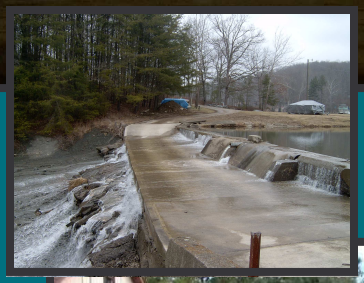
Allen County, Indiana

Multi-Hazard Mitigation Plan



MULTI-HAZARD MITIGATION PLAN

Prepared for:

Allen County, Indiana
City of Fort Wayne, Indiana
Town of Grabill, Indiana
Town of Huntertown, Indiana
Town of Leo-Cedarville, Indiana
Town of Monroeville, Indiana
City of New Haven, Indiana
City of Woodburn, Indiana
Maumee River Basin Commission

April 2005

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CBBEL Project Number 04-453

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF EXHIBITS

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 PROJECT SCOPE AND PURPOSE

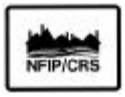
The development of a Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). According to DMA 2000, the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify 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 MHMP program is administered in Indiana by the State Emergency Management Agency (SEMA) and the Federal Emergency Management Agency (FEMA) Region V offices.

The Allen County MHMP is a multi-jurisdictional planning effort led by the Allen County Emergency Management Agency (EMA) in cooperation with the Maumee River Basin Commission (MRBC). This Plan was prepared in partnership with Allen County, the City of Fort Wayne, the Town of Grabill, the Town of Huntertown, the Town of Leo-Cedarville, the Town of Monroeville, the City of New Haven, and the City of Woodburn.

Representatives from each of these NFIP 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 full representation in the planning process, the process used to develop the Allen 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 Allen County. The intent of this planning effort was to identify the hazards and the extent that they affect Allen County, and to determine what type of mitigation strategies or projects may be undertaken to mitigate for these hazards. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Act (FMA), Pre-Disaster Mitigation (PDM) Grant, as well as other FEMA programs including the NFIP’s 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 rates may be 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 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. In Allen County, the County and the City of Fort Wayne currently participate in the CRS program. The City of Fort Wayne currently is classified as a Class 7 community and flood insurance policyholders receive a 15% discount on their insurance premiums and Allen County currently is a Class 9 community and policy holders receive a 5% discount on their insurance premiums.

Funding to prepare this MHMP was made available through a Pre-Disaster Mitigation Planning (PDM) grant that the SEMA awarded to the Allen County EMA. The Maumee River Basin Commission (MRBC) provided the 25% cash match required by the grant. Christopher B. Burke Engineering, Ltd. (CBBEL) was hired to facilitate the planning process and prepare the Allen County MHMP.

1.2 PLANNING PROCESS

The planning process to prepare the Allen County MHMP took 12 months and began in June 2004 when the Allen County EMA Director requested funds from SEMA to prepare a MHMP for the County and NFIP communities. Once those funds were awarded in August 2004, the County Commissioners agreed to contract with CBBEL.

In order to meet the deadline imposed by DMA 2000, the planning process to prepare the Allen County MHMP was on an accelerated timeline. In August 2004, the EMA Director compiled a list of Planning Committee members that met during the months of September, November, and December. In November 2004, a media release regarding the planning process and opportunities to comment on the draft Plan was published in the local paper. From September through January 2005, CBBEL researched and compiled historic hazard data necessary to prepare the MHMP. In March 2005, CBBEL provided the draft Allen County MHMP to the Planning Committee for their review and comment. Once changes were made to the draft Plan a public meeting was scheduled in April 2005 and the Plan was made available to the public and other interested parties via the Allen County webpage. Public comments were accepted through April 2005 and then the Plan was forwarded to SEMA and FEMA for their review and comment. The comments from SEMA and FEMA were incorporated into the draft Plan and reviewed by the Planning Committee. Local adoption of the Allen County MHMP by the County, the City of Fort Wayne, the Town of Grabill, the Town of Huntertown, the Town of Leo-Cedarville, the Town of Monroeville, and the City of New Haven was complete in May 2005.

1.3 PLANNING COMMITTEE

The Allen County MHMP Planning Committee was a new committee specifically formed to develop this Plan. Members include representatives from the MRBC, Allen County, the City of Fort Wayne, the Town of Grabill, the Town of Huntertown, the Town of Leo-Cedarville, the Town of Monroeville, the City of New Haven, and the City of Woodburn. The 19-member Planning Committee included representatives from homeland security, emergency management, public information, public safety, public works, planning, zoning and code enforcement, parks and recreation, and public utilities. **Table 1-1** lists the individuals that participated on the Planning Committee and the entity they represented.

The Planning Committee met on September 23, 2004, November 3, 2004, and December 12, 2004. These meetings were held in the Allen County Commissioners Courtroom. Each meeting was 2 hours in length and well attended by representatives from each NFIP community. The Planning Committee was focused and worked efficiently to discuss and make decisions on the information that was presented at each meeting. During these 3 meetings, the Planning Committee successfully identified critical facilities and local hazards; reviewed the State's

mitigation goals and set local mitigation goals; reviewed hazard data and maps; identified and assessed the effectiveness of existing mitigation measures; established mitigation projects;, and reviewed materials for public participation. Rather than meeting a fourth time, the Planning Committee opted to review the draft MHMP independently, and forward comments to the EMA Director. A sign-in sheet was used at each meeting to document participation. Meeting agendas and summaries are included in **Appendix 1**.

Members of the Planning Committee attended the public meeting in April 2005 and assisted with adoption of the Allen County MHMP in each of their jurisdictions.

Table 1-1
MHMP Planning Committee

Name		Title	Representing
Bernie	Beier	Director	Office of Homeland Security
Marty	Bender	Deputy Chief	Fort Wayne Police Department
John	Bennett	Chief	New Haven Fire Department
Tony	Burrus		Safety and Environmental Affairs
Al	Frisinger	County Surveyor	Allen County Surveyor's Office
Dave	Fuller	Building Commissioner	Allen County Building Department
Don	Geradot	Councilor	Town of Monroeville
John	Hidy	Council	Town of Huntertown
Bob	Kennedy	Deputy Director	Fort Wayne Public Works
Brad	Kohrman	Lieutenant	Allen County Sheriff's Department
Edward	LaRocque	Director	Allen County EMA
John	McGauley		Allen County Commissioners PIO
Rodney	Renkenberger	Executive Director	Maumee River Basin Commission
Kris	Rice	Supervisor	Town of Woodburn Hwy Dept
Loren	Robertson	Administrator	Department of Health, 5th Floor
Paul	Steffens		Town of Leo-Cedarville
Jeff	Sorg		Allen County Highway Department
Maureen	Voors	Planner	Allen County Planning Department
Glenda	Whittern	Clerk Treasurer	Town of Grabill

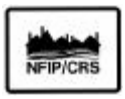
1.4 PUBLIC INVOLVEMENT IN THE PLANNING PROCESS

In November 2004, a media release was distributed to the newspapers in Allen County that have the largest distribution – The Journal Gazette and News Sentinel. The media release was titled "How do tornadoes, floods, and severe winter storms affect you?" The article identified the communities participating in the MHMP effort, the requirements of DMA 2000, and 4 hazard questions for interested residents to respond to. The News Sentinel published the article and as a result, the EMA Director received 1 letter and 2 phone calls, one of whom wished to schedule and appointment to discuss these issues.

A media release announcing a public meeting on April 13, 2005 was distributed to both the Journal Gazette and News Sentinel. The local CBS TV station reported on the public meeting and interviewed the Allen County EMA Director. Christopher B. Burke Engineering, Ltd. presented 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. Additional comments on the draft Allen County MHMP were collected during the public meeting. **Appendix 2** includes a copy of the media release.

1.5 INVOLVEMENT OF OTHER INTERESTED PARTIES

Neighboring EMA Directors in DeKalb County, Noble County, Whitley County, Huntington County, Wells County, and Allen County, as well as interested agencies, businesses, academia, and nonprofits were invited to review and comment on the draft Allen 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

This Section provides a broad perspective, brief history, and describes the make-up and development of Allen County.

2.1 TOPOGRAPHY

The topography of the St. Joseph River and the St. Mary's River basins is typical of the entire Maumee River basin, ranging from flat plains to rolling hills of low relief. The prominent features of the landscape are three terminal moraines which set the wedge-shaped pattern of the Maumee River drainage basin.

2.2 CLIMATE

The climate in Allen County varies greatly during the year from freezing temperatures in the winter to hot and humid weather in the summer. The seasonal range of temperature is a daily winter temperature of approximately 20 degrees Fahrenheit (^{o}F) to a daily summer maximum of about 85^{o}F. The average annual temperature is 50^{o}F. Annual precipitation varies from approximately 35.3 inches at Fort Wayne to 37.5 inches at Huntington and is well distributed throughout the year.

2.3 DEMOGRAPHICS

Allen County is the third most populous County in Indiana. According to Stats Indiana, Allen County experienced a population growth of 10.3% between 1990 and 2000. The 2003 population is estimated at 340,153. The population is projected to reach 346,653 by 2010. **Table 2-1** lists the individual 2003 population for the communities in Allen County.

Table 2-1
2003 Population

	Population	% County
Allen County	340,153	100.0
City of Fort Wayne	219,495	64.5
Town of Grabill	1,147	0.3
Town of Huntertown	2,335	0.7
Town of Leo-Cedarville	2,874	0.8
Town of Monroeville	1,275	0.4
City of New Haven	13,592	4.0
Town of Woodburn	1,629	0.5

(Stats Indiana, 2004)

In 2003, the median age of the population in Allen County was 34.3 years. Overall, 51% of the population was between 25 to 64 years old, with 28.1% being 25-44 and 23.2% being 45-64 years old. The third largest classification of the population is school aged children. Twenty percent of the population living in Allen County was 5 to 17 years. The majority, 84.7%, of the population in Allen County is white. Approximately 24% percent of the population in Allen County is married with children and 65.8% of residents own their home. **Appendix 3** contains more details on Allen County's demographics.

2.4 ECONOMY

In 2003, 94.5% of the population in Allen County was employed in the private sector (22.1%), retail trade (11.3%), construction (6.0%), professional technical services (4.3%), and health care and social services (12.4%). The annual per capita personal income in 2002 was $29,493 and the median household income in 2000 was $42,671. More people living outside of Allen County commuted into the County for work (11.8%) than those commuting out of the County for work (5.0%). **Appendix 3** contains more details on Allen County's economy.

2.5 INDUSTRY

Allen County, primarily because of its location, has achieved prominence as a progressive and rapidly growing area in northeastern Indiana. The advent of the Wabash-Erie Canal in the mid-1800s facilitates travel between the Great Lakes and the Mississippi River. Rail travel increased the convenience and economy of moving goods and services and hastened the area's expansion into the commercial, industrial, agrarian, and cultural community it is today.

The largest employers and 2004 employment statistics in Allen County include: Parkview Health Systems (4,254), Fort Wayne Community Schools (3,445), Lutheran Health Network (2,889), General Motors Truck Group (2,847), Lincoln Financial Group (2,000), Allen County Government (1,993), City of Fort Wayne (1,671), ITT Aerospace-Communications Division (1,634), Shambaugh & Sons, Inc. (1,500), Sirva (1,500), Verizon (1,459), Uniroyal Goodrich Tire Manufacturing (1,325), Waterfield Mortgage Co, Inc. (1,319), East Allen County Schools (1,283), International Truck and Engine Corporation (1,200), Raytheon Systems Co. (1,188), IPFW (1,148), Fort Wayne Developmental Center (1,100), and the US Postal Service (1,053).

2.6 LAND USE AND DEVELOPMENT TRENDS

Allen County's predominant land use is agriculture. Approximately 70% of the land area in the County is in agriculture production. The majority of the farmland in Allen County is located in the eastern third of the county in Milan, Maumee, Jefferson, Jackson, Madison, and Monroe Townships as well as in the communities of the Town of Huntertown and Town of Leo Cedarville. Residential development is approximately 20% of the total land use in Allen County and is predominantly concentrated in the central area of the County in the City of Fort, City of New Haven, and Aboite Township. **Table 2-2** compares the acres of land use classifications for the NFIP communities in Allen County.

Allen County is the third most populous County in the State. It is anticipated that the City of Fort Wayne, City of New Haven, Town of Huntertown, and Town of Leo Cedarville will continue to experience growth as more and more people choose to live and work in Allen County.

Table 2-2
Land Use (%)

	Agriculture	Institutional	Commercial	Residential	Industrial
Allen County	70	2	4	20	4
City of Fort Wayne	1	8	16	65	10
Town of Grabill	15	2	10	72	1
Town of Huntertown	50	6	2	40	2
Town of Leo Cedarville	40	12	5	40	3
Town of	15	5	4	75	1

Monroeville					
City of New Haven	5	8	12	70	5
City of Woodburn	20	5	10	60	5

(Estimates from Allen County Land Use Map, 2004)

2.7 RIVERS AND WATERSHEDS

According to the Indiana Department of Natural Resources (IDNR) and the Indiana Department of Environmental Management (IDEM), there are 192 waterways in Allen County. **Table 2-3** lists the waterways identified.

Three major rivers flow through Allen County – the St. Mary's River, St. Joseph River, and the Maumee River. The St Mary's River enters the County in the southeast and flows northwest to the center of the City of Fort Wayne where it joins with the St. Joseph River to form the headwaters of the Maumee River. The St. Joseph River enters the northeast portion of the County and continues southwest to the center of the City of Fort Wayne where it joins the St. Mary's River to form the Maumee River. The Maumee River flows east from its headwaters through the City of New Haven into Ohio. The Eel River drains the northwest portion of the County and flows west to the Wabash River. The southwest portion of the County is drained by the Little River which flows to the southwest prior to joining the Wabash River.

Table 2-3
List of Waterways

ABOITE CREEK	HAIFLY DITCH	RENNIGER DITCH
ALLEN DITCH	HAMM DITCH	RINEHOLD DITCH
ADAM-SCHLEMER-BAKER DITCH	HAMM INTERCEPTOR DITCH	ROBINSON CREEK
ALEX WARNER DITCH	HARBER DITCH	ROMY-BOBILYA DITCH
ANSPAUGH DITCH	HARDING DITCH	RORICK DITCH
AVER DITCH	HATCH DITCH	ROTH DITCH
BANDELIER DITCH	HENRY BANDELIER DITCH	ROY DELAGRANGE DITCH
BEAL TAYLOR DITCH	HISER DITCH	RSVR PK LAKE
BECKETTS RUN	HOFFMAN CREEK	RUSHART DITCH
BEEDY DITCH	HOFFMAN DITCH	RYAN DITCH
BELL PECKHAM DITCH	HOSPITAL DITCH	SCHAAF DITCH
BENDER CREEK	HOUK DITCH	SCHMIDT DITCH
BENDER DITCH	HUGUENARD DITCH	SCHNEIDER DITCH
BENWARD DITCH	HURSHTOWN RESERVOIR	SCHOPPMAN DRAIN
BERNING DRAIN	IMBACH DITCH	SCHUMACHER DITCH
BERTHAUD DITCH	JACKSON DITCH	SCOTT DITCH
BIG INDIAN CREEK	JACKSON NO 2 DITCH	SEEGAR CREEK
BLACK CREEK	JOHNSON DITCH	SEEGAR DITCH
BOBAY DITCH	JOHNSON DRAIN	SHARPENBURG DITCH
BOGER DITCH	JONES BRANCH	SHOAFF
BOHNKE DITCH	JONES DITCH	SHOAFF DAWSON DITCH
BOHNKE FLAUCH DRAIN	JUNK DITCH	SHORT DITCH

BONJOUR DITCH	KELL DITCH	SHUMACHER DITCH
BOTTERN DITCH	KILLIAN DITCH	SIMMERMAN DITCH
BRINDLE DITCH	KNAPP DITCH	SIX MILE CREEK
BROWN DITCH	KNOBLAUGH DITCH	SMITH-FRY DITCH
BULLERMAN BRANCH	KOESTER DITCH	SNYDER DITCH
BULLERMAN DITCH	KRUMLAUF BRANCH	SOLON DITCH
CEDAR CREEK	KURTZ AMSTUTZ DITCH	SORGEN DITCH
CEDAR LAKE	KURTZ DITCH	SOUTH BR MARIE DE LARME CREEK
CEDARVILLE RESERVOIR	LANGLEY DITCH	SOWERS DITCH
CHURUBUSCO BRANCH	LENNINGTON DITCH	SPINDLER DITCH
CLARK-CHAPMAN DITCH	LEPPER DITCH	SPY RUN CREEK
COCHOIT DITCH	LITTLE CEDAR CREEK	ST JOSEPH RIVER
CONVERSET DITCH	LITTLE INDIAN CREEK	ST MARYS RIVER
DENNIS DITCH	LITTLE RIVER	STOLTE DITCH
DEPTMER DITCH	LITTLE WABASH RIVER	SUMMERS DITCH
DOCTOR DITCH	LITZENBERG DITCH	SUTORIOUS DITCH
DRAIN DITCH 1	LOMONT DITCH	SWARTZ-CARNAHAN DITCH
DRAIN DITCH 2	MARSH DITCH	SWIFT DITCH
DRIVER DITCH	MARTIN BRANCH	THIELE DITCH
DUGLAY DUGLAY DITCH	MARTIN DITCH	TIERNAN DITCH
DURNELL DITCH	MASON DITCH	TRIER DITCH
EDGERTON/CARLSON DITCH	MAUMEE RIVER	VALENTINE DITCH
EDGERTON-CARSON DITCH	MC HENRY DITCH	VIBERG LAKE
EEL RIVER	MEIER DITCH	VILAND DITCH
EIGHTMILE CREEK	METCALF DITCH	WABASH AND ERIE CANAL
ELLISON DITCH	MILLER DITCH	WANN DITCH
ELY RUN	MIRROR LAKE	WAPPES DITCH
FAIRFIELD DITCH	MOONEY DITCH	WARD LAKE DITCH
FELGER DITCH	MOUREY DITCH	WARNER DITCH
FISHER DITCH	MUNCH DITCH	WERLING DITCH
FLATROCK CREEK	NARHWOLD DITCH	WERTZ DITCH
FLAUGH DITCH	NETTLEHORST DITCH	WHITE DITCH
GALLMEYER DITCH	NEUHAS DITCH	WHITE LAKE
GAR CREEK	NEUHAUS DITCH	WILBER DITCH
GELLER DITCH	NICKELSEN CREEK	WILLOW CREEK
GERKE DITCH	OBERHALTZER DITCH	WILLOW CREEK BRANCH
GRABNER DITCH	PAUL TRIER DITCH	WILLOW CREEK DITCH
GRAHAM MCCULLOCH DITCH	PIERSON DITCH	WITMER DITCH
GRESSLEY DITCH	PLEASANT RUN DITCH	WITZGALL DITCH
GRICE DITCH	POPITZ DITCH	WOODS DITCH
GROMEAUX DITCH	RAY DITCH	YANT DITCH
GROVER DITCH	REICHELDERFER DITCH	YOQUELET DITCH

(IDEM, 2004)

According to the IDEM, there are 61 14-digit Hydrologic Unit Code (HUC) watersheds in Allen County. The largest watershed is Little Cedar Creek-Black Creek Watershed (16,982.50 acres) and the smallest is Marie DeLarme Creek-Tustison Creek Watershed (0.20 acres). **Table 2-4** lists the 14-digit HUC watersheds in Allen County.

Table 2-4
14-Digit HUC Watersheds

14-Digit HUC #	14-digit HUC Name	Acres	% County
04100003090030	Cedar Creek-Dosch Ditch	16,609.03	3.87%
04100003090060	Little Cedar Creek-Black Creek	16,982.50	3.95%
04100003070030	St. Joseph River-Walker/Metcalf Ditches	14,955.27	3.48%
05120104020010	Blue River-Headwaters (Noble)	13,391.33	3.12%
04100005020040	Marie DeLarme Creek-Tustison Creek	2,809.45	0.65%
04100003090070	Willow Creek-Yant Ditch	9,705.53	2.26%
04100003070040	St. Joseph River-Swartz Carnahan Ditch	12,697.67	2.96%
04100005010140	Ham Interceptor Ditch	14,652.74	3.41%
04100003090080	Willow Creek-Willow Creek Ditch	10,992.05	2.56%
04100003070050	St. Joseph River-Cedarville Reservoir	12,911.75	3.01%
04100003090090	Cedar Creek-Cedar Canyons	6,784.31	1.58%
05120104010020	Eel River-Johnson Dt/Johnson Drain	15,796.76	3.68%
04100005020040	Marie DeLarme Creek-Tustison Creek	0.20	0.00%
04100005010110	Black Creek (Allen)	12,289.82	2.86%
05120104010010	Eel River-Berward/Shoaff Dawson Ditches	12,244.37	2.85%
04100005020040	Marie DeLarme Creek-Tustison Creek	272.65	0.06%
04100003100010	St. Joseph River-Ely Run	8,867.51	2.06%
05120104010030	Eel River-Smith/Krider Ditches	11,756.10	2.74%
04100005010090	Wilbur Ditch-Bottern Ditch	8,870.19	2.07%
04100005010120	Maumee River-Marsh Ditch	12,383.87	2.88%
04100003100020	St. Joseph River-Tiernan Ditch	9,336.74	2.17%
04100003100030	Becketts Run	6,008.51	1.40%
05120104010040	Eel River-Solon Ditch	14,520.21	3.38%
04100005010130	Maumee River-Viland Ditch	8,781.80	2.04%
04100005010080	Maumee River-Spindler Ditch	6,129.98	1.43%
04100005010100	Maumee River-Grover Ditch	6,730.21	1.57%
04100005010060	Maumee River-Sixmile Creek	7,769.58	1.81%
04100004060060	St. Mary's River-Sly Run Creek	9,862.85	2.30%
05120101100040	Seager Ditch	11,099.82	2.58%
04100003100040	St. Joseph River-Schoppman Drain	7,127.62	1.66%
04100005010040	Maumee River-Bullerman Ditch	5,614.46	1.31%
05120104010050	Gangwer Ditch	12,689.85	2.95%
05120101100020	Graham McCulloch Ditch #1	13,852.41	3.23%
04100005010070	Gar Ditch	7,720.71	1.80%
04100005010010	Maumee River-River Haven	9,176.54	2.14%
05120101100050	Aboite Creek-Beal Taylor Ditch	11,569.99	2.69%
04100004060050	St. Mary's River-Junk Ditch	11,381.93	2.65%
04100005010050	Martin Ditch	6,746.63	1.57%
04100005010030	Trier Ditch	7,580.00	1.77%

04100007120050	Flatrock Creek-White/Maurey Ditches	7,907.24	1.84%
04100005010020	Schmidt Ditch-Cochoit Ditch	10,464.13	2.44%
05120101100060	Aboite Creek-Big Indian/Little Indian Creeks	11,058.03	2.57%
04100007120040	Hoffman Creek-Bohnke Ditch-Ellison Ditch	14,694.50	3.42%
04100004060030	St. Mary's River-Snyder Ditch	12,655.36	2.95%
04100004060040	Fairfield Ditch-Harber/Deptmer Ditches	15,636.25	3.64%
04100007120030	Hoffman Creek-Headwaters	14,895.30	3.47%
04100007120020	Flatrock Creek-Brown Ditch	15,284.99	3.56%
05120101100070	Little River-Calf/Cow Creeks	15,471.00	3.60%
05120101100030	Little River-Allen	8,583.58	2.00%
04100004060020	Houk Ditch	11,017.53	2.57%
05120101100010	Robinson Creek	10,570.13	2.46%
04100004060010	St. Mary's River-Simmerman Ditch	13,798.62	3.21%
04100007100020	Blue Creek-Headwaters (OHIO)	0.55	0.00%
05120101110050	Eightmile Creek-Pleasant Run Ditch	7,961.34	1.85%
05120101110040	Eightmile Creek-Witzgall Ditch	7,465.11	1.74%
04100004050040	St. Mary's River-Buhlman Ditch	15,082.83	3.51%
05120101120020	Little River-Flat Creek (lower)	12,856.69	2.99%
04100007100020	Blue Creek-Headwaters (OHIO)	419.95	0.10%
04100004050050	Nickelsen Creek-Lambert Ditch	16,482.05	3.84%
04100004050030	St. Mary's River-Gerke/Weber Ditches	11,414.73	2.66%
05120101110030	Eightmile Creek-Big Creek	11,410.57	2.66%

(IDEM, 2004)

2.8 CRITICAL AND NON-CRITICAL FACILITIES

Critical facilities in Allen County were identified using the HAZUS-MH database, the MHMP Planning Committee, and the County's GIS database. There are 380 critical facilities in Allen County. These include 13 dams, 4 airports, 25 broadcast facilities, 2 potable water facilities, 4 military installations, 38 fire stations, 64 hazardous material sites, 38 medical facilities, 5 police stations, 1 power substations, 180 schools, and 6 wastewater treatment plants. **Exhibit 1** illustrates the location of critical facilities and **Appendix 4** lists the critical facilities by NFIP community.

Non-critical facilities were identified using the total building count available from the HAZUS-MH database. According to HAZUS-MH, there are 104,218 buildings in Allen County. These include 102,390 residential, 1,357 commercial, 218 industrial, 60 religious, 13 governmental, and 180 educational buildings. Critical facilities have not been separated from the total number of buildings identified here. The development of this MHMP focused on critical facilities; therefore, non-critical facilities are not mapped or listed by NFIP community as part of this planning exercise. It should be noted that HAZUS-MH is currently populated based on national data. Future updates to the County's MHMP should consider updating the HAZUS default data with more accurate, locally-based statistics.

3.0 RISK ASSESSMENT

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on risk assessment.

A risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard, and the impact on community assets. A risk assessment consists of three components: hazard identification, risk analysis (extent of hazard), and vulnerability analysis. Technically, these are three different items, but the terms are sometimes used interchangeably.

3.1 HAZARD IDENTIFICATION

The MHMP Planning Committee reviewed the list of natural hazards prepared by FEMA, identified hazards that affected Allen County, and decided which ones they would like to study in detail as part of this planning effort. In addition to the list of natural hazards provided by FEMA, the Planning Committee discussed the storage and transport of hazardous materials, utilities, levees, and special events with large crowds. As illustrated in **Table 3-1**, the Planning Committee decided to study dam failure, drought, earthquake, extreme heat, flood, severe winter storm, tornado, wind storm, hazardous materials, utility failure, levee failure, and special events with large crowds in detail as part of this planning effort.

Table 3-1
Hazard Identification

Hazards	Hazards Affecting Allen County	Hazards for Detailed Study
Avalanche	No	
Coastal Erosion	No	
Coastal Storm	No	
Dam Failure	**Yes**	**Yes**
Drought	**Yes**	**Yes**
Earthquake	**Yes**	**Yes**
Expansive Soils	No	No
Extreme Heat	**Yes**	**Yes**
Flooding	**Yes**	**Yes**
Hailstorm	No	No
Hurricane	No	
Land Subsidence	No	
Landslide	No	
Severe Winter Storm	**Yes**	**Yes**
Tornado	**Yes**	**Yes**
Tsunami	No	
Volcano	No	
Wildfire	No	
Wind storm	**Yes**	**Yes**
Hazardous Materials *(storage & transport)*	***Yes***	***Yes***

Utility Failure	***Yes***	***Yes***
Levees Failure	***Yes***	***Yes***
Special Events	***Yes***	***Yes***

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

Table 3-2 identifies an overall Calculated Priority Risk Index (CPRI) for all of the hazards studied as part of this planning effort. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-2
Calculated Priority Risk Index (CPRI) for Allen County

	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**
Flooding	Highly likely	Critical	12-24 hrs	> 1 wk	3.40
Severe Winter Storm	Likely	Limited	12-24 hrs	> 1 wk	2.65
Tornado/Wind Storm	Possible	Limited	< 6 hrs	< 6 hrs	2.20
Hazardous Materials	Possible	Limited	< 6 hrs	< 6 hrs	2.00
Utility Failure	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
Dam/Levee Failure	Unlikely	Limited	< 6 hrs	< 6 hrs	1.45
Earthquake	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Special Event	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Extreme Heat	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Drought	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3

According to the CPRI, flooding (3.40) ranked as the number one hazard in Allen County followed by severe winter storms (2.65), tornado/wind storms (2.20), the storage and transport of hazardous materials (2.00), utility failure (1.85), dam/levee failure (1.45) earthquake (1.45), special events (1.45), and extreme heat (1.3), and drought (1.3). **Section 3.2** includes a profile the individual hazards as well as a CPRI value for each NFIP community.

3.2 HAZARD PROFILE

3.2.1 FLOODING

Floods are the most common and widespread of all natural disasters--except fire. 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 National Flood Insurance Program, 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. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in mitigation steps now, such as, engaging in floodplain management activities, constructing barriers, such as levees, and purchasing flood insurance will help reduce the amount of structural damage to homes and financial loss from building and crop damage should a flood or flash flood occur.

The standard for flooding is a 1% 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 also 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, it is the flood elevation that has a 1% chance of being equaled or exceeded. It is possible to experience multiple 1% events in a relatively short period of time.

Previous Occurrences

Flooding is common in Allen County. The greatest known flood occurred in 1913. This event was approximately equivalent to a 500-year event on the St. Mary's and St Joseph Rivers and was equivalent to a 50-year event on the Maumee River. The greatest flood since the 500-year storm event of 1913 occurred in 1982 along the St. Mary's, St. Joseph, and Maumee Rivers on March 15-17, 1982. The National Weather Service reported that the snow accumulation in Northern Indiana at the time of this flood event had a snowmelt water equivalent of 3 to nearly 7 inches. The St. Mary's gage near Fort Wayne reached a peak of 19.64 feet and a discharge of 13,000 cubic feet per second (cfs). The St. Joseph River also crested at 13,000 cfs, and the Maumee River gage reached 25.05 feet and a discharge of 26,500 cfs. A record flood event, known as the "Firecracker Flood" was recorded in July 2003 and resulted in the St. Mary's River cresting at 21.20 feet with a discharge of 15,000 cfs.

The National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC) has identified 19 significant floods in Allen County between April 1994 and June 2004. The total property loss is estimated at $22 million during this same 11-year period. During January 2005, Allen County again experienced damaging floods as the result of several days of rain, followed by several inches of ice and snow, and then unseasonable warmer temperatures resulting in rapid ice and snow melt. **Table 3-3** lists the flood events recorded by NCDC.

Table 3-3
Historical Flood Data

Location	Date	Magnitude	Death/Injury	Property Damage
County +	4-12-94	NA	1/0	$500,000
County	6-26-95	NA (flash flood)	0/0	$0
County	5-16-96	NA (flash flood)	0/0	$20,000
Fort Wayne	7-23-97	NA (flash flood)	0/0	$0
Leo Cedarville	8-16-97	NA (flash flood)	0/0	$5,000
Fort Wayne	9-10-97	NA (flash flood)	0/0	$1,000
Fort Wayne	5-3-98	NA (flash flood)	0/0	$0
Fort Wayne	6-26-02	NA (flash flood)	0/0	$0
Fort Wayne	6-27-02	NA (flash flood)	0/0	$5,000,000
County +	7-5-03	NA	1/0	$16,500,000
Fort Wayne	7-21-03	NA (flash flood)	0/0	$50,000
County+	5-7-04	NA	0/0	$0
Fort Wayne	5-30-04	NA (flash flood)	0/0	$0
Fort Wayne	6-13-04	NA (flash flood)	0/0	$0
New Haven	6-13-04	NA (flash flood)	0/0	$0
Fort Wayne	6-13-04	NA (flash flood)	0/0	$0
Fort Wayne	6-13-04	NA (flash flood)	0/0	$0
Fort Wayne	9/3/2004	NA (flash flood)	0/0	$0
Fort Wayne	9/3/2004	NA (flash flood)	0/0	$0
TOTAL			2/0	$22,076,000

Note: “County+” denotes that more than Allen County was affected
(NCDC, 2005)

Geographic Location

Allen County lies in two major watersheds of North America. The western part of the County is in the Mississippi River watershed, which flows west and south to the Gulf of Mexico. The eastern part of the County sits in the Great Lakes Watershed, which flows east to the Atlantic Ocean.

The primary source of flooding in Allen County is from the St. Mary’s, St. Joseph, and Maumee Rivers and tributaries. The St Mary’s River enters the County in the southeast and flows northwest to the center of the City of Fort Wayne where it joins with the St. Joseph River to form the headwaters of the Maumee River. The St. Joseph River enters the northeast portion of the County and continues southwest to the center of the City of Fort Wayne where it joins the St. Mary’s River to form the Maumee River. The Maumee River flows east from its headwaters through the City of New Haven into Ohio. The Eel River drains the northwest portion of the County and flows west to the Wabash River. The southwest portion of the County is drained by the Little River which flows to the southwest prior to joining the Wabash River.

There are 22 USGS stream gages in Allen County. Three gages are located on the Maumee River, 4 gages are located on the St. Joseph River, 3 gages are located on Cedar Creek, 1 gage is located on the St. Mary’s River, and the remaining 11 are located on various tributaries throughout the County. The Town of Leo-Cedarville is warned of rising flood waters by 6 gages located on Willow Creek (1), Little Cedar Creek (1), Cedar Creek (3), and the St. Joseph River

(1). There are 10 stream gages in and around the City of Fort Wayne located on the St. Joseph River (3), Spy Run Creek (1), Harbour Ditch (1), St. Mary's River (1), Houk Ditch (1), and the Maumee River (3). In addition to these gages, there are 2 gages in Jackson Township, located on Flat Rock Creek and Hoffman Creek, 2 gages in Eel River Township, located on Johnson Drain and Eel River, and 1 gage in Aboite Township, located on Aboite Creek.

Hazard Extent

River flooding, flash flooding, and urban flooding are the predominant types of flooding that occur in Allen County. Although the primary sources of flooding in Allen County are the St. Mary's, St. Joseph, and Maumee Rivers and tributaries, flooding may also occur in urbanized areas as a result of increased imperviousness and inadequate drainage. Flooding is more common during the spring as a result of heavy rains combined with melting snow.

Allen County has experienced many flood disasters that resulted in both Presidential Major Disaster and Governor's Disaster Declarations. These disasters have caused millions of dollars in damages to homes, businesses, personal property, and agriculture. The most recent recorded flood events affecting Allen County occurred in June 2002 and July 2003 and resulted in $21.55 million in personal and property damage combined. Table 3-3 summarizes the historical flood data available through NCDC.

Due to the extent of potential economic loss caused by flooding and the concentration of flood-prone buildings within the City of Fort Wayne and vicinity, the estimation of potential loss for Allen County was divided into two regions. The first region included the City of Fort Wayne and vicinity, including the City of New Haven. More reliable and detailed flood damage analyses data were available for this region as a result of studies performed by the U.S. Army Corps of Engineers (USACE) in 1993 as part of a comprehensive engineering economic feasibility study for the Fort Wayne Diking Project and additional detailed studies performed by CBBEL that was published in 1995 as part of the Maumee River Basin Flood Control Master Plan prepared for the MRBC. The second region included the remaining area of Allen County, for which detailed data were not available. For this latter region, the GIS-based HAZUS-MH Flood Model was used along with the most recent GIS information to estimate potential economic loss as a result of a 100 and 500-year flood event.

Study Region 1: Fort Wayne and Vicinity

The first exhibit provided in **Appendix 6** shows an index map of the damage reaches identified in the City of Fort Wayne and its vicinity. The damage area is divided into sixty 64 damage reaches of which 9 are completely, and 1 partially, protected by the USACE's Diking Project. These damage reaches are also designated in the exhibit. Based on the 1995 MRBC Master Plan study, the remaining 54 reaches contain a total of 1,456 buildings subject to 100-year flood damage, of which 18 are critical facilities. Due to the level of protection afforded by the USACE's Diking Project being limited to the 100-year flood, all 64 stream reaches will be subject to flood damages in an event of a 500-year flood, which is estimated to damage approximately 7,369 buildings, of which 23 are critical facilities. A detailed breakdown of the number of buildings expected to sustain some level of damage as a result of a 100-year and 500-year flood, summarized by each major stream within the study area, is provided in **Table 3-4**.

Table 3-4
Breakdown of Number of Buildings Subject to Flood Damage in Fort Wayne and Vicinity

Stream	100-Year Flood (1% Flood Event) [1]			500-Year Flood (0.2% Flood Event) [1]		
	Residential	Non-Residential	Total	Residential	Non-Residential	Total
St. Mary's River	479 [2]	65 [2]	544 [2]	3,207	280	3,487
Maumee River	146 [2]	12 [2]	158 [2]	1,895	60	1,955
St. Joseph River	28 [2]	0 [2]	28 [2]	465	13	478
Spy Run Creek	114 [2]	6 [2]	120 [2]	177	27	204
Junk Ditch	48	42	90	117	52	169
Fairfield Ditch	487	2	489	622	12	634
Trier Ditch	17	10	27	419	23	442
TOTAL	1,319	137	1,456	6,902	467	7,369

Notes: 1 Numbers represent the number of structures that, based on the USACE 1993 study, sustain some damage regardless of their first floor elevations.
2 Numbers shown exclude the buildings protected by the USACE's Diking Project.

To estimate the expected economic loss associated with flooding within the City of Fort Wayne and vicinity, the summary results of the detailed building damage analyses published in the 1995 MRBC Master Plan study reports was extracted from the report and the extracted values were first adjusted to bring the estimated average annual damage values from 1993 dollar basis to 2005 dollar basis. Assuming a 5% average annual appreciation rate, a correction factor of 1.8 resulted from standard cash flow analysis. The adjusted total building loss values were then multiplied by a factor of 2.0 (based on typical HAZUS results) to obtain an estimate of the total economic loss due to flooding that would not only include the estimate of damage to buildings and their contents, but would also include such losses as business interruption losses, temporary living expenses for displaced residents, and emergency response costs. **Table 3-5** provides a summary of the noted calculations. In addition to the estimated average annual damage values, Table 3-5 also shows an estimate of the present worth of losses prevented over a 50-year period if mitigation measures capable of eliminating all losses were put in place. This latter estimate was calculated by multiplying the average annual estimates by a factor of 18.25 based on standard cash flow calculation methodologies assuming a 5% interest rate.

Table 3-5
Estimated Flood Damage Loss in Fort Wayne and Vicinity

Stream	Estimated Average Annual Damage based on 1993 Values ($)	Estimated Average Annual Damage based on 2005 Values ($)	Estimated Average Annual Total Economic Loss ($)	Estimated Present Worth of Losses that can be Prevented ($)
St. Mary's River	$558,830	$1,005,894	$2,011,788	$36,715,131
Maumee River	$96,650	$173,970	$347,940	$6,349,905
St. Joseph River	$70,330	$126,594	$253,188	$4,620,681
Spy Run Creek	$604,130	$1,087,434	$2,174,868	$39,691,341
Junk Ditch	$682,520	$1,228,536	$2,457,072	$44,841,564
Fairfield Ditch	$562,690	$1,012,842	$2,025,684	$36,968,733

Trier Ditch	$43,100	$77,580	$155,160	$2,831,670
TOTAL	$2,618,250	$4,712,850	$9,425,700	$172,019,025

As Table 3-5 indicates, the total average annual economic loss as a result of flooding in Fort Wayne and vicinity is expected to be approximately $9.4 million, with a present worth value estimated at about $172 million based on a 50-year planning period/project life.

Study Region 2: Remaining Area of Allen County

As part of this planning process, the GIS-based HAZUS-MH Flood Model was used along with the most recent GIS information to simulate a 100 and 500-year flood event for stream reaches within Allen County that were outside the Fort Wayne and vicinity (region 1). The HAZUS-MH Flood Model estimates that a 100-year event would result in $32 million in total economic loss, $31.44 million of which would be in building loss in these areas. Based on the HAZUS estimates, 1,483 buildings (4 critical facilities) will be damaged as a result of a 100-year flood within the Region 2. For the 500-year flood, the total economic loss was estimated by HAZUS to be approximately $37 million for this region. The number of buildings damaged was estimated to be 143. HAZUS also estimated that 4 critical facilities would be damaged within this region as a result of a 500-year flood event.

Since the HAZUS-MH Flood Model is still under development, the data generated should be used with some reservation. Subsequent releases may address the following limitations. Estimated losses for an individual building are actually averages for a group of similar buildings and although the buildings are similar, they may experience vastly different damage and losses during a flood. The replacement costs associated with schools and transportation facilities are based on national data and may not reflect actual local conditions.

The HAZUS-MH Flood Model predicted that a 500-year flood event would result in a total of $37 million in economic loss for Allen County.

Repetitive Loss Properties

FEMA defines a repetitive loss structure as a structure, covered by a contract of flood insurance issued under the NFIP, that has suffered flood damage on two occasions during a 10-year period that ends on the date of the second loss, in which the cost to repair the flood damage, on average, equaled or exceeded 25% of the market value of the structure at the time of each flood loss. There are 70 repetitive flood insurance losses in Allen County. Four are in the City of New Haven, 53 in the City of Fort Wayne, and 13 in unincorporated Allen County. The general location of these structures is shown on **Exhibit 3**.

Probability of a Future Event

The probability of a flood in Allen County is highly likely. The magnitude or severity of flooding in Allen County is critical and typically results in substantial damage and/or disruption to homes, businesses, and transportation corridors. Through the accuracy of the National Weather Service (NWS) NEXRAD RADAR and Local TV stations Doppler Radar, there can be as much as a 24-hour or greater warning time that a flood event will occur. However, the volume of water is often greater than prevention measures can withstand. In Allen County, the duration of a rain event or snow melt that results in flood event can disrupt the residents and businesses in the County for more than a week at a time.

Table 3-6 identifies the Calculated Priority Risk Index (CPRI) for a flood in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-6
Calculated Priority Risk Index (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**
Allen County	Highly likely	Critical	12-24 hrs	> 1 wk	3.40
City of Fort Wayne	Highly likely	Critical	12-24 hrs	> 1 wk	3.40
Town of Grabill	Possible	Limited	12-24 hrs	< 1 day	2.00
Town of Huntertown	Possible	Limited	12-24 hrs	< 1 day	2.00
Town of Leo-Cedarville	Likely	Limited	12-24 hrs	< 1 day	2.45
Town of Monroeville	Possible	Limited	12-24 hrs	< 1 day	2.00
City of New Haven	Highly likely	Critical	12-24 hrs	> 1 wk	3.40
City of Woodburn	Possible	Limited	12-24 hrs	< 1 day	2.00

According to the CPRI, the probability of a flood in Allen County, the City of Fort Wayne, and the City of New Haven is highly likely. The St. Joseph, St. Mary's, and Maumee Rivers and their tributaries are the predominant source of flooding in Allen County. The magnitude or severity of flooding in these three communities can be significant and may impact the community for more than a week.

Based on the historical data and knowledge among local planning and emergency management professionals, flooding ranked 1st (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Based on the estimated number of buildings subject to flood damage in the Fort Wayne and vicinity area (Region 1) as well as the HAZUS-MH analyses performed for Region 2, it is estimated that 6,585 people or 2.2% of the Allen County population could be at risk during a flood event. The total potential building loss for buildings vulnerable to flooding in Allen County is estimated to be $837 million. For the purpose of vulnerability analysis, the total potential loss to buildings vulnerable to flood was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was

determined using national averages for both structure and content replacement. All non-residential buildings were calculated at the HAZUS-MH commercial replacement value.

Six percent or 22 critical facilities in Allen County could be at risk, and 3% or 2,917 non-critical facilities in Allen County could be at risk, as a result of a flood event. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to a flood.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within the County should grow proportionally with the predicted population growth.

3.2.2 SEVERE WINTER STORM

A 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 lasts 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 rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can impact 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. Residents, travelers, and livestock may become isolated or stranded without adequate 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 National Weather Service (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.

Previous Occurrences

There have been a number of severe winter storms recorded in Allen County. The NCDC has recorded 1 extreme cold, 1 ice storm, 7 heavy snow, and 4 winter storm events since January 1994. The Allen County Comprehensive Hazards Analysis identified a countywide shutdown of businesses and services as the result of a 1999 snowstorm. Local fire departments were forced to borrow four-wheel drive vehicles from car dealerships to use in rescuing and transporting

stranded residents during this event. **Table 3-7** illustrates the historical winter storm data collected by NCDC.

Table 3-7
Historical Severe Winter Storm Data

Location	Date	Type	Magnitude	Death/ Injury	Property Damage
County +	1-14-94	Extreme cold	NA	3/0	$5,000,000
County +	2-25-94	Heavy snow	NA	0/0	$0
County +	12-8-95	Winter storm	NA	0/0	$0
County +	12-18-95	Winter storm	NA	0/0	$0
County +	1-2-96	Winter storm	NA	0/0	$0
County +	1-2-99	Heavy snow	NA	0/0	$0
County +	3-11-00	Heavy snow	NA	0/0	$0
County +	12-13-00	Heavy snow	NA	0/0	$0
County +	12-16-00	Heavy snow	NA	0/0	$0
County +	1-31-02	Ice Storm	NA	0/1	$10,000
County +	12-24-02	Heavy snow	NA	0/0	$0
County +	2-22-03	Heavy snow	NA	0/0	$0
County +	1-26-04	Winter storm	NA	0/0	$0
TOTAL				3/1	$5,010,000

Note: "County+" denotes that more than Allen County was affected
(NCDC, 2004)

Geographic Location
The impact of a severe winter storm is typically felt regionally, over several counties or states, rather than isolated within a single county.

Hazard Extent
Severe winter storms including freezing rain, sleet, heavy snow, blizzards, icy conditions, extreme low temperatures, and strong winds are common during the winter months in Allen County. Such conditions can result in substantial personal and property damage.

The personal and property damage as the result of a severe winter storm can be significant. According to the NCDC data, a total of 3 deaths and $5 million in property damage have resulted within the past 11 years from severe winter storms that have affected Allen County.

Probability of Future Event
The probability of a severe winter storm causing disruption to residents and businesses in Allen County is likely with a magnitude and/or severity that can affect the entire county. Although the warning time associated with severe winter storms is typically 12-24 hours, the duration of the event could last for more than 1 week.

Table 3-8 identifies the Calculated Priority Risk Index (CPRI) for a severe winter storm in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-8
Calculated Priority Risk Index (CPRI) for Severe Winter Storm

	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**
Allen County	Likely	Limited	12-24 hrs	> 1 wk	2.65
City of Fort Wane	Likely	Limited	12-24 hrs	> 1 wk	2.65
Town of Grabill	Likely	Limited	12-24 hrs	> 1 wk	2.65
Town of Huntertown	Likely	Limited	12-24 hrs	> 1 wk	2.65
Town of Leo-Cedarville	Likely	Limited	12-24 hrs	> 1 wk	2.65
Town of Monroeville	Likely	Limited	12-24 hrs	> 1 wk	2.65
City of New Haven	Likely	Limited	12-24 hrs	> 1 wk	2.65
City of Woodburn	Likely	Limited	12-24 hrs	> 1 wk	2.65

According to the CPRI, no one community seems to be affected more than another by a severe winter storm.

Based on the historical data and knowledge among local planning and emergency management professionals, severe winter storms ranked 2nd (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk during a severe winter storm, the entire population of Allen County has been identified. Total loss to buildings was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement.

One hundred percent or 380 critical facilities and 100% or 103,841 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to a severe winter storm event.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within county should grow proportionally with the predicted population growth.

3.2.3 TORNADO/WIND STORM

Tornadoes are defined as violently rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground. However, the violently rotating column of air may reach the ground very quickly – becoming a tornado. If there is debris being picked up or blown around by the "funnel cloud" – it's reached the ground and it's a tornado.

A tornado is spawned by a thunderstorm, which is produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally March through June in Indiana, although tornadoes can occur at any time of year. They tend to occur in the afternoons and evenings: over 80 percent of all tornadoes strike between 3 pm and 9 pm, but can occur at any time of day or night. Tornadoes are found most frequently in the United States east of the Rocky Mountains.

While most tornadoes (69%) have winds of less than 100 miles per hour, they can be much stronger. Although violent tornadoes (winds greater than 205 mph) account for only 2% of all tornadoes, 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. Once 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.

Wind storms 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 or greater, either sustaining or gusting.

Previous Occurrences

Twenty-three tornadoes and 167 wind storms have been reported in Allen County since July 1950. Significant wind storm events are characterized by top wind speeds achieved during the event. Tornadoes, on the other hand, are often classified using the Fujita Scale of tornado intensity. Tornado intensity ranges from low intensity (F0) tornadoes with effective wind speeds of 40-70 miles-per-hour (mph) to high intensity (F5) tornadoes with effective wind speeds of 261 to over 318 mph. Tornados recorded for Allen County include 7 F0, 10 F1, 4 F2, and 1 F3 tornadoes. Wind storms have been recorded with magnitudes ranging from 50 knots (57.5 mph) to 77 knots (88.61mph). **Table 3-9** and **Table 3-10** summarize the historic tornado and wind storm data available from NCDC. Indiana's "tornado season" is typically from March through June. Wind storms have historically occurred year round with the greatest frequency and damage occurring primarily in May, June, and July.

Table 3-9
Historical Tornado Data

Location	Date	Magnitude	Death/Injury	Property Damage
County	7/19/1950	F2	0/0	$0
County	3/18/1953	F2	0/0	$25,000
County	5/11/1957	F1	0/0	$0
County	7/18/1959	F	0/0	$0
County	4/29/1963	F1	0/1	$3,000

Location	Date	Magnitude	Death/Injury	Property Damage
County	6/19/1964	F0	0/0	$0
County	6/6/1965	F1	0/0	$25,000
County	5/16/1968	F3	0/0	$0
County	5/14/1972	F1	0/0	$25,000
County	5/10/1973	F1	0/0	$25,000
County	5/10/1973	F1	0/0	$25,000
County	5/10/1973	F1	0/0	$250,000
County	3/12/1976	F1	1/0	$25,000
County	4/10/1978	F1	0/0	$250,000
County	3/28/1985	F1	0/0	$3,000
County	7/6/1987	F0	0/0	$3,000
County	10/8/1992	F2	0/9	$250,000
Monroeville	5/3/1998	F0	0/0	$0
New Haven	5/3/1998	F0	0/0	$0
Monroeville	5/3/1998	F0	0/0	$0
Grabill	5/18/2001	F0	0/0	$1,000
Ft. Wayne	5/26/2001	F0	0/0	$2,000
Ft. Wayne	5/26/2001	F2	0/1	$6,500,000
TOTAL			1/13	$7,412,000

Note: “County+” denotes that more than Allen County was affected
(NCDC, 2004)

Table 3-10
Historical Wind Storm Data

Location	Date	Magnitude (knots)	Magnitude (mph)	Death/ Injury	Property
County	3/3/1955	NA	NA	0/0	$0
County	5/28/1955	68	78	0/0	$0
County	8/13/1956	NA	NA	0/0	$0
County	4/5/1958	55	63	0/0	$0
County	5/22/1958	60	69	0/0	$0
County	5/22/1959	NA	NA	0/0	$0
County	6/1/1961	NA	NA	0/0	$0
County	6/13/1961	60	69	0/0	$0
County	4/30/1962	77	89	0/0	$0
County	7/19/1963	50	58	0/0	$0
County	6/12/1964	NA	NA	0/0	$0
County	6/15/1964	60	69	0/0	$0
County	7/22/1965	NA	NA	0/0	$0
County	7/23/1965	NA	NA	0/0	$0
County	8/27/1965	56	64	0/0	$0
County	9/14/1965	NA	NA	0/0	$0
County	11/12/1965	58	67	0/0	$0
County	4/9/1967	50	58	0/0	$0
County	6/11/1968	58	67	0/0	$0

Location	Date	Magnitude (knots)	Magnitude (mph)	Death/ Injury	Property
County	5/31/1969	60	69	0/0	$0
County	10/11/1969	NA	NA	0/0	$0
County	4/29/1970	50	58	0/0	$0
County	5/12/1970	NA	NA	0/0	$0
County	5/15/1970	NA	NA	0/0	$0
County	5/15/1970	55	63	0/0	$0
County	5/25/1973	NA	NA	0/0	$0
County	6/23/1973	NA	NA	0/0	$0
County	6/26/1973	52	60	0/0	$0
County	10/4/1973	NA	NA	0/0	$0
County	6/20/1974	55	63	0/0	$0
County	6/20/1974	NA	NA	0/0	$0
County	5/25/1975	51	59	0/0	$0
County	9/3/1975	NA	NA	0/0	$0
County	5/2/1976	51	59	0/0	$0
County	7/7/1977	50	58	0/0	$0
County	6/20/1979	56	64	0/0	$0
County	8/5/1979	NA	NA	0/0	$0
County	6/2/1980	NA	NA	0/0	$0
County	6/2/1980	NA	NA	0/0	$0
County	6/7/1980	61	70	0/0	$0
County	7/5/1980	58	67	0/0	$0
County	7/5/1980	69	79	0/0	$0
County	4/28/1981	51	59	0/0	$0
County	4/28/1981	65	75	0/0	$0
County	5/31/1982	NA	NA	0/0	$0
County	6/15/1982	61	70	0/0	$0
County	6/15/1982	51	59	0/0	$0
County	6/15/1982	NA	NA	0/0	$0
County	6/15/1982	NA	NA	0/0	$0
County	6/20/1982	NA	NA	0/0	$0
County	6/20/1982	NA	NA	0/0	$0
County	7/1/1983	51	59	0/0	$0
County	3/28/1985	NA	NA	07	$0
County	3/28/1985	NA	NA	0/0	$0
County	7/9/1985	NA	NA	0/0	$0
County	7/9/1985	NA	NA	0/0	$0
County	8/14/1985	51	59	0/0	$0
County	9/9/1985	NA	NA	0/0	$0
County	5/6/1986	51	59	0/0	$0
County	5/6/1986	NA	NA	0/0	$0
County	6/27/1986	NA	NA	0/0	$0
County	6/27/1986	NA	NA	0/0	$0
County	7/25/1986	NA	NA	0/0	$0

Location	Date	Magnitude (knots)	Magnitude (mph)	Death/ Injury	Property
County	8/26/1986	52	60	0/0	$0
County	8/25/1986	52	60	0/0	$0
County	8/2/1987	NA	NA	0/0	$0
County	8/2/1987	NA	NA	0/0	$0
County	6/20/1988	61	70	1/7	$0
County	7/15/1988	NA	NA	0/0	$0
County	7/15/1988	NA	NA	0/0	$0
County	7/15/1988	NA	NA	0/0	$0
County	9/19/1988	0	0	0/0	$0
County	10/17/1988	52	60	0/0	$0
County	11/10/1988	0	0	0/0	$0
County	5/31/1989	0	0	0/0	$0
County	7/11/1989	75	83	0/0	$0
County	7/27/1989	0	0	0/0	$0
County	8/5/1989	0	0	0/0	$0
County	9/9/1989	0	0	0/0	$0
County	11/27/1989	50	58	0/0	$0
County	11/27/1989	NA	NA	0/0	$0
County	11/27/1989	NA	NA	0/0	$0
County	6/2/1990	NA	NA	0/0	$0
County	8/28/1990	NA	NA	0/0	$0
County	3/27/1991	NA	NA	0/0	$0
County	6/15/1991	NA	NA	0/1	$0
County	6/15/1991	NA	NA	0/0	$0
County	6/15/1991	NA	NA	0/0	$0
County	6/17/1992	NA	NA	0/0	$0
County	6/23/1992	NA	NA	0/0	$0
County	7/2/1992	NA	NA	0/0	$5,000
County	7/14/1992	NA	NA	0/0	$50,000
County	10/8/1992	NA	NA	0/4	$0
New Haven	4/15/1993	NA	NA	0/0	$5,000
Woodburn	8/31/1993	NA	NA	0/0	$5,000
County	6/16/1994	NA	NA	0/0	$50,000
Woodburn	7/8/1994	NA	NA	0/0	$120,000
Fort Wayne	7/20/1994	NA	NA	0/0	$8,000
County	11/21/1994	NA	NA	0/0	$0
Allen County	11/27/1994	NA	NA	0/0	$2,000
Fort Wayne	6/26/1995	NA	NA	0/0	$2,000
County	7/15/1995	NA	NA	0/0	$1,000
County	7/15/1995	NA	NA	0/0	$0
County	7/22/1995	NA	NA	0/0	$0
County	7/22/1995	NA	NA	0/0	$40,000
Fort Wayne	7/24/1996	65	75	0/0	$1,000
Fort Wayne	10/29/1996	54	62	0/0	$10,000

Location	Date	Magnitude (knots)	Magnitude (mph)	Death/ Injury	Property
County	10/30/1996	50	58	0/0	$0
Fort Wayne	5/18/1997	NA	NA	0/0	$0
Fort Wayne	6/25/1997	NA	NA	0/0	$20,000
Cedarville	7/8/1997	70	81	0/0	$1,000
Monroeville	7/18/1997	NA	NA	0/0	$5,000
Fort Wayne	7/26/1997	65	75	0/0	$0
Fort Wayne	7/27/1997	NA	NA	0/0	$0
Fort Wayne	6/28/1998	NA	NA	0/0	$0
Fort Wayne	6/29/1998	65	75	0/0	$0
Fort Wayne	7/19/1998	50	58	0/0	$50,000
Fort Wayne	7/19/1998	60	69	0/0	$100,000
Fort Wayne	7/21/1998	50	58	0/0	$150,000
Fort Wayne	8/24/1998	52	60	0/0	$0
Fort Wayne	8/24/1998	NA	NA	0/0	$0
Fort Wayne	11/10/1998	NA	NA	0/1	$30,000
Fort Wayne	5/5/1999	NA	NA	0/0	$0
New Haven	7/26/1999	NA	NA	0/0	$3,000,000
Monroeville	7/26/1999	NA	NA	0/0	$0
Huntertown	9/28/1999	NA	NA	0/0	$1,000,000
Huntertown	5/9/2000	NA	NA	0/2	$0
Huntertown	5/9/2000	61	70	0/7	$0
Fort Wayne	5/9/2000	NA	NA	0/0	$5,000
Fort Wayne	5/9/2000	NA	NA	0/0	$0
Fort Wayne	5/18/2000	NA	NA	0/0	$0
Fort Wayne	5/18/2000	NA	NA	0/0	$0
Fort Wayne	6/14/2000	NA	NA	0/0	$0
Huntertown	6/14/2000	NA	NA	0/0	$100,000
Fort Wayne	6/14/2000	51	59	0/0	$0
Fort Wayne	6/14/2000	NA	NA	0/0	$0
Fort Wayne	6/14/2000	NA	NA	0/0	$0
Fort Wayne	8/2/2000	NA	NA	0/0	$25,000
Grabill	8/6/2000	NA	NA	0/0	$0
Fort Wayne	9/11/2000	NA	NA	0/0	$0
Fort Wayne	4/6/2001	NA	NA	0/0	$2,000
Fort Wayne	6/19/2001	NA	NA	0/0	$5,000
Fort Wayne	8/18/2001	NA	NA	0/0	$0
Fort Wayne	8/18/2001	NA	NA	0/0	$0
Fort Wayne	8/18/2001	NA	NA	0/0	$0
Woodburn	11/24/2001	52	60	0/0	$0
County	3/9/2002	55	63	0/0	$0
Fort Wayne	6/26/2002	NA	NA	0/0	$0
Fort Wayne	6/28/2003	50	58	0/0	$0
Fort Wayne	7/4/2003	50	58	0/0	$0
Fort Wayne	7/7/2003	50	58	0/0	$0

Location	Date	Magnitude (knots)	Magnitude (mph)	Death/ Injury	Property
Fort Wayne	7/8/2003	50	58	0/0	$0
Woodburn	7/8/2003	51	59	0/0	$0
Fort Wayne	7/21/2003	50	58	0/0	$0
Fort Wayne	8/26/2003	50	58	0/0	$50,000
Fort Wayne	8/26/2003	50	58	0/0	$0
Fort Wayne	8/26/2003	51	59	0/0	$0
County	11/12/2003	56	64	0/0	$0
County	3/5/2004	52	60	0/0	$0
Fort Wayne	5/21/2004	61	70	0/0	$0
Fort Wayne	5/21/2004	55	63	0/0	$0
Woodburn	5/23/2004	50	58	0/0	$0
Fort Wayne	6/13/2004	50	58	0/0	$0
Fort Wayne	6/14/2004	50	58	0/0	$0
Fort Wayne	7/3/2004	50	58	0/0	$0
Fort Wayne	7/6/2004	50	58	0/0	$0
Fort Wayne	7/6/2004	50	58	0/0	$0
Total					$4,842,000

Note: "County+" denotes that more than Allen County was affected
(NCDC, 2004)

Geographic Location

Tornados in Indiana generally come from the south through the west and move to the north through the east. In Allen County, the predominant tornado path seems to be from the southwest to the northeast. Several tornados have been recorded in Lafayette (2), Lake (2), Washington (2), Wayne (7), Pleasant (1), Allen (5), St. Joseph (2), Cedar Creek (1), Springfield (1), Milan (1), Madison (2), Monroe (2), and Jackson (1) Townships. The Town of Monroeville, Town of Grabill, City of New Haven, and City of Fort Wayne have all been directly affected by tornado activity in the County. **Exhibit 4** illustrates the historical tornado activity in Allen County.

There are 54 tornado sirens in Allen County as shown on Exhibit 4. There are 14 sirens in the City of Fort Wayne, 5 in the City of New Haven, 3 in both the Town of Leo-Cedarville and the City of Woodburn, 2 in both the Town of Monroeville and the Town of Huntertown, and one in the Town of Grabill. There are 24 other sirens spread throughout the rest of the County.

Hazard Extent

According to the NCDC, the most significant tornado in Allen County was an F2 event on May 26, 2001, which is responsible for 3 injuries, and $6.5 million in property damage.

Outdoor warning sirens are necessary to warn the population of possible tornado or wind storm activity. The Town of Grabill has a single siren which appears to provide sufficient coverage for each of its critical facilities. The Town of Huntertown is covered by two sirens; however a significant portion of the Town, including a nursing home, a police station, and a school is not adequately covered. The Town of Leo-Cedarville is covered by 3 sirens. These sirens cover all but a small area of the northwest portion of the Town. There are no critical facilities located in the portion of the Town not covered by sirens. The Town of Monroeville has 2 sirens and all

urban areas and critical facilities are sufficiently covered by the sirens. The City of New Haven is covered by 5 sirens, which appear to adequately cover all critical facilities with the exception of one school and the majority of urban areas within the City. The City of Woodburn and its critical facilities are adequately covered by 3 sirens. The City of Fort Wayne is covered by 17 sirens. However, there are numerous relatively large areas that are not adequately covered by sirens. In total, there are 42 schools, eight colleges, 2 airports, 8 fire stations, a police station, 2 hospitals, and 20 hazardous materials facilities, within the City that are not covered by the tornado sirens. There are numerous other critical facilities within the unincorporated areas of the County that are not covered by Tornado sirens, including numerous schools located within Aboite, Pleasant, Washington, Cedar Creek, St. Joseph, Marion, Madison, Jefferson, Milan, and Springfield Townships.

Probability of Future Event

The probability of a tornado event in Allen County is possible. The warning time of a tornado or wind storm is limited and may be as little as only a few hours. The duration of a tornado or wind storm event is relatively short as well. However, the magnitude or severity of the hazard can be significant.

Table 3-11 identifies the Calculated Priority Risk Index (CPRI) for a tornado and/or wind storm in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-11
Calculated Priority Risk Index (CPRI) for Tornado/Wind Storm

	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**
Allen County	Possible	Limited	< 6 hrs	< 6 hrs	2.20
City of Fort Wayne	Possible	Limited	< 6 hrs	< 6 hrs	2.20
Town of Grabill	Possible	Limited	< 6 hrs	< 6 hrs	2.20
Town of Huntertown	Possible	Limited	< 6 hrs	< 6 hrs	2.20
Town of Leo-Cedarville	Possible	Limited	< 6 hrs	< 6 hrs	2.20
Town of Monroeville	Possible	Limited	< 6 hrs	< 6 hrs	2.20
City of New Haven	Possible	Limited	< 6 hrs	< 6 hrs	2.20
City of Woodburn	Possible	Limited	< 6 hrs	< 6 hrs	2.20

According to the CPRI and the unpredictable nature of tornadoes and wind storms, no one community seems to be affected more than another by a tornado or wind storm.

Based on the historical data and knowledge among local planning and emergency management professionals, tornado and wind storm ranked 3rd (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk during a tornado/wind storm, the entire population of Allen County (340,153) has been identified. Total loss to buildings was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement.

One hundred percent or 380 critical facilities and 100% or 103,841 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to a tornado/wind storm.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within the County should grow proportionally with the predicted population growth.

3.2.4 STORAGE AND TRANSPORT OF HAZARDOUS MATERIALS

An explosion is the sudden loud release of energy and a rapidly expanding volume of gas that occurs when a gas explodes. Explosions result from the ignition of volatile products such as petroleum products, natural and other flammable gases, hazardous materials/chemicals, dust, and bombs. While an explosion surely may cause death, injury and property damage, a fire routinely follows which may cause further damage and inhibit emergency response. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials response units.

Previous Occurrences

According to the Allen County Comprehensive Hazard Analysis, there has not been a significant large scale hazardous material incident in Allen County. Local firefighters, hazardous material teams, emergency management, and local law enforcement have dealt with a number of minor hazardous material releases. **Table 3-12** lists past significant land transportation accidents involving hazardous materials in Allen County. There have been numerous other small spills, mostly of petroleum products; however, they are too many to list in detail.

Table 3-12
Significant Land Transportation Accidents in Allen County

Date	Location	Comments
8/1997	Fort Wayne	Tire fire.
11/1999	Interstate 69	A diesel fuel tanker overturned and caused a lengthy shutdown on Interstate 69.
Multiple	U.S. 24	Numerous occasions when tankers and semi-trailers have overturned or been involved in vehicular accidents

Years		that have forced the closure of U.S. 24.

(Allen County Comprehensive Hazard Analysis, 2003)

Geographic Location

According to HAZUS-MH, there are 64 hazardous material sites in Allen County. Fifty-seven are located in the City of Fort Wayne or New Haven, 3 are located in the Town of Grabill, one is located in the City of Woodburn, and the others are located in or near other non NFIP communities in Allen County. However, according to the Tier II Reporting System maintained by IDEM and the Allen County EMA, there are 90 hazardous material sites and 100 sites with extremely hazardous substances (EHS).

The Hazardous Waste Notifiers database, maintained by IDEM's Office of Land Quality, identifies 825 hazardous material facilities in Allen County. These include:

- 33 large quantity generators of hazardous waste
- 75 small quantity generators of hazardous waste
- 322 conditional exempt generators of hazardous waste
- 395 no longer a generator
- 27 transporters of hazardous waste (5 are also classified as conditionally exempt, 3 are also classified as small quantity generators, and 3 are also classified as large quantity generators).
- 3 closed treatment, storage, disposal facility (3 are also classified as large quantity generators).

Also identified by IDEM's Office of Land Quality, are 2,930 underground storage tanks (UST) and 166 leaking underground storage tanks (LUST). **Table 3-13** lists the community within which these are located.

Table 3-13
Underground Storage Tanks

	Underground Storage Tanks (UST)	Leaking Underground Storage Tanks (LUST)
Allen County	82	1
City of Fort Wayne	2566	160
Town of Grabill	32	-
Town of Huntertown	39	3
Town of Leo- Cedarville	22	-
Town of Monroeville	34	-
City of New Haven	116	-
City of Woodburn	39	2

(IDEM, 2004)

The communities in Allen County are intersected and joined by seven major roads and six rail corridors which converge on the City of Fort Wayne. These routes may be used to transport hazardous materials. Interstate 69, travels through the City of Fort Wayne and between the Towns of Huntertown and Leo-Cedarville, SR 1 travels through the City of Fort Wayne and the Town of Leo-Cedarville, State Road 3 travels through the City of Fort Wayne and the Town of Huntertown, US 24 and US 30 travel through the Cities of Fort Wayne and New Haven, US 33

enters Allen County in Lake Township and joins with US 30 in Washington Township, and Interstate 469, by-passes the City of Fort Wayne and travels through the City of New Haven. Rail lines converge on the City of Fort Wayne from all directions and run through the Town of Grabill, the City of Woodburn, the City of New Haven, and the Town of Monroeville.

Exhibit 5 illustrates hazardous material sites identified by HAZUS-MH, underground storage tanks (UST), and leaking underground storage tanks (LUST) as well as major transportation corridors in Allen County.

Hazard Extent

A significant large scale hazardous material event is defined as one that results in multiple deaths or serious injuries. There are hundreds of facilities throughout Allen County that store or transport extremely hazardous substances. Fortunately, each one is subject to the Superfund Amendments and Reauthorization Ace (SARA) Title III requirements which require the Allen County Local Emergency Planning Committee (LEPC) to provide for emergency planning, reporting and training necessary to minimize the impact of hazardous materials in the County.

Probability of Future Event

Although the probability of a major hazardous material event in possible, based on the efforts of the Allen County LEPC and past occurrences, it is unlikely that one will occur.

Table 3-14 identifies the Calculated Priority Risk Index (CPRI) for the storage and transport of hazardous materials in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-14
Calculated Priority Risk Index (CPRI) for Hazardous Material

	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**
Allen County	Possible	Negligible	< 6 hrs	< 1 day	2.00
City of Fort Wayne	Possible	Limited	< 6 hrs	< 1 day	2.30
Town of Grabill	Unlikely	Negligible	< 6 hrs	< 1 day	1.55
Town of Huntertown	Unlikely	Negligible	< 6 hrs	< 1 day	1.55
Town of Leo-Cedarville	Unlikely	Negligible	< 6 hrs	< 1 day	1.55
Town of Monroeville	Unlikely	Negligible	< 6 hrs	< 1 day	1.55

City of New Haven	Possible	Limited	< 6 hrs	< 1 day	2.30
City of Woodburn	Unlikely	Limited	< 6 hrs	< 1 day	1.55

According to the CPRI, the City of Fort Wayne and the City of New Haven would be affected more by the storage and transportation of hazardous materials since there are more facilities located in these communities. Because of the efforts of the Allen County LEPC, storage, handling, and transport requirements, the magnitude of a hazardous material event would be negligible to limited throughout the County. If a hazardous material hazard were to occur, both the warning time and duration of event would be relatively short.

Based on the historical data and knowledge among local planning and emergency management professionals, the storage and transport of hazardous materials ranked 4th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk by the storage and transport of hazardous materials, the entire population of Allen County (340,153) has been identified. Although the majority of the hazardous material facilities are located in the City of Fort Wayne and New Haven, there are major transportation routes throughout the entire County that could be used to transport hazardous materials. Total loss to buildings was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement.

One hundred percent or 380 critical facilities and 100% or 103,841 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to hazardous materials.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within County should grow proportionally with the predicted population growth.

3.2.5 UTILITY FAILURE

A power/utility failure is defined as an actual or potential shortage of electric power or the interruption of electrical power which significantly threatens health and safety. Many communities are vulnerable to many localized, short and long term energy emergencies. Utility failures do occur and may be brought on by severe weather conditions, such as blizzards, ice storms, extreme heat, thunderstorms, or events such as war, and civil disturbance.

Previous Occurrences

Although isolated areas throughout Allen County have been affected by temporary utility failures, there has not been a significant utility failure reported for the County.

Geographic Location

Allen County communities are serviced by several utility providers. Electricity service is provided by American Electric Power (AEP), Northern Rural Electric Membership Corporation, and Paulding Putnam. Natural gas is available through Northern Indiana Public Service Company (NIPSCO) and Northern Indiana Fuel and Light. Telecommunication services are

provided by IN Digital Telecom, Choice One, KC Telecom, Verizon, Budget Phone, and Starhawk Communications. Fort Wayne Sewer Service, Fort Wayne Water, Woodburn Water, Monroe Sewage Disposal, Huntertown Water, Grabill Sewage and Water and New Haven Sewage and Water provide sewer and water service within the County. Aqua Indiana provides water service to southwest Allen County.

Hazard Extent

A utility failure during periods of extreme heat and extreme cold could result in loss of life. Regardless of time of year or temperature, a utility failure in Allen County could have significant economic and social impacts. Depending on the type of utility failure, major employers, medical facilities, schools and government centers would not be able to operate at full capacity even with a back up system.

Probability of a Future Event

Based on previous occurrences and local knowledge of the utility network in Allen County, the probability of a major utility failure is unlikely. However, because parts of Allen County are heavily populated, the magnitude or severity of a utility failure could be critical. Should a utility failure occur, the warning time would be short and duration could last as long as a week.

Table 3-15 identifies the Calculated Priority Risk Index (CPRI) for utility failure in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-15
Calculated Priority Risk Index (CPRI) for Utility 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**
Allen County	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
City of Fort Wayne	Unlikely	Critical	< 6 hrs	< 1 wk	2.15
Town of Grabill	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
Town of Huntertown	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
Town of Leo-Cedarville	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
Town of Monroeville	Unlikely	Limited	< 6 hrs	< 1 wk	1.85
City of New Haven	Unlikely	Critical	< 6 hrs	< 1 wk	2.15
City of Woodburn	Unlikely	Limited	< 6 hrs	< 1 wk	1.85

According to the CPRI, the probability of a utility failure is unlikely. The magnitude or severity would be limited throughout most of Allen County, however, critical in the more urbanized areas including the City of Fort Wayne and City of New Haven. The warning time of a utility failure would be very short and the duration of the event may last up to one week.

Based on the historical data and knowledge among local planning and emergency management professionals, a utility failure ranked 5th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk as a result of a utility failure, the entire population of Allen County (340,153) has been identified. Total loss to buildings was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement.

One hundred percent or 380 critical facilities and 100% or 103,841 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to a utility failure.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within county should grow proportionally with the predicted population growth.

3.2.6 DAM/LEVEE 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 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 failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which causes most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross section of the dam and abutments;
- Improper design, including the use of improper construction materials and construction practices;
- Negligent operation, including failure to remove or open gates or valves during high flow periods;
- Failure of upstream dams on the same waterway;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and Earthquakes, which typically cause longitudinal cracks at the tops of embankments that weaken entire structures.

A Levee is a flood control structure designed to hold water away from a building. The 1993 USACE's Diking Project in Fort Wayne was designed to protect against the 100-year storm event. Levees protect buildings from flooding as well as from the force of water, scour at the foundation and impacts of floating debris. The principle causes of levee failure are similar to those associated with dam failure and include overtopping, surface erosion, internal erosion, and slides within the levee embankment or the foundation walls.

Previous Occurrences

There are no records or local knowledge of a dam or levee failure to date in Allen County.

Geographic Location

There are 12 dams and 3 sets of levees located in Allen County. **Exhibit 2** and **Appendix 6** illustrate the geographical location of the dams and levees in Allen County.

There are 4 dams in the City of Fort Wayne. These include: St. Joseph River Dam, Spy Run Dam (Spy Run Creek), Hosey Dam (Maumee River), and Daus Addition Lake Dam (Tributary to St. Joseph River). Four other dams are located upstream from the City of Fort Wayne. One is on the St. Joseph River just down stream from Leo Cedarville. The second is located on Whitmer Run, a small tributary to the Cedarville Reservoir and located upstream of the Town of Leo- Cedarville. The third and fourth dams are also located upstream from Leo-Cedarville and are located on Tri-Alex Warner Ditch. In addition to these dams, there are three dams located in Aboite Township and one located in Springfield Township.

The 3 sets of levees in Allen County are all located in Fort Wayne along Spy Run Creek, St. Mary's River, St' Joseph River, and Maumee River. The USACE's Diking Project re-classified 9 flood damage reaches as being protected to the 100-year flood or 1% flood event. A tenth reach was partially re-classified as being protected to the 100-year flood or 1% flood event. The levees for this project are located in and around the downtown area of the City of Fort Wayne. Although this affords protection to a large number of residential and commercial structures within downtown Fort Wayne area. It should be noted however, that these damage reaches still lie in the floodplain of a 500-year flood or 0.20% flood event.

Hazard Extent

According to the National Inventory of Dams, there are 13 dams in Allen County. Of those dams, 5 are classified as high hazard dams, 6 have a significant hazard potential, and the remaining 2 are considered low hazard dams. The dams range in height from a 10 foot buttress dam to a 40-foot earthen dam. Seven of the dams are privately owned by individuals or Homeowners Associations (HOA) and used primarily for recreation, five other dams are owned by public utilities, and ownership information for Daus Addition Lake Dam is not known. Regular inspection and maintenance certified by a professional engineer is required for all high hazard dams in Indiana. According to IDNR and the National Inventory of Dams, none of these dams have an Emergency Action Plan. An Emergency Action Plan is not required by the State at this time; however it is one of the recommendations of the 2003 Indiana Dam Safety & Inspection Manual. **Table 3-16** summarizes the data collected from the National Inventory of Dams.

Table 3-16
Inventory of Dams

Name	**Dam Type** (Height)	**Waterway** (drainage area)	**Downstream Community** (distance)	**Owner** (type/ purpose)	**Down-stream Hazard Potential** (EAP)
Cedarville Dam	Earth (27 ft)	St. Joseph River (763 sq mi)	Cedarville (0 miles)	Fort Wayne Municipal Utilities (water supply/ recreation)	High (no)
Kekionga Lake Dam	Earth (22 ft)	Tri-Graham McCulloch Ditch (0.32 sq mi)	Rolling Hills (0 miles)	Kekionga Shores HOA (private/ recreation)	High (no)
Bittersweet Lake Dam	Earth (23 ft)	Tri-Graham McCulloch Ditch (0.13 sq mi)	Aboite (2 miles)	Bittersweet Moors HOA (private/ recreation)	High (no)
Hurshtown Lake Dam	Earth (40 ft)	Whitmer Run (0.4 sq mi)	Cedarville (1 mile)	Fort Wayne Municipal Utilities (Public utility/ water supply)	High (no)
St. Joseph River Dam	Buttress (10 ft)	St. Joseph River (1,060 sq mi)	Fort Wayne (3 miles)	Fort Wayne Municipal Utilities (water supply/other)	Significant (no)
Spy Run Dam	Buttress (10 ft)	Spy Run Creek (no data)	Fort Wayne (2 miles)	Fort Wayne Municipal Utilities (public utility/ other	Significant (no)

Name	**Dam Type** (Height)	**Waterway** (drainage area)	**Downstream Community** (distance)	**Owner** (type/ purpose)	**Down-stream Hazard Potential** (EAP)
Poe Lake Dam	Earth (12 ft)	Tri-Alex Warner Ditch (0.24 sq mi)	Leo (2 miles)	Mary Menge (private/ recreation)	Significant (no)
Covington Dry Dam	Earth	Tri-Graham McCulloch Ditch (0.14 sq mi)	Aboite (4 miles)	Aboite Corporation (private/flood control)	Significant (no)
Daus Addition Lake Dam	Earth	Becketts Run, St. Joseph River (0.14 sq mi)	Fort Wayne (5 miles)	No owner data (recreation)	Significant (no)
Covington Lake Dam	Earth	Tri-Beal Taylor Ditch (1.45 sq mi)	Dunfee (3 miles)	Covington Lakes HOA (private/recre ation)	Significant (no)
Beedy Lake Dam	Earth	Tri-Alex Warner Ditch (0.12 sq mi)	Leo (3 miles)	Elenor Beedy (private/ recreation)	Low (no)
Hosey (Maumee River) Dam	Buttress	Maumee River (1,822 sq mi)	Fort Wayne (0 miles)	Fort Wayne Municipal Utilities (Public utility/ recreation)	Low (no)

(NCDC, 2004)

Cedarville Dam, Kekionga Lake Dam, Bittersweet Lake Dam, and Hurshtown Lake Dam are considered high hazard dams. Failure or misoperation of a high hazard dam will probably cause loss of life, economical, and environmental losses.

Cedarville Dam is a 27-foot earthen dam on The St. Joseph River. The dam is owned by the City of Fort Wayne Municipal Utilities and the water impounded behind the dam is primarily used as a public drinking water source. Cedarville Dam is five miles up stream from the City of Fort Wayne.

Kekionga Lake Dam is a 22-foot earthen dam located on Tri-Graham McCulloch Ditch. The Dam is privately owned by Kekionga Shores HOA and the water impoundment behind the dam is primarily used for recreation. Bittersweet Lake dam is a 23-foot earthen dam that is also located on Tri-Graham McColloch Ditch. The Dam is privately owned by Bittersweet Moors HOA and the water impoundment behind the dam is primarily used for recreation. Hurshtown Lake Dam is 40 foot earthen dam located on Whitmer Run, which is a small tributary of Cedarville Reservoir. The dam is owned by the City of Fort Wayne Municipal Utilities.

St. Joseph River Dam, Spy Run Dam, Poe Lake Dam, Covington Lake Dam, Covington Dry Dam, and Daus Addition Dam are classified as having a significant hazard potential. Failure or

misoperation of a significant hazard dam should not result in loss of life but can cause economical loss, environmental damage, and/or disruption of lifeline facilities.

The remaining 2 dams, Beedy Lake Dam and Hosey Dam are classified as low hazard dams. Failure or misoperation of a low hazard dam should have no loss of life and limited economic or environmental losses. Beedy Lake Dam is privately owned and used for recreation and Hosey Dam is owned by the City of Fort Wayne Municipal Utilities.

The USACE Diking project in Fort Wayne affords protection to a large number of residential and commercial structures within downtown Fort Wayne area. However, these levees are designed for the 100-year event that, by definition, has a 1% chance of being equaled or exceeded in any given year. The levees are vulnerable to floods that may exceed the design event. In addition, like any other structure, the levees are susceptible to structural failure. If such failure occurs, significant damage is expected to the buildings that were previously protected by the levee system. **Table 3-17**, taken from the 1995 MRBC Master Plan which was in turn prepared based on data provided by the USACE, provides a summary of the number of residential and commercial buildings within currently protected areas.

Table 3-17
Breakdown of Number of Buildings Currently Protected by the USACE Diking Project

Stream	100-Year Flood [1]		
	Residential	Non-Residential	Total
St. Mary's River	1,597	118	1,715
Maumee River	1,316	37	1,353
St. Joseph River	107	7	114
Spy Run Creek	0	7	7
TOTAL	3,020	169	3,189

Notes: 1 Numbers represent the number of structures that, based on the USACE 1993 study, sustain some damage regardless of their first floor elevations.

To estimate the expected economic loss associated with levee failure within the Fort Wayne and vicinity, the summary results of the detailed building damage analyses published in the 1995 MRBC Master Plan study reports was extracted from the report and the extracted values were first adjusted to bring the estimated average annual damage values from 1993 dollar basis to 2005 dollar basis. Assuming a 5% average annual appreciation rate, a correction factor of 1.8 resulted from standard cash flow analysis. The adjusted total building loss values were then multiplied by a factor of 2.0 (based on typical HAZUS results) to obtain an estimate of the total economic loss due to levee failure that would not only include the estimate of damage to buildings and their contents, but would also include such losses as business interruption losses, temporary living expenses for displaced residents, and emergency response costs. **Table 3-18** provides a summary of the noted calculations. In addition to the estimated average annual damage values, Table 3-16 also shows an estimate of the present worth of losses prevented over a 50-year period by the USACE Fort Wayne Diking project. This latter estimate was calculated by multiplying the average annual estimates by a factor of 18.25 based on standard cash flow calculation methodologies assuming a 5% interest rate.

As Table 3-16 indicates, the total average annual total economic loss as a result of levee failure in Fort Wayne and vicinity is expected to be approximately $31.2 million, with a present worth value estimated at about $569 million based on a 50-year planning period/project life.

Table 3-18
Estimated Levee Failure Loss in Fort Wayne and Vicinity

Stream	Estimated Average Annual Damage based on 1993 Values ($)	Estimated Average Annual Damage based on 2005 Values ($)	Estimated Average Annual Total Economic Loss ($)	Estimated Present Worth of Losses that can be Prevented ($)
St. Mary's River	$1,381,580	$2,486,844	$4,973,688	$90,769,806
Maumee River	$7,173,360	$12,912,048	$25,824,096	$471,289,752
St. Joseph River	$96,880	$174,384	$348,768	$6,365,016
Spy Run Creek	$19,090	$34,362	$68,724	$1,254,213
TOTAL	$8,660,830	$15,589,494	$31,178,988	$569,016,531

Probability of a Future Event

Based on operation and maintenance requirements, and local knowledge of the dams and levees in Allen County, the probability of a failure is unlikely. However, if a high hazard dam or levee were to fail, in a densely populated area the magnitude or severity of the damage could be critical. The warning time and duration of a dam and levee failure are both considered to be very short.

Table 3-19 identifies the Calculated Priority Risk Index (CPRI) for dam and levee failure in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-19
Calculated Priority Risk Index (CPRI) for Dam/Levee 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
Allen County	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Fort Wayne	Unlikely	Critical	< 6 hrs	< 6 hrs	2.05
Town of Grabill	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Huntertown	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Leo-Cedarville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45

Town of Monroeville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of New Haven	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Woodburn	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45

According to the CPRI, dam and levee failure is a greater priority for the City of Fort Wayne. The City of Fort Wayne could potentially be impacted by failure of its two high hazard dams and the 1993 USACE's diking project.

Based on the historical data and knowledge among local planning and emergency management professionals, dam/levee failure ranked tied for 6th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Without conducting a detailed dam break analysis, it is difficult to predict exactly what area would be affected following a dam failure. In order to estimate the losses due to a dam failure in Allen County, the following assumptions were made:

- the dam failure would occur during dry weather which is judged as more critical for the cases considered since the downstream floodplains would be able to accommodate increased flow;
- the area of inundation was estimated based on judgment
- dam failure for the high hazard (5) and significant hazard dams (6) were considered; and
- structures in the path of the dam failure would be substantially damaged.

Based on these assumptions, approximately 24 residential structures would be affected in the event of a dam failure in Allen County. Based on the estimated number of buildings (3,189) subject to flooding induced by levee failure, it is estimated that 7,097 people or 2.3% of the Allen County population could be at risk during a major levee failure event.

The total potential building loss for buildings vulnerable to flooding induced by dam or levee failure in Allen County is estimated to be $993 million.

For the purpose of vulnerability analysis, the total potential loss to buildings vulnerable to dam or levee failure was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement. All non-residential buildings were calculated at the HAZUS-MH commercial replacement value.

One percent or 4 critical facilities and 3% or 3,189 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to a dam or levee failure.

According to Stats Indiana, Allen County's 2003 population is estimated at 340,153 and is projected to reach 346,653 by 2010. The number of critical and non-critical facilities within county should grow proportionally with the predicted population growth.

The above vulnerability and extent of damage, resulting from a potential dam or levee failure is believed to be too high. However, it was decided to keep these estimates for the purpose of this Plan as a conservative estimate. These numbers will be adjusted in subsequent updates to the

MHMP as more accurate dam inundation estimates become available as a result of proposed Emergency Action Plans.

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 be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and 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 were felt over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Previous Occurrences

Although there has not been a previous occurrence of an earthquake recorded in Allen County, it is possible that because of the County's proximity to the New Madrid fault line and the Fort Wayne Rift (Anna) Zone, the County could experience an earthquake or the aftershock of an earthquake at some point in the future.

Geographic Location

Allen County is primarily affected by the Fort Wayne Rift Zone which extends into Western Ohio. As part of this planning process, the GIS-based HAZUS-MH Earthquake Model was used along with the most recent GIS information to simulate an annualized loss for Allen County. According to the HAZUS-MH earthquake results, the portions of Wayne, Adams, and Washington Townships, in and directly adjacent to the City of Fort Wayne would experience the greatest direct economic losses. However, Aboite and Cedar Creek Townships would also experience a substantial amount of economic loss. **Exhibit 6** illustrates the HAZUS-MH earthquake results.

Hazard Extent

The most significant earthquakes affecting the State of Indiana and Allen County were from the Great New Madrid Earthquakes of 1811-1812. These were a series of large earthquakes, the three largest of which were believed to be Richter Scale 8.0 or larger, with hundreds of aftershocks in various magnitude ranges. The area hit the hardest was the New Madrid Seismic Zone in Southern Illinois.

The HAZUS-MH Earthquake Model averages 8 probabilistic scenarios including the 100, 250, 500, 750, 1000, 1500, 2000, and 2500 year earthquake events. This is known as an Annualized Loss. The HAZUS-MH Earthquake Model estimates that 98% of buildings exposed to earthquake damage are residential and that all 104,221 buildings in the County could be affected for a total building replacement value of $22,600 million.

According to the HAZUS-MH earthquake results, the portions of Wayne, Adams, and Washington Townships, in and directly adjacent to the City of Fort Wayne would experience the greatest direct economic losses. HAZUS-MH defines direct economic loss as the cost of repair and replacement of damaged or destroyed buildings and transportation systems as well as the cost associated with a facility or transportation system that is non-operational. This is logical considering the commercial and retail development that currently exists in the northwest portion of Wayne Township along US 24 and State Road 14, and in Wayne Township along Coldwater Road and Coliseum Boulevard.

Since the HAZUS-MH Earthquake Model is still under development, the data generated should be used with some reservation. Subsequent releases may address the following limitations. Estimated losses for an individual building are actually averages for a group of similar buildings and although the buildings are similar, they may experience vastly different damage and losses during an earthquake. The damage estimated for small earthquakes (less than M6.0) centered within an urban region tend to be overestimated.

Probability of Future Event

Based on historical earthquake data, local knowledge of previous earthquake events, and the HAZUS-MH results conducted as part of this planning process, the probability of an earthquake occurring in Allen County is unlikely. However, because Allen County is the third most populous county in the State of Indiana and the City of Fort Wayne is the second most populated City in the State, the magnitude or severity of an earthquake event could be significant. Should an earthquake event occur, the warning time and duration would both be very short.

Table 3-20 identifies the Calculated Priority Risk Index (CPRI) for an earthquake event in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-20
Calculated Priority Risk Index (CPRI) for Earthquake

	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**
Allen County	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Fort Wayne	Unlikely	Critical	< 6 hrs	< 6 hrs	2.05
Town of Grabill	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Huntertown	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Leo-Cedarville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Monroeville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of New Haven	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Woodburn	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45

Based on historical earthquake information and the HAZUS-MH earthquake results, the CPRI an earthquake event is more of a priority for portions of Wayne, Adams, and Washington Townships, in and directly adjacent to the City of Fort Wayne. These areas are heavily populated and contain numerous commercial and retail developments.

Based on the historical data, HAZUS-MH Earthquake Model, and the knowledge among local planning and emergency management professionals, earthquake ranked tied for 6th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk during an earthquake, the entire population of Allen County (340,153) has been identified. The HAZUS-MH Earthquake Model was used to estimate potential losses in Allen County. Total loss to buildings was calculated by multiplying the number of buildings by the estimated replacement value available in the HAZUS-MH database. Replacement value was determined using national averages for both structure and content replacement.

One hundred percent or 380 critical facilities and 100% or 103,841 non-critical facilities in Allen County could be at risk. **Appendix 5** lists the number of critical facilities, the total number of buildings, and estimates the value of those buildings exposed to an earthquake.

3.2.8 SPECIAL EVENTS

Special Events are those events of such a magnitude, media visibility, or importance that may require extraordinary preparations by government and possible response by emergency response agencies. Such events may be considered an opportunity or target for activist or terrorist activities.

Previous Occurrences

Although there are no known past occurrences of special events resulting in large scale public hazards within Allen County, the possibility of such an occurrence exists. Nation-wide there have been numerous instances where large crowds associated with special events have become unruly and/or violent, and certainly, the attacks of 9/11 have proven that high profile public places and events are at risk for terrorist attacks. Potential events for such occurrences within Allen County include Fort Wayne Komet hockey games, Fort Wayne Freedom football games, Fort Wayne Wizard baseball games, the Three Rivers Festival, Canal Days, and the Allen County Fair.

Geographic Location

Within Allen County there are dozens of events that require extraordinary preparations and possible action by emergency response agencies. The majority of these events occur within the City of Fort Wayne at Headwaters Park, the Allen County War Memorial Coliseum, and Memorial Stadium.

Hazard Extent

Dozens of special events occur every year in Allen County that could potentially result in public hazards. While these hazards have been avoided in the past at a local level, nation-wide there have been a numerous special events that have resulted in public hazards. These events range from sporting event celebrations escalating into violence, the Los Angeles riots of 1992, and the terrorist attacks of 9/11.

Probability of Future Event

Based on previous occurrences and local knowledge, the probability of a special event resulting in a public hazard is unlikely and both the warning time and duration of the incident would be very short.

Table 3-21 identifies the Calculated Priority Risk Index (CPRI) for special events in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-21
Calculated Priority Risk Index (CPRI) for Special Events

	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**
Allen County	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Fort Wayne	Unlikely	Critical	< 6 hrs	< 6 hrs	2.05
Town of Grabill	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Huntertown	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Leo-Cedarville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
Town of Monroeville	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of New Haven	Unlikely	Negligible	< 6 hrs	< 6 hrs	1.45
City of Woodburn	Unlikely	Negligible	< 6 hrs	< 6hrs	1.45

According to the CPRI hazards associated with special events range from unlikely to possible and the magnitude of such events range from negligible to limited. The majority of special events occurring in Allen County take place in the City of Fort Wayne and therefore the City scored the highest on the CPRI for special events.

Based on the historical data and knowledge among local planning and emergency management professionals, special events tied for 6th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

While local history has shown that hazards associated with these types of events are unlikely throughout Allen County, nationwide hazards associated with these events have resulted in a variety of economic and social economic impacts. Due to the lack of historical data, damage estimates have not been calculated.

3.2.9 DROUGHT

A drought is a period of drier-than-normal conditions that results in water-related problems. When no rain or only a small amount of rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells decreases. If dry weather persists and water supply problems develop, the dry period can become a drought.

The first evidence of drought usually is seen in records of rainfall. Within a short period of time, the amount of moisture in soils can begin to decrease. Although, the effects of a drought on flow in streams and rivers or on water levels in lakes and reservoirs may not be noticed for

several weeks or months. Water levels in wells may not reflect a shortage of rainfall for a year or more after the drought begins.

The severity of a drought depends not only on its location, duration, and geographical extent, but also on the water supply and usage demands made by human activities and vegetation or agricultural operations. The impact of droughts are numerous and include shortages of water for business, industrial and recreational uses, decreases in the quantity and quality of agricultural products, and potentially the loss of human life resulting from food shortages and other health related problems associated with drought.

Previous Occurrences

According to the Allen County Comprehensive Hazards Analysis, there is no significant history of drought in Allen County. However, there have been six statewide droughts reported in Indiana since 1930, according to the United States Geological Survey.

Geographic Location

The impact of a drought is typically felt regionally, over several counties or states, rather than isolated within a single county.

Hazard Extent

Dry weather periods characteristic of Indiana summers can have adverse impacts and can lead to drought. Financial impacts of drought in Allen County and in the State of Indiana as a whole are limited. However, nation-wide financial impacts of the drought of 1988 have been estimated in the billions of dollars.

Probability of Future Event

Based on previous occurrences and local knowledge the probability of a drought causing disruption to residents and businesses in Allen County is unlikely. Droughts last more than a week and are usually predicted well in advance.

Table 3-22 identifies the Calculated Priority Risk Index (CPRI) for a drought event in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-22
Calculated Priority Risk Index (CPRI) for Drought

	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
Allen County	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of Fort Wayne	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Grabill	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Huntertown	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Leo-Cedarville	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Monroeville	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of New Haven	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of Woodburn	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3

According to the CPRI the probability of a drought occurring in Allen County is unlikely and the magnitude or severity would be negligible. The warning time of a drought would be very short and the duration of the event would be greater than one week. No one community seems to be affected more than another by a drought.

Based on the historical data and knowledge among local planning and emergency management professionals, drought tied for 7th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis
Because of the difficulty predicting which communities are at risk during a drought and a lack of historical data the entire population of Allen County has been identified as being at risk and damage estimates have not been made.

3.2.10 EXTREME HEAT

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

Human risks associated with extreme heat include heatstroke, heat exhaustion, heat syncope, and heat cramps. These conditions have varying degrees of severity ranging from discomfort to death. In a normal year, approximately 175 Americans die from extreme heat. Young children, elderly people, and those who are sick, overweight, or impoverished are more likely to become victims of heat. **Table 3-23** shows the risk associated with ranges in apparent temperature and heat index.

Table 3-23
Heat Index and Heat Disorders

Danger Category	Heat Disorder	Apparent Temperature (°F)
IV. Extreme Danger	Heatstroke imminent	>130
III. Danger	Sunstroke, heat cramps, heat exhaustion likely.	>105-130
II. Extreme Caution	Sunstroke, heat cramps, heat exhaustion with prolonged physical activity.	90-95
I. Caution	Fatigue possible with Prolonged exposure and physical activity	80-90

Previous Occurrences

According to NCDC data and as shown in **Table 3-24**, there have been two recorded events of extreme heat affecting Indiana, including Allen County, since 1995. These events resulted in the death of 15 people within the state, almost all of whom were elderly or sick, and property damages resulting from these events totaled $1 million.

Table 3-24
Historical Extreme Heat Data

Location	Date	Magnitude	Death/Injury	Property Damage
County+	7/13/1995	90+	14/0	$1,000,000
County+	8/21/1995	95 -105	1/0	N/A
Total			15/0	$1,000,000

Note: "County+" denotes that more than Allen County was affected
(NCDC, 2004)

Geographic Description

The impacts of extreme heat are typically felt regionally, over several counties or states, rather than isolated within a single county. The two extreme heat events listed above impacted the entire state of Indiana.

Hazard Extent

Extreme heat can bring about illness and death to humans and animals and can often bring about periods of drought, which could compound the hazards associated with either event. Though historically the impact from extreme heat has been limited in Allen County, the County is susceptible to extreme heat conditions.

Probability of Future Event

Based on previous occurrences and local knowledge the probability of extreme heat conditions impacting the County is unlikely and there is usually a substantial amount of warning time to prepare for such events.

Table 3-25 identifies the Calculated Priority Risk Index (CPRI) for extreme heat conditions in Allen County. 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 hrs – less than 6 hours), and duration of event (less than 6 hours – greater than 1 week). The following formula, adopted from MitigationPlan.com, is used to calculate CPRI:

CPRI = Probability X 0.45 + Magnitude/Severity X 0.30 + Warning Time X 0.15 + Duration of Event X 0.10.

Table 3-25
Calculated Priority Risk Index (CPRI) for Extreme Heat

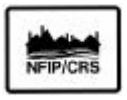
	Probability • Unlikely • Possible • Likely • Highly likely	**Magnitude/ Severity** • Negligible • Limited • Critical • Catastrophic	**Warning Time** • > 24 hrs • 12-24 hrs • 6-12 hrs • < 6 hrs	**Duration of Event** • < 6 hrs • < 1 day • < 1 wk • > 1 wk	**CPRI**
Allen County	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of Fort Wayne	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Grabill	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Huntertown	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Leo-Cedarville	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
Town of Monroeville	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of New Haven	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3
City of Woodburn	Unlikely	Negligible	> 24 hrs	> 1 wk	1.3

According to the CPRI, no one community seems to be affected more than another by extreme heat.

Based on the historical data and knowledge among local planning and emergency management professionals, extreme heat ranked tied for 7th (of 10 hazards studied) in order of most important hazards affecting Allen County.

Vulnerability Analysis

Because of the difficulty predicting which communities are at risk during periods of extreme heat and a lack of historical data the entire population of Allen County has been identified as being at risk and damage estimates have not been made. Impoverished, sick, and extremely young and elderly residents will likely be most affected by such events.



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, redevelopment, and population trends in the community.

4.0 COMMUNITY CAPABILITY ASSESSMENT

This Section provides an inventory of existing mitigation efforts in Allen County. The capability assessment identifies what is currently being done, what is working well, and where gaps may exist to mitigate the impacts of hazards.

4.1 NFIP PARTICIPATION

All of the communities participating in the development of this Plan are members of the National Flood Insurance Program (NFIP). **Table 4-1** lists each participant's NFIP number and the date they joined the program. The City of Fort Wayne has participated in the NFIP CRS program since October 1, 1994 and Allen County has participated in the NFIP Community Ratings System (CRS) program since October 1, 2002. Fort Wayne is classified as a Class 7 community and Allen County is classified as a Class 9. All residents and business owners in special flood hazard areas in unincorporated Allen County receive a 5% discount off flood insurance premiums and residents and business in special flood hazard areas in the City of Fort Wayne receive a discount of 15% on their flood insurance premiums.

As a result of this planning process, several other NFIP communities in Allen County have expressed an interest in joining the CRS program and will hopefully use this Plan to assist them to achieve CRS status.

Table 4-1
NFIP Participation

	NFIP Number	Join Date	CRS Effective Date
Allen County	180302	9/28/1990	10/1/2002
City of Fort Wayne	180003	4/03/1985	10/01/1994
Town of Grabill	180499	9/11/1990	NA
Town of Huntertown	180005	9/4/1990	NA
Town of Leo- Cedarville	180518	02/09/2000	NA
Town of Monroeville	180498	9/4/1990	NA
City of New Haven	180004	7/18/1983	NA
City of Woodburn	180500	9/17/1990	NA

(FEMA, 2005)

4.2 FLOOD INSURANCE CLAIMS

According to the NFIP Insurance Report for Indiana, there have been 1379 flood insurance claims processed since 1978 in Allen County. Eighty-eight percent or 1219 were in the City of Fort Wayne, 143 in Allen County, and 17 in the City of New Haven.

4.3 EXISTING PLANS, PROGRAMS, AND PROJECTS

To facilitate the discussion, the Planning Committee discussed existing mitigation plans, programs, and projects in terms of the six mitigation measures used by FEMA – prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.

Prevention
FEMA defines prevention as measures that are designed to keep the problem from occurring or getting worse. Allen County and participating NFIP communities currently have long-range planning, zoning, and subdivision control ordinances that guide or restrict development from known hazardous areas. The County's GIS system includes numerous layers including the most recent flood boundaries. As a requirement of the NPDES Phase II General Permit Application (Rule 13), Allen County, the City of Fort Wayne, the Town of Huntertown, the Town of Leo-Cedarville, and the City of New Haven have prepared Stormwater Quality Management Plans (SWQMP) and stormwater ordinances.

Property Protection
FEMA defines property protection as measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away. Buildings in Allen County are required to follow the guidelines of the International Building Code. The Maumee River Basin Commission (MRBC), with cooperation from affected communities, works to acquire, relocate, elevate, and/or flood proof structures and flood zone areas through the National Flood Insurance Program. Each community is responsible for maintaining Elevation Certificates within their jurisdiction.

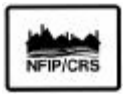
Natural Resource Protection
FEMA defines natural resource protection as opportunities to preserve and restore natural areas and their function to reduce the impact of hazards. Allen County SWCD encourages agricultural landowners to implement filter strips along drainage ditches and setbacks along natural waterways. Development is restricted in the floodplain. Allen County, the City of Fort Wayne, the Town of Huntertown, the Town of Leo-Cedarville, and the City of New Haven are required to reduce the pollutants carried by stormwater runoff as part of Rule 13. Hydraulic and hydrology studies have been completed for several watersheds in the County. Designated wellhead protection areas restrict development in groundwater recharge areas.

Emergency Services
FEMA defines emergency services as measures that protect people during and after a hazard. Allen County has a countywide outdoor warning siren system; however, there is a need for additional sirens. Weather systems are monitored by the EMA's office in cooperation with the SEMA using the National Weather Service. USGS river gauges are used to monitor changes in water levels. Local TV and radio carry weather warnings and advisories. A Mutual Aid Agreement for emergency services exists with the surrounding counties as well as the communities in Allen County.

Structural Control Projects
FEMA defines structural control projects as physical measures used to prevent hazards from reaching a property. Allen County resizes culverts and bridges as resources allow. The Surveyor's Office, in partnership with IDNR and MRBC has developed procedures for maintaining natural streams and drainage ditches. Allen County and participating communities have stormwater detention/retention sizing requirements for new development.

Public Information
FEMA defines public information activities as those that advise property owners, potential property owners, and visitors about the hazards, as well as ways to protect themselves and their property from the hazards. There are several education and training programs throughout the County. These include EMA and Red Cross preparedness materials, school programs, SWCD

programs, service groups, public library programs and materials, and media outlets (TV, radio, newspaper). By the end of 2005, visitors to the County's webpage should be able to search for their property by address and its relationship to potential hazards. Allen County and the City of Fort Wayne distribute educational materials to floodplain properties as a requirement of the NFIP CRS program. The Fort Wayne City Council conducts a monthly public meeting prior to the Council Meeting to specifically discuss flooding issues. The EMA sponsors one of the largest Storm Spotter Training Program for ham radio operators. Allen County, Fort Wayne, Huntertown, Leo-Cedarville, and New Haven are required to conduct stormwater-related public education, outreach and participation programs as part of Rule 13.



The CRS program credits NFIP communities a maximum of 30 points for reviewing and evaluating the effectiveness of existing activities as they relate to prevention, property protection, protection of natural resources, emergency services, structural control projects, and public information for flooding and other known natural hazards.

5.0 MITIGATION GOALS AND PROJECTS

This Section identifies the mitigation goals and projects identified by the MHMP Planning Committee.

5.1 MITGATION GOALS

To facilitate the discussion, the Planning Committee prepared mitigation goals in terms of the six mitigation measures used by FEMA – prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.

PREVENTION

FEMA defines prevention as measures that are designed to keep the problem from occurring or getting worse. The multi-hazard goal for prevention for Allen County and NFIP communities is to continue to manage the development of land and buildings to reduce the impact of hazards on people and property.

PROPERTY PROTECTION

FEMA defines property protection as measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away. The multi-hazard goal for property protection for Allen County and NFIP communities is to continue to modify the buildings subject to hazard damage to protect people and property from the impacts of hazards.

NATURAL RESOURCE PROTECTION

FEMA defines natural resource protection as opportunities to preserve and restore natural areas and their function to reduce the impact of hazards. The multi-hazard goal for natural resource protection for Allen County and NFIP communities is to continue to preserve and maintain the function of existing natural resources to reduce the impact of hazards to people and property.

EMERGENCY SERVICES

FEMA defines emergency services as measures that protect people during and after a hazard. The multi-hazard goal for emergency services for Allen County and NFIP communities is to continue to improve the efficiency, timing and effectiveness of warning, as well as response and recovery efforts before, during, and after a hazard.

STRUCTURAL CONTROL PROJECTS

FEMA defines structural control projects as physical measures used to prevent hazards from reaching a property. The multi-hazard goal for structural control projects for Allen County and NFIP communities is to continue to use structural control projects, where feasible, to minimize the potentially damaging effects of hazards on people and property.

PUBLIC INFORMATION

FEMA defines public information activities as those that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards. The multi-hazard goal for public information for Allen County and NFIP communities is to continue to educate and inform the public about the risks of hazards and ways to protect themselves and their property.

5.2 MITIGATION PROJECTS

The 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.

Proposed mitigation projects were evaluated by the Planning Committee based on 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.

As part of the process to identify mitigation projects, the Planning Committee weighed the benefit derived from each mitigation project with the estimated cost of that project. Preparing detailed benefit cost ratios was beyond the scope of this planning effort and the intent of the MHMP. A more detailed benefit cost analysis will need to be completed during the pre-application phase of a grant request. The Planning Committee identified the mitigation projects as having a high, medium, or low benefit cost ratio based on their experience and professional judgment.

The following is a description of the proposed mitigation projects for Allen County and NFIP communities. These projects are categorized by the six mitigation measures used by FEMA – prevention, property protection, natural resource protection, emergency services, structural control projects, and public information. The following proposed mitigation projects are general in nature, specific details on project location for each project is identified in **Table 5-1**.

5.2.1 PREVENTION

Mitigation projects for prevention include land use planning and zoning, special projects and studies, floodplain management, geographic information services, safe rooms and community shelters, community ratings system, safety procedures for hazardous materials, tree maintenance, and utilities.

P1 – Land Use Planning and Zoning

P1.a) Incorporate hazard mitigation goals into the current Comprehensive Land Use Plan. The Comprehensive Land Use Plan is a powerful planning tool for hazard mitigation since it defines how and where a community should be developed and the goals and objectives identified in the Plan become the foundation for all development ordinances in the community.

P1.b) Establish hazard zones or overlay districts in the Zoning Ordinance to permit only those land uses, such as parks or agriculture that are less susceptible to damage from hazards like flooding. Limit development, especially of critical facilities, in known hazard areas.

P1.c) Encourage the use of innovative planning tools such as open space planning, cluster development, greenways development, and conservation easements to limit development in known hazard areas.

P1.d) Review construction standards and building codes to ensure that hazard protection standards, especially for critical facilities, are incorporated into local building codes. Building codes are an important mitigation measure for flood, earthquake, tornado, wind storm, and severe winter storms. This may include: sprinkler systems, structural bracing, anchor bolts, and secured exterior materials such as roof shingles, shutters, and furnishing. Equally important to ensuring that hazard protection standards are included in the local code is enforcement through regular inspections during construction.

P1.e) Consider adopting a water use ordinance to prioritize or control water use, particularly for emergency situations like fire fighting.

P2 – Special Projects and Studies

P2.a) Conduct special projects and studies such as hydrology and hydraulic modeling and watershed management planning in known hazard areas to better understand conditions and identify solutions. Based on a review of available flood insurance studies, a large percentage of waterways in Allen County have not been studied in detail and will need to be studied in detail in order to have a more accurate picture of the flood risk areas, to more accurately estimate the magnitude of expected damages, and to provide the needed data to the regulating agencies so that they can prohibit new development in the highest risk areas such as floodways. MRBC is a Cooperative Technical Partner (CTP) with FEMA. As a result, it has been continually performing needs assessment studies, detailed floodplain studies, and floodplain refinement studies within the five-county region in its jurisdiction that includes Allen County. The County and NFIP communities should allocate additional budget for cost-sharing the noted studies so that a larger number of detailed studies can be conducted each year.

P2.b) Continue to pursue watershed-based solutions such as regional detention to resolve flooding problems in more than one jurisdiction.

P3 – Floodplain Management

P3.a) Restrict development in the floodplain through the Association of State Floodplain Managers (ASFPM) “No Adverse Impact” (NAI). The premise of the NAI concept is that when left in its natural state, the floodplain is able to store and dissipate floods with no adverse impact on humans or the built infrastructure. The intent of NAI is not to stop development but to ensure that any adverse impact caused by a project is mitigated such as through compensatory storage requirements.

P3.b) Participate in the Indiana Association of Floodplain and Stormwater Managers (INAFSM). INAFSM members include federal, state, and local agency staff, engineers, consultants, planners, elected officials, members of academia, students, and floodplain residents interested in floodplain and stormwater management in the State of Indiana.

P3.c) Encourage that one or more staff for each NFIP community is a Certified Floodplain Manager (CFM). The ASFPM has established a national program for professional certification for floodplain managers. The role of floodplain managers is expanding due to increases in disaster losses, the emphasis being placed upon mitigation to alleviate the cycle of damage-rebuild-damage, and a recognized need for professionals to adequately address these issues.

P4 – Geographic Information Systems (GIS)

P4.a) Incorporate local data into the HAZUS-MH database. HAZUS-MH uses national data which may not accurately reflect the conditions in Allen County. Local data should include physical (soil, hydrology, and floodplain) and cultural (critical and non-critical facility location and attributes).

P4.b) Ensure local GIS data includes classifications that are compatible with HAZUS-MH including type of critical facilities, building type by occupancy, construction materials, transportation systems, and lifeline systems.

P4.c) Update HAZUS-MH with local data that is at the parcel level rather than based on averaged Census Tract (Earthquake Model) or Census Block (Flood Model).

P4.d) Train GIS staff in HAZUS-MH to quantitatively estimate losses in "what if scenarios". Such scenarios could aid with planning efforts as well as determining the benefit-cost ratios necessary for mitigation project grant applications. Although HAZUS is recommended by FEMA, it is not a substitute for detailed engineering studies and is intended to serve as a planning tool for communities interested in assessing their risk to flood and earthquake.

P4.e) Continue to use the most recent GIS data in land use planning efforts.

P5 – Safe Rooms and Community Shelters

P5.a) Establish safe rooms or community shelters in vulnerable locations. The warning time associated with many hazards, such as dam failure, earthquake, tornado, wind storm, utility failure, and hazardous material is very short. Communities that have known hazards, based on historical hazard data or the HAZUS-MH Earthquake or Flood Models, should ensure the population is protected.

P5.b) Require safe rooms in all new public facilities. These facilities are typically centrally located, are accessible for all levels of mobility, and regularly occupied by a large percentage of the population.

P5.c) Clearly advertise the location of local safe rooms and community shelters for both residents and visitors to Allen County.

P5.d) Designate public cooling centers for vulnerable populations that are unable to afford air conditioning and escape extreme heat conditions. Center operations should be linked to outreach projects that encourage at-risk populations to use the centers. Transportation to cooling centers may be necessary.

P6 – Community Ratings System (CRS)

P6.a) Encourage CRS participation among NFIP communities in Allen County. 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 rates are discounted to reflect the reduced flood risk.

P6.b) Encourage an improvement in CRS ratings for communities currently participating in the program. Savings in flood insurance premiums are proportional to the points assigned to various activities. Flood insurance policyholders in participating NFIP communities with 4500 or more CRS activity points would receive a 45% discount in flood insurance premiums.

P7 – Safety Procedures for Hazardous Materials

P7.a) Require employee training to ensure the proper storage, transport, and disposal of hazardous materials. Dangerous spills of hazardous materials can be avoided through safe handling and transport techniques.

P7.b) Maintain LEPC reporting and training efforts as required through SARA Title II.

P8 – Tree Maintenance

P8.a) Maintain trees in good condition in road right-of-way, utility corridors, and public property. Regular maintenance improves the health and longevity of public trees as well as reduces the potential for dead or dying limbs from falling and damaging people, property, and utility lines during a tornado, wind storm, or severe winter storm.

P9 – Utility Use and Location

P9.a) Where feasible, locate utilities outside of known hazard areas. With the exception of urban flooding, floodplains are known hazard areas for both flooding and dam failure. Identifying the location of tornados, wind storms, earthquakes, hazardous materials and severe winter storms are more difficult to predict.

P9.b) Continue to participate in digging hotline services such as HOLEY MOLEY to identify underground utilities and minimize disruption during construction. The Indiana Underground Plant Protection Service Inc. (IUPPS) offers a free statewide utility notification service to locate and mark all underground utility lines.

P9.c) Continue to bury new and retrofitted utilities (phone, electrical) to minimize exposure to hazards. Although access to buried utility lines may be more difficult when the ground is frozen, they are less likely to be damaged by tornados, wind storm, or severe winter storms. The benefit to bury all above ground utility lines does not outweigh the associated cost however; it does make sense for new development and reconstruction projects.

P9.d) Encourage at-risk populations to participate in cooling payment plans or special payment options to maintain cool indoor temperatures during periods of extreme heat. Encourage donations from other utility users to assist with payment of air conditioning to at-risk populations.

P9.e) Encourage citizens to take water-saving measures, especially when extra water is needed for irrigation and farming. Possibilities include installing low-flow water saving showerheads and toilets, and turning water flow off while brushing teeth or during other cleaning activities.

P10 – Large-scale Special Events

P10.a) Anticipate and plan for potential incidents at events that attract large crowds. Ensure adequate and well trained security at all public gatherings and special events.

P10.b) Event organizers should coordinate with local law enforcement to designate evacuation procedures to safely and quickly move people out of a dangerous situation.

5.2.2 PROPERTY PROTECTION

Mitigation projects for property protection include techniques for protecting building and property insurance.

PP1 – Building Protection

PP1.a) Discourage the construction of critical facilities in known hazard areas. Access to and from medical care, police, fire, emergency operation centers, power substations, potable water, and wastewater treatment facilities may be necessary during and following a hazard event. Other types of critical facilities such as schools and government buildings are regularly occupied by a large percentage of the population that could become trapped if built in a known hazard area.

PP1.b) Continue to secure funding to assist with the acquisition, relocation, and elevation of buildings in known hazard areas. Ninety percent of federal disaster declarations are for flood events. Response and recovery costs can be extremely high, so where risks are apparent, it makes sense to take actions that prevent damage from occurring. MRBC, in cooperation with various NFIP communities within Allen County, has been actively pursuing voluntary acquisition of flood-prone properties within the County. Based on the recommendations of the 1995 MRBC Master Plan, priority is given to structures within the regulatory floodway, structures subject to 3 feet or higher depth of flooding during the 100-year flood, and those properties that are targeted by each community for voluntary buyout based on past floodfighting experience, park and open space plans, and those designated by FEMA or State as repetitive loss properties. Based on the 1995 MRBC Master Plan study, a total of 250 residential structures within Fort Wayne and vicinity were proposed to be bought out according to a voluntary acquisition program detailed in a report by CBBEL prepared for MRBC in September 1996. Exhibits provided in **Appendix 6** highlight the number and general locations of the structures recommended for voluntary acquisition in each study reach. 25 of the noted 250 residential structures have been purchased and the buildings demolished and removed since the inception of the Master Plan.

PP1.c) Both residential and non-residential structures may be floodproofed to prevent structure and content damage during a flood event. Dry-floodproofing is permitted for accessory structures only in Allen County and may be used to prevent flood water from damaging the building by strengthening walls, sealing openings, or using waterproof compounds or plastic sheeting on walls. Although not a permitted technique in Allen County, wet-floodproofing techniques may be utilized to allow for easier clean up following a flood event through the use of water resistant paints or other materials. Wet-floodproofing may be used in residential garages or accessory structures. Based on the 1995 MRBC Master Plan study, a total of 871 residential structures within Fort Wayne and vicinity were proposed to be floodproofed according to a voluntary floodproofing program detailed in a report by CBBEL prepared for MRBC in January 1996. The number and general locations of the structures recommended for voluntary floodproofing in each study reach has also been highlighted in exhibits provided in Appendix 6 of this report. Ten of the noted 871 structures have been floodproofed since the inception of the Master Plan.

PP2 – Property Insurance

PP2.a) Encourage property owners in known hazard areas to obtain insurance to protect their investment. Insurance should not be considered as an alternative to reducing damages for any type of hazard, but it does have value of protecting oneself from financial devastation if damage were to occur.

5.2.3 NATURAL RESOURCE PROTECTION

Mitigation projects for natural resource protection include land use planning and stormwater management.

NR1 – Natural Resource Planning

NR1.a) Restrict development in the floodplain through ASFPM's "No Adverse Impact" (NAI). The premise of the NAI concept is that when left in its natural state, the floodplain is able to store and dissipate floods with no adverse impact on humans or the built infrastructure. The intent of NAI is not to stop development but to ensure that any

adverse impact caused by a project is mitigated such as through compensatory storage requirements.

NR1.b) Adopt a Watercourse Protection Ordinance. Floodplains and riparian corridor, when left in their natural state, are able to store flood waters, filter sediments and pollutants carried by stormwater, and provide valuable aquatic and biotic wildlife habitat. The CRS provides additional credit to NFIP communities that prepare a habitat protection plan including riparian corridor protection.

NR1.c) Protect natural wetland from encroachment from development and agricultural activities. Wetlands serve as natural collection basins for flood waters. Acting like sponges, wetlands collect water, filter it, and release it slowly into rivers and streams. Protecting and preserving wetlands can go a long way toward preventing flooding in other areas.

NR1.d) Enforce erosion and sediment control practices during construction activities. Soil carried by stormwater runoff will settle at the bottom of streams and detention basins restricting the volume of flood waters held and cause localized flooding.

NR2 – Stormwater Management

NR2.a) Implement the Best Management Practices (BMPs) identified in the recently completed Stormwater Quality Management Program (SWQMP) that address construction and post-construction site stormwater runoff control. Municipal Separated Storm Sewer System (MS4) communities are required to prepare a SWQMP as part of the NPDES Program.

5.2.4 EMERGENCY SERVICES

Mitigation projects for emergency services include mutual aid agreements, emergency warning systems, and power back up systems.

ES1 – Mutual Aid Agreements

ES1.a) Utilize mutual aid agreements with neighboring communities and counties to ensure quick response in the event of a hazard. In addition to fire and police, mutual aid agreements can be extended for utility and communication systems, including 9-1-1.

ES2 – Emergency Warning Systems

ES2.a) Utilize emergency warning sirens to alert the population of a potential tornado or wind storm. Advanced warnings such as sirens, in conjunction with the Emergency Alert System (EAS) broadcasts, are an effective mitigation measure to reduce loss of life and property.

ES2.b) Utilize stream gages for flood warning. Although the use of stream gages does not provide long-term damage reduction, it can alleviate health and safety risk by providing citizens time to escape and possibly remove belongings that could be damaged. NOAA Weather Radio and the EAS broadcast can be incorporated into the community's flood warning system.

ES2.c) Encourage residents and businesses, especially critical facilities, in known hazard areas to stay abreast of current weather conditions with NOAA Weather Radio. NOAA Weather Radio continuously broadcasts National Weather forecasts, warnings, and other crucial weather information. NOAA Weather Radio also provides direct warning to the public for natural, man-made, or technological hazards, and it is the primary trigger for activating the EAS on commercial radio, television, and cable systems.

ES3 – Power Back-Up Generators

ES3.a) Require emergency back-up generators for all critical facilities in known hazard areas. Back-up power is essential at medical care, police, fires, and community shelter facilities.

5.2.5 STRUCTURAL CONTROL PROJECTS

Mitigation projects for structural control projects include requirements for high hazard dams and drainage systems.

SC1 – Maintenance and Management of High Hazard Dams

SC1.a) Require an Emergency Action Plan (EAP) for high hazard dams. Dams should be designed, monitored, and maintained so that they do not fail. However, conditions beyond the control of the dam owner and engineer can occur due to unforeseen structural problems, natural forces, mistakes in operation, negligence, or vandalism. An Emergency Action Plan is not required by the State at this time; however it is one of the recommendations of the 2003 Indiana Dam Safety Inspection Manual.

SC1.b) Ensure regular inspection and maintenance of high hazard dams. 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 should include: formal technical inspections, maintenance inspections, informal inspections, and special inspections.

SC2 – Stormwater Drainage System Improvements

SC2.a) Minimize impacts from flooding by utilizing systems to divert and/or retain flood water. Flood mitigation can involve installing, re-routing, or increasing the capacity of a storm drainage system that may involve detention and retention ponds, drainage easements, or creeks and streams. It can include separation of storm and sanitary sewage systems as well as higher engineering standards for drain and sewer capacity.

SC2.b) Maintain channels and regulated drains on a regular basis to prevent localized flooding. If a drainage system in not maintained, erosion, material dumping, or deterioration of man-made reinforcement materials may reduce the carrying capacity of a stream.

SC3 – Construction of Levee and Floodwalls

SC3.a) Minimize impacts from flooding by utilizing levee and floodwall systems. Although the structural flood control solutions such as levees and floodwalls are generally considered inferior in performance and reliability as compared to non-structural solutions such as property acquisition or floodproofing project, they may sometimes constitute the only economical and/or socially acceptable means of curbing potential large economic losses resulting from riverine flooding. This normally happens when a large number of flood-prone buildings are concentrated in a relatively small area. Based on a detailed reach by reach techno-economical comparison of structural and non-structural measures, the 1995 MRBC Master Plan study recommended that 2 of the 54 stream reaches not already protected by the Fort Wayne Diking Project (in the St. Mary's River – Junk Ditch area) be considered for protection by flood control levees. The estimated cost of constructing flood control levees was considerably lower than the non-structural alternatives in these two reaches. It should be noted that the MRBC Master Plan also indicated that due to the unique hydraulic properties of the area where the two levee segments are being proposed for, a detailed hydraulic analysis of the St. Mary's River – Junk Ditch hydraulic interconnected system needs to be performed before prior to proceeding with this alternative to ensure that there would be no negative impacts to

other study reaches as a result of such levee construction. Exhibits provided in **Appendix 7** are taken from the 1995 MRBC Master Plan report, highlight the general location of the proposed line of protection for these two stream reaches.

5.2.6 PUBLIC INFORMATION

Mitigation projects for public information include education and outreach projects.

PI1 – Public Education and Outreach Projects

PI1.a) Implement the Best Management Practices (BMPs) identified in the recently completed Stormwater Quality Management Program (SWQMP) that address public education, outreach, participation, and involvement. Municipal Separated Storm Sewer System (MS4) communities are required to prepare a SWQMP as part of the NPDES Program.

PI1.b) Take advantage of opportunities to participate in community events, local neighborhood meetings, and area school activities to share information on the different types of hazards, methods for preventing damages resulting from hazardous conditions, and how to respond when a hazard threatens. These efforts should be year-round with a special emphasis during Severe Weather Awareness Week in March of each year.

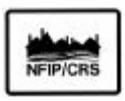
PI1.c) Maintain hazard literature at public facilities. FEMA publishes information on all types of hazards, methods for preventing damages resulting from hazardous conditions, and how to respond when a hazard threatens. Materials should be readily available at the EMA's office, police and fire stations, government offices, public libraries, and community webpage.

PI1.d) Incorporate literature on other known hazards, in addition to flood materials, as part of the regular outreach efforts required through the CRS program.

5.3 SUMMARY OF PROPOSED MITGATION PROJECTS

Table 5-1 lists the mitigation projects, local status, local priority, benefit-cost ratio, project location, responsible entity, funding source, and hazard addressed as identified by the MHMP Planning Committee. The local status, as identified in Table 5-1, is categorized as "on-going", "on-going (but enhancement needed)", and "proposed". Mitigation projects identified as "on-going (but enhancement needed)" and "proposed" will be implemented within the 5-year term of this MHMP. However, depending on availability of funding, some proposed mitigation projects may take longer to implement. The following mitigation projects are organized in terms of the six mitigation measures used by FEMA – prevention, property protection, natural resource protection, emergency services, structural control projects, and public information.

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 Allen County. The intent of this planning effort was to identify the hazards and the extent that they affect Allen County and to determine what type of mitigation strategies or projects may be undertaken to mitigate for these hazards. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Act (FMA), Pre-Disaster Mitigation (PDM) Grant, as well as other FEMA programs including the NFIP's Community Ratings System (CRS), additional detailed studies will need to be completed prior to applying for these grants or programs.



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 5-1
Mitigation Projects

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Land Use Planning & Zoning P1.a P1.b P1.c P1.d	On-going	High	High	Allen County and all communities. Allen County provides planning services for Grabill, Huntertown, Monroeville, and Woodburn.	*Planning & Engineering for:* Allen County Fort Wayne Leo-Cedarville New Haven	Existing budget	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
Land Use Planning & Zoning P1.e	Proposed	Medium	Medium	Allen County and all communities.	*EMA & Fire for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Drought
Special Projects & Studies P2.a P2.b	On-going	High	High	Allen County and communities with floodplains and flooding problems including Fort Wayne, New Haven, and Leo-Cedarville	MRBC *Planning, Engineering, & Surveyor for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Floodplain Management P3.a P3.b P3.c	On-going	High	High	Allen County and communities with floodplains and flooding problems including Fort Wayne, New Haven, and Leo-Cedarville.	MRBC *Planning, Engineering, & Surveyor for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood
Geographic Information Systems P4.a P4.b P4.c P4.d P4.e	Proposed & on-going (but enhancement needed)	Medium	High	Allen County and Fort Wayne Allen County provides GIS services for Grabill, Huntertown, Leo-Cedarville, Monroeville, New Haven, and Woodburn.	*GIS & Planning for:* Allen County Fort Wayne	Existing budget, FEMA PDM grant for mapping	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
Safe Rooms & Community Shelters P5.a P5.b P5.c P5.d	Proposed & ongoing (but enhancement needed)	Medium	High	All public buildings throughout the County.	Building Owner *EMA & Red Cross for:* Allen County	Existing budget for construction & operation	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Community Ratings System P6.a	Proposed	High	Medium	All NFIP communities not currently participating in the CRS program.	*NFIP coordinator for:* Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood
Community Ratings System P6.b	On-going	High	High	Exiting CRS program participants.	*NFIP coordinators for:* Allen County Fort Wayne	Existing budget	Flood
Safety Procedures for Hazardous Materials P7.a P7.b	On-going	High	High (training & reporting) Medium (transport & disposal)	All hazardous material facilities and transportation routes per SARA Title III requirements.	Hazardous material owner (public & private) and transporter *EMA & LEPC for:* Allen County	Existing budget for operation	Hazardous Materials
Tree Maintenance P8.a	On-going	High	Medium	All public property, utility corridors, and ROW	AEP Verizon *Parks, Streets & Highway for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Utility rate or existing budget	Severe Winter Storm Tornado/Wind Storm Utility Failure

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Utility Use & Location P9.a P9.b P9.c	On-going	High	High	All above and underground utility corridors throughout Allen County.	AEP Verizon NIPSCO *Public works for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Utility rate or existing budget	Utility Failure
Utility Use & Location P9.d	On-going	Medium	Medium	Allen County and all communities with at-risk populations.	AEP	Utility rate	Extreme Heat
Utility Use & Location P9.e	Proposed	Medium	Medium	Allen County and all communities regardless of private or public water supply.	Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Utility rate for public water	Drought
Utility Use & Location P10.a P10.b	On-going	High	High	Allen County and all communities that host large special events especially Fort Wayne and New Haven.	Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Event fee	Special Event

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Building Protection PP1.a PP1.b	On-going	High	High	All buildings in the floodplain especially repetitive loss structures, those in the regulatory floodway, and the areas identified in the MRBC Master Plan and HAZUS-MH with the greatest total economic loss in Fort Wayne, New Haven, and Leo-Cedarville.	MRBC *NFIP coordinator for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, property owners, and PDM & HMGP grants from FEMA	Flood
Building Protection PP1.c	On-going	High	High	All non-residential structures in the floodplain especially repetitive loss structures, those in the regulatory floodway, and those identified in the MRBC Master Plan and HAZUS-MH with the greatest total economic loss in Fort Wayne, New Haven, and Leo-Cedarville.	*NFIP coordinator for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, property owners, and PDM & HMGP grants from FEMA	Flood
Property Insurance PP2.a	On-going	High	High	All buildings in known hazards, especially for predictable hazard paths such as flood, dam, and levee failure throughout Allen County.	Building Insurance Carriers Building Owners *NFIP coordinator for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget and property owners	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Natural Resource Planning NR1.a	On-going	High	High	Allen County and communities with floodplains and flooding problems including Fort Wayne, New Haven, and Leo-Cedarville. Allen County provides planning services for New Haven and Leo-Cedarville.	*Planning for:* Allen County Fort Wayne	Existing budget	Flood
Natural Resource Planning NR1.b	Proposed	Medium	Medium	Allen County and communities with floodplains and flooding problems including Fort Wayne, New Haven, and Leo-Cedarville. Allen County provides planning services for New Haven and Leo-Cedarville.	*Planning for:* Allen County Fort Wayne	Existing budget	Flood
Natural Resource Planning NR1.c NR1.d	On-going	High	High	Allen County and all communities. Allen County provides planning services for Grabill, Huntertown, Leo-Cedarville, Monroeville, New Haven, and Woodburn.	*Surveyor & Planning for:* Allen County Fort Wayne	Existing budget	Flood
Stormwater Managment NR2.a	Proposed & on-going	High	High	MS4 communities identified by IDEM, including Allen County, Fort Wayne, New Haven, Huntertown, and Leo-Cedarville. Allen County, Huntertown, and Leo-Cedarville are co-permittees for this program.	*MS4 Coordinator or Operator for:* Allen County Fort Wayne New Haven	Existing budget	Flood

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Mutual Aid Agreements ES1.a	On-going	High	High	All police, fire, and EMA in Allen County and where needed with neighboring communities in DeKalb, Noble, Whitley, Huntington, Wells, and Allen Counties.	*EMA, Police, & Fire for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
Emergency Warning Systems ES2.a	On-going	High	Medium	Additional outdoor warning sirens are needed in Fort Wayne (18), Huntertown (1), and New Haven (1).	*EMA, Police, & Fire for:* Allen County Fort Wayne Huntertown New Haven	Existing budget	Tornado/Wind Storm
Emergency Warning Systems ES2.b	On-going	High	High	Additional stream gages needed on Fairfield Ditch (Fort Wayne).	USGS *EMA & Surveyor for:* Allen County	Existing budget	Flood
Emergency Warning Systems ES2.c	Proposed	High	High	Allen County and all communities.	*EMA, Police, & Fire for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, PDM grant, Homeland Security funds	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Power Back-Up Generators ES3.a	Proposed & on-going (but enhancement needed)	High	Medium	All critical facilities including dams, airports, broadcast facilities, WTPs, EOC, public safety facilities, hazardous materials, power facilities, schools, and WWTPs throughout Allen County.	Building owner (private & public) *EMA for:* Allen County	Cost of construction/ operation. PDM grants	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
High Hazard Dams SC1.a	Proposed	High	High	All high hazard dams and levees should have an EAP.	High hazard dam and levee owner.	Cost of operation, HOA fees	Dam/Levee Failure
High Hazard Dams SC1.b	On-going	High	High	All dams and levees in Allen County regardless of downstream hazard potential.	Dam and levee owner IDNR	Cost of operation, HOA fees, existing budget	Dam/Levee Failure
Stormwater Drainage Improvements SC2.a	On-going (limited due to cost)	Low	Medium	All new development requires flood storage.	*Surveyor & Engineering for*: Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Stormwater Drainage Improvements SC2.b	On-going	High	High	All regulated drains, St. Mary's, St. Joseph, and Maumee River and tributaries.	*Surveyor & Public Works for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, landowner, special assessment	Flood
Levees & Floodwalls SC3.a	On-going	High	High	Protect older, establish developments along the St. Mary's. St. Joseph, and Maumee River with levees or floodwalls	*Surveyor & Engineering for*: Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, FEMA grants for design and/or construction	Flood
Public Education & Outreach PI1.a	Proposed & on-going	High	High	MS4 communities identified by IDEM, including Allen County, Fort Wayne, New Haven, Huntertown, and Leo-Cedarville. Allen County, Huntertown, and Leo-Cedarville are co-permittees for this program.	*MS4 Coordinator or Operator for:* Allen County Fort Wayne New Haven	Existing budget	Flood

Project	Status	Local Priority	Benefit Cost Ratio	Project Location	Responsible Entity	Funding Source	Hazards Addressed
Public Education & Outreach PI1.b	On-going	High	High	All schools and community events especially during Severe Weather Awareness Week in March.	*PIO for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget, FEMA grants may be available	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
Public Education & Outreach PI1.c	On-going	High	Hgh	All public buildings including EMA's office, public safety facilities, government offices, public libraries, and webpage.	*PIO for:* Allen County Fort Wayne Grabill Huntertown Leo-Cedarville Monroeville New Haven Woodburn	Existing budget	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event
Public Education & Outreach PI1.d	Proposed	High	High	Existing CRS communities. Add new communities as they join the CRS program.	*NFIP coordinator for:* Allen County Fort Wayne	Existing budget	Flood Severe Winter Storm Tornado/Wind Storm Hazardous Materials Utility Failure Dam/Levee Failure Earthquake Drought Extreme Heat Special Event

6.0 PLAN MAINTENANCE PROCEDURES

6.1 MAINTENANCE PROCESS

Throughout the 5-year planning cycle, the Allen 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 are readily available to engage in email correspondence between annual meetings. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual NFIP communities or through local partnerships.

This is the first MHMP that Allen County and NFIP communities have prepared. The data used to prepare the Allen 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 better data becomes available, updates should be made to the risk assessment and vulnerability analysis.

Updates or modifications to the Allen 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.

6.2 INCOPRORATION INTO EXISTING PLANS

Allen County and NFIP communities are very progressive. 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.

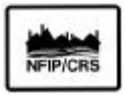
GIS data needed for hazard analysis, including attributes needed for HAZUS, will be updated and maintained throughout the 5-year planning cycle by the County GIS Department.

6.3 CONTINUED PUBLIC INVOLVEMENT

Continued public involvement is critical to the successful implementation of the Allen County MHMP. Comments from the public on the MHMP will be received by the EMA Director and forwarded onto 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 posted on the Allen County webpage and available for public review at the EMA's Office.

Updates or modifications to the Allen 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 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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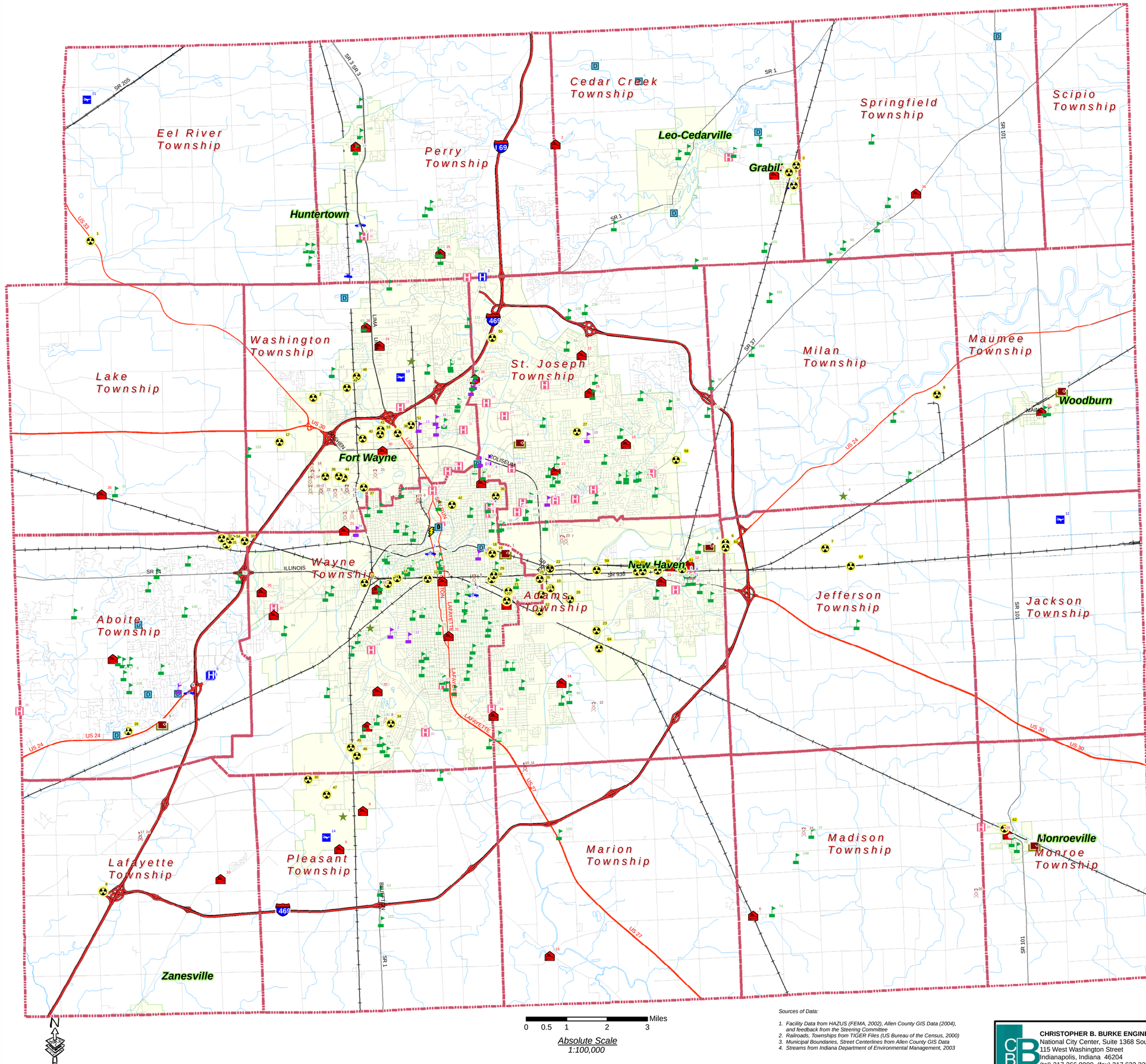
Critical Facilities

Allen County, Indiana



AIRPORTS

ID	Name
12	BASTING
13	SMITH FIELD
14	FORT WAYNE MUNI/BAER FLD/
21	MCDUFF ROAD & SR 205

Broadcast Towers

ID	Name
1	WHJG-TV CH 33
2	WPWA CH 39
3	WANE-TV CH 4
4	WFFT-TV CH 55
5	WPTA CH 21
6	WISAQ CH 45
7	WFCV 1090
8	WGL 1250
9	WLYV 1450
10	WOWO 1380
11	WHWD 1380
12	WJFX CH 300
13	WWWD CH 242
14	WFWI CH 222
15	WQHK-FM CH 286
16	WLAB CH 202
17	WCKZ CH 231
18	WMEE CH 247
19	WBNI-FM CH 206
20	WBYR CH 255
21	WKKE CH 280
22	WAJI CH 236
23	WLDE CH 269
24	WCYT CH 216
25	WBCL CH 212

DAMS

ID	Name
1	RICH LAKE DAM
2	ST. JOSEPH RIVER DAM
3	CEDARVILLE DAM
4	BEEDY LAKE DAM
5	SPY RUN DAM
6	POE LAKE DAM
7	HOSEY (MAUMEE RIVER) DAM
8	KEKIONGA LAKE DAM
9	COVINGTON LAKE DAM
10	BITTERSWEET LAKE DAM
11	HURSHTOWN RESERVOIR DAM
12	COVENTRY DRY DAM
13	DAVIS ADDITION LAKE DAM **

MILITARY INSTALLATIONS

ID	Name
1	Indiana Air National Guard
2	Army Reserve
3	Army Guard
4	CASAD Military Storage Depot

Potable Water Facilities

ID	Name
1	GRABILL WATER WORKS
2	DUPONT WATER TREATMENT PLANT

POWER STATIONS

ID	Name
1	AMERICAN INDIANA MICHIGAN POWER

WASTEWATER TREATMENT PLANTS

ID	Name
1	NEW HAVEN WATER POLLUTION CONTROL PLANT
2	LAKE DALECARLIA PWTP
3	MONROEVILLE MUNICIPAL WWTP
4	NEW HAVEN WWTP
5	UTILITY CENTER INCORPORATED AQUASOURCE M
6	WOODBURN MUNICIPAL WWTP

COLLEGES/UNIVERSITIES

ID	NAME
1	Indiana Business College Fort Wayne
2	Masters of Cosmetology College
3	Michiana College
4	Concordia Theological Seminary
5	Indiana Institute of Technology
6	IUPUI-Ft Wayne
7	International Business College
8	ITT Technical Institute
9	Ivy Tech State College-Northeast
10	Ravenscroft Beauty College
11	Rudy's School of Beauty Culture
12	Taylor University-Ft Wayne
13	Tri-State University
14	University of Saint Francis-Ft Wayne

HAZARDOUS MATERIAL HANDLERS

ID	Facility Name
1	Chemical Eng. Corp.
2	Fort Wayne Fndy. Corp.-Columbia City
3	Cambridge Inds, Inc.
4	Grabill Cabinet Co.
5	Wieland Furniture Inc.
6	Aeroquip Corp.
7	Superior Aluminum Alloys L.L.C.
8	Gmtg Fort Wayne Assembly
9	Michelin N.A. Inc.
10	Phelps Dodge Magnet Wire Co.
11	*Slater Steels, Ft. Wayne Specialty Allo
12	Ge Indl. Sys. Broadway
13	Ge Indl. Sys. Taylor Street
14	Essex Goup Inc. Fort Wayne Plant
15	Chemcentral/Ft. Wayne
16	Chromaxance Inc.
17	Dekko Stamping
18	Dexter Machine Co. Inc.
19	Franke Plating Works Inc
20	Fort Wayne Fndy. Corp. - Pontiac Div.
21	Fort Wayne Anodizing Corp.
22	Metallurgical Processing Inc.
23	Nishikawa Standard Co.
24	Trohemn Corp.
25	Vee Eng. Inc. Plant 2
26	Vee Engineering Inc.
27	Van Waters & Rogers Inc.
28	Tt Group Specialty Polymer Prods. Seals
29	Wayne Metal Protection Co.
30	Kuc Zollner Div.
31	Fort Wayne Pools Inc.
32	Lincoln Foodservice Prods, Inc.
33	Master Spas Inc.
34	Essex Group Inc. Chemical Processing
35	Wayne Chemical
36	Craft Labs, Inc.
37	Dana Corp. Spicer Mfg, Inc.
38	Fort Wayne Fndy. Corp. Lima Rd. Div.
39	Harris Kayot Inc.
40	Safety-Kleen Sys. (506801)
41	Stonhard Inc.
42	Vallpar Corp. - Ft Wayne
43	Ottenweller Co.
44	Avery Dennison
45	Chemrex Inc.
46	Foamex L.P.
47	Mb Insulated Prods. Inc.
48	Hy-Tec Fiberglass Inc.
49	Mascotech Forming Techs. - Fort Wayne
50	Plastic Composites Corp.
51	Pyromation Inc.
52	Rea Magnet Wire Co. Inc.
53	*Precision Prods. Group Inc., Paramount
54	Press-Seal Gasket Corp.
55	Chem-Central Chemica
56	IVS RR Yards
57	Casad Depot
58	AEP Maintenance
59	Ulrich Chemical Co.
60	Vopak Chemical Co.
61	Aq. Pro/Allen County Coop
62	Linder Oil
63	Parker Hanefin/Aeroquip
64	Adams Center Landfill

SCHOOLS

ID	NAME
1	Aboite Elementary School
2	Covington Elementary School
3	Deer Ridge Elementary
4	Haverhill Elementary School
5	Homestead Senior High School
6	Summit Middle School
7	Whispering Meadow Elem Sch
8	Woodside Middle School
9	Allen Co Youth Services Ctr
10	Arcola School
11	Carroll High School
12	Carroll Middle School
13	Hickory Center Elementary Sch
14	Huntertown Elementary School
15	Maple Creek Middle Sch
16	Perry Hill Elementary School
17	Adams Elementary School
18	Anthis Career Center
19	Arlington Elementary School
20	Ben F Geyer Middle School
21	Blackhawk Middle School
22	Bloomingdale Elementary Sch
23	Brentwood Elementary School
24	Bunche Elementary School
25	Elmhurst High School
26	Fairfield Elementary School
27	Forest Park Elementary School
28	Francis M Price Elem Sch
29	Franke Park Elementary School
30	Fred H Croninger Elem Sch
31	Glenwood Park Elementary Sch
32	Harrison Hill Elementary Sch
33	Indian Village Elementary Sch
34	J Wilbur Haley Elementary Sch
35	Jefferson Middle School
36	John S Irwin Elementary Sch
37	Kekionga Middle School
38	Lakeside Middle School
39	Lane Middle School
40	Levan R Scott Academy
41	Lincoln Elementary School
42	Lindley Elementary School
43	Mabel K Holland Elem Sch
44	Maplewood Elementary School
45	Memorial Park Middle School
46	Merle J Abbett Elementary Sch
47	Miami Middle School
48	Nebraska Elementary School
49	North Side High School
50	Northcrest Elementary School
51	Northrop High School
52	Northwood Middle School
53	Pleasant Center Elem School
54	Portage Middle School
55	R Nelson Snider High School
56	Robert C Harris Elem Sch
57	Saint Joseph Central School
58	Shawnee Middle School
59	South Side High School
60	South Wayne Elementary School
61	Special Education Center
62	Study Elementary School
63	Washington Center Elem Sch
64	Washington Elem School
65	Wayne High School
66	Waynedale Elementary School
67	Weisser Park Elem Sch
68	Whitney M Young Early Childhood
69	Willard Shambaugh Elem Sch
70	Cedarville Elementary Sch
71	Harlan Elementary School
72	Heritage Jr/Sr High School
73	Highland Terrace Elem Sch
74	Hoagland Elementary School
75	Leo Elementary School
76	Leo Junior/Senior High School
77	Maple Grove Learning Center
78	Meadowbrook Elementary School
79	Monroeville School
80	New Haven Elementary School
81	New Haven High School
82	New Haven Middle School
83	Park Hill Learning Center
84	Paul Harding High School
85	Prince Chapman Academy
86	Southwick Elementary School
87	Village Elementary School
88	Woodburn Elementary School
89	Woodlan Jr/Sr High School
90	Abacus Child Care/Early Lrn Ctr
91	Beautiful Savior Lutheran
92	Blackhawk Christian Elem Sch
93	Blackhawk Christian Jr-Sr High Sch
94	Canterbury School
95	Central Christian School
96	Cornerstone College Prep Sch
97	Coventry Sch of Early Learning
98	Crossroads*Ft Wayne Children's Home
99	Cuba Mennonite School
100	DBA Heritage Mission
101	Fellowship Haven Bible School
102	Fort Wayne Christian Academy
103	Gateway Woods School
104	Hand-In-Hand Ministry
105	Harlan Christian School
106	Keystone Schools
107	Keystone Schools
108	Keystone Schools SW
109	Kiddie Prep Inc
110	Learning Chapel Christian Academy
111	Martin Luther King Montessori Sch
112	Messiah Lutheran Preschool
113	Pine Hills Kiddie Garden
114	Taylor Chapel Preschool
115	Three Rivers Montessori Schl
116	Ft Wayne Juvenile Correction Fac
117	Northeast Juvenile Corr Facility
118	Benoit Academy
119	Bishop Dwenger High School
120	Bishop Luers High School
121	Most Precious Blood Sch
122	Queen Of Angels School
123	Saint Aloysius Catholic School
124	Saint Charles Borromeo School
125	Saint John The Baptist Catholic Sc
126	Saint John The Baptist School
127	Saint Joseph Catholic School
128	Saint Jude Elementary School
129	Saint Louis Besancon Catholic Sch
130	Saint Therese School
131	Saint Vincent DePaul School
132	St Joseph - St Elizabeth School
133	St Joseph Hessen Cassel Cath Sch
134	Ascension Lutheran Sch
135	Bethlehem Lutheran Sch
136	Central Lutheran School
137	Christ's Child Learning Corner
138	Concordia Evangelical Lutheran Sch
139	Concordia Lutheran High School
140	Emmanuel Lutheran Church Preschool
141	Emmanuel St Michael Lutheran Sch
142	Emmaus Lutheran School
143	Holy Cross Lutheran School
144	Mt Calvary Lutheran Preschool
145	Our Hope Lutheran Shool
146	Peace Lutheran Preschool
147	Praise Lutheran In Fort Wayne
148	Saint John Ev Lutheran School
149	Saint John Lutheran School
150	Saint Paul Lutheran School
151	Saint Peter's Lutheran School
152	St Peter Lutheran School
153	Suburban Bethlehem Lutheran Sch
154	Trinity Lutheran Evangelical Sch
155	Trinity Lutheran Preschool
156	Unity Lutheran School
157	Woodburn Lutheran School
158	Zion Lutheran Academy
159	Amish Sch No 1 Springfield Ctr
160	Black Creek Amish School
161	Cedar Creek Amish School
162	Maple Lane Amish School
163	Maumee Valley School
164	Milan Center Amish School
165	Westridge Amish School
166	Timothy L Johnson Academy

MEDICAL CARE FACILITIES

Hospitals

ID	Name
1	Select Specialty Hospital
2	DuPont Hospital
3	Rehab Hospital of Ft Wayne
4	Parkview Hospital
5	Lutheran Hospital of Indiana
6	St. Joseph Hospital

Nursing Homes

ID	Name
7	Applewood Health and Rehab Center
8	Bethlehem Woods Nursing and Rehab Cente
9	Beverly Rehab and Specialty Care Center
10	Canterbury Nursing and Rehab Center
11	The Cedars
12	Courtland Health and Rehab Center
13	Covington Manor Nursing Home
14	Englewood Health and Rehab Center
15	Golden Years Homestead
16	Harborside Healthcare
17	Heritage Park
18	Kingston at DuPont
19	Kingston Care Center
20	Kingston Residence
21	Life Care Center of Fort Wayne
22	Lutheran Homes, Inc
23	Miller's Merry Manor
24	Parkview Memorial Hospital - CCC
25	Regency Place of Fort Wayne
26	Riverbend Health Care Center
27	Saint Anne Home
28	Sunrise of Fort Wayne
29	Towne House Retirement Community
30	Transitional Care Unit of St. Joseph Medical Center
31	University Park Nursing Center
32	Villa of the Woods
33	Village Oaks at Fort Wayne
34	The Village of the Heritage
35	Woodview Healthcare Inc
36	Byron Residential Center
37	Byron Health Center
38	Renaissance Village

FIRE STATIONS

ID	NAME
1	Aboite Township Fire Departme
2	Cedar Canyons Fire Department
3	Churubusco Fire Department
4	Fort Wayne Fire Department
5	Fort Wayne International CFR
6	Hoagland Fire Department
7	Huntertown Fire Department
8	Indiana Air Guard CFR
9	Southwest Allen County Fire D
10	Southwest Allen County Fire D
11	Woodburn Fire Department
12	New Haven/Adams Township Fire
13	New Haven/Adams Township Fire
14	New Haven/Adams Township Fire
15	Pine Fire Department
16	St. Joe Township Fire Departm
17	Fort Wayne - Fire Station 1
18	Fort Wayne - Fire Station 2
19	Fort Wayne - Fire Station 4
20	Fort Wayne - Fire Station 5
21	Fort Wayne - Fire Station 7
22	Fort Wayne - Fire Station 8
23	Fort Wayne - Fire Station 14
24	Fort Wayne - Fire Station 15
25	Fort Wayne - Fire Station 16
26	Fort Wayne - Fire Station 17
27	Grabill Fire Department
28	Washington Township Fire Depa
29	Monroeville Fire Department
30	Fort Wayne - Fire Station 6
31	Fort Wayne - Fire Station 9
32	Fort Wayne - Fire Station 10
33	Fort Wayne - Fire Station 11
34	Fort Wayne - Fire Station 12
35	Arcola Fire Department
36	Harlan Fire Department
37	Southwest Allen County Fire D
38	Fort Wayne - Fire Station 13

POLICE STATIONS

ID	Name
1	Allen County Sherriff's Office
2	Fort Wayne Police Dept
3	New Haven Police Dept
4	State Police Dept
5	Allen County Police Dept

- Airport
- Broadcast Tower
- College/University
- Dam
- Fire Station
- Hazardous Materials
- Hospital
- Nursing Home
- Military Installation
- Police Station
- Potable Water Facility
- Power Station
- School
- Wastewater Treatment Plant
- Municipal Boundaries
- Township Boundary
- Railroad
- Streams
- Interstate
- State Road
- U.S. Highway

Sources of Data:

1. *Facility Data from HAZUS (FEMA, 2002), Allen County GIS Data (2004), and feedback from the Steering Committee*
2. *Railroads, Townships from TIGER Files (US Bureau of the Census, 2000)*
3. *Municipal Boundaries, Street Centerlines from Allen County GIS Data*
4. *Streams from Indiana Department of Environmental Management, 2003*

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: Allen County, Indiana Multi-Hazard Mitigation Plan		PROJECT NO.: 04-453	APPROX. SCALE: as shown
TITLE: Critical Facilities			DATE: 04/05
			EXHIBIT: 1

Flood Zones, USGS Stream Gages and Dams

Allen County, Indiana

FACILITIES	Municipality	LOCATION		% of Facility Type	
		In 100-Year Floodplain	In 500-Year Floodplain	In 100-Year Floodplain	In 500-Year Floodplain
Dams				23%	23%
Facility ID **Name**					
3 Cedarville Dam	Leo-Cedarville	Yes	Yes		
5 Spy Run Dam	Fort Wayne	Yes	Yes		
7 Hosey (Maumee River Dam)	Fort Wayne	Yes	Yes		
Fire Stations				3%	3%
Facility ID **Name**					
18 Fort Wayne - Fire Station 2	Fort Wayne	Yes	Yes		
Hazardous Materials Handlers				3%	6%
Facility ID **Name**					
11 Slater Steels, Fort Wayne Specialty Allo	Grabill	Yes	Yes		
14 Essex Group Inc., Fort Wayne Plant	New Haven	No	Yes		
19 Franke Plating Works, Inc.	New Haven	No	Yes		
36 Craft Labs, Inc.	Roanoke	Yes	Yes		
Power Stations				100%	100%
Facility ID **Name**					
1 American Indiana Michigan Power	Fort Wayne	Yes	Yes		
Schools				5%	5%
Facility ID **Name**					
22 Bloomington Elementary School	Fort Wayne	Yes	Yes		
48 Nebraska Elementary School	Fort Wayne	Yes	Yes		
49 North Side High School	Fort Wayne	Yes	Yes		
72 Heritage Jr/Sr High School	Monroeville	Yes	Yes		
95 Central Christian School	Fort Wayne	Yes	Yes		
110 Learning Chapel Christian Academy	Fort Wayne	Yes	Yes		
125 Saint John the Baptist Catholic School	New Haven	Yes	Yes		
136 Central Lutheran School	New Haven	Yes	Yes		
Colleges/Universities				7%	7%
Facility ID **Name**					
1 Masters of Cosmetology College	Fort Wayne	Yes	Yes		
Wastewater Treatment Plants				33%	33%
Facility ID **Name**					
1 Fort Wayne Water Pollution Control Plant	Fort Wayne	Yes	Yes		
4 New Haven WWTP	New Haven	Yes	Yes		
Broadcast Facilities				10%	12%
Facility ID **Name**					
7 WFCV 1090	Fort Wayne	Yes	Yes		
21 WXKE Ch 280	Fort Wayne	No	Yes		
23 WLDE Ch 269	Fort Wayne	Yes	Yes		
Medical Care Facilities				3%	8%
Facility ID **Name**					
8 Bethlehem Woods Nursing and Rehab Center	Fort Wayne	No	Yes		
21 Life Care Center of Fort Wayne	Fort Wayne	Yes	Yes		
25 Regency Place of Fort Wayne	Fort Wayne	No	Yes		
Military Installations				25%	25%
Facility ID **Name**					
4 CASAD Military Storage Depot	Allen County (East of New Haven)	Yes	Yes		

USGS STREAM GAGES

ID	Site Name
1	JOHNSON DRAIN NR CHURUBUSCO, IN
2	EEL RIVER NR CHURUBUSCO, IN
3	ST. JOSEPH RIVER AT HURSH, IN
4	ST. JOSEPH RIVER AT CEDARVILLE, IND.
5	LITTLE CEDAR CREEK NR GARRETT, IN
6	WILLOW CREEK NR HUNTERTOWN, IN
7	CEDAR CREEK NEAR CEDARVILLE, IND.
8	ST. JOSEPH RIVER NEAR FORT WAYNE, IN
9	ST. JOSEPH RIVER AT FORT WAYNE, IND.
10	HOUK DITCH NR HESSEN CASSEL, IN
11	ST. MARYS RIVER NEAR FORT WAYNE, IND.
12	HARBER DITCH AT FORT WAYNE, IND.
13	SPY RUN CREEK AT FORT WAYNE, IN
14	MAUMEE RIVER AT FORT WAYNE, IN
15	MAUMEE RIVER AT COLISEUM BLVD AT FORT WAYNE, IN
16	MAUMEE RIVER AT NEW HAVEN, IND.
17	FLATROCK CREEK NR TOWNLEY, IN
18	HOFFMAN CREEK AT TOWNLEY, IN
19	ABOITE CK 0.3 MI US USHWY 24 AT TIMBERCREST, IN
20	WILBUR DITCH NEAR FORT WAYNE, IN
21	CEDAR CREEK NEAR CEDARVILLE
22	CEDAR CREEK NEAR ROBINSON CHAPEL

Map ID	Name	National ID	River	City
1	Rich Lake Dam	IN00781	Tributary To Hamm Ditch	Antwerp, Oh
2	St. Joseph River Dam	IN00811	St. Joseph River	Ft Wayne
3	Cedarville Dam	IN00012	St. Joseph River	Cedarville
4	Beedy Lake Dam	IN00780	Tributary To Alex Warner Ditch	Leo
5	Spy Run Dam	IN03691	Spy Run Creek	Fort Wayne
6	Poe Lake Dam	IN00779	Tributary To Alex Warner Ditch	Leo
7	Hosey (Maumee River) Dam	IN00810	Maumee River	Ft. Wayne
8	Kekionga Lake Dam	IN00447	Tributary To Graham Mcculloch Ditch	Rolling Hills
9	Covington Lake Dam	IN00113	Tributary To Beal Taylor Ditch, Aboite	Dunfee
10	Bittersweet Lake Dam	IN00118	Tributary To Graham Mcculloch Ditch	Aboite
11	Hurshtown Reservoir Dam	IN00259	Whitmer Run	Cedarville
12	Coventry Dry Dam	IN00777	Tributary To Graham Mcculloch Ditch	Aboite
13	Daus Addition Lake Dam **	IN00778	Becketts Run, St. Joseph River	Ft. Wayne

- 100-Year Floodplain
- 500-Year Floodplain
- USGS Stream Gages
- Streams
- Airport
- Broadcast Tower
- Dam
- Fire Station
- Hazardous Material Handler
- Hospital
- Nursing Home
- Military Installation
- Police Station
- Potable Water Facility
- Power Station
- School
- Wastewater Treatment Plant
- Municipal Boundaries
- College/University
- Township Boundary
- Interstate
- State Road
- U.S. Highway
- Railroad

N

0 0.5 1 2 3 Miles

Absolute Scale:
1:100,000

Sources of Data:

1. *Facility Data from HAZUS (FEMA, 2002), Allen County GIS Data (2004), and feedback from the Steering Committee*
2. *Railroads, Townships from TIGER Files (US Bureau of the Census, 2000)*
3. *Municipal Boundaries, Street Centerlines from Allen County GIS Data*
4. *Streams from Indiana Department of Environmental Management, 2003*
5. *Flood Zone Boundaries from Federal Emergency Management Agency. DFIRM, 11/05/2003*
6. *USGS Gage Data from United States Geological Survey, 2004*

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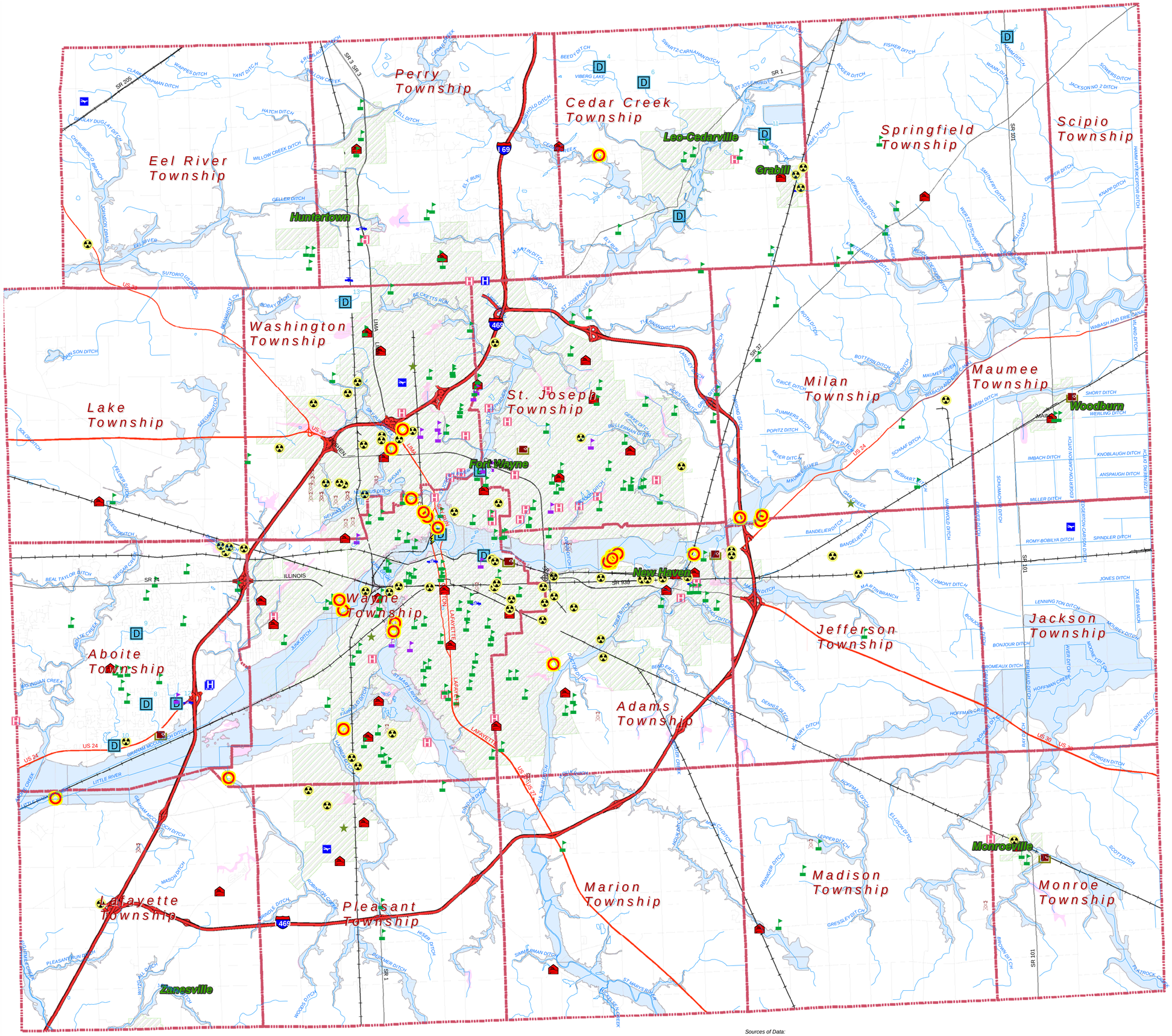
(tel) 317.266.8000 (fax) 317.632.3306

PROJECT:	PROJECT NO.:	APPROX. SCALE:
Allen County, Indiana Multi-Hazard Mitigation Plan	04-453	as shown
		DATE: 04/05
TITLE: Flood Zones, USGS Stream Gages, and Dams		EXHIBIT: 2

Repetitive Loss Areas

Allen County, Indiana



Sources of Data:

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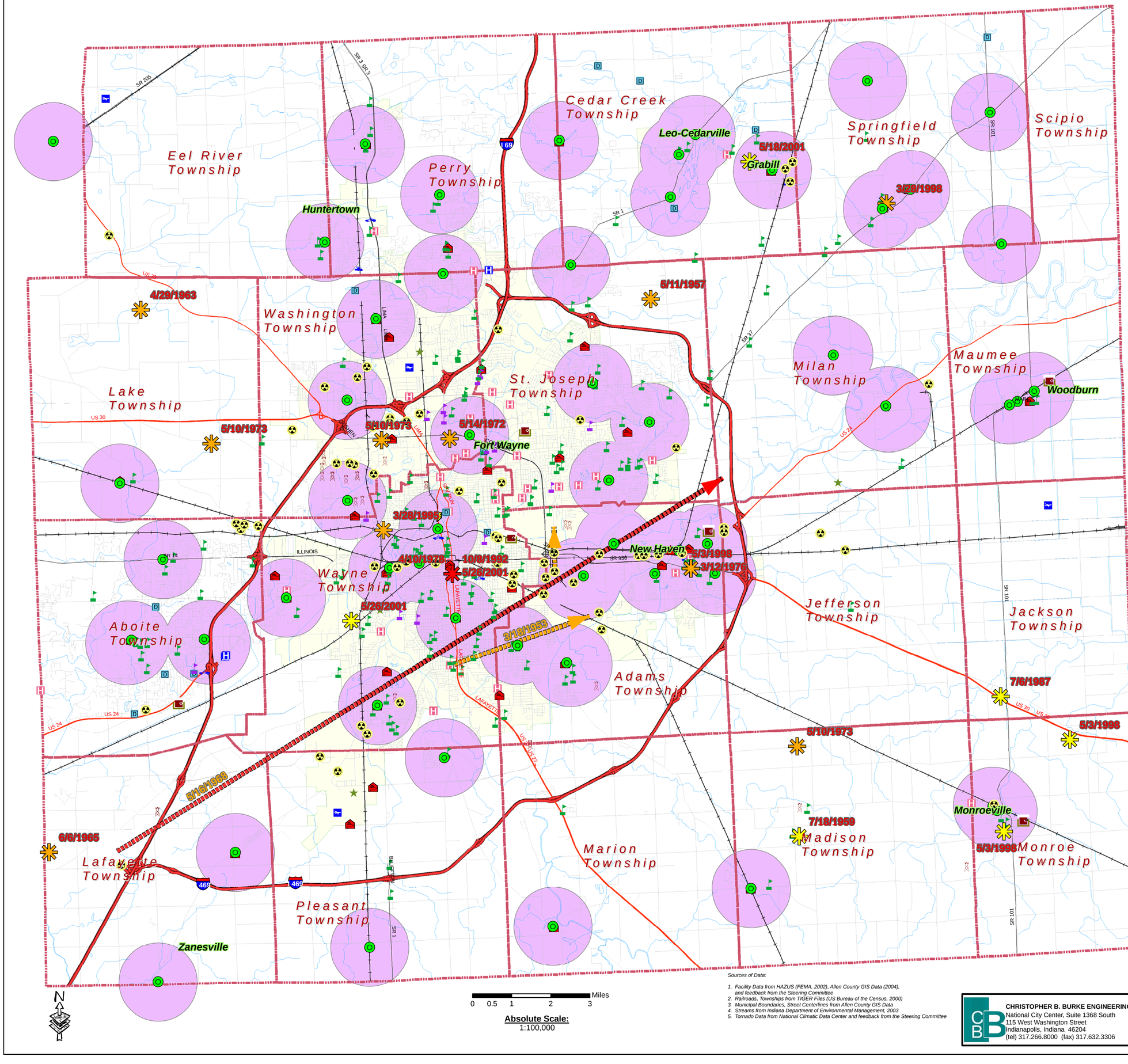
PROJECT: Allen County, Indiana Multi-Hazard Mitigation Plan		PROJECT NO.: 04-453	APPROX. SCALE: as shown
TITLE: Repetitive Loss Areas			DATE: 04/05
			EXHIBIT: 3

Historical Tornado Activity

Allen County, Indiana



Magnitude of Tornadoes

Tornado Touchdowns

- F0
- F1
- F2

Tornado Paths

- F2
- F3

- Warning Siren
- 1 Mile Radius Around Warning Siren
- Airport
- Broadcast Tower
- College/University
- Dam
- Fire Station
- Hazardous Materials
- Hospital
- Nursing Home
- Military Installation
- Police Station
- Potable Water Facility
- Power Station
- School
- Wastewater Treatment Plant
- Municipal Boundaries
- Township Boundary
- Railroad
- Streams
- Interstate
- State Road
- U.S. Highway

N

0 0.5 1 2 3 Miles

Absolute Scale:
1:100,000

Sources of Data:

1. *Facility Data from HAZUS (FEMA, 2002), Allen County GIS Data (2004), and feedback from the Steering Committee*
2. *Railroads, Townships from TIGER Files (US Bureau of the Census, 2000)*
3. *Municipal Boundaries, Street Centerlines from Allen County GIS Data*
4. *Streams from Indiana Department of Environmental Management, 2003*
5. *Tornado Data from National Climatic Data Center and feedback from the Steering Committee*

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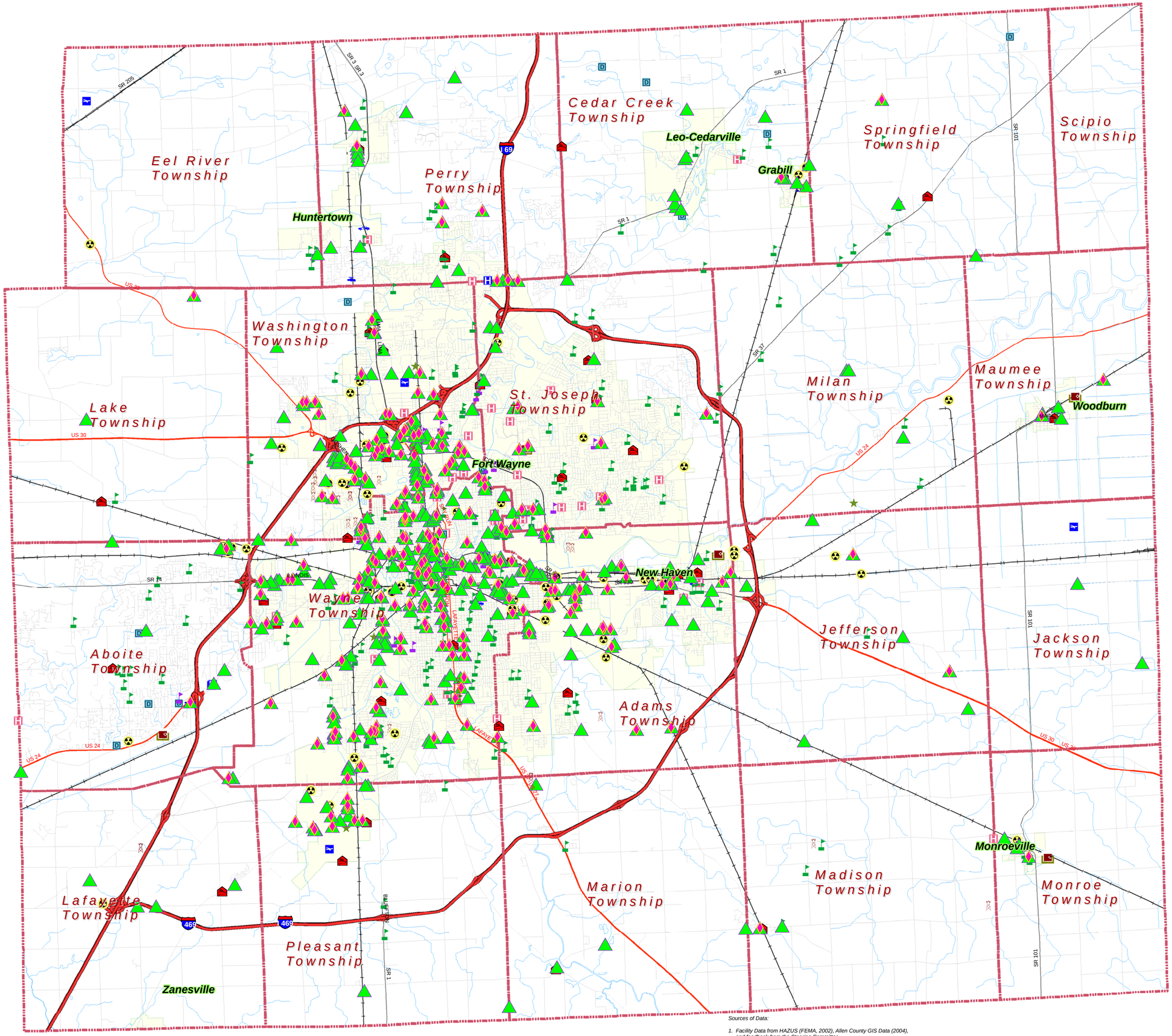
(tel) 317.266.8000 (fax) 317.632.3306

PROJECT: Allen County, Indiana Multi-Hazard Mitigation Plan		PROJECT NO.: 04-453	APPROX. SCALE: as shown
			DATE: 04/05
TITLE: Historical Tornado Activity			EXHIBIT: 4

Hazardous Material Sites

Allen County, Indiana



Absolute Scale:
1:100,000

Sources of Data:

1. *Facility Data from HAZUS (FEMA, 2002), Allen County GIS Data (2004), and feedback from the Steering Committee*
2. *Railroads, Townships from TIGER Files (US Bureau of the Census, 2000)*
3. *Municipal Boundaries, Street Centerlines from Allen County GIS Data*
4. *Streams from Indiana Department of Environmental Management, 2003*
5. *LUSTs and USTs from Indiana Department of Environmental Management Database*
6. *Hazardous Material Handlers from HAZUS Database and Input from Steering Committee*

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(tel) 317.266.8000 (fax) 317.632.3306

PROJECT:	PROJECT NO.:	APPROX. SCALE:
Allen County, Indiana Multi-Hazard Mitigation Plan	04-453	as shown
		DATE: 04/05
TITLE: Hazardous Material Sites		EXHIBIT: 5

Earthquake Loss Areas

Allen County, Indiana

Direct Economic Loss**
By Census Tract

- $0 - $1,000
- $1,000 - $2,500
- $2,500 - $5,000
- $5,000 - $8,000
- $8,000 - $15,000

*** - Calculations Based on Average Annualized Methodology*

Total Average Annual Loss = $169,000

Eel River Township
Perry Township
Cedar Creek Township
Springfield Township
Scipio Township
Washington Township
Lake Township
St. Joseph Township
Milan Township
Maumee Township
Wayne Township
Aboite Township
Adams Township
Jefferson Township
Jackson Township
Lafayette Township
Pleasant Township
Marion Township
Madison Township
Monroe Township

Huntertown
Leo-Cedarville
Grabill
Woodburn
Fort Wayne
New Haven
Zanesville
Monroeville

Airport
Broadcast Tower
College/University
Dam
Fire Station
Hazardous Materials
Hospital
Nursing Home
Military Installation
Police Station
Potable Water Facility
Power Station
School
Wastewater Treatment Plant
Township Boundary
Railroad
Streams
Interstate
State Road
U.S. Highway
Municipal Boundaries

N

0 0.5 1 2 3 Miles

Absolute Scale
1:100,000

Sources of Data:

1. *Facility Data from HAZUS (FEMA, 2002), Allen County GIS Data (2004), and feedback from the Steering Committee*
2. *Railroads, Townships from TIGER Files (US Bureau of the Census, 2000)*
3. *Municipal Boundaries, Street Centerlines from Allen County GIS Data*
4. *Streams from Indiana Department of Environmental Management, 2003*
5. *Earthquake Data from HAZUS, 2002.*

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PROJECT:	PROJECT NO.:	APPROX. SCALE:
Allen County, Indiana Multi-Hazard Mitigation Plan	04-453	as shown
		DATE: 04/05
TITLE: Earthquake Loss Areas		EXHIBIT: 6

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1-3 pm Thursday, September 23, 2004
Commissioner's Courtroom
2nd Floor, City-County Building, Fort Wayne

AGENDA

1. Overview of the Multi-Hazard Mitigation Plan (MHMP) Requirements
2. Overview of the MHMP Planning Process
3. Identify Critical Facilities
4. Discussion of Local Hazards and Determine which to Study in Detail
5. Identify Data Sources for Hazards
6. Schedule October Meeting

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1:00-3:00 pm Thursday, September 23, 2004
Commissioner's Courtroom
2nd Floor, City-County Building, Fort Wayne

MEETING SUMMARY

Planning Committee Members Present:
Marty Bender, Fort Wayne Police Department
John Bennett, City of New Haven Fire Department
Allan Frisinger, Allen County Surveyor's Office
Dave Fuller, Allen County Building Department
Don Gerardot, Town of Monroeville
John Hidy, City of Huntertown
Brad Kohrman, Allen County Sheriff's Department
Edward LaRocque, Allen County EMA
Loren Robertson, Allen County Health Department
Paul Steffens, Town of Leo-Cedarville
Maureen Voors, Allen County Planning Department

Others Present:
Sheila McKinley, Christopher Burke Engineering, Ltd. (CBBEL)
Matt Rummel, Christopher Burke Engineering, Ltd. (CBBEL)
Larry Weber, Allen County Surveyor's Office

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

The DMA 2000 requires MHMPs to be approved by FEMA before November 1, 2004 in order to qualify for all future project grant funds however; according to the State Emergency Management Agency (SEMA), this is only a "drop dead deadline" for the State. If Allen County experienced a disaster before their MHMP is adopted they will qualify for future project grant funds as long as their MHMP is approved and adopted within the 18 month application period (12 months plus two 90 day extensions).

The intent is to have a draft MHMP for Allen County and participating NFIP communities completed by January 2005. However, it may take as long as 6 months for SEMA and FEMA to approve the draft plan. Once the plan is approved by SEMA and FEMA, Allen County and participating NFIP communities may adopt the MHMP and begin implementation.

The MHMP is often confused with the Comprehensive Emergency Management Plan (CEMP). Allen County CEMP was adopted in August 2004. Although the CEMP

provides some hazard and vulnerability analysis, it does not identify historical community–based mitigation projects, risk assessment, cost of disasters or costs avoided through use of mitigation, and detailed mitigation measures required in the MHMP

There are four components to a MHMP including:
Organize Resources – establish a Planning Committee; coordinate among the various agencies and departments involved with hazard preparedness and/or response; coordinate among neighboring communities and the public; and review and incorporate existing plans, studies, and reports into the MHMP.
Assess Risks – identify all hazards; determine which hazards to study in detail; profile hazard events using HAZUS GIS software; assess vulnerability of community; and estimate potential losses.
Develop Mitigation Strategies – establish hazard mitigation goals and identify and prioritize mitigation actions.
Implement and Monitor Progress – monitor, evaluate and update MHMP; incorporate into existing planning mechanisms; and continue public involvement

2. Overview of the MHMP Planning Process

The 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 include representation from:

- Planning/Community Development
- Engineering
- 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:
    - City of Fort Wayne
    - Town of Grabill
    - Town of Huntertown
    - Town of Leo-Cedarville
    - Town of Monroeville
    - City of New Haven
    - City of Woodburn

A 12 month project timeline was distributed to the Planning Committee. This includes 5 months to prepare a draft MHMP, 6 months for SEMA and FEMA to review and comment, and 1 month for local adoption. The participation of the Planning Committee will be predominantly from September 2004 through January 2005.

MHMP PLANNING PROJECT TIMELINE

September 2004

- Assemble Planning Committee
- Planning Committee meeting (#1)
    - Overview of DMA 2000, MHMP requirements
    - Identify critical facilities
    - Discuss all hazards; identify which to study in detail
    - Identify data sources for hazards

October 2004

- Assess Risks:
    - Profile hazards
    - Inventory assets
    - Estimate losses
- Develop Plan:
    - Introduction
    - Community Profile
- Planning Committee meeting (#2)
    - Review hazard data (maps & scenarios)
    - Discuss goals and mitigation strategies

November 2004

- Edits to hazard data and scenarios
- Develop Plan:
    - Hazard Vulnerability Assessment
    - Community Capability Assessment
- Public Participation
- Planning Committee meeting (#3)
    - Discuss goals and mitigation strategies

December 2004

- Develop Plan:
    - Hazard Goals
    - Mitigation Strategies
- Planning Committee meeting (#4, possibly via internet)
    - Review draft plan

January 2005

- Public Participation
- Edits to Plan
- Review by Planning Committee (via internet)
- Submit DRAFT Plan to SEMA & FEMA for review

July 2005

- Edits to Plan based on SEMA & FEMA comments
- Review by Planning Committee (via internet)

August 2005

- Local adoption of Plan
- Submit adopted version of Plan to SEMA & FEMA

3. Identify Critical Facilities

FEMA defines critical facilities as:

a. Structures or facilities that produce, use or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials;
b. Hospitals, nursing homes and housing likely to have occupants who may not be sufficiently mobile to avoid injury or death during a hazard;
c. Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for flood response activities before, during and after a hazard; and
d. Public and private utility facilities that are vital to maintaining or restoring normal services to areas before, during and after a hazard.

An 11x17 map of critical facilities including emergency facilities, hospitals, schools, power facilities, airports, and dams in Allen County was distributed for the Planning Committee to comment on. The location of these critical facilities came from a national database available through FEMA's HAZUS GIS program and that there may be some errors and omissions. After much discussion regarding the numerous errors and omissions on the critical facilities map, the Planning Committee agreed that the County GIS database would be more accurate. Staff from CBBEL will work with the County GIS person to update the critical facilities map before the next meeting. The Planning Committee requested that utilities (gas, water, sewer, electricity), major transportation routes, medical professional buildings, nursing homes, libraries, major employers, jails, and juvenile detention facilities be added to the map.

4. Discussion of Local Hazards and Determine which to Study in Detail

The Planning Committee reviewed the list of hazards identified by FEMA and determined which hazards affect Allen 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, drought, earthquake, extreme heat, flood, severe winter storm, tornado, windstorm, hazardous materials (storage and transport), utilities (gas, sewer, water, and electricity), and public events that attract large crowds in detail as part of this planning effort.

List of Hazards	Hazards with Local Impact	Hazards for Detailed Study
Avalanche	No	
Coastal Erosion	No	
Coastal Storm	No	
Dam Failure	**Yes**	**Yes**
Drought	**Yes**	**Yes**
Earthquake	**Yes**	**Yes**
Expansive Soils	Yes	No
Extreme Heat	**Yes**	**Yes**
Flood	**Yes**	**Yes**
Hailstorm	Yes	No
Hurricane	No	
Land Subsidence	No	
Landslide	No	
Severe Winter Storm	**Yes**	**Yes**

Tornado	**Yes**	**Yes**
Tsunami	No	
Volcano	No	
Wildfire	No	
Windstorm	**Yes**	**Yes**
Hazardous Materials *(storage & transport)*	***Yes***	***Yes***
Utilities *(gas, sewer, water, electricity)*	***Yes***	***Yes***
Public events with large crowds	***Yes***	***Yes***

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

5. Identify Data Sources for Hazards

As noted in the previous discussion, the Planning Committee agreed to study dam failure, earthquake, flood, severe winter storm, tornado, windstorm, hazardous materials (storage and transport), and utilities (gas, sewer, water, and electricity) in detail as part of this MHMP effort. The following data sources were identified:

a. General hazard information – Comprehensive Emergency Management Plan (EMA document); FEMA materials
b. Floods & Dam Failure – Flood Insurance Study (FIS), Flood Insurance Rate Map (FIRM), County GIS data; Dam Plan (FW Utilities); Levee Plan (FW Flood Control Department)
c. Earthquake – national seismic data
d. Tornadoes & Windstorms – national wind zone data, local tornado paths identified on County map; local newspaper archives
e. Utilities – County GIS data
f. Severe Winter Storm – national weather databases; local newspaper archives
g. Hazardous Materials – County GIS data; Resource Conservation Recovery Act (RCRA) (State database); Community Right To Know (State database); Superfund Amendments and Reauthorization Act (SARA) (State database)

6. Schedule October Meeting

Before the next meeting was scheduled, Edward LaRocque asked if there was any other business to discuss or if there is anyone missing from the Planning Committee. There was no additional business discussed or additions to the Planning Committee.

The next Planning Committee meeting will be held from 1:00-3:00 pm on Wednesday, November 3, 2004 in the Commissioner's Courtroom of the City-County Building.

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1:00-3:00 pm Wednesday, November 3, 2004
Commissioner's Courtroom
2nd Floor, City-County Building, Fort Wayne

AGENDA

7. Review Critical Facilities Map and Information
8. Review List of Hazards
9. Review Hazard Maps and Information
10. Review State MHMP Goals
11. Discuss Local Goals
12. Discuss Options for Public Participation
13. Set November Meeting Date

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1:00-3:00 pm Wednesday, November 3 2004
Commissioner's Courtroom
2nd Floor, City-County Building, Fort Wayne

MEETING SUMMARY

Planning Committee Members Present:
Bernie Beier, Office of Homeland Security
John Bennett, New Haven Fire Department
Tony Burrus, Safety & Environmental Affairs
Dave Fuller, Allen County Building Department
Don Gerardot, Town of Monroeville
John Hidy, City of Huntertown
Brad Kohrman, Allen County Sheriff's Department
Ed LaRocque, Allen County Emergency Management Agency
Loren Robertson, Allen County Health Department
Paul Steffens, Town of Leo-Leo-Cedarville
Maureen Voors, Allen County Planning Department
Glenda Whittern, Town of Grabill

Others Present:
Sheila McKinley, Christopher Burke Engineering, Ltd. (CBBEL)
Kimberly Stier, Fort Wayne Public Works Department
Alex Wernher, Allen County GIS
Kurt Whited, Allen County GIS

1. Review Critical Facilities Map and Information

The Planning Committee reviewed the updated critical facilities map and noted that the locations of several critical facilities are not in the correct location. CBBEL staff will continue to work with the County GIS staff to update the GIS data necessary for the hazard assessment.

7. Review List of Hazards

The Planning Committee reviewed the list of hazards to study in detail as part of this planning process. These include: dam failure, drought, earthquake, extreme heat, flood, severe winter storm, tornado, windstorm, hazardous materials, utilities, and public events that attract large crowds. Following some discussion, the Planning Committee agreed to add levees to the list of hazards to study in detail as part of this planning effort.

8. Review Hazard Maps and Information

The Planning Committee reviewed dam failure, flood, earthquake, and tornado hazard research that has been completed to date.

Information regarding dam failures was gathered from the National Inventory of Dams. Of the 13 dams in Allen County, five (Leo-Cedarville Dam, Kekionga Lake Dam,

Bittersweet Lake Dam, and Hurshtown Lake Dam) are considered to be a "High Potential Hazard" because of their proximity to urban centers (Antwerp, Leo-Cedarville, Rolling Hills, Aboite, and Leo-Cedarville respectively). A failure at any one of these dams would most likely result in loss of life as well as lifeline, economic, and environmental losses. There are no known past occurrences of dam failures in Allen County.

The impact of a 100 and 500 year flood event was simulated using the GIS-based Flood Wizard Tool. The preliminary results indicate that 83% residential, 14% commercial, and 3% industrial buildings are exposed to flood damage. The total economic loss (content and building loss) is estimated at $50 M. Fifty-eight percent ($29 M) commercial buildings, 31% ($15 M) residential buildings and 7% ($3.7 M) industrial buildings will be affected. The Flood Wizard Tool will be re-run with the updated critical facilities information.

The impact of an earthquake event was simulated using the GIS-based HAZUS program. The simulation represented an annualized loss which is an average of 8 probabilistic events including the 100, 250, 500, 750, 1000, 1500, 2000, and 2500 year. Although these results are preliminary, the HAZUS program indicated that there would be little to no damage to critical facilities, 78% of the expected building damage would be to residential structures, there would be zero casualties, and only 2 households would be displaced. The total economic loss (building and lifeline loss) is estimated at $810,000. The HAZUS program will be re-run with the updated critical facilities information.

The tornado map and information was collected from the National Oceanic Atmospheric Administration (NOAA) and data available from the Allen County EMA. Between July 1950 and May 2001, there have been 23 tornadoes reported in Allen County resulting in $7.4 M in damage to Allen and neighboring Counties. The largest tornado recorded was a F3 tornado on May 16, 1968.

9. Review State's Mitigation Goals

The following goals are from the State's draft MHMP.

1. Develop an effective public awareness program for the natural hazards that Indiana is most likely to experience

2. Promote economic development consistent with floodplain management, earthquake, and tornado guidelines

3. Use Pre-Disaster Mitigation program to promote recognition of the value of hazard mitigation to public safety and the welfare of the population.

4. Encourage scientific study of natural hazards and the development of data to support mitigation strategies for those hazards that are a threat to Indiana.

5. Develop a program to identify need for warning or monitoring systems (dam structures, river levels, weather conditions) and provide a plan of action to protect communities or individuals from hazards.

6. Maintain an effective State Hazard Mitigation Council that will facilitate implementation of the Indiana Hazard Mitigation Plan, and recommend modifications to the GAR and Governor.

7. Identify mitigation opportunities for long-range planning considerations.

8. Develop a workshop for local mitigation planning.

9. Establish building and zoning codes that support floodplain management, earthquake, and tornado objectives in all counties of Indiana.

10. Identify critical and governmental facilities. Determine methods of protection in hazard prone areas, including relocation, flood proofing, earthquake/wind retrofit, back-up systems.

11. Develop a state-wide hazard mitigation training program for local government officials (i.e. building inspectors, community planners and public works, state agencies, and construction professionals (contractors, architects, designers).

10. Discuss Local Mitigation Goals

The Planning Committee reviewed the list of Mitigation Measures prepared by FEMA and agreed to focus Allen County mitigation goals, objectives, and projects based on these measures. General "all-hazard" goals will be established for each of FEMA's mitigation measures and as appropriate, mitigation objectives and projects will be identified for each hazard in Allen County.

Prior to setting mitigation goals, the Planning Committee discussed existing programs and polices to prevent duplication of resources or efforts. This information will be incorporated in the Community Capability portion of the MHMP.

1. Prevention
   FEMA defines prevention as measures that are designed to keep the problem from occurring or getting worse. Allen County and participating NFIP communities currently have long-range planning, zoning, and subdivision control ordinances that guide or restrict development from known hazardous areas. The County's GIS system includes numerous layers including the most recent flood boundaries. The all-hazard goal for prevention is to manage development of land and buildings to reduce the risk and loss due to hazards.

2. Property Protection
   FEMA defines property protection as measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away. The Maumee River Basin Commission (MRBC) works to acquire, relocate, elevate, and/or flood proof structures and flood zone areas through the National Flood Insurance Program. The all-hazard goal for property protection is to protect new and existing property from the impacts of hazards.

3. Natural Resource Protection
   FEMA defines natural resource protection as opportunities to preserve and restore natural areas and their function to reduce the impact of hazards. Allen County SWCD encourages agricultural landowners to implement filter strips

along drainage ditches and setbacks along natural waterways. Development is restricted in the floodplain. Allen County, Fort Wayne, Huntertown, Leo-Cedarville, and New Haven are required to reduce the pollutants carried by stormwater runoff as part of Rule 13. Hydraulic and hydrology studies have been completed for several watersheds in the County. Designated wellhead protection areas restrict development in groundwater recharge areas. The all-hazard goal for natural resource protection is to preserve and restore the beneficial function of existing natural areas to reduce the impact of hazards.

4. Emergency Services
   FEMA defines emergency services as measures that protect people during and after a hazard. Allen County has a countywide siren system however there is a need for additional sirens. Weather systems are monitored by the EMA's office in cooperation with the SEMA using the National Weather Service. USGS river gauges are used to monitor changes in water levels. Local TV and radio carry weather warnings and advisories. A Mutual Aid Agreement for emergency services exists with the surrounding counties as well as the communities in Allen County. The all-hazard goal for emergency services is to continue to improve the efficiency, timing, and effectiveness of response and recovery efforts in Allen County.

5. Structural Control Projects
   FEMA defines structural control projects as physical measures used to prevent hazards from reaching a property. Allen County resizes culverts and bridges as resources allow. The Surveyor's Office, in partnership with IDNR and MRBC has developed procedures for maintaining natural streams and drainage ditches. Allen County and participating communities have stormwater detention/retention sizing requirements for new development. The all-hazard goal for structural control projects is to continue to apply structural control projects, where feasible, to minimize the potentially damaging effects of hazards on people and property.

6. Public Information
   FEMA defines public information activities as those that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards. There are several education and training programs throughout the County. These include EMA and Red Cross preparedness materials, school programs, SWCD programs, service groups, public library programs and materials, and media outlets (TV, radio, newspaper). By the end of 2004, visitors to the County's webpage should be able to search for their property by address and its relationship to potential hazards. Allen County, Woodburn, Monroeville, Grabill, Huntertown and Fort Wayne distribute educational materials to floodplain properties as a requirement of the NFIP Community Ratings System (CRS) program. The Fort Wayne City Council conducts a monthly public meeting prior to the Council Meeting to specifically discuss flooding issues. The EMA sponsors one of the largest Storm Spotter Training Program for ham radio operators. Allen County, Fort Wayne, Huntertown, Leo-Cedarville, and New Haven are required to conduct stormwater-related public education, outreach and participation programs as part of Rule 13. The all-hazard goal for public information is to continue to educate and inform the public about the risks of hazards and methods to reduce the threat to life and property.

11. Discuss Options for Public Participation
The Planning Committee plans to hold a public meeting in January to present the draft MHMP. However, the Committee would like to include comments from the public during the development of the MHMP. Several opportunities were discussed. The Committee decided to publish an article in the newspapers with a couple survey questions that participants can respond to either by email or mail. CBBEL staff agreed to work directly with Ed LaRocque to prepare an article in order to get it in the newspapers mid-November.

12. Schedule November Meeting
The next Planning Committee meeting will be held from 1:00-3:00 pm on Tuesday, December 7, 2004 in the Omni Room of the City-County Building in Fort Wayne.

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1:00-3:00 pm Tuesday, December 7, 2004
Omni Room, 2nd Floor
City-County Building, Fort Wayne

AGENDA

14. Discuss Newspaper Article and Survey Responses

15. Review Mitigation Goals

16. Discuss Mitigation Projects

17. Discuss Options for Continued Public Participation

18. Discuss Options for Public Meeting

Allen County Multi-Hazard Mitigation Plan
Planning Committee Meeting

1:00-3:00 pm Tuesday, December 7, 2004
Omni Room, 2nd Flood
City-County Building, Fort Wayne

MEETING SUMMARY

Planning Committee Members Present:
Bernie Beier, Office of Homeland Security
Marty Bender, Fort Wayne Police Department
John Bennett, New Haven Fire Department
Dave Fuller, Allen County Building Department
Don Gerardot, Town of Monroeville
John Hidy, City of Huntertown
Brad Kohrman, Allen County Sheriff's Department
Ed LaRocque, Allen County Emergency Management Agency
Loren Robertson, Allen County Health Department
Kris Rice, Town of Woodburn
Loren Robertson, Allen County Health Department
Paul Steffens, Town of Leo-Leo-Cedarville
Maureen Voors, Allen County Planning Department
Glenda Whittern, Town of Grabill

Others Present:
Sheila McKinley, Christopher B. Burke Engineering, Ltd.

19. Discuss Newspaper Article and Survey Responses
A copy of the media release that was distributed to The News Sentinel and Journal Gazette was distributed to the Planning Committee. The News Sentinel published the article and as a result, the EMA Director has received 1 letter and 2 phone calls, one of whom wished to schedule and appointment to discuss these issues further.

20. Review Mitigation Goals
The Planning Committee reviewed the list of all-hazard goals that were drafted at the last meeting. All-hazard goals were established for each of the six mitigation measures identified by FEMA. The six all-hazard goals are as follows:

Prevention – Continue to manage the development of land and buildings to reduce the loss due to hazards.

Property Protection – Continue to protect new and existing property form the impacts of hazards.

Natural Resource Protection – Continue to preserve and restore the beneficial function of existing natural areas to reduce the impacts of hazards.

Emergency Services – Continue to improve the efficiency, timing, and effectiveness of warning, response, and recovery efforts in Allen County.

Structural Control Projects – Continue to use structural control projects, where feasible, to minimize the effects of hazards on people and property.

Public Information – Continue to educate and inform the public about the risks of hazards and methods to reduce the threat of life and property.

21. Discuss Mitigation Projects
The Planning Committee participated in an extensive exercise to identify mitigation projects suitable for all-hazards, dam failure, drought, earthquake, extreme heat, flood, severe winter storms, tornado and windstorms, hazardous materials, utility failure, levees, and public events with large crowds. Many of the mitigation project identified are on-going and would benefit from continued support or additional resources. Each mitigation project was discussed and evaluated based on priority (high, medium, low), cost benefit ratio, project location, responsible entity, and funding source. The charts on the following pages summarize the discussion.

22. Discuss Options for Continued Public Participation
Allen County and participating NFIP communities have well-established education and training programs. The Planning Committee agreed that the existing programs were sufficient for multi-hazard mitigation planning efforts.

23. Discuss Options for Public Meeting
As part of this planning process, Allen County and participating NFIP communities need to hold a public meeting. The Planning Committee agreed to host a meeting in February 2005. AT this meeting, the draft MHMP will be presented in an effort to share the goals and mitigation projects as well as obtain additional suggestions from the general public. CBBEL staff agreed to make the arrangements for the public meeting to be held at the City-County Building.

ALL-HAZARDS MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Public Education & Awareness	High	Low	Countywide	EMA Health Department Red Cross	Grant Existing budget
Mutual Aid and/or Interagency Agreements	High	Medium	Countywide	EMA Haz Mat Health Department Fire	Existing budget
Critical Facility Protection	High	Medium	Countywide	Facility owner (public & private)	Grant (HLS) Private Existing budget Operation expense
Emergency Warning System	High	Medium	Needed in New Haven, Fort Wayne, Rural areas	EMA	Grant Existing budget
Power Backup at Critical Facilities	High	Medium	Critical Facilities throughout county	Owner	Grant (HLS) Existing budget
Land Use Planning	High	Low	Countywide	Planning	Existing budget User fees
Geographic Information System	Medium	Low	Countywide	County GIS (IMAP) City GIS	Grant Existing budget
Building Code	High	Low	Countywide	Planning Building Department	Existing budget User fee
Safe Room/Shelter	Medium	Low	Countywide	EMA Red Cross Major Employers	Existing budget

DAM & LEVEE FAILURE MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Emergency Action Plan	Medium	Medium-High	Dams Levees (Fort Wayne)	Dam Owner DNR	Existing budget Assessment Grant
Inspection and Maintenance Program	Medium	Medium	Dams Levees (Fort Wayne)	Dam Owner	Existing budget

EARTHQUAKE MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Seismic Hazard Mapping	Low	Medium	Countywide	County GIS City GIS State GIS	Grant
HAZUS Earthquake Program	High	Low	Countywide	County GIS City GIS	Grant Existing budget

EXTREME HEAT MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Cooling Bills (special arrangement for payment)	Medium	Medium-Low	Lower income areas throughout County	Utility	Consumer Grants Donations
Cooling Centers	Medium	Low	Lower income areas	Facility Owner (public	Existing budget

			throughout County	& private)	

FLOOD MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Acquisition, Relocation, and Elevation	High	Medium	Buildings in flood hazard	MRBC	Property owner Grant (PDM, HMGP) Flood insurance
Floodproofing	Medium	Medium	Buildings in flood hazard	MRBC	Property owner Grant (PDM, HMGP) Flood insurance
Stormwater Management Program	High	Medium	Urban centers	Planning, Engineering	Existing budget Grant
Community Ratings System	High	Medium	NFIP communities	NFIP coordinator	Existing budget Grant
Structural Flood Control Measures	Medium-Low	Medium	Flooded areas	MRBC	Existing budget Grant
Flood Warning System	High	Low	Countywide	EMA County GIS	Existing budget Grant
HAZUS Flood Program	Medium	Medium	Countywide	EMA County GIS	Existing budget Grant
Channel Maintenance	High	Medium	Streams Ditches	SWCD Surveyor MRBC	Existing budget Grant
Flood Insurance	High	Medium	Buildings in flood hazard area	Building owner	Owner

SEVERE WINTER STORM MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Road Maintenance	High	Medium-High	Countywide	Street Highway (State, County, Local)	Existing budget Grant
Power Lines (buried)	Low	High	Countywide (existing in New Haven)	Utilitiy	Utility fees

TORNADO & WINDSTORM MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Tree Maintenance	High	Medium	Public property, ROW, Utility corridors	Parks, DPW, Utility	Existing budget Utility fee
Tornado Sirens	Medium	Medium	Populated areas	EMA	Existing budget

HAZARDOUS MATERIALS MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Safety Procedures and Policies	High	Medium	On-site	EMA Company	Existing budget

Employee Training	High	Low	On-site	EMA (SARA Title III) Company	Existing budget Grant
Emergency Plan	High	Low	On-site	EMA	Existing budget Grant
Transportation	High	Low	Countywide (routes not enforced in Woodburn or Fort Wayne)	EMA INDOT Hwy Police Traffic Engineer	Existing budget Grant
Storage	High	Medium	On-site	Company	Existing budget
Disposal	High	Medium	Countywide	Facility Owner	Existing budget
Industrial Site Buffering	Medium	Medium	Countywide	Planning	Existing budget
Facility Security	High	Low	On-site	Facility owner	Existing budget

UTILIY FAILURE MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Water and Sewer	High	Medium	Where available	Utility	Existing budget Utility assessment
Power Lines	High	High	Countywide (except Amish Community)	Utility	Existing budget Utility assessment
Digging Hotlines	High	Low	Countywide	Utility	Existing budget

					Utility assessment
Communications	High	High	Countywide	Utility	Existing budget Utility assessment

PUBLIC EVENTS WITH LARGE CROWDS MITIGATION PROJECTS

Project	**Priority** (High, Medium, Low)	**Cost Benefit Ratio** (High C>B, Medium C=B, Low C<B)	**Project Location**	**Responsible Entity**	**Funding Source**
Security (Crowd Control)	High	Medium-Low	Festival location	Local Police Festival organizers	Existing budget Event fees
Evacuation Procedures	High	Low	Festival location	Local Police Festival organizers	Existing budget Event fees

MEDIA RELEASE

For Immediate Release
Media Release Date: November 18, 2004
Contact: Ed LaRocque, Emergency Management Agency (260-449-7684)

How do tornadoes, floods, and severe winter storms affect you?

The Allen County Emergency Management Agency, in cooperation with Allen County, the City of Fort Wayne, Town of Grabill, Town of Huntertown, Town of Leo-Cedarville, Town of Monroeville, City of New Haven, and City of Woodburn is preparing a Multi-Hazard Mitigation Plan.

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.

The flood that occurred in July 2003 and September 2003 were significant events resulting in both personal and property loss for many residents in Allen County. In addition to your personal experience with floods, the Multi-Hazard Mitigation Planning Committee would also like to know if severe winter storms, tornado/windstorms, the storage and transport of hazardous materials, public utility failures, dam failures, and earthquakes have affected you in Allen County.

Please answer the following questions and send your response to Ed LaRocque at the Allen County Emergency Management Agency at 1 East Main Street, Room B-86, Fort Wayne, IN 46802-1804 or email ed.larocque@co.allen.in.us before Friday, December 10, 2004.

1. Have you ever experienced or been impacted by flood, severe winter storm, tornado/windstorm, the storage and transport of hazardous material, public utility failure, dam failure, and/or earthquake (Identify all that apply)
2. Did your experience result in a personal or financial loss? If so, to what extent was the damage?
3. In your opinion, what is the likelihood of a flood, severe winter storm, tornado/windstorm, the storage and transport of hazardous material, public utility failure, dam failure, and/or earthquake occurring in Allen County in the near future? (Identify all that apply)
4. Any other comments you may have regarding local hazards in Allen County.

The Allen County Emergency Management Agency will host a public meeting early in 2005 to present the DRAFT Multi-Hazard Mitigation Plan to the public and gather additional public input. The meeting date and time is not available at this time but will be widely published in the near future.

---- End ----

MEDIA RELEASE

For Immediate Release
Media Release Date: March 29, 2005
Contact: Ed LaRocque, Emergency Management Agency (260-449-7684)

Public Presentation of the Allen County Multi-Hazard Mitigation Plan Scheduled for 7 pm Wednesday, April 13

The Allen County Emergency Management Agency, in cooperation with Allen County, the City of Fort Wayne, Town of Grabill, Town of Huntertown, Town of Leo-Cedarville, Town of Monroeville, City of New Haven, and City of Woodburn have prepared a Multi-Hazard Mitigation Plan. This Plan assesses the risk and vulnerability of these communities for flood, severe winter storms, tornado/windstorms, hazardous materials, utility failure, dam/levee failure, earthquake, special events, extreme heat, and drought.

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.

The draft Allen County Multi-Hazard Mitigation Plan will be presented at a public meeting on Wednesday, April 13 at 7 pm at the Omni Room in the City County Building in Fort Wayne. 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.

For additional information please contact Ed LaRocque, Emergency Management Agency Director for Allen County at 260-449-7684 or ed.larocque@co.allen.in.us or Sheila McKinley, Senior Resource Planner for Christopher B. Burke Engineering, Ltd. at 317-266-8000 or smckinley@cbbel-in.com

---- End ----

Allen County IN Depth Profile

County: Allen GO

Region: IEDC NW GO

Create a Region: CUSTOMIZE

Population | Age | Race | Households | Education | Poverty | Health | Labor Force | Employment & Earnings | Commuting | Taxes | Building Permits

Allen County, Indiana

Named for Colonel John Allen, who fought Tecumseh's siege of Fort Wayne in 1812

County Seat: Fort Wayne
Largest City: Fort Wayne (pop in 2003: 219,495)
Population per Sq. Mile: 517.6 Sq. Miles: 657.2
Link to County's in-map.net Site

Population Over Time	Number	Rank in State	Percent of State	Indiana
Yesterday(1990)	300,836	3	5.4%	5,544,156
Today(2003)	340,153	3	5.5%	6,195,643
Tomorrow(2010 proj.)	346,653	3	5.4%	6,417,198
Percent Change 1990 to 2000	10.3%	30		9.7%

Top More Data

Sources: US Census Bureau; Indiana Business Research Center

Components of Population Change in 2003	Number	Rank in State	Percent of State	Indiana
Net Domestic Migration 2002 to 2003	-612	87		1,019
Net International Migration 2002 to 2003	839	4		11,147
Natural Increase (births minus deaths)	2,674	2	9.9%	27,045

Top More Data

Source: US Census Bureau

Population Estimates by Age in 2003	Number	Rank in State	Pct Dist. in County	Pct Dist. in State
Preschool (0 to 4)	26,534	3	7.8%	6.9%
School Age (5 to 17)	69,117	3	20.3%	18.9%
College Age (18 to 24)	31,865	4	9.4%	10.2%
Young Adult (25 to 44)	95,545	3	28.1%	28.0%
Older Adult (45 to 64)	78,947	3	23.2%	23.6%
Older (65 plus)	38,145	3	11.2%	12.3%
Median Age	34.3			Median Age = 35.5

Top More Data

Sources: US Census Bureau; Indiana Business Research Center

Population Estimates by Race or Hispanic Origin in 2003	Number	Rank in State	Pct Dist. in County	Pct Dist. in State
American Indian or Alaska Native Alone	1,305	3	0.4%	0.3%
Asian Alone	5,727	4	1.7%	1.2%
Black Alone	39,059	3	11.5%	8.6%
Native Hawaiian and Other Pac. Isl. Alone	182	5	0.1%	0.0%
White Alone	288,290	3	84.8%	88.9%
Two or More Race Groups	5,590	2	1.6%	1.0%
Hispanic or Latino(can be of any race)				
Non-Hispanic or Latino	324,178	3	95.3%	96.1%
Hispanic or Latino	15,975	4	4.7%	3.9%

Top More Data

Source: US Census Bureau

Household Types	Number	Rank in State	Pct Dist. in County	Pct Dist. in State
Households in 2000 (Includes detail not shown below)	128,745	3	100.0%	100.0%
Married With Children	31,048	3	24.1%	23.8%

Top

Married Without Children	35,203	3	27.3%	29.8%	More Data
Single Parents	12,836	3	10.0%	9.1%	
Living Alone	35,279	3	27.4%	25.9%	

Source: US Census Bureau

Housing	Number	Rank in State	Pct Dist. in County	Pct Dist. in State	
Total Housing Units in 2003 (estimate)	145,300	3	100.0%	100.0%	
Total Housing Units in 2000 (includes vacant units)	138,905	3	100.0%	100.0%	
Owner Occupied (Pct. distribution based on all housing units) Median Value (2000)	91,415 $88,700	3 35	65.8% --	65.9% --	Top More Data
Renter Occupied (Pct. distribution based on all housing units) Median Rent (2000)	37,330 $506	3 22	26.9% --	26.3% --	

Source: US Census Bureau

Education	Number	Rank in State	Percent of State	Indiana	
School Enrollment (2003/2004 Total Reported)	58,713	3	5.6%	1,040,061	
Public	53,365	3	5.3%	1,010,492	
Private	5,348	2	18.1%	29,569	
High School Graduates (2003/2004)	3,034	3	5.4%	56,222	
Going on to Higher Education	2,724	3	6.2%	43,805	
4-year	2,274	3	7.0%	32,572	Top More Data
2-year	268	3	3.8%	7,052	
Voc/tech.	182	3	4.4%	4,181	
Adults (25+ in 2000 Census)	208,769	3	5.4%	3,893,278	
with High School diploma or higher	85.7%	12		82.1%	
with B.A. or higher degree	22.7%	9		19.4%	

Sources: Indiana Department of Education; US Census Bureau

Income and Poverty	Number	Rank in State	Percent of State	Indiana	
Per Capita Personal Income (annual) in 2002	$29,493	13	105.2%	$28,032	
Median Household Income in 2002	$43,077	29	102.6%	$41,973	
Poverty Rate in 2002	9.4%	38	97.9%	9.6%	
Poverty Rate among Children under 18	12.0%	35	100.8%	11.9%	Top More Data
Welfare (TANF) Monthly Average Families in 2002	2,637	4	5.6%	47,459	
Foodstamp Recipients in 2002	21,548	3	5.4%	395,444	
Free and Reduced Fee Lunch Recipients in 2004	26,110	3	7.0%	372,503	

Sources: U.S. Bureau of Economic Analysis; US Census Bureau; Indiana Family Social Services Administration; Indiana Department of Education

Health and Vital Statistics in 2002	Number	Rank in State	Percent of State	Indiana	
Births	5,161	3	6.1%	84,839	
Births to Teens	516	3	5.3%	9,701	Top More Data
Deaths	2,701	3	4.9%	55,123	

Source: Indiana State Department of Health

Labor Force in 2003	Number	Rank in State	Percent of State	Indiana	
Total Resident Labor Force	180,377	3	5.7%	3,187,734	
Employed	170,531	3	5.6%	3,024,367	Top More Data
Unemployed	9,846	3	6.0%	163,367	
Unemployment Rate	5.5	40	107.8%	5.1	
December 2004 Unemployment Rate	**5.2**	**49**	**104.0%**	**5.0**	

Source: Bureau of Labor Statistics; Indiana Department of Workforce Development

Employment and Earnings by Industry in 2002 (NAICS)	Employment	Pct Dist. in County	Earnings ($000)	Pct Dist. In County	Avg. Earnings Per Job

Total by place of work	226,809	100.0%	$8,617,461	100.0%	$37,994
Wage and Salary	197,607	87.1%	$6,526,370	75.7%	$33,027
Farm Proprietors	1,632	0.7%	-$213	0.0%	-$131
Nonfarm Proprietors	27,570	12.2%	$721,664	8.4%	$26,176
Farm	1,829	0.8%	$3,548	0.0%	$1,940
Nonfarm	224,980	99.2%	$8,613,913	100.0%	$38,287
Private	205,626	90.7%	$7,801,455	90.5%	$37,940
Accomodation, Food Serv.	16,263	7.2%	$214,130	2.5%	$13,167
Arts, Ent., Recreation	3,390	1.5%	$41,272	0.5%	$12,175
Construction	13,549	6.0%	$572,800	6.6%	$42,276
Health Care, Social Serv.	28,201	12.4%	$1,224,064	14.2%	$43,405
Information	4,411	1.9%	$225,832	2.6%	$51,197
Manufacturing	31,944	14.1%	$1,871,155	21.7%	$58,576
Professional, Tech. Serv.	9,775	4.3%	$448,097	5.2%	$45,841
Retail Trade	25,735	11.3%	$541,921	6.3%	$21,058
Trans., Warehousing	8,597	3.8%	$469,932	5.5%	$54,662
Wholesale Trade	13,651	6.0%	$632,479	7.3%	$46,332
Other Private (not above)	50,110	22.1%	$1,559,773	18.1%	$31,127
Government	19,354	8.5%	$812,458	9.4%	$41,979

Top
Employment & Earnings
More Data

Source: US Bureau of Economic Analysis

Assessed Property Value in 1999 (for taxes payable in 2000)	Value	Rank in State	Pct Dist. in County	Pct Dist. in State
Assessed Value by Property Class	$3,127,292,950	3	100.0%	100.0%
Commercial & Industrial	$1,436,324,790	3	45.9%	43.2%
Residential	$1,424,206,250	3	45.5%	41.5%
Agricultural	$139,275,120	1	4.5%	9.6%
Utilities	$127,486,780	4	4.1%	5.6%
Total Assesed Value Per Capita	$9,946	32		

Top
More Data

Source: The State Board of Tax Commissioners

Residential Building Permits in 2003	Units	Pct Dist. in County	Pct Dist. in State	Cost ($000)	State Cost ($000)
Total Permits Filed	2,312	100.0%	100.0%	$357,800	$5,392,722
Single Family	1,953	84.5%	80.9%	$341,766	$4,859,081
Two Family	26	1.1%	3.7%	$2,203	$137,119
Three & Four Family	16	0.7%	2.1%	$1,630	$58,920
Five families and More	317	13.7%	13.3%	$12,201	$337,602

Top
More Data

Source: US Census Bureau (Greene County totals are not included as it does not currently issue building permits.)

Commuting Patterns - Top 5 in 2002					
Into Allen FROM	Number	Percent	Out of Allen TO	Number	Percent
All Areas	27,584	11.8%	All Areas	10,884	5.0%
Whitley County	5,181	2.2%	Dekalb County	2,942	1.4%
Huntington County	3,892	1.7%	Whitley County	1,423	0.7%
Wells County	3,800	1.6%	Noble County	1,146	0.5%
Dekalb County	3,090	1.3%	Huntington County	758	0.4%
Noble County	2,786	1.2%	Adams County	676	0.3%

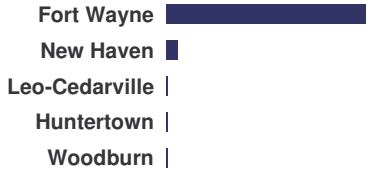
Top
More Data

Source: Indiana Department of Revenue

Cities and Towns in Allen County

	Population in 2003	% of County
Fort Wayne	219,495	64.5%
Grabill	1,147	0.3%
Huntertown	2,335	0.7%
Leo-Cedarville	2,874	0.8%
Monroeville	1,275	0.4%

Order by Size



New Haven	13,592	4.0%	**Monroeville** |
Woodburn	1,629	0.5%	**Grabill** |
Zanesville	88	0.0%*	**Zanesville*** |

* Population in this county is shown, this city or town crosses county lines.

Links to Maps:
Census Tract Boundary Map of Allen county
Tiger Mapping Service Map of Area
Top of page

County Profiles is a component of **STATS Indiana**, a web-based information service of the State of Indiana and the Indiana Department of Commerce, developed and maintained by the Indiana Business Research Center at Indiana University's Kelley School of Business.
Updated: January 31, 2005 at 11:17

CRITICAL FACILITIES

AIRPORTS

Name	NFIP Community
SMITH FIELD	Fort Wayne
FORT WAYNE MUNI/BAER FLD/	Fort Wayne
McDUFF ROAD & SR 205	Huntertown
BASTING	Woodburn

COLLEGES/UNIVERSITIES

Name	NFIP Community
Indiana Business College Fort Wayne	Fort Wayne
Masters of Cosmetology College	Fort Wayne
Michiana College	Fort Wayne
Concordia Theological Seminary	Fort Wayne
Indiana Institute of Technology	Fort Wayne
IUPUI-Ft Wayne	Fort Wayne
International Business College	Fort Wayne
ITT Technical Insitute	Fort Wayne
Ivy Tech State College-Northeast	Fort Wayne
Ravenscroft Beauty College	Fort Wayne
Ruade's School of Beauty Culture	Fort Wayne
Taylor University-Ft Wayne	Fort Wayne
Tri-State University	Fort Wayne
Univeristy of Saint Francis-Ft Wayne	Fort Wayne

SCHOOLS

Name	NFIP Community
Arcola School	Allen County
Suburban Bethlehem Lutheran Sch	Allen County
Harlan Elementary School	Allen County
Cuba Mennonite School	Allen County
Harlan Christian School	Allen County
Hoagland Elementary School	Allen County
Saint Aloysius Catholic School	Allen County
Aboite Elementary School	Fort Wayne
Covington Elementary School	Fort Wayne
Deer Ridge Elementary	Fort Wayne
Haverhill Elementary School	Fort Wayne
Homestead Senior High School	Fort Wayne
Summit Middle School	Fort Wayne
Whispering Meadow Elem Sch	Fort Wayne
Woodside Middle School	Fort Wayne
Allen Co Youth Services Ctr	Fort Wayne
Carroll High School	Fort Wayne
Carroll Middle School	Fort Wayne
Hickory Center Elementary Sch	Fort Wayne
Maple Creek Middle Sch	Fort Wayne
Perry Hill Elementary School	Fort Wayne
Adams Elementary School	Fort Wayne
Anthis Career Center	Fort Wayne
Arlington Elementary School	Fort Wayne

Ben F Geyer Middle School	Fort Wayne
Blackhawk Middle School	Fort Wayne
Bloomingdale Elementary Sch	Fort Wayne
Brentwood Elementary School	Fort Wayne
Bunche Elementary School	Fort Wayne
Elmhurst High School	Fort Wayne
Fairfield Elementary School	Fort Wayne
Forest Park Elementary School	Fort Wayne
Francis M Price Elem Sch	Fort Wayne
Franke Park Elementary School	Fort Wayne
Fred H Croninger Elem Sch	Fort Wayne
Glenwood Park Elementary Sch	Fort Wayne
Harrison Hill Elementary Sch	Fort Wayne
Indian Village Elementary Sch	Fort Wayne
J Wilbur Haley Elementary Sch	Fort Wayne
Jefferson Middle School	Fort Wayne
John S Irwin Elementary Sch	Fort Wayne
Kekionga Middle School	Fort Wayne
Lakeside Middle School	Fort Wayne
Lane Middle School	Fort Wayne
Levan R Scott Academy	Fort Wayne
Lincoln Elementary School	Fort Wayne
Lindley Elementary School	Fort Wayne
Mabel K Holland Elem Sch	Fort Wayne
Maplewood Elementary School	Fort Wayne
Memorial Park Middle School	Fort Wayne
Merle J Abbett Elementary Sch	Fort Wayne
Miami Middle School	Fort Wayne
Nebraska Elementary School	Fort Wayne
North Side High School	Fort Wayne
Northcrest Elementary School	Fort Wayne
Northrop High School	Fort Wayne
Northwood Middle School	Fort Wayne
Pleasant Center Elem School	Fort Wayne
Portage Middle School	Fort Wayne
R Nelson Snider High School	Fort Wayne
Robert C Harris Elem Sch	Fort Wayne
Saint Joseph Central School	Fort Wayne
Shawnee Middle School	Fort Wayne
South Side High School	Fort Wayne
South Wayne Elementary School	Fort Wayne
Special Education Center	Fort Wayne
Study Elementary School	Fort Wayne
Washington Center Elem Sch	Fort Wayne
Washington Elem School	Fort Wayne
Wayne High School	Fort Wayne
Waynedale Elementary School	Fort Wayne
Weisser Park Elem Sch	Fort Wayne
Whitney M Young Early Childhood	Fort Wayne
Willard Shambaugh Elem Sch	Fort Wayne
Cedarville Elementary Sch	Fort Wayne
Maple Grove Learning Center	Fort Wayne

Paul Harding High School	Fort Wayne
Prince Chapman Academy	Fort Wayne
Southwick Elementary School	Fort Wayne
Village Elementary School	Fort Wayne
Abacus Child Care/Early Lrn Ctr	Fort Wayne
Beautiful Savior Lutheran	Fort Wayne
Blackhawk Christian Elem Sch	Fort Wayne
Blackhawk Christian Jr-Sr High Sch	Fort Wayne
Canterbury School	Fort Wayne
Central Christian School	Fort Wayne
Cornerstone College Prep Sch	Fort Wayne
Coventry Sch of Early Learning	Fort Wayne
Crossroad/Ft Wayne Children's Home	Fort Wayne
Fort Wayne Christian Academy	Fort Wayne
Hand-In-Hand Ministry	Fort Wayne
Keystone Schools	Fort Wayne
Keystone Schools	Fort Wayne
Keystone Schools SW	Fort Wayne
Kiddie Prep Inc	Fort Wayne
Learning Chapel Christian Academy	Fort Wayne
Martin Luther King Montessori Sch	Fort Wayne
Messiah Lutheran Preschool	Fort Wayne
Pine Hills Kiddie Garden	Fort Wayne
Taylor Chapel Preschool	Fort Wayne
Ft Wayne Juvenile Correction Fac	Fort Wayne
Northeast Juvenile Corr Facility	Fort Wayne
Benoit Academy	Fort Wayne
Bishop Dwenger High School	Fort Wayne
Bishop Luers High School	Fort Wayne
Most Precious Blood Sch	Fort Wayne
Queen Of Angels School	Fort Wayne
Saint Charles Borromeo School	Fort Wayne
Saint John The Baptist School	Fort Wayne
Saint Jude Elementary School	Fort Wayne
Saint Therese School	Fort Wayne
Saint Vincent DePaul School	Fort Wayne
St Joseph - St Elizabeth School	Fort Wayne
St Joseph Hessen Cassel Cath Sch	Fort Wayne
Ascension Lutheran Sch	Fort Wayne
Bethlehem Lutheran Sch	Fort Wayne
Christ's Child Learning Corner	Fort Wayne
Concordia Evangelical Lutheran Sch	Fort Wayne
Concordia Lutheran High School	Fort Wayne
Emmanuel Lutheran Church Preschool	Fort Wayne
Emmanuel St Michael Lutheran Sch	Fort Wayne
Emmaus Lutheran School	Fort Wayne
Holy Cross Lutheran School	Fort Wayne
Mt Calvary Lutheran Preschool	Fort Wayne
Peace Lutheran Preschool	Fort Wayne
Praise Lutheran In Fort Wayne	Fort Wayne
Saint John Lutheran School	Fort Wayne
Saint Paul Lutheran School	Fort Wayne

Saint Peter's Lutheran School	Fort Wayne
St Peter Lutheran School	Fort Wayne
Trinity Lutheran Evangelical Sch	Fort Wayne
Trinity Lutheran Preschool	Fort Wayne
Unity Lutheran School	Fort Wayne
Zion Lutheran Academy	Fort Wayne
Cedar Creek Amish School	Fort Wayne
Timothy L Johnson Academy	Fort Wayne
Fellowship Haven Bible School	Grabill
Amish Sch No 1 Springfield Ctr	Grabill
Black Creek Amish School	Grabill
Maple Lane Amish School	Grabill
Westridge Amish School	Grabill
Huntertown Elementary School	Huntertown
DBA Heritage Mission	Huntertown
Our Hope Lutheran Shool	Huntertown
Leo Elementary School	Leo Cedarville
Leo Junior/Senior High School	Leo Cedarville
Gateway Woods School	Leo Cedarville
Heritage Jr/Sr High School	Monroeville
Monroeville School	Monroeville
Saint Joseph Catholic School	Monroeville
Saint John Ev Lutheran School	Monroeville
Highland Terrace Elem Sch	New Haven
Meadowbrook Elementary School	New Haven
New Haven Elementary School	New Haven
New Haven High School	New Haven
New Haven Middle School	New Haven
Park Hill Learning Center	New Haven
Three Rivers Montessori Schl	New Haven
Saint John The Baptist Catholic Sc	New Haven
Saint Louis Besancon Catholic Sch	New Haven
Central Lutheran School	New Haven
Maumee Valley School	New Haven
Milan Center Amish School	New Haven
Woodburn Elementary School	Woodburn
Woodlan Jr/Sr High School	Woodburn
Woodburn Lutheran School	Woodburn

BROADCAST FACILITY

Name	**NFIP Community**
WCKZ CH 231	Allen County
WWWD CH 242	Churubosco
WQHK-FM CH 286	Decatur
WFWI CH 222	Fort Wayne
WLAB CH 202	Fort Wayne
WMEE CH 247	Fort Wayne
WBNI-FM CH 206	Fort Wayne
WXKE CH 280	Fort Wayne
WAJI CH 236	Fort Wayne
WLDE CH 269	Fort Wayne
WCYT CH 216	Fort Wayne

WBCL CH 212	Fort Wayne
WKJG-TV CH 33	Fort Wayne
WFWA CH 39	Fort Wayne
WANE-TV CH 4	Fort Wayne
WFFT-TV CH 55	Fort Wayne
WPTA CH 21	Fort Wayne
W45AG CH 45	Fort Wayne
WFCV 1090	Fort Wayne
WGL 1250	Fort Wayne
WLYV 1450	Fort Wayne
WONO 1380	Fort Wayne
WHWD 1380	Fort Wayne
WJFX CH 300	New Haven
WBYR CH 255	Van Wert

DAMS

Name	NFIP Community
BITTERSWEET LAKE DAM	Allen County
COVENTRY DRY DAM	Allen County
HURSHTOWN RESERVOIR DAM	Allen County
KEKIONGA LAKE DAM	Allen County
RICH LAKE DAM	Antwerp, OH
CEDARVILLE DAM	Cedarville
COVINGTON LAKE DAM	Dunfee
SPY RUN DAM	Fort Wayne
ST. JOSEPH RIVER DAM	Fort Wayne
HOSEY (MAUMEE RIVER) DAM	Fort Wayne
DAUS ADDITION LAKE DAM **	Fort Wayne
BEEDY LAKE DAM	Leo Cedarville
POE LAKE DAM	Leo Cedarville

FIRE STATIONS

Name	NFIP Community
Arcola Fire Department	Allen County
Churubusco Fire Department	Churubusco
Aboite Township Fire Departme	Fort Wayne
Fort Wayne Fire Department	Fort Wayne
Fort Wayne International CFR	Fort Wayne
Indiana Air Guard CFR	Fort Wayne
Southwest Allen County Fire D	Fort Wayne
New Haven/Adams Township Fire	Fort Wayne
Poe Fire Department	Fort Wayne
St. Joe Township Fire Departm	Fort Wayne
Fort Wayne - Fire Station 1	Fort Wayne
Fort Wayne - Fire Station 2	Fort Wayne
Fort Wayne - Fire Station 4	Fort Wayne
Fort Wayne - Fire Station 5	Fort Wayne
Fort Wayne - Fire Station 7	Fort Wayne
Fort Wayne - Fire Station 8	Fort Wayne
Fort Wayne - Fire Station 14	Fort Wayne
Fort Wayne - Fire Station 15	Fort Wayne
Fort Wayne - Fire Station 16	Fort Wayne

Fort Wayne - Fire Station 17	Fort Wayne
Washington Township Fire Depa	Fort Wayne
Fort Wayne - Fire Station 6	Fort Wayne
Fort Wayne - Fire Station 9	Fort Wayne
Fort Wayne - Fire Station 10	Fort Wayne
Fort Wayne - Fire Station 11	Fort Wayne
Fort Wayne - Fire Station 12	Fort Wayne
Southwest Allen County Fire D	Fort Wayne
Fort Wayne - Fire Station 13	Fort Wayne
Grabill Fire Department	Grabill
Harlan Fire Department	Allen County
Hoagland Fire Department	Allen County
Huntertown Fire Department	Huntertown
Cedar Canyons Fire Department	Leo Cedarville
Monroeville Fire Department	Monroeville
New Haven/Adams Township Fire	New Haven
New Haven/Adams Township Fire	New Haven
Woodburn Fire Department	Woodburn
Southwest Allen County Fire D	Allen County

MEDICAL FACILITIES

Name	NFIP Community
Select Specialty Hospital	Fort Wayne
DuPont Hospital	Fort Wayne
Rehab Hospital of Ft Wayne	Fort Wayne
Parkview Hospital	Allen County
Lutheran Hospital of Indiana	Allen County
St. Joseph Hospital	Fort Wayne
Applewood Health and Rehab Center	Fort Wayne
Bethlehem Woods Nursing and Rehab Cente	Fort Wayne
Beverly Rehab and Specialty Care Center	Fort Wayne
Canterbury Nursing and Rehab Center	Fort Wayne
Courtland Health and Rehab Center	Fort Wayne
Covington Manor Nursing Home	Fort Wayne
Englewood Health and Rehab Center	Fort Wayne
Golden Years Homestead	Fort Wayne
Heritage Park	Fort Wayne
Kingston at DuPont	Fort Wayne
Kingston Care Center	Fort Wayne
Kingston Residence	Fort Wayne
Life Care Center of Fort Wayne	Fort Wayne
Lutheran Homes, Inc	Fort Wayne
Miller's Merry Manor	Fort Wayne
Parkview Memorial Hospital - CCC	Fort Wayne
Regency Place of Fort Wayne	Fort Wayne
Riverbend Health Care Center	Fort Wayne
Saint Anne Home	Fort Wayne
Sunrise of Fort Wayne	Fort Wayne
Towne House Retirement Community	Fort Wayne
Transitional Care Unit of St. Joseph Medical Center	Fort Wayne
University Park Nursing Center	Fort Wayne
Villa of the Woods	Fort Wayne

Village Oaks at Fort Wayne	Fort Wayne
The Village of the Heritage	Fort Wayne
Woodview Healthcare Inc	Fort Wayne
Byron Residential Center	Fort Wayne
Byron Health Center	Fort Wayne
Renaissance Village	Fort Wayne
The Cedars	Leo Cedarville
Harbordie Healthcare	New Haven

MILITARY INSTALLATIONS

Name	NFIP Community
CASAD Military Storage Depot	Allen County
Indiana Air National Guard	Fort Wayne
Army Reserve	Fort Wayne
Army Guard	Fort Wayne

POLICE STATIONS

Name	NFIP Community
Allen County Sherriff's Office	Fort Wayne
Fort Wayne Police Dept	Fort Wayne
State Police Dept	Fort Wayne
Allen County Police Dept	Huntertown
New Haven Police Dept	New Haven

WASTEWATER TREATMENT PLANTS

Name	NFIP Community
FORT WAYNE WATER POLLUTION CONTROL PLANT	Fort Wayne
LAKE DALECARLIA RWD	Fort Wayne
UTILITY CENTER INCORPORATED AQUASOURCE M	Fort Wayne
MONROEVILLE MUNICIPAL WWTP	Monroeville
NEW HAVEN WWTP	New Haven
WOODBURN MUNICIPAL WWTP	Woodburn

POWER STATIONS

Name	NFIP Community
AMERICAN INDIANA MICHIGAN POWER	Fort Wayne

HAZARDOUS MATERIALS

Name	NFIP Community
Chemical Eng. Corp.	Allen County
Casad Depot	Allen County
Fort Wayne Fndy. Corp.-Columbia City	Columbia City
Phelps Dodge Magnet Wire Co.	Fort Wayne
"Slater Steels, Ft. Wayne Specialty Allo	Fort Wayne
Ge Indl. Sys. Broadway	Fort Wayne
Ge Indl. Sys. Taylor Street	Fort Wayne
Esses Goup Inc. Fort Wayne Plant	Fort Wayne
Chemcentral/Ft. Wayne	Fort Wayne
Chromasource Inc.	Fort Wayne
Dekko Stamping	Fort Wayne
Deister Machine Co. Inc.	Fort Wayne

Franke Plating Works Inc.	Fort Wayne
Fort Wayne Fndy. Corp. - Pontiac Div.	Fort Wayne
Fort Wayne Anodizing Corp.	Fort Wayne
Metallurgical Processing Inc.	Fort Wayne
Nishikawa Standard Co.	Fort Wayne
Tokheim Corp.	Fort Wayne
Vee Eng. Inc. Plant 2	Fort Wayne
Vee Engineering Inc.	Fort Wayne
Van Waters & Rogers Inc.	Fort Wayne
Ti Group Specialty Polymer Prods. Seals	Fort Wayne
Wayne Metal Protection Co.	Fort Wayne
Kus Zollner Div.	Fort Wayne
Fort Wayne Pools Inc.	Fort Wayne
Lincoln Foodservice Prods. Inc.	Fort Wayne
Master Spas Inc.	Fort Wayne
Essex Group Inc. Chemical Processing	Fort Wayne
Wayne Chemical	Fort Wayne
Craft Labs. Inc.	Fort Wayne
Dana Corp. Spicer Mfg. Inc.	Fort Wayne
Fort Wayne Fndy. Corp. Lima Rd. Div.	Fort Wayne
Harris Kayot Inc.	Fort Wayne
Safety-Kleen Sys. (506801)	Fort Wayne
Stonhard Inc.	Fort Wayne
Valspar Corp. - Ft Wayne	Fort Wayne
Ottenweller Co.	Fort Wayne
Avery Dennison	Fort Wayne
Chemrex Inc.	Fort Wayne
Foamex L.P.	Fort Wayne
Mti Insulated Prods. Inc.	Fort Wayne
Hy-Tec Fiberglass Inc.	Fort Wayne
Mascotech Forming Techs. - Fort Wayne	Fort Wayne
Plastic Composites Corp.	Fort Wayne
Pyromation Inc.	Fort Wayne
Rea Magnet Wire Co. Inc.	Fort Wayne
"Precision Prods. Group Inc., Paramount	Fort Wayne
Press-Seal Gasket Corp.	Fort Wayne
Cambridge Inds. Inc.	Grabill
Grabill Cabinet Co.	Grabill
Wieland Furniture Inc.	Grabill
Aeroquip Corp.	New Haven
Superior Aluminum Alloys L.L.C.	New Haven
Chem-Central Chemica	New Haven
N/S RR Yards	New Haven
AEP Maintenance	New Haven
Ulrich Chemical Co	New Haven
Vopak Chemical Co.	New Haven
Aq. Plus/Allen County Coop	New Haven
Linder Oil	New Haven
Parker Hanefin/Aeroquip	New Haven
Adams Center Landfill	New Haven
Gmtg Fort Wayne Assembly	Roanoke
Michelin N.A. Inc.	Woodburn

POTABLE WATER FACILITIES

Name	NFIP Community
DUPONT WATER TREATMENT PLANT	Fort Wayne
GRABILL WATER WORKS	Grabill

Number of Critical Facilities Exposed to Hazards

	Flood	Severe Winter Storm	Tornado/Wind Storm	Hazardous Materials	Utility Failure	Dam/Levee Failure	Earthquake
Dams	3	13	13	13	13	1	13
Airports	0	4	4	4	4	0	4
Broadcast Facilities	2	25	25	25	25	0	25
Potable Water	0	2	2	2	2	0	2
Military Installations	1	4	4	4	4	0	4
Fire Departments	1	38	38	38	38	0	38
Hazardous Materials	2	64	64	64	64	0	64
Medical Facilities	1	38	38	38	38	0	38
Police Stations	0	5	5	5	5	0	5
Power Facilities	1	1	1	1	1	1	1
Schools	9	180	180	180	180	2	180
Wastewater Treatment Plant	2	6	6	6	6	0	6
TOTAL	**22**	**380**	**380**	**380**	**380**	**4**	**380**

(Source: HAZUS-MH)

Replacement Value of Critical Facilities Exposed to Hazards ($Millions)

	Flood	Severe Winter Storm	Tornado/Wind Storm	Hazardous Materials	Utility Failure	Dam/Levee Failure	Earthquake
Dams	$5	$23	$23	$23	$23	$1.8	$23
Airports	$0	$22	$22	$22	$22	$0.0	$22
Broadcast Facilities	$0	$3	$3	$3	$3	$0.0	$3
Potable Water	$0	$69	$69	$69	$69	$0.0	$69
Emergency Operation Centers	$0	$0	$0	$0	$0	$0.0	$0
Fire Departments	$1	$23	$23	$23	$23	$0.0	$23
Hazardous Materials	$0	$4	$4	$4	$4	$0.0	$4
Medical Facilities	$7	$274	$274	$274	$274	$0.0	$274
Police Stations	$0	$7	$7	$7	$7	$0.0	$7
Power Facilities	$2	$2	$2	$2	$2	$1.5	$2
Schools	$5	$93	$93	$93	$93	$1.0	$93
Wastewater Treatment Plant	$137	$412	$412	$412	$412	$0.0	$412
TOTAL	**$157**	**$932**	**$932**	**$932**	**$932**	**$4.3**	**$932**

(Source: HAZUS-MH)

Total Number of Buildings Exposed to Hazard in Allen County

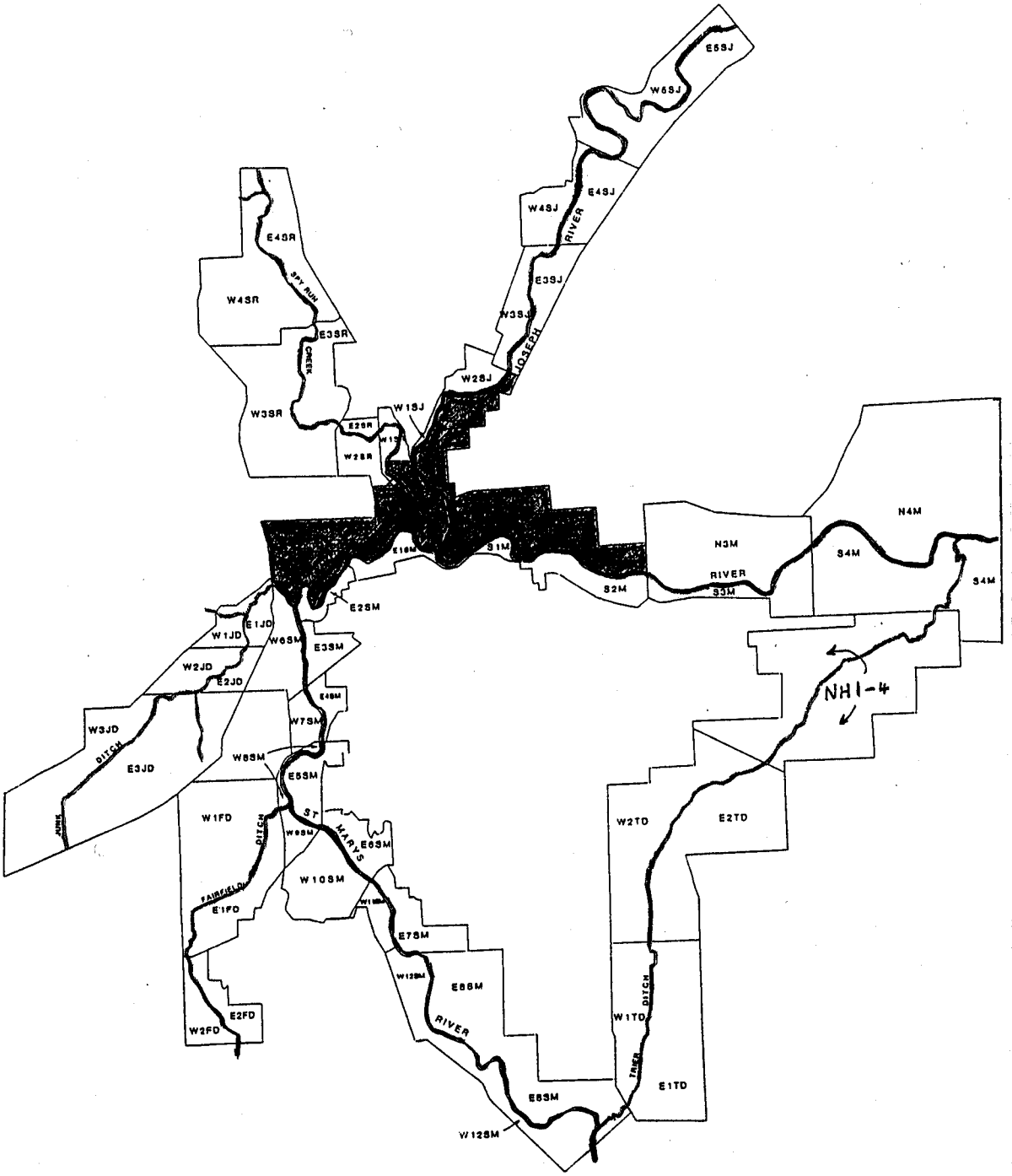
	Flood	Severe Winter Storm	Tornado/Wind Storm	Hazardous Materials	Utility Failure	Dam/Levee Failure*	Earthquake
Residential	2,802	102,393	102,393	102,393	102,393	3,044	102,393
Commercial	137*	1,357	1,357	1,357	1,357	169*	1,357
Industrial		218	218	218	218		218
Agricultural		0	0	0	0		0
Religious		60	60	60	60		60
Governmental		13	13	13	13		13
Educational		180	180	180	180		180
TOTAL	**2,939**	**104,221**	**104,221**	**104,221**	**104,221**	**3,213**	**104,221**

* Commercial buildings include all non-residential buildings.
(Source: HAZUS-MH)

Total Replacement Value of Buildings Exposed to Hazards in Allen County ($Millions)

	Flood	Severe Winter Storm	Tornado/Wind Storm	Hazardous Materials	Utility Failure	Dam/Levee Failure	Earthquake
Residential	$505	$18,440	$18,440	$18,440	$18,440	$584	$18,440
Commercial	$332*	$3,286	$3,286	$3,286	$3,286	$409*	$3,286
Industrial		$615	$615	$615	$615		$615
Agricultural		$0	$0	$0	$0		0
Religious		$156	$156	$156	$156		$156
Governmental		$21	$21	$21	$21		$21
Educational		$82	$82	$82	$82		$82
TOTAL	**$837**	**$22,600**	**$22,600**	**$22,600**	**$22,600**	**$993**	**$22,600**

* Commercial buildings include all non-residential buildings.
(Source: HAZUS-MH)



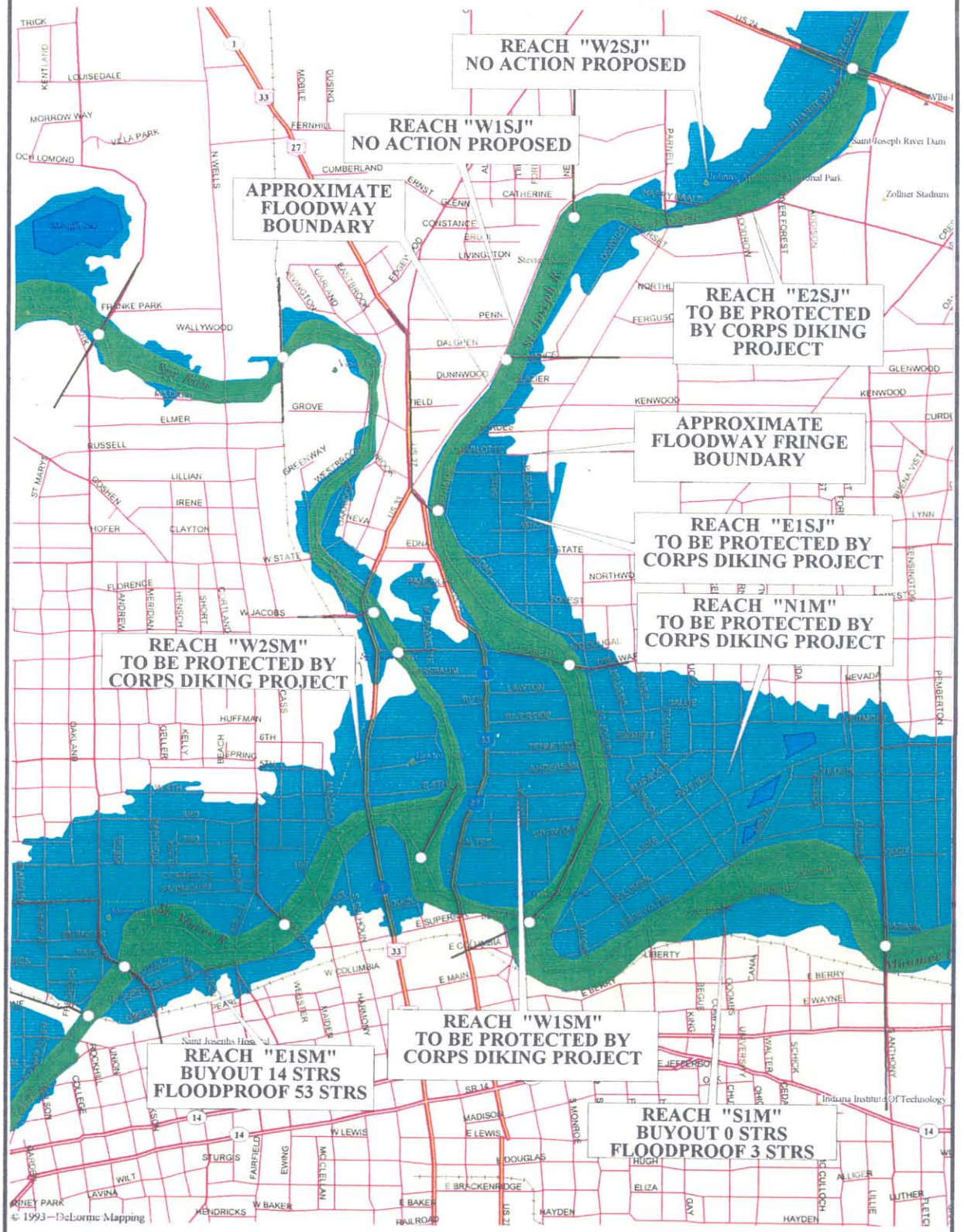
LEGEND

REACHES TO BE PROTECTED BY COE DIKING PROJECT

SOURCE: FORT WAYNE AND VICINITY, INDIANA, FINAL FEASIBILITY REPORT, COE, SEP. 1987.

CHRISTOPHER B. BURKE ENGINEERING, LTD.
MERCHANTS PLAZA, SUITE 1368 SOUTH
115 W. WASHINGTON ST.
INDIANAPOLIS, IN 46204
TEL: (317)266-8000 FAX: (317)632-3306

CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: **NOT TO SCALE**
TITLE: **FORT WAYNE AND VICINITY STUDY REACHES INDEX MAP** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 3



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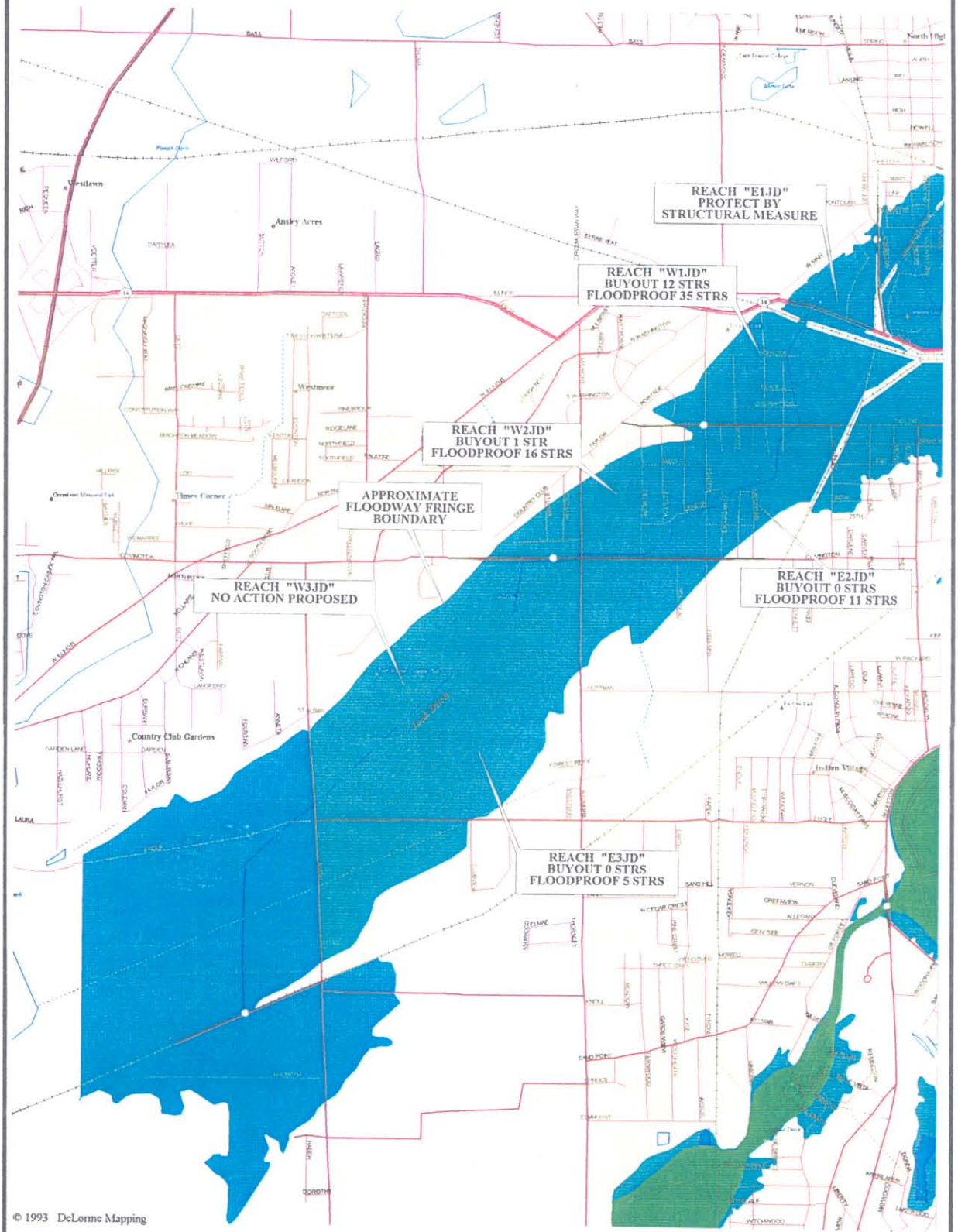
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: **1" = 2000'**
TITLE: **RECOMMENDED PLAN FOR CONFLUENCE AREA STUDY REACHES IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 4

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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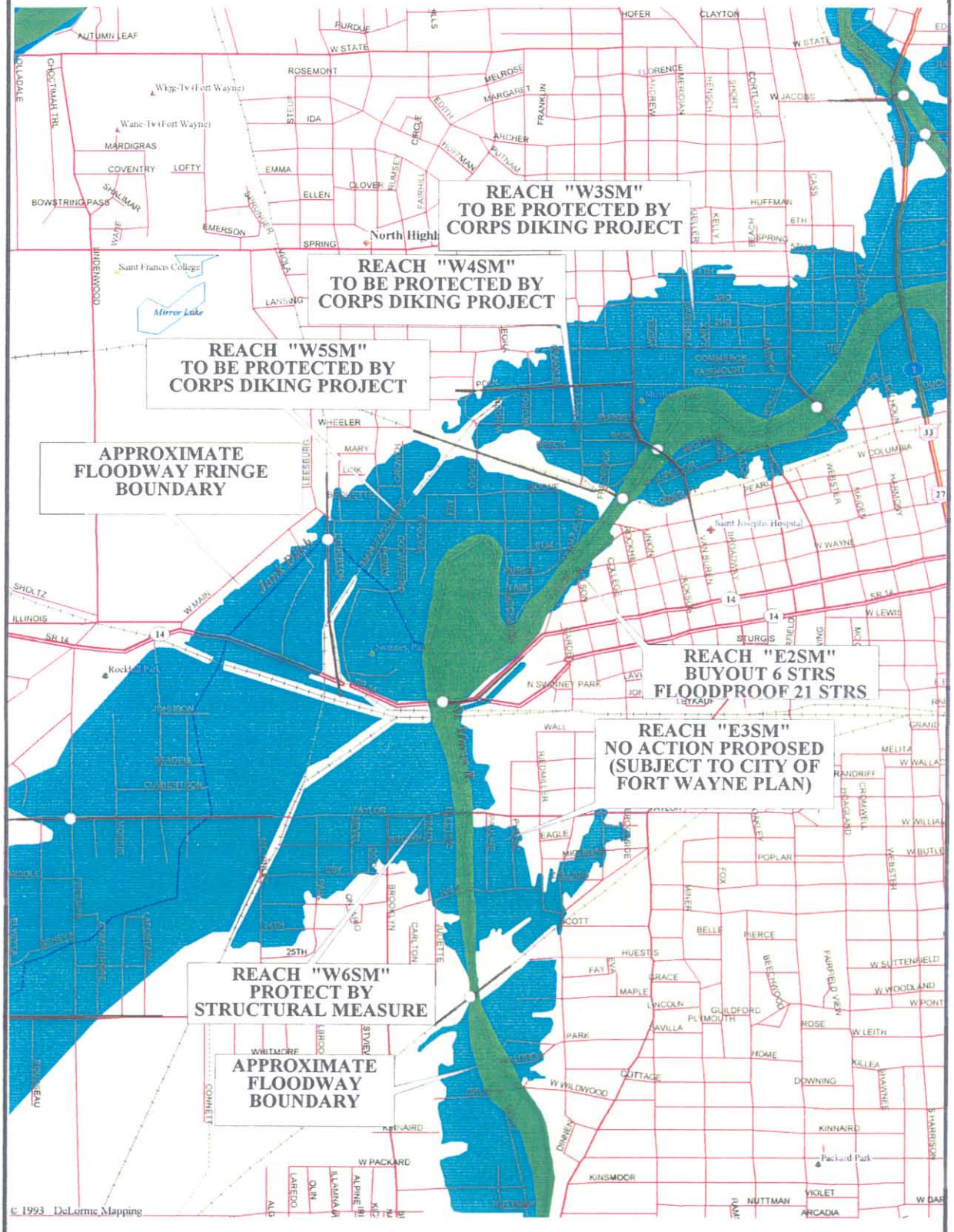
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR JUNK DITCH STUDY REACHES IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 11

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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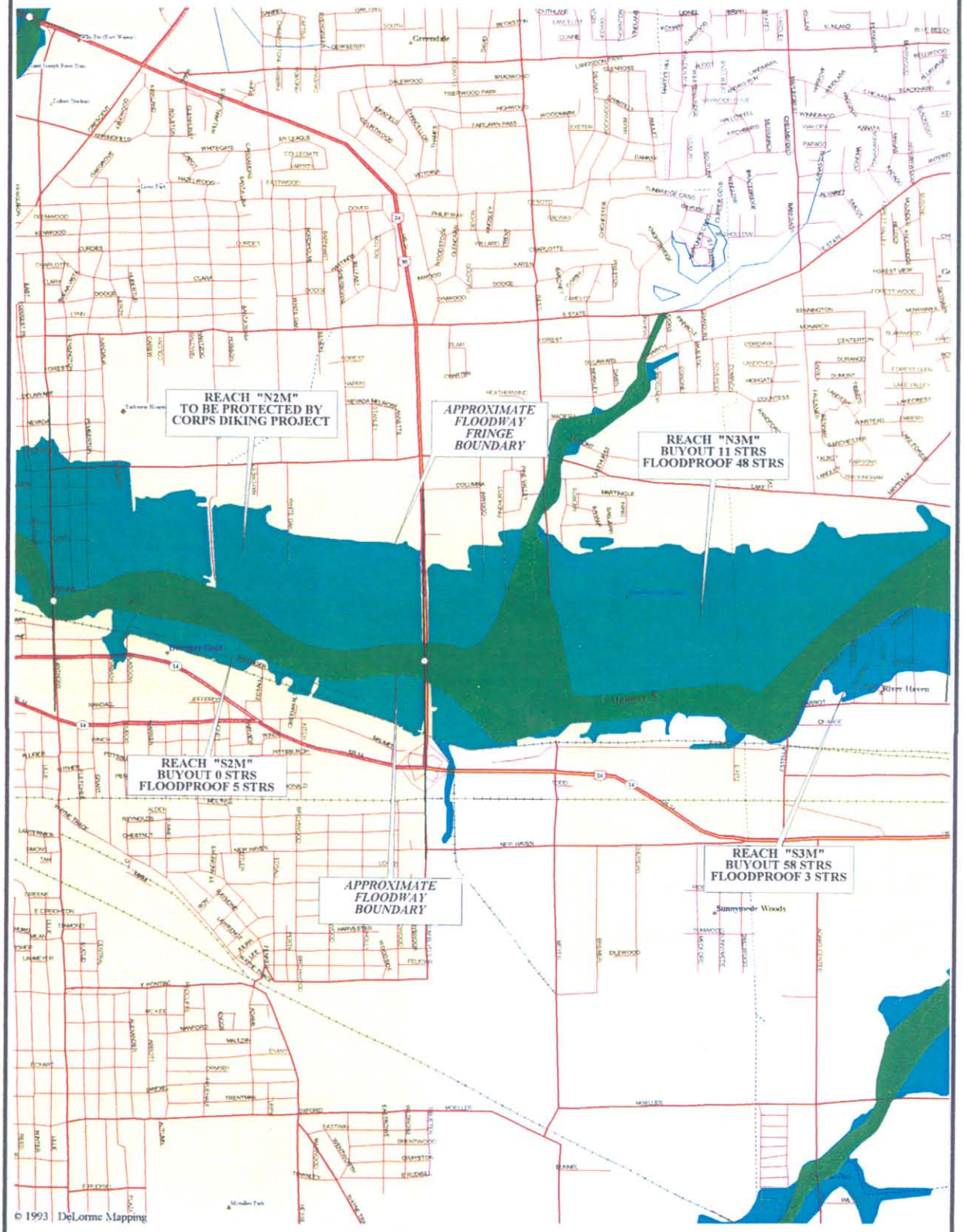
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: **1" = 2000'**
TITLE: **RECOMMENDED PLAN FOR LOWER STUDY REACHES OF THE ST. MARYS RIVER IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 5

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE



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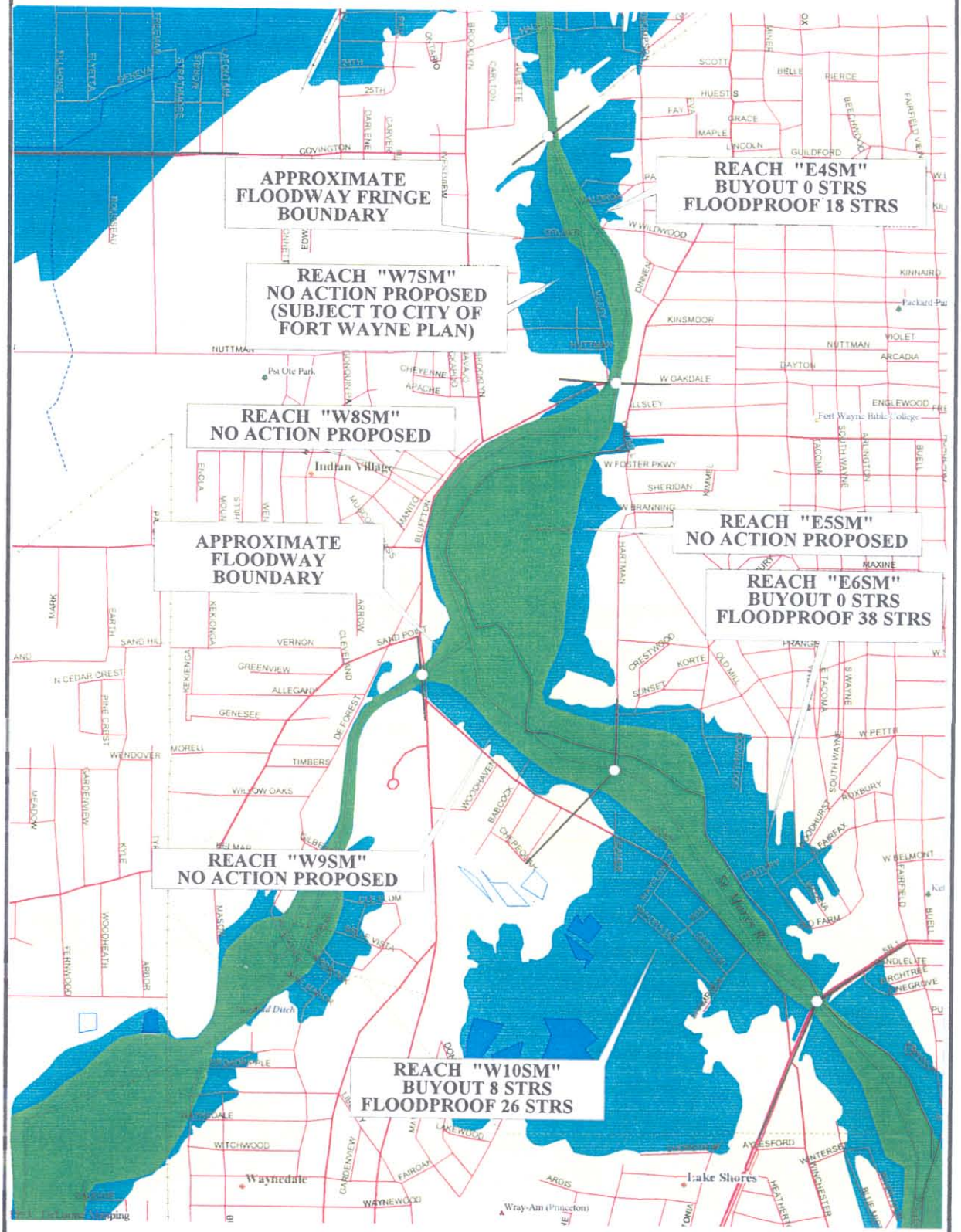
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR MIDDLE STUDY REACHES OF THE MAUMEE RIVER IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 8

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE



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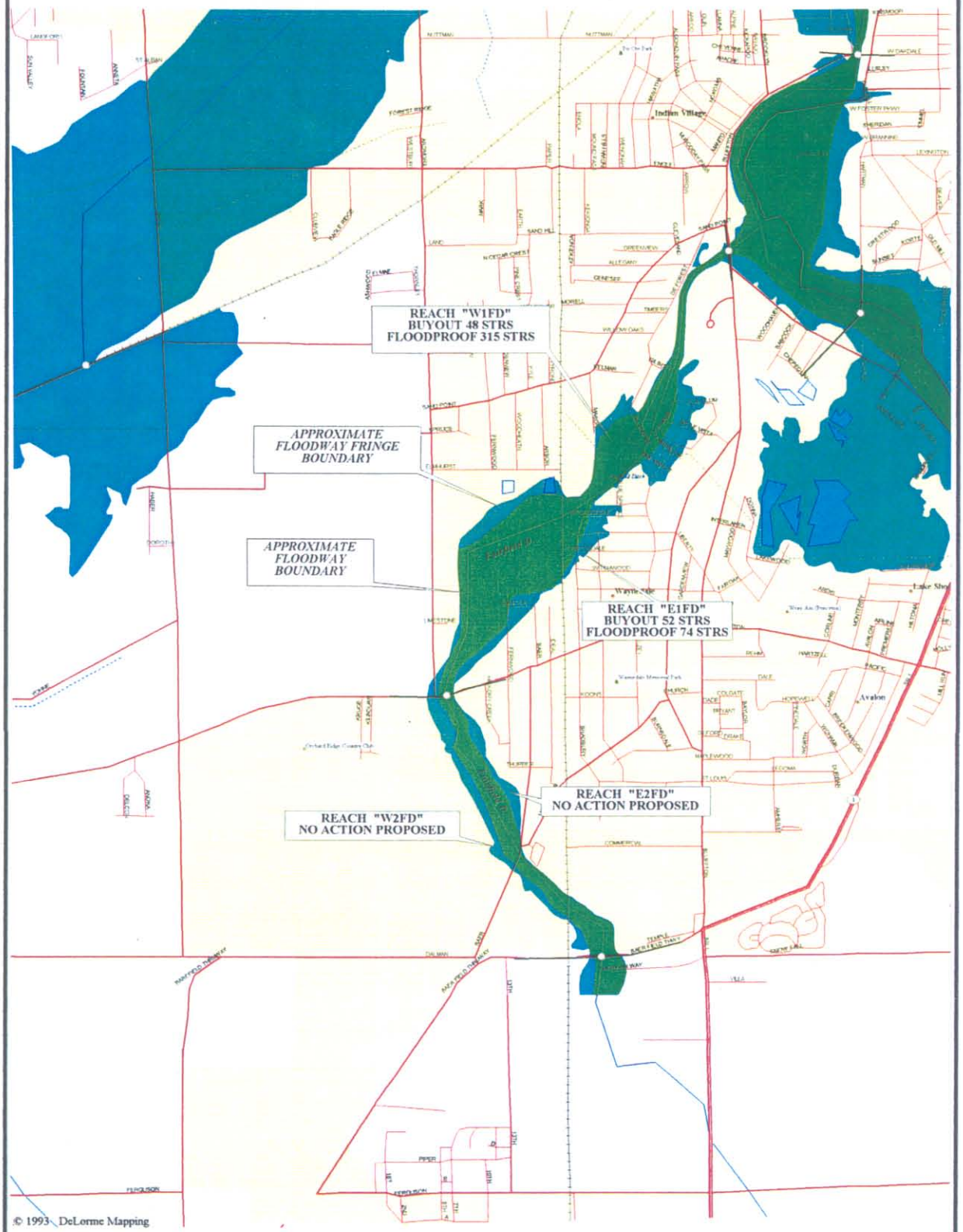
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: **1" = 2000'**
TITLE: **RECOMMENDED PLAN FOR MIDDLE STUDY REACHES OF THE ST. MARYS RIVER IN FORT WAYNE**		DATE: **JUNE 1994**
MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		EXHIBIT 6

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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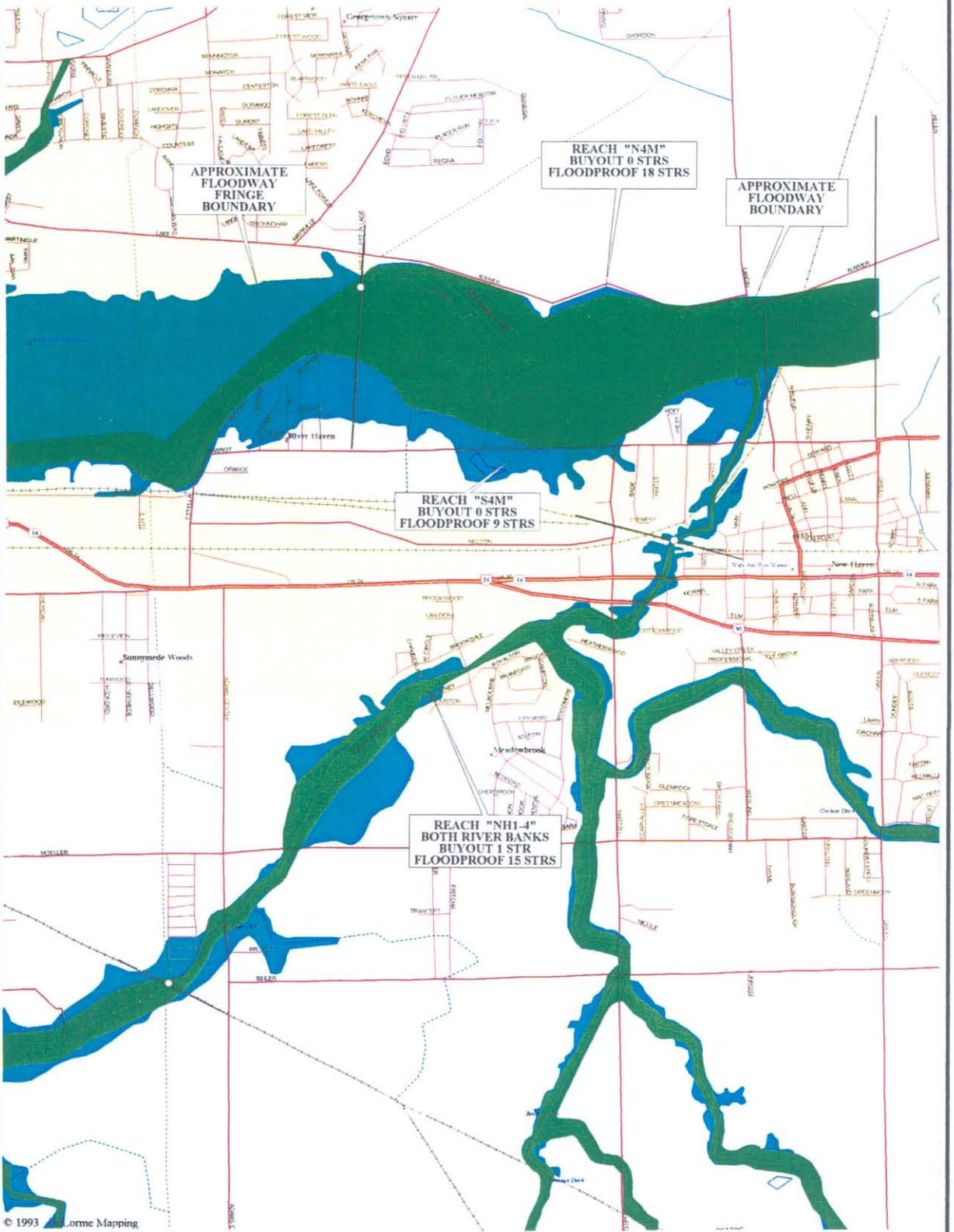
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR THE FAIRFIELD DITCH STUDY REACHES IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 12

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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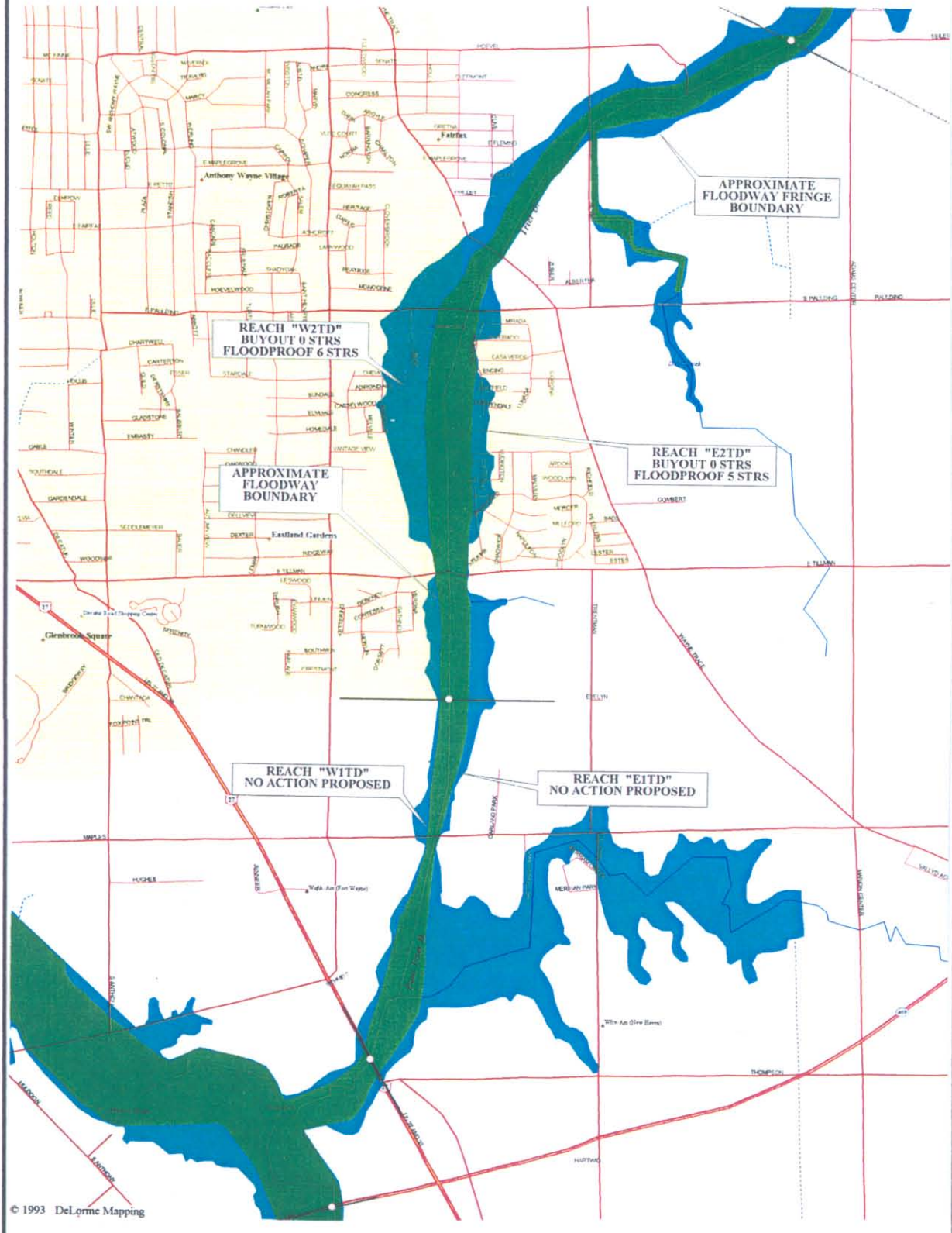
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR THE NEW HAVEN AREA STUDY REACHES IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 14

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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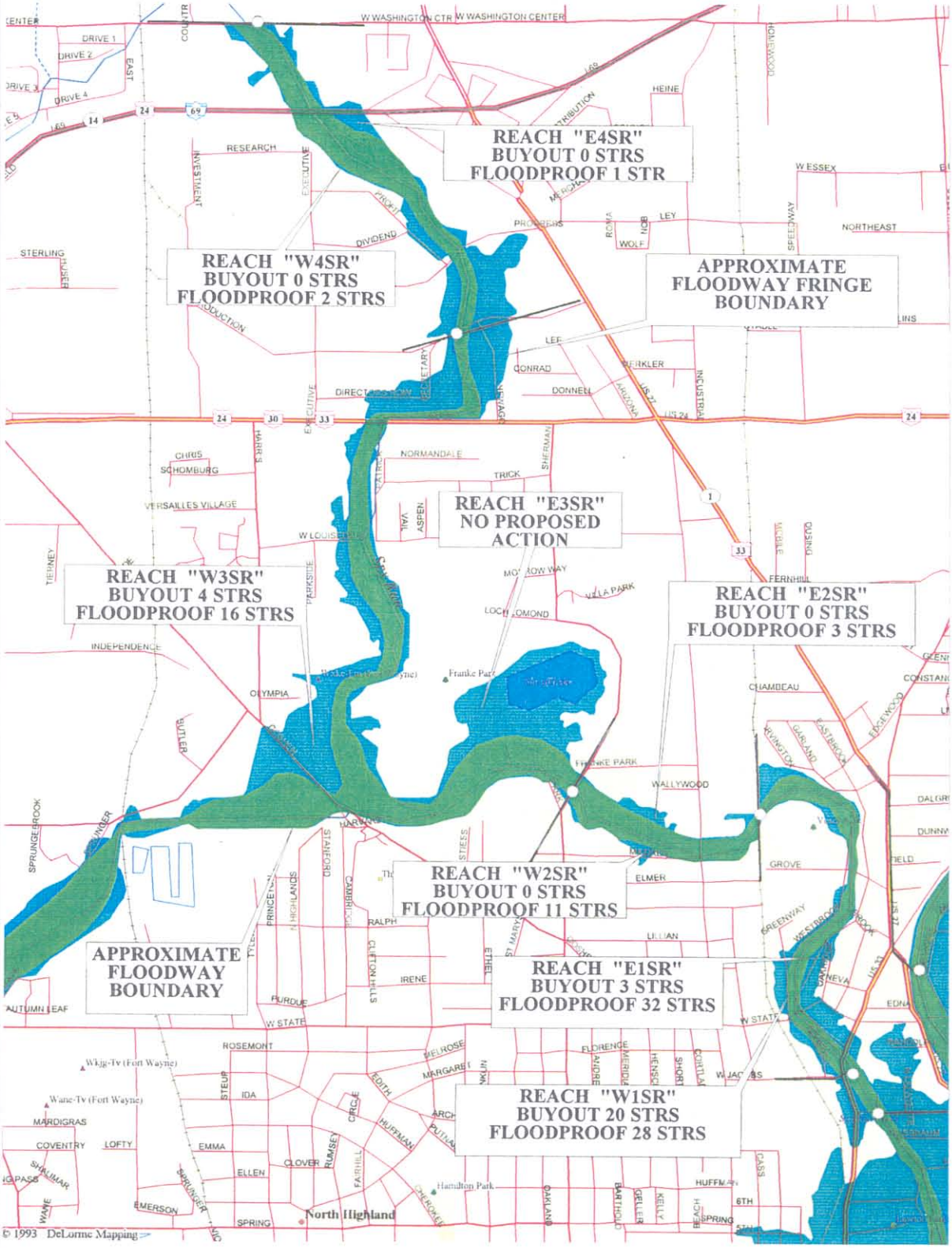
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR THE TRIER DITCH STUDY REACHES IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 13

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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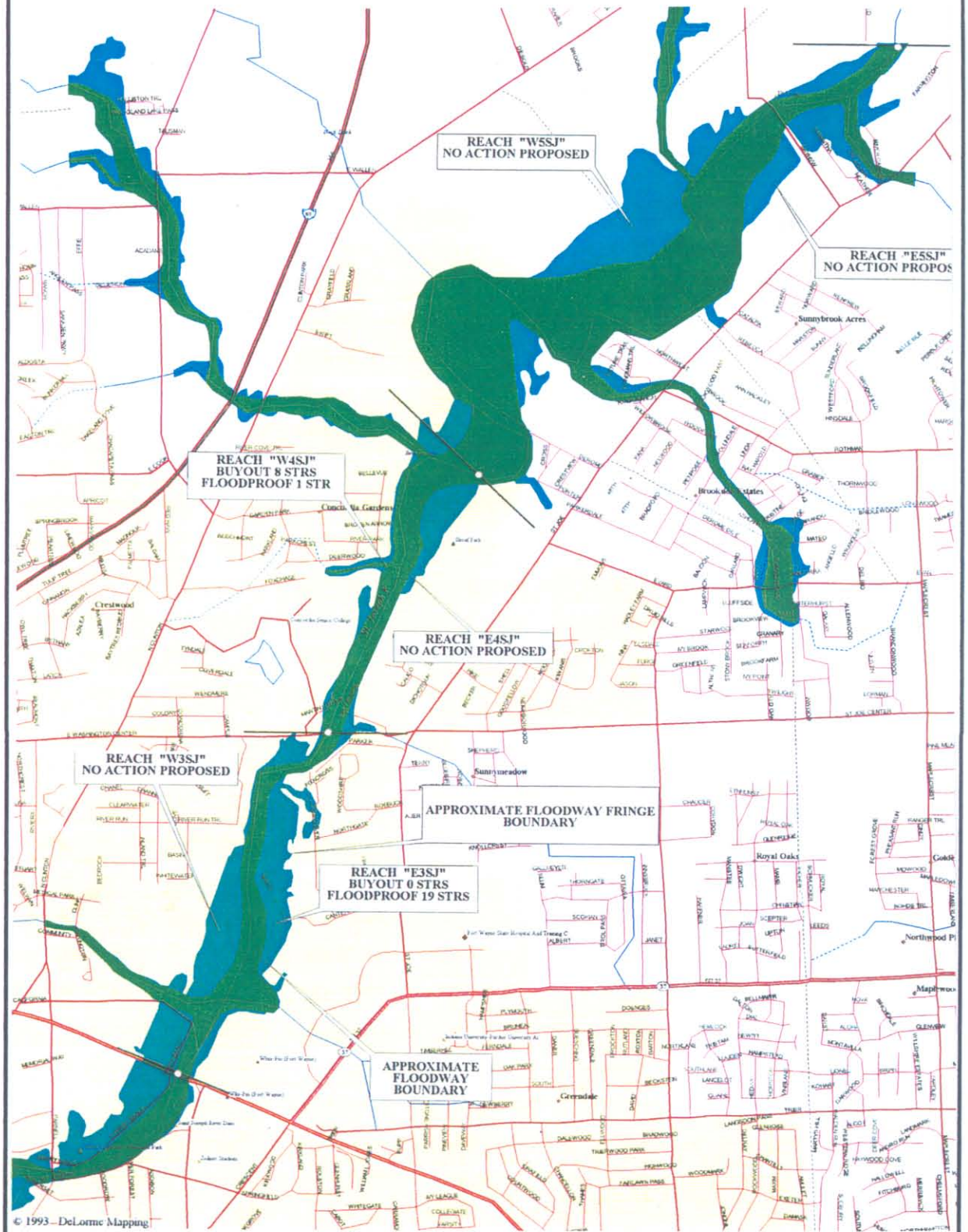
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 2000'
TITLE: **RECOMMENDED PLAN FOR UPPER STUDY REACHES OF SPY RUN IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 10

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE



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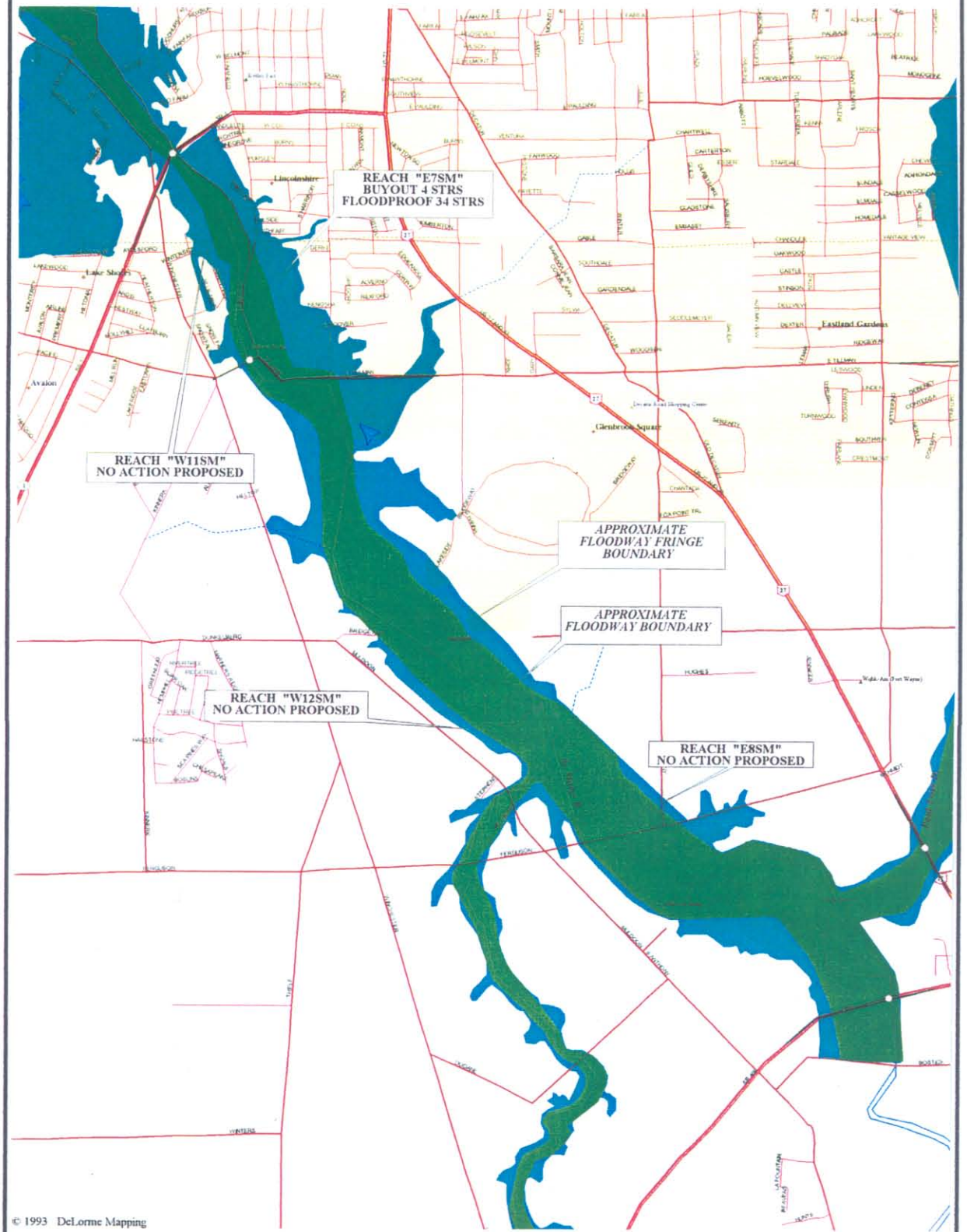
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR UPPER STUDY REACHES OF THE ST. JOSEPH RIVER IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 9

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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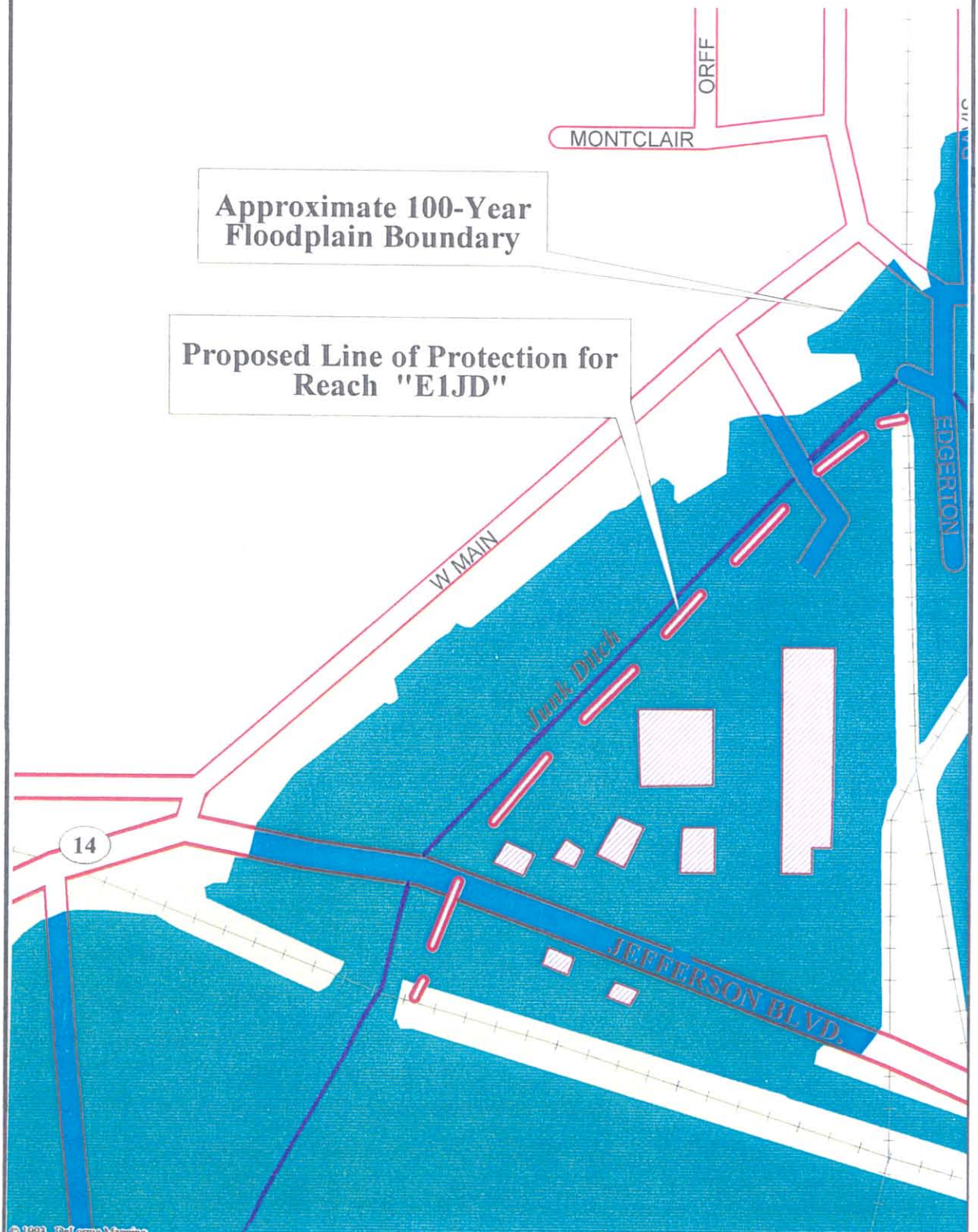
CLIENT: **MAUMEE RIVER BASIN COMMISSION**	PROJECT No. **93 - 64**	APPROX. SCALE: 1" = 3000'
TITLE: **RECOMMENDED PLAN FOR UPPER STUDY REACHES OF THE ST. MARYS RIVER IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 7

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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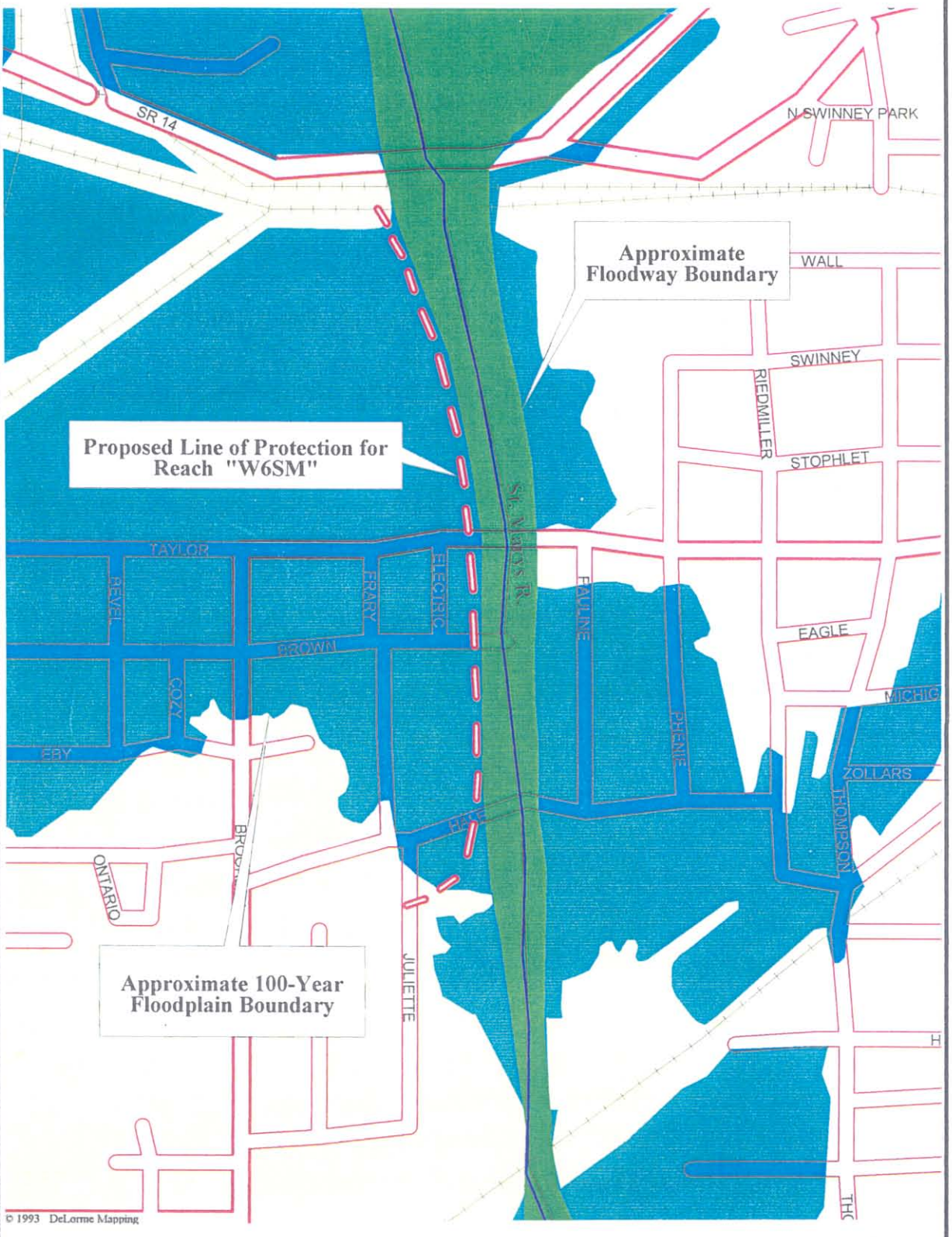
INDIANAPOLIS, IN 46204
TEL: (317) 266-8000 FAX: (317)632-3306

CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: NOT TO SCALE
TITLE: **APPROXIMATE LOCATION OF THE PROPOSED LINE OF PROTECTION FOR REACH "E1JD" IN FORT WAYNE** MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		DATE: **JUNE 1994** EXHIBIT 16

BASE MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE.



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TEL: (317) 266-8000 FAX: (317)632-3306

CLIENT: **MAUMEE RIVER BASIN COMMISSION**	**PROJECT No. 93 - 64**	APPROX. SCALE: NOT TO SCALE
TITLE: **APPROXIMATE LOCATION OF THE PROPOSED LINE OF PROTECTION FOR REACH "W6SM" IN FORT WAYNE**		DATE: **JUNE 1994**
MAUMEE RIVER BASIN FLOOD CONTROL MASTER PLAN		EXHIBIT 15

PROMULGATION AUTHORITY INFORMATION

Allen County
Linda Bloom, County Commissioner
Marla Irving, County Commissioner
Nelson Peters, County Commissioner

City of Fort Wayne
Graham Richard, Mayor

Town of Grabill
Wilmer Delagrange, Town Councilor
Greg Liechthy, Town Councilor
Candy DeCamp, Town Councilor

Town of Huntertown
Jim Fortman, Town Councilor
Bruce Dunwiddie, Town Councilor
James Reid, Town Councilor
Susan Gongwer, Town Councilor
John Hidy, Town Councilor

Town of Leo Cedarville
Jan Linn, Town Councilor
John Clendenen, Town Councilor
Cindy Kimm, Town Councilor
Paul Steffens, Town Councilor
Mathew Akins, Town Councilor

Town of Monroeville
Don Geradot, Town Councilor
Suzie Stephenson, Town Councilor
Blaine Ryan, Town Councilor
Ronnie Gleckler, Town Councilor

City of New Haven
Terry McDonald, Mayor

City of Woodburn
Richard Hoeppner, Mayor