



## Shelby County Natural Hazards Mitigation Plan

Prepared for  
**Shelby County, Ohio**

February, 2005

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## EXECUTIVE SUMMARY



The Shelby County Emergency Management Agency/Office of Homeland Security spearheaded this effort to complete a comprehensive countywide Mitigation Plan. Their dedication to this mitigation planning effort is seen in the results of having full

participation from the County as well as the incorporated jurisdictions.

Shelby County is subject to natural hazards that threaten life and health as well as having caused extensive property damage. To better understand these natural hazards and their impacts on people and property and to identify ways to reduce those impacts, the County's Emergency Management Agency (EMA) undertook this countywide Mitigation Plan.

Most mitigation activities need funding. Under the Disaster Mitigation Act of 2000 (DMA2K, 42 USC 5165), a mitigation plan is a requirement for Federal mitigation funds. Therefore, a mitigation plan will both guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from the Department of Homeland Security's Federal Emergency Management Agency (FEMA). This Mitigation Plan meets the criteria as set forth by FEMA in the DMA2K and provides a community with a "comprehensive guide" for future mitigation efforts as they relate to the hazards that affect their community.

This Mitigation Plan was developed under the guidance of a Core Group of individuals from communities and agencies throughout Shelby County. The Core Group met four separate times during the planning process to discuss the hazards that affect the County, the problems associated with these hazards, potential mitigation alternatives to minimize the effect of these hazards and goals that they would like to see achieved within the County.

Shelby County has experienced many natural disasters in the past one hundred years. The Core Group evaluated these hazards and chose to address the following hazards based on their impact on human health and property damage: winter storms (snow, ice, and extreme cold), severe storms (thunderstorms, high winds, hail and lightning), flooding, tornadoes, droughts and extreme heat, and earthquakes.

With the hazards identified, a vulnerability assessment was completed for Shelby County. This assessment reviews how vulnerable the county is to property damage, threats to public health and safety, and adverse impact on the local economy. It also evaluates the location and likely damage to critical facilities and other structures from different scenarios of strikes by the five hazards. As part of this assessment, a multi-hazard map was produced to illustrate some of the hazard areas and locations of structures and critical facilities with respect to these hazard areas.

The culmination of Shelby County's Mitigation Plan was an Action Plan for the communities to use to track progress on the implementation of their mitigation alternatives.

**LIST OF ACRONYMS**

ARC	American Red Cross
BFE	Base Flood Elevation
BMPs	Best Management Practices
CNMP	Comprehensive Nutrient Management Plan
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DMA2K	Disaster Mitigation Act of 2000
EAS	Emergency Alert System
EMA	Emergency Management Agency
EMS	Emergency Management Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIMS	Geographical Information Management Systems
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
HMGP	Hazard Mitigation Grant Program
HUD	Housing and Urban Development
I/I	Inflow and Infiltration
LEADS	Law Enforcement Automated Data System
LEAP	Livestock Environmental Assurance Program
LLIA	Lake Loramie Improvement Association
LVA	Loramie Valley Alliance
MCD	Miami Conservancy District
mi <sup>2</sup>	square miles
Mitigation Plan	All Natural Hazards Mitigation Plan
MMI	Modified Mercalli Intensity
MNM	Manure Nutrient Management
mph	miles per hour
NAWAS	National Warning System
NCDC	National Climatic Data Center
NFIP	National Floodplain Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPPC	National Pork Producers Council
NRCS	Natural Resource Conservation Service
NWS	National Weather Service
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEMA	Ohio Emergency Management Agency
OPF	Official Plan Flood
OSHP	Ohio State Highway Patrol
PDM	Pre-Disaster Mitigation

## Shelby County- Countywide All Natural Hazards Mitigation Plan

PIO	Public Information Officer
PUCO	Public Utilities Commission of Ohio
SCARES	Shelby County Amateur Radio Emergency Services
SWCD	Soil and Water Conservation District
SWMP	Storm Water Management Plan
USDA	United States Department of Agriculture
USGS	United States Geographical Survey
WCT	Wind Chill Temperature
WMSC	Water Management and Sediment Control
WWTP	Wastewater Treatment Plant

**1.0 INTRODUCTION**

A mitigation plan addresses natural disasters that could affect a local community, whether it is flooding, tornadoes, high winds, winter storms, landslides or some other natural disaster. A mitigation plan is an administrative document that is issued to establish activities that should reduce or, when possible, eliminate long-term risk to human-life and property. The plan will also provide a community with a “comprehensive guide” for future mitigation efforts as they relate to the hazards that affect their county. By developing a mitigation plan, a community can identify their areas of risk, assess the magnitude of the risk and develop strategies and priorities to identify projects for reducing risk.

The Shelby County Commissioners supported developing their All Natural Hazards Mitigation Plan (Mitigation Plan) with funds received from Ohio Emergency Management Agency (OEMA) and the Federal Emergency Management Agency (FEMA). Although this planning effort was specifically designed to address the creation of a Pre-Disaster Mitigation (PDM) compliant plan, there has been an on-going effort in publicizing the County’s activities in relation to mitigation and how the public can continue to get involved and support the County’s mitigation efforts.

The State of Ohio completed an analysis in 1988 that determined the hazards that affect the state as a whole. Shelby County used this analysis for guidance when choosing their hazards. They include but are not limited to:

- Flooding
- Tornadoes
- Severe Storms
- Erosion (Stream Bank and Landslides)
- Earthquakes
- Droughts

As part of the Disaster Mitigation Act (DMA2K, 42 USC 5165), communities that desire to remain eligible for Federal and State mitigation funds must have an approved mitigation plan in place.

According to the DMA2K, incorporated jurisdictions within a county must participate as well as representatives from the unincorporated areas. Townships are not required to participate because the County Commissioners can represent them on mitigation projects. However, if a township would like to take an active part by submitting a hazard mitigation project, then their participation in the planning effort is crucial. Local participation is “key” to the successful implementation of these mitigation plans.

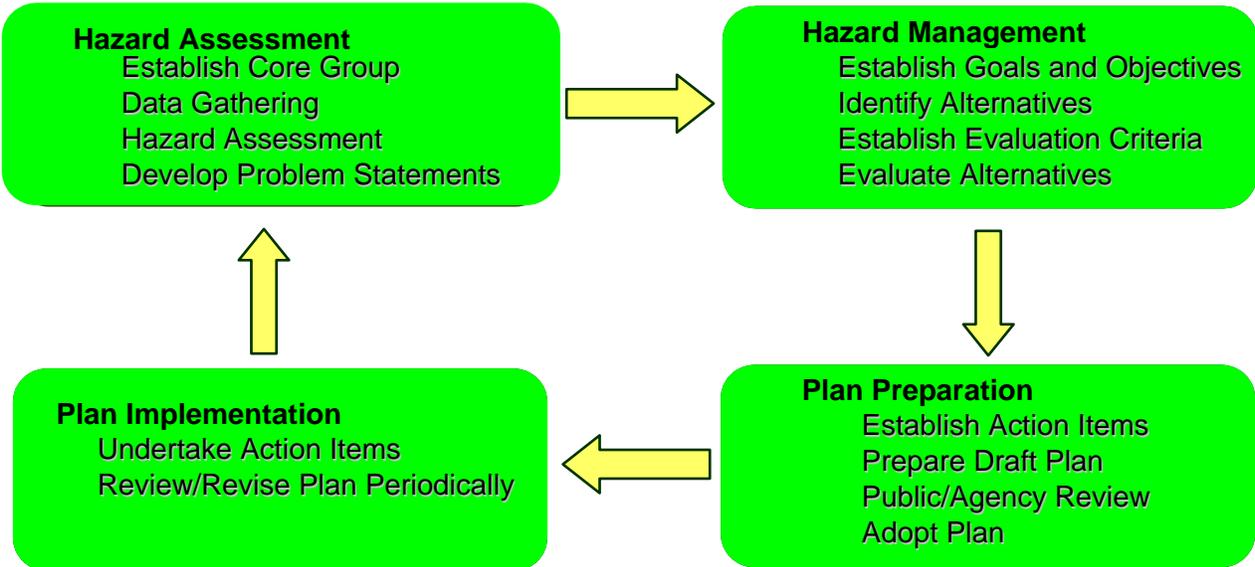
If a community chooses not to participate in the mitigation planning effort, the community becomes ineligible for any future federal or state mitigation money. This mitigation money usually comes in the form of a grant such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) or the PDM Grant Program, which is to be used to implement mitigation strategies and activities. Examples of eligible activities that could be supported by mitigation dollars include: relocation, acquisitions, elevation, dry-floodproofing, wet-floodproofing, lightning prediction systems, interoperable siren systems, stream restorations or any other activity potentially funded with mitigation dollars.

The mitigation planning process that Shelby County followed was adapted from the State of Ohio’s Guidance Book, 2001, and the DMA2K Federal Guidelines. The planning process also involved evaluating several approved FEMA mitigation planning efforts from around the country

that the Core Group approved for their content and set-up, which met the needs of Shelby County as well as satisfied the requirement of the reviewers, OEMA and FEMA.

The following flow diagram shows the typical Natural Hazard Mitigation Planning Process that was followed:

**NATURAL HAZARD MITIGATION PLANNING PROCESS**



In addition to the aforementioned process, the Core Group and the designated leaders of the group made sure that every community that participated in this planning effort was aware of their responsibilities as well as how they could represent their community the best. Some suggestions that were incorporated into the initial invitation to participate in the natural hazard mitigation planning effort included:

- Participate in the Core Group planning meetings representing your community’s interests
- Supply any historic information (background) on natural disasters for your community to the Core Group
- Review and comment on the Draft Mitigation Plan
- Review and select mitigation activities developed by the Core Group for your community to implement
- Be an advocate for Final Adoption of the Mitigation Plan by your community

**1.1 Planning Approach**

In an effort to continue to meet the mission of protecting lives, property, economic viability and quality of life for the people of Shelby County, the County Commissioners desired to create the Shelby County Mitigation Plan for their community and its residents. Shelby County authorized the engineering firm EMH&T, Inc. to help them fulfill this task.

The approach undertaken in the creation of the Mitigation Plan for the county can be described as both comprehensive and collaborative. The comprehensive approach includes following the interim final rule guidelines enacted under the DMA2K and FEMA suggested guidelines for the

creation of a mitigation plan. Any additional items that Shelby County and the Core Group chose to address as part of the comprehensive analysis of their community were addressed as well. The collaborative portion of creating the plan included working with the different agencies within Shelby County and coordinating with all participating jurisdictions. The County could not have a comprehensive plan without the coordination of several other agencies. Information was collected from agencies such as the Shelby County Emergency Management Agency (EMA) and any other agencies that were involved in planning efforts for the County.

## **1.2 Participating Communities**

Shelby County has nine incorporated areas within its borders. All six incorporated communities chose to participate in this planning effort. A representative from the Village of Jackson Center was unable to attend the designated Core Group meetings. The Shelby County EMA, in coordination with their consultant, developed a comprehensive survey for the village to complete and return with mitigation planning information specific to their community. The community was also contacted for involvement in the selection of problem statements and mitigation alternatives. See Appendix A for a copy of the list of attendees from each community as well as the initial concept of how the groups would interact. See Appendix A for an example of the letter that was sent, via certified mail, to the village unable to attend the Core Group meetings, as well as their completed survey.

The process to create the Mitigation Plan started with the creation of a “Mitigation Core Group” of decision makers and implementers. In order to lead the planning efforts effectively and on a countywide basis, other representatives were added. The Core Group included individuals from the following departments and agencies:

- Village of Lockington
- County Commissioner(s) or Office
- Shelby County Emergency Management Agency
- Village of Kettlersville
- Salem Township
- Clinton Township
- Shelby County Engineer’s Office
- Cynthian Township
- McLean Township
- Shelby County Regional Planning
- Village of Russia
- Shelby County Chamber of Commerce
- Turtle Creek Township
- Loramie Township
- Perry Township
- City of Sidney
- Village Fort Loramie
- Franklin Township
- Dinsmore Township
- Jackson Township
- Village of Port Jefferson
- Village of Botkins
- Village of Anna

## 2.0 COMMUNITY INFORMATION

As required by DMA2K, a community profile must be developed for the county and any jurisdictions participating in this effort. Because of the multiple jurisdictions involved in this plan, this section presents a demographical as well as historical description, if available, of each jurisdiction that will be adopting this plan. This brief profile of each jurisdiction gives some insight as to what types of communities exist in the County and provides a better understanding of the effect natural hazards, to be discussed in later sections, may have on this population. In numerous cases, the communities themselves provided the information that follows.

### 2.1 County Profile

Shelby County is located in western Ohio, approximately 40 miles north of Dayton. It is bordered by Auglaize County to the north, Logan and Champaign counties to the east, Miami County to the south and Darke and Mercer counties to the west. The County encompasses approximately 409.3 square miles of land, with a population of 47,910 according to the 2000 Census. The County consists of 14 townships including Van Buren, McClean, Cynthian, Loramie, Jackson, Salem, Perry, Turtle Creek, Washington, Dinsmore, Franklin, Clinton, Orange and Green Townships. Please refer to Appendix B for a map of the political boundaries.



The incorporated areas of Shelby County include Anna, Botkins, Fort Loramie, Jackson Center, Kettlersville, Lockington, Port Jefferson, Russia, and Sidney. According to the 2000 Census, the largest areas of population are the City of Sidney (20,211), Village of Jackson Center (1,375), Village of Fort Loramie (1,348), and the Village of Anna (1,319). Other Incorporated jurisdictions in the order of descending population include: Botkins, Russia, Port Jefferson, Lockington and Kettlersville.

The City of Sidney is the County Seat. The County has combined the Sidney-Shelby County Chamber of Commerce for the purpose to enhance the business climate in Shelby County in an effort to serve, support, and promote the Corporation and its Members. The Sidney-Shelby County Chamber of Commerce offers a significant resource within the community to promote growth and development.

Manufacturing and agriculture are the leading industries in Shelby County. In 2001, the manufacturing sector was the largest employer in the County and also the largest source of payroll. In 2001, the largest source of value added, which is a broad measure of income, was the manufacturing sector contributing 44.6% of the Shelby County economy. In 2001, agricultural crop receipts were \$42,369,000 and livestock receipts were \$30,934,000 from 991 farms, with a total of 202,000 acres of land. Corn generated the largest amount of crop cash receipts while dairy produced the largest amount of livestock cash receipts.

### 2.2 County History

Shelby County was named for General Isaac Shelby, an officer in the American Revolution who was noted for his bravery and honesty, and was elected Governor of Kentucky. Even though it was his namesake, it is believed that General Shelby did not ever visit this area. The people of

the County chose the name Shelby because many of the settlers were from Kentucky and admired General Shelby.

The James Thatcher family was the first to settle in this area. In the years preceding the War of 1812, there were less than 50 families in Shelby County. The migration into Shelby County was negatively impacted by a renewed fear of Indians during the War of 1812. Even though local men joined the Army, there was little military activity in this area and no record of combat deaths. After the War ended, the settlers began to inhabit parts of the County other than Loramie Creek and the Great Miami River basin. There were a number of Indians near Shelby County. After the War of 1812, more than 6,000 Indians had settled near Colonel John Johnston's home in Piqua, Miami County. Although most Indians were peaceful, some threats were present due to Indian existence.

Once the Indian threat was resolved by the War of 1812, new pioneers begin arriving in Shelby County settling in different areas. They still established their homes on Loramie Creek and the Great Miami River basin because water was needed for transportation, drinking, crop irrigation, as well as other daily activities.

David Henry came to what is now known as Sidney in 1814. Henry held many governmental posts and, in 1819, was appointed Director of the Village of Sidney. He was responsible for its platting and selling of the lots. Henry kept many of the records that now reflect the earliest days of the County. In October of 1816, the original plat for Hardin was filed. After Shelby County was established in 1819, the small Village of Hardin would become the first County Seat. After about a year, however, the Ohio General Assembly determined that Shelby County needed a more central and permanent site to serve as County Seat, and Sidney was considered favorable. Thomas Van Horn and James Steele were appointed to select the new location. They were approached by Charles Starrett who owned 70 acres in what is now the heart of Sidney. He was interested in forming a village and offered the land under two conditions: 1) the county seat would be permanently located there, and 2) Starrett would keep half of the money received from the sale of the lots. The offer was accepted.

It was during the years from 1870 to 1920 that many of Sidney's downtown buildings were constructed. This new county existed in what used to be the northern part of Miami County and also included land in what is now Allen and Auglaize counties. ([www.shelbycountyhistory.org](http://www.shelbycountyhistory.org))

## **2.3 Jurisdictions**

### **Sidney**

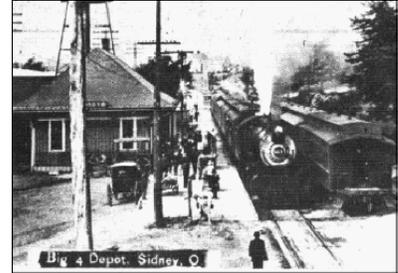
The City of Sidney is strategically located 40 miles north of Dayton, 85 miles west of Columbus, 100 miles south of Toledo, and 120 miles east of Indianapolis. As of the Census of 2000, there are 20,211 people, 7,981 households and 5,371 families residing in the City. The population density is 1,938.5 people per mi<sup>2</sup>. There are 8,557 housing units at an average density of 820.7 people per mi<sup>2</sup>. The median income for a household in the City is \$38,663, and the median income for a family is \$45,672. The per capita income for the City is \$19,075.

The City of Sidney, named after Sir Philip Sidney, a well-known poet and member of British Parliament, was originally a 70-acre parcel of land located along the west side of the Great Miami River. This land was donated by Charles Starrett to be used as the site of a new village, which was to become the County Seat of Shelby County. The area around Sidney was once the

richly-forested hunting ground of the Shawnee and Miami Indian nations. This fertile area was developed as agricultural lands over time.

The construction of the Miami-Erie Canal between 1825 and 1837 connected Sidney in a north/south direction with the major trade centers in Ohio. In addition to opening the first significant "outside" trade for Sidney, the construction of the canal also attracted an influx of settlers to the area.

As the influence of the canal declined, another transportation element, railroads, began to develop in Sidney. East-west rail began to be constructed in 1851, followed by north-south rail in 1856. Sidney is still served by these railroad lines today.



**Early Sidney Train Depot**

In the 1950's, another transportation element, the Interstate Highway, would play a significant role in the development of Sidney. Today, Interstate 75 connects Sidney with Canada to the north, and Florida to the south. Sidney has four interchanges with Interstate 75, providing quick and convenient access for both commercial and industrial users.

Sidney is a progressive, growth-oriented community. Sidney offers an historic downtown featuring the famous Louis Sullivan designed People's Savings & Loan building, the Monumental Building (erected as a monument to those Shelby Countians who died in the Civil War), and the Shelby County Courthouse. The Courthouse, which occupies one city-block known as Court Square, was recently named as one of the "Great American Public Places".

The Sidney-Shelby County Chamber of Commerce is instrumental in leading the Sidney Mainstreet and Sidney Visitors Bureau initiatives. Sidney Mainstreet strives to develop downtown Sidney as an essential center of opportunity for retail, commercial, residential, cultural, and religious activities. In addition, the goal of the Sidney Visitors Bureau is to advance, encourage, and promote visitation and tourism activities within the City of Sidney.



**City of Sidney**  
[www.sidneyoh.com](http://www.sidneyoh.com)

Another unique characteristic of Sidney is its outstanding parks and recreation system. When the City's first comprehensive plan was being developed in the mid-1950s, the City decided that it would be an attractive feature to have a park or recreation area within ½ mile of every residence. This goal has resulted in a system of 14 neighborhood parks, a baseball complex, softball complex, soccer complex, municipal swimming pool, and the 180-acre Tawawa Park. ([www.sidneyoh.com](http://www.sidneyoh.com))

**Jackson Center**

According to the Census of 2000, there are 1,369 people, 541 households and 394 families residing in the Village. The population density is 1,088.9 people per mi<sup>2</sup>. There are 584 housing units at an average density of 464.5 people per mi<sup>2</sup>. The median income for a household in the Village is \$40,650, and the median income for a family is \$47,240. The per capita income for the Village is \$17,755.

Jackson Center originated on May 4, 1835 with 24 lots. Businesses in the area included dry goods stores, a shoe shop, a blacksmith shop, an undertaking and wagon shop, a cabinet

maker, a hotel known as the Carter House, Heinler Hardware, a drug store, a bicycle and musical instrument shop, a restaurant, a bakery and ice cream parlor, a seamstress, a hat shop, and a well equipped dental office. There was also a newspaper published by J.G. Sailor. Two early physicians were Dr. Holsten and M.M. Carter. At one time as many as five physicians served Jackson Center and the community.

Jackson Center was incorporated November 7, 1894 with the first Council meeting on April 9, 1895. In June of 1895, the first bank of Jackson Center was organized under the name of The Farmer's & Merchants Bank of Jackson Center, with Shelby Baughman as president. The first account was opened by the Jackson Center Elevator Company. In 1907, the institution was reorganized and became the First National Bank of Jackson Center.

Around 1890, a college was constructed west of the D.T. & I, Railroad. The college was financed by local citizens using solicitation. Shelby Baughman served as president of the Trustees of the school. In a newspaper account of the dedication, a writer editorialized, "It is the only institution of its kind in Shelby County and Jackson Center is a most desirable place for an institution of its kind." Over 140 students, who completed the college courses, proceeded to teach in the surrounding area. The college was only open for four years.

Records of early schools indicate that German pastors presided over parochial schools first, but the immediate settlement of Jackson Center was by Seventh Day Baptists rather than German Lutherans or Catholics. One room elementary schools dotted the rural area around Jackson Center with a high enrollment. This enrollment varied with the type of farm work because students had other responsibilities at home. As many as 50 pupils attended each of these schools. These pupils were grouped by ability to read, not by age or grade. One school, built around 1902, consisted of six rooms and three downstairs rooms, housing the first eight grades. The upstairs rooms served as the high school, and a faculty of five to six teachers instructed the entire school. The present high school



**Early Seventh Day Baptist Church**

building was built in 1926 and 1927.

Throughout the years, the people of Jackson Center have found many ways to entertain themselves. Home town musicians got together and organized a band, not only for their own satisfaction, but to give street concerts during the summer months, and lead parades on Memorial Day. On Saturday nights, ice cream socials were held on church lawns. They served homemade ice cream and cake. There was also a picture house that showed silent movies to the patrons.

Although Jackson Center was one of the last Shelby County settlements to be established, the village grew rapidly. During the 1930's, the village's water and electric utilities were installed. Currently, Jackson Center is the only Shelby County municipality to own its own electric system. ([www.jacksoncenter.com](http://www.jacksoncenter.com))

### **Fort Loramie**

According to the Census of 2000, there are 1,344 people, 480 households and 358 families residing in the Village. The population density is 1,848.7 people per mi<sup>2</sup>. There are 494 housing units at an average density of 679.5 people per mi<sup>2</sup>. The median income for a household in the Village is \$54,750, and the median income for a family is \$65,089. The per capita income for the Village is \$19,602.

In 1794, Anthony Wayne ordered the construction of Fort Loramie. It was located at the portage between St. Mary's River and modern-day Loramie's Creek. The fort was named for Peter Loramie, the French trader who had established a trading post in the area. Wayne initially intended Fort Loramie to be an actual stockade, but after defeating the natives at the Battle of Fallen Timbers in August 1794, he determined a blockhouse and several storage buildings were more important.

The fort served as an important link in a trail of forts built by General Wayne extending from the Ohio River to Lake Erie. Fort Loramie was a supply depot for American fortifications, including Fort Wayne, Fort Adams, and Fort Defiance, in modern-day northern Ohio. In December 1795, the American military finally completed construction of the buildings.

During the War of 1812, Fort Loramie served as a supply depot for forts in northern Ohio, as well as for military forces sent to fight against the British in Michigan and Canada. In 1815, the United States sold Fort Loramie to James Furrow, who created a tavern and post office out of the buildings. In 1820, Furrow abandoned the business. Despite Furrow's failing business venture, a village had begun to form. Many people had moved from eastern Ohio, seeking better land and increased opportunity. Most of the early migrants were of German descent. Fort Loramie was founded in 1837. Currently, there is only a historical sign located 1/2 mile north of present-day Fort Loramie on State Route 66 which indicates where the fort once stood. ([www.ohiohistorycentral.org](http://www.ohiohistorycentral.org))

## **Anna**

Anna is located forty-five miles north of Dayton, Ohio. According to the Census of 2000, there are 1,319 people, 474 households and 365 families residing in the Village. The population density is 1,576.7 people per mi<sup>2</sup>. There are 483 housing units at an average density of 577.4 people per mi<sup>2</sup>. The median income for a household in the Village is \$48,676, and the median income for a family is \$51,797. The per capita income for the Village is \$19,835.

The Village of Anna was once part of the Northwest Territory, which was inhabited by various Indian tribes. To account for the earthquakes that have plagued Anna, many villagers point to the early ancestors of the land. Legend states that the famous Shawnee leader Tecumseh has influenced Anna's history. To stand ground against the white man, Tecumseh tried to unite the Indian tribes in what is now the Anna area. After the various tribes refused to join Tecumseh, he put a curse on the land and prophesied that it would be forever plagued by the trembling of the earth according to the legend.

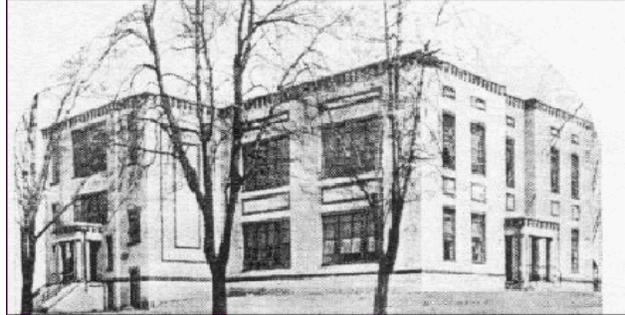
Modern science, however, has a different approach toward explaining the Anna earthquakes. The Village of Anna lies directly on the Greenville Fault. This geological feat of nature extends from Toledo, southward through Anna, Greenville, Cincinnati, and then directs itself through Kentucky all the way to the border of Tennessee.

The March 9 quake of 1937 rocked the small Village of Anna, giving it a permanent nickname of "The Earthquake Capital of Ohio". Its people, houses, and school have never been quite the same. On the other hand, it was this great disaster that united the Village of Anna as a community.

Anna villagers were not the only communities affected by this earthquake. Office workers in Dayton and even the animals in the Cincinnati Zoo all felt the earth move. The quake centered

in Anna was felt across six states. The Village of Anna became the spotlight of media attention. The earthquake even made front page headlines in *The New York Sun* that afternoon.

Ironically, the Anna Board had just purchased earthquake insurance for the school. At the time of the March 1937 earthquake, the \$55,000 school building was only ten years old. Dr. Milliette had remembered a small shake that rattled the medicine bottles on his shelves. After some research, Dr. Milliette learned of Anna's earthquake prone situation. He urged the Board to take out a policy to protect the school in case of future tremors. The Board listened to Milliette, and had \$30,000 of earthquake insurance for the school at the time of the big disaster. The Anna school district became the only one in Ohio to have earthquake insurance. This insurance proved to be a profitable investment, because only \$90 had been paid on the policy when the earthquakes struck.



***Anna School in 1927  
before 1937 earthquakes***

On September 6, 1938, the new Anna school opened for classes. Villagers saw their hard work being rewarded with the new earthquake-proof structure. There were many individuals that helped make the new Anna school a reality. Dr. Milliette became a hero. The residents of Anna named their babies Delphis, after Dr. Milliette. A new village street was named Milliette in his honor. A "Dr. Milliette" day was even observed and celebrated by the Anna villagers. To date, Dr. Milliette remains the most famous figure in Anna history. When Anna High School renovated its old gym into an auditorium in 1995, the name Milliette Auditorium was affixed to the new room.

The current building that houses both the Anna Middle School and Anna High School is the structure that was built as a result of the 1937 earthquakes. If not for the ingenuity and spirit of the Anna people, the new building would not have been possible. The Anna earthquakes are a legacy of the Village of Anna uniting for the good of all.

<http://www.anna.k12.oh.us/About/History/html/earthquakes.htm>

## **Botkins**

According to the Census of 2000, there are 1,205 people, 463 households and 330 families residing in the Village. The population density is 1,311.0 people per mi<sup>2</sup>. There are 482 housing units at an average density of 24.4 people per mi<sup>2</sup>. The median income for a household in the Village is \$43,000, and the median income for a family is \$53,750. The per capita income for the Village is \$18,880.

Richard Botkin was born in Morgan County, Virginia, migrated to Hamilton County, Ohio in 1803, and moved to Shelby County in 1832. He married Elizabeth Short in Hamilton County in 1829, and after her death in 1839, married June Elliott, daughter of Cornelius Elliott, who relocated to Shelby County from Licking County.

Shortly after moving to present day Botkins, Richard Botkin built a log house. In 1850, he constructed a barn, with a frame house, the first for miles, to follow in 1854.

Richard surrendered the right-of-way for one mile north and one mile south to the Dayton and Michigan Railroad, later the CH&D, and then the B&O Railroad. With horse and oxen he graded a mile of the future railroad. Richard died in 1858, but saw the first train pass, having been helped from his bed during his last illness to see it. After his death, the village was incorporated and named Botkins as requested in his will. ([www.botkinsohio.com](http://www.botkinsohio.com))



***Botkins Train Depot  
State Street Crossing***

## **Russia**

The Village Russia is in the southwestern corner of Shelby County, and is bordered by the Conrail Railroad to the north. As of the Census of 2000, there are 551 people, 197 households, and 157 families residing in the village. The population density is 854.0 people per mi<sup>2</sup>. There are 206 housing units at an average density of 319.3 people per mi<sup>2</sup>. The median income for a household in the Village is \$51,250, and the median income for a family is \$62,143. The per capita income for the Village is \$23,577.

Highway extensions have enabled Russia to attract industrial development. Major manufacturers are Clopay Corporation, Francis Manufacturing and Superior Aluminum Products.

## **Port Jefferson**

According to the Census of 2000, there are 321 people, 122 households and 90 families residing in the Village. The population density is 2,084.8 people per mi<sup>2</sup>. There are 128 housing units at an average density of 831.3 people per mi<sup>2</sup>. The median income for a household in the Village is \$34,306, and the median income for a family is \$47,000. The per capita income for the Village is \$16,897.

This canal town traces its existence to the excitement generated by the construction of the canal. Although there were settlers in the area as early as 1814, Jonathan Counts surveyed and platted the Village in August 1836, after the precise route of the Sidney Feeder was first determined. First known as Pratt, Ohio, the Village adopted its present name when it was incorporated as a Village on April 18, 1842.

Port Jefferson was located where the Sidney Feeder canal connected with the Great Miami River. The purpose of the feeder was to provide a steady flow of water to the Miami Canal at the Lockington locks. A large dam in the river east of Port Jefferson diverted the waters into the feeder.

Because Port Jefferson was the closest point on the canal system for the vast territory east of Sidney and Port Jefferson, it became an important center for commercial activity. All grain, lumber, and other products north and east of town, destined for the canal, passed through Port Jefferson. The canal feeder at Port Jefferson was completed to Sidney by 1841, four years before the Miami & Erie Canal was opened between Cincinnati and Toledo.

Samuel Rice learned of the bright economic prospects of the Village in the early 1840s. After first touring a small underdeveloped town called Chicago in northern Illinois, he traveled to this area, evaluated the prospects of Port Jefferson, and chose to invest in this Village. He

purchased a substantial amount of property around the village, and waited for development to follow.

Between 1845 and the 1860s, Port Jefferson almost rivaled Sidney in size and influence. Approximately 150 Port Jefferson men worked in the wooden products (barrels and staves) industry. Four blacksmiths, including Epler and Johnson, were kept busy by the canal boat work. Gottlieb Allinger built a large mill on the canal in 1871, now the site of Hussey's Restaurant. Three dry goods stores, three groceries, and a shoe shop blossomed.

Construction of two major railroads in Sidney by 1860 signaled the decline of the canal's importance, as well as Port Jefferson. Samuel Rice's idea that the Village would become a major Midwest trading center materialized. Local residents referred to Port Jefferson as 'Little Chicago' for many of years. ([www.shelbycountyhistory.org/schs/canal/portjefferson.htm](http://www.shelbycountyhistory.org/schs/canal/portjefferson.htm))

### **Lockington**

According to the Census of 2000, there are 208 people, 74 households and 60 families residing in the Village. The population density is 2,494.0 people per mi<sup>2</sup>. There are 77 housing units at an average density of 923.3 people per mi<sup>2</sup>. The median income for a household in the Village is \$37,500, and the median income for a family is \$39,500. The per capita income for the Village is \$15,374.

David Mellinger filed a plat for the town of Locksport in November 1837, just as canal construction was moving north from Piqua (Miami County). Since Mellinger knew the precise location of the canal, he laid out the Village to take advantage of the location at the series of locks. Piqua historian Jim Oda aptly described Mellinger's intent as "*Its whole function was to be a boomtown for the Miami-Erie canal.*" Locksport, (later renamed Lockington because two other towns on canals in Ohio bore that name), fulfilled every wish of its founder.

The little village was situated at the site of the six locks, which enabled canal boats to be raised or lowered a total of 67 feet at the edge of the "Loramie Summit." At the height of the activity on the canal, scores of boats a day moved through the system of locks. This slow process, which took as long as five or six hours to traverse the locks, caused a backup of boat traffic, which in turn allowed travelers to go ashore for a period of time. Mrs. Joseph Avy, a long-time Lockington resident, recalled in a 1991 interview that boat captains would race to the first lock in the village, hoping the locktender would let them pass through first. Passing through the lock first was especially important when the cargo was perishable goods.



***Lockington Dam***

A collection of log houses and huts soon emerged, first occupied by laborers working on the canal, and later by the owners of stores and other businesses. Chief among the enterprises were at least six saloons and a brothel. Jim Oda notes that the canalers came to town with "*...one criterion and that was to drink.*" The traditional tavern had two floors, one where the men would drink, and the other where they would sleep (usually with three or four men to each bed). One of the taverns, known as Fort Sumpter, was invaded by women armed with guns one night, but the bar was back in business the next night.

Lockington attained true “boomtown” status about 1845 when the entire length of the canal was first opened. Business activity peaked close to 1860, and curtailed gradually as canal boat traffic declined. Construction of the railroads, which initiated the decline and eventual demise of the canal, spelled the end of dreams of Lockington's residents for they thought it would also become a large city. ([www.shelbycountyhistory.org](http://www.shelbycountyhistory.org))

**Kettlersville**

The Village of Kettlersville is located in the northwest section of Shelby County approximately five miles west of I-75. Kettlersville is the smallest village in the County. As of the Census of 2000, there are 175 people, 60 households and 46 families residing in the Village. The population density is 171.5 people per mi<sup>2</sup>. The median income for a household in the Village is \$50,000, and the median income for a family is \$51,250. The per capita income for the Village is \$17,167.

The Village of Kettlersville is comprised of mostly rural, undeveloped land. Growth has been limited in the outlying areas of Kettlersville due to insufficient public utilities, limited employment opportunities, and poor accessibility. Auglaize Farmers-Provico, a producer of livestock feeds, is the Village’s major employer.

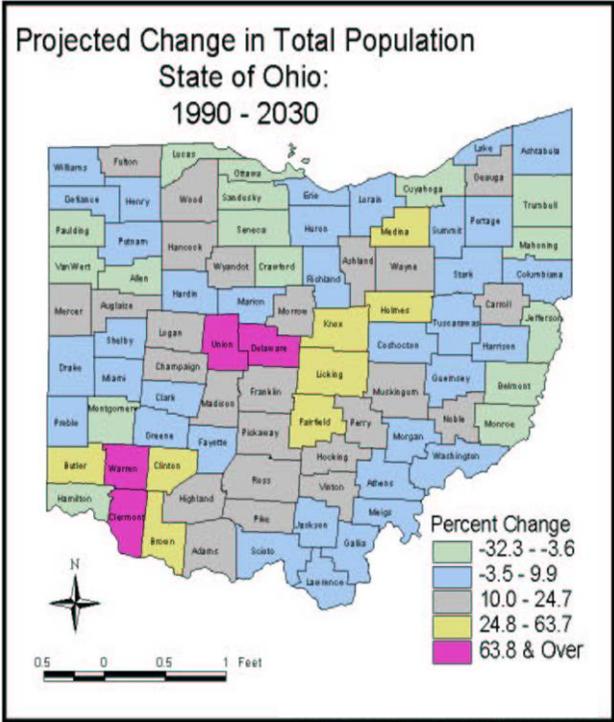
**2.4 Census Information**

**2.4.1 State Population**

The State of Ohio’s population in 2000 was 11,353,140 and it is projected to climb to 12,317,613 by 2030, an increase of 8.5%. However, it appears that the rate at which Ohio’s population is growing is diminishing.

Several factors may be contributing to this decline. The birth to death ratio is much smaller than in faster growing states, with Ohio expected to have 4.4 million births and 3.6 million deaths. Net migration is a factor as well. Ohio may gain approximately 247,000 people through in-migration but may lose about 758,000 people through out-migration.

The projected percentage of population change by county in Ohio from 1990 to 2030 is reflected on the map in this section. Counties surrounding a major metropolitan area – Cincinnati, Columbus, and Cleveland – generally will experience higher growth rates. Counties in the north central and eastern region of the state are projected to experience a decline.



**2.4.2 County Population Projection**

According to U.S. Census figures, the 2000 total population of Shelby County was 47,910. The area of highest population density is the City of Sidney. The largest village is the Village of Jackson Center, with a population of 1,375. The largest unincorporated area is Cynthian Township, with no incorporated jurisdiction within its boundaries and a population of 1,972.

The population of Shelby County has increased over the last 100 years. From 1820 to 1880, the population increased by over 19,000 people. From 1890 to 1970, there has been a gradual increase in population with the population growing by 13,041 people. From 1970 to 1980 the population increased by 5,341 people, which was the largest net change experienced by the County. Shelby County is expected to increase in population to 52,666 by 2030. Please refer to the Table 2-1 for more demographic information.

**Table 2-1  
POPULATION TABLE**

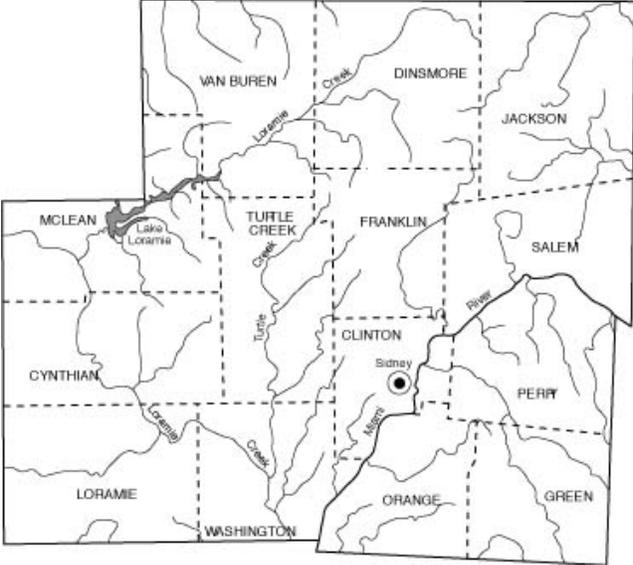
Year	Total Population	Year	Total Population
1800	NA	1910	24,663
1810	NA	1920	25,923
1820	2,106	1930	24,924
1830	3,671	1940	26,071
1840	12,154	1950	28,488
1850	13,958	1960	33,586
1860	17,493	1970	37,748
1870	20,748	1980	43,089
1880	24,137	1990	44,915
1890	24,707	2000	47,910
1900	24,625		

A Shelby County demographic profile is also available on the Ohio Department of Development's website and provides more specific information for Shelby County and its political jurisdictions. ([http://www.odod.state.oh.us/osr/profiles/pdf/.](http://www.odod.state.oh.us/osr/profiles/pdf/))

## 2.5 County Land Use and Future Land Use

### 2.5.1 Topography

Approximately 95% of the County lies in the Upper Great Miami River basin, which flows south to the Ohio River. A small area in northwest Shelby County drains into tributaries of the St. Mary's River and the Auglaize River, which ultimately drain to Lake Erie.



#### 2.5.1.1 Watersheds

Shelby County is located on a major watershed divide. A small portion of the northwest section of the County drains into small tributaries that are a part of the St. Mary's River system. The St. Mary's is part of the larger Lake Erie watershed. In addition, the Upper Auglaize River watershed encompasses a small section in Dinsmore, McClean and Van Buren townships which is also a part of the Lake Erie watershed. The remaining portions of the County are all part of the Great Miami River watershed. The Great Miami is part of the greater Ohio River watershed.

#### *Loramie Creek Watershed*

The Loramie Creek Watershed is located in West Central Ohio, and is comprised of portions of four counties, including Shelby, Darke, Mercer, and Auglaize. The watershed is at the headwaters of the Great Miami River, and once served as a heavily traveled portage route for Native Americans and colonial settlers. The majority of land use in this watershed is agricultural (87%). Several villages and towns exist in the watershed including Fort Loramie, Minster, Anna, Botkins, North Star, Osgood, Yorkshire, Newport, Russia, Lockington, and Kettlersville. Although the western edge of the City of Sidney drains to the Loramie Creek, most of Sidney lies outside the watershed and drains directly to the Great Miami River. The drainage area of this system draining into the Loramie Creek is 265 square miles. See Map C-1, Loramie Creek Watershed, Appendix C.

#### *Great Miami River Watershed*

The Great Miami River Watershed is located in the southwest portion of Ohio. This watershed contains 2,360 miles of rivers and streams, including the Great Miami, Stillwater, and Mad Rivers. The drainage area of these rivers in Ohio is 4,277 square miles. Total drainage area including that portion in Indiana is 5,702 square miles. The Great Miami River Watershed includes all or part of 15 counties with the headwaters in Hardin and Auglaize counties and the mouth in Hamilton County. The majority of land use in this watershed is agricultural (80.5%) See Map C-2, Great Miami River Watershed, in Appendix C.

Some of the most significant water resource features in the watershed are the Stillwater Scenic River, the Great Miami buried valley aquifer, the five major dams (dry) and flood protection system of Miami Conservancy District (MCD), and Indian Lake, a remnant of the Miami-Erie Canal system and one the largest lakes in Ohio.

#### *Upper Auglaize River Watershed*

The Upper Auglaize River basin is a sub-watershed of the Maumee River basin (Lake Erie drainage basin) located in portions of Auglaize, Allen, Putnam, Van Wert, Shelby, and Paulding counties. Agricultural, predominantly row crop, accounts for 89% of the land,use in the Upper Auglaize River basin. Only 2.2% of the total land,use is urban (residential and commercial/industrial combined). See Map C-3, Upper Auglaize River Watershed, Appendix C.

#### **2.5.1.2 Aquifers**

The carbonate aquifer, which is composed of layers of limestone and dolomite, is the principal source of groundwater in west central Ohio, including Shelby County. Limestone consists of fossilized sea shells, shell fragments, calcareous sands and consolidated limy mud. Its main mineral is calcium carbonate,  $\text{CaCO}_3$ . Dolomite is similar to limestone, but has few recognizable fossils; its main mineral is calcium magnesium carbonate,  $(\text{Ca,Mg})\text{CO}_3$ . Both limestone and dolomite are commonly referred to as limestone or carbonate rocks. The limestone and dolomite formations, which underlie most of the western portion of Ohio, were deposited between about 400 and 500 million years ago. In most areas of this region, these formations are covered by a layer of glacial till, which is an unsorted mixture of clay, silt, sand, gravel and boulders deposited by glacial activity.

Limestone formations are usually good sources of groundwater because of their naturally formed solution channels, joints and fractures, which provide water storage capacity and pathways for water movement. The number of fractures and other openings in limestone varies greatly from one location to another and affects the amount of water that may be encountered when drilling a well. The position of such openings rarely can be determined from the land surface; therefore, there is always some uncertainty as to the production capability of a proposed well.

Groundwater also occurs in lenses (or pockets) of sand and gravel deposited by glacial activity. These deposits occur above the carbonate bedrock and may be imbedded in the glacial till or deposited in layers.

ODNR's Division of Water, maintains a statewide data base of more than 700,000 well logs. The Groundwater Resources Section of the Division manages this valuable data base, which includes some information collected by the U.S. Geological Survey (USGS) and the Ohio Environmental Protection Agency (Ohio EPA). Since 1948, well log information has been collected to increase the understanding of the groundwater resources in Ohio. Geologists and hydro geologists continue to study the state's groundwater resources, and as a result, Ohio is one of only a few states that has been completely mapped for groundwater availability (mapped by river basin, from 1959 to 1962).

Estimates of the size, shape, geologic make-up and yields of aquifers are being mapped county by county. Most of Ohio's counties have a completed map. See Map E-1, Groundwater Resources of Shelby County. The map presented in Appendix E is a generalized representation of the water-bearing formations underlying Shelby County (adapted from map by Kostelnick,

1983). This illustration is based on a hydrogeologic interpretation of the well log data from Shelby County and surrounding areas, to be used only as a guide to understanding the groundwater resources in the County. The remainder of this section provides a brief description of the types of aquifers illustrated on the Map E-1.

*AREA A: Permeable Sand and Gravel with High-Yield Potential*

Area A illustrates the outwash sand and gravel deposits in the Loramie and Turtle Creek flood plains. These areas may yield large water supplies to properly screened wells. Well yields of up to 500 gpm generally can be obtained from depths of less than 75 feet.

*AREA B: Ancestral Teays Valley filled with Glacial Till*

This buried valley, illustrated as Area B, is a tributary to the ancestral Teays River valley. Commonly misunderstood to be an underground river, the Teays valley is a remnant of an ancient drainage system that cut a valley into the limestone before the area was glaciated. Later, with the coming of glaciers, the valleys were completely filled with glacial deposits. Intermittent deposits of sand and gravel can be found interbedded with thick layers of clay-rich glacial till.

Deep sand and gravel deposits in the ancestral Teays valley may yield small industrial and municipal supplies. The coarsest deposits generally occur between 100 and 300 feet below the surface. Yields of up to 500 gpm are possible from properly-constructed wells. Flowing wells have been noted near Salem and Perry townships. Test drilling may be necessary to locate the coarser deposits that have the potential for maximum yields. Deeper drilling into the impermeable shale in the valley floor is not advised.

*AREA C: Thick Limestone beneath Glacial Till*

The limestone aquifer illustrated as Area C is part of the regional carbonate aquifer which underlies much of west central Ohio. It is overlain by 15 to more than 200 feet of glacial till, consisting principally of clay with intermittent deposits of sand and gravel. Most wells are drilled into the limestone, and yields generally are adequate for domestic and farm water supplies. Where openings in the rock have been enlarged by solution, drilled wells may yield over 150 gpm.

*AREA D: Limestone beneath Glacial Till*

Area D is also part of the regional carbonate aquifer of west central Ohio. However, the water-bearing bedrock is thinner than in similar formations to the north. Yields of 25 to 100 gpm, considered adequate for industrial and municipal water supplies, may be developed from this aquifer at depths of less than 200 feet. Farm and domestic water supplies can usually be developed at depths of 60 to 120 feet.

*AREA E: Shallow Permeable Sand and Gravel*

Area E shows the thin outwash deposits in the Loramie Creek area. Shallow, irregular sand and gravel deposits within 75 feet of the surface may yield 25 to 100 gpm to properly screened wells.

*AREA F: Carbonate Bedrock*

Area F outlines the thin bedrock surface surrounding ancestral valleys. Well yields vary from 10 to 25 gpm from the thin limestone and shale present.

*AREA G: Shallow Sand and Gravel with Low-Yield Potential*

Thick clay, fine sand, and gravel over impermeable bedrock are found in these ancestral drainage channels, shown as Area G. Yields of 3 to 10 gpm may be developed for domestic supplies in the valley fill material. However, deeper drilling into the shale is not recommended, since dry holes do occur.

**Groundwater Levels**

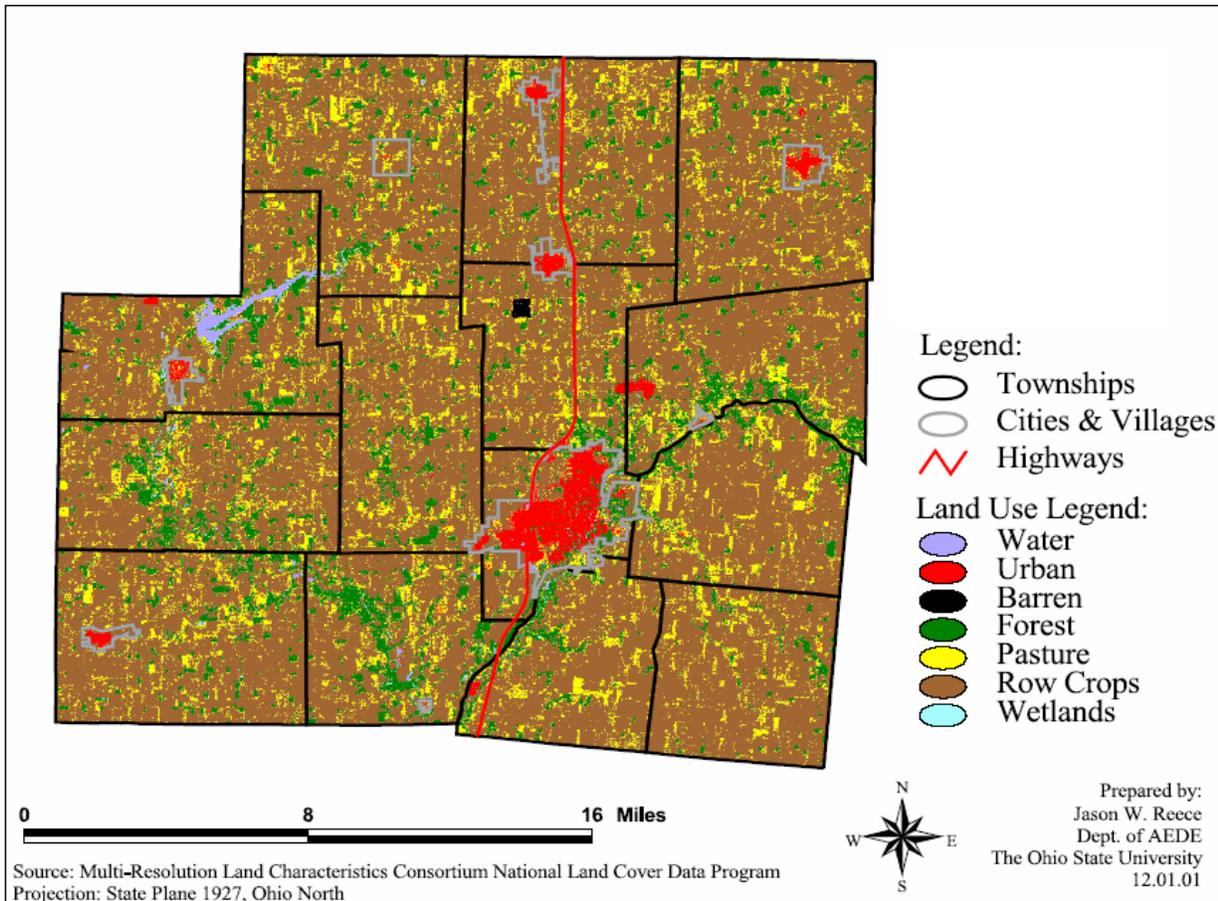
The water level in any well typically does not remain constant, but changes depending upon the proximity of adjacent wells and surface streams, and natural rainfall. Groundwater discharge and recharge greatly affect water levels in wells. The ODNR Division of Water monitors groundwater levels in one well in Shelby County. This well is located near Sidney and designated as SH-4 on Map E-1. This well is one of a number of wells throughout west central Ohio used to monitor the natural seasonal fluctuation, or the effects of nearby pumping, on water levels in the carbonate aquifer.

Observation well SH-4 is 280 feet deep and the depth to limestone is approximately 136 feet. It is representative of many limestone wells in the region. Continuous water level measurements have been recorded at SH-4 since September 1979. The lowest level recorded on SH-4 (Sidney) was 94 feet below land surface in October of 1982; the highest level recorded was 56 feet below land surface in April and June of 1990.

**2.5.2 County Land Use**

According to the Comprehensive Plan for Shelby County, it has traditionally been a rural, agriculturally dominated County. Although it has a significant industrial base, interstate access, outstanding water resources, and stable communities, farming continues to be the dominate land use. Shelby County contains approximately 261,000 land acres, of which 87% is agriculture or open space. About 1.6% of the County is classified as “urban,” which contains all residential, commercial and industrial development. In addition, about 10% of the County contains woodlands. The balance of the County (2.4%) contains non-forested wetlands, shrub/scrub vegetation, open water, and barren land.

As estimated by the Soil Conservation Service, the County’s water acreage consists of approximately 1,823 acres of lakes, including 1,655-acre Lake Loramie, as well as 18 private lakes and ponds of five to 18 acres in size, and numerous smaller ponds. Lake Loramie and several small lakes were originally developed as feeders for the old Miami-Erie Canal System and now are used primarily for recreation. According to the ODNR’s Division of Water, approximately 245 linear miles of major streams and rivers, 120 miles of County maintained ditches, and nearly 400 miles of private maintained ditches are used for land drainage. This availability lends itself to many uses by both communities and individuals.



The map above illustrates Shelby County's land use from the early 1990's.

### 2.5.3 Future Land Use

#### 2.5.3.1 Shelby County

The Shelby County Land Use Plan is based upon the organization of future land use at two levels: countywide and local (village, sewer service areas, and townships).

The countywide level addresses such regional items as sewer service areas (existing and proposed), priority farm areas, areas suitable for residential development, major industrial and commercial concentrations, corridors and greenways, and major community facilities. This categorization serves as the general development background for the plan.

The local level addresses the future development pattern around villages and other areas with utilities, such as Anna or Lake Loramie, as well as proposed future sanitary service areas. This local level is a more detailed level of development and is comprised of three layers:

- Allocate funds for future expansion of a village via utilities;
- Support transition zone for single-family development with onsite systems would be supported
- Support rural area where farming should be dominant.

The Land Use Plan represents a new, organized way of addressing future development in response to the goals and development principles of the County's Comprehensive Plan. To an extent, it builds upon the existing land use practices in the County.

### **2.5.3.2 City of Sidney**

The City of Sidney's Land Use Plan focuses on guiding future expansion of the City, as well as future development. The plan provides for the physical expansion, through annexation, of areas suited for development, particularly based upon current land use trends, as well as a future build-out population of 35,000. The plan recommends continued industrial development west of I-75, commercial development principally focused on SR 47 and Vandemark Road and residential expansion in the City's north end. Open space is recommended for preservation along the Great Miami River and several of its tributaries.

## **2.6 County Utilities**

### **2.6.1 Electric, Telephone and Gas**

The electric power for Shelby County is provided by five utilities: Dayton Power & Light Company, Pioneer Rural Electric Company, Logan Power & Light, American Municipal Power and Midwest Rural Electric. See Map D-1, Service Areas of Ohio Electric Companies, in Appendix D.

Phone companies that service Shelby County include Verizon North, Sprint, New Knoxville and SBC. See Map D-2, Telephone Service Areas in Ohio, in Appendix D. Vectren Energy Delivery of Ohio provides gas distribution services to Shelby County. Columbia and East Ohio also supply a portion of Shelby County. See Map D-3, PUCO Regulated Natural Gas Companies, in Appendix D.

### **2.6.2 Water and Wastewater**

#### **2.6.2.1 County Groundwater Resources**

Shelby County's primary groundwater source is the carbonate aquifer composed of limestone and carbonate bedrock. In the northern half of the county, yields of greater than 150 gallons per minute (gpm) have been developed from wells penetrating fractured zones in the carbonate bedrock. Farm and domestic supplies of greater than 10 gpm may be developed from shallow wells. Wells finished in the sand and gravel deposits in the northern part of the County also yield ample water supplies.

The limestone aquifer in the southern portion of the county generally yields 25 to 100 gpm. This water-bearing bedrock is thinner than formations to the north. Sand and gravel deposits may also yield 25 to 100 gpm within 75 feet of the surface from properly screened wells. Valley fill areas can provide up to 10 gpm, but deeper drilling into the shale bedrock below may produce dry holes

Groundwater is a major water source for rural households in Shelby County. Approximately 41% of all households obtain their water from private wells. Based on an estimated usage of 75 gallons per person per day, 1,380,000 gallons per day (gpd) from private wells are used. Additional private water uses include industry (2,930,000 gpd), golf course and crop irrigation (190,000 gpd each in season) and livestock use (646,000 gpd), mostly from groundwater supplies. The remaining 59% use public water supplies, ground or surface water as the source.

### **2.6.2.2 Incorporated Jurisdictions and County Groundwater Resources**

#### **Sidney**

Sidney operates both a water and wastewater treatment plant. The County's largest public water system is the City of Sidney, which utilizes the Great Miami River, Tawawa Creek and five groundwater wells for its supply. The water treatment plant's capacity is 10,000,000 gpd .

The Wastewater Treatment Plant (WWTP) began construction December 2001 for upgrading the treatment capacity, as well as adding additional process equipment and facilities. This \$5 million project continued through 2002 with completion in early 2003. The modifications to the plant and processes allowed for the treatment of 7,000,000 gpd at that site.

#### **Jackson Center**

Jackson Center operates both a water and wastewater treatment plant. The Village of Jackson Center receives its water from three wells and treats the water in its own facility. The water treatment plant's capacity is 500,000 gpd and the wastewater treatment plant's capacity is 1,800,000 gpd.

#### **Fort Loramie**

Fort Loramie operates both a water treatment plant. The water treatment plant has a capacity of 576,000 gpd and services the Fort Loramie village limits. The wastewater is sent to the County wastewater treatment plant.

#### **Anna**

Anna operates both a water treatment plant and wastewater treatment plant. The water treatment plant has a capacity of 350,000 gpd and services the Anna village limits. The capacity of the wastewater plant was not readily available for inclusion in this plan.

#### **Botkins**

Botkins operates both a water treatment plant and wastewater treatment plant. The water treatment plant has a capacity of 500,000 (gpd) and services the Botkins village limits. The capacity of the wastewater plant was not readily available for inclusion in this plan.

#### **Russia**

Russia does not operate its own water treatment plant. However, Russia does operate its own wastewater treatment plant. The capacity of the wastewater plant was not readily available for inclusion in this plan.

**Port Jefferson**

Port Jefferson does not have a water treatment plant. The village uses individual water wells and has a connection to the City of Sidney's sewer system.

**Lockington**

Lockington uses individual water wells and individual sewer systems.

**Kettlersville**

Kettlersville uses individual water wells and individual sewer systems.

**Shelby County**

The County owns and operates six wastewater treatment plants within its limits. They are the Arrowhead Hills subdivision wastewater treatment plant, the Fair Haven County Home wastewater treatment plant, two Millcreek Subdivision wastewater treatment plants, the Hickory Dell subdivision wastewater treatment plant and the Lake Loramie wastewater treatment plant. A capacity for each of the wastewater plants was not readily available for inclusion in this plan.

### **3.0 COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLANNING PROCESS**

#### **3.1 Mission Statement**

At the beginning of the planning process, a mission statement was drafted to establish a clear goal for the Core Group. The Core Group reviewed and approved the following as its Mission Statement:

**“The mission is to develop a document that meets the mandates of the Federal Disaster Mitigation Act of 2000. Through research, Shelby County will anticipate future natural hazard occurrences so as to implement appropriate mitigation techniques. The techniques identified in this document will have a positive impact on the residents, property and resources of Shelby County. Implementation of these techniques will: a) save lives, b) protect property; c) reduce the cost of recoveries through an efficient, coordinated rapid response; and, d) increase the educational awareness of frequency of natural hazard events. “**

#### **3.2 Notification Process**

The incorporated jurisdictions of the County, as well as other agencies that work within the County, were notified of the mitigation planning process. The Shelby County EMA Office created a master list of jurisdictions they felt necessary to participate in this planning effort. The comprehensive list was reviewed to ensure that all the appropriate agencies as well as jurisdictions would be invited to participate in this effort. A Core Group representing a wide array of political subdivisions, as well as agency and private businesses, was notified of the mitigation planning process.

Prior to commencing this planning process, in addition to contacting the Core Group, Shelby County notified adjacent counties as well as the general public regarding this mitigation planning process. The Shelby County EMA sent letters to adjacent counties with contact information for learning more about the planning effort. Shelby County also issued a press release dated November 04, 2004 inviting concerned citizens in all jurisdictions of the County. The Shelby County EMA Director was the contact source and his contact information was provided. See Appendix A for copies of these correspondences.

#### **3.3 Groups**

The Core Group is the original planning unit for this project. All Core Group members are involved for the entire planning process. They are the decision makers and implementers. The purpose of the Core Group is to provide information to the various entities of Shelby County that has a stake, either directly or indirectly, in the Mitigation Plan. They provide feedback, input, and review as the process of the Mitigation Plan development is completed, leading to a better quality and more inclusive scope of the Mitigation Plan that everyone can acknowledge and adopt, truly implementing a countywide plan.

Obtaining support from the whole community required a comprehensive approach to preparing the Mitigation Plan. Identifying those persons, community leaders and government agencies with the knowledge and authority to help the community organize a plan was key to the planning effort. Establishing a group of leaders was necessary to give this task validity. The Core Group

included individuals from multiple agencies, County departments and incorporated jurisdictions as previously listed in Section 1.2. Please see Appendix A for a complete list of participants.

### **3.4 Core Group Meetings**

There were four Core Group meetings, and one community meeting for public comment on the Draft Mitigation Plan.

#### **3.4.1 Determination of Hazards - Meeting 1-Kick-Off Meeting**

The kick-off meeting presented the Core Group with the process to be followed in the creation of the Mitigation Plan. Overall goals of the plan for Shelby County were discussed and the Core Group decided upon which hazards to focus. By the end of the first meeting, Core Group members had exchanged contact information, organized and scheduled several interviews to be conducted, established a priority list of hazards and discussed the general process and timeline of the project.

The list of prioritized hazards was established looking at the National Climatic Data Center (NCDC) tables that illustrated which hazards in Shelby County had produced the largest amount of damage based on human or monetary losses. The Core Group also used the collective knowledge they had coupled with the vast amount of local experience and history to determine which hazards to address in their Mitigation Plan. The hazards were prioritized as follows:

1. Winter Storms – Snow, Ice and Extreme Cold
2. Summer Storms – Thunderstorms, high winds, hail and lightning
3. Flooding
4. Tornadoes
5. Droughts, Extreme Heat and Wildfires
6. Earthquakes

Please see Appendix F for Meeting 1 Minutes.

#### **3.4.2 Determination of Problem Statements and Overall Goals – Meeting 2**

The second meeting focused on the discussion of the problems within the county as it related to the hazards that were identified at the first meeting. Prior to the second meeting, each Core Group member received several documents to facilitate the discussion during the meeting. During this meeting, the Core Group developed problem statements for each community hazard that was identified at the first meeting. Please see Appendix F for the Meeting 2 Minutes.

In order to determine the issues associated with the hazards in Shelby County and to establish the problem statements associated with the hazards, the group first decided on an overall “state of the hazard” and how it has affected the community in the past. The Core Group reviewed the draft problem statements in the time period between the second and third meeting, to be revised or approved as noted at the third Core Group meeting.

In addition to developing the problem statements, the Core Group determined overall mitigation goals with respect to each hazard. Goals were defined as general guidelines that explain mitigation activities that a community wants to implement in the future. The goals were then used to prioritize mitigation activities for each community. These goals are included with the Problem Statements document attached in Appendix G.

### **3.4.3 Determination of Alternatives and Evaluation Criteria – Meeting 3**

At the commencement of the third meeting, the problem statements and goals developed at the second meeting were approved as drafted or revised by the Core Group. The third meeting focused the Core Group's discussion on developing possible mitigation alternatives and solutions to problems with respect to each hazard. The draft problem statements were used as a reference guide in discussing these possible solutions. The Core Group received several guidance documents at this meeting to facilitate discussion. Alternatives were discussed among the Core Group members and noted for the Mitigation Plan when all were in agreement. These alternatives were then transposed into a rating matrix to be discussed in the following section of this report.

In addition to the selected evaluation criteria, the Core Group discussed and evaluated the potential costs and benefits of each of the mitigation alternatives at this meeting. By evaluating "No Action" as an alternative, the Core Group was encouraged to analyze the feasibility that each alternative could be implemented.

See Appendix F for Meeting 3 Minutes.

### **3.4.4 Wrap-Up Meeting – Meeting 4**

The final meeting with the Core Group focused on the discussion of the final mapping products, as well as the mitigation alternatives and completed matrices. The multi-hazard maps were reviewed for any errors or omissions. The results of the matrices were then reviewed by the Core Group for approval. Each individual community then chose which alternative or alternatives they wanted to support and implement within their community. Please see Appendix F for Meeting 4 Minutes.

The remaining steps in the mitigation planning process were reviewed, which included setting a date for a public meeting.

### **3.4.5 Public Meeting**

Public input was necessary to gauge the opinion of the community and build support for the Mitigation Plan. A public meeting was held on February 17, 2005 to review the planning process with the general public. This meeting gave the public an opportunity to comment on the plan. This meeting was also used to address comments and questions concerning the Draft Mitigation Plan.

## **3.5 Matrix Development**

Once the mitigation alternatives were created for each hazard, the Core Group established evaluation criteria to rank each of the alternatives. The criteria included: technically feasible; frequency of hazard risk; activities reduce risk; and funding available.

The evaluation criteria and the alternatives developed at the third meeting were then copied into a matrix that organized all the alternatives with respect to the County's hazards as prioritized by the Core Group. Utilizing a matrix allowed the community to systematically review all alternatives and to identify which mitigation method(s) were appropriate based on the specified criteria. The combined results of all the Core Group members were tabulated to determine the County's average overall mitigation activities. Each activity was given an averaged rating

number based on all the Core Group scores, which would help Shelby County focus their mitigation strategies on the highest rating activities.

### **3.6 Public Review and Involvement**

Since public participation was crucial for implementation of the draft mitigation plan, four draft professionally bound copies were mailed to the Shelby County EMA Director for posting at several key locations around the County for public comment. Suggested locations for posting the draft plan were local libraries, the County Commissioners Office, the local EMA office and other publicly accessible facilities.

The formal public notification process as defined in the Federal Code occurred prior to approval and/or adoption of the plan. A press release informing residents of status of the mitigation process, the locations the plan was posted for review, as well as the public meeting date, was published in the local media. The public was notified of their opportunity to review and comment on the draft plan during a 30 day review period. Comments were to be forwarded to the EMA Director for inclusion in the final plan. Please see Appendix A for a copy of the draft plan press release. Please see Appendix A for public comments received.

The Draft Mitigation Plan was submitted concurrently to the OEMA and FEMA for review and approval.

### **3.7 Finalization**

Upon incorporation of all comments into the Draft Mitigation Plan, the Final Mitigation Plan will be prepared and submitted to Shelby County in hard copy and digital form. Each incorporated jurisdiction, as well as any township choosing to adopt this Mitigation Plan as a separate entity from the County, will also receive a digital copy of the plan.

Each community that participates in this planning effort is responsible for administering the various aspects of the Mitigation Plan including how the plan will be implemented within their particular community.

Implementation of the Mitigation Plan is crucial. The Core Group must strategize effectively to put the Mitigation Plan into action. Shelby County must follow up to translate the goals and objectives, developed during the planning process, into action steps. It is recommended that a monitoring program be included in the Mitigation Plan.

## 4.0 HAZARD PROFILE

Shelby County has experienced many natural disasters in the past one hundred years. These disasters have ranged from tornadoes and blizzards, to flooding and droughts. The purpose of this document is to identify the number and frequency of disasters in Shelby County to better prepare and deal with them when they do occur. The following sections describe the process of determining upon which hazards to focus, general background information on each hazard as well as hazard events that have occurred in Shelby County.

### 4.1 Initial Hazard Assessment

In order to properly evaluate the natural hazards to which Shelby County may be susceptible, a three-step process was utilized. This three-step process was completed in order to “narrow-down” the hazards for which Shelby County should prepare, and potentially mitigate, in the future. The three steps are described in the following paragraphs.

Step 1 - FEMA’s database was researched to determine which hazards FEMA had documented as possible natural hazards, including future threats, for the State of Ohio. Several hazards that are listed on FEMA’s website include flooding, severe storms, tornadoes and winter storms.

Step 2 - The NCDRC was contacted and historic hazard information was reviewed all the way down to the county level. The NCDRC website presented each type of hazard and the historic information associated with it for each county, offering several hazard search parameters. These parameters included: droughts, dust storm, flooding, fog, hail, hurricanes, lightning, tornadoes, wild/forest fires, ocean/lake surf, precipitation, snow and ice, temperature extremes and thunderstorms and high winds.

Because NCDRC information did not address earthquakes other sources were contacted for this data. The information pertaining to earthquake susceptibility was attained from USGS data and the Ohio Earthquake Program Manager at OEMA.

Step 3 - The *Ohio Hazard Analysis and Risk Assessment*, which is a document created in 1998 by OEMA for local and state emergency preparedness officials was reviewed. The *Ohio Hazard Analysis and Risk Assessment* documented both natural and non-natural (technological) hazard event information.

### 4.2 Risk Assessment Ranking

The research compiled during the initial hazard assessment was provided to the Core Group for their review and assessment. The Core Group evaluated all the hazards being considered and ranked them based on the number of historic events and cumulative damage that has occurred. The following list shows the Core Group’s ranking of hazards with number one being the hazard of the most concern:

1. Winter Storms – Snow, Ice, and Extreme Cold
2. Summer Storms – Thunderstorms, high winds, hail and lightning
3. Flooding
4. Tornadoes
5. Droughts, Extreme Heat and Wildfires
6. Earthquakes

### **4.3 Winter Storms**

A winter storm encompasses several types of storm systems that develop during the late fall to early spring. It deposits any of the following types of precipitation: snow, freezing rain, or ice. Blizzards and ice storms are subcategories of winter storms. A winter storm watch indicates that severe winter weather may affect an area. A winter storm warning indicates that severe winter weather conditions are definitely on the way.

#### **4.3.1 Blizzards**

A blizzard warning signifies that large amounts of falling or blowing snow, and sustained winds of at least 35 mph, are expected for several hours. In order to be classified as a blizzard, as opposed to merely a winter storm, the weather must meet several conditions. The storm must decrease visibility to a quarter of a mile for three consecutive hours, include snow or ice as precipitation, and have wind speeds of at least 35 mph. A blizzard is also characterized by low temperatures.

#### **4.3.2 Ice Storms**

An ice storm is defined as a weather event containing liquid rain that falls upon cold objects creating 1/4 inch thick or more accumulation of ice buildup. This ice accumulation creates serious damage such as downed trees and power lines, leaving people without power and communication. It also makes for extremely treacherous road conditions.

Occasionally, snow will fall after an ice storm has occurred. With the ice covered, it is nearly impossible to determine which travel areas to avoid. When traveling by car, this snow covered ice causes accidents and when walking it causes people to fall, possibly sustaining injuries.

#### **4.3.3 Extreme Cold**

Extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with extreme cold with a wind chill. The impacts include frostbite and hypothermia.

The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. On November 1, 2001, the NWS implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index which was based on the 1945 Siple and Passel Index. For more on the new index, please visit [www.nws.noaa.gov/om/windchill/index.shtml](http://www.nws.noaa.gov/om/windchill/index.shtml).

Therefore, the wind makes it feel much colder. If the temperature is 0 degrees Fahrenheit and the wind is blowing at 15 mph, the wind chill is -19 degrees Fahrenheit. At this wind chill temperature, exposed skin can freeze in 30 minutes. The following chart lists wind chill values associated with degrees in Fahrenheit and wind in mph.



		Temperature (°F)																		
		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times: ■ 30 minutes ■ 10 minutes ■ 5 minutes  
**Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)**  
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

Frostbite is a severe reaction to cold exposure that can permanently damage its victims. A loss of feeling and a white or pale appearance in fingers, toes, or nose and ear lobes are symptoms of frostbite.

Hypothermia is a condition brought on when the body temperature drops to less than 90 degrees Fahrenheit. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness and exhaustion.

**4.3.4 Frequency/Probability of Future Occurrence**

According to the NCDC, there were 23 recorded snow, ice and extreme cold events in Shelby County from 1993 to 2004. Eight of these events caused \$3.3 million in property damage, nine injuries and eight deaths. Based on historical information, Shelby County can expect to endure at least two winter storms, ice storms or extreme cold events in any given year.

**4.4 Summer Storms – Thunderstorms, High Winds, Hail and Lightning**

Hazards that fit into the severe storm category include thunderstorms, high winds, hail and lightning. One of the biggest problems associated with severe weather is the lack of public education and awareness. Severe storms can do damage, but are often the precursor for much more severe weather to follow. One example is the direct association of tornadoes with thunderstorms.

**4.4.1 Thunderstorms**

A severe thunderstorm watch is issued by the National Weather Service (NWS) when the weather conditions are such that damaging winds of 58 mph or more, or hail 3/4 of an inch in diameter or greater, are likely to develop. Citizens should locate a safe place in the home and tell family members to watch the sky and listen to the radio or television for more information. A severe thunderstorm warning is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, danger is imminent and citizens should move to a safe

place, turn on a battery-operated radio or television, and wait for the "all clear" by the authorities.

Severe storms are also associated with other hazards such as tornadoes and severe flooding. Since tornadoes and flash flooding are spawned by thunderstorms, people should review what action to take under a tornado warning or a flash flood warning when a "severe thunderstorm warning" is issued. When thunderstorms are forecasted to bring heavy rains (which can cause flash flooding), strong winds, hail, lightning and tornadoes, people should get inside a sturdy building and stay tuned to a battery-operated radio for weather information. People should also be aware that lightning and high winds are also major threats during thunderstorms.

Data obtained from FEMA shows that the frequency of recorded severe storm events are increasing year after year as shown in Table 4-1.

**Table 4-1  
Ohio Disaster History**

Year	Disaster	# of Storm Events
1989	Severe Storms & Flooding	831
1990	Severe Storms, Tornadoes & Flooding	870
1992	Severe Storms, Tornadoes & Flooding	951
1995	Severe Storms & Flooding	1,065
1996	Flooding & Severe Storms	1,097
1996	Flooding & Severe Storms	1,122
1997	Severe Storms & Flooding	1,164
1998	Severe Storms	1,227
2000	Severe Storms & Tornadoes	1,343
2001	Severe Storms & Flooding	1,390
2002	Severe Storms & Tornadoes	1,444
2003	Severe Storms & Flooding	1,478
2004	Severe Storms & Flooding	1,556

**4.4.2 High Winds**

Straight-line winds are often responsible for most of the wind damage associated with a thunderstorm. These winds are often confused with tornadoes because of similar damage and wind speeds. However, the strong and gusty winds associated with straight-line winds blow roughly in a straight line unlike the rotating winds of a tornado.

Property damage and loss of life from windstorms are increasing due to a variety of factors. According to the Ohio Manufactured Housing Association, the use of manufactured housing is on an upward trend, and this type of structure provides less resistance to wind than conventional construction. Uniform building codes for wind resistant construction are not adopted by all states, and population trends show rapid growth in the highly exposed areas.

A total of 86 thunderstorm and high wind events were recorded in Shelby County between 1950 and 2004, according to the NCDC. The monetary damage totaled \$2.4 million in property damage and \$40,000 in crop damage. Fifty-four events had an average of approximately \$45,000 in property damage per event.

#### **4.4.3 Hail**

Hail is a type of precipitation composed of balls or irregular lumps of ice. It occurs when supercooled water droplets (remaining in a liquid state despite being below the freezing point, 0 °C/32 °F) in a storm cloud collide with some solid object, such as a dust particle or an already-forming hailstone.

Hail often forms in strong thunderstorms, often along a cold front, where the layer of air on top is much colder than that on the bottom. The smaller hailstones can bounce up and down between the warm and cold layers due to updrafts and gravity. The longer the stones bounce around, the larger they grow. These strong, severe, or even supercell thunderstorms can also produce hail in the summer months, even without a cold front.

Hailstones, while most commonly only a few millimeters in diameter, can sometimes grow to several inches or occasionally even bigger. Such large hailstones can do serious damage, notably to automobiles, skylights, and glass-roofed structures. Pea or golf ball-size hailstones are not uncommon in severe storms. Rarely, massive hailstones have been known to cause concussions or to kill people by causing head trauma.

Twenty-five hail events were recorded from 1950 to 2004 by the NCDC for Shelby County. Hail size ranged from  $\frac{3}{4}$  inch to two inches. None of these events caused any property damage.

#### **4.4.4 Lightning**

Lightning kills 75 to 100 people a year. It is the second largest killer of natural hazard events, exceeded only by floods. Lightning strikes can happen anywhere and affect anyone. Only 10% of lightning strikes result in death, leaving the rest with various degrees of disability, most being central nervous system issues.

Seven lightning events were recorded from 1950 to 2004 for Shelby County by the NCDC. Property damage associated with these events totaled over \$5.2 million.

#### **4.4.5 Frequency/Probability of Future Occurrence**

According to the NCDC, there were 118 thunderstorm, high wind and hail recorded from 1971 to 2004 in Shelby County. These events have caused \$7.7 million in property damage, two deaths and 20 injuries. Severe storms in Shelby County have caused the most cumulative property damage of any of natural hazard and quantitatively have the highest likelihood of occurring on a yearly basis. Based on historical information, Shelby County can expect to endure at least three severe storms in any given year.

#### **4.5 Flooding**

Floods are a naturally recurring event for a river or stream, and are caused by weather phenomena and events that deliver more precipitation to a drainage basin that can be readily absorbed or stored within the basin. Flooding is a localized hazard that is a result of heavy or continuous rainfall exceeding the absorptive capacity of soil and the flow capacity of rivers and streams. Floods can be generally considered in two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and riverine floods, caused by precipitation over a longer time period and over a given river basin.

Flash floods occur within a few minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Flash floods can destroy buildings and bridges, uproot trees, and scour out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or by heavy rains from hurricanes and tropical storms. Although flash flooding occurs often in higher elevation areas, it is also common in urban areas where much of the ground is covered by impervious surfaces. Roads and buildings generate greater amounts of runoff than typical forested land. Fixed drainage channels in urban areas may be unable to contain the runoff that is generated by relatively small, but intense, rainfall events.

Riverine flooding refers to periodic flooding of lands adjacent to non-tidal rivers and streams. It is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal watercourse, some of the above-normal stream flow spills over onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of the stream or river. The recurrence interval of a flood is defined as the average time interval, in years, expected to take place between the occurrence of a flood of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.



**Port Jefferson  
Flood of 2003**

Flooding is an important issue for the residents and business owners of Lake Loramie. Whether it was flash floods or riverine flooding events that have occurred in the past, damage has been extensive. Areas that are prone to flooding in Shelby County are along the banks of Lake Loramie and the watersheds of the Great Miami River and Loramie Creek.

#### **4.5.1 Special flood zone (100-year Floodplain)**

Flood Insurance Rate Maps (FIRM) show areas delineated to be special flood hazards. The Base Flood Elevation (BFE) refers to the elevation associated with a special flood zone, or a flood with a 1% chance of occurring in any given year. Areas within a special flood zone area, also known as the 100-year floodplain, have an elevation lower than the BFE and are categorized into zones. Zone “A” is the flood insurance rate zone that corresponds to a special flood zone area that is determined in the Federal Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone. Zone “AE” is the flood insurance rate zone that corresponds to a special flood zone area that is determined in the Federal Flood Insurance Study by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Shelby County has special flood zone floodplains identified within the County. The best way to combat a disaster happening within these special zone flood hazard areas is through public awareness. All of unincorporated Shelby County is in compliance with state floodplain management standards and participates in the National Flood Insurance Program (NFIP). The County has been involved since September 02, 1982. The following list gives the incorporated jurisdictions that participate in the NFIP and the date in which they entered the program.

- Botkins September 29, 1978
- Port Jefferson September 2, 1988
- Russia September 30, 1988
- Sidney November 17, 1982

The Villages of Fort Loramie and Jackson Center have had special flood hazard areas identified within their jurisdiction, September 22, 1978 and May 31, 1974 respectively, but they are actively choosing not to participate in the NFIP. There are three villages, the Village of Anna, the Village of Lockington and the Village of Kettlersville, that have not had special flood hazards identified within their jurisdictions and therefore are not participating in the National Flood Insurance Program (NFIP). The Core Group plans to work with these villages to have them join the NFIP.

**4.5.2 Repetitive Loss**

In most counties there are areas that periodically suffer damages from floods. They are known as “repetitive loss” properties. Repetitive loss properties are defined as properties with structures that have had two or more insurance claims within a 10 year period. According to FEMA, there are five properties that have suffered from repeated flooding occurrences in Shelby County. Please refer to the Shelby County Multi-Hazard Maps in Appendix J for the general locations of the repetitive loss structures in Shelby County.

**4.5.3 Frequency/Probability of Future Occurrence**

According to the NCDRC, there were 29 flood events recorded in Shelby County from 1993 to 2004. Sixteen of the 29 flood events caused \$2.4 million in property and crop damage. No deaths or injuries were recorded.

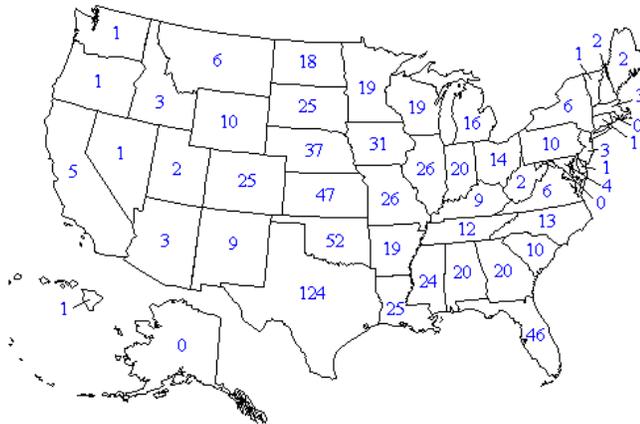
Past floods are indications of what can happen in the future, but mitigation plans are based on the risk of future flooding. Flood studies interpret historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their recurrence interval.

Recurrence interval, or frequency of occurrence, is defined as the average number of years between storms of a given intensity. Recurrence intervals commonly used in technical studies and design are 2, 10, 25, 50 and 100 years. Recurrence interval addresses how often a flood of a specific depth will be expected to occur. Structures located within areas considered at higher risk should be prioritized higher as it relates to mitigation. Since most of Shelby County is rural in nature, estimated losses were based on just a few higher populous areas, where significant property damage was likely to occur.

**4.6 Tornadoes**

Tornadoes are produced from the energy released during a thunderstorm, but account for only a tiny fraction of the overall energy generated. What makes them particularly dangerous is that the energy is concentrated in a small area, perhaps only 100 yards across. Not all tornadoes are the same and science does not yet completely understand how a portion of a thunderstorm's energy becomes focused into something as small as a tornado.

Annual Average Number of Tornadoes, 1950-1995



Tornadoes occur mostly in the central plains of North America, east of the Rocky Mountains and west of the Appalachian Mountains. They occur primarily during the spring and summer – the tornado season comes early in the south and later in the north according to the seasonal changes in relation to latitude – usually during the late afternoon and early evening. They have been known to occur in every state in the United States and every continent on the earth, any day of the year, and at any hour.

The damaging strong winds generated from tornadoes can reach 300 mph in the most violent tornadoes, causing automobiles to become airborne, ripping ordinary homes to shreds, and turning broken glass and other debris into lethal missiles. The biggest threat to living creatures, including humans, during tornadoes is flying debris and being tossed about in the wind. Contrary to previous belief, it is not true that the pressure in a tornado contributes to damage by making buildings "explode."

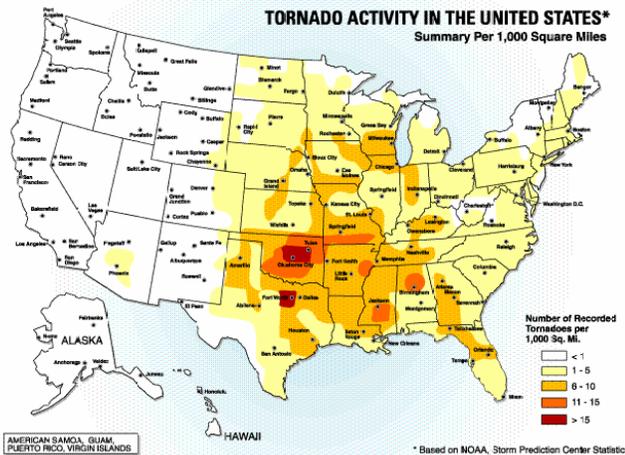


Figure I.1 The number of tornadoes recorded per 1,000 square miles

**Based on NOAA Storm Prediction Center Statistics**

According to the NWS, the development of Doppler radar has made it possible, under certain circumstances, to detect tornadic winds with radar. However, spotters remain an important part of the system to detect tornadoes, because not all tornadoes occur in situations where the radar can "see" them. Citizen volunteers comprise what is called the SKYWARN ([www.skywarn.org](http://www.skywarn.org)) network of storm spotters, who work with their local communities to watch out for approaching tornadoes to ensure that appropriate action is taken during tornado events. Spotter information is relayed to the NWS, who operates the Doppler radars and issues warnings, usually relayed to the public by radio and TV, for communities ahead of the storms. The NWS utilizes all the information they can obtain from weather maps,

modern weather radars, storm spotters, monitoring power line breaks, as well as additional sources for issuing tornado warnings.

Although the process by which tornadoes form is not completely understood, scientific research has revealed that tornadoes usually form under certain types of atmospheric conditions. Those conditions can be predicted, but it is not yet possible to predict in advance exactly when and where they will develop, how strong they will be, or precisely what path they will follow. According to the NWS, there are some "surprises" every year, when tornadoes form in situations that do not look like the right conditions in advance, but these are becoming less frequent. Once a tornado is formed and has been detected, warnings can be issued based on the path of the storm producing the tornado, but even these cannot be perfectly precise regarding who will, or will not, be struck.

Table 4-2 shows that although the State of Ohio may not have the most tornadoes, those that do hit Ohio are significant in damage and have other indication factors of a large scale tornado.

**Table 4-2  
State Tornado Ranking**

Rank	Total Number of Tornadoes	Deaths per 10,000 sq. miles	Number of Killer Tornadoes	Total Tornado Path Length per 10,000 sq. miles	Killer Tornadoes as a % of all Tornadoes	Annual Tornadoes per 10,000 sq. miles
1	Texas	Massachusetts	Texas	Mississippi	Tennessee	Florida
2	Oklahoma	Mississippi	Oklahoma	Alabama	Kentucky	Oklahoma
3	Florida	Indiana	Arkansas	Oklahoma	Arkansas	Indiana
4	Kansas	Alabama	Alabama	Iowa	<b>Ohio</b>	Iowa
5	Nebraska	<b>Ohio</b>	Mississippi	Illinois	Alabama	Kansas
6	Iowa	Michigan	Illinois	Louisiana	Mississippi	Delaware
7	Missouri	Arkansas	Missouri	Kansas	North Carolina	Louisiana
8	Illinois	Illinois	Indiana	Indiana	Michigan	Mississippi
9	S Dakota	Oklahoma	Louisiana	Nebraska	New York	Nebraska
10	Louisiana	Kentucky	Tennessee	Wisconsin	Massachusetts	Texas

Although the number of tornadoes in Ohio does not rank high compared to other states in the United States, the State does average around 14 tornadoes a year. Ohio's peak tornado season runs from April through July, with most tornadoes occurring between 2 p.m. and 10 p.m. Even though June has been the month with the most tornado occurrences, many of the State's major tornado outbreaks have taken place in April and May. However, history has shown that tornadoes can occur during any month of the year and at any time of the day or night.

Tornadoes are considered the most violent atmospheric phenomenon on the face of the earth with their strength being measured by the Fujita Scale as described in Table 4-3. This scale is the mechanism used to determine the potential type of tornado that may have affected a particular community. It is based on velocity of wind and the type of damage the tornado caused. Many F0 and F1 tornadoes have touched down in Ohio, but Ohio has also been struck by some of the most destructive (F5) tornadoes ever, including the April 3, 1974 tornado which devastated Xenia, killing over 30 people and destroying 2,000 buildings.

**Fujita Scale for Tornadoes**

Scale	Wind Speed	Typical Damage
F-0 Weak	40-72 miles per hour (mph)	Light Damage: Some chimneys damaged, twigs and branches broken off trees, shallow-rooted trees pushed over, signboards damages, some windows broken.
F-1 Weak	73-112 mph	Moderate Damage: Surface of roofs peeled off, mobile homes pushed off foundations or overturned, outbuildings demolished, moving autos pushed off the roads, trees snapped or broken; beginning of hurricane speed winds.
F-2 Strong	113-157 mph	Considerable Damage: Roofs torn off frame houses, mobile homes demolished, frame houses with weak foundations lifted and moved, large trees snapped or uprooted, light-object missiles generated.
F-3 Strong	158-206 mph	Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted, heavy cars lifted off the ground and thrown, weak pavement blown off the roads.
F-4 Violent	207-260 mph	Devastating Damage: Well-constructed houses leveled, structures with weak foundations blown off the distance, cars thrown and disintegrated, trees in forest uprooted and carried some distance away.
F-5 Violent	261-318 mph	Incredible Damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile-sized missiles fly through the air in excess of 300 feet, trees debarked, incredible phenomena will occur.

**4.6.1 Frequency/Probability of Future Occurrence**

Shelby County has had five tornadoes from 1961 to 2004, according to the NCDC. One tornado that occurred in 1965 was rated an F4 on the Fujita Scale. This tornado alone caused \$2.5 million in property damages, 50 injuries and three deaths. The other tornadoes caused \$1.5 million worth of property damage, 24 injuries and no deaths. Based on historical information, Shelby County can expect to endure one tornado every eight to nine years.

**4.7 Droughts**

A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance (i.e., crop damage, water supply shortage, etc.) The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area.

The worst drought in 50 years affected 35 states during the long, hot summer of 1988, when some areas had been suffering from lack of rainfall since 1984. Rainfall totals in 1988 throughout the mid-west, Northern Plains and the Rockies were 50% to 85% below normal. Crops and livestock died, and some areas became desert. Forest fires began over the Northwest that left 4,100,000 acres destroyed by autumn.

According to the NCDC, drought and extreme heat conditions existed in Shelby County in 1999 from June through August. None of these events caused any property damage, but the excessive heat in July of 1999 resulted in 13 deaths.

#### 4.7.1 Droughts as a Precursor to Other Disasters

Rural counties are susceptible to wild land fires especially during drought conditions. When most people think of wild fires, the first thing that comes to mind is the devastating and disastrous western fires that are quite prevalent during the summer months.

With more people than ever living, working, traveling and recreating in the urban/urban interface, the odds of wild land fires are increasing. Causes of wild land fires include the careless burning of debris, household trash and cigarettes, lightning, equipment and vehicles, railroad accidents, electrical fires, and arson.

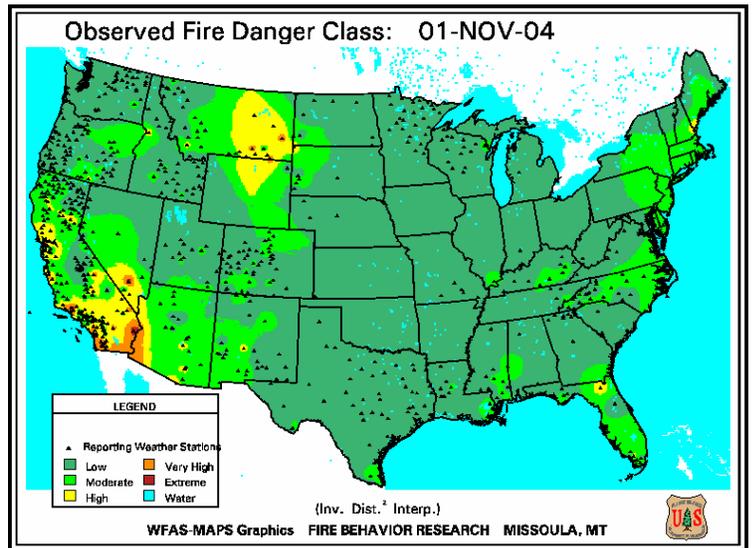
Fire fighters talk of the fire triangle in terms of the heat of combustion, fuel and oxygen all being necessary for fire to occur. Wild land fire fighters are concerned with the wild land fire triangle of fuel (grass, brush, forests, crops, etc.), terrain (open flat lands, steep slopes and everything conducive to wild land fire spread) and weather (hot, dry, windy conditions are typical wild land fire weather).

During an average year in Ohio, an estimated 15,000 wildfires and natural fuel fires occur. Typically, a reported 1,000 wild land fires burn an average between 4,000 to 6,000 acres in Ohio each year.

#### 4.7.3 Urban/Rural Fire Interface

The wildland-urban interface can be defined as the zone where structures and other human developments meet or intermingle with undeveloped lands.

Topography plays a major role in how fast a wildfire spreads. Steep slopes are the greatest topographical influence on fire behavior. As the steepness of a slope increases, fires spread more quickly. A fire will spread twice as fast on a 30% slope than it will on level ground. This fast speed is due to the fact that a fire starting at the bottom of a slope has a longer upslope run with more available fuel in its path. Unlike most hazards, the threat of a drought tends to be dismissed because of the relatively long time a drought takes to have damaging effects. The current US Forest Service forecasts a low fire danger potential for Shelby County.



#### 4.7.4 Frequency/Probability of Future Occurrence

In Shelby County, there were one drought, one extreme heat event and no wildfires recorded from 1950 to 2004, according to the NCDC. The extreme heat event caused 17 deaths. There was no property damage or injuries recorded for either of the events.

According to the NCDC, Shelby County has experienced one drought of significance in the past 54 years. The odds of future occurrences based on this information are less than 1% (.01). However, 87% of the land in Shelby County is agricultural. The County suffers varying amounts of crop damage during severe heat and dry conditions that may not be categorized as a drought. The Core Group concluded that this damage is not always recorded but still has a detrimental effect on the County. The Core Group also realized that, unlike other hazards such as flooding or tornadoes, there is little mitigation that can be preplanned to reduce the amount of agricultural damage caused by a drought.

## **4.8 Earthquakes**

### **4.8.1 Earthquakes in Ohio**

The problem with earthquakes are major earthquakes are a low probability, high consequence event. It is because of the potential high consequences that geologists, emergency planners and other government officials have taken a greater interest in understanding the potential for earthquakes in some of the areas of the eastern United States and educating the population as to the risk in their areas. Although there have been great strides in increased earthquake awareness in the eastern United States, the low probability of such events makes it difficult to convince most people that they should be prepared.

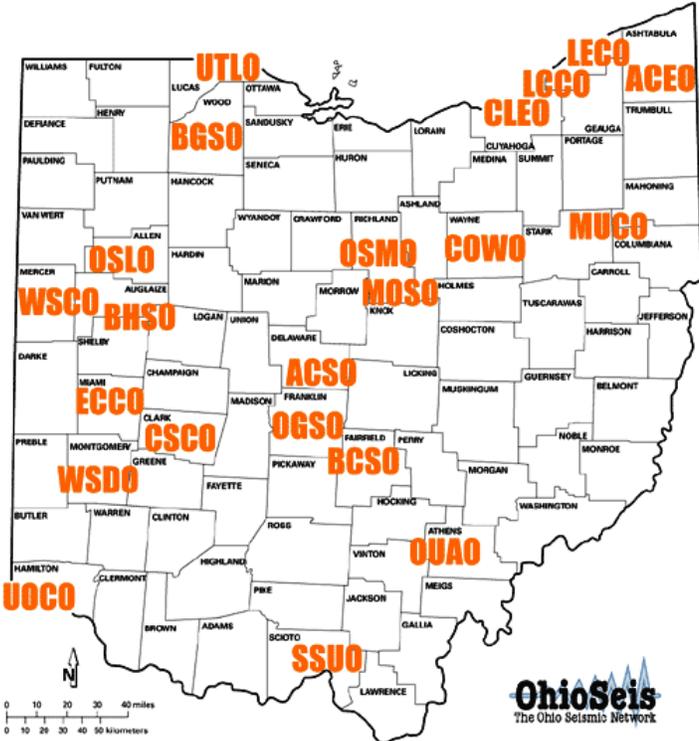
It is surprising to many Ohioans that the State has experienced more than 120 earthquakes since 1776, and that 14 of these events have caused minor to moderate damage. The largest historic earthquake in Ohio was centered in Shelby County in 1937. This event, estimated to have had a magnitude of 5.5 on the Richter scale, caused considerable damage in Anna and several other western Ohio communities, where at least 40 earthquakes have been felt since 1875. Northeastern Ohio, east of Cleveland, is the second most active area of the state. At least 20 earthquakes have been recorded in the area since 1836, including a 5.0 magnitude event in 1986 that caused moderate damage. A broad area of southern Ohio has experienced more than 30 earthquakes.

Although the New Madrid Line is in close proximity to the State of Ohio, there has not been an earthquake of any significance since 1875 caused by this fault line. An earthquake on June 18, 1975 caused damage in western Ohio, and affected a total area estimated at over 40,000 square miles. Walls were cracked and chimneys thrown down in Sidney and Urbana. The shock was felt sharply at Jeffersonville, Indiana. The affected area included parts of Illinois, Indiana, Kentucky and Missouri.

**4.8.2 Monitoring of Earthquakes**

The ODNR Division of Geological Survey has established a 23 station cooperative network of seismograph stations throughout the State in order to continuously record earthquake activity. The network, which went on line in January 1999, ended a five-year gap during which there was only one operating station in Ohio. The State was dependent on seismographs in Kentucky and Michigan to record Ohio earthquakes.

The 23 stations of the new seismograph network, which is called OhioSeis, are distributed across the State, but are concentrated in the most seismically active areas or in areas that provide optimal conditions for detecting and locating very small earthquakes that are below the threshold of human notice. These small micro earthquakes are important because they occur more frequently and help to identify the location of faults that may periodically produce larger, potentially damaging earthquakes.

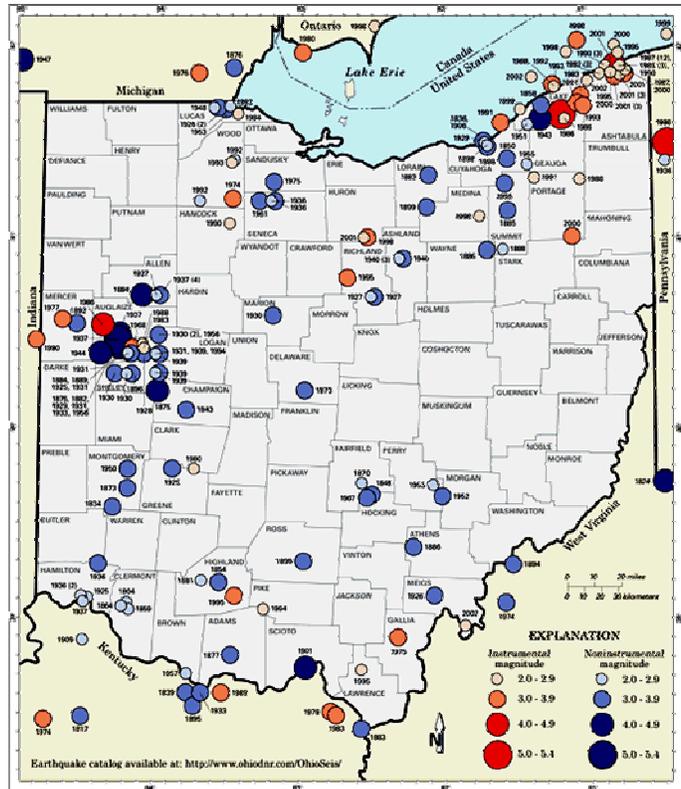


The OhioSeis seismograph stations are located at colleges, universities and other institutions, employing new technology that not only makes them very accurate, but also relatively inexpensive and easy to operate and maintain. In contrast to the old technology, in which a pen made a squiggly line on a paper drum, the new system is entirely digital and uses a desktop computer to continuously record and display data. Two other innovations have made the system unique. An inexpensive Global Positioning System (GPS) receiver is used to keep very precise time on the continuously recorded seismogram, and each station's computer is connected to the Internet for rapid data transfer.

Each OhioSeis station is a cooperative effort. Seismometers, the instrument that detects Earth motions, and other seismic components were purchased by the Division of Geological Survey with funds provided by FEMA through the OEMA, as part of the National Earthquake Hazards Reduction Program. The computers and Internet connection were purchased and provided by the cooperating institutions.

The Division of Geological Survey is coordinating the seismic network and has established the Ohio Earthquake Information Center at the Horace R. Collins Laboratory at Alum Creek State Park, north of Columbus. This facility functions as a repository and laboratory for rock core and well cuttings, but has a specially constructed room for earthquake recording. The seismograph system allows for very rapid location of the epicenter and calculation of the magnitude of any earthquake in the State. The earthquake records, or seismograms, from at least three seismograph stations are needed to determine earthquake locations (epicenters). These records can be downloaded from the internet at any station on the network, and location and magnitude can be determined. Small earthquakes were in many cases not even detected by distant, out-of-date seismograph stations.

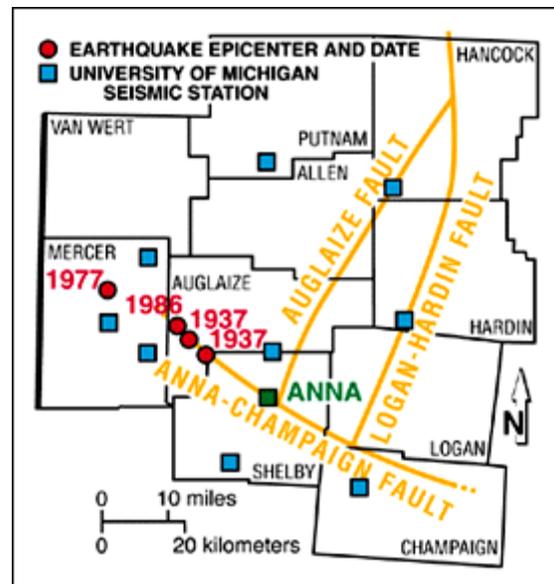
The OhioSeis network provides a whole new dimension of understanding about the pulse of the Earth beneath Ohio. Although the new seismograph network will not predict earthquakes or provide an alert prior to an event, it will provide insight into earthquake risk in the State so that intelligent decisions about building and facility design and construction, insurance coverage and other planning decisions can be made by individuals, business and industry, and governmental agencies.



**Epicenters of past earthquakes in Ohio.**

Shelby County has experienced more epicenters than any other area of the state. At least 40 earthquakes that were felt by residents have occurred in this area since 1875. Although most of these events have caused little or no damage, earthquakes in 1875, 1930, 1931, and 1937 caused minor to moderate damage. Two earthquakes in 1937, on March 2 and March 9, caused significant damage in the Shelby County community of Anna. The damage included toppled chimneys, cracked plaster, broken windows, and structural damage to buildings. The community school, of brick construction, was razed because of structural damage.

The 1986 Auglaize County earthquake occurred on the Anna-Champaign fault, a northwest-southeast trending structure that has been interpreted to extend from Champaign County through Shelby, Auglaize, and Mercer Counties.



**Faults in Shelby County**

This fault passes beneath the Shelby County community of Anna, the site of the most extensive earthquake damages in Ohio, in 1937.

There has been speculation that Anna received the brunt of damages from the 1937 earthquakes because the community is located directly above the sediment-filled valley of the pre-glacial Teays River. This ancient river apparently followed the trace of the Anna-Champaign fault until it was obliterated by an early Pleistocene glacier and its valley was filled with nearly 500 feet of glacial sediment. The speculation is that ground motion is amplified by these unconsolidated sediments in the Teays River valley and that Anna, located over the buried valley, receives a greater degree of shaking than nearby communities located on shallow bedrock.

Although the Anna area is the seismically most active region of the state, geologists currently have only minimal understanding of the geology of basement rocks in the region. There is some speculation that the Anna-Champaign fault is associated with a proposed failed rift zone in western Ohio. However, until additional data is derived from future earthquakes, deep drilling, and other investigations of basement geology in western Ohio, the cause of earthquakes in this area will remain speculative. ([www.ohiodnr.com/OhioSeis/el09/page1.htm](http://www.ohiodnr.com/OhioSeis/el09/page1.htm))

#### **4.9 Significant Events**

Significant events pertaining to Shelby County were chosen by evaluating the NCDC tables that listed hazards in Shelby County that have produced the largest amount of damage based on human or monetary measures. The Core Group also used the collective knowledge they had coupled with the vast amount of local experience and history to determine which events they considered significant. Refer to Appendix H for descriptions of significant events affecting this county for each type of hazard and Appendix I for a complete list of all NCDC tables.

**5.0 VULNERABILITY ASSESSMENT**

Shelby County is susceptible to many different kinds of natural hazards as reviewed in the previous section of this plan. If a hazard event struck vacant land, there would not be much cause for concern. However, since Shelby County has close to 50,000 residents and thousands of homes, businesses and critical facilities, the potential for damage and injury could be high, especially in higher populous areas such as Sidney, Jackson Center and Fort Loramie.

This chapter reviews how vulnerable Shelby County is to property damage and threats to public health and safety. This chapter also reviews how hazards may have an adverse impact on the economy. The potential for property damage is measured in dollars based on historical events of the past and damage incurred from those events.

A four-step process was followed to estimate the cost to Shelby County of the hazards reviewed in the Hazard Profile section (Section 4.0) of this report. This process was documented on a per hazard basis. The steps that were used are as follows:

- Step 1: Inventory critical facilities and structures susceptible to property damage.
- Step 2: Determine potential dollars lost based on various levels of damage on different categories of structures.
- Step 3: Evaluate the impact on infrastructure and general population.
- Step 4: Evaluate property damage, loss of life and economic losses.

**5.1 Critical Facilities**

Members of the Core Group from each of the communities were asked to compile a list of critical facilities pertaining to their community. All the critical facilities within Shelby County (schools, hospitals, water treatment plants, airports, police and fire stations, nursing homes, entertainment facilities, and any other facility deemed a critical facility for their county) are shown on the map entitled ‘Shelby County Multi-Hazard Map’ in Appendix J. See the Table 5-1 for a summary of critical facilities by facility type. Please refer to Appendix K for a complete list of these critical facilities.

**Table 5-1  
Critical Facilities in Planning Area**

<b>Property</b>	<b>Count</b>
Water Plant	1
Medical Facilities/Nursing Homes	5
Emergency Services	20
Schools	24
Comm. Facilities/Churches/Libraries	47
Municipal/Government Facilities	14
Law Enforcement	8
Daycare/Nursing School/Childcare	13
<b>Total Critical Facilities</b>	<b>132</b>

The Multi-Hazard Map will also be made available in digital form so that the table associated with the critical facilities shape file will be accessible. This accessibility will allow the attributed information for the critical facilities to be viewed by simply clicking on the critical facility on the map and viewing the information for that facility. This will also allow for easy facilitation of updates to the critical facilities list when the Mitigation Plan is updated.

**5.2 Potential Dollars Lost**

The second step of the vulnerability assessment was to calculate the impact of the given hazards in terms of property damage and loss of property use. Averages and typical situations were used for various categories of facilities. This approach did not predict which facilities will be hit by which hazard, but it instead provided a general estimate of the level of damage that would be expected based upon available data.

First, the value of the property being damaged was determined based on average value of a facility within that category. Typical values of the structures were determined using data received from the County’s Auditor’s Office.

Contents value was calculated as a percentage of the structure’s value. Table 5-2 shows the relative value of the typical contents to the typical structure type. These ratios were taken from FEMA guidance documents.

**Table 5-2  
Contents Value as a Percentage of Structure Value**

<b>Occupancy Class</b>	<b>Value (%)</b>
Residential	50%
Commercial	100%
Industrial	150%
Medical Facilities	150%
Emergency Services	150%
General Government	100%
Schools/Libraries	100%
Colleges/Universities	150%
Religion/Non-profit	100%
Shelters	100%

Second, three levels of physical damage were evaluated for each category of structure. These levels have a percentage of damage associated with each. The dollars lost for each level, however, may be underestimated since there may be downtime associated with closing a business for an extended period of time.

- **Minor damage:** Many structures exposed to a storm or other hazard will suffer only minor to moderate damage. For example, a hurricane may just damage the roof and windows of some structures. For this calculation, 5% of

the structure’s value was used. Because the structure stays substantially intact, no contents losses were considered.

- **Moderate damage:** This category represents more serious damage, such as a collapsed wall or floodwater over the first floor of a building. Moderate damage is calculated as 40% of the structure’s value plus 40% of the content’s value.
- **Major damage:** This category is used when a building is demolished or heavily damaged. An example of the former is a house leveled by a tornado. An example of the latter is floodwater more than 1.5 feet over the lowest floor (i.e., over the electrical outlets). The average dollar figure for this category is 75% of the structure’s value and 75% of the contents’ value.

Table 5-3 shows the calculated dollar losses for each level of damage per facility type. The type of facility as listed was limited to that information available from the County Auditor’s Office.

**Table 5-3  
Physical Potential Dollar Losses**

Property	Average Value	Minor Damage	Moderate Damage	Major Damage
Residential	\$79,133	\$3,957	\$47,480	\$89,025
Commercial	\$182,289	\$9,114	\$145,831	\$273,434
Hospital	\$22,501,400	\$1,125,070	\$22,501,400	\$42,190,125
Fire Stations	\$412,872	\$20,644	\$412,872	\$774,135
Rescue Squad Facilities	\$98,478	\$4,924	\$98,478	\$184,646
Police Stations & Jails	\$6,719,420	\$335,971	\$6,719,420	\$12,598,913
Municipal Buildings	\$129,844	\$6,492	\$103,875	\$194,766
Owned Buildings	\$1,085,294	\$54,265	\$868,235	\$1,627,941
Township Buildings	\$26,369	\$1,318	\$21,095	\$39,554
Post Offices	\$76,220	\$3,811	\$60,976	\$114,330
Libraries	\$218,208	\$10,910	\$174,566	\$327,312
Schools	\$2,877,780	\$143,889	\$2,302,224	\$4,316,670
Wastewater Treatment Plants	\$1,387,597	\$69,380	\$1,110,078	\$2,081,396
Water Plants/Towers	\$515,737	\$25,787	\$412,590	\$773,606
Child Care Facilities	\$113,636	\$5,682	\$90,909	\$170,454

**5.3 Vulnerability Data Collection**

Prior to beginning an assessment of a community’s vulnerability to hazards, local sources of information were researched including comprehensive plans, land use plans, land development regulations and flood regulations, to determine if the county previously addressed its vulnerability to any particular hazard. In most cases, local plans and regulations did not yet exist or were very minimal in addressing natural hazard situations and building parameters.

Therefore, other state and national sources were researched for detailed information. One of these resources was the NCDL. The NCDL is the world's largest active archive of weather

data. The NCDC produces numerous climate publications and responds to data requests from all over the world. The NCDC supports a three-tier national climate services support program that includes partners such as the NCDC, Regional Climate Centers, and State Climatologists. The NCDC has long served as a national resource for climate information. The NCDC's data is used to address issues that span the breadth of this nation's interests. As climate knows no boundaries, the NCDC works closely with scientists and researchers world-wide to develop both national and global data sets that have been used by both government and the private sector to maximize the resources provided by our climate and minimize the risks of climate variability and weather extremes. The NCDC has a statutory mission to describe the climate of the United States and acts as the nation's scorekeeper regarding the trends and anomalies of weather and climate. The NCDC's climate data have been used in a variety of applications including agriculture, air quality, construction, education, energy, engineering, forestry, health, insurance, landscape design, livestock management, manufacturing, recreation and tourism, retailing, transportation, and water resources management among other areas. The NCDC's data and products fulfill needs ranging from building codes to power plant and space shuttle design.

Another source of hazard information that was explored was the Ohio Seismic Network as described in previous sections of this report. The Division of Geological Survey of the ODNR coordinates a 23-station cooperative network of seismograph stations throughout the state in order to continuously record earthquake activity. OEMA's Ohio Earthquake Program Manager was also contacted to discuss the risks associated with each county to determine if the type of geology lends itself to increased damage.

Because the state and national agencies are not always privy to the local knowledge, some information extracted from their libraries may not be comprehensive or complete. Therefore, the Core Group used their experience and knowledge with verification from the local EMA directors to prioritize the hazards determined to affect the county the most and assess them according to local concerns.

## **5.4 Vulnerability Assessment by Hazard**

### **5.4.1 Winter Storms**

Shelby County is located in the west central portion of the state and is susceptible to winter storms, which encompass snow, ice and extremely cold temperatures. See Appendix I for tables extracted from the NCDC that show the number of reported events since 1950.

#### **5.4.1.1 Infrastructure Impacts**

Because the area receives a moderate amount of snowfall and can be stricken by ice storms, all of the structures erected in the County are susceptible to damage if not designed to the proper snow loading parameters.

#### **5.4.1.2 Population Impacts**

Because snow, ice and extreme cold storms occur countywide, the entire county population is susceptible and should be prepared. Motorists should be aware of declared snow emergencies and seek safety before becoming stranded. Motorists should also be educated on the presence of black ice on roadways and bridges. The sensitive populations will be the most susceptible to snow, ice, and extreme cold conditions, such as hypothermia, and should prepare for such events prior to the winter months.

### **5.4.1.3 Property Damage**

According to the NCDRC, there have been 19 winter storm events in Shelby County reported since 1995, with total property losses of \$1.4 million. The total property damage was recorded in 1995 and 1996. No property damage has been recorded since February of 1996.

In addition to winter storms, Shelby County has suffered four extreme cold events since 1993. These events occurred in 1993, 1995, and 1996 causing \$1.9 million in property damage. A single event in 1996 caused \$1.3 million of the total damage.

### **5.4.1.4 Loss of Life**

Since 1993, there have been nine recorded injuries and eight recorded deaths due to winter storms and extreme cold. Because the number of winter events affecting Shelby County is low to moderate but only a few events caused excessive damage, the potential for injury and death is moderate. As the population of the county continues to grow there is more potential for injury and/or loss of life. One of the biggest problems associated with winter storms and extreme cold is the lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with severe winter weather, such as driving on ice and snow, or medical conditions such as hypothermia.

### **5.4.1.5 Economic Losses**

The economic losses a community suffers during a winter storm event, which can leave behind snow and thick layers of ice, can be high. In communities with hazard trees, these trees have the potential to destroy homes and businesses if uprooted. Fallen branches may also cause severe damage. If power lines become burdened with snow and snap, prolonged power outages may cause some businesses to close for an extended period of time leading to loss of revenue.

With the average house value at \$79,133 and the majority of the houses built prior to 1980, damage costs from snow and ice begin to accumulate quickly due primarily to the age of the house and its susceptibility to damage. Residents often cannot rely on federal assistance for the total damages incurred. Since January 1, 1964, the President of the United States has declared Shelby County a federal disaster area on only six occasions due to damage suffered by winter storms. If a Presidential Disaster Declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process.

## **5.4.2 Severe Storms**

Shelby County is highly susceptible to severe storms, which encompasses thunderstorms, high winds, hail and lightning. See Appendix I for tables extracted from the NCDRC that show the number of reported events since 1950.

### **5.4.2.1 Infrastructure Impact**

Since severe storms are random in nature, the impact on Shelby County's infrastructure is not limited to a certain area as with river flooding. Homes and businesses all throughout the County are susceptible to high winds, hail and lightning. Shingles are blown from rooftops and hail may

dent siding or break windows. Lightning strikes may be more damaging to structures that are not grounded with lightning rods. Trees may become uprooted and limbs detached and blown into structures. High winds may also cause severe damage to mobile home parks and campgrounds if units are not properly tied down to permanent concrete pads or structures. On occasion, a structure may be destroyed completely but a high frequency of this extent of damage will not be expected.

Utilities and municipal plants may also be damaged during severe storms. Debris, such as tree limbs, blown into utility lines may cause downed power lines. Wastewater plants may also be adversely affected with blown limbs and debris clogging the tanks and filters.

#### **5.4.2.2 Population Impact**

Because severe storms are random in nature, the entire County population is susceptible and should be prepared. All citizens should become familiar with locations of shelters in which they can seek safety in the event of severe weather.

#### **5.4.2.3 Property Damage**

According to the NCDC, there have been 118 severe storms, hail and lightning events in Shelby County reported since 1971, with total property losses of \$7.7 million. Between 1993 and 2004, the average annual losses reported for the County have been approximately \$700,000. The year 1994 proved to be the most costly with losses totaling \$5.7 million in property damage. A single lightning event in 1994 caused \$5.0 million of this damage.

This information shows that severe storms, namely thunderstorms, high winds and lightning are extremely costly to the County.

#### **5.4.2.4 Loss of Life**

Since 1950, there have been 20 recorded injuries and two deaths due to severe storms, high winds, hail and lightning. Twelve of these injuries were associated with a high wind event in March of 2002. Because the number of severe storms affecting Shelby County is large, the potential for injury and death is high. As the population of the County continues to grow, as forecasted by the 2000 Census, there is more potential for injury and/or loss of life. One of the biggest problems associated with severe storms is the lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with severe weather and thus may not be prepared.

#### **5.4.2.5 Economic Losses**

The economic losses a community suffers during a severe storm event can be high. In communities with hazard trees, these trees have the potential to destroy homes and businesses if uprooted. Fallen branches may also cause severe damage. Residents and business owners then turn their efforts from work and running a business to clean up efforts.

With the average house value at \$79,133 and the majority of the houses built prior to 1980, damage costs from severe storms begin to accumulate quickly due primarily to the age of the house and its susceptibility to damage. Residents often cannot rely on federal assistance for the total damages incurred. Since January 1, 1964, the President of the United States has declared Shelby County a disaster area on five occasions due to damage suffered by severe storms. If a

Presidential Disaster Declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process.

### **5.4.3 Flooding**

Flooding is a site-specific hazard. Therefore, floodplains are an important planning consideration. A floodplain is any land area susceptible to inundation by floodwaters from any source. Floodplains are measured in terms of the amount of storm water that it takes to cover a given area of land. These storm events are measured in frequency of occurrence, such as 5-year, 100-year and 500-year, with the standard measurement being the 100-year storm or floodplain. The 100-year floodplain is the land area having a 1 in 100 chance of flooding in any given year, but the statistics can be misleading. In reality, the 100-year storm or flood could occur two, three, or several years in a row (unlikely, but possible), because the 100-year flood is a statistical probability and not a predictable recurrence. Statistically, the 100-year flood has a 25% chance of occurring during the typical 30-year lifespan of a home mortgage.

Any development within floodplains can impact the direction, flow and level of the watercourse during periods of high water or flooding. In other words, if fill material is placed or a house constructed in a floodplain, it will alter the boundaries of the floodplain downstream of that area. This alteration happens because structures or fill utilize valuable space that would otherwise act as a natural retaining area for floodwaters to spread and slow. Not only does development in the floodplain increase dangers downstream, developments within the floodplain are at higher risk of damage due to flooding. This damage includes fill material and debris from destroyed structures upstream colliding with structures in the floodplain downstream of an affected area. Many bridges are washed out in floods because river borne debris clog their free-flow area.

#### **5.4.3.1. Infrastructure Impact**

There are a total of 1,046 structures in Shelby County considered to be at-risk due to flooding. Of this total number, 745 of the structures are located in the unincorporated areas of the County. (This information was collected from the ODNR's Division of Water Floodplain Geographical Information Management System (GIMS) Project.) All the at-risk structures are located on the maps in Appendix J. These at-risk structures are located within the 100-year floodplain and are therefore susceptible to damage during a flood.

At-risk structures in areas of flash flooding areas, which are not within the 100-year floodplain were not identified by the ODNR's GIMS project and consequently have not been mapped.

#### **5.4.3.2 Population Impact**

Based on the NCDC data published from 1950 through June 2004, Shelby County's citizens have had to endure multiple flooding situations, including flash floods and river floods. See Appendix I for tables extracted from the NCDC that show the number of reported events since 1950. Flash floods affect a specific area over a short period of time and a smaller population than river floods. On occasion, a life may be lost because of water rising very quickly in this short time.

Unlike flash flooding, the 100-year river flood has a less likelihood of occurring but will impact a larger population. There is a 1% chance each year that the rivers and streams within Shelby County will flood to the delineated 100-year flood zone (special flood zone). This flood will affect

the populations occupying at-risk structures located in the floodplain area shown on the Multi-hazard Map in Appendix J.

#### **5.4.3.3 Property Damage**

Based on information retrieved from the NCDC, flooding in Shelby County has accounted for \$1.5 million in property damage and \$900,000 in crop damage from 1993 through 2004. On average, the County suffered \$221,818 per year in total damage.

Approximately 25% of Shelby County is in the 100-year floodplain as shown on the Multi-Hazard Map in Appendix J. There are an estimated 1,046 at-risk structures in the 100-year floodplain. Of this number of at-risk structures, 5% are assumed to be commercial buildings with the rest of the buildings being residential. According to the County Auditor's Office, the average value of a residential housing unit in Shelby County is \$79,133. With 993 of the at-risk structures being residential, the County's average potential dollars lost due to residential property complete destruction is \$78,579,069 not including contents replacement. The average commercial unit value is \$182,289, which would account for an average loss in property damage of \$9,661,317, not including contents replacement, assuming the structures were completely destroyed.

Furthermore, based on information retrieved from the NCDC, most flood damage in Shelby County is caused by riverine flooding. From 1993 through June 2004, the County suffered \$2 million in property and crop damage from riverine flooding as compared to \$432,000 in damage from flash flooding. On average, Shelby County incurred approximately \$333,333 of property and crop damage per year due to riverine flooding since 1998. This average also includes the years 1999 and 2001 in which no property and crop damage losses were recorded due to riverine flooding. Since the flash flood areas have not been mapped, it is difficult to assess the number of impacted structures and potential future dollars lost due to this hazard.

#### **5.4.3.4 Loss of Life**

Even though the NCDC has no recorded injuries or deaths due to flooding from 1993 through 2004, the potential for injury and death is ever present, especially in flash flood events. During flash floods, water rises very quickly and may catch citizens by surprise. Homeowner's may not be prepared for the rising waters and the need to seek safety quickly. Motorists often think that they can drive through ponded water and risk getting stuck in the flooded area. Due to the extent of flooding in Shelby County, the risk to human life is high but can be reduced by educating the residents of the County.

#### **5.4.3.5 Economic Losses**

The economic losses a community suffers during a flood event can be high. Productivity decreases as residents miss work to tend to the damage incurred at their homes. Some inventory within a business itself may be lost if the owner is not prepared and the facility not flood proofed prior to a flood event. Small businesses may suffer so much damage that they are unable to reopen. Contractors and clean up companies may reap the benefits of the damage but not enough to offset the overall losses to the economy.

The County's infrastructure will also suffer damage to be repaired. Some roads and bridges may wash out. Shelby County has several areas that suffer repeated flooding. These areas are mapped on the Multi-Hazard Map in Appendix J.

Residents often cannot rely on Federal assistance for the damages incurred. Since January 1, 1964, Shelby County has been declared a federal disaster area on four occasions due to damage suffered by severe storms and associated flooding. If a Presidential Disaster Declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process.

#### **5.4.4 Tornadoes**

As seen in the hazard profile and as determined by the Core Group, Shelby County has a relatively low risk of incurring damage from tornadoes. See Appendix I for tables extracted from the NCDC that show the number of reported events since 1950.

##### **5.4.4.1 Infrastructure Impact**

Because tornadoes are random in nature, no one area of the County is more susceptible to infrastructure damage than another area. Since the occurrence of tornadoes is low, the effect on the infrastructure will also be low with only a few houses or businesses needing repairs. Trees may become uprooted, limbs detached and blown into structures. On occasion, a structure may be destroyed completely but a high frequency of this extent of damage is not expected.

Please see the Shelby County Multi-Hazard Map in Appendix J for tornado paths recorded in the County.

##### **5.4.4.2 Population Impact**

Since tornadoes typically present localized hazards, the overall population impact within the County is relatively low. Several homes may need repair, but typically homeowners will have insurance to cover these expenses and will not suffer any long term financial hardship. The populations located in mobile home parks and campgrounds should take particular care to seek adequate permanent shelter with approaching severe weather.

##### **5.4.4.3 Property Damage**

According to the NCDC, there have been five tornadoes in Shelby County reported since 1961 with magnitudes ranging from F0 to F4. These tornadoes caused property losses of \$3.0 million. One recorded F4 tornado in 1965 caused \$2.5 million in damage, which also was the most damage in one event that has been recorded. The average loss for the other four recorded events was \$125,500, with one event not causing any property damage.

With the exception of the 1965 tornado, the County has not suffered significant property damage due to tornadoes. Therefore, there is a low impact relative to property damage.

##### **5.4.4.4 Loss of Life**

Since 1961, there have been 74 recorded injuries and three recorded deaths due to tornadoes. In addition, 50 injuries and three deaths were associated with one particular F4 tornado that struck the County in 1965. Because the number of tornadoes that have affected Shelby County is small, the potential for injury and death is low. As the population of the County continues to grow, as forecasted by the 2000 Census, there is more potential for injury and/or loss of life.

However, the frequency of tornadoes in the County is such that even with a growing population, the potential for injury or death will still be relatively low.

One of the biggest problems associated with tornadoes is the lack of public education and awareness, especially since tornadoes do not happen frequently. Citizens are not aware of the warnings and dangers associated with severe weather and tornadoes and thus may not be prepared.

#### **5.4.4.5 Economic Losses**

Due to the infrequency of tornado events in Shelby County, the overall impact on the economy is very low. If a tornado were to touch down, the economic losses would be local versus countywide. Residents often cannot rely on federal assistance for damages incurred. Since January 1, 1964, Shelby County has been declared a federal disaster area on two occasions due to damage suffered by tornadoes. If a Presidential Declaration is granted to the County, federal money may not cover the entire amount of damage. Therefore, the County and local governments must find the additional money needed to complete the clean up process

#### **5.4.5 Droughts and Extreme Temperatures**

As seen in the hazard profile and as determined by the Core Group, Shelby County has a low risk of incurring damage from droughts and extreme heat. Due to the non-site specific nature of this hazard, the best way to deal with preparing for future events is to consider historical occurrences. This information was obtained from the NCDC shown in Appendix I.

##### **5.4.5.1 Infrastructure Impact**

Because droughts and extreme heat are non-site specific hazards, the effects of a drought should be evaluated countywide. There are no documented critical facilities that are considered at-risk as it relates to droughts.

By itself, a drought does not damage developed property. However, over a long period of time, certain soils can expand and contract resulting in some structural damage to buildings. A small percentage of buildings in areas with such soils suffer minor damage during their “useful lives.” Therefore, the overall impact on the County’s infrastructure will be very low.

##### **5.4.5.2 Population Impact**

Since drought and extreme heat events are non-site specific, the entire County population could be affected by hot, dry conditions. The overall impact that droughts and extreme heat have on the Shelby County population is low based on the number of events recorded by the NCDC since 1950. However, the County’s residents, especially the sensitive populations, should still be aware of the dangers of extreme heat, such as heat exhaustion and heat stroke.

##### **5.4.5.3 Property Damage**

According to the NCDC, there have been two drought events and one extreme heat event in Shelby County. All events were recorded in 1999. The drought of 1999 lasted two months. However, no recorded property or crop damage was associated with these events.

#### **5.4.5.4 Loss of Life**

Since 1995, there have been no injuries and 13 deaths due to drought and extreme heat conditions, namely excessive heat. Because the number of deaths occurred only in one year, 1999, the County's overall potential for injury and death is low. As the population of the County continues to grow, as forecasted by the 2000 Census, there is more potential for injury and/or loss of life.

One of the biggest problems associated with droughts and extreme heat is the lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with droughts or medical conditions like heat exhaustion and heat stroke.

#### **5.4.5.5 Economic Losses**

Due to the minimal amount of damage recorded for drought and extreme heat events in Shelby County, the overall impact on the economy is low. However, when droughts do occur, the economic losses will be countywide affecting the farming community the most. It is very unlikely that a Presidential Disaster Declaration would occur, therefore all mitigation costs would have to be funded locally.

#### **5.4.6 Earthquakes**

As seen in the hazard profile and as determined by the Core Group, Shelby County has a moderate risk of incurring damage from earthquakes. The County has had over 40 epicenters within its boundaries. Please refer to Section 4.7.2 for additional information on Shelby County's epicenters.

##### **5.4.6.1 Infrastructure Impact**

Shelby County and surrounding counties in western Ohio have experienced more earthquakes than any other area of the state. At least 40 earthquakes have occurred in this area since 1875. Although most of these events have caused little or no damage, earthquakes in 1875, 1930, 1931 and 1937 caused minor to moderate damage. Two earthquakes that occurred in 1937, on March 2 and March 9, caused significant damage in the Shelby County community of Anna. The damage included toppled chimneys, cracked plaster, broken windows and structural damage to buildings. The community school, of brick construction, was razed because of structural damage. Therefore, the overall impact on infrastructure in this area is moderate to high.

##### **5.4.6.2 Population Impact**

Since the threat of an earthquake is moderate based on the frequency of occurrences in this area, the overall impact on the County's population will also be moderate. All citizens within the County need to be aware of the threat of potential earthquakes since the County is located on two fault lines.

##### **5.4.6.3 Property Damage**

The level of damage expected from an earthquake in Shelby County is moderate to high. It would be expected to be on the order of a 4.0-5.4 magnitude quake, or lower, as registered on the Richter scale. Quakes of this magnitude would be felt by all, even people driving

automobiles. Damage to buildings would vary depending on the quality of construction. Walls, monuments and chimneys may fall. Some heavy furniture may move.

The 1937 earthquake that shook Anna destroyed the school, which was then razed. Because of the magnitude of an expected event, the level of property damage in the County could be moderately high.

#### **5.4.5.4 Loss of Life**

The level of an expected earthquake in Shelby County is to be considered life threatening. Some injuries may result from falling objects. Because the likelihood of an earthquake occurring is moderate, the potential for injury or death is also moderate.

#### **5.4.5.5 Economic Losses**

Based on the property damage expected from a 4.0-5.4 magnitude earthquake, the impact on the local economy and local government expenditures is considered to be moderate.

## **6.0 GOALS**

Goals were needed for this planning effort to guide the review of the possible mitigation measures. The recommended actions of this plan are consistent with what is appropriate for Shelby County. Mitigation goals reflected community priorities and should be consistent with other plans for the county.

After the determination of the draft problem statements, the Core Group agreed to goals that they wanted to achieve for each hazard. These goals are listed in the following section.

### **6.1 County Goals**

#### **Winter Storms – Snow, Ice and Extreme Cold**

*Overall Goal: To educate the County's citizens to increase awareness of winter storms and where to seek safety during storm events, to maintain operations of critical facilities and emergency services and to reduce property damage caused by severe weather.*

#### **Summer Storms – Thunderstorms, High Winds, Hail and Lightning**

*Overall Goal: To educate the County's citizens to increase awareness of and preparedness for severe storms, to maintain operations of critical facilities and emergency services, to improve the warning system throughout the County and to reduce property damage caused by severe weather.*

#### **Flooding**

*Overall Goal: To save lives and property, reduce damage and expedite the clean up process, to establish administrative controls for construction and to increase citizens' awareness of the hazards associated with flooding.*

#### **Tornadoes**

*Overall Goal: To reduce the risk of injury and fatalities during an event by providing permanent structures for congregating, to reduce potential damage through preplanning, to improve the warning system throughout the County and to increase citizen awareness of the hazards of tornadoes.*

#### **Droughts, Extreme Heat and Wildfires**

*Overall Goal: To establish administrative controls to limit potential property damage, to establish contingency plans for alternate water supply and to reduce potential damage through preplanning.*

#### **Earthquakes**

*Overall Goal: To increase awareness of the hazards of an earthquake event, to improve the warning system throughout the County, to maintain operations of critical facilities and emergency services and to establish administrative controls that address earthquakes during construction.*

## 7.0 HAZARD MITIGATION PRACTICES

As required by the DMA2K, this Mitigation Plan summarizes policies, plans, regulations, programs and projects that Shelby County has implemented or is planning to implement in the future that affect growth and how the County can achieve and maintain sustainability and disaster resiliency. These administrative controls and activities are separated into six categories as determined by FEMA which are referred to as hazard mitigation activities. The following sections describe these general categories, as well as plans and activities that the communities are implementing now or plan to implement in the future.

### 7.1 Property Protection

Protection measures are usually undertaken by property owners on a building-by-building or parcel basis. They help reduce a building's susceptibility to flood damage.

#### 7.1.1 Acquisition

Acquisition of a property and removing any structures eliminates the potential for harm to residents and businesses. After any structures are removed, the land is usually converted to public use, such as a park, or allowed to revert to natural conditions.

#### 7.1.2 Relocation

Relocation is moving a building to higher ground, either within the same property boundary or to a separate property. The building should always be moved to an area not susceptible to flooding.



#### 7.1.3 Retrofitting

Retrofitting a flood-prone structure entails installing flood protective measures on a specific structure or group of structures. Some of the more common examples of retrofitting and floodproofing are elevating a flood-prone building above the flood level, creating barriers around a flood-prone structure, dry floodproofing a structure to make it water-tight and wet floodproofing to intentionally allow flood waters to enter and yet reduce water pressure on the structure.

Retrofitting structures for other hazards is also possible. Structures affected by high winds can possibly be mitigated by securing a roof structure with adequate fasteners or tie downs to

mitigate damage that may occur. Other retrofits are to strengthen garage doors, windows and other large openings. For tornadoes, constructing underground shelters or safe rooms can save lives. Burying power lines is a retrofit measure that addresses the winds from tornadoes, thunderstorms and ice that accompany winter storms.

To date, Shelby County has not implemented any property protection projects.

## **7.2 Preventive Measures**

### **7.2.1 Planning and Zoning**

#### **7.2.1.1 Comprehensive Planning**

Comprehensive plans and land use plans specify how a community should be developed (and where development should not occur). Through these plans, uses of land can be tailored to match the land's hazards. Comprehensive planning reflects what a community wants to see happen to their land in the future. A comprehensive plan can look 5, 10, or even 20 years into the future to help a community plan and shape how they envision their community. However, planning is only one part of the puzzle and usually has limited authority. Tied with zoning comprehensive planning can be more effective.

#### *Shelby County Comprehensive Plan*

In March of 1999, Shelby County launched the update of their Comprehensive Plan: *Shelby County Works – Embracing a Vision, Shaping the Future*. Shelby County began with a Steering Committee that reflected the diverse interests of the County which consisted of citizens, business leaders, township officials, and appointed leaders of the County.

The first chapter, Existing Conditions, is very detailed and provides a comprehensive analysis of physical conditions affecting Shelby County. This chapter includes discussions on historical context, 1976 comprehensive plan summary, regional context, local context, cost of community services, demographics, economic development, farmland, land use, natural resources, public utilities and facilities, recreation, open space and parkland, and transportation.

There are nine additional chapters that represent each element of the Comprehensive Plan. These elements are community services, economic development, farmland preservation, land use, population and housing, public utilities and facilities, recreation, open space and parkland, and thoroughfares and transportation. Each element presents the goal, objectives and strategies and, when appropriate, a detailed plan. The Implementation chapter summarizes actions and strategies that must be accomplished to achieve the policies identified by Shelby County citizens.

#### *City of Sidney Comprehensive Plan*

The City of Sidney updated their 1997 Comprehensive Plan in 2003. This plan, *Imagine Sidney – 2020!*, was adopted by resolution on March 23, 2003. The City of Sidney used several committees to prepare the Comprehensive Plan including the Planning Commission, Steering Committee, City Council, City Administration, and Consultants.

There are 10 chapters that represent each element of the Comprehensive Plan. These elements are community facilities and services, downtown, economic development, housing,

land use, natural resources, transportation, urban design and utilities. Each element presents an introduction, planning issues, existing conditions, detailed plan and implementation. The Implementation chapter summarizes actions and strategies that must be accomplished to achieve the policies identified by the City of Sidney.

### **7.2.1.2 Zoning Ordinance and Building Codes**

A zoning ordinance regulates development by dividing the community into zones or districts and establishing the type of development allowed within each district. The floodplain can be designated as one or more separate zoning districts in which development is prohibited or allowed only if it is not susceptible to flood damage. Some districts that are appropriate for floodplains are those designated for public use, conservation or agriculture. Zoning works best in conjunction with a comprehensive plan or “road map” for future development and building codes.

Building codes provide some of the best methods of addressing all the hazards in this plan. They are the prime measure to protect new property from damage by high winds, tornadoes, earthquakes, hail and winter storms. When properly designed and constructed according to code, the average building can withstand the impact of most of these forces.

The incorporated jurisdictions of Shelby County are required to have their own building codes and zoning regulations. All nine incorporated areas adopted an ordinance revising the zoning regulations and establishing a zoning code. Furthermore, all 14 townships have adopted zoning regulations.

### **7.2.1.3 Open Space Preservation**

Open space preservation is a technique that can be used to not only preserve floodplains but to preserve lands that may be crucial to controlling runoff that adds to flood problems. Existing undeveloped areas can be preserved as open space through zoning ordinances. Lands that ought to be set aside as open space but are already being put to other uses can be converted to public ownership (acquisition) or to public use (easement). Once the land is owned by the county, municipality, or state, buildings and other development that are subject to flood damage can be removed or prohibited. Open space lands and easements do not always have to be purchased outright. Developers can be required to dedicate land to the public for a park and/or to provide easements for flood flow, drainage or maintenance.

Shelby County Park District operates three park facilities, which include Lockington Reserve, Bornhorst Woods and Hardin Park. The total acreage for outdoor recreation is 6,286 acres. In addition, the County contains several outstanding recreation resources, including the North County National Scenic Trail, Buckeye Trail, Lake Loramie State Park, Lockington Locks State Memorial, and the Miami and Erie Canal. Outdoor educational areas such as Lake Loramie, Gross Woods State Nature Preserve and Lockington Reserve provide for wildlife observation, bird watching, fishing, hiking and outdoor learning.

### **7.2.1.4 Subdivision Regulations**

Subdivision Regulations govern how land will be divided into individual lots. These regulations set construction and location standards for the infrastructure built by the developer, including roads, sidewalks, utility lines, storm sewers, storm water retention or detention basins, and drainage ways.

The subdivision regulations for the unincorporated areas of Shelby County were amended March 13, 1997. All of the unincorporated areas in Shelby County are subject to the Shelby County Unincorporated Area Subdivision Regulations, other than land within 1.5 miles of the City of Sidney as provided in Section 711.09 of the Ohio Revised Code. Section 711 of the Ohio Revised Code enables the Shelby County Commissioners and the Shelby Regional Planning Commission to adopt regulations governing plats and subdivisions of land within their jurisdiction. The subdivision regulations consist of nine articles, including preliminary design plan, final plan, subdivision design standards and requirements for construction of improvements, revisions and enforcement.

In addition, the City of Sidney adopted an ordinance on August 24, 1998 for subdivision regulations. These regulations have jurisdiction over any division, subdivision, resubdivision and/or replat, dedication plat or vacation plat of land located within the City. City Engineering Department requirements, standards and regulations apply to all subdivisions and associated public improvements proposed and/or required for areas within the Sidney Corporation limits. The subdivision regulations consist of 10 articles, including general provisions, definitions, minor subdivisions, preliminary plats, final plats, surety requirements, waiver procedure, enforcement and violations, fees and penalty.

The other eight incorporated villages have also adopted subdivision regulations. These subdivision regulations are all similar and consist of eight sections, including general provisions, definitions, minor subdivisions, preliminary plat, final plat, assurance for completion and maintenance of improvements, requirements for construction improvements and design, and miscellaneous provisions.

#### **7.2.1.5 Manufactured Homes**

Previously, the location and installation of manufactured and mobile homes were regulated at the local level of government, with the construction and fabrication standards being set by the United States Department of Housing and Urban Development (HUD). All mobile type homes constructed after 1976 must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements.

The installation of manufactured homes in Shelby County is currently regulated by Senate Bill 102, which became effective on August 6, 2004. This bill created the Ohio Manufactured Homes Commission to regulate the installation of manufactured housing, which includes mobile and manufactured homes, and vests it with the exclusive authority to regulate manufactured housing installers, the installation of manufactured housing and manufactured housing foundations and support systems. The bill set forth that municipal corporations and other political subdivisions are preempted from regulating and licensing installers and regulating and inspecting the installation of manufactured housing and manufactured housing foundations and support systems. The Commission has exclusive power to adopt rules of uniform application throughout the state to govern the installation of manufactured housing, the inspection of manufactured housing, the inspection of manufactured housing foundations and support systems, the training and licensing of manufactured housing installers, and the investigation of complaints concerning manufactured housing installers. No political subdivision of the state or any other department or agency of the state may establish any other standards.

The Commission must establish standards by rule that govern the installation of manufactured housing, with the minimum standards being the model standards the Secretary of the United States Department of HUD adopts. The standards established by the Commission must be consistent with, and not less stringent, than the standards adopted by the Department of HUD. The Commission has the exclusive authority to make rules regarding “blocking” and “tiedowns” of mobile and manufactured homes. The Commission must also approve permanent foundations to which a mobile or manufactured home may be affixed.

#### **7.2.1.6 Floodplain Regulations**

Communities that adopt and enforce a floodplain management ordinance, to regulate new and exciting development within the floodplains, can significantly reduce the effects of flood damage. Communities typically adopt minimum standards that are recommended by FEMA. The objective of these regulations is to ensure that development will not aggravate existing flooding conditions and that new buildings will be protected from flood damage. Zoning and open space preservation work to keep damage-prone development out of hazardous or sensitive areas while floodplain development regulations impose construction standards on what is allowed to be built in the floodplain.

On August 1, 1995, Shelby County adopted Flood Damage Prevention Regulations pursuant to authorization contained in Section 307.37 and 307.85 of the Ohio Revised Code. These regulations apply to all areas of special flood hazard within the jurisdiction of Shelby County. The purpose of the implementation of these flood regulations is to protect human life and health, minimize public money expenditure for flood control projects, minimize need for rescue and relief efforts associated with flooding, minimize prolonged business interruptions, minimize damage to public facilities and utilities, maintain a stable tax base by providing for the proper development in flood prone areas to minimize future flood height areas, and to ensure that those who occupy flood hazard areas assume responsibility for their actions. The regulations consist of five sections that outline definitions, general provisions, administration and provisions for flood hazard reduction. In addition to meeting the minimum standards for the State of Ohio, the regulations require construction of buildings or structures to be two feet above the highest adjacent grade elevation.

Incorporated areas are also required to have floodplain regulations pursuant to authorization contained in Section 307 of the Ohio Revised Code. These regulations are the same as the Flood Damage Prevention Regulations described previously. The following incorporated areas of Shelby County have adopted these regulations and are Botkins, Port Jefferson, Russia and Sidney.

All of Shelby County is in compliance with state floodplain management standards and participates in the NFIP as previously discussed in Section 4.5.1.

#### **7.2.1.7 Drainage Regulations**

In order to protect a county’s natural resources a community can implement regulations such as County Water Management and Sediment Control Regulations. The purposes of these regulations are to protect the county’s water resources by ensuring that the proper storm water and erosion and sediment control measures are in place. Erosion and sediment control measures are called Best Management Practices (BMPs), and when installed and maintained correctly, they help prevent soil from leaving the site. Storm water control measures ensure that the volume of storm water runoff remains the same as before development occurs.

Some examples of what can go into a County Water Management and Sediment Control Ordinance are as follows:

- Submit a Water Management and Sediment Control (WMSC) Plan for proposed commercial, industrial, or residential development sites on parcels greater than five acres.
- Submit an abbreviated plan for sites on parcels less than five acres and part of a larger plan of development.
- Submit a plan for residential dwellings only if a village, township, or city zoning requires them to do so. They must check with the appropriate community for this information.
- Comply with the regulations whether or not a plan is required. All county residents are responsible for being familiar and complying with the regulations.

A designated agency should inspect sites to ensure that the regulations are being followed correctly. The designated agency should also work diligently to review plans and perform site inspections to ensure that these erosion and sediment control measures are in place.

Shelby County has storm water regulations, which govern unincorporated areas. They however, do not regulate lots smaller than five acres. This lot size limitation effectively leaves residential development unregulated. Sidney and the villages of Anna, Fort Loramie and Russia have enacted storm water regulations, which generally require retention basins for commercial, industrial, and major residential subdivisions. Botkins is also evaluating similar regulation to adopt in the future.

#### *Miami Conservancy District Phase II Storm Water Management Program*

The MCD is required to submit a storm water management plan (SWMP) in accordance with 40 CFR Part 122.32 and Ohio Law. This document contains that program which will be executed during the five years of coverage under Ohio's General Permit. The program reduces the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate requirements of the Clean Water Act in accordance with the National Pollutant Discharge Elimination System and Ohio EPA's Phase II Storm Water Program. The SWMP addresses the six minimum control measures as required by federal and state regulations. The Notice of Intent (NOI) and SWMP were submitted to the Ohio EPA in March of 2003. The MCD, as a watershed-based organization whose mission includes the conservation of water resources, accepts responsibility for implementing BMP's under the minimum control measures of public education and outreach on storm water impacts, public involvement/participation, and illicit discharge detection and elimination, within the five year permit period on behalf of the City of Sidney.

### **7.3 Natural Resource Protection**

#### **7.3.1 Riparian Buffer/Wetland Protection**

Riparian area refers to the vegetated area next to a watercourse often thought of as the floodplain and its connected uplands. Riparian buffers can protect water resources from non-point source pollution and provide bank stabilization, flood storage and aquatic wildlife habitat. They can be a natural resource management tool used to limit disturbance within a certain distance of a water course to maintain streamside vegetation. Some communities in the State of

Ohio have proceeded to adopt riparian buffer overlays and zoning ordinances to reap the benefits of such protection.

Currently, Shelby County, nor its villages and townships have codes for the development and protection of wetlands. The Shelby Soil and Water Conservation District (SWCD) uses the State and Federal programs as they become available for issues associated with wetlands protection.

However, the Loramie Valley Alliance (LVA) Watershed Management Plan states that there are currently 96 contracts on file with the Shelby County's United States Department of Agriculture (USDA) Farm Service Agency for filter strip establishment, a total of 455.8 acres.

### **7.3.2 Urban Forestry**

Eighty percent of Ohioans live and/or work within urban areas. The quality of life for them and their families is dependent upon the urban environment. Healthy trees enhance this environment by promoting clean air and water, increasing property values, reducing erosion and storm water runoff, providing wildlife habitat, moderating temperature, lessening energy demands, and offering year-round enjoyment.

Ohio's Urban Forestry Program was created in 1979 within the ODNR to promote trees and other vegetation as tools to enhance the quality of life within cities and villages. The purpose of the Urban Forestry Program is to provide community officials and allied agencies with the organizational and technical ability to effectively manage the trees along streets, within parks, and on public grounds. Through a statewide network of regional urban foresters, the program helps communities manage their urban forest resources to meet their local needs.

Trees are particularly subject to damage by tornadoes, wind, ice and snow storms. Downed trees and branches break utility lines and damage buildings, parked vehicles, and anything else beneath them. An urban forestry program can reduce the damage potential of trees. A properly written and enforced urban forestry plan can reduce liability, alleviate the extent of fallen trees and limbs caused by wind and ice build-up, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a Tree City USA.

Ohio has been the Tree City USA national leader for the past 23 years. There are 233 Tree Cities USA in Ohio. Counties are not eligible for the program but can implement the credited activities. Currently, Shelby County does not have codes for issues concerning urban forestry. The Shelby County SWCD uses the State and Federal programs as they become available for issues associated with reforestation.

The Shelby County SWCD holds a tree seedling sale annually. Orders are taken from December through the middle of March. Seedlings are available to be picked up in the middle of April. A variety of conifers, hardwoods, and ground covers may be purchased.

One of the most popular SWCD activities, the Forestry Field Day, is held annually each October. Activities include chainsaw sculpting exhibitions, logging demonstrations, tree identification tours, and raffles. Woodland craft-making, visits with Smokey the Bear and other activities are available for the children.

The City of Sidney adopted a tree ordinance on April 10, 1989. The ordinance established a City Tree Board that consists of five members who are citizens and residents of the City. The ordinance regulates the tree species to be planted, prohibiting cottonwood trees, and discusses

public tree care, tree topping, pruning and maintenance on private property, the removal of dead or diseased trees on private property and the removal of stumps.

The City of Sidney's Urban Forestry Department consists of one full-time Park Ranger and one part-time seasonal Park Ranger. The Ranger/Urban Forester supervises the maintenance and planting of street trees. The Urban Forestry Department also maintains the memorial tree program. This program allows citizens to place a memorial tree and plaque along the Veterans Memorial Walkway.

### **7.3.3 Flood Compensation Banking**

A flood compensation bank is a detention basin that is used for floodplain encroachment compensation or for flood storage in which the basin's volume may be purchased to mitigate the effects of new development. A development may purchase storage volume from a bank to compensate for floodplain encroachment or to satisfy storm water detention requirements provided the basin is within the appropriate zone of influence.

Shelby County currently has nothing enacted within the County dealing with flood compensation banking.

### **7.3.4 Watershed Planning Efforts**

Approximately 95% of the County lies in the Upper Great Miami River basin, which flows south to the Ohio River. A small area in northwest Shelby County drains into tributaries of the Auglaize River, which ultimately drains to Lake Erie.

#### *Loramie Valley Alliance (LVA) Watershed Management Plan*

A decision was made to form a more diverse group to oversee the development of a watershed management plan. Various government agencies provided initial guidance and facilitated the formation of the Loramie Valley Alliance (LVA). The LVA emerged as a multi-stakeholder partnership. The LVA Advisory Board consisted of a joint board of soil and water conservation district supervisors, representatives of the four partner counties, village mayors, township trustees, the Lake Loramie Improvement Association, and the Loramie Watershed Association.

The watershed management plan consists of eight primary objectives of the LVA:

1. Water management and retention
2. Education (inform public about water quality, etc.)
3. Water quality
4. Manure nutrient management
5. Administration and management of projects
6. Erosion control
7. Lake issues and concerns
8. Regulations

To help make the primary objectives more manageable, the LVA created three planning committees. These committees were referred to as the Water Distribution, Nutrient Management, and Erosion Control committees. The Water Distribution Committee generally focused on issues related to flooding, drainage, and storm water management. The Nutrient Management Committee concentrated on concerns related to livestock manure management,

septic systems and wastewater treatment. The Erosion Control Committee attempted to address sources of erosion in the watershed including farm fields, streambanks, shorelines, and construction sites.

### **7.3.5 Habitat Restoration**

In urbanized watersheds, some stream and/or rivers suffer the effects of increased erosion and water quality problems because of the amount of development that is occurring in a given area. Bioengineering techniques can help prevent further degradation and also provide water quality and habitat benefits.

Biotechnical practices use vegetative or other natural materials to achieve stream management objectives, usually erosion control. One of the chief advantages of biotechnical practices is that they help restore natural stream features, like in-stream habitat and streambank vegetation. The materials used for biotechnical practices are generally less expensive than for more traditional approaches, but installation is more labor intensive and they may require more frequent maintenance.

The ODNR has published a *Stream Management Guide #10*. This Guide is one of a series of Ohio Stream Management Guides covering a variety of watershed and stream management issues and methods of addressing stream related problems. It maps and briefly describes some of the many projects that have been constructed in Ohio using biotechnical practices, including the installation date.

Downstream from Loramie-Washington Road to Lockington Dam, Loramie Creek remains in its unmodified state. Increased peak flows coupled with inadequate log jam removal in this stretch of creek has, however, resulted in areas of severe streambank erosion. Through the summer of 1998 the LVA contracted with the ODNR, Division of Civilian Conservation, to remove four log jams and stabilize 950 feet of eroding stream banks using bioengineering techniques.

### **7.3.6 Watershed Groups**

#### *Loramie Valley Alliance*

The LVA is a partnership of people representing public and private organizations, working together for the benefit of Loramie Creek and its tributaries. This type of organization is typically referred to as a “watershed project.”

#### *Lake Loramie Improvement Association (LLIA)*

The Lake Loramie Improvement Association (LLIA) was organized in 1938, and incorporated in 1949, to promote and establish the philosophy to continue resources and efforts to the progress and success of Lake Loramie. The LLIA celebrated its 50<sup>th</sup> anniversary on October 16, 1988.

#### *Loramie Watershed Association*

A local network of landowners banded together in order to voice concerns relative to area flooding and formed the Loramie Watershed Association. When the Loramie Watershed Association began working toward solving drainage problems, it became clear that in order to achieve its goals, the concerns of other groups must be recognized and appreciated.

### *Miami Conservancy District*

The MCD is a watershed-based organization that was established in 1915 to provide flood protection for the Miami Valley after the Great Flood of 1913. The challenge for the conservancy group in the 21st century is to maintain and continue upgrading the region's flood protection system, while working to protect and preserve the Great Miami River watershed and the region's valuable water resources. MCD's Watershed Initiatives Team works with other local watershed coordinators, and community leaders with the goal of combining forces to have the most positive impact on water quality in the Great Miami River watershed. This partnership group has been calling themselves the Great Miami River Watershed Alliance.

### *Middle Great Miami Watershed Alliance*

The Middle Great Miami Watershed Alliance developed from a request from multiple parties to address water issues in the central and northeast portions of Miami County. The Alliance works to promote the wisest use of the land and water resources for the present and future generations. Although the Alliance was originally developed for Miami County, the Middle Great Miami Watershed Alliance encompasses portions of the Great Miami River and tributaries on both the east and west sides of the river, from downstream of Plum Creek to upstream of Honey Creek. The watershed also includes the drainage area of Lost, Spring, Peters, Tawawa, Leatherwood, and Mosquito creeks, and includes areas in Miami, Shelby and Champaign counties.

### **7.3.4 Conservation Reserve Program (CRP)**

The Conservation Reserve Program (CRP) provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The CRP is administered by the Farm Service Agency, with the National Resource Conservation Service (NRCS) providing technical land eligibility determinations, conservation planning and practice implementation.

The CRP reduces soil erosion, protects the ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers.

Filter strips are implemented as part of the CRP program. Filter strips are buffer strips placed along creeks and ditches that “filter” or mitigate the movement of sediment, nutrients and pesticides within farm fields and from farm fields. Filter strips can be 15 to 100 feet wide and may be grassed areas or trees.

Grassed waterways control erosion in a cultivated field. When a crop field is experiencing gully erosion, constructing a grassed watercourse helps to stop the erosion and make the area more crossable with tillage equipment. If eligible, landowners receive maximum 90% cost-share assistance from the Farm Service Agency for the excavation of a grassed waterway, tile installation (up to six feet) for the distance of the waterway, and any necessary structures,

through the CRP. In addition, the CRP program provides a rental payment for the land in grassed waterways for 10 years.

### **7.3.8 Environmental Quality Incentive Program (EQIP)**

The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land.

In Shelby County, these management practices include manure storage facilities, roof runoff management, mortality composting, grade stabilization, livestock exclusion, woodland improvement, shallow water wetlands and precision farming for nutrient management.

### **7.3.9 Environmental Education**

The Shelby County SWCD considers the education program to be preventive medicine for the environment. Programs are offered for pre-schoolers through adults in schools, clubs, Boy and Girl Scout groups, civic organizations, churches and any other interested organizations. Topics offered include water quality, soils, agriculture, wetlands, wildlife, trees or numerous other natural resources issues. Some of the most popular educational programs are discussed in the following paragraphs.

#### *Envirothon*

The Envirothon is a competition for high school students that tests the students' knowledge in five areas: soils, wildlife, aquatics, forestry and current environmental issues. Schools send teams, usually consisting of five members, to compete in the Area Envirothon held each year in early May. The Area Envirothon includes teams from 18 counties. The top four teams from the Area Envirothon are invited to participate in the State Envirothon. The State Champion is then invited to participate in the National Envirothon.

#### *Conservation Day Camp*

Each summer, the SWCD, in cooperation with the Shelby County 4-H Program, hosts up to 125 elementary students for three days of fun and learning. A different theme is selected each year, and activities are structured around that theme. Campers learn the value of conserving natural resources as well as participate in many other fun activities and games.

### **7.3.10 Manure Nutrient Management (MNM) Program**

As many livestock producers know, animal manure has valuable nutrients within it and may be applied to fields in lieu of commercial fertilizer. The Manure Nutrient Management (MNM) program was created to teach the value of manure as well as the importance of properly handling manure so that it does not contaminate water sources. Services available through the MNM program include developing a Comprehensive Nutrient Management Plan (CNMP), manure sampling information, storage recommendations, site evaluations, storage design and layout, composting information and state cost-share assistance. The ODNR Division of Soil & Water Conservation offers cost share assistance for the construction of animal manure handling facilities. Eligible practices are selected and placed into high, medium and low funding

categories based on their pollution control effectiveness and other factors. Maximum cost share amounts are \$15,000, \$10,000, and \$5,000 for each high, medium and low practice or 75% of the total cost (whichever is less). The purpose of the cost share program is to encourage producers to handle animal manure in ways that will help to improve water quality in Ohio. Preplanning for state cost share and CNMPs is very important. A CNMP is required if asking for cost share. There is information and data about the farming operation that needs to be gathered for the CNMP. Also, state cost share is administered on a first come first served basis. Lastly, another requirement to receive state cost share assistance is attendance and certification of a Livestock Environmental Assurance Program (LEAP). LEAP is a program modeled after a similar program developed by the National Pork Producers Council (NPPC).

### **7.3.11 Conservation Reserve Enhancement Program (CREP)**

The Conservation Reserve Enhancement Program (CREP) program is a Federal/State conservation partnership program recently approved for Ohio's Western Lake Erie Watershed. A portion of Dinsmore, Mclean and Van Buren townships in Shelby County, drain into the Auglaize River which eventually drains into the waters of Lake Erie.

The intent of the Ohio CREP is to reduce stream sedimentation, filter surface water runoff prior to entering streams or open ditches and enhance wildlife habitat. Numerous federal and state agencies, as well as conservation organizations, are partners in the CREP effort.

The CREP is a voluntary program that uses financial incentives to encourage farmers to enroll in the CRP by committing to protect land for either 15, 20, or 30 years, depending upon the enrolled practice. In addition to reducing runoff of soil sediment, nutrients, and pesticides, watercourse buffers also help lower water temperatures, increase dissolved oxygen and provide additional habitat for fish and wild life. Other eligible practices for this program include hardwood tree plantings, filter strips, wetland restoration, field, (farmstead) windbreaks and wildlife habitat incentive.

### **7.3.12 Urban Conservation**

The Shelby County SWCD offers urban conservation services to urban homeowners, including soils advice, tree sales, yard waste composting, drainage assistance and backyard conservation. The SWCD is also involved in assisting the Shelby County Health Department with evaluations of development sites. The SWCD evaluates the drainage aspects of a site and makes recommendations to the Health Department.

## **7.4 Emergency Services**

Emergency Services protect people before, during and after a disaster. A good emergency management program addresses all hazards, natural and man-made. It involves the active participation and involvement of all County's departments and municipalities. Emergency services include:

- Threat Recognition
- Warning
- Response
- Evacuation and Sheltering
- Post-Disaster Recovery and Mitigation

### 7.4.1 Threat Recognition

The first step in responding to a hurricane, flood, tornado or other natural hazard is knowing when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

### 7.4.2 Warning

After there is a potential hazard recognized following steps must be taken to notify the public of its possible onset. Early and specific warnings allow more people the ability to set protection procedures in motion.

The NWS issues notices to the public using two levels of notification:

*Watch:* conditions are right for flooding, thunderstorms, tornadoes or winter storms.

*Warning:* a flood, tornado, etc. has started or has been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens
- Sirens on public safety vehicles
- Door-to-door contact
- Mobile public address systems
- E-mail notifications

According to the *Shelby County Emergency Operations Plan (EOP)*, the County has seven sirens that are used to notify residents of in-coming hazards. Six of these sirens are located throughout the City of Sidney for warning and one siren is located in the Village of Jackson Center.

In a news article from the *Sidney Daily News* on November 15, 2003, the Sidney Police Department tested four new tornado warning sirens. With these new sirens, the County's total number of sirens is 11. Thanks to the partnership between the Sidney Police Department and Clinton Township Trustees, two of the sirens are located in the township, which increases the coverage for two large populations in rural areas of the township. Also, two of the new sirens protect residents at Fair Haven Shelby County Home and Dorothy Love Retirement Community.

According to the *Sidney Daily News*, on September 29, 2004, a new tornado warning siren for the Village of Anna was nearly complete. Town officials plan to incorporate the countywide protocol of having the system linked to the County Sheriff's Office.

Currently, weather alert radios, radio and television stations are also used to provide warning to the jurisdiction. All schools have weather alert radios. Cell phones, telephones and radios are utilized to notify Emergency Operations Center (EOC) staff and emergency personnel.

The Ohio State Highway patrol (OSHP) is the State of Ohio Warning point for the National Warning System (NAWAS) and operates the Ohio portion of NAWAS.

Upon receipt of a NAWAS warning, the OSHP, District #5 Headquarters in Piqua notifies the Shelby County Sheriff's Dispatch Office. Other warnings are sent through the Law Enforcement Automated Data System (LEADS) to law enforcement agencies in the warning area. The Sheriff's Dispatcher also provides warnings to the fire departments, the Shelby County Engineer, Emergency Management Services (EMS) Squads, hospitals and the Shelby County EMA. The Shelby County EMA disseminates warnings to the other organizations listed in the EOP as needed.

The following are some of the local Emergency Alert System (EAS) stations that provide continuous public information about emergencies.

- LP 1 – WHKO 99.1 FM
- LP 2 – WTUE 104.7 FM
- WMVR AM 1080 AND WMVR FM 105.5
- LOCAL TV CHANNELS 2, 7, 16, 22, 45

However, emergencies may require communications capabilities beyond the normal capacities of equipment of local government. Therefore, the Shelby County Amateur Radio Emergency Services (SCARES) provides personnel and equipment support to the Shelby County EOC throughout an emergency.

The Shelby County Communications Officer and communications personnel from SCARES report to the Shelby County EOC upon notification of activation. They secure operable communications equipment and supplies necessary to carry out required emergency activities.



**SCARES Mobile Unit**

During winter storm events, the Shelby County Sheriff, at their discretion, may declare the following Snow Alerts in Shelby County.

- Level One: Roadways are hazardous with blowing and drifting snow. Roads are also icy. Drive very cautiously.
- Level Two: Roadways are hazardous with blowing and drifting snow. Only those who feel it is necessary to drive should be out on the roadways. Contact your employer to see if you should report to work.
- Level Three: All roads are closed to non-emergency personnel. No one should be out during these conditions unless it is absolutely necessary to travel. All employees should contact their employer to see if they should report to work. Those traveling on the roadway may be subject to arrest.

### **7.4.3 Response**

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries.

Typical actions and responding parties include the following:

- Activate the emergency operations center (emergency preparedness)
- Close streets or bridges (sheriff or public works)
- Shut off power to threatened areas (utility company)
- Pass out sand and sandbags (public works)
- Hold children at school/releasing children from school (school superintendent)
- Open evacuation shelters (American Red Cross)
- Monitor water levels (engineering)
- Establish security and other protection measures (police/sheriff)

An Emergency Operations Plan (EOP) ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

The EOP is a requirement of the Ohio Revised Code, Section 5502.271. The purpose of the Shelby County EOP is to predetermine, to the extent possible, actions to be taken by the governmental jurisdictions of Shelby County to prevent avoidable disasters and respond quickly and adequately to emergencies in order to protect the lives and property of the residents of Shelby County.

The EOP is designed to work for all types of natural and man-made disasters. The document has a Basic Plan which defines and identifies areas of potential risk, lists people and organizations involved in response situations, and discusses plan development and maintenance.

The Basic Plan is augmented with annexes that describe the details of various aspects of emergency response. Some examples of these annexes include Direction and Control, Notification and Warning, Law Enforcement, Medical, Anti-Terrorism and Resource Management.

The plan contains guidelines with respect to roles and responsibilities. The EOC is responsible for directing and controlling the conduct of emergency operations from that center, or from an alternate facility during emergencies. The EOC, in coordination with the Incident Commander at the site, is the point of contact for all operating/responding departments and agencies, other counties and the State.

### **7.4.4 Evacuation and Sheltering**

#### **7.4.4.1 Evacuation**

There are five key components to a successful evacuation:

1. Adequate warning
2. Adequate routes
3. Traffic control
4. Knowledgeable travelers
5. Care for special populations (i.e. handicapped, prisoners, school children)

When the Incident Commander/first fire chief on the scene determines that loss of life and/or injury may be prevented by an evacuation, he will initiate the evacuation in coordination with fire departments and law enforcement.

The Shelby County EMA Director coordinates evacuation information with the County Commissioners, township trustees and mayors in the affected area as he receives it from the Incident Command Center.

#### **7.4.4.2 Shelter**

Shelter is required for those who cannot get out of harm's way. Typically, the American Red Cross (ARC) will staff a shelter and ensure that there is adequate food, bedding and washing facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring their pets, and the potential for an overcrowded facility.

The Shelby County EMA maintains a written agreement with the ARC for emergency shelter and mass care services. This agreement is reviewed at least once every three years or earlier as requested by the ARC or Shelby County EMA. If ARC services are reduced or not available during an emergency, the Salvation Army and local churches provide shelter and mass care services.

#### **7.4.5 Post-Disaster Recovery and Mitigation**

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

- Patrol evacuated areas to prevent looting
- Provide safe drinking water
- Monitor for diseases
- Vaccinate residents for tetanus
- Clear streets
- Clean up debris and garbage

Throughout the recovery phase, everyone wants to return to their daily routines. The problem is when recovery efforts are being instituted; people may be performing a quick fix that returns them to their daily routines faster. However, it is imperative that during this recovery phase every effort should be made to think about how to prevent repeated damage from happening if another disaster were to strike. Some efforts include:

- Advise residents through public information activities to advise residents about mitigation measures they can incorporate into their reconstruction work
- Evaluate damaged public facilities to identify mitigation measures that can be included during repairs
- Acquire substantially or repeatedly damaged properties from willing sellers,

- Plan for long term mitigation activities, and
- Apply for post-disaster mitigation funds.

The responsibility for damage assessment ultimately lies with the chief elected officials of Shelby County, who use ARC damage assessments when dealing with private dwellings.

Damage assessment officials must be trained in order to provide fast and accurate information to the EOC so that effective response and recovery efforts may be utilized. A primary responsibility of the County EMA is to gather all the county, city, village and township damage assessments, consolidate them and forward them to the OEMA in accordance with established timeframes.

## **7.5 Flood Control**

Flood control projects have traditionally been used by communities to control or manage floodwaters. They are also known as “structural” projects that keep flood waters away from an area as opposed to “non-structural” projects, like retrofitting, that do not rely on structures to control flows.

In 1997, \$200,000 was budgeted to the Loramie Valley Alliance (LVA) from the Ohio General Revenue Fund to implement flood control and water quality improvements in the Loramie Creek Watershed. According to the coordinator for the LVA, there is a huge interest in reducing flooding in the Loramie Watershed. To date, all funds used have been geared toward the removal of log jam obstructions on the Loramie Creek and its tributaries. The removal of these obstructions has alleviated flooding pressure caused by the back up of the jams.

### **7.5.1 Flood Control Measures**

The most common type of measures that keep flood waters away from an area are reservoirs and dams, diversion channels, levees and floodwalls.

The City of Sidney’s Flood Abatement Program was established to address residential properties that were succumbing to sewer backups and basement flooding during precipitation events. The original program provided monetary relief to the property owner to address flood control measures on private property. These measures included the removal of foundation drains, roof drains and/or the installation of backflow prevention devices on the sanitary lateral.

The Flood Abatement Program was modified to incorporate residential or private property problems discovered during the City’s Inflow and Infiltration Reduction (I/I) Program. This program is an ongoing and active program whereby City staff members investigate sources of I/I into the City’s sanitary sewer system. The I/I Reduction Program utilizes numerous tools such as sewer televising, smoke testing, flow monitoring and dye testing to identify those contributors of clean water into the sanitary sewers.

Reduction of I/I into the sanitary sewer system has become the City Sewer Department’s primary objective. Clean water intrusion into the sanitary sewer system creates potential sewer flooding problems and increases the City’s operational costs at the Wastewater Treatment Plant.

The majority of I/I discovered comes from private property sources, such as, downspout connections to sanitary lateral, missing or defective cleanout caps, foundation drain connections

to the sanitary lateral and/or defective sanitary lateral pipes. It has become necessary to modify the Flood Abatement Program to provide monetary assistance to residential property owners that have been identified and targeted for repairs or removal of their contributing I/I.

#### **7.5.1.1 Reservoirs and Dams**

Reservoirs and dams impound water to reduce the amount of water that reaches an area at one time. A reservoir holds high flows behind a dam or in a storage basin. Water is released at a controlled rate. Reservoirs and dams are generally perpendicular to a stream or river.

There are two Class I dams in Shelby County, which are classified by the ODNR's Division of Dam Safety ([www.dnr.state.oh.us/water/dsafety/whatdam.htm](http://www.dnr.state.oh.us/water/dsafety/whatdam.htm)). One dam is located near the Village of Lockington, for which it is named, in the southwestern part of the County. The dam does not hold a body of water on a day to day basis. The dam and basin are the property of the MCD, who maintains the integrity of the structure, as well as restricts activities in the area of the dam. Studies have indicated the dam is capable of holding 500 year flood waters. Failure of the dam could result in flooding of the area downstream, which is primarily farm land with no concentration of housing. Movement of water from the dam would be south into Miami County and could affect the Historical Johnson Farm. An earthquake could affect the dam; however it is not likely to cause a flooding threat with no body of water retained at the dam. Any build up of water to threaten overflow would be slow in progression taking several days, perhaps weeks.

The other dam is the Lake Loramie Dam located in the northwest corner of the County. Lake Loramie was originally constructed in 1824 and 1825 as a storage reservoir to supply water for the Miami-Erie Canal system. A short feeder canal connected Lake Loramie with the main canal which furnished transportation from the Ohio River at Cincinnati north to Lake Erie. The canal system reached its peak of economic importance in the mid-1800s. Eventually, the advent of the railroads and destruction caused by the floods of 1913 forced the abandonment of the canals in that year. Since that time, Lake Loramie and other canal lands became recognized for their potential to serve increasing outdoor recreational needs. In 1949, Lake Loramie became the possession of the newly created Division of Parks and Recreation of the ODNR and has been maintained as a state park since.

#### **7.5.1.2 Diversion Channels**

A diversion is a new channel or overflow weir that sends floodwater to a different location, thereby reducing flooding along a watercourse. During normal flows, the water stays in the old channel. During flood flows, the stream spills over to the diversion channel.

The Lockington Dam has two concrete conduits through the base of the embankment near the center of the valley. The conduits are sized to discharge a peak flow during an Official Plan Flood (OPF) that can be handled by the flood protection levees and channels downstream. The remainder of the floodwaters are temporarily stored behind the dam and released over time. An emergency spillway is located directly above the conduits in the same structure.

Lake Loramie functions to a very limited extent for flood control. However, Lake Loramie is impounded by a 3,260 foot earth embankment, stretching northwest to southeast, with a maximum height of 23 feet. Sluice gates atop the concrete weir spillway determine the lake level. Two separate outlet gate structures are located in the northern portion of the dike. The southward outlet is utilized to draw down the lake. The northern gate structure, once linked to the feeder canal, is now permanently sealed.

### **7.5.1.3 Levees and Floodwalls**

Levees and floodwalls restrain the flow of the stream or river. During a flood, the stream or river flow is not reduced; only confined. Levees and floodwalls are generally parallel to the flow of the stream.

Currently, Shelby County has no levees or floodwalls within the County.

### **7.5.2 Drainage Maintenance**

Man-made ditches and storm sewers help drain areas where the surface drainage system is inadequate, or where underground drainageways may be safer or more practical. Particularly appropriate for depressions and low spots that will not drain naturally, drainage and storm sewer improvements are designed to carry the runoff from smaller, more frequent storms. There are three types of drainage improvements that are usually pursued to reduce storm water flooding: putting drainageways in underground pipes, channelization, and removing obstructions caused by stream crossings, such as culverts and bridges with small openings. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving stream or river has sufficient capacity to handle the additional volume and flow of water. To reduce the cumulative downstream flood impacts of numerous small drainage projects, additional detention or run-off reduction practices should be provided in conjunction with the drainage system improvements.

Adequate field drainage remains a very important issue for the majority of landowners in the Lake Loramie Watershed. The Shelby SWCD currently employs two individuals to handle the workload generated from requests related to field drainage. The Shelby County Engineer's Office also manages a significant workload relative to ditch maintenance.

Several miles of Loramie Creek, from Lake Loramie to Loramie-Washington Rd., and one of its primary tributaries, Mile Creek, are maintained as open ditches. These stream segments were petitioned in 1981 for spot clean out, sandbar removal and brush clearing. The Mile Creek section also included bank reconstruction. The permanent maintenance program for these drainage projects includes periodic brush, log jam and sandbar removal. A 15-foot wide strip is kept clear of trees along the length of these stream segments to accommodate maintenance access. The access strips are recorded as easements on the adjacent property.

## **7.6 Public Information**

A successful hazard mitigation plan program involves both the public and private sectors. Public information activities advise property owners, renters and businesses about hazards and ways to protect people and property from these hazards. These activities can motivate people to take the steps necessary to protect themselves and others. Information can initiate voluntary mitigation activities at little or no cost to the government. Property owners mitigated their flooding problems long before there was government funding programs.

### **7.6.1 Outreach Projects**

Outreach projects are the first step in the process of orienting property owners to the hazards they face and the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties. Research has proven that outreach projects work. However, awareness of the hazard is not enough; people need to be told what they can do about the hazard, so projects should include information on safety, health and property protection measures. Research has also shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

Currently, the following programs are available from the Shelby County Public Information Officer (PIO) to educate the public about preparation for and response to emergencies. These programs are provided to organizations at their request.

- Winter Safety Week
- Flood Safety Week
- Earthquake Awareness for Shelby County
- Terrorism and Your Community
- Hazardous Materials Preparedness in Shelby County

Prepared instructions for the public are available from the Shelby County PIO for the following hazards:

- Civil Disturbances
- Drought
- Earthquakes
- Energy Emergencies
- Floods
- Hazardous Material Incidents
- Dam Failures
- Terrorism
- Tornadoes and Severe Storms
- Winter Storms

### **7.6.2 Real Estate Disclosure**

Many times after a natural disaster, people say they would have taken steps to protect themselves if only they had known they had to purchase a property that is exposed to a natural hazard. By reaching out to residents in a community to become informed as to what hazards are a potential in the community, the community has armed them with information that they did not have previously. This knowledge allows them to make an informed decision on purchasing insurance to cover their potential losses.

#### **7.6.2.1 Federal law**

Federally regulated lending institutions must advise applicants for a mortgage or other loan that is to be secured by an insurable building whether the property is in a floodplain as shown on the

Flood Insurance Rate Map. If so, flood insurance is required for buildings located within the floodplain if the mortgage or loan is federally insured. However, because this requirement has to be met only 10 days before closing, often the applicant is already committed to purchasing the property when he or she first learns of the flood hazard.

#### **7.6.2.2 State law**

The state of Ohio's Department of Commerce has a Residential Property Disclosure Form pursuant to section 5302.30 of the Revised Code and rule 1301:1-4-10 of the Administrative Code. It is to be completed by the owners who want to sell their property. Under a good faith stipulation, they are to note any areas of the house that may be dangerous which include being in a floodplain/Lake Erie Coastal Erosion Area, whether there are drainage/erosion problems, and if there are zoning/code violations.

Shelby County's and surrounding areas' multiple listing service does not include a listing of whether a property is in a flood zone or wetland. Disclosure practices are left up to the individual broker or agent.

#### **7.6.3 Websites and Libraries**

The County maintains a website of general county information such as departments and engineer's information ([www.co.shelby.oh.us](http://www.co.shelby.oh.us)). This website is currently not used as a tool for making relevant hazard mitigation information available to the public. However, the Shelby County EMA uses their own website ([www.shelby-ema.com](http://www.shelby-ema.com)), which is linked to the County's website, as a resource for dissemination of educational materials concerning the natural hazards that affect communities. Other community websites include:

- [www.sidneydailynews.com](http://www.sidneydailynews.com) Sidney Daily News - Sidney, OH
- [www.hits1055.com](http://www.hits1055.com) WMVR 1080 AM / 105.5 FM - Sidney, OH

In addition, the Shelby County SWCD operates a lending library for environmental and agricultural books, pamphlets, leaflets and videos. These materials are made available for public use.

**8.0 MATRIX RESULTS**

**8.1 Matrix Results**

The Core Group chose a total of 50 potential mitigation activities. Of those 50 activities, 17 were labeled as “prioritized” activities and are listed in the following sections. The Core Group evaluated the activities by first taking into account the risk assessment ranking of hazards located in Section 4.0 of this report. The various hazards had been ranked according to past historical events and the cumulative costs of each potential disaster.

The following matrices’ results show the average rating for all the Core Group members. Each member filled out an individual matrix, and then the results for each hazard were averaged. The hazard of flooding had the most activities associated with it. The top rated activities have been highlighted; however the other activities are important and should be reevaluated during the monitoring process of the Mitigation Plan for Shelby County. To see the complete list of mitigation alternatives for each hazard please see the complete matrix in Appendix L. A more detailed benefit/cost analysis will be conducted once the Mitigation Plan Alternatives are looked at more critically and turned into actual implemental mitigation projects.

**8.1.1 Matrix Results for Winter Storm**

Shelby County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Average
<b>Winter Storms - Snow, Ice, Extreme Cold</b>						
Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.	22	21	23	22	6	23.1
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	17	18	20	19	6	19.6
Develop an outreach program for informing citizens of designated shelter locations.	17	17	18	19	6	19.2

The three highest rating activities within the winter storm hazard category include:

- Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Develop an outreach program for informing citizens of designated shelter locations.

**8.1.2 Matrix Results for Summer Storms**

Shelby County Mitigation Alternative Results	Matrix Total					Hazard Prioritization	Average
	Matrix Total						
<b>Summer Storms - Thunderstorms, High Winds, Hail, Lightning</b>							
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.	17	16	18	19	5	19.5	
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	17	18	20	19	5	18.7	
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.	17	17	18	19	5	17.4	

The three highest rating activities within the summer storm hazard category include:

- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.

**8.1.3 Matrix Results for Flooding**

Shelby County Mitigation Alternative Results	Matrix Total					Hazard Prioritization	Average
	Matrix Total						
<b>Flooding</b>							
Develop a river and stream maintenance program for removing debris and log jams from drainage ways.	15	16	14	13	4	14.8	
Seek funding to update Flood Insurance Rate Maps. Current FIRMs are dated September 2, 1982.	14	12	13	14	4	14.5	
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.	12	13	12	12	4	13.9	

The three highest rating activities within the flooding hazard category include:

- Develop a river and stream maintenance program for removing debris and log jams from drainage ways.

Shelby County- Countywide All Natural Hazards Mitigation Plan

- Seek funding to update Flood Insurance Rate Maps. Current FIRMs are dated September 2, 1982.
- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.

**8.1.4 Matrix Results for Tornadoes**

Shelby County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Average
<b>Tornadoes</b>						
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	16	15	17	18	3	17
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.	14	16	17	15	3	16.9
Develop an education program on hazards associated with tornadoes and how to prepare prior to the tornado season.	15	14	16	15	3	16.3

The three highest rating activities within the tornado hazard category include:

- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.
- Develop an education program on hazards associated with tornadoes and how to prepare prior to the tornado season.

**8.1.5 Matrix results for Droughts**

Shelby County Mitigation Alternative Results	Matrix Total	Matrix Total	Matrix Total	Matrix Total	Hazard Prioritization	Average
<b>Droughts</b>						
Develop a public education program for restrictions on open burning and water usage during drought conditions.	10	9	11	10	2	11.9
Develop a public education program on the hazards associated with drought and extreme heat, including open burning.	10	10	8	11	2	11.6
Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.	10	8	9	9	2	10.3

The three highest rating activities within the drought hazard category include:

- Develop a public education program for restrictions on open burning and water usage during drought conditions.
- Develop a public education program on the hazards associated with drought and extreme heat, including open burning.
- Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.

**8.1.6 Matrix results for Earthquakes**

Shelby County Mitigation Alternative Results	Matrix Total					Average
Earthquakes	Matrix Total					Average
Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.	10	9	11	10	1	10.4
Develop a public education program concerning the frequency that earthquakes may occur and the hazards associated with earthquakes and tremors.	10	10	8	11	1	9.1

The two highest rating activities within the earthquake hazard category include:

- Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.
- Develop a public education program concerning the frequency that earthquakes may occur and the hazards associated with earthquakes and tremors.

**8.1.7 Additional County Alternatives**

Due to natural disasters occurring during the mitigation planning process, the Core Group reevaluated the overall matrix results at the final mitigation planning meeting. As a result, the Core Group chose to reprioritize the alternatives as listed under Winter Storms and Flooding. The Core Group reprioritized the alternatives as follows:

*Winter Storms*

- Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human life and health.

*Flooding*

- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.
- Develop an education program on hazards associated with severe flooding and how to prepare prior to a flood event.
- Develop a river and stream maintenance program for removing debris and log jams from drainage ways.

Furthermore, the Core Group developed additional alternatives that the County as a whole would like to support as part of the mitigation effort. These alternatives are as follows:

- Provide the hook ups necessary to operate back-up generators.
- Provide public education for the proper use of back-up generators.
- Seek funding to acquire additional snow and debris removal equipment for use during the winter storm, severe storm and flooding clean up process.

**8.2 Mitigation Alternatives for Each Participating Community**

Each of the participating communities was required to select a mitigation alternative or alternatives for their community to support. Individual communities are responsible for implementing these activities. The alternatives chosen by each community are as follows:

*Sidney*

- Agree with the overall revised matrix results.

*Jackson Center*

- Agree with the overall revised matrix results.

*Fort Loramie*

- Agree with overall revised matrix results.
- Seek funding for additional manpower and overtime needed to maintain water plant operations and debris removal

*Anna*

- Agree with the overall revised matrix results.

*Botkins*

- Agree with the overall revised matrix results.

*Russia*

- Agree with the overall revised matrix results.

*Port Jefferson*

- Agree with the overall revised matrix results.

*Lockington*

- Agree with the overall revised matrix results.

*Kettlersville*

- Agree with overall revised matrix results.
- Provide back-up generators for the Village water systems.

*Cynthian Township*

- Agree with overall revised matrix results.
- Seek funding to acquire additional equipment for debris removal, such as chainsaws and wood chippers.

*Franklin Township*

- Agree with overall revised matrix results.
- Seek funding to acquire additional equipment for debris removal, such as chainsaws and wood chippers.

*Salem Township*

- Agree with overall revised matrix results.
- Seek funding to acquire additional snow and debris removal equipment.
- Seek funding to hire additional manpower for debris cleanup as necessary.

**8.3 Action Plan**

The culmination of Shelby County's Mitigation Plan is an Action Plan. The general direction of the overall program is outlined in this document. Specific activities pursuant to the general direction are detailed in the Action Plan that is placed in Appendix M for ease of access. The overall direction of the Action Plan is to give the Core Group an easily accessible document to check their status on implementing their chosen mitigation alternatives.

**8.4 Mitigation Plan Maintenance and Schedule**

The Core Group, in conjunction with the Shelby County EMA, will establish methods for monitoring and evaluating the Mitigation Plan for the county and its participating incorporated jurisdictions on a five-year cycle. During the first review, Shelby County will consider restructuring the Drought section of the Mitigation Plan to include three headings, one each for urban, suburban and rural areas. The Shelby County EMA will also refer to the Mitigation Plan wherever feasible within the existing documents that support mitigation and growth within Shelby County.

The Core Group will initially meet on a yearly basis, as determined by the Shelby County EMA/Office of Homeland Security's Director, once the Mitigation Plan has been approved by the State of Ohio and FEMA. At these initial yearly meetings, it will be decided whether the Mitigation Plan needs to be updated immediately or to wait and collectively do the updates on the five-year cycle. The Core Group will evaluate the Mitigation Plan and act as a forum for hazard mitigation issues. The Core Group's detailed Action Plan will act as a guide in evaluating the Mitigation Plan. The Action plan will also provide a method for monitoring the Mitigation Plan, as well as a schedule for the implementation of the mitigation alternatives. The success of the Mitigation Plan depends upon the efforts of the Core Group to become involved with other planning efforts in the community. Communities will be able to use the plan for a variety of activities, including implementing specific mitigation projects, as well as implementing changes in the daily operation of the local government. To ensure the success of an ongoing program, it is critical that the plan remains relevant to the County's growth and development. Thus, it is important for the County to conduct periodic evaluations and make revisions as needed, as well as incorporate changes into other planning documents in the County.

The Core Group will review the goals and action items on a yearly basis, as needed, to determine their relevance to changing situations in Shelby County and ensure that they are addressing current and expected conditions. They will also review the risk assessment portion of the mitigation plan to determine if this information should be updated or modified, given any new available data.

The public will be involved on a continuous basis. Public involvement will be accomplished by establishing a website whereby the mitigation action items that are slated for development that current year will be highlighted. The public will be encouraged to participate in the continued development of the Mitigation Plan. There will also be a formalized press release developed for their annual review process.

## **8.5 Local Planning Mechanisms**

There are several local planning mechanisms in place within the County, which are described in detail in Section 7.2 Preventive Measures. This section of the Mitigation Plan describes existing plans and efforts in the community, when they were adopted and what the document does for the community.

Within three years of the formal adoption of the Mitigation Plan, the Core Group will strive to incorporate into the process of existing planning mechanisms any local policies recommended for revision by the Action Plan developed as part of this effort. The County utilizes comprehensive land use planning, development standards and building codes, as well as various other regulatory mechanisms to guide and control development in the community. Since the County has autonomy over these various tools, the County can augment them as necessary to address applicable hazard mitigation requirements. However, as a community that exists in a rural area, many of these processes may also affect neighboring communities and development. To ensure that altering these standards does not negatively affect adjacent communities, Shelby County will seek consistency and collaboration with its counterpart regulatory documents from surrounding jurisdictions. After adoption of the *Shelby County All Natural Hazards Mitigation Plan*, the Core Group should encourage its incorporated jurisdictions to be aware of the hazards that are affected by the planning and development decisions they may make and implement. The Shelby County All Natural Hazards Mitigation Core Group will conduct periodic reviews of the planning documents described in Section 7.2. The Core Group

will also analyze any plan amendments, and provide technical assistance if needed to any incorporated jurisdiction participating in this effort.

### **8.6 Resolution of Adoption**

The Shelby County Commissioners as well as the incorporated areas of Sidney, Jackson Center, Fort Loramie, Anna, Botkins, Russia, Port Jefferson, Lockington, and Kettlersville will be passing a Resolution of Support for the Shelby County countywide Mitigation Plan after contingent approval from the State of Ohio EMA as well as FEMA.

Examples of the Resolution of Adoption that will be presented to the Commissioners, as well as the Ordinance that the participating incorporated jurisdictions will pass, are provided on the following pages.

RESOLUTION NO. \_\_\_\_\_

ADOPTION OF THE SHELBY COUNTY COUNTYWIDE ALL NATURAL HAZARDS  
MITIGATION PLAN COUNTY NATURAL HAZARDS MITIGATION PLAN AND  
ESTABLISHMENT OF A SHELBY COUNTY COUNTYWIDE ALL NATURAL HAZARDS  
MITIGATION PLAN COUNTY HAZARD MITIGATION CORE GROUP

WHEREAS, on \_\_\_\_\_, the Shelby County Commissioners passed Resolution No. adopting the SHELBY COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN (the Mitigation Plan) pursuant to \_\_\_\_\_ which established goals to minimize and reduce storm water damages to existing structures and land use in order to maximize the protection of public health, safety, and welfare, and identify and develop revenue sources to complete the goals and objectives; and

WHEREAS, the mission of the Shelby County Countywide All Natural Hazards Mitigation Plan Core Group is: "To develop a working document that fulfills the mandates of the Federal Disaster Mitigation Act of 2000, and satisfies the requirements of FEMA and the Ohio EMA, as well as meets the needs of all of Meigs County. Further, by researching and planning for future natural hazards and implementing appropriate mitigation techniques, all of Shelby County can save lives and protect property, reduce the cost of disasters and provide for a rapid and efficient recovery by coordinating response efforts, and increasing the educational awareness of natural hazard events and their effects on the people, property, and resources of all Shelby County."; and

WHEREAS, on September 27, 2004, the Shelby County Emergency Management Agency Director approved the development of a Mitigation Plan on behalf of the Shelby County Board of County Commissioners; and

WHEREAS, a Mitigation Plan for Shelby County will be required beginning in November 1<sup>st</sup>, 2004 to receive any state or federal mitigation funding such as flood prone property improvement or buyout funds; and

WHEREAS, the County of Shelby County is subject to flooding, tornadoes, winter storms, and other natural hazards that can damage property, close businesses, disrupt traffic, and present a public health and safety hazard; and

WHEREAS the Mitigation Planning Core Group, comprised of representatives from the County, municipalities and stakeholder organizations, has prepared a recommended Mitigation Plan that reviews the options to protect people and reduce damage from these natural hazards; and

WHEREAS, the recommended Mitigation Plan has been widely circulated for review by the County's residents and federal, state and regional agencies and has been supported by those reviewers.

NOW, THEREFORE BE IT RESOLVED by the Shelby County Commissioners that:

1. SHELBY COUNTY COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN is hereby adopted as an official plan of Shelby County.

2. The Mitigation Planning Core Group is hereby established as a permanent advisory body. It shall be composed of representatives from the existing Mitigation Planning Core Group, as recommended by the Shelby County Emergency Management and Homeland Security Office. This includes those municipalities that pass a resolution to adopt for the Mitigation Plan.
3. The Core Group shall meet as often as necessary to prepare or review mitigation activities and progress toward implementing the Mitigation Plan. It shall meet at least once each year to review the status of ongoing projects.
4. The schedule of Core Group meetings shall be posted in appropriate places. All meetings of the Core Group shall be open to the public.
5. By November 30 each year, the Core Group shall prepare an annual evaluation report on the Mitigation Plan for the County Board of Commissioners and the municipalities.

The report will cover the following points:

- a. A review of the original plan.
  - b. A review of any natural disasters that occurred during the previous calendar year.
  - c. A review of the action items in the original plan, including how much was accomplished during the previous year.
  - d. A discussion of why any action items were not completed or why implementation is behind schedule.
  - e. Recommendations for new projects or revised action items. Such recommendations shall be subject to approval by the County Board of Commissioners and the affected municipality's governing boards as amendments to the adopted plan.
6. The director of each County office identified as "responsible agency" for the Mitigation Plan's action items shall ensure that the action item is implemented by the listed deadline subject to fiscal and staff time constraints.

Passed by the Shelby County Board of Commissioners on

Vote:

Yes \_\_\_\_

No \_\_\_\_



**Appendix A:  
Notification Process**

FOR IMMEDIATE RELEASE: November 4th, 2004

Contact: Tom Cisco, 937-693-3395

**Shelby County to Complete an All Natural Hazard Mitigation Plan**

Sidney, OH – The Shelby County EMA is moving forward in making their community disaster resistant by creating an All-Natural Hazards Mitigation Plan. Shelby County has received funding through the Ohio Emergency Management Agency to complete an All Natural Hazard Mitigation Plan. This will be an exciting process that will involve all jurisdictions of Shelby County. Tom Cisco, Director for Shelby County EMA, will head the Core Group: a mingling of leaders that has been established within the community. They will have a key role in creating a Mitigation Plan of which the entire County can be proud.

As part of the Disaster Mitigation Act, communities that desire to remain eligible for Federal and State mitigation funds must have an approved Mitigation Plan in place. Local participation is “key” to the successful implementation of these mitigation plans. Please Note: Townships may be covered by their County’s planning effort however all incorporated jurisdictions must participate in their County’s planning effort and adopt the approved plan (individually) in order to remain eligible for federal and state mitigation dollars in the future.

By choosing to participate in the Natural Hazard Mitigation Planning effort your communities (Shelby County and all incorporated jurisdictions) will become eligible for future federal or state mitigation money. This mitigation money usually comes in the form of a grant such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) or the Pre-Disaster Mitigation Grant Program (PDM), which is to be used to implement mitigation strategies and activities. Examples of eligible activities that could be supported by mitigation dollars include: relocation, acquisitions, elevation, dry-floodproofing, wet-floodproofing, lightning prediction systems, interoperable siren system, stream restorations or any other activity potentially funded with mitigation dollars.

Evans, Mechwart, Hambleton and Tilton (EMH&T), Inc. has been selected to lead this effort and brings to the table a substantial amount of experience in creating these types of plans.

FOR IMMEDIATE RELEASE: January 13, 2005  
Contact: Tom Cisco, 937-492-5635

### Shelby County Draft All Natural Hazard Mitigation Plan Public Hearing

Sidney, OH – The Shelby County EMA/Department of Homeland Security in coordination with a Core Group of leaders invited to participate has created a draft Shelby County All Natural Hazard Mitigation Plan (Mitigation Plan). This plan, once approved by the Federal Emergency Management Agency will guarantee Shelby County's eligibility to receive mitigation dollars from Federal and State sources in the future. Shelby County is only one of seventeen counties that received funding from the Ohio Emergency Management Agency to complete an All Natural Hazard Mitigation Plan in 2004. Tom Cisco, Director for Shelby County EMA, headed up the Core Group, which had representation from all incorporated areas of Shelby County as well as key County Agency representation. Each Core Group member had a key role and was instrumental in moving Shelby County forward in disaster resistance.

This mitigation money usually comes in the form of a grant such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) or the Pre-Disaster Mitigation Grant Program (PDM), which is to be used to implement mitigation strategies and activities. Examples of eligible activities that could be supported by mitigation dollars include: relocation, acquisitions, elevation, dry-floodproofing, wet-floodproofing, lightning prediction systems, interoperable siren system, stream restorations or any other activity potentially funded with mitigation dollars.

There will be a public hearing on the draft Mitigation Plan on February 17, 2005, at 6:00 pm at the Agricultural Building next to the EMA Offices on Fair Road in Sidney.

There are several copies of the draft mitigation plan available for review at the following locations:

September 13th, 2004

Re: **Kick-off Meeting for Hazard Mitigation Planning**

The Shelby County Emergency Management Agency (EMA) is moving forward in making their community Disaster Resistant and wants you to be a part of this precedent setting process.

A Core Group of people are needed for the purpose of creating the Shelby County All-Natural Hazards Mitigation Plan (Mitigation Plan) and it's now time to start planning. This will be an exciting process that will involve all nine incorporated jurisdictions (Kettlersville, Botkins, Anna, Jackson Center, Fort Loramie, Port Jefferson, Russia, Lockington and Sidney) of Shelby County as well as the townships of the County.

The Core Group will have a key role in creating the Mitigation Plan that the entire County can be proud of. It is anticipated that we will be meeting approximately 4 times.

There will be an initial "**kick-off**" meeting on September 27<sup>th</sup>, at 6:00 pm at the Shelby County Agricultural Center (next door to EMA). The agenda of this meeting will consist of the following items:

1. Discussion and Presentation of the All Hazard Mitigation Planning process
2. Establish meetings and important dates
3. Organize, schedule and conduct initial interviews
4. Review initial hazard assessment
5. Exchange information among Core Group Members
6. Discuss prioritizing the list of potential hazards
7. Discuss creation of a mission statement for the group

Evans, Mechwart, Hambelton and Tilton (EMH&T), Inc. has been selected to lead this effort and brings to the table a substantial amount of experience in creating these types of plans.

If you have any questions before the kick-off meeting please do not hesitate to call or e-mail with questions or comments.

Your attendance during this project is very important to your political sub-division and their part of the Mitigation Plan.

Sincerely,

Tom Cisco  
Director  
Shelby County EMA

CC: Kari Mackenbach, EMH&T  
File

August 2, 2004

Auglaize  
Darke  
Miami  
Champaign  
Logan

Re: **Shelby County All Natural Hazards Plan (Mitigation Plan)**

Dear County Commissioners or EMA Director: **(personalize)**

The purpose of this letter is to notify adjacent counties that Shelby County is actively developing a countywide All Natural Hazards Mitigation Plan. The purpose of this Mitigation Plan is to allow all of Shelby County to better plan for natural hazard events. We are also using our Mitigation Plan to meet the mandates of the Federal Disaster Mitigation Act of 2000. We also wanted to develop a working plan that would meet the needs of Shelby County, and not be merely a “shelf document.”

We have been advised of the possible potential requirement to notify adjacent communities. *Therefore, let this letter serve as notification to adjacent communities that Shelby County is actively developing an All Natural Hazards Mitigation Plan.*

Please contact us as necessary with any questions, comments, concerns, or for more information or clarification on this or any other issue.

Thank you,

Sincerely,

Tom Cisco  
Director

CC: Shelby County Board of Commissioners  
Kari Mackenbach, EMH&T  
Shelby County EMA file



January 13, 2005

Mr. Michael Busse  
232 West Main Street  
P.O. Box 306  
Russia, Ohio 45365

**Re:** Shelby County Natural Hazards Mitigation Plan

Dear Mr. Busse:

As you are aware, the Shelby County Emergency Management Agency (EMA) and a selected Core Group have been actively involved in drafting an All Natural Hazards Mitigation Plan (Mitigation Plan) for your County. As a group, the EMA and Core Group developed alternatives and projects to mitigate the problems within the County due to natural disasters. These alternatives are listed in a matrix that is attached to this letter and will be included in the Mitigation Plan. The rating of these alternatives was discussed and revised at the January 12, 2005 mitigation planning meeting. Please review the minutes from that meeting for those changes.

Another component of this plan is compiled of mitigation alternatives and projects that each individual jurisdiction chooses to support in their community. As a representative of one of the incorporated jurisdictions within Shelby County and a member of the Core Group, you are being asked to review the overall matrix and select a mitigation alternative or alternatives to support in your community. Please choose your alternative(s) to support and forward them to me by January 25, 2005.

If you have any questions before the final meeting please do not hesitate to call me at (513) 697-8701 or e-mail me at [mrichard@emht.com](mailto:mrichard@emht.com).

Sincerely,

EVANS, MECHWART, HAMBLETON & TILTON, INC.

Maureen M. Richard, P.E.  
Senior Project Engineer

# Village of Jackson Center, Ohio

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P.O. Box 819, 122 E. Pike Street, Jackson Center, Ohio 45334  
Phone (937) 596-6314

January 24, 2005

Ms. Maureen Richard, P.E.  
EMH&T Inc  
8790 Governor's Hill Drive, Suite 110  
Cincinnati, Ohio 45249

Subject: Mitigation Plan Survey Shelby County  
Village of Jackson Center

Dear Ms. Richard;

I apologize for not having a representative from Jackson Center to participate in the discussions of the Shelby County Mitigation Plan. Apparently the meeting notices were sent to the Mayor. Our Mayor is a part-time position. Consequently, the flow of information sent to the Mayor's office may not be distributed to the proper individuals in a timely manner. If possible, please send the notices to my attention. Either I or Fire Chief Bruce Metz will attend the meeting. Bruce or I will be attending the meeting on February 17, 2005.

I have enclosed a completed survey for your perusal. Please contact me if you have questions or need more information.

Best regards,



W. Michael Dodds  
Village Administrator

Enclosure

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## Shelby County Natural Hazards Mitigation Plan Survey

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**1. Community Name**

Village of Jackson Center

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**2. Name, phone number, fax and e-mail address of contact for this community information:**

W. Michael Dodds, Village Administrator  
Phone 937-596-5440, Fax 937-596-6672, E-mail vjcmike@woh.rr.com

---

**3. Does your community have a web site? If yes, what is the URL address?**

jacksoncenter.com

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**4. Please provide background information on your community's "history," such as when it was organized, when it became a city or a village, interesting people from your community, how it got its name and any other important or interesting facts? If you are not familiar with this information, do you know anyone we can contact to get this information? If so, please list these contacts.**

See attached: Village of Jackson Center History

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**5. Can you list any significant historical natural events that occurred in your community? Specifically, have there been any natural disaster events in your community that have left a permanent mark? (i.e., Nicknamed: The Blizzard of 78', The Flood of 1913 etc.)**

See attached

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**6. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?**

See attached

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**7. Please provide a list of addresses/phone numbers of all your critical facilities? Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, prisons etc.? If you do not have this information, can you provide us with a contact in your community that may?**

Jackson Center Local School, 204 South Linden, 937-596-6149, 937-596-6053  
Village Offices, 122 E. Pike St., 937-596-5440, 937-596-6314  
Village Police 110 S. Linden, 937-596-6140, 937-498-1111, 911  
Fire Dept. 110 S. Linden, 911, 937-498-1111  
Water Treatment Plant, 600 S. Main 937-596-5251  
Wastewater Treatment Plant, 500 Jerry Drive 937-596-5251

**8. Does your community have any facilities that have the ability to hold large crowds such as arenas, sporting events, etc.? If yes, please give the name and location of these facilities.**

Jackson Center Local School, 204 South Linden

**9. Does your community have any type of early warning detection system(s)? Please describe:**

Siren

**10. Are any of the following natural hazards a serious concern in your community? Please rank based on severity with:**

- 3 - being a serious concern,**
- 2 - moderate concern, and**
- 1 - representing no concern :**

Hazards	Rank
<b>Floods</b>	
▪ 100-year Floodplain Floods - <i>defined with the NFIP Maps</i>	2
▪ Flash Floods - <i>defined as flooding that follows heavy rain</i>	3
▪ Non-Flood Zone Floods - <i>defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.</i>	3
<b>Tornadoes</b>	
▪ Tornadoes	3
<b>Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.</b>	
▪ Ice Storms	2
▪ Hail	2
▪ Winter Storms	2
▪ Thunderstorms	2
▪ High and Low Temperatures	1
▪ Lightning	1
▪ High Winds	2
<b>Earthquakes</b>	
▪ Earthquakes	3
<b>Droughts</b>	
▪ Wild land Fires	1

**11. Are there other natural hazards not mentioned above that your community has experienced?**

None

**12. Can you provide the following documents? If you do have any of these documents, may we contact you to get more information?**

1. **Comprehensive Plan(s)** Emergency Water Contingency Plan
2. **Floodplain Ordinance(s)** None
3. **Land Use Ordinance(s)** Zoning Regulations & Subdivision Regulations
4. **Organized Watershed Group(s)** None

**Are there any other documents you think we should look at?**

None

## Village of Jackson Center History

Ohio is composed of 88 counties, one of which is Shelby, named for General Shelby of Kentucky, who was involved in Indian Affairs in this locality. 1819 is the recorded date for the start of Shelby County. The county was subdivided into townships, one of which is Jackson which lays in the north eastern corner of the county.

Jackson Center started May 4, 1835 with 24 lots. Businesses in the area included dry goods stores, a shoe shop, a blacksmith shop, an undertaking and wagon shop, a cabinet maker, a hotel known as the Carter House, Heinler Hardware, a drug store, a bicycle and musical instrument shop, a restaurant, a bakery and ice cream parlor, a seamstress, a hat shop and a well equipped dental office. There was a newspaper published by J.G. Sailor. Two early physicians were Dr. Holsten and M.M. Carter. At one time as many as five physicians served Jackson Center and the community. They were Doctors Carter, McBurney, Ailes, McCormick and Mollie Hawver.

The earliest church, the First Methodist Church, was started in 1838. The Seventh Day Baptists organized on March 22, 1840. Another early church in the Village was the Church of Christ. Grace Lutheran Church was organized around 1921. In 1946 the Seventh Day Adventist Church was built.

Jackson Center was incorporated November 7, 1894 and the first Council met on April 9, 1895. In June of 1895 the first bank of Jackson Center was organized under the name of The Farmer's & Merchants Bank of Jackson Center with Shelby Baughman as president. The first account was opened by the Jackson Center Elevator Co. After a service of two years, the cashier died and was succeed by Frank Baughman. F.M. Wildermuth became assistant cashier. In 1907, the institution was reorganized and became the First National Bank of Jackson Center.

Around 1890, a college was built west of the D.T.&I, railroad. The college was financed by local citizens using solicitation. Shelby Baughman served as president of the Trustees of the school. A man named Professor Heck was in charge of the curriculum. In a newspaper account of the dedication, the writer editorialized, "It is the only institution of its kind in Shelby County and Jackson Center is a most desirable place for an institution of its kind." Over 140 students, who finished the courses, went on to teach in the surrounding area. The college lasted only four years.

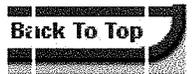
Records of early schools are vague. Some believe that German pastors presided over parochial schools first, but the immediate settlement of Jackson Center was Seventh Day Baptist people rather than German Lutherans or Catholics. One room elementary schools dotted the rural area around Jackson Center with a high enrollment. This enrollment varied with the type of farm work because boys and girls did help parents at home. As many as 50 pupils attended each of these schools. These pupils were grouped by how well the individual could read, not by age or grade. One school was built around 1902. There were 6 rooms. The 3 downstairs rooms housed the first 8 grades. The upstairs rooms served the high school. The primary room was located by a stove until 1912. The remainder of the building was heated by furnaces. A faculty of 5 to 6 teachers instructed the entire school. The

present high school building was built in 1926 and 1927.

The village has been the home of different fraternal bodies. Epler Masonic Lodge began working in Montra in 1871, but it moved to Jackson Center in 1977 and became the Jackson Center #458 Free & Accepted Masons. In 1901, Eureka Chapter, Order of the Eastern Star was instituted. The I.O.O.F. and the Daughters of Rebecca were instituted , but each of these disbanded after fires destroyed their hall. The Ladies American Club organized in 1895 and has continued through the years. They changed the name of the group to The American Club, but their objectives have remained the same. The most outstanding project was organizing the library and providing a building for the books. This was made possible with the cooperation of the area citizens and the Amos Library in Sidney, Ohio.

Throughout the years the peoples of Jackson Center have found many ways to keep entertained. Home town musicians got together and organized a band, not only for their own satisfaction, but to give street concerts during the summer months, and lead parades on Memorial Day. On Saturday nights ice-cream socials were held on church lawns. They served homemade ice cream and cake. There was a picture-house that showed silent movies to the patrons.

Although Jackson Center was one of the last Shelby County settlements to be established, the village grew rapidly. During the 1930's, the village's water and electric utilities were installed. Today, Jackson Center is the only Shelby County municipality to own its own electric system. The 2000 census figures show a population of 1,369. That makes Jackson Center the largest Shelby County village.



# Village of Jackson Center, Ohio

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P.O. Box 819, 122 E. Pike Street, Jackson Center, Ohio 45334  
Phone (937) 596-6314

1-19-05

## SHELBY COUNTY NATURAL HAZARDS MITIGATION PLAN SURVEY

5. Can you list any historical natural events that occurred in your community?

January 2005, Snow, Ice, Rain –  
Ice caused trees and tree limbs to fall. Massive clean up. Following the ice, 2.5 inches of rain caused the detention ponds to overflow, many streets were flooded. Minor electric outages, minutes to maximum 2 hours. Surrounding areas no electricity for 3 days to a week.

July 2003. Rain caused detention ponds to overflow, many streets were flooded.

6. What infrastructure concerns does your community have as it relates to flooding?

If we have a rainfall of more than 2" of rain in 12-hour period it causes the detention ponds to overflow. This causes many streets to be flooded. The worst flooding occurs in the eastern half of the village, east of railroad. The railroad acts as a dam, causing flooding on the east side of the railroad, north of Washington St. On the west side of the railroad there is some flooding of streets: Davis St. at the intersection with Linden Ave., West Pike (SR 274) of the intersection with Church St. and Jerry Drive at the wastewater Treatment Plant.

The culverts on East Pike St. (SR 274) and North Main St. (SR 65) and the bridge on West Pike St. appear to be adequate.

This flooding causes problems at the wastewater treatment plant

**Shelby County  
All Natural Hazard Mitigation Plan  
Core Group Attendance Sheet**

**IF YOU ARE IN ATTENDANCE PLEASE  
CIRCLE YOUR NAME.**

<b>Name</b>	<b>Affiliation</b>	<b>Address</b>	<b>Phone</b>	<b>Fax (Please record your fax number if you do NOT have an email address)</b>	<b>E-Mail</b>
Jerry Keener 1,2,3	Mayor – Lockington	10478 Seminole Piqua, Ohio 45356	937-778-0701		
Jack Toomey 1,3	County Commissioner	128 E. Court Street, Sidney, Ohio 45336	937-498-7226		<a href="mailto:commish@woco-k12.org">commish@woco-k12.org</a>
Mike Martz 1,2,3	Shelby County EMA	800 Fair Road, Sidney, Ohio 45336	937-538-6067		<a href="mailto:mikemartz-99@yahoo.com">mikemartz-99@yahoo.com</a>
John Shumate 1,2,3	Village of Kettlersville	8766 North Street, Kettlersville, Ohio 45306	937-693-6365	937-693-6365	
Dave Geuy 1,2,3	Salem Twp. Trustee	10960 Pasco Montra Road, Sidney, Ohio 45336	937-492-6765		<a href="mailto:romburns@hotmail.com">romburns@hotmail.com</a>
Mike Burns 1	Clinton Township	501 S. Ohio Avenue, Sidney, Ohio 45336	937-498-9678	937-492-8411	<a href="mailto:rbg@sceoshe.com">rbg@sceoshe.com</a>
Robert Geuy 1,3	Shelby County Engineer	500 Gearhart Road, Sidney, Ohio 45336	937-498-7244		
Urban Holthaus, Jr. 1,2,3	Cynthian Twp. Trustee	8605 Brandewine Road, Fort Loramie, Ohio 45845	419-582-4133		
John Pleiman 1,2	Cynthian	7675 Cardo Road, Sidney, Ohio 45336	937-492-1482		
Vernon Siegel 1,2	McLean	12203 Schmitmeyer-Baker Road Minster, Ohio 45865	419-628-2506		
Gary Bensman 1,2,3	Shelby Cty. Regional Planning	129 E. Court Street, Sidney, Ohio 45336	937-498-7273	937-498-1293	<a href="mailto:scrpc@bright.net">scrpc@bright.net</a>

1 Kick Off Meeting Attendees, 2 Problem Statement Meeting Attendees, 3 Alternative Meeting Attendees, 4 Final Meeting Attendees

**Shelby County  
All Natural Hazard Mitigation Plan  
Core Group Attendance Sheet**

**IF YOU ARE IN ATTENDANCE PLEASE  
CIRCLE YOUR NAME.**

Name	Affiliation	Address	Phone	Fax (Please record your fax number if you do NOT have an email address)	E-Mail
Michael L. Busse 1,2	Village of Russia	232 West Main Street, PO Box 306, Russia, Ohio 45365	937-526-4436	937-526-3884	<a href="mailto:russiapd@bright.net">russiapd@bright.net</a>
Denny Barker 1,2,3	Franklin Twp.	9183 North County Road 25A, Sidney, Ohio 45336	937-492-1857	937-492-1465	<a href="mailto:dbarker3@rr.com">dbarker3@rr.com</a>
Jeff Raible 1	Shelby County Chamber	101 South Ohio, Floor 2, Sidney, Ohio 45336	937-492-9122		<a href="mailto:jraible@sidneyshelbychamber.com">jraible@sidneyshelbychamber.com</a>
Paul Pulfer 1,2,3	Salem Twp. Trustee	11666 Shroyer Maplewood Road Maplewood, Ohio 45340	937-492-8226		
Tom Cisco 1,2,3	EMA	108 North Street, Botkins, Ohio 45306	937-693-3395	937-492-8507	<a href="mailto:schoema@woh.rr.com">schoema@woh.rr.com</a>
Mike Eilerman 1	Turtle Creek Twp. Trustee	128 West Russell Road, Sidney, Ohio 45336	937-497-1991	937-497-1939	
Larry Phlipot 1,2,3	Loramie Twp.	6111 Smith Road, Houston, Ohio 45333	937-773-3720		
John Greiwe 1,3	Perry Twp.	5965 SR 29E, Sidney, Ohio 45336	937-492-7209		
E D Kennedy 1,2,3	Turtle Creek Twp.	10490 Cisco Road, Sidney, Ohio 45336	937-492-8880		
Harry Groves 2,3	Perry Twp.	19200 Johnston Road, Sidney, Ohio 45365	937-492-1332		
Frank Mariano 2,3	City of Sidney	1620 Ash Place, Sidney, Ohio 45365 Mail: Jocele Fahnestock City Clerk 201 W. Poplar Street Sidney, Ohio 45365	937-492-2389		

1 Kick Off Meeting Attendees, 2 Problem Statement Meeting Attendees, 3 Alternative Meeting Attendees, 4 Final Meeting Attendees

**Shelby County  
All Natural Hazard Mitigation Plan  
Core Group Attendance Sheet**

**IF YOU ARE IN ATTENDANCE PLEASE  
CIRCLE YOUR NAME.**

Name	Affiliation	Address	Phone	Fax (Please record your fax number if you do NOT have an email address)	E-Mail
Ed Hasselman 2,3	Ft. Loramie	110 Grandview, Fort Loramie, Ohio 45845	937-295-3625		
Roger Schulze 2,3	Franklin Twp. Trustee	13523 Sharp Road, Sidney, Ohio 45365	937-498-1758		
Bill Knasel 2	Franklin Twp.	13765 Ft. Loramie Swanders Road, Sidney, Ohio 45365	937-492-9587		
Richard Meyer 2,3	Dinsmore Twp.	13390 Lock Two Road, Botkins, Ohio 45306	937-693-3806		
Larry Sprague 2,3	Jackson Twp.	22201 Linker Road, Jackson Center, Ohio 45334	937-596-6358		
Stephen R. Butterfield 2	Port Jefferson	P.O. Box 1891, Port Jefferson, Ohio 45360	937-492-9652		
Steve Stepler 2,3	Shelby County EMA	9050 Pleiman Road, Anna, Ohio 45302	937-394-2199		
Scott Garrett 3	Shelby County EMA	9363 Pasco-Montra Road, Sidney, Ohio 45365	937-497-9363		
Bryan Esser 3	Village of Botkins	Box 378, 212 Edgewood, Botkins, Ohio 45306	937-693-3844		<a href="mailto:esserb@bright.net">esserb@bright.net</a>
Jim King 3	Village of Botkins	Box 114, 328 King Street, Botkins, Ohio 45306	937-693-2886		
Dawn Pulfer 3	Village of Anna	201 Onyx, Anna, Ohio 45302	937-394-8491		<a href="mailto:spulfer@bright.net">spulfer@bright.net</a>
Dennis Martin 3	Orange Township	2300 Bulle Road, Sidney, Ohio 45365	937-492-7451		

1 Kick Off Meeting Attendees, 2 Problem Statement Meeting Attendees, 3 Alternative Meeting Attendees, 4 Final Meeting Attendees

**Shelby County  
All Natural Hazard Mitigation Plan  
Core Group Attendance Sheet**

**IF YOU ARE IN ATTENDANCE PLEASE  
CIRCLE YOUR NAME.**

Name	Affiliation	Address	Phone	Fax (Please record your fax number if you do NOT have an email address)	E-Mail
Max Bell	Salem Township	9780 Tawawa-Maplewood Road, Maplewood, Ohio 45340	937-492-1008		

Shelby County All Natural Hazard Mitigation  
Public Meeting Comments

Date: February 17, 2005

There were no comments recorded from the public meeting.

**Appendix B:  
Political Boundaries**



ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

EVANS, MECHWART, HAMBLETON & TILTON  
170 MILL STREET  
GAHANNA, OHIO 43230  
TELEPHONE (614) 471-5150  
FACSIMILE (614) 471-9286

SHELBY COUNTY, OHIO  
**MAP B-1**  
COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN  
Political Boundaries

January 2005

Job No 2004 1605

Scale: As Noted



**Appendix C:**  
**Watershed Maps**



ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

EVANS, MECHWART, HAMBLETON & TILTON

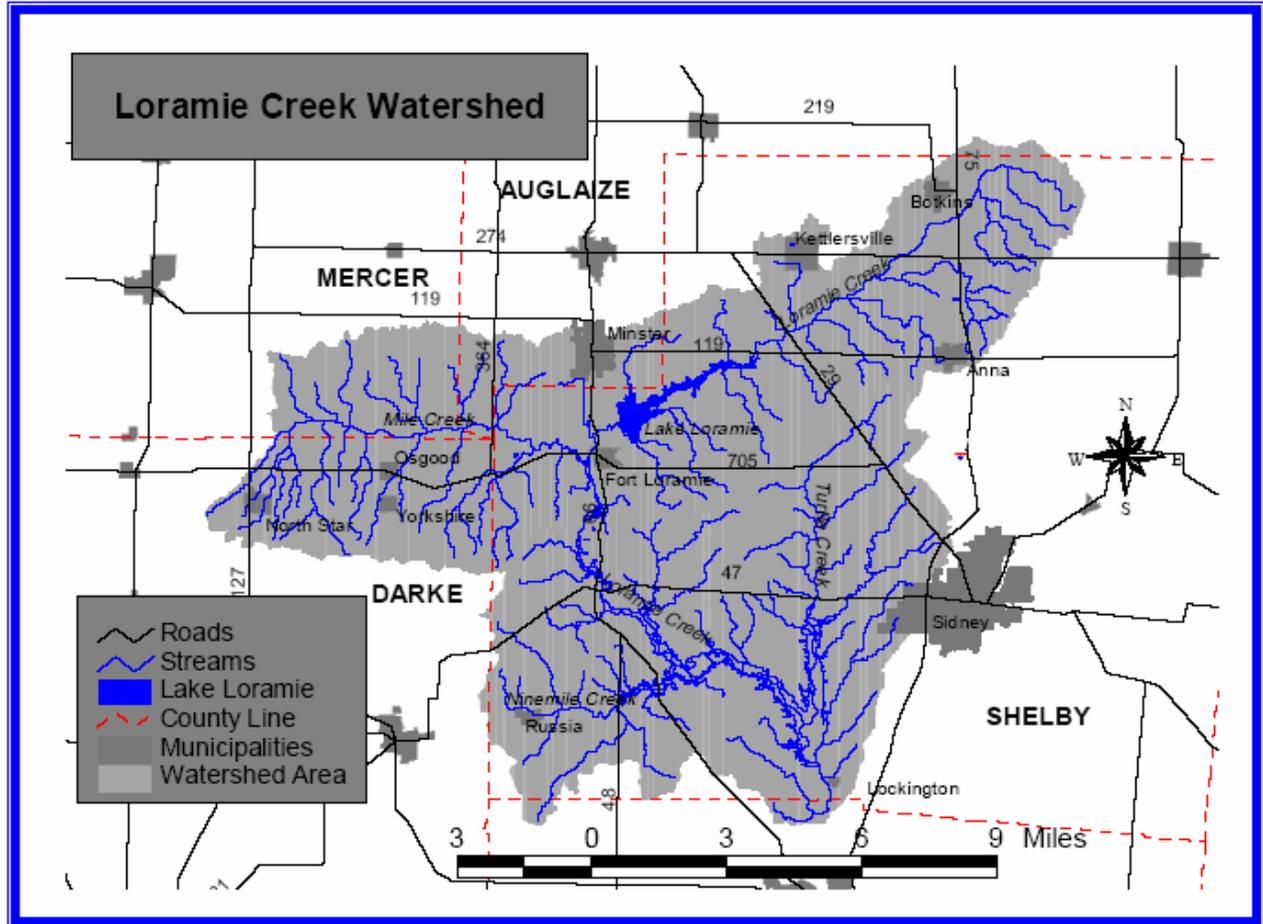
170 MILL STREET  
GAHANNA, OHIO 43230  
TELEPHONE (614) 471-5150  
FACSIMILE (614) 471-9286

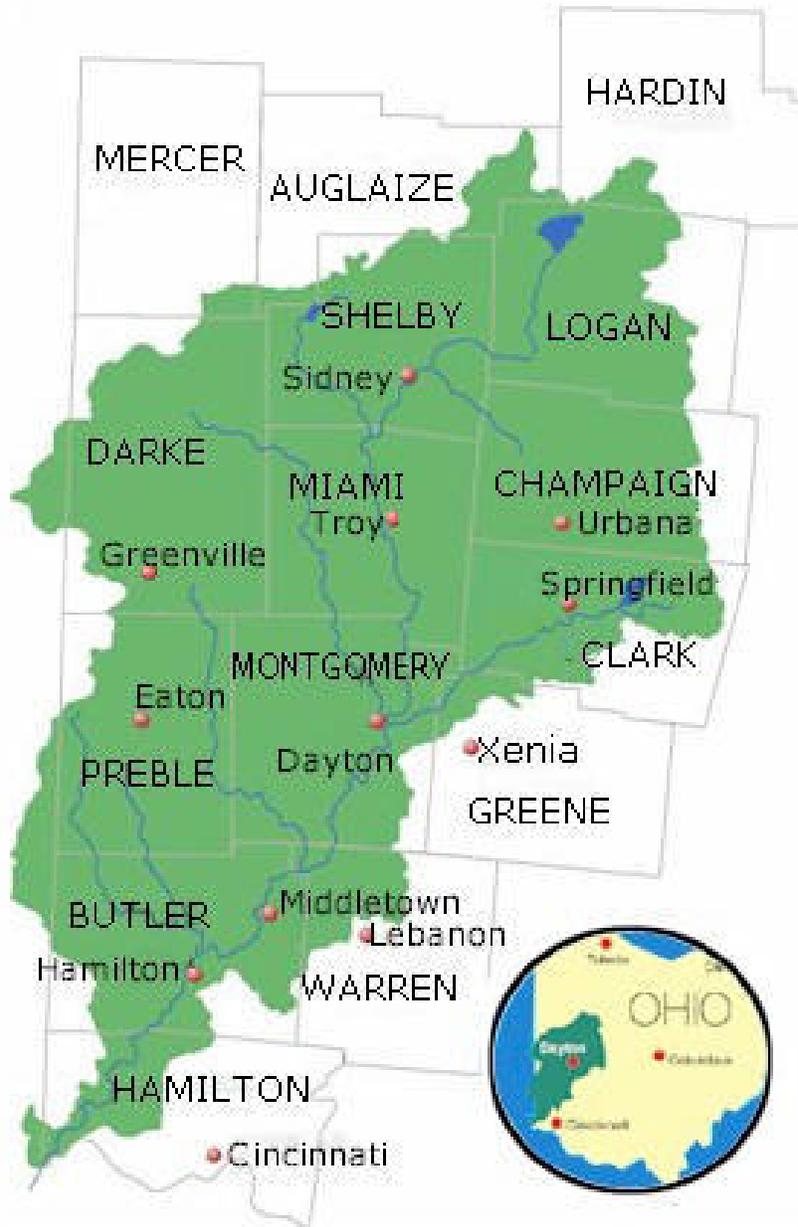
SHELBY COUNTY, OHIO  
**MAP C-1**  
COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN  
Loramie Creek Watershed

January 2005

Job No 2004 1605

Scale: As Noted







ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

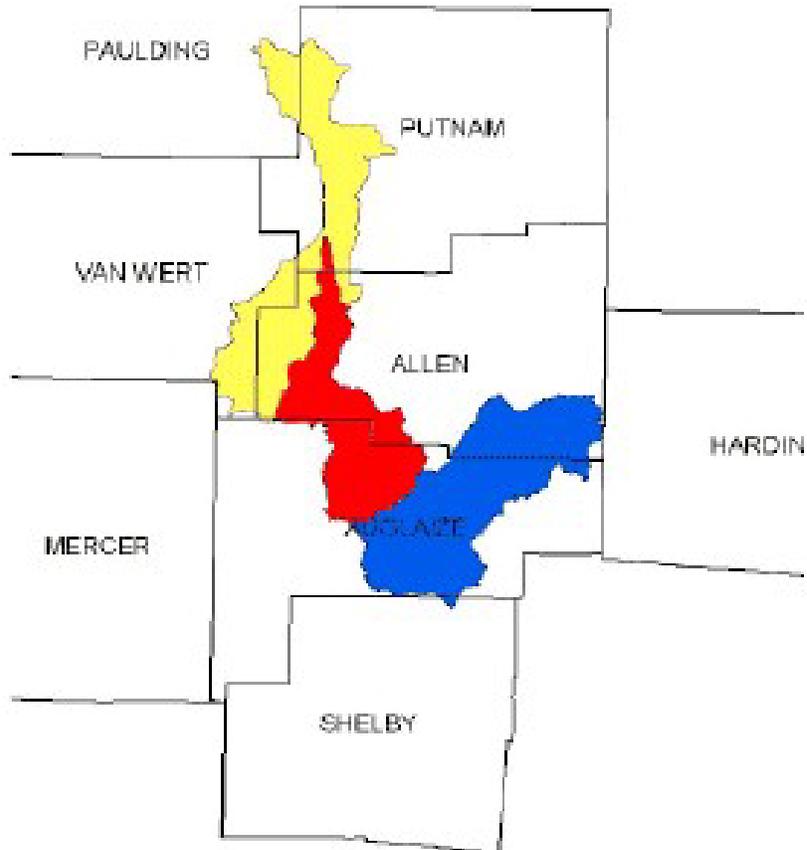
EVANS, MECHWART, HAMBLETON & TILTON  
170 MILL STREET  
GAHANNA, OHIO 43230  
TELEPHONE (614) 471-5150  
FACSIMILE (614) 471-9286

SHELBY COUNTY, OHIO  
**MAP C-3**  
COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN  
Upper Auglaize River Watershed

January 2005

Job No 2004 1605

Scale: NTS



**Appendix D:  
Utility Service Maps**



ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

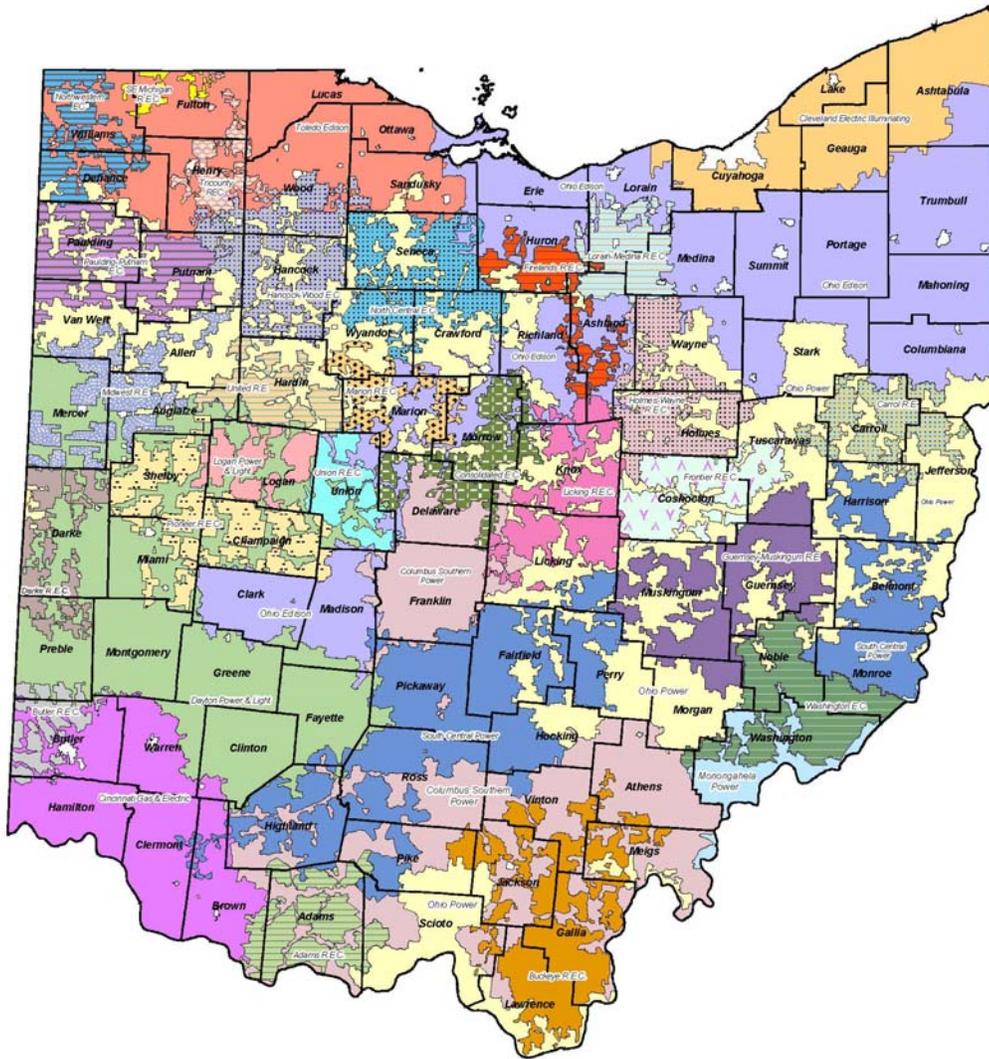
EVANS, MECHWART, HAMBLETON & TILTON  
 170 MILL STREET  
 GAHANNA, OHIO 43230  
 TELEPHONE (614) 471-5150  
 FACSIMILE (614) 471-9286

SHELBY COUNTY, OHIO  
**MAP D-1**  
 COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN  
 Service Areas of Ohio Electric Companies

January 2005

Job No 2004 1605

Scale: NTS



Investor-owned Utilities		Rural Electric Companies			
	Cincinnati Gas & Electric		Adams		Firelands
	Cleveland Electric Illuminating		Buckeye		Frontier
	Columbus Southern Power		Butler		Guemsey-Muskingum
	Dayton Power & Light		Carroll		Lorain-Medina
	Monongahela Power		Consolidated		Marion
	Ohio Edison		Hancock-Wood		Midwest
	Ohio Power		Holmes-Wayne		North Central
	Toledo Edison		Licking		Northwestern
			Darke		Pioneer
					South Central
					Southern Michigan
					Tricounty
					Union
					United
					Washington
					Pauling-Putnam



ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

EVANS, MECHWART, HAMBLETON & TILTON

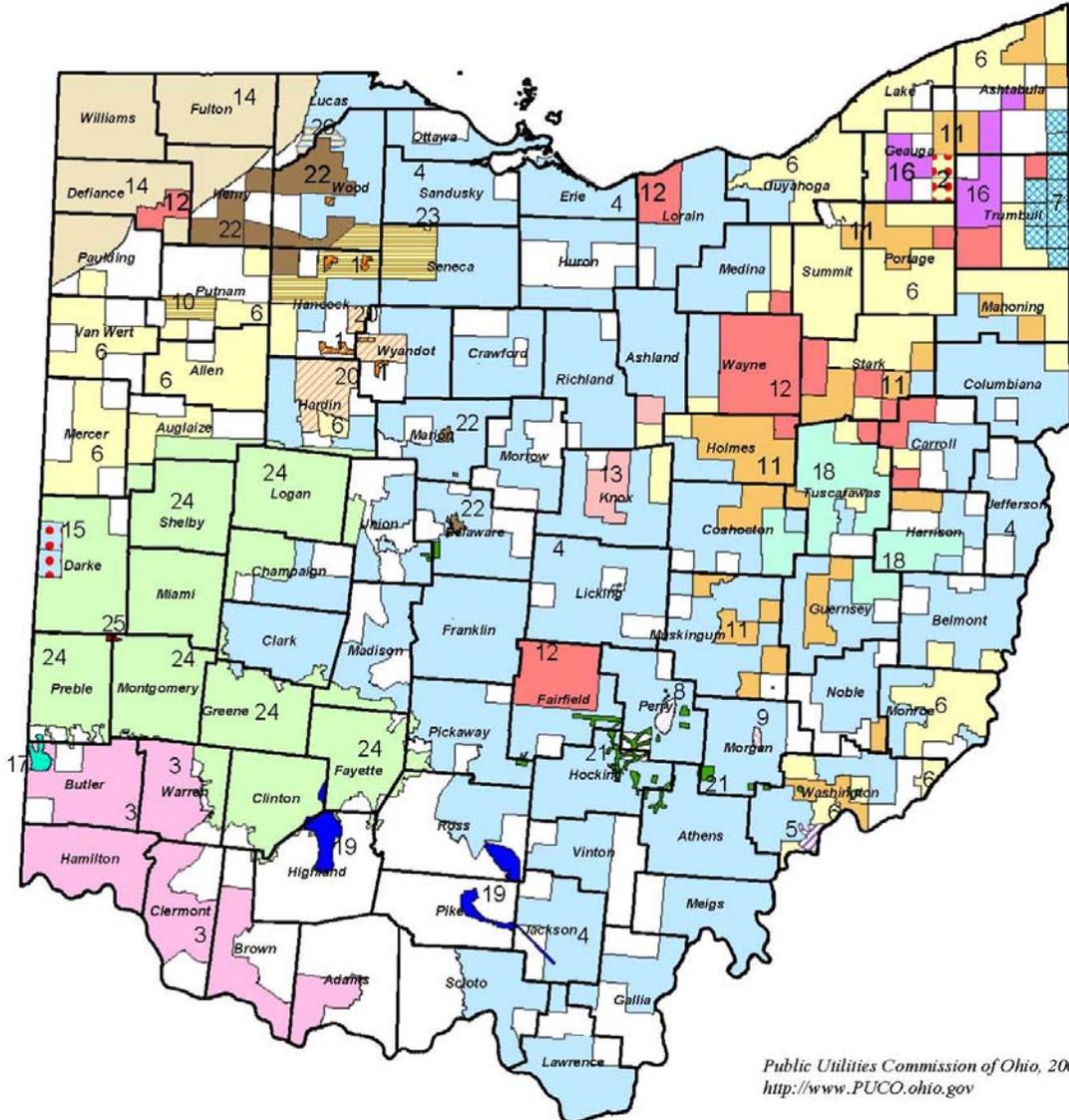
170 MILL STREET  
GAHANNA, OHIO 43230  
TELEPHONE (614) 471-5150  
FACSIMILE (614) 471-9286

SHELBY COUNTY, OHIO  
**MAP D-3**  
COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN  
PUCO Regulated Natural Gas Companies

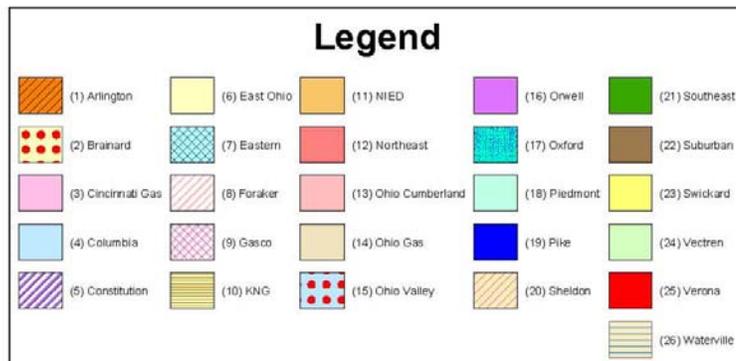
January 2005

Job No 2004 1605

Scale: NTS



Public Utilities Commission of Ohio, 2002  
<http://www.PUCO.ohio.gov>





**Appendix E:**  
**Groundwater Resources of**  
**Shelby County**



ENGINEERS, SURVEYORS, PLANNERS, SCIENTISTS

EVANS, MECHWART, HAMBLETON & TILTON

170 MILL STREET  
GAHANNA, OHIO 43230  
TELEPHONE (614) 471-5150  
FACSIMILE (614) 471-9286

SHELBY COUNTY, OHIO

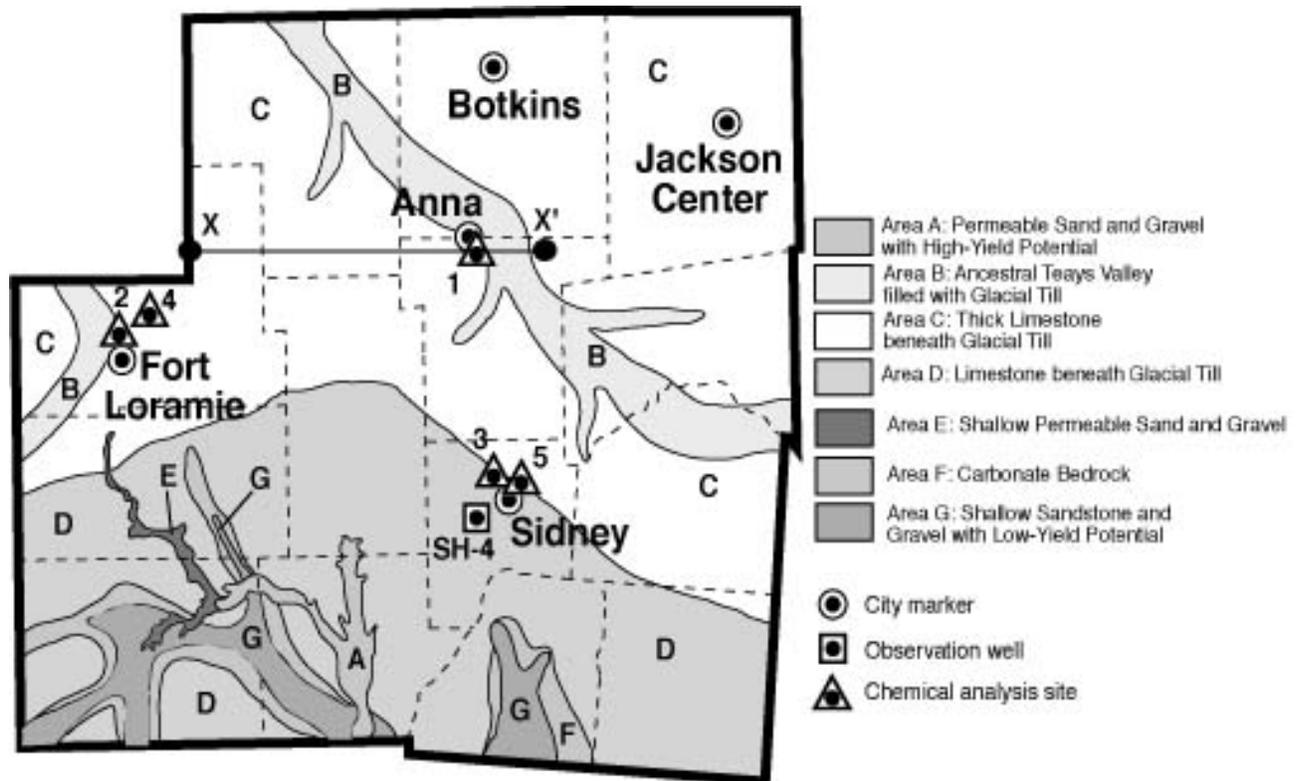
### MAP E-1

## COUNTYWIDE ALL NATURAL HAZARD MITIGATION PLAN Groundwater Resources for Shelby County

January 2005

Job No 2004 1605

Scale: NTS



**Appendix F:  
Meeting Minutes**

**Shelby County  
All Natural Hazard Mitigation Meeting Minutes  
Kick off Meeting**

Date: September 27, 2004

Attendance:

Jerry Keener, Mayor – Lockington  
Jack Toomey, Shelby County Commissioner  
Mike Martz, Shelby County EMA  
John Shumate, Village of Kettlersville  
Dave Geuy, Salem Twp. Trustee  
Mike Burns, Clinton Township  
Robert Geuy, Shelby County Engineer  
Urban Holthaus, Jr., Cynthian Twp. Trustee  
John Pleiman, Cynthian  
Vernon Siegel, McLean Township  
Gary Bensman, Shelby Cty. Regional Planning  
Michael L. Busse, Village of Russia  
Denny Barker, Franklin Township  
Jeff Raible, Shelby County Chamber of Commerce  
Paul Pulfer, Salem Twp. Trustee  
Tom Cisco, Shelby County EMA  
Mike Eilerman, Turtle Creek Twp. Trustee  
Larry Philpot, Loramie Twp.  
John Greiwe, Perry Twp.  
Ed Kennedy, Turtle Creek Twp.  
Kari Mackenbach, EMH&T  
Maureen Richard, EMH&T

Meeting began with introductions of EMH&T, who will serve as our consultant during the planning process and document development. Ms. Kari Mackenbach is the Program manager for Natural Hazard Mitigation Planning and is located in their Columbus office. Ms. Maureen Richard is a Professional Engineer acting as a Project Manager in this effort and is located in their Cincinnati office.

An overview of the planning process was presented by Kari Mackenbach of EMH&T Inc.

Ms. Mackenbach provided a list of disasters that have affected Shelby County since 1950 as part of EMH&T's initial hazard assessment. A project timeline was presented as well as the three C's of planning (Comprehensive, Coordinated, and Collaborative). Ms. Mackenbach emphasized the need for input from those in the community in this plan development.

Ms. Mackenbach led a discussion on critical facilities. EMH&T needs names and addresses of all critical facilities within each community. Critical facilities are fire departments, police departments, emergency services (EMA and hospitals), nursing homes, schools, day care facilities, large populous areas, municipal buildings as well as any other structure that a community may feel needs to be included to protect human health. These facilities will be illustrated on a GIS map to be included in the Mitigation

Plan. Mr. Tom Cisco is to provide a list of facilities for everyone's review at the next planning meeting.

A question and answer period followed the presentation. There were many questions concerning the GIS mapping. Ms. Mackenbach explained that base map information was extracted from ODOT as well as from ODNR through their Geographical Information Mapping System (GIMS). The software being used is ArcView. There were also concerns as to who the Core Group would continue to see from EMH&T. Ms. Mackenbach assured the Group that they would continue to deal with herself and/or Ms. Richard.

Ms. Mackenbach requested contact information and documents from the Core Group that would aid EMH&T in their research (subdivision regulations, floodplain regulations, building codes, zoning codes, comprehensive plan). It was noted that Shelby County has its own building codes. Anna and Jackson Center have adopted the County's building codes. The County also has subdivision regulations. The townships and villages have zoning codes. The County also has floodplain regulations and thought that all communities were participating in the National Flood Insurance Program. EMH&T to confirm.

A need to involve other communities not in attendance was stressed by Ms. Mackenbach. Mr. Cisco will send a letter to the Mayors of those communities that were identified inviting them to the next meeting (Fort Loramie, Botkins, Anna, Jackson Center, Port Jefferson, Sidney).

Next meeting: Wednesday October 20<sup>th</sup> at 6:30 PM, Location TBD.

**Shelby County  
All Natural Hazard Mitigation  
Problem Statement Development Meeting Minutes**

Date: November 3, 2004

Attendance:

Jerry Keener, Mayor – Village of Lockington  
Jack Toomey – Shelby County Commissioner  
Mike Martz, Shelby County EMA  
John Shumate, Village of Kettlersville  
Dave Geuy, Salem Twp. Trustee  
Urban Holthaus, Jr., Cynthian Twp. Trustee  
John Pleiman, Cynthian  
Vernon Siegel, McLean Township  
Gary Bensman, Shelby Cty. Regional Planning  
Michael L. Busse, Village of Russia  
Denny Barker, Franklin Township

Paul Pulfer, Salem Twp. Trustee  
Tom Cisco, Shelby County EMA  
Larry Philpot, Loramie Twp.  
Ed Kennedy, Turtle Creek Twp.  
Harry Groves, Perry Twp.  
Frank Mariano, City of Sidney  
Ed Hasselman, Village of Fort Loramie  
Roger Schulze, Franklin Twp. Trustee  
Bill Knasel, Franklin Twp.  
Richard Meyer, Dinsmore Twp.  
Larry Sprague, Jackson Twp.  
Stephen Butterfield, Village of Port Jefferson  
Steve Stepler, Shelby County EMA  
Maureen Richard, EMH&T

Meeting began with brief overview of the purpose of the Mitigation Planning process and the Core Group's Mission Statement for those who did not attend the Kick-Off meeting.

**Core Group Natural Mitigation Plan  
Mission Statement**

**The mission is to develop a document that meets the mandates of the Federal Disaster Mitigation Act of 2000. Through research, Shelby County will anticipate future natural hazard occurrences so as to implement appropriate mitigation techniques. The techniques identified in this document will have a positive impact on the residence, property and resources of Shelby County. Implementation of these techniques will: a) save lives, b) protect property; c) reduce the cost of recoveries through an efficient, coordinated rapid response; and, d) increase the educational awareness of frequency of natural hazard events.**

Ms. Richard reviewed which communities were participating in the National Flood Insurance Program – Sidney, Botkins, Port Jefferson, Russia. She also discussed those communities who are eligible to participate – Anna, Fort Loramie, Jackson Center, Kettlersville, Lockington. No communities in Shelby County have specifically voiced to FEMA that they did not want to participate in the NFIP program.

Ms. Richard asked for comments on the meeting minutes from the September 27, 2004 meeting. No comments were noted.

Ms. Richard reviewed the initial hazard assessment and explained that the hazards as listed in the assessment needed to be ranked by the group in the order of relevance to

their county. The hazards were ranked as follows, the first being the hazard with the highest level of concern and the last being the hazard of least concern:

1. Winter Storms – Snow/Ice/Extreme Cold
2. Summer Storms – Thunderstorms/High Winds/Hail/Lightning
3. Flooding – Include landslides as a result
4. Tornadoes
5. Droughts/Extreme Heat/Wild Fires
6. Earthquakes

Ms. Richard reviewed the information (names and addresses) needed from the communities concerning compiling a critical facilities list. EMH&T will be mapping the facilities for the communities and returning the maps to them in an electronic format for their future use. Mr. Cisco distributed a list of facilities for the Core Group to review and provide additional information.

Ms. Richard led a discussion concerning problems existing in the County as they pertain to the ranked hazard categories. These problems will be transferred into Draft Problem Statements for the Core Group to review prior to the next meeting. The Core Group voiced problems that were listed on paper and are as follows:

#### Winter Storms

- Lack of back-up generators for critical facilities.
- Factories/Employers and other counties ignore States of Emergencies.
- Lack of public awareness of dangers and how to prepare.
- Prolonged power outages and effect on sensitive populations – do communities know where the sensitive populations are?
- Need additional salt storage facilities because the County runs out of salt year after year.
- Public unaware of designated shelter locations.
- Need public awareness of snow loading on older buildings built prior to building codes.
- Blocked transportation may interrupt service.

#### Summer Storms

- Prolonged power outages and effect on sensitive population.
- Lack of equipment for debris removal.
- Many older, large hazard trees throughout county cause damage to power lines.
- Hail causes extensive roof damage.
- Ditches/culverts lack capacity to handle flow from heavy rain events.
- Lack of early warning system – lack of sirens, NOAA radios, reverse 9-1-1.
- Lack of “All Clear” message after warning expires.
- Lack of back-up generators for critical facilities.
- Lack of public awareness of dangers of severe storms.

#### Flooding

- Bridges, culverts and roads get washed out.
- Lack of public awareness of dangers of driving through high water.
- No regulations for propane tanks located above ground and outside of the 100-year floodplain.

- Citizen apathy due to infrequency of flooding.
- Lack of gas powered trash pumps for clean up process.
- Potential well water contaminations from flood water as well as from some leach fields located in the floodplain.
- Lack of river/stream maintenance program for log and debris jams.

#### Tornadoes

- Lack of early warning system - lack of sirens, NOAA radios, reverse 9-1-1.
- Lack of "All Clear" message after warning expires.
- Lack of safe rooms in new construction.
- No shelters at mobile home parks and campgrounds.
- Lack of equipment for debris clean up process.
- Lack of back-up generators for critical facilities.

#### Droughts/Extreme Heat/Wild Fires

- Lack of public awareness of open burning.
- No current restrictions on open burning during drought conditions.
- Water supply could be depleted during severe droughts. County wells may be susceptible to drying up.
- Risk of grass fires increases.
- Communities do not have contingency plans for back up water supply.
- Communities do not have a list of critical facilities and businesses that are dependent on water to operate.
- Water treatment plant may not have capacity to treat raw water that is needed.

#### Earthquakes

- Lack of public awareness of risks.
- Lack of back-up generators for critical facilities.
- Lack of shelters.
- Water service may be disrupted.
- Transportation service may be interrupted due to road damage.
- Older buildings not built to current codes.
- Lack of early warning system.
- Old mines, combined with land subsidence risks, elevate earthquake damage potential.
- Mobile homes may not have adequate foundation/anchoring and may fall.
- Communities may be subject to soil liquefaction.

Ms. Richard discussed some of the information, such as Subdivision Regulations, Zoning Codes, Floodplain Regulations, Comprehensive Plans and Emergency Operation Plans, of which EMH&T will need to get copies from the County for inclusion in the Mitigation Plan. Ms. Richard left a typed list of information needed to be collected with Mr. Cisco and Mr. Gary Bensman (Regional Planning Commission). It was noted that if all townships have similar regulations, EMH&T only needs one copy for summarizing the contents.

Next meeting: Wednesday November 24th at 6:30 PM, at the Agricultural Building next door to the EMA.

**Shelby County  
All Natural Hazard Mitigation  
Mitigation Alternatives Development Meeting Minutes**

Date: November 24, 2004

Jerry Keener, Mayor – Village of Lockington  
Jack Toomey – Shelby County Commissioner  
Mike Martz, Shelby County EMA  
John Shumate, Village of Kettlersville  
Dave Geuy, Salem Twp. Trustee  
Urban Holthaus, Jr., Cynthian Twp. Trustee  
Gary Bensman, Shelby Cty. Regional Planning  
Denny Barker, Franklin Township  
Paul Pulfer, Salem Twp. Trustee  
Tom Cisco, Shelby County EMA  
Larry Phlipot, Loramie Twp.  
John Greiwe, Perry Twp.

Ed Kennedy, Turtle Creek Twp.  
Harry Groves, Perry Twp.  
Frank Mariano, City of Sidney  
Ed Hasselman, Village of Fort Loramie  
Roger Schulze, Franklin Twp. Trustee  
Richard Meyer, Dinsmore Twp.  
Larry Sprague, Jackson Twp.  
Steve Stepler, Shelby County EMA  
Scott Garrett, Shelby County EMA  
Bryan Esser, Village of Botkins  
Jim King, Village of Botkins  
Dawn Pulfer, Village of Anna  
Dennis Martin, Orange Twp.  
Max Bell, Salem Twp.  
Maureen Richard, EMH&T

Ms. Richard gave a brief overview of the mitigation planning process for those not in attendance at previous meetings.

The Core Group reviewed the meeting minutes from November 3, 2004. There were no comments on the minutes.

The Draft Problem Statements were redistributed for the Core Group's review. Ms. Richard stated that the Group should review and forward any comments to Mr. Cisco.

Overall goals are attached to the Problem Statements. The Core Group members are to review these goals and approve or comment. Comments to be sent to Mr. Cisco to forward to EMH&T.

Ms. Richard led a brief discussion on needed information for critical facilities. Mr. Cisco is compiling the list and needs additional information forwarded to him.

Ms. Richard reviewed the six categories of Hazard Management Practices as approved by FEMA.

- Preventive Measures
- Property Protection Measures
- Natural Resource Protection
- Emergency Services
- Structural Projects
- Public Information

Ms. Richard led a discussion concerning possible alternative activities to mitigate the problems which exist in Shelby County. Alternatives were developed by the Core Group per hazard.

#### Winter Storms (Snow, Ice)

- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.
- Seek funding for additional salt storage facilities and loading equipment for townships.
- Develop an outreach program for informing citizens of designated shelter locations.
- Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.
- Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.

#### Summer Storms (Thunderstorms, High Wind, Lightning, Hail)

- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.
- Develop an outreach program for informing citizens of designated shelter locations.
- Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Develop an education program on hazards associated with severe storms and how to prepare prior to a severe weather event.
- Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.
- Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.
- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.

## Flooding

- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.
- Develop an outreach program for informing citizens of designated shelter locations.
- Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Develop an education program on hazards associated with severe flooding and how to prepare prior to a flood event.
- Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.
- Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.
- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.
- Seek funding for auto sandbag filling equipment.
- Seek funding to update Flood Insurance Rate Maps. Current FIRMs are dated September 2, 1982.
- Develop river and stream maintenance program for removing debris and log jams from drainage ways.
- Encourage communities to join the National Flood Insurance Program, which would allow residents to purchase flood insurance.
- Elevate flood prone structures above Base Flood Elevation, which is the elevation of the 100-year floodplain.

## Tornadoes

- Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.
- Develop an outreach program for informing citizens of designated shelter locations.
- Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.
- Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
- Develop an education program on hazards associated with tornadoes and how to prepare prior to the tornado season.
- Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.
- Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.
- Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.

- Provide permanent shelters for mobile home parks and campgrounds, where citizens may seek safety from severe weather.
- Develop regulations to require concrete safe rooms to be included in new building construction.
- Develop a public education program for informing residents of an "All clear" message that sounds when a severe weather warning expires.

### Droughts

- Develop a public education program on the hazards associated with drought and extreme heat, including open burning.
- Develop a public education program for restrictions on open burning and water usage during drought conditions.
- Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.

### Earthquakes

- Develop a public education program concerning the frequency that earthquakes may occur and the hazards associated with earthquakes and tremors.
- Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.

Ms. Richard briefly reviewed the alternatives ranking matrix that will be sent to the Core Group. The Core Group then decided which evaluation criteria were to be used when ranking each alternative. Those criteria are as follows:

- Technically Feasible
- Activities Reduce Risk
- Funding Available
- Frequency of Hazard Risk

EMH&T will mail matrices to each member of the Core Group to be completed and returned. A self addressed stamped envelope will be included.

**Next Meeting: Wednesday January 12, 2005 at 6:30 pm (Dinner served at 5:45 pm) at the Agricultural Building next to the EMA.**

## **Shelby County All Natural Hazard Mitigation Wrap Up Meeting Minutes**

Date: January 12, 2005

Jerry Keener, Mayor – Village of Lockington  
John Shumate, Village of Kettlersville  
Dave Geuy, Salem Twp. Trustee  
Robert Geuy, Shelby County Engineer  
Urban Holthaus, Jr., Cynthian Twp. Trustee  
John Pleiman, Cynthian Twp. Trustee  
Gary Bensman, Shelby Cty. Regional Planning

Denny Barker, Franklin Township  
Paul Pulfer, Salem Twp. Trustee  
Tom Cisco, Shelby County EMA  
Frank Mariano, City of Sidney  
Ed Hasselman, Village of Fort Loramie  
Roger Schulze, Franklin Twp. Trustee  
Richard Meyer, Dinsmore Twp.  
Bill Knasel, Franklin Twp.  
Max Bell, Salem Twp.  
Maureen Richard, EMH&T

The Core Group did not receive the minutes from the November 24, 2004 meeting due to the multiple winter and ice storm events that occurred since then. EMH&T will forward those meeting minutes to the Group.

Overall goals are attached to the Problem Statements. The Core Group members are to review these goals and approve or comment. Comments to be sent to Mr. Cisco to forward to EMH&T.

Ms. Richard briefly discussed the final mapping project. All required information from Erie County has been received. Ms. Richard reviewed Critical Facilities that each jurisdiction needs to forward to Mr. Ciscos. Address information is still needed for some facilities.

Ms. Richard asked the Core Group if there were any other items to add or discuss further on the Mitigation Alternatives. A discussion followed concerning how the alternatives were rated. The Core Group revised the alternatives to reflect a new ranking as follows:

### Winter Storms

1. Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.
2. Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.
3. Provide back-up generators for critical facilities, which need to maintain continuous power to protect human life and health.

### Flooding

1. Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.
2. Develop an education program on hazards associated with severe flooding and how to prepare prior to a flood event.

3. Develop a river and stream maintenance program for removing debris and log jams from drainage ways.

The rankings for the remaining hazards were approved as they were presented in the overall results.

Ms. Richard then stated that each community will need to support a mitigation alternative. Ms. Richard went through the list of communities and those that were present chose alternatives to support. Those not present will need to be contacted to get their alternatives to include in the Mitigation Plan.

Ms. Richard reviewed the Action Plan. The columns for "Implementation Schedule," "Funding," and "Responsible Agency" will need to be completed by Mr. Cisco for the final plan.

**A date was set for the Public Meeting. The Public Meeting is scheduled for Thursday February 17, 2005 at 6:00 pm.**

**Appendix G:  
Problem Statements and  
Overall Goals**

November 5, 2004

## **DRAFT PROBLEM STATEMENTS FOR SHELBY COUNTY NATURAL HAZARD MITIGATION PLAN**

The Core Group discussed the following hazards and prioritized them below:

1. Winter Storms – Snow/Ice/Extreme Cold
2. Summer Storms – Thunderstorms/High Winds/Hail/Lightning
3. Flooding – Include landslides as a result
4. Tornadoes
5. Droughts/Extreme Heat/Wild Fires
6. Earthquakes

### **SEVERE STORMS**

Severe storms occur throughout the year in Geauga County, and historically have had a significant impact on the community as a whole as well as on the individual cities and villages. Since the County has had significant problems with winter and summer storms separately, the Core Group decided to evaluate the problems associated with these events in two separate categories.

### **WINTER STORMS – Snow, Ice and Extreme Cold**

The Core Group has prioritized winter/ice storms as their number one concern.

#### **Core Group Developed Problem Statements**

- Critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.
- Factories, employers and other counties are apathetic to the warnings and levels of snow emergencies issued by Shelby County, which encourage citizens to take risks to get to work.
- Citizens lack the education on the dangers and hazards associated with winter storm events as well as how to prepare.
- The County does not have an accurate account of the number of people considered to be sensitive population or where they are located within the unincorporated areas.
- Prolonged power outages have adverse affects on the sensitive population within the County.
- Shelby County does not have an adequate number of salt storage facilities. As a result the County runs out of salt for the roadways year after year.

- The citizens within Shelby County are unaware of designated shelter locations where they can seek safety in the event of a winter storm.
- Homeowners are unaware that many of the older homes existing in the County are unable to withstand the weight of a heavy snowstorm because they were built prior to the County establishing building codes which address snow loads.
- Blocked roadways and transportation may interrupt service and make it difficult for citizens to receive help and seek safety.

**Overall Goal:**

To educate the County's citizens to increase awareness of winter storms and where to seek safety during storm events, to maintain operations of critical facilities and emergency services and to reduce property damage caused by severe weather.

**SUMMER STORMS – Thunderstorms, High Winds, Hail and Lightning**

The Core Group has prioritized summer storms as their second concern.

**Core Group Developed Problem Statements**

- Prolonged power outages have adverse affects on the sensitive population within the County.
- The County is unable to keep up with road impediments and debris removal due to lack of manpower and equipment.
- Many communities have large, older trees that are susceptible to loosing limbs or being knocked down by high winds. Uprooted trees and limbs cause damage to power lines.
- Hail causes extensive roof damage to new and older structures.
- Ditches and culverts throughout the county lack the capacity to carry flow from heavy rain events.
- Shelby County lacks sirens, NOAA weather radios, reverse 9-1-1 and other system capabilities to give the citizens an early warning of approaching severe weather.
- The County lacks the capability to issue an "All Clear" message once any warnings have expired.
- Critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.
- Citizens lack the education on the dangers and hazards associated with severe storm events as well as how to prepare.

**Overall Goal:**

To educate the County's citizens to increase awareness of and preparedness for severe storms, to maintain operations of critical facilities and emergency services, to improve the warning system throughout the County and to reduce property damage caused by severe weather.

**FLOODING (including 100-year flood zone, non-flood zone, and flash flooding)**

The Core Group has decided to prioritize the natural hazard of flooding as their third rated concern. Flooding occurs periodically throughout the year in Shelby County in the form of riverine flooding as well as flash flooding.

**Core Group Developed Problem Statements**

- Numerous roads, culverts and bridges within the County are being washed out during flood events.
- Citizens lack the awareness and education of the dangers associated with driving through high water.
- The County does not have any regulations for above ground propane tanks located outside of the 100-year floodplain.
- Citizens are apathetic to the dangers of flooding due to the infrequency of floods in the county.
- Shelby County lacks gas powered trash pumps for the clean up process after a severe storm event.
- All of Shelby County relies on wells for water. These wells have the potential to become contaminated when inundated with flood water.
- Some leach fields still exist in the 100-year flood plain. These fields pose a potential threat for contaminating well water during flooding conditions.
- The County lacks a river/stream maintenance program, which includes addressing debris and log jams.

### **Overall Goals:**

To save lives and property, reduce damage and expedite the clean up process, to establish administrative controls for construction and to increase citizens' awareness of the hazards associated with flooding.

### **TORNADOES**

The Core Group has prioritized the natural hazard of tornado as their fourth highest concern. Tornadoes occur sporadically throughout the County, which has limited capacity to handle the damages caused by this hazard.

- Shelby County lacks sirens, NOAA weather radios, reverse 9-1-1 and other system capabilities to give the citizens an early warning of approaching severe weather.
- The County lacks the capability to issue an "All Clear" message once any warnings have expired.
- There are no regulations that require safe rooms to be included in new construction.
- There are no tornado shelters or permanent structures near mobile home communities or campgrounds.
- The County is unable to keep up with debris removal after an event due to lack of manpower and equipment.
- Critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.

### **Overall Goal:**

To reduce the risk of injury and fatalities during an event by providing permanent structures for congregating, to reduce potential damage through preplanning, to improve the warning system throughout the County and to increase citizen awareness of the hazards of tornadoes.

### **DROUGHTS/EXTREME HEAT/WILD FIRES**

The Core Group has prioritized the natural hazard of droughts as their fifth rated concern.

### **Core Group Developed Problem Statements**

- There is a lack of public awareness concerning open burning issues during times of drought.

- Shelby County has not current restrictions on open burning during drought conditions.
- During droughts, the County's wells may be susceptible to running dry, which would deplete the communities' water supplies.
- Due to the extremely dry conditions, the risk of grass fires increases. Grass fires may grow uncontrollable and quickly spread endangering lives and property.
- Individual communities do not have contingency plans for an alternate water supply in case wells begin to dry up.
- Communities do not have a list of critical facilities and businesses that are dependent on a continuous water supply to operate.
- The County's water treatment plant may not have the capacity to treat raw water that is needed during drought conditions.

**Overall Goal:**

To establish administrative controls to limit potential property damage, to establish contingency plans for alternate water supply and to reduce potential damage through preplanning.

**EARTHQUAKES**

The Core Group has prioritized the natural hazard of earthquakes as their sixth rated concern. Shelby County has had multiple epicenters and tremors within its boundaries and the potential for damages from earthquakes could be significant.

**Core Group Developed Problem Statements**

- There is a lack of public awareness in the County concerning how to react safely in the workplace and at home in the case of an earthquake.
- Critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.
- Water wells can be affected when earthquakes take place.
- Shelby County lacks shelters to house citizens in the event of an earthquake.
- Wells may be damaged and water service disrupted to communities as a result of a quake.
- Transportation service may be interrupted due to road and infrastructure damage.

- The older buildings existing in Shelby County have not been built or upgraded to current seismic codes and may suffer significant damage from an earthquake.
- Shelby County lacks sirens, NOAA, reverse 9-1-1 and other system capabilities to give the citizens an early warning.
- Old mines, combined with land subsidence risks, elevate earthquake damage potential.
- Mobile homes may not have adequate foundation/anchoring and may suffer significant damage.
- Soils in the affected areas of an earthquake are subject to liquefaction.

**Overall Goal:**

To increase awareness of the hazards of an earthquake event, to improve the warning system throughout the County, to maintain operations of critical facilities and emergency services and to establish administrative controls that address earthquakes during construction.

**Appendix H:  
Significant Events**

## Winter Storms

*December 13, 1995*

A warm front moving north through Ohio produced mixed precipitation. By mid morning the freezing precipitation had spread north to Shelby County, causing many accidents, especially on major roads. Numerous power outages also occurred as the ice accumulated to as much as 1/8 inch thick.

*December 19, 1995*

The first major snowstorm of the season developed over central and west Central Ohio as a deep low pressure system tracked from the Lower Mississippi Valley to the Mid-Atlantic States. Rain changed to snow, with a period of sleet and freezing rain. Across West Central areas the precipitation fell mainly as snow, and blizzard conditions were experienced. Total snow accumulations for Shelby County ranged between eight and 14 inches. Farther south, Dayton received around five inches of snow, and Columbus received near four inches. Over 60,000 customers were without power at times near and north of Dayton and Columbus. For parts of West Central Ohio this storm was the worst storm since the Blizzard of 1978.

*January 2, 1996*

Low pressure strengthening in the Tennessee valley passed into southeast of Ohio. The heaviest snow fell near and north of interstate 70, across Shelby County where there was up to one foot of snowfall and blizzard conditions. Wind gusts up to 40 mph were common in this area, with snow drifts between three and five feet. Roads oriented east to west were quite hazardous as strong north winds produced large snow drifts shortly after these roads were plowed. Temperatures during much of this event were in the upper teens and 20s.

*January 1, 1999*

A major winter storm affected much of Ohio beginning late on January 1 and continuing through much of January. Heavy snow fell initially with some areas receiving greater than one inch per hour. Some thunder was reported with some of the heaviest snow around Dayton. By early afternoon on January 2, much of the snow had changed to a mixture of sleet and freezing rain. However, by that point the snow had accumulated from six to eight inches, with local 10 inch amounts around and north of Shelby County.

*January 13, 1999*

The rain changed to freezing rain first across the northern Miami Valley where up to one inch of ice accumulation occurred. Then, the freezing rain changed to snow with three to six inches of accumulation occurring. Around Shelby County, the rain changed to freezing rain with up to ½ inch of ice accumulation occurring. Eventually, the freezing rain changed to sleet with up to ½ inch of accumulation occurring.

*December 22, 2004*

A destructive ice storm left more than 100,000 electric customers without power across the northern Miami Valley. Officials with Dayton Power and other electric providers said it could be days before all power was restored. The ice storm, which began knocking out power on Wednesday December 22, did not make it farther south than northern Miami County. Following a large batch of freezing rain that coated trees with up to ½ inch of ice, emergency management officials in counties such as Darke, Shelby, Mercer and Auglaize braced Thursday afternoon for a different kind of flood: hundreds of locals seeking water, food and shelter from the cold, which conspired with ice and wind to undermine efforts to restore power. Temperatures were expected to dip into the upper teens to lower 20s by morning.



***Shelby County December 2004  
– picture courtesy of  
Dayton Daily News***



***Shelby County December  
2004 – picture courtesy of  
Dayton Daily News***

## Thunderstorms and High Winds

*June 20, 1994*

Trees were downed. Several structures were struck by lightning and caught fire. A barn in Russia burnt to the ground after being struck by lightning and 15 head of cattle perished.

*June 7, 1995*

Numerous trees were downed, and a metal shed was blown down on State Route 47, 10 miles north of Russia. Trees were also blown into a car just east of Sidney.

*August 9, 2000*

Numerous trees were downed in Ft. Loramie, Newport and Sidney, and a barn was damaged near Hardin. In Sidney, some trees fell on houses, some falling trees ripped up sidewalks, and a roof was blown from a shed. Two clusters of thunderstorms caused significant damage on the August 9. During the morning hours, a large bow echo raced across the area causing widespread wind damage. During the afternoon and evening hours, a large cluster of storms formed causing widespread wind damage and hail along with some flooding.

*June 12, 2001*

A morning thunderstorm toppled large limbs and a tree. The tree fell on a home causing damage in Port Jefferson.

*September 26, 2003*

A strong microburst caused damage to homes across the eastern part of the County near Port Jefferson. One house was from of its foundation, and several others sustained major damage. Numerous trees were downed across the area. Maximum wind speeds were estimated between 100 and 120 mph.

*November 12, 2003*

Several power outages occurred countywide. Trees were reported down on Ohio 66, Fair and Kuther Roads 3 miles southwest of Sidney, Kirkwood-Miami River Road four miles south southwest of Sidney, and Miami-Shelby East Road. Power poles were reported either leaning or downed in the village of Anna. Several counties in west central and portions of central ohio experienced damage to trees and power lines due to synoptic wind. A cold front associated with low pressure over the Great Lakes region produced strong winds behind it, averaging 25 to 35 mph with higher gusts.

## **Lightning**

*July 17, 1994*

Lightning struck a warehouse that stored rolls of plastic in Jackson Center. The building and contents valued at about \$1 million were destroyed.

*July 15, 1995*

An attic of a house was extensively damaged by fire started by lightning in Sidney.

*July 17, 1996*

A family farmhouse was destroyed by a fire that started with a lightning strike in Kettlersville.

*July 31, 1999*

Lightning struck a barn causing a damaging fire. It also struck a man who received minor injuries in Anna.

*August 11, 2002*

In Russia, a house along State Route 48 near the Shelby-Miami County line was set on fire by a lightning strike. Firefighters from surrounding villages responded to the blaze, which took nearly two hours to extinguish. The five year old home was completely destroyed. There were no injuries, as the homeowners were out of town at the time of the fire.

## **Tornadoes**

*April 4, 1965*

The Palm Sunday tornado cut a devastating path through the County, wrecking farmsteads and injuring several residents.

*June 20, 2000*

A tornado made a brief touchdown near the intersection of routes 47 and 65 near Port Jefferson. A few trees were knocked down.

## Flooding

*August 8, 1995*

Another round of thunderstorm rains dropped an additional two to 3 1/2 inches of rain in two hours on saturated soil. This additional rainfall caused flooding of roads, streams, and basements. Additional evacuations were executed in Sidney due to rapidly rising waters.

*June 16, 1994*

Heavy rains from slow moving thunderstorms produced flooding of streets, poor drainage areas, and basements. A resident measured 2.2 inches of rain in less than one hour throughout Shelby County.

*June 20, 1994*

Heavy rains during a slow moving thunderstorm produced flooding of streets, basements, and poor drainage areas. Four inches of rain fell in less than two hours in Sidney.

*July 7, 2003,*

Several clusters of heavy thunderstorms continued to move across western Ohio during the early morning, and again in the afternoon. An additional two to four inches of rain fell from the thunderstorms, exacerbating flooding in saturated areas. Flooded roads and creeks and small streams out of their banks occurred throughout the region. Some of the worst flooding was in Shelby and Logan counties, where evacuations were executed near the swollen Great Miami River. Evacuations were also executed in Lakeview and Jackson Center with numerous homes and structures inundated with water.

*July 8, 2003,*

Lake Loramie State Park was evacuated as the lake came out of its banks. Numerous roads were flooded across the northern half of the county. County Road 25A and nearby parkland were underwater in Sidney. One hundred homes near Lake Loramie were flooded. Evacuations occurred near Fort Loramie, Jackson Center, and Port Jefferson. Numerous roads remained underwater across the northern half of the county.

*July 9, 2003,*

Thunderstorms with heavy rain moved across portions of western Ohio during the early morning. Another two to three inches fell on many areas that had seen six to 12 inches over the last week. This additional rainfall caused many road closures due to high water, and small streams to rise out of their banks again. The most serious flooding occurred from northern Darke County through Shelby and Logan counties. Communities along the swollen Great Miami River from Indian Lake downstream through Lakeview, DeGraff, Port Jefferson and Sidney dealt with flooded homes and businesses. A mobile home park near Russells Point was flooded and evacuated. Sandbagging occurred in Port Jefferson in an effort to keep water out of homes.



**Port Jefferson – 7-9-2003**



**Port Jefferson – 7-10-2003**

*May 21, 2004,*

An intense line of thunderstorms moved across west central and central Ohio during the afternoon and evening. Torrential rainfall accompanied the storms, with two to four inches falling over much of the region. Numerous roads were flooded and closed due to the heavy rain in Sidney.

*January 13, 2005*

As weary electric utility crews completed repairs to ice storm-damaged power lines from the December storm another concern was on the rise, Sidney and Shelby County communities turned anxiously to a rising Great Miami River and new threat of flooded roadways. The river went from an elevation of 8.5 feet to 13.5 feet but was expected to crest short of 14 feet.



***Shelby County January 2005***

## Droughts

*July 1, 1999*

Dry conditions that began in the spring and early summer continued into July. Excessive heat contributed to substantial crop loss across much of the Buckeye state. Rainfall was widely scattered and did little to help farmers.

*August 1, 1999*

Drought conditions continued across the Ohio Valley through August with most areas receiving well below normal rainfall for the month. In some areas around 50% of crops were considered total losses. Most counties in southwest Ohio were declared Federal Disaster Areas by the US Department of Agriculture. At the time of this writing, no monetary estimates were available concerning the crop loss.

## Earthquakes

*June 18, 1875*

This earthquake was felt throughout an area of at least 40,000 square miles and was most intense at Sidney and Urbana (Champaign County), where masonry walls were cracked and chimneys toppled. It has been interpreted to have had a Modified Mercalli Intensity (MMI) of VIII, which equates to a 4.1-5.4 magnitude on the Richter scale.

*September 30, 1930*

This earthquake cracked plaster and toppled a chimney in Anna. An epicentral MMI of VII and a magnitude of 4.2 have been assigned to this event.

*March 2 and 9, 1937*

These two earthquakes are the most damaging to have struck Ohio. Maximum intensities were experienced at Anna; where a MMI of VII was associated with the March 2 event and an MMI of VIII was associated with the March 9 event. In Anna, chimneys were toppled, organ pipes were twisted in the Lutheran Church, the masonry school building was so badly cracked that it was razed, water wells were disturbed and cemetery monuments were rotated. Both earthquakes were felt throughout a multi-state area. Analysis of seismograms from these earthquakes by the USGS assigned magnitudes of 4.7 and 4.9, respectively, to these events.

*1981-1983*

In 1980 and 1981, six small earthquakes occurred in eastern Shelby County. In 1983, four earthquakes occurred in the same location. The 1983 quakes, along with the earlier ones, all measured about 2.0 or less on the Richter scale--too small to be felt locally. The significance of this cluster of micro earthquakes is uncertain, but this general area has been the source of at least 35 earthquakes that were felt by local residents, including two damaging events in March 1937.

*July 12, 1986*

Minor damage, consisting primarily of cracked windows and plaster and fallen bricks from chimneys, was reported when an earthquake with a MMI of VI occurred, centered northwest of Anna, near St. Marys, in Auglaize County. It had a magnitude of 4.5.



**1937 Earthquake  
damage— Anna, Ohio**

**Appendix I:**  
**National Climatic Data Center**

Winter Storms								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Multiple Counties	01/21/1995	0100	Snow	N/A	2	6	500K	0
2 Southern And Central	12/13/1995	0400	Freezing Rain	N/A	0	2	25K	0
3 West Central And Cent	12/19/1995	0200	Heavy Snow	N/A	0	0	100K	0
4 Multiple Counties	01/02/1996	02:00 PM	Winter Storm	N/A	0	0	750K	0
5 Multiple Counties	03/06/1996	01:00 AM	Ice Storm	N/A	0	0	0	0
6 Multiple Counties	03/19/1996	04:00 PM	Winter Storm	N/A	1	0	0	0
7 Multiple Counties	01/01/1999	10:00 PM	Winter Storm	N/A	0	0	0	0
8 Multiple Counties	01/07/1999	10:00 PM	Winter Storm	N/A	0	0	0	0
9 Multiple Counties	01/13/1999	03:00 AM	Winter Storm	N/A	0	0	0	0
10 Multiple Counties	03/09/1999	12:00 AM	Heavy Snow	N/A	0	0	0	0
11 Multiple Counties	12/13/2000	12:00 PM	Heavy Snow	N/A	0	0	0	0
12 Multiple Counties	03/26/2002	01:15 AM	Winter Storm	N/A	0	0	0	0
13 Multiple Counties	11/22/2002	08:00 AM	Winter Storm	N/A	0	0	0	0
14 Multiple Counties	12/24/2002	10:40 PM	Winter Storm	N/A	0	0	0	0
15 Multiple Counties	01/29/2003	01:45 AM	Winter Storm	N/A	0	0	0	0
16 Multiple Counties	02/15/2003	01:25 AM	Winter Storm	N/A	0	0	0	0
17 Multiple Counties	12/14/2003	05:45 AM	Winter Storm	N/A	0	0	0	0
18 Multiple Counties	01/25/2004	05:00 PM	Winter Storm	N/A	0	0	0	0
19 Multiple Counties	03/16/2004	03:30 AM	Winter Storm	N/A	0	0	0	0
TOTALS:					3	8	1.375M	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes,  
Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Temperature Extremes								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Northern Ohio	12/26/1993	0000	Extreme Cold	N/A	1	0	500K	0
2 Multiple Counties	02/11/1995	2000	Extreme Cold	N/A	4	0	100K	0
3 Statewide	12/09/1995	1200	Extreme Cold	N/A	0	1	2K	0
4 Multiple Counties	02/01/1996	06:00 PM	Extreme Cold	N/A	0	0	1.3M	0
TOTALS:					5	1	\$1.1M	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

### Thunderstorms & High Winds

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 SHELBY	06/25/1971	2115	Tstm Wind	0 kts.	0	0	0	0
2 SHELBY	07/02/1973	1810	Tstm Wind	0 kts.	0	0	0	0
3 SHELBY	08/11/1973	1510	Tstm Wind	0 kts.	0	0	0	0
4 SHELBY	01/11/1975	0015	Tstm Wind	0 kts.	0	0	0	0
5 SHELBY	04/19/1978	1700	Tstm Wind	0 kts.	0	0	0	0
6 SHELBY	07/01/1978	1435	Tstm Wind	0 kts.	0	0	0	0
7 SHELBY	04/08/1980	1500	Tstm Wind	60 kts.	0	0	0	0
8 SHELBY	07/05/1980	0725	Tstm Wind	0 kts.	0	0	0	0
9 SHELBY	07/09/1980	1040	Tstm Wind	0 kts.	0	0	0	0
10 SHELBY	07/12/1980	1839	Tstm Wind	0 kts.	0	0	0	0
11 SHELBY	08/11/1980	1543	Tstm Wind	0 kts.	0	0	0	0
12 SHELBY	08/11/1980	1645	Tstm Wind	60 kts.	0	0	0	0
13 SHELBY	06/24/1981	1930	Tstm Wind	0 kts.	0	0	0	0
14 SHELBY	06/24/1981	2214	Tstm Wind	0 kts.	0	0	0	0
15 SHELBY	03/16/1982	1605	Tstm Wind	0 kts.	0	0	0	0
16 SHELBY	04/05/1985	1640	Tstm Wind	0 kts.	0	1	0	0
17 SHELBY	03/10/1986	1603	Tstm Wind	0 kts.	0	0	0	0
18 SHELBY	05/17/1986	1835	Tstm Wind	0 kts.	0	0	0	0
19 SHELBY	06/22/1986	1920	Tstm Wind	0 kts.	0	0	0	0
20 SHELBY	06/02/1987	1640	Tstm Wind	0 kts.	0	0	0	0
21 SHELBY	06/27/1989	1300	Tstm Wind	0 kts.	0	0	0	0
22 SHELBY	06/03/1990	1621	Tstm Wind	0 kts.	0	0	0	0
23 SHELBY	09/14/1990	1410	Tstm Wind	0 kts.	0	0	0	0
24 SHELBY	03/27/1991	2045	Tstm Wind	0 kts.	0	0	0	0
25 SHELBY	06/18/1992	1515	Tstm Wind	0 kts.	0	0	0	0
26 SHELBY	07/02/1992	1825	Tstm Wind	0 kts.	0	0	0	0

Thunderstorms & High Winds								
27 SHELBY	07/14/1992	1710	Tstm Wind	0 kts.	0	0	0	0
28 SHELBY	11/22/1992	1812	Tstm Wind	0 kts.	0	0	0	0
29 Just N Of Sydney	05/28/1993	2135	High Winds	0 kts.	0	0	5K	0
30 Countywide	04/27/1994	0329	Thunderstorm Winds	N/A	0	0	50K	0
31 Sidney	06/12/1994	1440	Thunderstorm Winds	N/A	0	0	5K	0
32 Sidney	06/16/1994	1630	Thunderstorm Winds	N/A	0	0	5K	0
33 South Of Sidney	06/19/1994	1815	Thunderstorm Winds	N/A	0	0	5K	0
34 Shelby And Russia	06/20/1994	1515	Thunderstorm Winds	N/A	0	0	50K	0
35 Sidney	07/20/1994	2005	Thunderstorm Winds	N/A	0	0	50K	0
36 Sidney	08/20/1994	1540	Thunderstorm Winds	N/A	0	0	5K	0
37 Port Jefferson	08/28/1994	1520	Thunderstorm Winds	N/A	0	0	5K	0
38 Multiple Counties	11/01/1994	2000	High Winds	0 kts.	0	1	500K	0
39 Multiple Counties	11/27/1994	1400	High Winds	0 kts.	0	1	50K	0
40 Sidney	04/11/1995	1545	Thunderstorm Winds	N/A	0	0	30K	0
41 Port Jefferson	05/28/1995	2243	Thunderstorm Winds	N/A	0	0	3K	0
42 West Half	06/07/1995	2113	Thunderstorm Winds	N/A	0	0	20K	0
43 West Half	06/08/1995	0052	Thunderstorm Winds	N/A	0	0	3K	0
44 Countywide	07/15/1995	1330	Thunderstorm Winds	N/A	0	0	9	5K
45 Countywide	07/26/1995	1343	Thunderstorm Winds	N/A	0	4	60K	0
46 Botkins	10/30/1996	12:40 AM	Tstm Wind	50 kts.	0	0	3K	0
47 Sidney	11/07/1996	04:00	Tstm Wind	50	0	0	10K	0

### Thunderstorms & High Winds

		PM		kts.				
48 Multiple Counties	04/06/1997	02:30 PM	High Wind	60 kts.	0	0	19K	0
49 Botkins	07/02/1997	03:50 PM	Tstm Wind	50 kts.	0	0	20K	0
50 Jackson Center	06/12/1998	07:25 PM	Tstm Wind	50 kts.	0	0	3K	0
51 Anna	06/19/1998	01:45 AM	Tstm Wind	58 kts.	0	0	10K	0
52 Sidney	07/19/1998	07:40 PM	Tstm Wind	60 kts.	0	0	10K	0
53 Pemberton	08/25/1998	02:50 PM	Tstm Wind	50 kts.	0	0	5K	0
54 Countywide	11/10/1998	02:05 PM	Tstm Wind	50 kts.	0	0	20K	0
55 Sidney	02/11/1999	11:30 PM	Tstm Wind	50 kts.	0	0	3K	0
56 Sidney	05/06/1999	01:15 PM	Tstm Wind	55 kts.	0	0	5K	0
57 Jackson Center	07/09/1999	05:33 PM	Tstm Wind	60 kts.	0	0	25K	0
58 Lockington	07/26/1999	02:05 PM	Tstm Wind	50 kts.	0	0	3K	0
59 Sidney	07/26/1999	04:40 PM	Tstm Wind	50 kts.	0	0	3K	0
60 Countywide	07/31/1999	06:00 PM	Tstm Wind	50 kts.	0	0	10K	0
61 Countywide	10/13/1999	02:15 PM	Tstm Wind	50 kts.	0	0	4K	0
62 Sidney	04/20/2000	05:20 PM	Tstm Wind	50 kts.	0	0	5K	0
63 Anna	06/14/2000	06:55 PM	Tstm Wind	53 kts.	0	0	0K	0
64 Sidney	08/01/2000	02:54 PM	Tstm Wind	50 kts.	0	0	15K	0
65 Sidney	08/09/2000	03:30 PM	Tstm Wind	50 kts.	0	0	10K	0
66 Ft Loramie	08/09/2000	09:10	Tstm Wind	50	0	0	60K	0

**Thunderstorms & High Winds**

		AM		kts.				
67 Multiple Counties	12/11/2000	09:00 PM	High Wind	58 kts.	1	0	100K	0
68 Port Jefferson	06/12/2001	08:00 AM	Tstm Wind	50 kts.	0	0	5K	0
69 Sidney	08/18/2001	06:55 PM	Tstm Wind	50 kts.	0	0	0	0
70 Multiple Counties	03/09/2002	12:43 PM	High Wind	73 kts.	1	12	971K	0
71 Sidney	05/25/2002	05:20 PM	Tstm Wind	50 kts.	0	0	2K	0
72 Sidney	07/29/2002	04:50 PM	Tstm Wind	55 kts.	0	0	6K	0
73 Russia	08/11/2002	04:20 PM	Tstm Wind	50 kts.	0	0	3K	0
74 Sidney	05/11/2003	03:20 AM	Tstm Wind	50 kts.	0	0	3K	0
75 Countywide	07/04/2003	06:55 PM	Tstm Wind	50 kts.	0	0	7K	0
76 Sidney	07/05/2003	08:40 PM	Tstm Wind	50 kts.	0	0	3K	0
77 Sidney	07/06/2003	02:55 PM	Tstm Wind	50 kts.	0	0	3K	0
78 Sidney	07/08/2003	02:35 AM	Tstm Wind	55 kts.	0	0	15K	0
79 Sidney	07/08/2003	05:15 PM	Tstm Wind	50 kts.	0	0	15K	0
80 Botkins	08/26/2003	05:53 PM	Tstm Wind	60 kts.	0	0	0	0
81 Anna	08/26/2003	06:12 PM	Tstm Wind	50 kts.	0	0	3K	0
82 Port Jefferson	09/26/2003	10:35 PM	Tstm Wind	90 kts.	0	0	150K	0
83 Multiple Counties	11/12/2003	06:45 PM	High Wind	50 kts.	0	0	63K	35K
84 Sidney	05/17/2004	06:35 PM	Tstm Wind	50 kts.	0	0	1K	0
85 Sidney	06/13/2004	07:19	Tstm Wind	59	0	0	0	0

Thunderstorms & High Winds								
		PM		cts.				
86 Sidney	06/15/2004	12:25 PM	Tstm Wind	50 cts.	0	0	2K	0
TOTALS:					2	19	2.441M	40K

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

cts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Hail								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 SHELBY	04/08/1980	1500	Hail	1.50 in.	0	0	0	0
2 SHELBY	07/12/1980	1839	Hail	0.75 in.	0	0	0	0
3 SHELBY	08/11/1980	1543	Hail	1.75 in.	0	0	0	0
4 SHELBY	06/24/1981	1930	Hail	1.00 in.	0	0	0	0
5 SHELBY	06/24/1981	2027	Hail	1.00 in.	0	0	0	0
6 SHELBY	05/06/1986	1845	Hail	0.75 in.	0	0	0	0
7 SHELBY	11/22/1992	1752	Hail	1.00 in.	0	0	0	0
8 SHELBY	11/22/1992	1752	Hail	1.00 in.	0	0	0	0
9 Shaker Heights	11/01/1994	0415	Hail	1.00 in.	0	0	0	0
10 Sidney	04/09/1995	0805	Hail	0.75 in.	0	0	0	0
11 Sidney	06/21/1995	1345	Hail	0.75 in.	0	0	0	0
12 Sidney	06/26/1995	1810	Hail	0.88 in.	0	0	0	0
13 Botkins	06/03/1996	02:45 PM	Hail	1.75 in.	0	0	0	0
14 Botkins	05/31/1998	05:16 PM	Hail	1.50 in.	0	0	0	0
15 Sidney	05/18/2000	01:50 PM	Hail	1.00 in.	0	0	0	0
16 Anna	05/25/2001	02:17 PM	Hail	0.75 in.	0	0	0	0
17 Sidney	07/07/2001	11:11 AM	Hail	2.00 in.	0	0	0	0
18 Houston	10/24/2001	07:08 PM	Hail	0.88 in.	0	0	0	0
19 Sidney	06/26/2002	02:42 PM	Hail	0.88 in.	0	0	0	0
20 Mc Cartyville	04/30/2003	03:15 PM	Hail	1.00 in.	0	0	0	0
21 Sidney	07/07/2003	01:16 PM	Hail	0.75 in.	0	0	0	0
22 Ft Loramie	05/21/2004	03:10 PM	Hail	0.88 in.	0	0	0	0
23 Sidney	05/21/2004	03:30 PM	Hail	1.00 in.	0	0	0	0

Hail								
24 Botkins	06/13/2004	07:34 PM	Hail	0.75 in.	0	0	0	0
25 Ft Loramie	06/24/2004	04:53 PM	Hail	1.00 in.	0	0	0	0
TOTALS:					0	0	0	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Lightning								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Jackson Center	07/17/1994	1805	Lightning	N/A	0	0	5.0M	0
2 Plattsville	06/21/1995	1425	Lightning	N/A	0	0	25K	0
3 Sidney	07/15/1995	1348	Lightning	N/A	0	0	20K	0
4 Sidney	02/27/1996	06:37 PM	Lightning	N/A	0	0	1K	0
5 Kettlersville	07/17/1996	11:15 PM	Lightning	N/A	0	0	50K	0
6 Anna	07/31/1999	05:50 PM	Lightning	N/A	0	1	20K	0
7 Russia	08/11/2002	04:15 PM	Lightning	N/A	0	0	100K	0
TOTALS:					0	1	5.216M	0

**KEY:**

**Mag:** Magnitude

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F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Flooding								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Countywide	11/14/1993	1030	Flash Flood	N/A	0	0	50K	0
2 SHELBY	06/16/1994	1650	Flash Flood	N/A	0	0	50K	0
3 Sidney	06/20/1994	1630	Flash Flood	N/A	0	0	50K	0
4 Countywide	04/10/1995	0445	Flash Flood	N/A	0	0	3K	0
5 Countywide	06/07/1995	2004	Flash Flood	N/A	0	0	6K	0
6 SHELBY	06/21/1995	1500	Flash Flood	N/A	0	0	7K	10K
7 Countywide	06/22/1995	2145	Flash Flood	N/A	0	0	4K	0
8 Central Portion	08/01/1995	1750	Flash Flood	N/A	0	0	2	0
9 Countywide	08/08/1995	1935	Flash Flood	N/A	0	0	10K	0
10 Sidney	04/09/1998	01:00 AM	Flood	N/A	0	0	0	0
11 Pemberton	04/09/1998	06:00 AM	Flood	N/A	0	0	0	0
12 Countywide	06/11/1998	09:56 AM	Flood	N/A	0	0	5K	0
13 Countywide	01/22/1999	12:53 AM	Flood	N/A	0	0	0	0
14 Sidney	04/28/1999	06:00 AM	Flood	N/A	0	0	0	0
15 Countywide	04/07/2000	08:00 PM	Flood	N/A	0	0	5K	0
16 Multiple Counties	08/11/2002	05:00 PM	Flood	N/A	0	0	0	0
17 Multiple Counties	07/06/2003	03:19 PM	Flood	N/A	0	0	0	0
18 Multiple Counties	07/07/2003	12:02 AM	Flood	N/A	0	0	600K	0
19 Ft Loramie	07/08/2003	05:15 PM	Flash Flood	N/A	0	0	100K	0
20 Ft Loramie	07/08/2003	08:00 PM	Flash Flood	N/A	0	0	150K	0
21 Multiple Counties	07/09/2003	02:00 AM	Flood	N/A	0	0	500K	0
22 Multiple Counties	08/02/2003	02:15 AM	Flood	N/A	0	0	0	0

Flooding								
23 Multiple Counties	08/04/2003	09:05 AM	Flood	N/A	0	0	0	0
24 Multiple Counties	01/04/2004	12:50 PM	Flood	N/A	0	0	0	0
25 Multiple Counties	05/21/2004	03:00 PM	Flood	N/A	0	0	0	890K
26 Sidney	05/21/2004	05:30 PM	Flash Flood	N/A	0	0	0	0
27 Multiple Counties	06/13/2004	08:00 PM	Flood	N/A	0	0	0	0
28 Multiple Counties	06/15/2004	01:10 PM	Flood	N/A	0	0	0	0
29 Multiple Counties	06/17/2004	06:25 PM	Flood	N/A	0	0	0	0
<b>TOTALS:</b>					0	0	1.540M	900K

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Tornadoes								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 SHELBY	07/28/1961	1955	Tornado	F3	0	22	250K	0
2 SHELBY	04/11/1965	2100	Tornado	F4	3	50	2.5M	0
3 SHELBY	06/28/1973	1000	Tornado	F0	0	0	0K	0
4 SHELBY	06/08/1981	1838	Tornado	F2	0	2	250K	0
5 Port Jefferson	06/20/2000	08:20 PM	Tornado	F0	0	0	2K	0
TOTALS:					3	74	3.002M	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Drought								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Multiple Counties	07/01/1999	12:00 AM	Drought	N/A	0	0	0	0
2 Multiple Counties	08/01/1999	12:00 AM	Drought	N/A	0	0	0	0
TOTALS:					0	0	0	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

Excessive Heat								
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Multiple Counties	07/20/1999	12:00 AM	Excessive Heat	N/A	13	0	0	0
TOTALS:					13	0	0	0

**KEY:**

**Mag:** Magnitude

N/A: Non-Applicable (Droughts, Flooding, Lightning, Temperature Extremes, Thunderstorms, Snow and Ice)

F(X): Fujita Scale Rating designation for Tornadoes

in.: Inches in diameter measuring Hail

kts: Knots measuring degree of Wind

**Dth:** Deaths

**Inj:** Injuries

**PrD:** Property Damage

**CrD:** Crop Damage

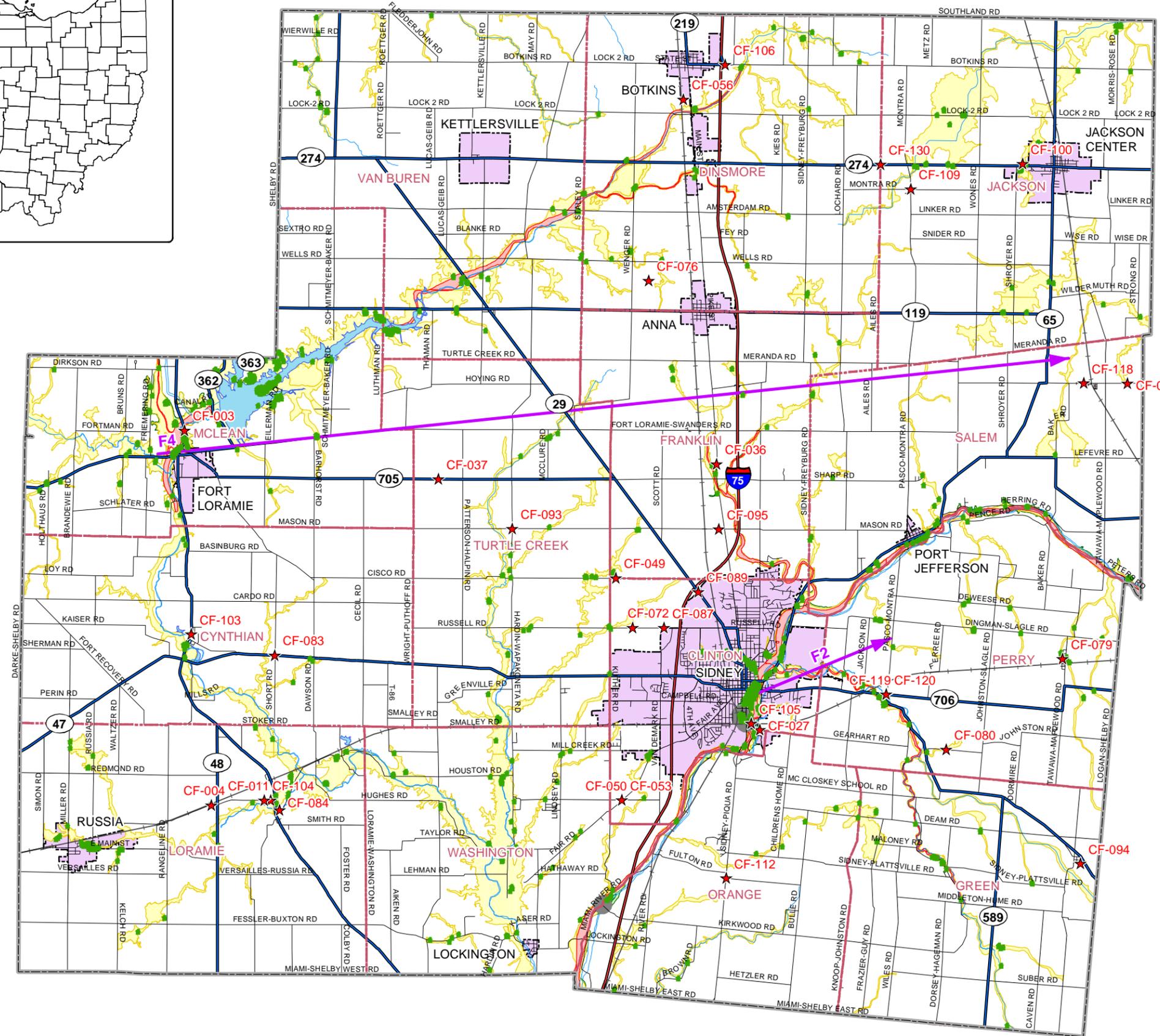
**Appendix J:**  
**Multi Hazard Maps**

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for entire county: 1046  
 At-Risk structures for unincorporated areas: 745



### Legend

- ★ Critical Facilities
- At-Risk Structures
- Tornado Paths
- ▭ County Line
- ▭ Township Lines
- Interstate Route
- U.S. Route
- State Route
- Roads - County
- Roads - Municipal
- Railroads
- Repetitive Loss Areas
- Waterways
- Lakes
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- ▭ Municipalities



Map intended for reference only

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SHELBY COUNTY, OHIO  
**MULTI-HAZARD MAP OF SHELBY COUNTY**  
 SHELBY COUNTY - COUNTYWIDE ALL NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY01

Job No. 2004-1605  
 Date: January 31, 2005  
 Scale: 1" = 12,000'



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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF ANNA, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY02

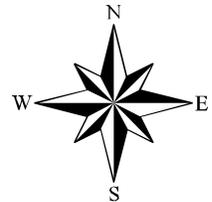
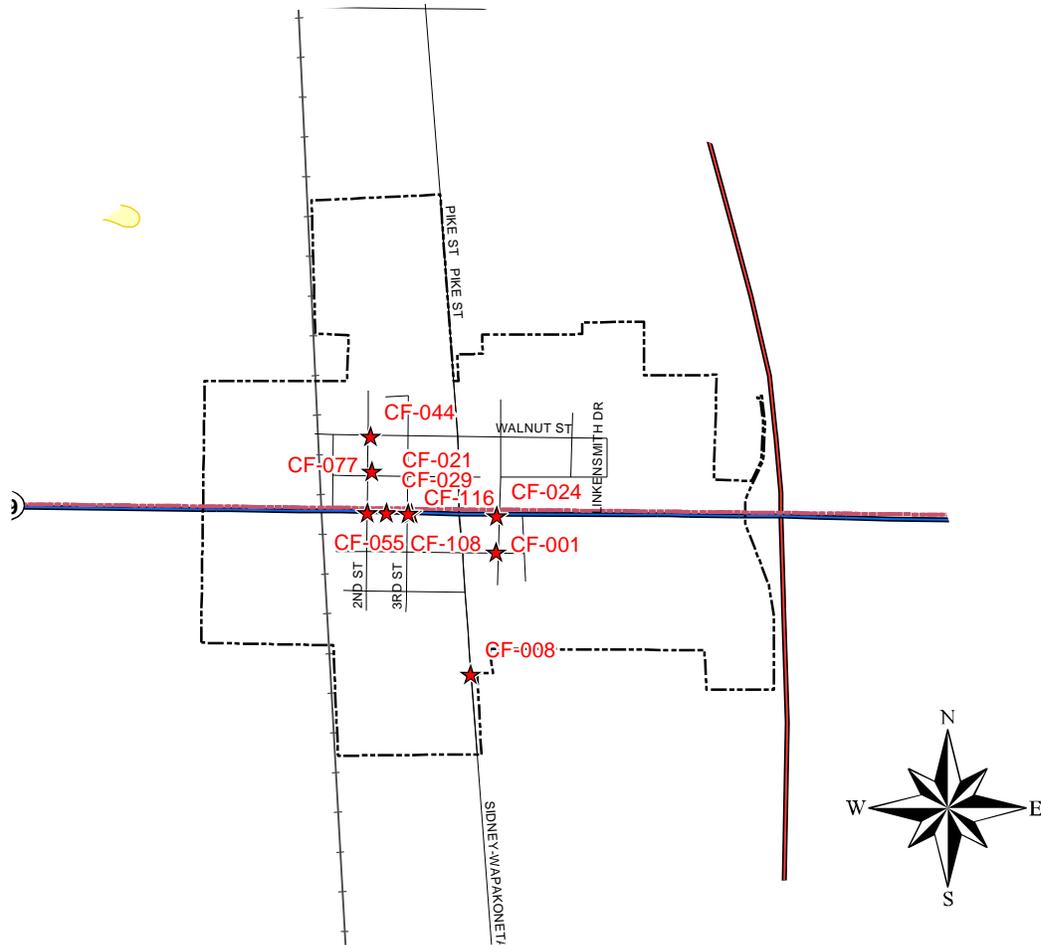
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Anna: 0

Map intended for reference only



## Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ◆ At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➔ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)



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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF BOTKINS, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY03

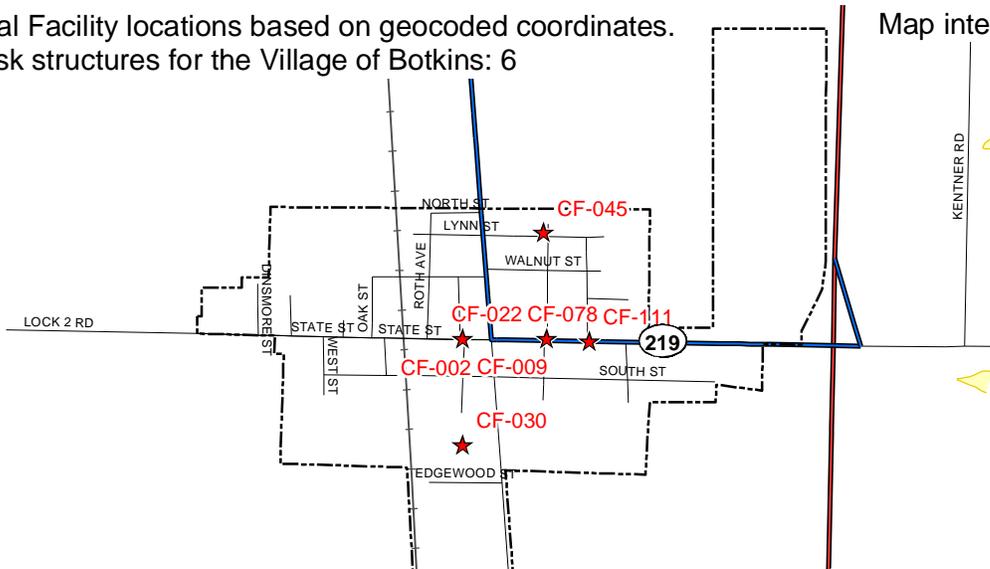
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

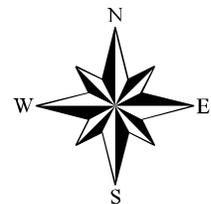
Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Botkins: 6

Map intended for reference only



## Legend

- ★ Critical Facilities
- At-Risk Structures
- Repetitive Loss Areas
- ➔ Tornado Paths
- ▭ County Line
- ▭ Township Lines
- ▭ Municipalities
- Interstate Route
- U.S. Route
- State Route
- Roads - County
- Roads - Municipal
- Railroads
- Waterways
- Lakes
- Floodway
- Floodplain - 100 year
- Floodplain - Other





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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF FORT LORAMIE, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY04

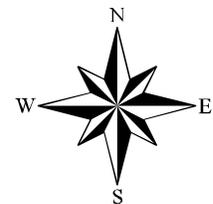
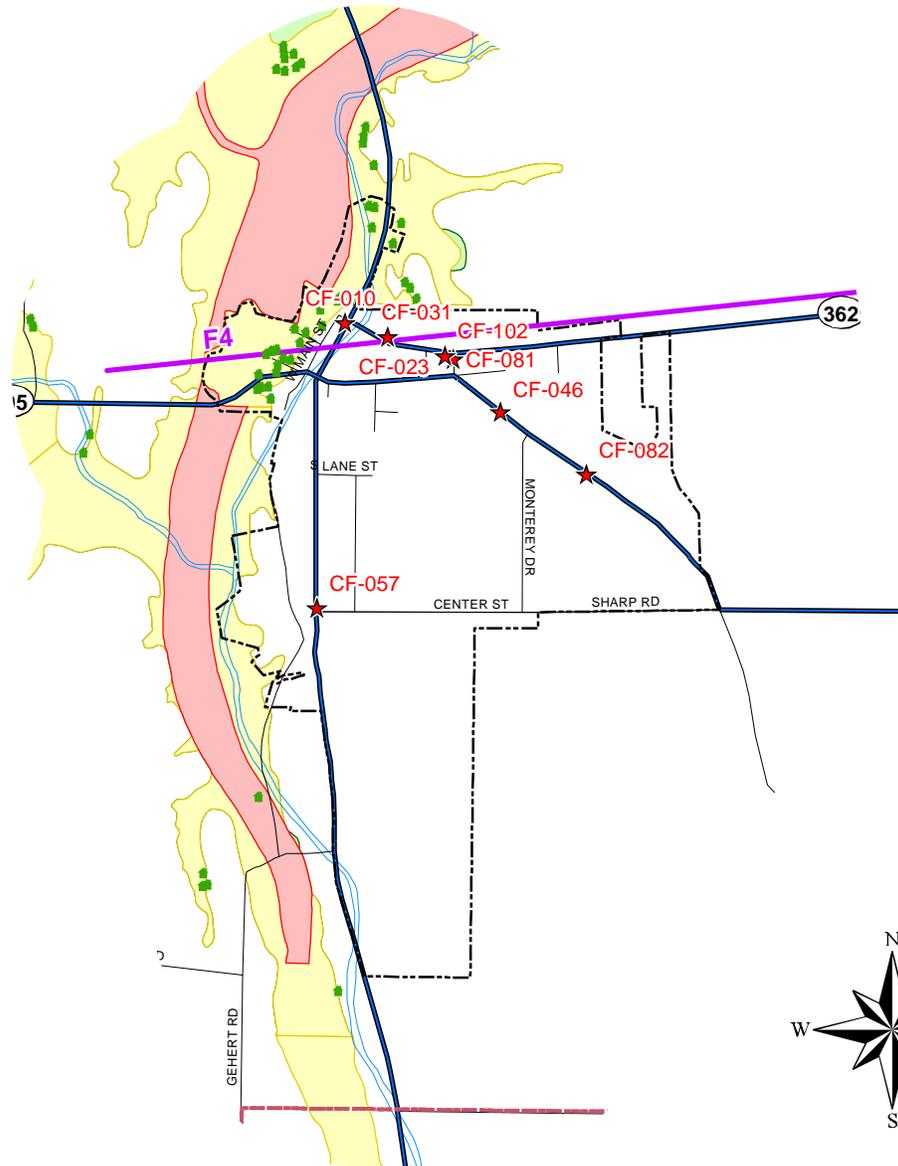
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Fort Loramie: 24

Map intended for reference only



## Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ■ At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➔ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)



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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF JACKSON CENTER, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY05

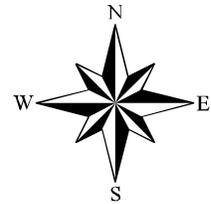
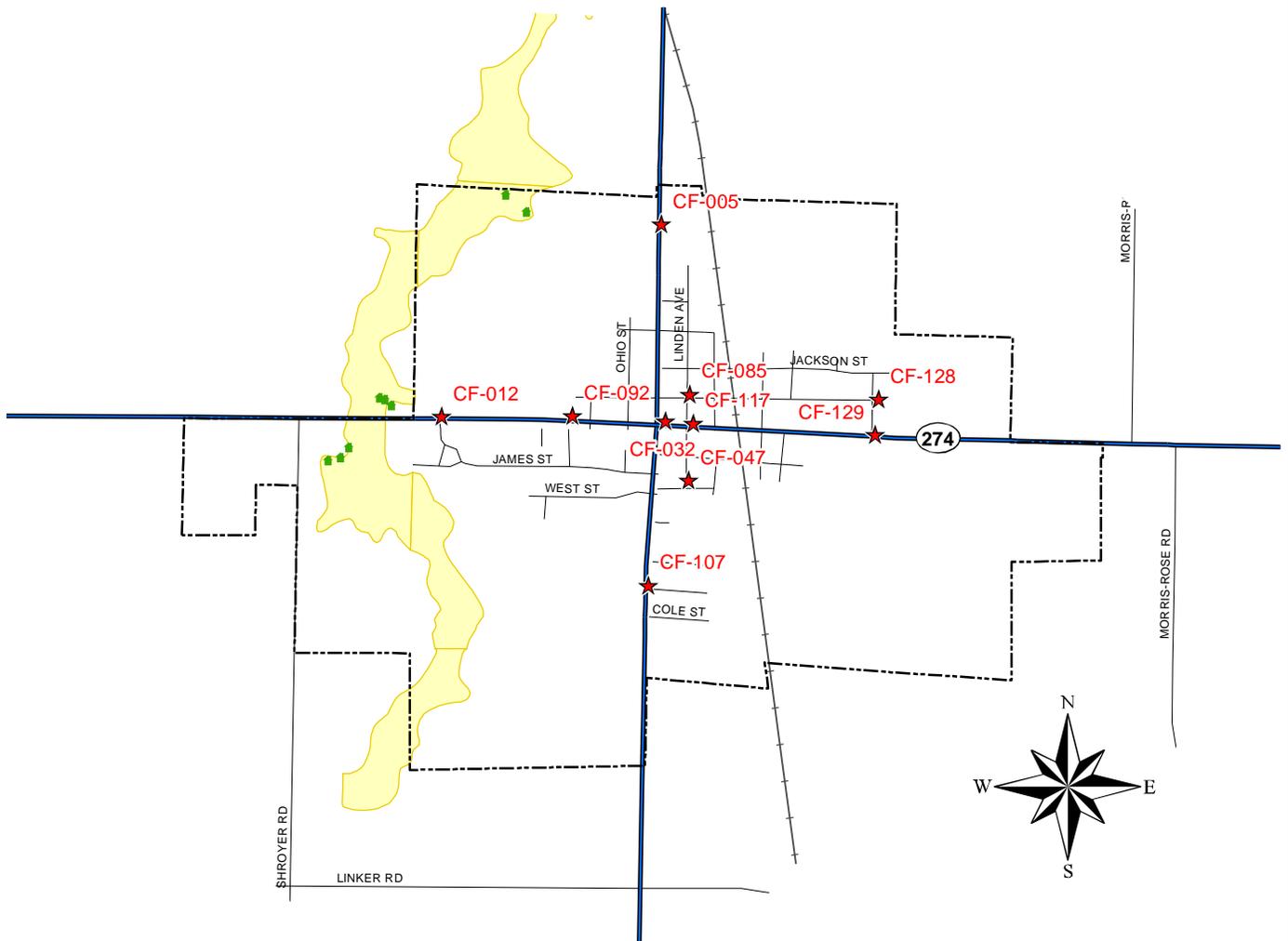
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Jackson Center: 5

Map intended for reference only



## Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ■ At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➔ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)



EVANS, MECHWART, HAMBLETON, & TILTON, INC.  
 170 MILL STREET, GAHANNA, OHIO 43230  
 TEL: 614-471-5150 FAX: 614-471-9286

SHELBY COUNTY, OHIO  
**MULTI-HAZARD MAP OF  
 KETTLERSVILLE, OHIO**

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
**MULTI-HAZARD MAP: SHELBY06**

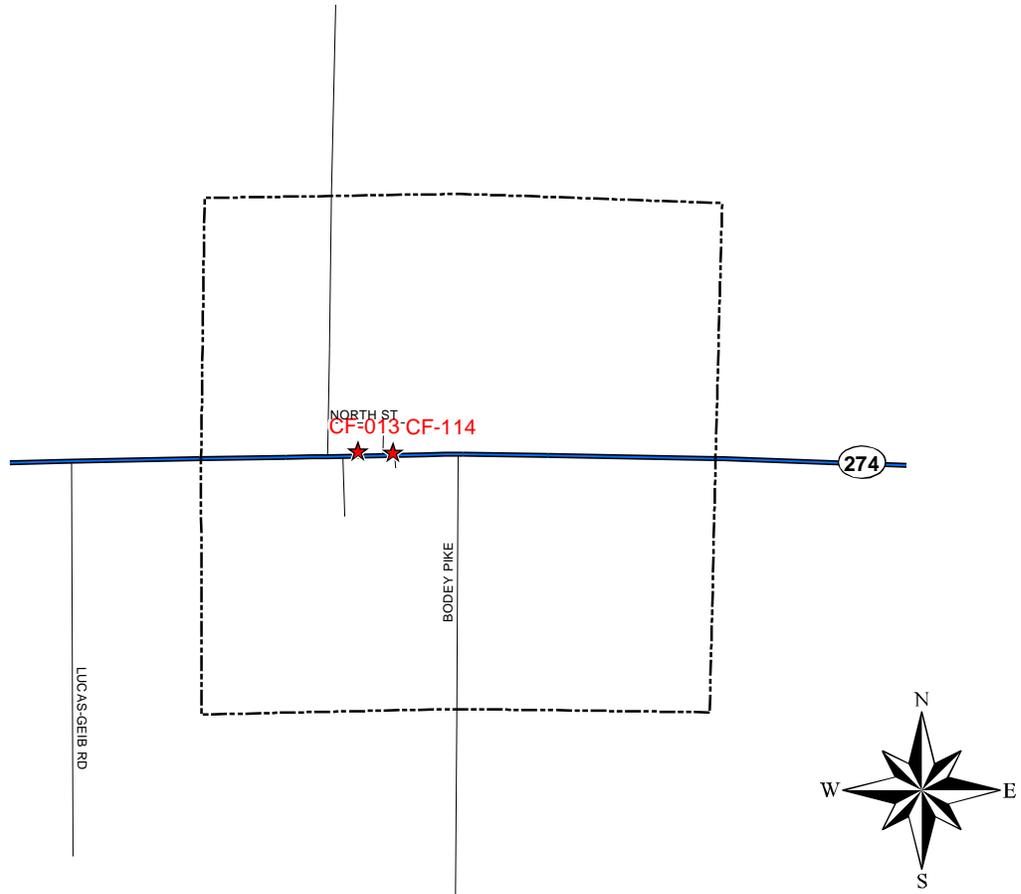
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Kettlersville: 0

Map intended for reference only



**Legend**

- |                         |                |                   |                       |
|-------------------------|----------------|-------------------|-----------------------|
| ★ Critical Facilities   | County Line    | Interstate Route  | Waterways             |
| ▲ At-Risk Structures    | Township Lines | U.S. Route        | Lakes                 |
| ● Repetitive Loss Areas | Municipalities | State Route       | Floodway              |
| ➔ Tornado Paths         |                | Roads - County    | Floodplain - 100 year |
|                         |                | Roads - Municipal | Floodplain - Other    |
|                         |                | Railroads         |                       |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)



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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF LOCKINGTON, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY07

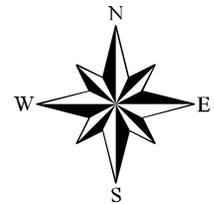
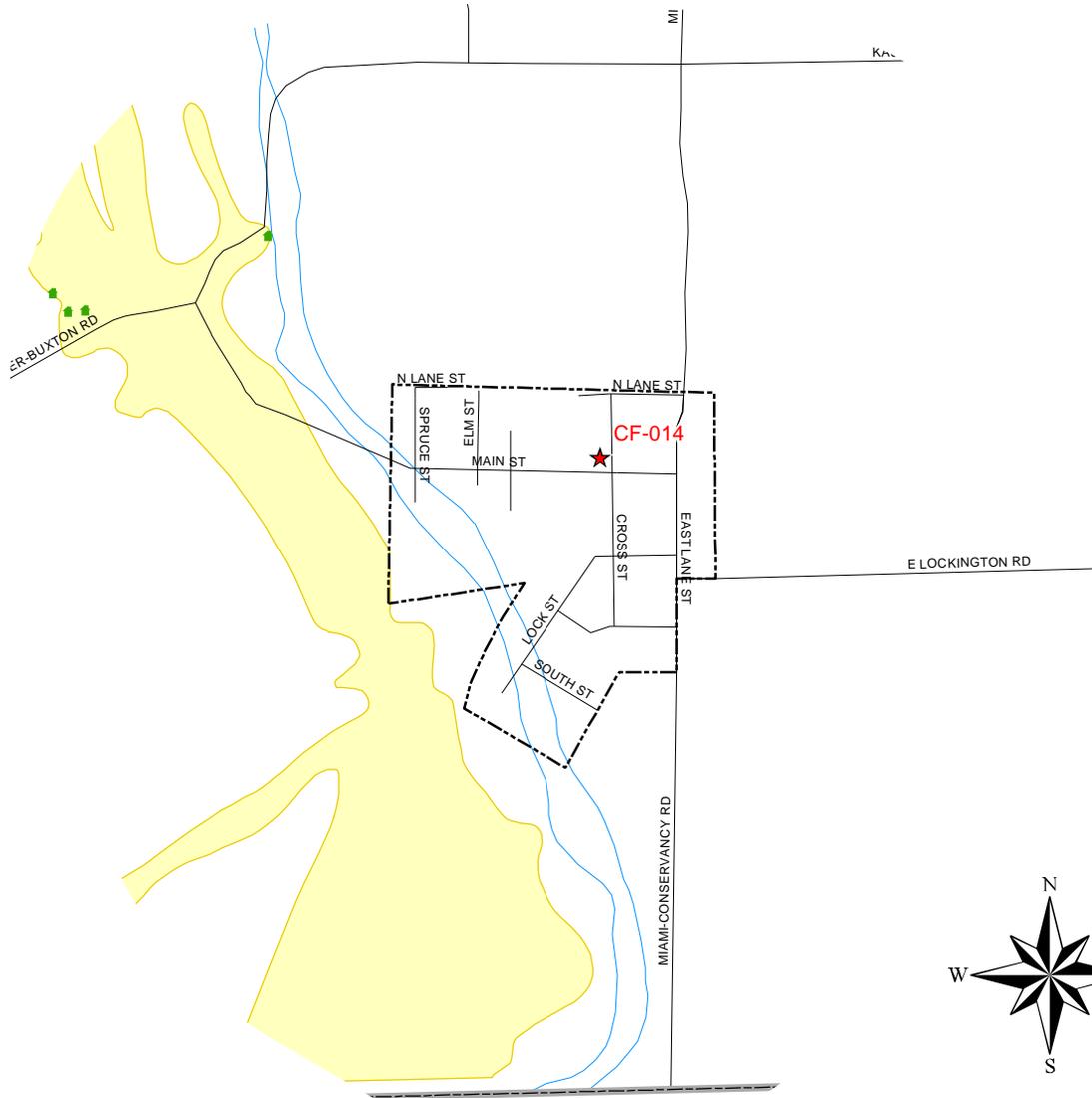
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 1,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Lockington: 0

Map intended for reference only



## Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ■ At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➔ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Port Jefferson: 10

Map intended for reference only



**Legend**

- |                         |  |   |   |
|-------------------------|--|---|---|
| ★ Critical Facilities   |  County Line    |  Interstate Route  |  Waterways             |
| ■ At-Risk Structures    |  Township Lines |  U.S. Route        |  Lakes                 |
| ● Repetitive Loss Areas |  Municipalities |  State Route       |  Floodway              |
| ➔ Tornado Paths         |  |  Roads - County    |  Floodplain - 100 year |
|                         |  |  Roads - Municipal |  Floodplain - Other    |
|                         |  |  Railroads         |   |



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# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF RUSSIA, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY09

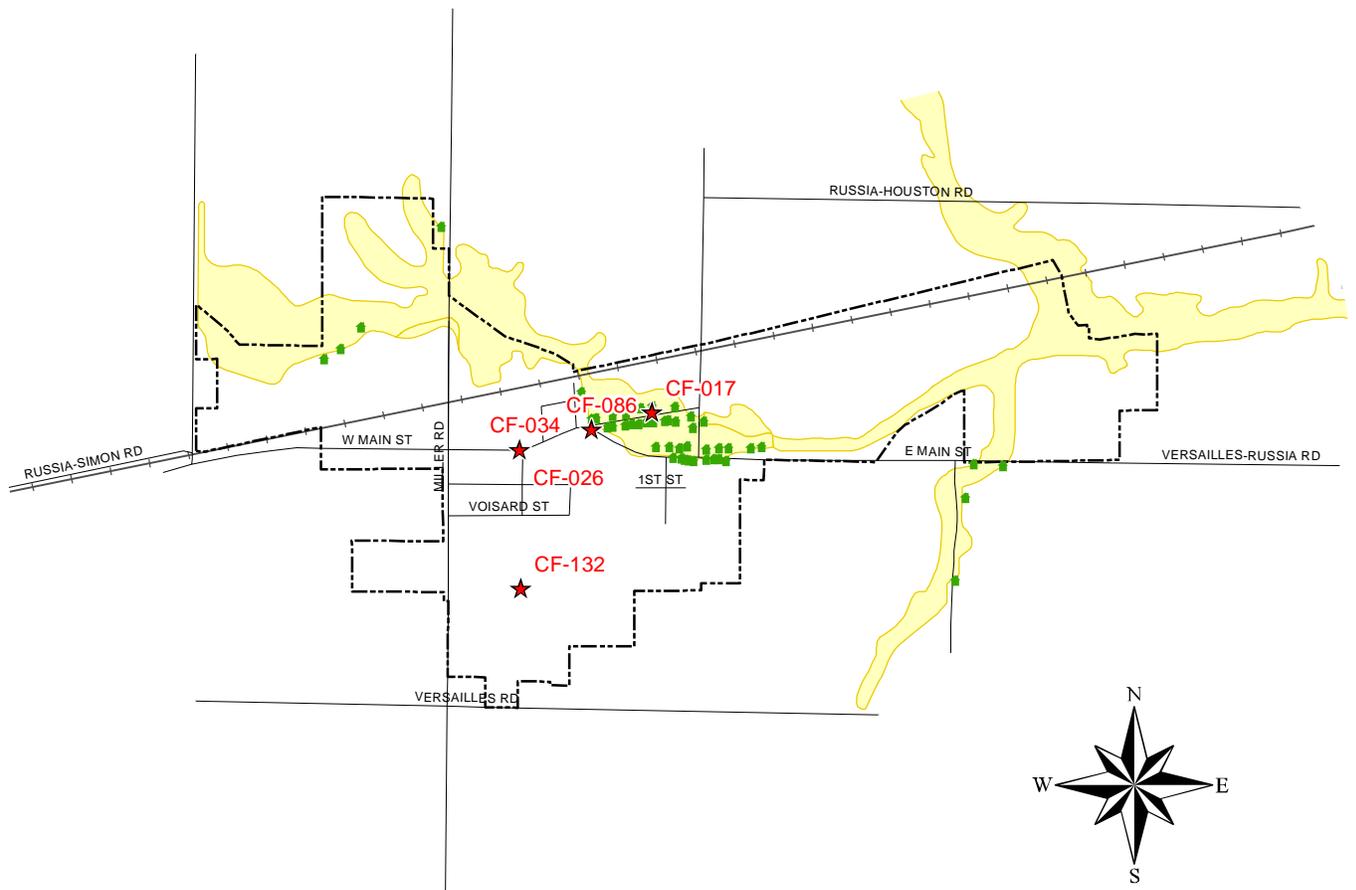
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 2,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the Village of Russia: 43

Map intended for reference only



### Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ■ At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➔ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)



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 TEL: 614-471-5150 FAX: 614-471-9286

# SHELBY COUNTY, OHIO MULTI-HAZARD MAP OF SIDNEY, OHIO

SHELBY COUNTY - COUNTYWIDE ALL  
 NATURAL HAZARDS MITIGATION PLAN  
 MULTI-HAZARD MAP: SHELBY10

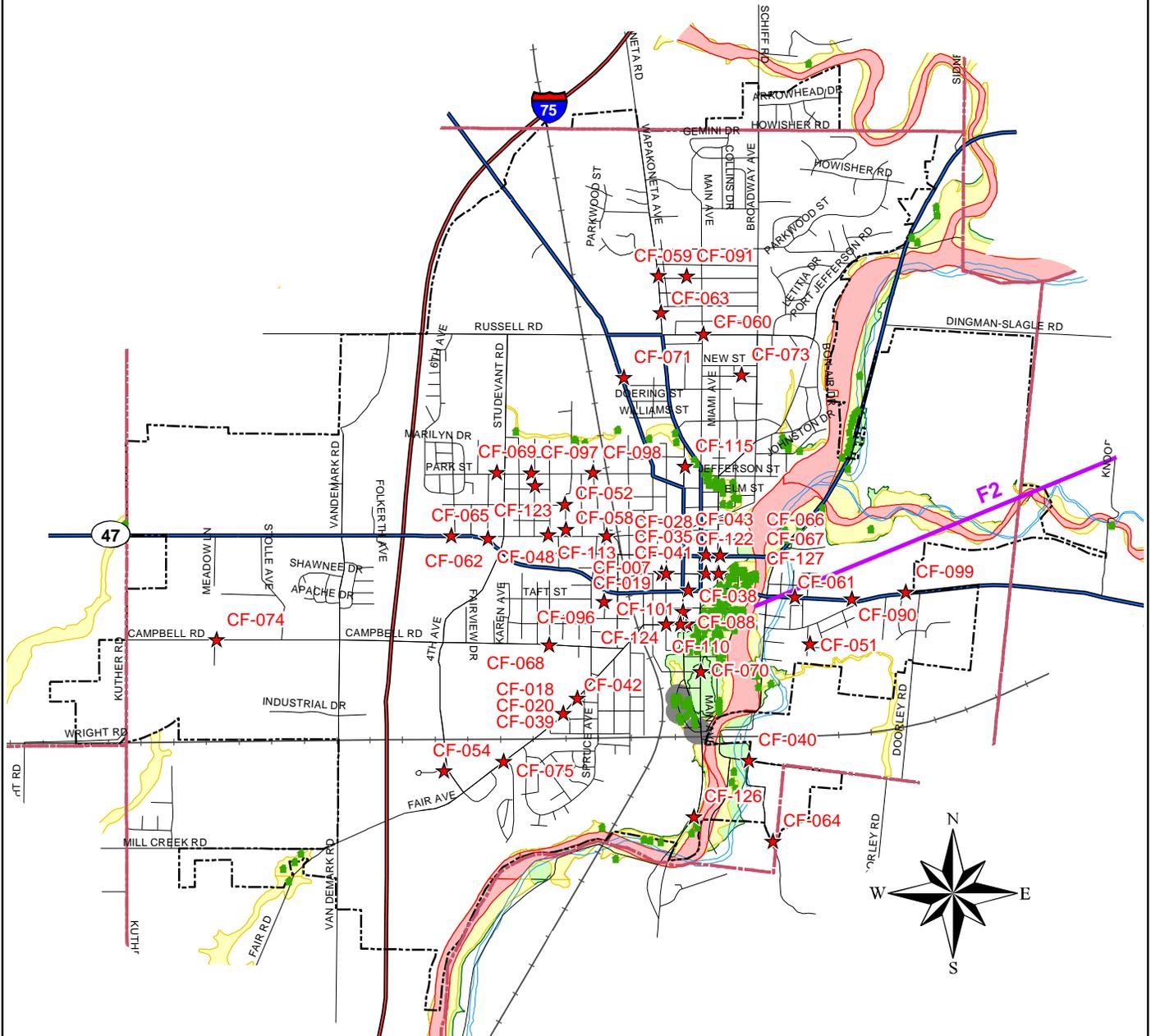
Date: January 31, 2005

Job No. 2004-1605

Scale: 1" = 4,000'

Critical Facility locations based on geocoded coordinates.  
 At-Risk structures for the City of Sidney: 213

Map intended for reference only



### Legend

- |                         |                  |                     |                         |
|-------------------------|------------------|---------------------|-------------------------|
| ★ Critical Facilities   | ▭ County Line    | — Interstate Route  | — Waterways             |
| ● At-Risk Structures    | ▭ Township Lines | — U.S. Route        | ■ Lakes                 |
| ● Repetitive Loss Areas | ▭ Municipalities | — State Route       | ■ Floodway              |
| ➡ Tornado Paths         |                  | — Roads - County    | ■ Floodplain - 100 year |
|                         |                  | — Roads - Municipal | ■ Floodplain - Other    |
|                         |                  | — Railroads         |                         |

Data Sources: Ohio Department of Transportation (ODOT) & Ohio Department of Natural Resources (ODNR)

**Appendix K:  
Critical Facilities**

C.F. ID	Critical Facility	Address	City	Zip	American Red Cross Shelter
CF-001	Anna Rescue	203 S. Linden Ave.	Anna	45302	
CF-002	Anna Rescue (Botkins)	203 W. State St.	Botkins	45306	
CF-003	Ft. Loramie	11044 St. Rt. 66	Ft. Loramie	45845	
CF-004	Houston	5125 Russia Houston Rd.	Houston	45333	
CF-005	Jackson Center	523 N. Main	Jackson Center	45334	
CF-006	Perry, Port, Salem	205 W. Wall St.	Port Jefferson	45360	
CF-007	Sidney Fire & Rescue	222 W Poplar St	Sidney	45365	
CF-008	Anna	515 S. Pike St.	Anna	45302	Y
CF-009	Botkins	203 W. State St.	Botkins	45306	Y
CF-010	Ft Loramie	220 N Main St	Ft. Loramie	45845	Y
CF-011	Houston Fire	5005 Russia Houston Rd.	Houston	45333	Y
CF-012	Jackson Center	600 W. Pike St.	Jackson Center	45334	Y
CF-013	Kettlersville	8833 North St.	Kettlersville	45336	
CF-014	Lockington VFD	10363 Museum Trail	Piqua	45356	Y
CF-015	Maplewood	22555 Maplewood Rd.	Maplewood	45340	Y
CF-016	Port Jefferson	105 W. Wall St.	Port Jefferson	45360	Y
CF-017	Russia	113 North St	Russia	45363	
CF-018	Shelby County	800 Fair Road	Sidney	45365	
CF-019	Sidney Fire & Rescue	222 W Poplar St	Sidney	45365	
CF-020	HazMat Team	800 Fair Road	Sidney	45365	
CF-021	Anna Police	209 W. Main St.	Anna	45302	
CF-022	Botkins Police	207 W. South St.	Botkins	45306	
CF-023	Ft. Loramie Police	14 Elm St.	Fort Loramie	45845	
CF-024	Jackson Center Police	110 S Linden St	Anna	45302	
CF-025	Port Jefferson Police	100 Spring St	Port Jefferson	45360	
CF-026	Russia Police	232 W. Main St.	Russia	45363	
CF-027	Shelby Co. Sheriff	555 Gearhart Rd	Sidney	45365	Y
CF-028	Sidney Police	201 W Poplar St	Sidney	45365	
CF-029	Anna	209 W. Main St.	Anna	45302	
CF-030	Botkins	210 S. Mill St.	Botkins	45306	Y
CF-031	Ft Loramie	14 Elm St.	Fort Loramie	45845	Y
CF-032	Jackson Center	122 E. Pike St.	Jackson Center	45334	
CF-033	Port Jefferson	100 Spring St	Port Jefferson	45360	
CF-034	Russia	232 W. Main St.	Russia	45363	
CF-035	Sidney	201 W Poplar St	Sidney	45365	
CF-036	Franklin Township	11095 Cr Rd 25A	Sidney	45365	
CF-037	Turtle Creek Township	8347 SR 705	Sidney	45365	
CF-038	Courthouse and Annex	129 E. Court St.	Sidney	45365	
CF-039	Emergency Management	800 Fair Road	Sidney	45365	Y
CF-040	Engineer	500 Gearhart Rd.	Sidney	45365	
CF-041	Health Dept.	202 W Poplar St	Sidney	45365	
CF-042	County Fairgrounds	700 Fair Rd	Sidney	45365	
CF-043	Amos Memorial	230 E. North St	Sidney	45365	
CF-044	Anna Community	304 N. Second St	Anna	45302	
CF-045	Botkins Amos Branch	109 E. Lynn St.	Botkins	45306	
CF-046	Ft Loramie Amos Branch	300 E. Park St.	Fort Loramie	45845	
CF-047	Jackson Center	205 S. Linden	Jackson Center	45334	
CF-048	Wilson Memorial	915 Michigan St	Sidney	45365	

C.F. ID	Critical Facility	Address	City	Zip	American Red Cross Shelter
CF-049	Dorothy Love	3003 W. Cisco Rd.	Sidney	45365	Y
CF-050	Fair Haven	2901 Fair Rd.	Sidney	45365	
CF-051	The Pavilion	705 Fulton St	Sidney	45365	
CF-052	Sidney Care Center	510 Buckeye Ave.	Sidney	45365	
CF-053	Adult Daycare	2901 Fair Rd.	Sidney	45365	
CF-054	New Generations	1849 Progress Way	Sidney	45365	
CF-055	Anna Creative Learning Center	311 W. Main St.	Anna	45302	
CF-056	Care-A-A lot	108 E. South St.	Botkins	45306	
CF-057	Ft Loramie Day Care	101 S. Main St.	Fort Loramie	45845	
CF-058	Kangaroo Pouch	419 N. Buckeye	Sidney	45365	
CF-059	Kiddie Land	1899 Wapakoneta	Sidney	45365	
CF-060	Kids Learning Place	1502 N. Main Ave	Sidney	45365	
CF-061	My Daycare	716 E. Court	Sidney	45365	
CF-062	Teddy Bears Learn here	328 Wilson Ave	Sidney	45365	
CF-063	Tender Hearts	1611 Wapakoneta Ave	Sidney	45365	
CF-064	Wilma Valentine	1200 Childrens Home Rd.	Sidney	45365	
CF-065	YMCA Child Care	1540 Michigan St.	Sidney	45365	
CF-066	Bridgeview School	320 E. North St.	Sidney	45365	
CF-067	Central Elementary	102 N. Miami Av	Sidney	45365	Y
CF-068	Emerson	901 Campbell	Sidney	45365	Y
CF-069	Longfellow	1250 Park St.	Sidney	45365	Y
CF-070	Lowell Elementary	702 S. Main Av	Sidney	45365	Y
CF-071	Northwood	1152 St. Marys	Sidney	45365	Y
CF-072	Parkwood	315 W. Russell	Sidney	45365	Y
CF-073	Whittier	425 Belmont	Sidney	45365	Y
CF-074	Sidney High	115 Campbell	Sidney	45365	Y
CF-075	Sidney Middle	980 Fair Rd.	Sidney	45365	
CF-076	Anna Elementary	607 N. Pike	Anna	45302	Y
CF-077	Anna High	204 N 2nd St.	Anna	45302	Y
CF-078	Botkins	208 N. Sycamore	Botkins	45306	
CF-079	Fairlawn Elementary	6838 Palestine St.	Pemberton	45353	
CF-080	Fairlawn High	18800 Johnston Rd.	Sidney	45365	
CF-081	Ft. Loramie Elementary	35 Elm St.	Fort Loramie	45845	Y
CF-082	Ft Loramie High	600 E. Park	Fort Loramie	45845	Y
CF-083	Hardin Elementary	10207 St Rt 47	Houston	45333	
CF-084	Houston High	5300 Houston Rd.	Houston	45333	Y
CF-085	Jackson Center	204 S. Linden	Jackson Center	45334	Y
CF-086	Russia	110 W. Main St.	Russia	45363	Y
CF-087	Christian Academy	2151 W. Russell Rd.	Sidney	45365	
CF-088	Holy Angels	120 E. Water St.	Sidney	45365	
CF-089	Lehman High	2400 St. Marys Ave	Sidney	45365	
CF-090	Sidney City Water Plant	880 East Court St.	Sidney	45365	
CF-091	Grace Baptist	137 W. Edgewood	Sidney	45365	
CF-092	Jackson Center Nazarene	405 W. Pike	Jackson Center	45334	
CF-093	New Hope United Methodist	10021 W Mason Rd	Sidney	45365	
CF-094	Pemberton United Methodist	6541 Main St	Sidney	45365	Y
CF-095	Redeemer Lutheran Church	300 W. Mason	Sidney	45365	
CF-096	Sidney Apostolic Temple	210 Pomeroy	Sidney	45365	

C.F. ID	Critical Facility	Address	City	Zip	American Red Cross Shelter
CF-097	Cornerstone Assembly of God	1028 Park	Sidney	45365	
CF-098	Mt Vernon Baptist	606 Park St.	Sidney	45365	
CF-099	Sidney Baptist	1322 E. Court St.	Sidney	45365	
CF-100	Jackson Center Baptist	109 E College St	Jackson Center	45334	
CF-101	Holy Angels	324 S. Ohio Ave	Sidney	45365	
CF-102	St Michaels Catholic	33 Elm St.	Fort Loramie	45845	Y
CF-103	St Peter & Paul	6788 SR 66	Fort Loramie	45845	Y
CF-104	Houston Congregational	4883 Russia-Houston Rd	Houston	45333	
CF-105	Full Gospel	950 S. Childrens Home	Sidney	45365	
CF-106	Only Believe Ministries	13815 Botkins Rd	Botkins	45306	
CF-107	Grace Lutheran	607 S. Main	Jackson Center	45334	Y
CF-108	St Jacob Lutheran	101 W. Main St.	Anna	45302	
CF-109	St Jacobs Lutheran	18280 Pasco Montra	Jackson Center	45334	
CF-110	St Johns Lutheran	120 W. Water St.	Sidney	45365	
CF-111	St Paul Lutheran	301 E. State St.	Botkins	45306	Y
CF-112	Sidney Missionary	2500 County Road 25A S	Sidney	45365	
CF-113	The Lighthouse Ministries	514 Michigan St	Sidney	45365	
CF-114	Immanuel United Church of Christ	8889 St Rt 274	Kettlersville	45336	Y
CF-115	St Pauls United Church of Christ	707 N. Ohio	Sidney	45365	
CF-116	Anna United Methodist	201 W. North St.	Anna	45302	
CF-117	Jackson Center United Methodist	202 E. Pike St	Jackson Center	45334	
CF-118	Maplewood Unite Methodist	21544 Maplewood Rd	Maplewood	45340	
CF-119	Pasco United Methodist	17483 St Rt 706	Sidney	45365	
CF-120	Pasco Pemberton Methodist	17457 State Route 706	Sidney	45365	
CF-121	Potters House	431 W. Main St	Port Jefferson	45360	
CF-122	Sidney First Methodist	230 E. Poplar	Sidney	45365	
CF-123	Sidney Wesleyan	621 2nd Ave	Sidney	45365	
CF-124	American Red Cross Building	207 W. Water St.	Sidney	45365	Y
CF-125	Hardin Grange Hall	Hardin-Wapak Rd.	Sidney	45365	Y
CF-126	I.U.E. Hall	1330 S Main Av	Sidney	45365	Y
CF-127	Masonic Hall	303 E. Poplar St.	Sidney	45365	Y
CF-128	American Legion	627 College St.	Jackson Center	45334	Y
CF-129	Jackson Center Community Club	707 E. Pike St.	Jackson Center	45334	Y
CF-130	VFW Post 3316	17000 State Route 274	Jackson Center	45334	Y
CF-131	Port Jefferson Community Club	101 Spring St.	Port Jefferson	45360	Y
CF-132	Russia Community Center	101 St Remy St.	Russia	45363	Y

**Appendix L:  
Alternatives Matrix**

**ALL NATURAL HAZARD MITIGATION PLAN**  
**Shelby County Core Group**  
**Mitigation Alternatives Evaluation**

## **Directions for Filling out the Matrix**

We have provided the actual hazard mitigation alternatives so that you can refer to them when you are filling out the matrix.

1. Look at each statement under each hazard separately. Follow the example provided under the first hazard listed.
2. When you are ready to fill in the matrix you will use a rating criterion from 1 to 5. (5 being considered highest and most important. You may also leave boxes blank if you cannot answer the question.)
3. Please note that the first alternative under each hazard is “No Action”, which means the County will do nothing in terms of mitigation for this hazard. You must also rate doing nothing as an alternative.
4. Don't worry about the Hazard Prioritization Column (we will take care of that).
5. Don't total your scores. We will also take care of that component.
6. If you feel that any alternative does not apply to your community or is confusing, do not rate it and we can discuss at the next meeting.
7. If there are any questions concerning the alternatives or how to fill out the matrix, please contact me, Maureen Richard at (513) 697-8701 or e-mail me at [mrichard@emht.com](mailto:mrichard@emht.com)

For Example:

### **Under Winter Storms**

One of the alternatives listed says:

***Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.***

To fill in the matrix you must ask yourself several questions while you are filling out the matrix.

Is this statement technically feasible? Place a rating in the box between 1-5

Do you feel that this activity will reduce risk? Place a rating in the box between 1-5

Do you feel that the frequency of the hazard justifies this alternative? Place a rating in the box between 1-5

Should this alternative be pursued even if funding is not available? Place a rating in the box between 1-5

ALL NATURAL HAZARD MITIGATION PLAN  
Shelby County Core Group  
Mitigation Alternatives Evaluation

Once you are finished filling out the matrix please mail the matrix to Tracy Annett so we can compile it before our next meeting. The deadline for submittal of the matrix for your community is **December 21, 2004**. There is a self-addressed stamped envelope for your convenience.

This deadline will allow us to compile the results as well as give you a draft plan to review prior to our last meeting. Our last meeting as a Core Group will be **January 12, 2005 at 6:30 pm**, so it is critical that you get these in to us so we can compile them before the meeting. The location of the meeting is at the Agricultural Building next to the Shelby County EMA's office on Fair Road in Sidney.

Even if you are unable to attend this meeting, please mail the completed form back to Tracy Annett by **December 21, 2004** at the following address:

Tracy Annett  
EMH&T Inc.  
170 Mill Street  
Gahanna, Ohio 43230

THANKS AND SEE YOU ALL ON **January 12, 2005!**



December 1, 2004

Mr. Tom Cisco  
Shelby County EMA  
108 North Street  
Botkins, Ohio 45306

**Re:** Hazard Mitigation Planning Alternatives Matrix

Dear Mr. Cisco:

As a member of Shelby County's Natural Hazard Mitigation Plan Core Group, you are receiving a hazard mitigation alternatives matrix which was developed from the possible mitigation alternatives discussed at the Mitigation Alternatives Development meeting that was held on November 24, 2004. Each of you should fill out this matrix as it pertains to the county and your community. EMH&T will collect all communities' completed matrices and compile the results to be included in your County's All Natural Hazard Mitigation Plan that will be submitted to the Federal Emergency Management Agency (FEMA) for approval.

Please find the matrix attached to this letter, as well as directions for completing the matrix. EMH&T asks that you have the matrix completed by the date given at the end of the directions.

If you have any questions before the final meeting please do not hesitate to call or e-mail me.

Sincerely,

EVANS, MECHWART, HAMBLETON & TILTON, INC.

Maureen M. Richard, P.E.  
Senior Project Engineer

Direct: (513) 697-8701  
mrichard@emht.com

Shelby County All Natural Hazard Mitigation Plan					Technically Feasible	Frequency of Hazard Risk	Activities Reduce Risk	Funding Available	Hazard Prioritization	Total
<b>Winter Storms - Snow, Ice, Extreme Cold</b>										
EXAMPLE: Provide public education brochure to County residents to teach them about the dangers of winter storms and how to prepare for them.	5	5	5	4	TBD by EMH&T	TBD by EMH&T				
No Action.					TBD by EMH&T	TBD by EMH&T				
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.					TBD by EMH&T	TBD by EMH&T				
Seek funding for additional salt storage facilities and loading equipment for townships.					TBD by EMH&T	TBD by EMH&T				
Develop an outreach program for informing citizens of designated shelter locations.					TBD by EMH&T	TBD by EMH&T				
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.					TBD by EMH&T	TBD by EMH&T				
Develop an education program on hazards associated with severe winter weather and how to prepare prior to the winter months.					TBD by EMH&T	TBD by EMH&T				
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.					TBD by EMH&T	TBD by EMH&T				
<b>Summer Storms - Thunderstorms, High Winds, Hail, Lightning</b>										
No Action.					TBD by EMH&T	TBD by EMH&T				
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.					TBD by EMH&T	TBD by EMH&T				
Develop an outreach program for informing citizens of designated shelter locations.					TBD by EMH&T	TBD by EMH&T				
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.					TBD by EMH&T	TBD by EMH&T				
Develop an education program on hazards associated with severe storms and how to prepare prior to a severe weather event.					TBD by EMH&T	TBD by EMH&T				
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.					TBD by EMH&T	TBD by EMH&T				
Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.					TBD by EMH&T	TBD by EMH&T				
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.					TBD by EMH&T	TBD by EMH&T				
<b>Flooding</b>										
No Action.					TBD by EMH&T	TBD by EMH&T				
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.					TBD by EMH&T	TBD by EMH&T				
Develop an outreach program for informing citizens of designated shelter locations.					TBD by EMH&T	TBD by EMH&T				
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.					TBD by EMH&T	TBD by EMH&T				
Develop an education program on hazards associated with severe flooding and how to prepare prior to a flood event.					TBD by EMH&T	TBD by EMH&T				
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.					TBD by EMH&T	TBD by EMH&T				
Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.					TBD by EMH&T	TBD by EMH&T				
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.					TBD by EMH&T	TBD by EMH&T				
Seek funding for auto sandbag filling equipment.					TBD by EMH&T	TBD by EMH&T				
Seek funding to update Flood Insurance Rate Maps. Current FIRMs are dated September 2, 1982.					TBD by EMH&T	TBD by EMH&T				
Develop a river and stream maintenance program for removing debris and log jams from drainage ways.					TBD by EMH&T	TBD by EMH&T				
Encourage communities to join the National Flood Insurance Program, which would allow residents to purchase flood insurance.					TBD by EMH&T	TBD by EMH&T				
Elevate flood prone structures above the Base Flood Elevation, which is the elevation of the 100-year floodplain.					TBD by EMH&T	TBD by EMH&T				
<b>Tornadoes</b>										
No Action.					TBD by EMH&T	TBD by EMH&T				
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.					TBD by EMH&T	TBD by EMH&T				
Develop an outreach program for informing citizens of designated shelter locations.					TBD by EMH&T	TBD by EMH&T				
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.					TBD by EMH&T	TBD by EMH&T				
Develop an education program on hazards associated with tornadoes and how to prepare prior to the tornado season.					TBD by EMH&T	TBD by EMH&T				
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.					TBD by EMH&T	TBD by EMH&T				
Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.					TBD by EMH&T	TBD by EMH&T				
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.					TBD by EMH&T	TBD by EMH&T				
Provide permanent shelters for mobile home parks and campgrounds, where citizens may seek safety from severe weather.					TBD by EMH&T	TBD by EMH&T				
Develop regulations to require concrete safe rooms to be included in new building construction.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for informing residents of an "All clear" message that sounds when a severe weather warning expires.					TBD by EMH&T	TBD by EMH&T				
<b>Droughts</b>										
No Action.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program on the hazards associated with drought and extreme heat, including open burning.					TBD by EMH&T	TBD by EMH&T				
Develop a public education program for restrictions on open burning and water usage during drought conditions.					TBD by EMH&T	TBD by EMH&T				
Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.					TBD by EMH&T	TBD by EMH&T				

Shelby County All Natural Hazard Mitigation Plan	Technically Feasible	Frequency of Hazard Risk	Activities Reduce Risk	Funding Available	Hazard Prioritization	Total
<b>Earthquakes</b>						
No Action.					TBD by EMH&T	TBD by EMH&T
Develop a public education program concerning the frequency that earthquakes may occur and the hazards associated with earthquakes and tremors.					TBD by EMH&T	TBD by EMH&T
Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.					TBD by EMH&T	TBD by EMH&T

**Appendix M:**  
**Action Plan**



Shelby County Action Plan											
	Hazard Prioritization	Activity Rating	Implementation Schedule (Year)	Funding	Responsible Agency		Hazard Prioritization	Activity Rating	Implementation Schedule (Year)	Funding	Responsible Agency
<b>Flooding</b>							<b>Flooding</b>				
No Action.	4	8.2	N/A	N/A	N/A	Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.	4	13.9	2006-2007	PDM or other State / Federal Sources	EMA & Core Group
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.	4	13.0	2006-2007	PDM or other State / Federal Sources	EMA & Core Group	Seek funding for auto sandbag filling equipment.	4	12.8	2006-2007	PDM or other State / Federal Sources	EMA
Develop an outreach program for informing citizens of designated shelter locations.	4	12.5	2005-2006	Existing	Red Cross & EMA	Seek funding to update Flood Insurance Rate Maps. Current FIRMs are dated September 2, 1982.	4	14.5	2006-2007	PDM or other State / Federal Sources	EMA & Core Group
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.	4	11.2	2006-2007	Existing	Individual Political Subdivisions & EMA	Develop a river and stream maintenance program for removing debris and log jams from drainage ways.	4	14.8	2006-2007	Existing	EMA & Core Group
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	4	13.0	2005-2006	Existing	Emergency Management	Encourage communities to join the National Flood Insurance Program, which would allow residents to purchase flood insurance.	4	13.7	2005-2006	Existing	EMA & Core Group
Develop an education program on hazards associated with severe flooding and how to prepare prior to a flood event.	4	12.6	2005-2006	Existing	Emergency Management	Elevate flood prone structures above the Base Flood Elevation, which is the elevation of the 100-year floodplain.	4	12.6	2006-2007	PDM or other State / Federal Sources	EMA & Core Group
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.	4	11.9	2005-2006	Existing	Sheriff & EMA						
Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.	4	12.2	2005-2006	Existing	Builders Association & EMA						
<b>Tornadoes</b>							<b>Tornadoes</b>				

Shelby County Action Plan											
	Hazard Prioritization	Activity Rating	Implementation Schedule (Year)	Funding	Responsible Agency		Hazard Prioritization	Activity Rating	Implementation Schedule (Year)	Funding	Responsible Agency
No Action.	3	7.0	N/A	N/A	N/A	Develop a public education program for informing residents of an "All clear" message that sounds when a severe weather warning expires.	3	12.9	2005-2006	Existing	EMA & Sheriff & City of Sidney
Provide back-up generators for critical facilities, which need to maintain continuous power to protect human health and life.	3	14.5	2006-2007	PDM or other State / Federal sources	EMA & Core Group	<b>Droughts</b>					
Develop an outreach program for informing citizens of designated shelter locations.	3	16.1	2005-2006	Existing	Red Cross & EMA	No Action.	2	6.8	N/A	N/A	N/A
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.	3	12.1	2006-2007	Existing	Individual Political Subdivisions & EMA	Develop a public education program on the hazards associated with drought and extreme heat, including open burning.	2	11.6	2005-2006	Existing	EMA & Core Group
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	3	17.0	2005-2006	Existing	EMA	Develop a public education program for restrictions on open burning and water usage during drought conditions.	2	11.9	2005-2006	Existing	EMA & Fire Depts. & Law Enforcement
Develop an education program on hazards associated with tornadoes and how to prepare prior to the tornado season.	3	16.3	2005-2006	Existing	EMA	Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.	2	10.3	2006-2007	Existing	EMA & Core Group
Develop a usable advisory system for residents so they know traveling in severe weather is at their own risk.	3	14.5	2005-2006	Existing	Sheriff & EMA	<b>Earthquakes</b>					
Develop education programs for developers, contractors and communities concerning alternate methods for keeping basements dry.	3	11.5	2005-2006	Existing	Builders Association & EMA	No Action.	1	5.9	N/A	N/A	N/A
Seek funding for early warning systems, such as sirens and reverse 9-1-1, to warn residents of approaching severe weather.	3	16.9	2006-2007	PDM or other State / Federal Sources	EMA & Core Group	Develop a public education program concerning the frequency that earthquakes may occur and the hazards associated with earthquakes and tremors.	1	9.1	2005-2006	Existing	EMA & Core Group
Provide permanent shelters for mobile home parks and campgrounds, where citizens may seek safety from severe weather.	3	13.0	2006-2007	PDM or other State / Federal Sources	EMA & Core Group	Develop a County contingency plan to furnish those homes on wells in rural and unincorporated areas with a back-up water supply.	1	10.4	2005 - 2006	Existing	EMA & Core Group
Develop regulations to require concrete safe rooms to be included in new building construction.	3	11.9	2006-2007	Existing	EMA & Core Group						

**Appendix N:**  
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