	Angola
Steuben County WIC Program	Angola
Turning Point Shelter of Steuben County	Angola

Transportation System Facilities	
AIRPORTS	
Cameron Hospital Heliport	Angola
Clear Lake Heliport	Clear Lake
Clear Lake Seaplane Base	Clear Lake
Crooked Lake Seaplane Base	Angola
East Clear Lake Heliport	Clear Lake
Lake James Seaplane Base	Angola
Lake Pleasant Seaplane Base	Angola
Tri-State Steuben County	Angola

Lifeline Utility System Facilities	
WASTEWATER TREATMENT PLANT	
Angola WWTP	Angola
Ashley Municipal WWTP	Ashley
Fremont WWTP	Fremont
Hamilton Lake Treatment Plant	Hamilton
Helmer Regional Sewer District	Helmer
INDOT-Toll RD WWTP	Fremont
Lagrange Sewer District (Turkey Lake)	Lagrange
Pigeon Creek Rest Area I-69 SB	Pleasant Lake
Pokagon State Park WWTP	Angola
Quadland	Fremont
Ramada Inn Package Plant	Angola
Silver Lakes Mobile Homes	Angola
Steuben Lakes Regional District	Angola

POTABLE WATER	
Angola Satellite Water Treatment Plant	Angola
Angola Water Treatment Plant	Angola
Angola Water Works, Plant #1	Angola
Angola Water Works, Plant #2	Angola
Ashley Water Dept	Ashley
Hamilton Water Plant	Hamilton
Orland Water Plant	Orland
WATER TOWERS	
Angola 300 N	Angola
Angola Calvery Ln	Angola
Angola Maumee	Angola
Ashley Water Tower	Ashley
Fremont Water Tower	Fremont
Fremont Water Tower #2	Fremont
Hamilton Water Tower #1	Hamilton
Hamilton Water Tower #2	Hamilton
Hamilton Water Tower #3	Hamilton
Orland Water Tower	Orland
TELECOMMUNICATIONS	
WEAX Radio	Angola
WLKI Radio	Angola
CELL PHONE TOWERS	
1708 W 700 North Unit B	Angola
109 Jackson Street	Angola
3788 N 20 East	Angola
2826 W 800 South	Hudson
197 Ln 101A Hamilton LK	Hamilton
8440 W Orland Road	Orland
6303 CR 4	Hamilton
3799 W 700 S	Ashley
400 W Feather Valley Rd	Angola
8499 W 50 N	Angola
7491 N 850 W	Orland
132 N Old State Rd 1	Angola
2826 W 800 S	Ashley
3300 S 325 W	Pleasant Lake
645 W 275 N	Angola
7117 E 300 N	Fremont
5898 N 50 W	Fremont
7398 N 650 W	Orland
335 N 400 E	Angola
7500 N 650 W	Orland
2625 S Golden Lake Road	Pleasant Lake
705 W 155 S	Angola
5898 N 50 W	Fremont
7117 E 300 N	Fremont
7987 N STATE RD 327	Orland
705 W 155 S	Angola
5898 N 50 W	Fremont
7117 E 300 N	Fremont

7987 N STATE RD 327	Orland
5015 E 585 North	Fremont
7500 N. 650 W. ROAD	Orland
132 N OLD STATE HWY 1	Angola
5015 E 585 N	Fremont
1490 W MAUMEE ST	Angola
W 700 S	Ashley
1708 W 700 N	Fremont
7260 S. STATE RD	Hudson

High Potential Loss Facilities	
COUNTY DAMS	
60-acre Dam	Angola
Ceder Swamp Control Dam	Fremont
County Dam 1	Hamilton
County Dam 2	Hamilton
County Dam 3	Hamilton
County Dam 4	Angola
County Dam 5	
County Dam 6	
County Dam 7	Angola
County Dam 8	Angola
County Dam 9	Orland
Dam Spring Haven	Fremont
EJ Brooks Dam	Angola
State Fish Hatchery Dam	Orland
IDNR DAMS	
Ball Lake Control Structure	Fish Creek
Borrow Lake Dam	Unnamed Tributary West Branch Fish Creek
Clear Lake Control Structure	Unnamed Tributary Round Lake
Crooked Lake Control Structure	Unnamed Tributary Lake George
Fawn River Fishery Dam	Fawn River
Fish Lake Control Structure	Fawn River
Fox Lake Control Structure	Unnamed Tributary Pigeon Creek
Gordon T. Anderson Earthen Dam	Unnamed Tributary Pigeon Creek
Hamilton Lake-North Dam	Fish Creek
Hamilton Lake-South Dam	Fish Creek
Jimmerson Lake Dam	Crooked Creek
Lake Gage Control Structure	Unnamed Tributary Crooked Creek
Lake George Dam	Crooked Creek
Lake Of The Woods Control Structure	Unnamed Tributary Turkey Creek
Long Beach Lake Dam	Unnamed Tributary Snow Lake
Long Lake (Nr. Ray) Control Structure	Unnamed Mill Stream Drain #1
Minifenokee Lake Dam	Unnamed Tributary Follette Creek
Mud Lake Control Structure	Unnamed Tributary Fawn River
Oberlin Lake Dam	Haughey Ditch
Oberlin-Ford	Haughey Ditch
Otter Lake (West) Control Structure	Pigeon Creek
Silver Lake Control Structure	Unnamed Tributary Silver Lake
Swaggers Plug Control Structure	Upstream Channel At Fish Lake

MILITARY INSTALLATION	
National Guard Amory	Angola

Hazardous Materials Facilities	
2001 76 Inc (Citgo Gas Station)	Angola
AAA Galvanizing	Hamilton
Aggregate Industries - Angola Plant	Angola
Allegheny Coatings	Fremont
Amcast Automotive	Fremont
Amerigas-Bruce Moody	Fremont
Amerigas Propane LP, Inc.	Angola
Angola Food Shop	Angola
Angola LP Gas	Angola
Angola Marathon Express	Angola
Autoform Tool & Manufacturing	Fremont
B & F Grain	Orland
Bates Technologies, Inc	Angola
Big Turkey Lake Marina	Lagrange
Bills Orland Marathon	Orland
BP Gas Station	Angola
Camshaft Machine Co.	Orland
Cardinal IG Company	Fremont
Carper Farm Supply	Ashley
Casey's Cove Marina	Angola
Clarks Landing Marina	Hamilton
Clear Lake Marina	Fremont
CON-WAY Central Express	Fremont
Corner Landing Bait & Tackle	Angola
CVS #6494	Angola
Datec Industries	Angola
Dexter Axle/Philips Industries	Fremont
E & B Paving	Angola
Epic Technical Group, Inc	Angola
Fab-Glas	Angola
Fast Break	Angola
FedEx Am. Freightways	Fremont
Four Corners Phillips 66	Hamilton
FredaINC	Angola
Fremont Wire	Fremont
Gas America Services	Angola
GasAmerica #205	Angola
H&S Auto Machine Service	Angola
Hamilton Lake Marin	Hamilton
Hanson Aggregates Mideast Inc	Angola
Hillsdale Tool -Hamilton Plant	Hamilton
Hoosier Propane	Angola
Hudson Industries	Hudson
IMP Acquisition	Angola
INDOT - Steuben Maint. Facility	Orland
INDOT - Toll RD Angola Toll Plaza	Fremont

INDOT - Toll Road - Eastpoint Barrier	Angola
INDOT -Booth Tarkington Plaza	Fremont
INDOT Toll RD Svc Maint. Storage	Angola
Irving Gravel Co, Inc	Angola
ITW Automotive Finishing	Angola
Key Plastics	Hamilton
Klink Trucking	Ashley
Lagrange Products	Fremont
Lake George Marina	Fremont
Landfill	
Lime-O-Sol	Ashley
Meijer #190 Gas Station	Angola
Meridian Automotive Systems	Angola
Metaldyne	Fremont
Miller Poultry	Orland
Moore Wallace & RR Donnelley Co	Angola
Moyer Spring Co	Angola
Murphy Oil (Wal-Mart Gas Station)	Angola
New Horizons Baking Company	Fremont
NIPSCO	Angola
Noll Brothers Oil	Hudson
North Central Co-OP - Fremont Energy	Fremont
North Central Co-Op - Fremont Energy	Angola
North West Landing	Fremont
Owens Corning	Angola
Patty's Pantry	Angola
Pilot Travel Center #029	Fremont
Prime Outlet Gas Station	Fremont
Quadland Corp	Fremont
Reike Packaging Systems	Hamilton
Rittal Electromate	Fremont
Ryder Transportation Services	Fremont
S & S Gas Station	Angola
S & S Gas Station	Pleasant Lake
S & S Oil	Angola
S & S Oil Company	Hamilton
Sheets LP	Angola
Shell Spee-D-Mart #202	Angola
Speedway #8336	Angola
Sprint/United Telephone	Ashley
Stalhut's Phillips 66	Angola
Star Gas Propane LP	Orland
Steuben County REMC	Angola
Tenneco Automotive	Angola
Toll Rd James W. Riley SRV Plaza	Fremont
Trans Guard	Angola
Tyden Brammall	Angola
Univertical Corp.	Angola
Verizon	Angola
Verizon	Fremont
Verizon	
Verizon - Pleasant Lake	Pleasant Lake



Verizon (Angola)	Angola
Vestil Manufacturing	Angola
WilTel Communication	Angola

STEUBEN COUNTY MHMP

APPENDIX 4

Media Releases, Coverage, Public Survey,
and Summary of Responses



MEDIA RELEASE

For Immediate Release

Media Release Date: April 12, 2007

Contact: Heather Buck, Christopher B. Burke Engineering, Ltd. (317) 266-8000

How Do Tornadoes, Floods and Severe Winter Storms Affect You?

Angola, IN (April 12, 2007) – Steuben County, in cooperation with the City of Angola, Town of Clear Lake, the Town of Hamilton, and the Town of Hudson, is preparing a Multi-Hazard Mitigation Plan, and your input is very important to the planning process.

The Disaster Mitigation Act of 2000 (DMA 2000) requires communities to prepare a Multi-Hazard Mitigation Plan in order to be eligible for any future mitigation funding through the State and Federal Departments of Homeland Security. The intent of this planning process is to plan for a disaster before it occurs in order to reduce the physical, social and economical impact of that disaster.

Steuben County has had its share of natural disasters in the past. Flooding events have resulted in over \$5 million in property damages since 1993. Additionally, numerous tornado events have caused approximately \$38 million in property damages in Steuben County since 1961. Furthermore, there is a high hazard dam (Hamilton Lake Dam) located within the county that could pose a threat to homes and communities directly downstream from this dam. These are just some of the potential hazard threats to Steuben County.

The Multi-Hazard Mitigation Planning Committee would like your input regarding natural hazards in Steuben County. Information about your experience with hailstorms, thunderstorms, windstorms, severe winter storms, flooding, tornadoes, hazardous materials incidents, earthquake, or a dam failure would be particularly helpful.

Please respond to the following questions and send your responses to Maumee River Basin Commission, Attention: Rodney Renkenberger, Executive Director, 3864 New Vision Drive, Fort Wayne IN, 46845 or by email at rrenken-mrbc@verizon.net

1. While in Steuben County, have you ever experienced a hailstorm, thunderstorm, windstorm, severe winter storm, flooding, tornado, hazardous materials incident, earthquake or a dam failure? Please identify all that apply; include dates and specific locations when possible.
2. Did your experience result in a personal or financial loss? If so, to what extent was the damage?
3. Of the hazards mentioned in question 1, please indicate all hazards that you feel could occur in Steuben County in the near future.
4. Please feel free to include any further comments you have regarding local hazards in Steuben County.
5. Do you feel that your household is prepared (own a weather radio, have a safe spot in your home, know the locations of temporary shelter, etc) in the event of a local hazard such as a severe winter storm, tornado, or flood? How so?

The County will host a public meeting in the summer of 2007 to present the draft-version of the Steuben County Multi-Hazard Mitigation Plan to the public and gather additional public input.

The meeting date and time has not been determined but will be widely published in the near future.

---END---

How is Steuben County affected by hazards?

Steuben County, in cooperation with the City of Angola, the Town of Clear Lake, the Town of Hamilton, and the Town of Hudson, is preparing a Multi-Hazard Mitigation Plan (MHMP), and your input is very important to the planning process! The intent of this planning process is to plan for a disaster before it occurs in order to reduce the physical, social and economical impact to the county and communities.

Steuben County has had its share of natural disasters in the past; floods, tornadoes, and windstorms have caused millions of dollars in damages. The MHMP Planning Committee would like your input regarding both natural and man-made hazards in Steuben County.

1. While in Steuben County, have you ever experienced a dam failure, earthquake, flood, severe winter storm, tornado, thunderstorm/windstorm/hailstorm, or a hazardous material spill? Please identify all that apply and feel free to provide additional information such as dates and locations.
2. Did your experience result in a personal or financial loss? If so, to what extent was the damage?
3. Of the hazards mentioned in question 1, please indicate all hazards that you feel could occur in Steuben County in the near future.
4. Please feel free to include any further comments you have regarding local hazards in Steuben County.
5. Do you feel that your household is prepared (own a weather radio, have a safe spot in your home, know the locations of temporary shelters, etc) in the event of a local hazard such as a severe winter storm, tornado, or flood? How so?

Please return completed surveys by Wednesday, May 23, 2007



How is Steuben County affected by hazards?

Steuben County, in cooperation with the City of Angola, the Town of Clear Lake, the Town of Hamilton, and the Town of Hudson, is preparing a Multi-Hazard Mitigation Plan (MHMP), and your input is very important to the planning process! The intent of this planning process is to plan for a disaster before it occurs in order to reduce the physical, social and economical impact to the county and communities.

Steuben County has had its share of natural disasters in the past; floods, tornadoes, and windstorms have caused millions of dollars in damages. The MHMP Planning Committee would like your input regarding both natural and man-made hazards in Steuben County.

1. While in Steuben County, have you ever experienced a dam failure, earthquake, flood, severe winter storm, tornado, thunderstorm/windstorm/hailstorm, or a hazardous material spill? Please identify all that apply and feel free to provide additional information such as dates and locations.
 - Winter Storm (3)
 - Tornado (2)
 - Thunderstorm (2)
 - Windstorm (2)
 - Hailstorm (3)
 - No (5)
 - Yes, all but dam failure and earthquake
 - HazMat Spill (Firefighter)
 - Not to a serious, life threatening situation
 - The only 2 that I have personally experienced was the winter storm of 2000 (Snow emergency #3162, Dec 11-31, 2000) and the tornado (high horizontal winds) south of Hudson in DeKalb County in spring several years ago. T'storms, hailstorms, and hazmat spills are continuing fact of life, differing only in intensity.
2. Did your experience result in a personal or financial loss? If so, to what extent was the damage?
 - Hail damage to house roof (2)
 - No (7)
 - If you call spending 3 days in the fire hall because of my county roads were impassable in 2000 a personal loss due to the separation of my family, then yes, I have. The Town of Hudson suffered a financial loss of \$2,888.12 (\$2,187.12 reimbursed by FEMA). As far as other expenses for other incidents, the Town normally just adjusts the work week as necessary to avoid overtime. Sand, gravel, tree removal, etc are all just rolled into the cost of providing service to the Town's residents.
 - Lost several mature trees
3. Of the hazards mentioned in question 1, please indicate all hazards that you feel could occur in Steuben County in the near future.
 - All (5)
 - Tornado (4)
 - Severe Winter Storm (3)
 - Flood (3)

- All of the hazards listed could be possible in Steuben County, although a dam failure is unlikely to have any impact on the Town of Hudson.
 - Dam Failure
 - Thunderstorm/windstorm/hailstorm (2)
 - Blizzard
 - Hazardous Materials spill
 - ??
4. Please feel free to include any further comments you have regarding local hazards in Steuben County.
- People who use chemicals and just dump them out when done. And trying to explain there polluting the soil. (I was told it came out of the ground to begin with.)
5. Do you feel that your household is prepared (own a weather radio, have a safe spot in your home, know the locations of temporary shelters, etc) in the event of a local hazard such as a severe winter storm, tornado, or flood? How so?
- Yes (3)
 - No
 - Yes, Fire Station
 - No, we have a basement
 - Yes, plenty of communication equipment in the household
 - Yes, I am a police officer and aware of the available resources
 - I would be most concerned about flooding, because I could not do anything about it. Severe weather, I can keep supplies on hand.
 - I am not aware of the community gathering/shelter locations in the event of a disaster. Yes, I have a scanner that has weather radio included, plus I have a basement for severe weather conditions.

MEDIA RELEASE

For Immediate Release

Media Release Date: August 28, 2007

Contact: Rodney Renkenberger, Maumee River Basin Commission, (260) 449-7226

Public Presentation of the DRAFT Multi-Hazard Mitigation Plan

Angola, IN (August 28, 2007) – Steuben County, in cooperation with the Maumee River Basin Commission, City of Angola, Town of Clear Lake, Town of Hamilton, and Town of Hudson, has prepared a Multi-Hazard Mitigation Plan (MHMP). This Plan assesses the risk and vulnerability of these communities for flooding, hailstorms, thunderstorms, hazardous materials incidents, severe winter storms including ice, tornadoes, windstorms, earthquakes, and dam failure.

Steuben County has had its share of natural disasters in the past. Flooding events have resulted in over \$5 million in property damages since 1993. Additionally, numerous tornado events have caused approximately \$38 million in property damages, 3 deaths, and over 20 injuries in Steuben County since 1961. Furthermore, hailstorms, thunderstorms, and windstorms have resulted in approximately \$600,000 in property damages. These are just some of the potential hazard threats to Steuben County.

The Steuben County MHMP will be presented at a public meeting on **Monday, September 17th** at **7:00 pm** in the **EMS training room in the Steuben County Courthouse Annex, 205 South Martha St in Angola**. Topics covered during this public presentation will include: an overview of the planning requirements; a summary of the risk assessment and vulnerability analysis; and proposed mitigation projects for prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.

The Disaster Mitigation Act of 2000 (DMA 2000) requires communities to prepare a Multi-Hazard Mitigation Plan in order to be eligible for any future mitigation funding through the State and Federal Emergency Management Agencies. The intent of this planning process is to plan for a disaster before it occurs in order to reduce the physical, social and economical impact of that disaster.

---END---



STEUBEN COUNTY MHMP

APPENDIX 5

Promulgation Authorities

STEUBEN COUNTY MHMP
PROMULGATION AUTHORITIES

Steuben County

James Crowl, Commissioner
F. Mayo Sanders, Commissioner
Ronald Smith, Commissioner

City of Angola

Richard Hickman, Mayor

Town of Hamilton

Randall E. Hile, Council President

Town of Hudson

Sean Walker, Council



STEUBEN COUNTY MHMP

APPENDIX 6

Resolutions for Adoption

STEUBEN COUNTY MHMP
Resolutions for Adoption

STEUBEN COUNTY MHMP

APPENDIX 7

Potential Funding Sources

AmeriCorps

The AmeriCorps*State works with Governor-appointed State Service Commissions to provide grants to non-government and government entities that sponsor service programs. These organizations use their grants to engage AmeriCorps members in service to help meet critical community needs in education, public safety, health, and the environment.

Previous Activities Funded: Assisting disaster victims, building homes, restoring parks and other community facilities while mobilizing community volunteers.

Ms. Paula Parker-Sawyers, Exec. Director
Office of Faith-Based & Community Initiative
302 W Washington St. Room E220
Indianapolis IN 46204-4701
317.233.4273 ~ Phone
317.233.5660 ~ Fax

www.state.in.us/iccsv

Assistance to Firefighters Grant

The Assistance to Firefighters Grant (AFG) is a competitive grant opportunity for local fire departments and Emergency Medical Service (EMS) organizations that are not affiliated with a hospital.

Previous Activities Funded: The AFG funds activities such as purchasing firefighting equipment, personal protection equipment, training, firefighting vehicles, and firefighter/first responder safety projects.

<http://www.firegrantsupport.com/>

Challenge 21, Floodplain

Challenge 21, the Army Corps' flood hazard mitigation and riverine ecosystem restoration initiative, will focus on more sustainable approaches. Through its focus on non-structural alternatives to flood protection, it will, where appropriate, move families and businesses out of harm's way and strive to return the floodplains of rivers and creeks to a condition where they can naturally moderate floods as well as provide other benefits to communities and the environment. Watershed by watershed, Challenge 21 builds on existing programs and initiates and expands partnerships with other Federal agencies and non-Federal national and local entities. Key Federal partners include the FEMA, the Department of Agriculture, the Department of Interior and the EPA.

Previous Activities Funded: A project might include the relocation of threatened homes or businesses, conservation or restoration of wetlands and natural floodwater storage areas and planning for responses and solutions to potential future floods

http://www.americanrivers.org/site/PageServer?pagename=AMR_content_d156

CHIEF Grants Service

CHIEF Grants is a free service from CHIEF supply company. Dedicated to helping public safety professionals meet today's funding challenges, CHIEF Grants is a one-stop shop for open grants, grant writing tips, seminars, and grant news.

Previous Activities Funded: Various types of grants are highlighted with numerous activities funded. This a grant service, not an individual grant opportunity.

<http://www.chiefsupply.com/grants/>

Clean Water State Revolving Loan Fund

Clean Water State Revolving Loan Fund (CWSRLF) programs operate much like environmental infrastructure banks that are capitalized with federal and state contributions. CWSRLF monies are loaned to communities and loan repayments are recycled back into the program to fund additional water quality protection projects. The revolving nature of these programs provides for an ongoing funding source that will last far into the future.

Previous Activities Funded: The CWSRF funds a broad range of projects—from wastewater systems and nonpoint source pollution control to estuary management and a range of projects focusing on water quality. Funding is typically directed to state-identified high priority projects based on several factors, including: public health protection; condition of impacted waters; and communities' regulatory compliance status.

<http://epa.gov/OW-OWM.html/cwfinance/cwsrf/basics.htm>

Community Development Block Grants

Communities receiving Community Development Block Grants (CDBG) funds from the State may use the funds for many kinds of community development activities including, but not limited to property acquisition, public services, planning activities, and community development activities.

Previous Activities Funded: Funds have been used in Indiana for purposes such as Public facility improvements, flood and drainage facilities, Fire stations and equipment, and various community related activities and facilities.

<http://www.in.gov/ihfa/comdev/comp/manuals/im/im.htm>

Ms. Deanna Oware, Director
State of Indiana
Department of Commerce/Community Development
One N. Capitol Ave.
Suite 600
Indianapolis, IN 46204-2027
Phone: 317-232-8911
Fax: 317-233-3597

Community Facilities Grants and Loans

The Rural Housing Service (RHS) of the Department of Agriculture offers loans and grants to construct, enlarge, extend, or otherwise improve community facilities providing essential services to rural residents.

Previous Activities Funded: Priority for funding will be given to those projects that will enhance public safety such as fire, police, rescue, and ambulance services, and projects for health care facilities. The fire service can use the funding for fire stations, fire trucks and rescue vehicles.

www.rurdev.usda.gov/rhs/ProgramBriefs/brief_cp_grant.htm

Community Rating System

The National Flood Insurance Program's (NFIP) Community Rating System (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.

Previous Activities Funded: While the CRS does not provide direct funding, reductions in insurance premiums can be significant for participants.

<http://www.fema.gov/nfip/crs.shtm>

Conservation Reserve Program

The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland to reduce soil erosion, and potential flood loss and damage.

Previous Activities Funded: Filter Strip Establishment, Wetland Restoration, Riparian Buffer Establishment

<http://www.fsa.usda.gov/dafp/cepd/crp.htm>

The Cora Brown Fund

To provide for disaster-related needs that have not been, or will not be met by government agencies or any other organizations which have programs to address such needs; however, the fund is not intended to replace or supersede these programs. The fund may not be used in a way that is inconsistent with other federally mandated disaster assistance or insurance programs. Money from the fund will not duplicate assistance for which a person is eligible from other sources.

Previous Activities Funded: Disaster related home repair and rebuilding, services which alleviate human suffering due to disasters and disaster related unmet needs.

http://www.federalgrantswire.com/cora_brown_fund.html

Department of Interior Rural Fire Assistance Program

The Department of Interior (DOI) Rural Fire Assistance Program is aimed at enhancing the fire protection capabilities of rural fire districts in the wildland urban interface. The rural fire department must serve a community with a population of 10,000 or less and must have a statewide agreement with the state forester who maintains cooperative agreements with the rural fire departments or volunteer fire departments or a cooperative fire agreement with an agency in the DOI.

Previous Activities Funded: The program assists with training, equipment purchase, and prevention activities, on a 90/10 cost-share basis.

<http://www.nifc.gov/rfa/steps.html>

Direct Housing: Natural Disaster

Funds are only available to the extent that funds are not provided by the Federal Emergency Management Agency (FEMA). For the purpose of administering these funds, natural disaster will only include those areas identified by a Presidential declaration.

Previous Activities Funded: To assist qualified lower income rural families to meet emergency assistance needs resulting from natural disaster to buy, build, rehabilitate, or improve dwellings in rural areas.

http://www.federalgrantswire.com/direct_housingnatural_disaster.html

Disaster Reserve Assistance

To provide emergency assistance to eligible livestock owners, in a State, county, or area approved by the Secretary or designee, where because of disease, insect infestation, flood, drought, fire, hurricane, earthquake, hail storm, hot weather, cold weather, freeze, snow, ice, and winterkill, or other natural disaster, a livestock emergency has been determined to exist.

Previous Activities Funded: This assistance is in the form of a direct payment to affected eligible landowners and is administered through the Farm Service Agency.

http://www.federalgrantswire.com/disaster_reserve_assistance.html

Disposal of Federal Surplus Real Property for Parks, Recreation, and Historic Monuments

Surplus real property may be conveyed for public park and recreation use at discounts up to 100 percent of fair market value and for historic purposes without monetary consideration. Property conveyed for park and recreation use or historic purposes must be used for these purposes in perpetuity or be reverted to Federal ownership.

Previous Activities Funded: Property, either real or land, varies with time with items available for public sale, lease or extended use in perpetuity.

http://www.federalgrantswire.com/disposal_of_federal_surplus_real_property_for_parks_recreation_and_historic_monuments.html

Emergency Conservation Program

The United States Department of Agriculture (USDA) Farm Service Agency's (FSA) Emergency Conservation Program (ECP) provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures in periods of severe drought.

Previous Activities Funded: This assistance is in the form of a direct payment to affected eligible landowners and is administered through the Farm Service Agency.

<http://disaster.fsa.usda.gov/ecp.htm>

Environmental Quality Incentive Program

The Environmental Quality Incentive Program (EQIP) offers contracts with a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. These contracts provide incentive payments and cost-shares to implement conservation practices. Persons who are engaged in livestock or agricultural production on eligible land may participate in the EQIP program. EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. The practices are subject to Natural Resources Conservation Service



(NRCS) technical standards adapted for local conditions. The local conservation district approves the plan.

Previous Activities Funded: Cost sharing may pay up to 75 percent of the costs of certain conservation practices, such as grassed waterways, filter strips, manure management facilities, capping abandoned wells, and other practices important to improving and maintaining the health of natural resources in the area.

<http://www.nrcs.usda.gov/programs/eqip/>

Emergency Rehabilitation of Flood Control Works

Assistance does not extend to major improvements of flood control or federally authorized coastal protection structures, nor to reimbursement of individuals or communities for funds expended in repair or rehabilitation efforts.

Previous Activities Funded: Authorized assistance includes emergency repair or rehabilitation of flood control works damaged by flood, and restoration of federally authorized coastal protection structures damaged by extraordinary wind, wave, or water action.

http://www.federalgrantswire.com/emergency_rehabilitation_of_flood_control_works_or_federally_authorized_coastal_protection_works.html

Emergency Watershed Protection Program

The Emergency Watershed Protection Program (EWPP) work is not limited to any one set of prescribed measures. A case by case investigation of the needed work is made by NRCS.

Previous Activities Funded: EWPP work can include: removing debris from stream channels, road culverts, and bridges; reshaping and protecting eroded banks; correcting damaged drainage facilities; repairing levees and structures; reseeding damaged areas; and purchasing floodplain easements.

<http://www.nrcs.usda.gov/programs/ewp/questions.html>

Farmland Protection Program

The Farmland Protection Program provides funds to help purchase development rights to keep productive farmland in agricultural uses. To qualify, farmland must: be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production. Depending on funding availability, proposals must be submitted by the government entities to the appropriate NRCS State Office during the application window.

Previous Activities Funded: Working through existing programs, USDA joins with State, tribal, or local governments to acquire conservation easements or other interests from landowners. USDA provides up to 50 percent of the fair market easement value.

<http://www.info.usda.gov/nrcs/fpcp/fpp.htm>

Fire Prevention & Safety Grant

The purpose of these grants is to enhance the safety of the public and firefighters with respect to fire and fire-related hazards. The primary goal of the Assistance to Firefighters Grant (AFG) Program's Fire Prevention and Safety Grant (FP&S) is to reach high-risk target groups in order to mitigate the high incidences of death and injuries. Additionally for Fiscal Year (FY) 2005 Congress amended the authorization to include funding for Firefighter Safety Research and



Development. This guidance provides details for applying for either of these financial assistance instruments. There is no cost share requirement for the FY 2005 Fire Prevention and Safety grants.

Previous Activities Funded: Grants have been awarded to assist with the costs associated with training, equipment, vehicles for fire departments and firefighter safety research.

http://www.firegrantsupport.com/fp_about.aspx

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses.

Previous Activities Funded: A few examples of eligible FMA projects include: the elevation, acquisition, and relocation of NFIP-insured structures.

<http://www.fema.gov/fima/mitgrant.shtm>

Hazard Mitigation Grant Program

Authorized under Section 404 of the Stafford Act, the Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster.

Previous Activities Funded: Acquisition of hazard-prone property; stormwater management, elevation of flood-prone structures, and infrastructure protection measures are all considered eligible projects and have been funded in the past.

<http://www.fema.gov/fima/mitgrant.shtm>

Hazardous Materials Emergency Preparedness Grant

The Hazardous Materials Emergency Preparedness (HMEP) grant program is intended to provide financial and technical assistance as well as national direction and guidance to enhance State, Territorial, Tribal, and local hazardous materials emergency planning and training. The HMEP Grant Program distributes fees collected from shippers and carriers of hazardous materials to emergency responders for hazmat training and to Local Emergency Planning Committees (LEPCs) for hazmat planning.

Previous Activities Funded: These grants have been used for developing, improving, and implementing emergency plans, and training public sector employees to respond safely and efficiently to accidents and incidents involving the transportation of hazardous materials.

<http://hazmat.dot.gov/training/state/hmep/hmep.htm>

Increased Cost of Compliance Grant

ICC coverage provides for the payment of a claim to help cover the cost of mitigation activities that will reduce the risk of future damage to a building from flooding.

Previous Activities Funded:

When a building covered by a Standard Flood Insurance Policy suffers a flood loss and is declared to be substantially or repetitively damaged, ICC will help pay up to \$30,000 to bring the building into compliance with State or community floodplain management laws or ordinances. Usually this means elevating or relocating the building so that it is above the Base Flood Elevation (BFE). Non-residential structures may also be floodproofed. ICC coverage applies only to buildings, and covers only the cost of the compliance measures undertaken.

http://www.fema.gov/txt/rebuild/increased_cost_of_compliance_fact_sheet.txt

Indiana Family and Social Services Administration

The Family and Social Services Administration provides services to help keep children healthy and safe and help families to self-sufficient.

Previous Activities Funded: The agency may provide programs related to heating/cooling of residential buildings, temporary housing, and other important contacts in the event of an emergency or disaster.

<http://www.in.gov/fssa/families/>

Indiana Resource Conservation & Development Districts

The purpose of the Resource Conservation and Development (RC&D) program is to accelerate the conservation, development and utilization of natural resources, improve the general level of economic activity, and to enhance the environment and standard of living in designated RC&D areas. It improves the capability of State, tribal and local units of government and local nonprofit organizations in rural areas to plan, develop and carry out programs for resource conservation and development. The program also establishes or improves coordination systems in rural areas.

Previous Activities Funded: Forestry projects, wetland development, Community training projects, and other projects related to community and natural resource enhancement and protection.

<http://www.in.nrcs.usda.gov/programs/RC&D/RC&Dhomepage.html>

Indiana Rural Development Council

The Indiana Rural Development Council (IRDC) is a partnership of local, state, federal, profit and not-for-profit stakeholders that serve Indiana communities. The IRDC's purpose is to coordinate efforts of citizens and governments to meet the economic and social needs of rural Indiana.

Previous Activities Funded: These funds will be utilized to address a variety of rural issues in the areas of economic/community development, planning, leadership, infrastructure, health, telecommunication/education, workforce development, agriculture, and rural regional development initiatives.

<http://www.in.gov/irdc/index.html>

Indiana State Revolving Loan Fund

The Indiana State Revolving Fund (SRF) Loan Program provides low-interest loans to Indiana communities for projects that improve wastewater and drinking water infrastructure. The Indiana Department of Environmental Management (IDEM) and the Indiana State Budget Agency work together to administer this program and to protect public health and the environment. Recently, SRF has implemented a program to fund nonpoint source projects, as well.

Previous Activities Funded: Activities include Treatment plant improvements and upgrades, Riparian Buffers and Conservation Easements, and Wetland protection and restoration measures.

<http://www.in.gov/idem/srf/factsht0704.doc>

Indiana Transportation Enhancements Program

Transportation enhancements (TE) are transportation-related activities that are designed to strengthen the cultural, aesthetic, and environmental aspects of the Nation's inter-modal transportation system.

Previous Activities Funded: The transportation enhancements program provides for the implementation of a variety of non-traditional projects, with examples ranging from Acquisition of scenic easements, landscaping and scenic beautification, and to the mitigation of water pollution from highway runoff all of which could be utilized as measures to control or mitigate flood damage.

http://www.enhancements.org/statecontacts_TE.asp

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) program provides matching grants to States and local governments for the acquisition and development of public outdoor recreation areas and facilities. The program is intended to create and maintain a nationwide legacy of high quality recreation areas and facilities and to stimulate non-federal investments in the protection and maintenance of recreation resources across the United States.

Previous Activities Funded: Funds have been widely utilized for land acquisition, open space/greenspace development, which can include wetland development, critical seeding areas and other projects that can reduce the impacts of flooding.

<http://www.nps.gov/lwcf/>

Low Interest Loan Incentives

Loan amounts up to \$700,000 with interest rates of 2.5 percent to 3.0 percent are available to cities, towns and counties. The loan pays for the cost of remediation and/or demolition at identified brownfield sites.

Previous Activities Funded: Eligible activities include: soil and groundwater cleanup, demolition activities, asbestos/lead paint abatement, and additional investigations.

<http://www.idfabrownfields.com/assistance.aspx#LILI>

National Flood Insurance Program

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

Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Previous Activities Funded: Flood insurance is made available within the community as a financial protection against flood losses.

<http://www.fema.gov/nfip/intnfip.shtm>

Office for Domestic Preparedness Terrorism Formula Grants

The Office for Domestic Preparedness (ODP) provides funding through the states awards to enhance the capacity of emergency responders to prevent, deter, or respond to terrorist incidents involving weapons of mass destruction. The funding is awarded to a point of contact in each state and then distributed within the state.

Previous Activities Funded: Activities have included training, technical assistance, equipment, planning and exercises related to domestic terrorism events.

<http://www.ojp.gov/state.htm>

Petroleum Remediation Grant Incentive

Grant amounts up to \$250,000 per applicant and per funding round are available to cities, towns and counties. The grant pays for the cost of petroleum remediation at identified brownfield sites.

Previous Activities Funded: Eligible activities include: underground storage tank removal, Corrective Action Plan preparation, IDEM approved remediation and monitoring.

<http://www.idfabrownfields.com/assistance.aspx#PRGI>

Pre-Disaster Mitigation Program

The **Pre-Disaster Mitigation (PDM) program** provides technical and financial assistance to States and local governments for cost-effective pre-disaster hazard mitigation activities that complement a comprehensive mitigation program, and reduce injuries, loss of life, and damage and destruction of property. FEMA provides grants to States and Federally recognized Indian tribal governments that, in turn, provide sub-grants to local governments (to include Indian Tribal governments) for mitigation activities such as planning and the implementation of projects identified through the evaluation of natural hazards.

Previous Activities Funded: Acquisition and/or relocation of flood-prone properties, Drainage/stormwater management projects, and hazard mitigation planning activities.

<http://www.fema.gov/fima/mitgrant.shtm>

Public Assistance Grant Program

FEMA's Public Assistance (PA) Grant Program allows State and Local governments and Non-Profit Organizations to respond to disasters, to recover from their impact and to mitigate impact from future disasters. The PA Program provides the basis for consistent training and credentialing of staff who administer the program; more accessible and understandable guidance and policy for participating in the grant program; improved customer service through a more efficient grant delivery process, applicant-centered management, and better information exchange; and continuing performance evaluations and program improvements.

Previous Activities Funded: Debris removal from public roads and rights-of-way, Emergency protective measures including search and rescue, warning of hazards, and demolition of unsafe structures, Utility Distribution Systems, such as water treatment and delivery systems; and sewage collection and treatment facilities and public parks.

<http://www.fema.gov/rrr/pa/>

Purdue Cooperative Extension Service

Purdue Cooperative Extension Service provides valuable educational materials and training programs to assist in the event of a disaster or emergency

Steve Cain

Disaster Communication Specialist

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Previous Activities Funded: Activities are educational in nature and not generally monetary offerings.

<http://www.ces.purdue.edu/eden/index.html>

Small Business Administration Loan

The U.S. Small Business Administration (SBA) can make federally subsidized loans to repair or replace homes, personal property or businesses that sustained damages not covered by insurance.

Previous Activities Funded:

The Small Business Administration can provide three types of disaster loans to qualified homeowners and businesses: home disaster loans to homeowners and renters to repair or replace disaster-related damages to home or personal property, **business physical disaster loans** to business owners to repair or replace disaster-damaged property, including inventory, and supplies; and **economic injury disaster loans**, which provide capital to small businesses and to small agricultural cooperatives to assist them through the disaster recovery period.

http://www.fema.gov/assistance/process/sba_assistance.shtm

Staffing for Adequate Fire and Emergency Response Grants

The purpose of the Staffing for Adequate Fire and Emergency Response (SAFER) grants is to award grants directly to volunteer, combination, and career fire departments to help the departments increase their cadre of firefighters. Ultimately, the goal is for SAFER grantees to enhance their ability to attain 24-hour staffing and thus assuring their communities have adequate protection from fire and fire-related hazards.

Previous Activities Funded: The SAFER grants have two activities that will help grantees attain this goal: 1) hiring of firefighters and 2) recruitment and retention of volunteer firefighters.

<http://www.firegrantsupport.com/safer/>

Volunteer Fire Assistance Program

The purpose of the Volunteer Fire Assistance (VFA) Program, formerly known as the Rural Community Fire Protection (RCFP) Program, is to provide Federal financial, technical, and other assistance to State foresters to train, and equip fire departments in rural areas and rural communities to prevent and suppress fires. A rural community is defined as having 10,000 or less population. This 10,000-population limit for participation in the VFA Program facilitates



distribution of available VFA funding to the most needy fire departments. The funding must be matched on a 50-50% basis by non-federal dollars or in-kind.

Previous Activities Funded: Purchase of Self Contained Breathing Apparatus, Protective clothing, installation of dry hydrants, and training for volunteer fire fighters.

www.fs.fed.us/fire/planning/vfa

Weatherization Assistance Program

Indiana's Weatherization Assistance Program provides residential energy conservation services to the low income citizens of Indiana. Funding comes from federal sources and is allocated to **Community Action Agencies** (CAA) to provide services in each of Indiana's 92 counties. The CAAs use their own crews or private contractors to provide comprehensive energy conservation services.

Previous Activities Funded: A thorough evaluation of the structures, including the safe and efficient operation of the furnace and water heater, is included in the treatment of each home.

<http://www.in.gov/fssa/families/housing/wap.html>

Wetland Reserve Program

The Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.

Previous Activities Funded: The USDA Natural Resources Conservation Service (NRCS) provides technical and financial support to help landowners with their wetland restoration efforts.

<http://www.nrcs.usda.gov/programs/wrp/>

Wildlife Habitat Incentive Program

The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat primarily on private land. Through WHIP USDA's Natural Resources Conservation Service provides both technical assistance and up to 75 percent cost-share assistance to establish and improve fish and wildlife habitat. WHIP agreements between NRCS and the participant generally last from 5 to 10 years from the date the agreement is signed.

Previous Activities Funded: Development of areas primarily targeted for wildlife habitat also serve as beneficial areas for flood mitigation activities such as wetland construction/restoration, native grass plantings, and filter area establishment.

<http://www.nrcs.usda.gov/programs/whip/>