GALLIA COUNTY UPDATE

Executive Summary

The Gallia County Emergency Management Agency/Office of Homeland Security spearheaded this effort to update their comprehensive Natural Hazards Mitigation Plan. Their dedication to this mitigation planning effort is seen in the results of having participation from the County and all incorporated jurisdictions.

Gallia County is subject to natural hazards that threaten life and health and have caused extensive property damage. To better prepare for these natural hazards and their impacts on people and property and to identify ways to reduce those impacts, the County's Emergency Management Agency undertook updating their Natural Hazards 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 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 Gallia County. The Core Group met one (1) formal time 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. Additional coordination occurred via e-mail correspondence and the Gallia County Emergency Management Agency met with the communities involved on separate occasions to gather all the necessary data for the plan update.

Gallia County has experienced many natural disasters in the past one hundred years. The Core Group evaluated these hazards and chose to address the following eight (8) hazards based on their impact on human health and property damage: flooding, winter storms (heavy snow and ice), severe storms (thunderstorms, high winds, lightning, hail), landslides, tornadoes, strip mine subsidence, earthquakes, and droughts (extreme temperatures). The Core Group also reviewed the original list of hazards for Gallia County from the prior Mitigation Plan.

With the hazards identified, a vulnerability assessment was completed for Gallia County. This assessment helped to determine 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 eight (8) hazards. The culmination of Gallia County's Natural Hazard Mitigation Plan was an Action Plan for the communities to use to track progress on the implementation of their mitigation alternatives.

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Introduction

This plan is an update of the **Gallia County Natural Hazards Mitigation Plan** that was developed in 2004 and adopted for implementation by the Gallia County Commissioners and all incorporated jurisdictions within the County.

Gallia County is at risk of damage from a variety of natural hazards: flooding, winter storms, severe storms, landslides, tornadoes, mine subsidence, earthquakes and droughts. This plan explains the analysis of the potential effects of these natural hazards on the structures and infrastructure within Gallia County and proposes measures to reduce the risk of a natural hazard leading to a disaster with property loss, business disruption, or even loss of life.

In the past, natural hazards have led to costly disasters in Gallia County resulting in a Presidential Declaration of Major Disaster. These disasters are listed in Table 1 showing that their causes were flooding, wind, tornadoes, and ice/snow.

Table 1: Past Disasters in Gallia County

Date	Type of Declaration	Hazard
March 24, 1964	Presidential Declaration of Major Disaster	Heavy rains and floods
May 4, 1968	Presidential Declaration of Major Disaster	Tornadoes
June 5, 1968	Presidential Declaration of Major Disaster	Heavy rains and floods
January 26, 1978	Presidential Declaration of Major Disaster	Severe blizzard
January 27, 1996	Presidential Declaration of Major Disaster	Ohio River Flooding
June 24, 1996	Presidential Declaration of Major Disaster	Severe storms and flooding
March 4, 1997	Presidential Declaration of Major Disaster	Flash flooding
March 7, 2000	Presidential Declaration of Major Disaster	Flash flooding
March 24, 2003	Presidential Declaration of Major Disaster	Ice/snow storm
September 19, 2004	Presidential Declaration of Major Disaster	Severe storm and flooding
September 13, 2005	Presidential Declaration of Major Disaster	Severe rain storms from Hurricane Katrina
July 13, 2011	Presidential Declaration of Major Disaster	Severe storm and flooding

Gallia County's last disaster declaration was in July 13, 2011 for flooding. This was a Presidential Declaration in which funds were made available to the State of Ohio to supplement the state and local recovery efforts in the area struck by severe storms and flooding during the periods of April 4 to May 15, 2011.

Purpose of the Plan

The emergency management community, citizens, elected officials and others in Gallia County recognize the potential impacts of natural hazards on their community and have developed this plan to mitigate potential damages and reduce future losses. Mitigation actions reduce the potential for loss of life and destruction of property. Mitigation actions are evaluated in advance

of the occurrence of a potential hazard and are essential for breaking the disaster cycle of damage, reconstruction, and repeated damage.

This plan presents an evaluation of the potential negative consequences of the natural hazards that may affect Gallia County and proposes strategies that will reduce or mitigate losses.

Adoption of this plan ensures that Gallia County and participating jurisdictions continue to be eligible to apply for and receive certain Federal grant funds that are administered by the Ohio Emergency Management Agency (Ohio EMA) for the Federal Emergency Management Agency (FEMA). This plan complies with the requirements of the Disaster Mitigation Act of 2000 and its implementing regulations published in Title 44 of the Code of Federal Regulations (CFR) Section 201.6.

Organization of the Plan

The organization of the 2012 plan is somewhat different from the organization of the 2004 plan.

The 2004 plan is organized into nine sections and included several appendices. The nine sections are:

- **Introduction**, which identifies the purposes of this plan and the jurisdictions that have participated in plan development.
- **Community Information**, which discusses existing conditions, including development trends and current local government capabilities.
- **Natural Hazards Mitigation Planning Process**, which summarizes the earlier planning process as well as the process of creating this plan.
- **Hazard Profile**, which identifies the natural hazards that may affect Gallia County.
- **Vulnerability Assessment**, which assesses the vulnerability to each natural hazard and the critical facilities affected by each hazard.
- **Goals**, which presents planning principles, mitigation goals, and objectives.
- **Hazard Mitigation Practices**, which highlights the ways to protect from hazards and the different ways to mitigate the hazards identified.
- **Highest Rated Activities and Action Plan**, which includes the Core Group's action matrix results, mitigation action items for each jurisdiction, and mitigation plan maintenance.
- **Appendices**, which include sample plan adoption resolutions, public notices about the planning process, and the survey instruments used by participating jurisdictions.

To make the plan easier to follow, this updated plan is organized by hazard rather than by steps in the process. This plan explains all steps of the mitigation planning process for each hazard. By organizing the plan by hazard rather than by task, the relationships among a hazard, the potential

effect of the hazard, and the actions proposed for mitigating negative effects of that hazard are more obvious.

The sections of this plan are:

- **Introduction**, which identifies the purposes of this plan and the jurisdictions that have participated in plan development.
- **Planning Process**, which summarizes the earlier planning process as well as the process of updating this plan.
- **Community Profile**, which discusses existing conditions, including development trends and current local government capabilities.
- **Hazard Identification**, which identifies the natural hazards that may affect Gallia County.
- **Risk Assessment Sections for Each Identified Hazard**, which includes a summary of changes since the previous plan was adopted, a profile of each hazard, and an assessment of the potential impact of each hazard.
- **Summary of Risk Assessment Findings**, which highlights the conclusions of the previous Risk Assessment Sections.
- **Mitigation Goals**, which presents planning principles, mitigation goals, and objectives.
- **Alternative Mitigation Actions**, which explains the status of actions proposed in the previous plan, presents a comprehensive array of possible actions, and explains how actions were evaluated.
- **Proposed Mitigation Actions**, which explains how actions address existing and future development and continued compliance with the National Flood Insurance Program (NFIP), how actions will be incorporated into other plans, and how actions will be implemented.
- **Plan Maintenance**, which explains how mitigation actions will be monitored and how the plan will be evaluated and updated.
- **Sources of Information**, which lists Web sites and publications used to develop this plan.
- **Appendices**, which include sample plan adoption resolutions, public notices about the planning process, and the survey instruments used by participating jurisdictions.

Jurisdictions Represented in the Plan

This is a multi-jurisdictional hazard mitigation plan. The jurisdictions that participated in the development of this plan are the same jurisdictions that participated in the development of the initial version the plan and adopted it. Along with the County government officials involved, the participating jurisdiction's included: the Village of Centerville, Village of Cheshire, City of Crown, City of Gallipolis, Village of Rio Grande and the Village of Vinton. The townships within Gallia County were invited to participate as well.

Adoption Resolutions

Appendix I provides sample adoption resolutions that participating jurisdictions will adopt after FEMA Region V determines that this plan is approvable pending adoption. An approvable plan meets planning requirements specified in 44 CFR Section 201.6. A plan is fully approved after it is adopted; signed adoption resolutions will be included in **Appendix I** when the plan is submitted for final approval by FEMA Region V.

Planning Process

Planning Process Update

This 2012 plan is an update of the Gallia County Natural Hazards Mitigation Plan that was developed in 2004 and adopted for implementation by Gallia County, Ohio and participating jurisdictions within the County in 2004.

This updated **Gallia County Natural Hazards Mitigation Plan** represent the work of citizens, elected and appointed government officials, business leaders, and volunteers of non-profit organizations in developing a blueprint for protecting community assets, preserving the economic viability of the community, and saving lives.

The process of developing the initial plan was somewhat more complex than the process of updating the plan.

2004 Planning Process

2004 Core Group

Development of the Gallia County Natural Hazards Mitigation Plan was led by the Gallia County Mitigation Core Group.

Several letters were sent to incorporated jurisdictions to get involvement from all communities in the mitigation planning effort. 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:

- Gallia County Engineer's Office
- Gallia County Planning Commission
- Gallia County Soil and Water Conservation District Office
- Gallia County Board of Commissioners' Office
- Gallia County Sheriff's Office
- Gallipolis Fire Department
- Morgan Township
- Gallipolis Township
- Clay Township
- Green Township
- Ohio Township
- Raccoon Township
- Cheshire Township
- Village of Crown City
- Village of Rio Grande
- Huntington Township
- Perry Township
- Gallia County Emergency Management Agency
- Greenfield Township
- Village of Cheshire
- Walnut Township
- Addison Township
- Springfield Township
- Bossard Library
- Christ United Methodist Church
- Village of Centerville
- Harrison Township
- Village of Vinton
- Guyan Township
- Gallia County 9-1-1
- City of Gallipolis

2004 Jurisdictional Participation

Gallia County has six incorporated areas within its borders. All six incorporated communities chose to participate in this planning effort. Those incorporated jurisdictions included:

- City of Gallipolis
- Village of Centerville
- Village of Cheshire
- Village of Crown City
- Village of Rio Grande
- Village of Vinton

2004 Public Involvement

The formal public notification process as defined in the Federal Code took place prior to approval and/or adoption of the Mitigation Plan. The public was notified that the process to produce the Gallia County Natural Hazards Mitigation Plan was underway and that they will have an opportunity to review the draft plan for a period determined by the Core Group. The Draft Mitigation Plan was submitted concurrently to the OEMA and FEMA for review and approval.

Other Planning Mechanism

During the initial planning process, the Mitigation Core Group members reviewed existing planning mechanisms to ascertain community capabilities and identify opportunities for support in implementing mitigation actions. Documents consulted included existing municipal and county zoning and subdivision regulations and flood damage prevention ordinances, current county comprehensive plan and building code, and Flood Insurance Studies.

2012 Planning Process

2012 Mitigation Core Group

During 2012 Planning Process, the update of the plan was led by a Mitigation Core Group. Representatives of the previous 2004 Mitigation Core Group as well as other community leaders were invited in March of 2011 by the County EMA Office to actively participate in updating the plan; those who accepted the invitation comprise the current Mitigation Core Group members. The Core Group meeting was held on April 6th, 2011, and the minutes from this meeting are located in **Appendix II**.

In the early stages of the Mitigation Core Group Planning, several large businesses, academia and non-profits were invited to participate in the overall effort. The list included; the University of Rio Grande, Holzer Medical Center, Gallipolis Development Center, Gallia County Local School District, Gallipolis City School District, Walmart, Ohio Valley Bank, and Bob Evans. Most of the groups were interested in why they were contacted but were not interested in participating.

Mitigation Core Group members for updating the plan in 2011 were:

- **Gallia Co. EMA**- Mike Null, Jill Simpkins
- **Gallia Co. Sheriff**- Joe Browning
- **Gallia County**- Lois Snyder, Melissa Clark,
- **Providence Access Group**- Jason Sherrill
- **Village of Vinton**- Joshua Whealdon
- **Village of Gallipolis**- Randall Finney
- **URS**- Kari Mackenbach, Bill Porteus

To aid in the development of the plan, the County contracted the services of URS Corporation, a consulting firm with expertise in hazard mitigation planning.

As part of the effort of updating the initial mitigation plan, the Mitigation Core Group decided to re-organize the plan to make it simpler to follow and to include in each section of the plan a description of how and why it was modified. The Mitigation Core Group prioritized mitigation alternatives through an iterative process of document review during April 6th, 2011 Mitigation Core Group meeting until consensus was reached. Those incorporated jurisdictions that were not in attendance were contacted by the Gallia

County EMA Office to ensure their participation in the planning process. The Gallia County Emergency Management Director worked directly with numerous jurisdictions' including the Village of Centerville, Village of Cheshire, Village of Crown City and the Village of Rio Grande.

2012 Jurisdictional Participation

During the process of updating the plan, each meeting of the Mitigation Core Group was open to representatives of participating jurisdictions. Representatives were invited to attend the meetings in person or to take advantage of a conference call option to participate in the discussion.

A meeting of the Mitigation Core Group was held in the evening to accommodate schedules on April 6th, 2011 at the Gallia County Health Department Meeting Room. Each participating jurisdiction was invited by the Gallia County EMA Director by letter to participate in the meeting, a copy of the e-mail invitation and notes from the meeting are included in **Appendix II**. All jurisdictions not present at this meeting were personally contacted by the Gallia County EMA Office on the status of the plan and the jurisdictions responsibilities going forward.

On XXXXXXX, a printed copy of the draft plan was mailed to each participating jurisdiction along with a letter to explain their responsibilities and obligation to review the material in the plan. A copy of the draft plan was also made available to download online. A list of reviewers and a copy of the cover letter sent to each jurisdiction is located in **Appendix III**.

On XXXXXXX, representatives of each participating jurisdiction were invited by telephone call or e-mail to join a Mitigation Core Group Meeting on XXXXXXXX to discuss the draft.

At the April 2011 and May 2011 meetings, in addition to discussing the potential effects of hazards and possible mitigation projects, mitigation accomplishments were identified and mitigation planning principles, goals, and objectives were reviewed. Meeting participants unanimously agreed that no substantial changes should be made in the mitigation planning principles, goals, and objectives, which were presented in the initial version of this plan. However, a reprioritization of the hazards did occur and was unanimously agreed upon.

In an effort to simplify the plan and make it a more uniform document for every jurisdiction within the County, it was brought up to each jurisdiction to except the action items and prioritization for the County. By all jurisdictions having the same goals, jurisdictions can find ways to combine resources and efforts to accomplish their action items. This will improve the chances of action items being completed. By correspondence via email and direct communication by the County EMA director, all jurisdictions excepted the Counties action items. By adopting this plan each jurisdiction accepts change to their action items.

Additional correspondence occurred throughout the planning process update through the Gallia County Emergency Management Agency. When there were defined gaps in data, the Galloa County EMA helped the consultant either locate the source of the needed data or directly supplied the data to the consultant for inclusion in the Mitigation Plan.

2012 Public Involvement

A notice about updating the hazard mitigation plan was posted on the home page of the Gallia County Government site (http://www.gallianet.net/index.php/public-notices) and the County's social media page on Facebook beginning on June 12, 2012 and remained on the two sites for several months. Residents of Gallia County and neighboring communities who might be interested in participating in the process were invited to contact the Gallia County EMA Director. No volunteers responded to this invitation. A screen shot of the Web page is displayed in **Appendix IV**.

Because public participation in the drafting of the plan has been poor, a press release inviting review and comment on the plan was issued on June 12, 2012. A copy of the plan was places in the County library for the public to view and comment on. The press release was sent to:

- Gallipolis Daily Tribune

A copy of the press release is displayed in **Appendix IV**.

[*This section will be completed accurately after the plan is approvable and the public review period begins. These two paragraphs are provided in this draft as placeholders.]* The public was provided an opportunity to review and provide comments about the draft of the updated plan from [*actual dates to be inserted*] when it was posted on the Gallia County Web site. Gallia County received *[actual number to be inserted]* comments; the Mitigation Core Group reviewed these comments and modified the draft of the plan accordingly.

The public was provided a final opportunity to comment on the draft of the updated plan at public hearings when it was presented to the elected officials of each of the participating jurisdictions in Gallia County for adoption during the months of [*actual dates to be inserted*] 2011-2012.

Other Planning Mechanisms

During the process of updating the plan, URS and the Mitigation Core Group reviewed existing planning mechanisms to ascertain community capabilities and identify opportunities for implementing mitigation actions. These plans are further referenced in the Capability Assessment section of this plan. The Gallia County EMA office staff also

worked directly with incorporated communities not present at any of the planning meetings so they have input into the planning process.

Gathering New Data

Gathering and analyzing new data about natural hazards and the community was critical to the process of updating the plan. New data used for the plan is identified throughout the plan; however, because flooding is both the most common and the most costly natural hazard that occurs in Gallia County, particular attention was provided to gathering data about structures that have been damaged repeatedly by flooding.

Community Profile

Gallia County is located in southeastern Ohio. It is bounded by Meigs and Vinton counties to the north, Jackson and Lawrence counties to the west, Lawrence County to the south, and the state of West Virginia to the east. The county lies on the north and west shores of the Ohio River. Its river boundary stretches for more than sixty-miles. The county is comprised of 469 square miles of land. There are 15 townships in Gallia County.

The county is mostly rural (84.4%) and according to the 2010 Census has 30,934 residents. It is part of Ohio's Appalachian Region. U.S. Route 35 runs east-west through the county and State Route 7 is the main north-south thoroughfare that runs along the Ohio River in the county. The incorporated areas of Gallia County include City of Gallipolis, Village of Centerville, Village of Cheshire, Village of Crown City, Village of Rio Grande, and Village of Vinton. Gallipolis is the county seat. It combines with the surrounding townships to make up the area of highest population density for the county: 18,453. The County is governed by a Board of Commissioners. Employers today include American Electric Power, Gallia County and Gallipolis Board of Education, GKN Sinter Metals, and Holzer Clinic.

Jurisdictions

Centerville

The village of Centerville encompasses 0.1 square miles. The village is located along the western edge of Gallia County in Raccoon Township along U.S. Route 35. 103 residents occupied the village according to the 2010 Census. There are 43 households and 9 vacant houses in the village. The average household size is 2.40. The median income for a household in the village is $35,625, and the median income for a family is $35,938. The per capita income for the village is $15,169. 15.4% of the population and 20.0% of families are below the poverty line.

Cheshire

Cheshire is located along the Ohio River and is located in the northeastern part of Gallia County. It is situated in Cheshire Township and encompasses 0.2 square miles. According to the 2010 Census, the population was 132. There are 67 households in the village. The average household size is 1.97. The median income for a household in the village is $30,179, and the median income for a family is $31,786. The per capita income for the village is $13,926. 12.4% of the population and 11.4% of families are below the poverty line.

Cheshire was bought by American Electric Power Company for $20 million to avoid having to clean up environmental contamination. This represents the first time a private company has ever purchased an entire town in the United States.

Crown City

Crown City is a village located in the southern part of Gallia County and like the City of Gallipolis, lies along the Ohio River. State Route 7 runs east-west through the village. State Route 553 runs south to Crown City, ending on the southern edge of the village. Guyan Township is where Crown City is situated. It occupies 1.1 square miles of land with a 2010 population of 413. There are 176 households and 24 vacant houses in the village. The average household size is 2.35. The median income for a household in the village is $25,909, and the median income for a family is $35,000. The per capita income for the village is $17,553. 20.0% of the population and 13.6% of families are below the poverty line.

Gallipolis

The City of Gallipolis encompasses 3.62 square miles and is located in Gallipolis Township. The eastern boundary generally runs along the Ohio River, with sections extending only to First Avenue. The southwest is bordered by what eventually turns into Chickamauga Creek. Chestnut Street and the airstrip are the northeast boundaries. Finally, Fourth Street is the general western boundary for the City of Gallipolis.

According to the 2010 Census, the population is 3,641 with 1,576 households and 293 vacant houses in the village. The average household size is 2.31. The median income for a household in the village is $25,846, and the median income for a family is $36,477. The per capita income is $16,728. 21.5% of the population and 13.6% of families are below the poverty line.

Rio Grande

The Village of Rio Grande is located in the northwestern part of Gallia County along U.S. Route 35 in Raccoon Township. It encompasses 1.2 square miles. The population as of the year 2010 is 830. There are 223 households and 69 vacant houses in the village. The average household size is 3.72. The median income for a household in the village is $16,932, and the median income for a family is $29,167. The per capita income for the village is $10,822. 35.9% of the population and 32.6% of families are below the poverty line.

The University of Rio Grande and Rio Grande Community College is an integral part of the village. The University enrolls over 2400 students and is an additional population that needs to be included into hazard assessments.

Vinton

Vinton is located in the northwest portion of Gallia County along State Routes 160 and 325 in Huntington Township. It is made up of a 1.1 square mile. As of the Census of 2010, the population of Vinton is 222, with 95 households and 30 vacant houses in the village. The average household size was 2.33. The median income for a household in the

village is $25,417, and the median income for a family is $33,250. The per capita income for the village is $13,836. 16.4% of the population and 17.9% of families are below the poverty line.

County Population Projections

Gallia County is located in the southeast part of the State of Ohio. U.S. Route 35 crosses the county in the east-west direction and State Routes 160, 325, and 218 are some of the routes that cross the county in the north-south direction.

The population (see Table 2-1) of Gallia County has gone up and down over the last hundred years. From 1900 to 1930, there was a gradual decrease in the population. The 1970-1980 decade showed a 19.3% change, the population increasing by 4,859 people. Since that time, the population has gradually decreased and between 2000 and 2010 a 0.4% change occurred with the population decreasing by 135. Gallia County is expected to increase in population to 34,020 by 2030.

According to U.S. Census figures, the 2010 total population of Gallia County was 30,934. Gallia County's rural nature can be seen when comparing their 66.3 persons a square mile to the State of Ohio having 277.3. Gallipolis and the surrounding five (5) townships are the most concentrated areas with 18,453 people.

Table 2: Population Trend

Year	Total Population	Year	Total Population
1800	NA	1910	25,745
1810	4,181	1920	23,311
1820	7,098	1930	23,050
1830	9,733	1940	24,930
1840	13,444	1950	24,910
1850	17,063	1960	26,120
1860	22,043	1970	25,239
1870	25,545	1980	30,098
1880	28,124	1990	30,954
1890	27,005	2000	31,069
1900	27,918	2010	30,934

The Ohio Department of Development has made a "County Profile" available on their website that provides more specific information for Gallia County and the other political jurisdictions.

Land Use and Development Trends

The purpose of including an analysis of land use and development trends in this mitigation plan is to identify the potential for future structures to be at risk of damage due to natural hazards.

The county contains approximately 302,000 land acres, of which approximately 118,000 acres are farmland. 44% of farmland is made up of cropland, 33% is made up of woodland, 18% is pasture, and 5% is categorized as other uses. Land being used for farmland has decreased 9% from 1997 to 2002. The average size of farm has also decreased from 142 acres in 1997 to 126 acres in 2002.

The construction on new housing units slowed down tremendously over the past years. Of the 13,438 housing units in Gallia County, 17.2% were built in the 1990's, whereas the construction between 2000 and 2004 was 6.0% of the units and between 2005 and 2010 only 2.7% units were built.

Gallia County has not had an updated Land Use Plan since 1972. In this plan Gallia's goals and objectives as well as the policies for each of the following: Residential, Commercial, Industrial, Public and Semi-Public, and Agriculture. Short term range goals (1-5 years) and long term range goals (5-20 years) are discussed. A map of the current land uses in the County is shown in Figure 1. The information provided in this plan is outdated. Some of the concerns discussed are the following:

- Corridor growth is expected along State Routes 7, 141, 588, 160, and US Route 35.
- Rio Grande is expected to grow north and west of the existing residential development.
- Focus on a neighborhood center and a community shopping district for commercial expansion is planned.
- Gallipolis should make provisions for the expansion of the Central Business District through the zoning capabilities administered in this community by rezoning appropriately designated land for commercial uses.
- Diversifying the industrial base is needed.
- Drainage and soil suitability should be addressed when developing public and semi-public areas.
- A strong zoning ordinance should be adopted on a countywide basis to protect agricultural districts and limit the types of allowable uses within that established zone.

Two areas Gallia County currently is promoting through the Chamber of Commerce are Dan Evans Industrial Park and Main Street in Gallipolis. The Dan Evans Industrial Park is located between Rio Grande and Gallipolis northeast of State Route 35 on State Route 850. Main Street in Gallipolis is an area that since the 1980's has been working with The National Main Street Center to help attract businesses and rehabilitate the downtown of Gallipolis. Both of these sites boast tax advantages and access to large populations of workers. While the population for Gallia County is 31,000, 960,000 people are within an easily accessible 50-mile radius to The Dan Evans Industrial Park. Gallia County industries are eligible for the State's 13.5 percent Machinery and Equipment Tax Credit, almost double the amount available in many other parts of Ohio.

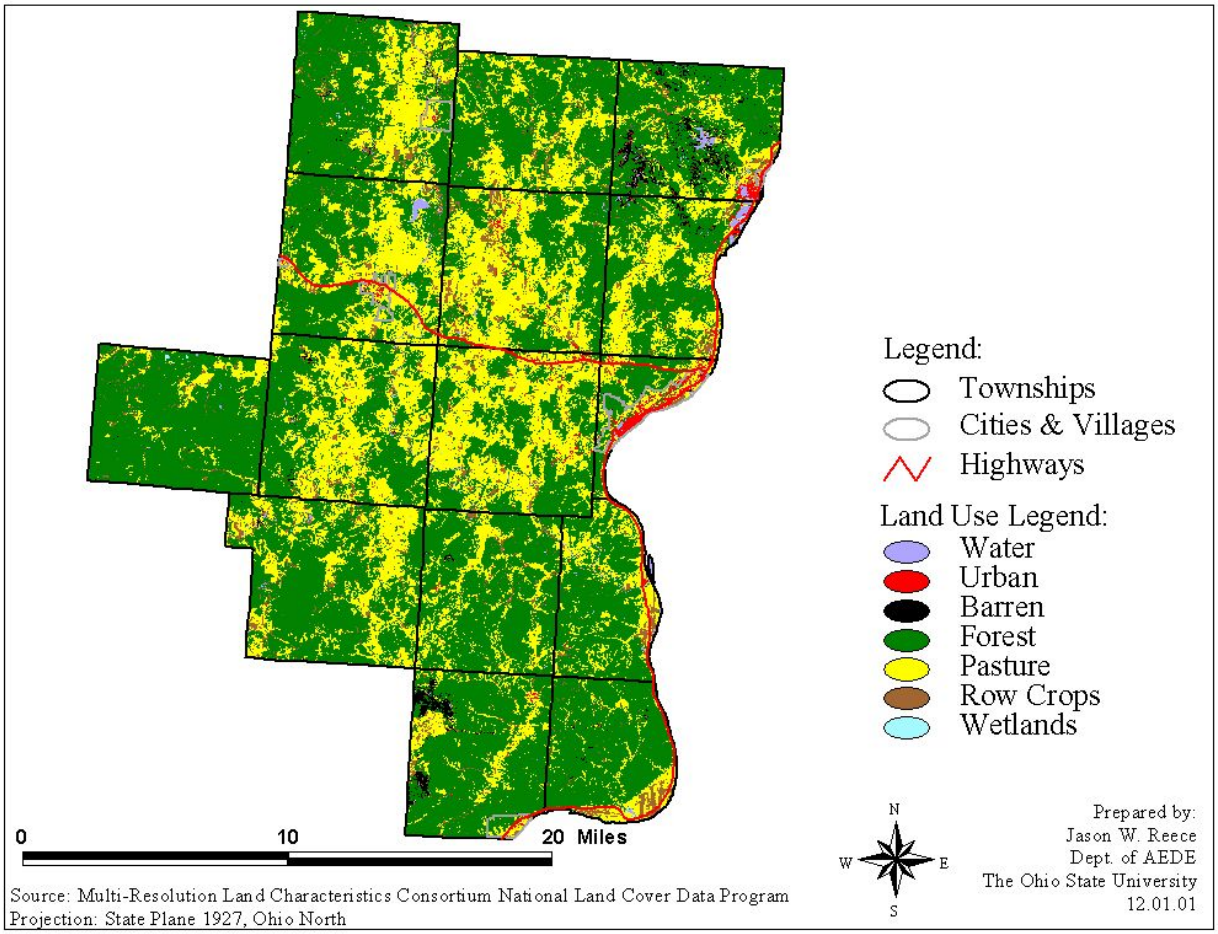


Figure 1: Gallia County Land Use Map

Capability Assessment

The purpose of the Capability Assessment is to identify strengths and weaknesses that will affect the ability of the County and participating jurisdictions to implement mitigation actions. Capabilities include a variety of regulations, existing planning mechanisms, and administrative capabilities provided through established agencies or authorities.

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.

Gallia County Land Use Plan

Gallia County has not updated the current Land Use Plan since 1972. In the existing plan, goals and objectives as well as the policies for each of the following: Residential, Commercial, Industrial, Public and Semi-Public, and Agriculture. Worthy of mention are the concerns associated with industrial expansion and the ability to provide adequate expansion room for industry. Other concerns were the protection of agricultural districts and the use and appearance of public and semi-public lands setting an example for private development. The County Commissioners acknowledge that the land use plan for the Gallia County needs to be updated.

Gallia County Strategic Plan

The purpose of this 1993 plan was to provide the entire community with a comprehensive blueprint for future progress and development of the Gallia County area. The planning started in 1992 and meetings were held over the next year. The focus of the meetings was establishing short and long range objectives that would adhere to the guiding principles in their mission statement. Among them were to assure a high quality education for all, to promote and enhance Gallia County as a destination for tourism, and to establish a level of acceptable environmental quality.

This report was broken down into three main sections. The first was the Short-Range Objectives from 1993-1994, the second was the Long-Range Objectives from 1995-2000, and the third was the Recommendation Section.

Emergency Operations Plan

This plan was completed in 1992 and went through two major revisions; one in January 2003 and the second in September 2011. The purpose of this Emergency Operations Plan is to predetermine, to the extent possible, actions to be taken by the governmental jurisdictions of Gallia County to prevent avoidable disasters and respond quickly and adequately to emergencies in order to protect the lives and property of the residents of Gallia County. Subsequent updates to the EOP have been made, mainly on new contact information, etc.

Farmland Preservation Plan

A Farmland Preservation Task Force was developed with guidance from the Gallia County Soil and Water District. The task force combined their talents and expertise into writing *The Farmland Preservation Plan* in June of 2000. The Mission Statement is as follows: "To increase public awareness of the importance of land use management and encourage citizens to establish a forward-thinking pro-active attitude toward land

management thus making it acceptable and palatable to the citizens of Gallia County." The agricultural crops that need to be protected in Gallia County are:

- year round grazing
- agricultural protected land that is currently in use as viable cropland for purposes such as grain crops (corn, soy, & wheat), tobacco crops and fruit and vegetable crops (apples, peppers, and tomatoes)
- hardwood crops

Regulatory Capabilities

Table 3 summarizes the regulatory tools used in Gallia County and participating jurisdictions. These regulations support the goals of this hazard mitigation plan and provide opportunities for further mitigating the potentially negative effects of natural hazards through regulation.

Table 3: Regulatory Capabilities

Jurisdiction	Zoning Ordinances	Open Space Preservation	Subdivision Regulations	Building Codes	Floodplain Management Regulations	Stormwater Management Regulations
Gallia County		✓	✓	✓	✓	
City of Gallipolis	✓				✓	
Village of Centerville					✓	
Village of Cheshire					✓	
Village of Crown City					✓	
Village of Rio Grande	✓				✓	
Village of Vinton					✓	

Zoning Ordinance

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.

Zoning does not exist for the unincorporated areas of Gallia County. However, the auditor's office must be notified of any construction and a Building Notice must be filled out and turned in. The Ohio Revised Code 5713.17 states that this must be submitted within 60 days of construction. The incorporated areas of Rio Grande and Gallipolis have zoning regulations enforced.

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.

In The Gallia County Subdivision Regulations a description of how open space should be dealt with is seen in Article 7, Sections 730 and 740. Article 730 deals with the disposition of open space. "The amount of open space reserved under a planned unit development shall either be held in corporate ownership by the owners of the project area building sites for the use of each owner who buys property within the development or be dedicated to the County and retained as open space for parks, recreation, and related uses. All land dedicated to the County must meet the Planning Commission's requirements as to shape, size, and location. Public utility and similar easements and right-of-way for watercourses and other similar channels are not acceptable for open space dedication to the County unless such land or right-of-way is usable as a trial or similar way and approved by the Commission."

Section 740 under item 2 says "not less than ten (10) percent of the total project area shall be devoted to open space and recreational facilities for the residents of the area being developed when building a residential development."

The O. O. McIntyre Park District provides recreation benefits while preserving the backwater floodplain of the Ohio River. Within this District are Raccoon Creek County Park, The Hike and Bike Trail, and the Elizabeth L. Evans Waterfowl and Bird Sanctuary.

The Waterfowl and Bird Sanctuary is a 66 acre wetland area designed to provide habitat for wetland bird, plant and wildlife species. It also serves as an outdoor learning laboratory for students. A one mile trail meanders along Chickamauga Creek, with observation platforms and a gazebo for viewing the fragile wetland.

Subdivision Regulations

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

The purpose of *The Gallia County Subdivision Regulations*, adopted on December 21, 2006, is to provide guidance relating to all development for the citizens and developers in

Gallia County. It is divided into thirteen (13) articles and includes subdivision design standards and hillside regulations.

Under Article 4 Subdivision Design Standards, Section 401 discusses the suitability of land. It states: "If the planning commission finds that land proposed to be subdivided is unsuitable for subdivision development due to poor drainage, flood hazard, topography, inadequate water supply, landslip potential, unstable subsurface conditions due to underground mining or other reasons and other such conditions which may endanger health, life, safety, or property; and, if by any public agencies concerned it is determined that in the best interest of the public the land should not be developed for the purpose proposed, the planning commission shall not approve the subdivision unless adequate methods for solving the problems are advanced by the subdivider. For major subdivisions a written statement may be required by the planning commission describing characteristics of the development site, such as bedrock geology and soils, topography, flood prone areas, existing vegetation, structures and road networks, visual features, and past and present use of the site."

The Planning Commission consists of ten members that meet monthly to discuss various types of development occurring within the County. They approve minor parcel splits and major subdivision developments according to the Subdivision Regulation Standards that are currently in effect.

Building Codes

Currently Gallia County does not have any Building Codes. The only jurisdiction within Gallia County that has building codes is the Village of Gallipolis. Adoption and enforcement of building codes ensure that both residential and commercial structures are safe. 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.

Floodplain Regulations

Communities that adopt and enforce floodplain regulations, to regulate new development within the floodplains, can significantly reduce the effects of flood damage. Communities typically adopt minimum standards that are recommended by the Federal Emergency Management Agency (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.

Gallia County adopted The Special Purpose Flood Damage Prevention Resolution on February 8, 1996, amended on March 30, 1996. The purpose of this resolution is to

establish regulations and standards for buildings in flood hazard areas identified by FEMA. It will enable the residents of unincorporated areas of Gallia County to receive flood insurance subsidized by the federal government.

Gallia County adopted the Gallia County Special Purpose Flood Damage Reduction Regulations on October 16, 2003. These regulations are adopted pursuant to authorization contained in Sections 307.37 and 307.85 of the Ohio Revised Code and are for areas of special flood hazard that are necessary for participation in the National Flood Insurance Program (NFIP). It requires citizens to apply for a floodplain development permit for all development activities located wholly within, partially within, or in contact with an identified special flood hazard area. The definition of the administrative role of the Floodplain Administrator is discussed along with use and development standards for flood hazard reduction.

The incorporated areas of Gallia County have similar regulation standards. According to The Floodplain Administrator of Gallia County, most went a step above the minimum standards. Examples cited were feet of freeboard required on projects and various filling projects' standards.

All of Gallia 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 29, 1989. The following cities have also been in compliance and participate in the NFIP:

- Centerville November 18, 1981
- Cheshire August 15, 1983
- Crown City July 5, 1983
- Gallipolis July 5, 1983
- Rio Grande September 4, 1985
- Vinton October 28, 2003

Stormwater management regulations provide for the conveyance of stormwater to decrease flooding. Gallia County currently does not have any drainage regulations in place. However, one of the resulting goals of the Mitigation Plan process is to establish administrative controls for construction practices to promote better drainage to avoid flooding.

A local **historic district ordinance** enables a community to regulate development in a specific, designated area of historic significance. As of today, Gallipolis is the only jurisdiction with a historic district ordinance developed in Gallia County. The Gallipolis Historic Preservation Guidelines were adopted by the Gallipolis City Commission on September 15, 1998, as the official document to be used by the Historic Design Review Board.

Currently, Gallia County does not have zoning regulations or building codes in place for the unincorporated areas of the county. The unincorporated areas typically comply with the State of Ohio's codes. Discussion for the need of zoning regulations has started and plans for implementation have begun.

Planning Capabilities

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.

A comprehensive plan has not been completed for Gallia County. Gallia County does not have a planning commission in place to pursue this effort.

Emergency Operations Planning

The Gallia County **Emergency Operations Plan** (EOP) is a requirement of the Ohio Revised Code, Section 5502.271. The purpose of this EOP is to predetermine, to the extent possible, actions to be taken by the governmental jurisdictions of Gallia County to prevent avoidable disasters and respond quickly and adequately to emergencies in order to protect the lives and property of the residents of Gallia 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 Emergency Operations Center (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, will be the point of contact for all operating/responding departments and agencies, other counties and the State.

Watershed Planning

Four different watersheds influence drainage in Gallia County: The Raccoon Creek drains the north western and central portions of the county, the Symmes Creek drains the western portion of the county, Indian Guyan Creek drains the southern portion of the county, and Campaign Creek drains a northeastern portion of the county. All four flow into the Ohio River which is the county's eastern boundary.

Currently, Gallia County does not have a watershed management plan enacted.

There are two organized watershed groups in Gallia County, Raccoon Creek Partnership and Symmes Creek Restoration Committee (SCRS). The Raccoon Creek Watershed Partnership was formed to continue the efforts that were started by the Raccoon Creek Improvement Committee which started during the 1980's. Raccoon Creek struggles to maintain a diverse and healthy ecosystem. Abandoned surface and underground coal mines leach thousands of pounds of sulfuric acid and metals into the creek each day. The environmental pressures of growing communities and run-off from roads, fields and abandoned mine sites continue to degrade the habitat. Industrial discharge, trash and untreated sewage deprive the creek of oxygen, which is vital to the survival of all aquatic species. The SCRC was incorporated in May of 1977 as a not-for-profit corporation. Our primary activity during the first 18 years was removal of logjams along Symmes Creek. In the late 1990's, our focus expanded to include stewardship of the entire watershed. In 1998, we were awarded an EPA 319 grant to establish a Long Range Management & Action Plan for the Symmes Creek watershed. The resulting plan is the basis for our efforts to raise public interest in the water quality in Symmes Creek by promoting recreation on the creek and improving land management practices near the creek.

Emergency Action Planning for Dams

In Ohio, most dams are constructed of earth. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams also have a drain or other water-withdrawal facility to control the pool or lake level and to lower or drain the lake for normal maintenance and emergency purposes.

Emergency Action Plans (EAPs) have been prepared for high hazard dams (Class 1) located in Gallia County as well as those for which the inundation area includes part of Gallia County. Each EAP addresses ways to safeguard lives and reduce property damage within the inundation area; procedures for effective dam surveillance; procedures for prompt notification of emergency management officials; warning and evacuation procedures; and emergency response actions that will be taken in the event of potential or imminent failure of the dam. According to Ohio Administrative Code Rule 1501:21-13-01, dams are classified as follows:

Class I: A dam shall be placed in Class I when failure of the dam would result in probable loss of human life. Dams having a storage volume greater than 5,000 acre-feet or a height of greater than 60 feet shall be placed in Class I.

Class II: Dams having a storage volume greater than 500 acre-feet or a height of greater than 40 feet shall be placed in Class II. A dam shall be placed in Class II when failure of the dam would result in at least one of the following conditions, but loss of human life is not envisioned.

Class III: Dams having a height of greater than 25 feet, or a storage volume of greater than 50 acre-feet, shall be placed in Class III. A dam shall be placed in Class III when failure of the dam would result in at least one of the following conditions, but loss of human life or hazard to health is not envisioned.

Class IV: When failure of the dam would result in property losses restricted mainly to the dam and rural lands, and not loss of human life or hazard to health is envisioned, the dam may be placed in Class IV.

According to the ODNR, Gallia County has 20 Class I-IV dams within its boundaries. The number of dams and their classifications are as follows:

- Class 1- 4
- Class II - 5
- Class III - 7
- Class IV-4

In addition, Gallia County has 33 exempt dams, five unclassified dams and two abandoned dams, which have been determined by the ODNR's Chief of the Division of Water to not constitute a hazard to life, health or property in the event of a failure.

Gallia County currently has two dams to be considered “high priority” by ODNR. The high hazard potential dams are Gavin Bottom Ash Pond and Stingy Run Fly Ash Dam. A failure of any one would presumably result in a loss of at least 50 human lives. In Hinton, West Virginia, the Bluestone Dam is a Class 1 dam. A failure of this dam has the potential to cause significant damage to Gallipolis if the conditions are right. The Bluestone Dam is on the New River, which outlets to the Ohio River on the opposite side of Gallipolis.

Additional Capabilities

A variety of additional capabilities are established in Gallia County. These capabilities can support the implementation of mitigation actions that are proposed in this plan. These capabilities are:

State of Ohio Rain Snow Monitoring System (STORMS)

The State of Ohio Rain/Snow Monitoring System (STORMS) is an automated rain gauge system that monitors an area's snow and rainfall for potential flooding while transmitting current, real-time precipitation data to the State Emergency Operations Center, the ODNR, the NWS and county emergency management agencies. The rain gauges are usually positioned near watersheds and report data 24 hours a day to computers in Columbus and are used by NWS as a prediction tool for flood and flash flood watches and warnings. Local governments are also able to access the data through special computer systems connected to the gauges.

In October of 2011, telecommunications technicians from the OEMA recently completed installation of three STORMS rain monitoring gauges in Gallia County. They are monitored by the EMA Director. One is located at the Fire Station in Greenfield Township, another in Rio Grande and the last one is located at Northup on S.R. 35.

Other Resources

Support for mitigation planning actions is provided by the State of Ohio and the Federal Government. Programs that compliment Gallia County mitigation planning initiatives are:

- Ohio administered programs including the:
    - **Hazard Mitigation Assistance Programs**, which provide grants for cost-effective mitigation projects either in the absence of a disaster or after a disaster declaration has occurred
    - **Ohio Department of Development,** which provide grants for job ready sites and community development block for economic development
    - **Ohio Department of Natural Resources,** which provide support for land and water conservation efforts.
    - **Ohio Environmental Protection Agency,** which provide grants and loans for capital improvements within a community.
- Federal Government programs including the:
    - **Hazard Mitigation Assistance Programs**, which provide grants for cost-effective mitigation projects either in the absence of a disaster or after a disaster declaration has occurred
        - Pre-Disaster Mitigation Assistance Program (PDM)
        - Flood Mitigation Assistance Program (FMA)
        - Repetitive Flood Claims Program (RFC)
        - Severe Repetitive Loss Program (SRL)
        - Hazard Mitigation Grant Program (HMGP)
    - **Community Development Block Grants**, which provides funds to address a wide range of community development needs
    - **Small Communities Program Fund**, which supports water quality infrastructure projects
    - **Weatherization Assistance** Program, which enables low-income households to make their homes more energy-efficient

Structure Assessment

The purpose of this section is to identify type, quantity, and value associated with each structure within all the jurisdictions. This will provide information when preparing a vulnerability analysis for each hazard. It will also give valuable information for estimating the damages when a disaster hits. Table 4 shows the type and value associated with each structure within each jurisdiction within Gallia County.

Table 4: Structure Inventory

	Residential		Non-Residential		Critical Facilities	
	Count	Ave. Value	Count	Ave. Value	Count	Ave. Value
GALLIA COUNTY	9280	$71,659	890	$356,352	458	$530,209
VILLAGE						
Centerville	50	$42,459	6	$12,678	3	$53,369
Cheshire	72	$66,660	11	$42,401	7	$250,877
Crown City	194	$47,407	11	$112,474	9	$64,599
Gallipolis	1431	$75,267	444	$165,203	148	$460,869
Rio Grande	134	$83,119	25	$160,908	49	$795,494
Vinton	127	$42,267	20	$30,606	10	$262,472
TOWNSHIP						
Addison	706	$68,720	62	$755,789	21	$344,843
Cheshire	256	$50,320	15	$7,564,687	7	$224,626
Clay	713	$58,280	11	$46,939	13	$269,393
Green	1524	$101,284	98	$438,866	38	$1,917,607
Greenfield	142	$37,732	4	$25,559	7	$107,706
Gallipolis	614	$75,250	59	$72,893	11	$185,456
Guyan	178	$56,627	5	$41,038	13	$646,638
Harrison	234	$47,999	5	$28,110	11	$56,247
Huntington	303	$46,409	5	$49,026	8	$47,915
Morgan	376	$59,199	6	$60,652	12	$165,294
Ohio	247	$47,318	4	$62,197	10	$61,310
Perry	342	$61,659	7	$269,897	13	$234,089
Raccoon	379	$74,672	21	$164,733	21	$651,209
Springfield	1097	$82,026	69	$360,203	35	$361,180
Walnut	161	$53,727	2	$27,463	12	$59,420

Hazard Identification

Hazard Identification Update

To reduce the potential for damage due to hazards, it is necessary to identify hazards that may affect the County. This process is completed using published information and Web sites that address hazards globally, nationally, within Ohio, or specifically within Gallia County as well as anecdotal information provided by members of the Mitigation Core Group and the public.

Only natural hazards are identified and examined in this plan update as required by the Disaster Mitigation Act of 2000.

Table 5 shows the hazards that the Mitigation Core Group prioritized back in 2004, which remains the current order of hazard priority.

Table 5: Identified Hazards

Hazards Identified for 2004 Plan
Flooding
Winter Storms (Snow and Ice)
Severe Storms (Lightning, Hail Tornadoes)
Landslides
Tornadoes
Mine Subsidence
Earthquakes
Droughts

Description of Hazards

The descriptions of hazards included in the 2004 plan were largely based on publicly available data provided by the National Oceanographic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) and the Ohio Department of Natural Resources. For the 2012 plan update, the hazard data was evaluated by the Mitigation Core Group. For the 2012 plan update the Mitigation Core Group unanimously agreed that the prioritization of the hazards were still accurate. Table 6 summarizes each natural hazard that may affect Gallia County.

Table 6: Descriptions of Natural Hazards Addressed in This Plan

Hazard	General Description of Hazard
Flooding	A flood is a natural event for rivers and streams. In Gallia County excess water from snowmelt or rainfall accumulates and overflows the stream banks into adjacent floodplains. Floods are considered hazards when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. In Ohio, flooding can occur during any season of the year. Serious flooding occurs regularly

Hazard	General Description of Hazard
	along one or more of Ohio's major rivers or streams, such as the Ohio River, which is at the eastern boundary of Gallia County.
Winter Storms	Heavy snow and ice are caused by winter storms bringing frozen precipitation and cold temperatures to the area. Heavy accumulations of ice can cause extensive damage by bringing down trees and toppling utility poles and communication towers, which disrupts power and communications. Winter storms may also lead to the collapse of roofs in deteriorated structures.
Severe Storms (Lightning, Hail and Tornadoes)	A tornado is an extraordinary feature generally associated with severe thunderstorms or hurricanes. A tornado is characterized by a funnel of violently rotating winds. While the extent of tornado damage is usually localized, the extreme winds of a tornado are among the most destructive and can cause millions of dollars of damage and loss of life when they move through populated, developed areas. Tornadoes can occur at any time but most frequently occur during the late afternoon or early evening, the warmest hours of the day. Peak months for tornado activity are April, May, and June. High winds are the movement of air from areas of higher pressure to areas of lower pressure. The greater the difference in pressure, the stronger the winds. High winds are generally associated with severe thunderstorms or hurricanes.
Landslides	A landslide is a sudden collapse of a large mass of hillside. The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. A landslide occurs when masses of rock, debris, or earth roll down steep slopes. Contributing causes of landslides include erosion, removal of vegetation cover and ground shaking from earthquakes.
Mine Subsidence	Mine subsidence happens when the bedrock and unconsolidated materials collapse into underground mined areas. Pit subsidence is the type of subsidence associated with the roof collapse of mines while sag subsidence is a gradual settling of the surface.
Earthquake	Earthquakes are the sudden motion or trembling of the ground caused by the breaking and shifting of rock beneath the surface of the earth. Ground shaking from earthquakes can collapse buildings and bridges and disrupt gas, electric, and phone service.
Drought	A drought is a period of prolonged dryness that contributes to depletion of ground water and surface water. Adverse consequences of drought include insufficient supplies of water for human consumption as well as agricultural and industrial uses and deterioration of water quality. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought.

Flooding Risk Assessment

Flooding Update

The list of previous occurrences in flooding was updated for the 2012 plan update. No substantive changes were made to the descriptions of the location, extent, and probability of flooding in Gallia County; however this section has been rewritten for greater clarity.

For updating the plan, because flooding is a site specific hazard, data about the location and types of structures and infrastructure in the County were reviewed to identify changes in vulnerability. New digital flood maps were created based on a revised Flood Insurance Study, call Map Modernization, and were completed in January 19, 2011. The maps used more accurate topographic data than were available in the past and that accounted for additional impervious ground cover due to new development in the townships.

Information about flood loss was augmented in order to comply with the modifications of 44 CFR Part 201.6 that became effective in October 2007. Regulations now require that local hazard mitigation plans place special emphasis on the mitigation of Repetitive Loss Structures, which are structures insured by the NFIP that have had at least two paid flood losses of more than $1,000 each in any 10-year period since 1978.

Hazard Profile – Flooding

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. If the area is a special area, also known as 100-year floodplain, they will have an "A" or "AE" classification. "A" zones are special flood hazard areas inundated by the 100-year flood; base flood elevations are not determined. "AE" zones are special flood hazard area inundated by the 100-year flood; base flood elevations are determined.

Gallia County has special zone floodplains identified within the County. The best way to combat a disaster happening within these special zone flood hazard areas is through awareness. All of Gallia 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 29, 1989. The following cities are in compliance and currently participate in the NFIP:

- Centerville November 18, 1981
- Cheshire August 15, 1983
- Crown City July 5, 1983
- Gallipolis July 5, 1983
- Rio Grande September 4, 1985
- Vinton October 28, 2003

Location

All of Gallia County lies within the drainage basin of the Ohio River, which is the largest tributary, by volume, to the Mississippi River. The villages of Crown City, Cheshire and Gallipolis have the Ohio River bordering the east side of each village.

The various tributary streams and creeks generally flow north to south, from the foothills of the Appalachian Plateau towards the Ohio River. Raccoon Creek and Symmes Creek have the largest tributaries for creeks that run through the County.

Of the 6 municipalities within Gallia County, the Village of Gallipolis has suffered the most severe damage from flooding due to extensive development within the floodplain and its proximity to the Ohio River.

Table 7 shows which tributaries have the potential to lead to flooding in particular jurisdictions; there is a potential for flooding due to rivers and streams in each jurisdiction in the County.

Table 7: Rivers and Streams in Gallia County

Municipality	Rivers and Streams						
	Campaign Creek	Chickamauga Creek	Kyger Creek	Indian Guyan Creek	Ohio River	Raccoon Creek	Symmes Creek
Centerville					✓		
Cheshire			✓		✓		
Crown City					✓		
Gallipolis		✓			✓		
Rio Grande						✓	
Vinton						✓	

Multi-Hazard Maps are in **Appendix V** and include maps of the entire county and each jurisdiction and township. Each map shows the floodplain locations, along with other previous disasters that have affected the county.

Extent

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 stormwater 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. In Gallia County flooding can happen almost anytime

however this number hazard can be exacerbated when heavy rains occur in late winter and accelerate the melting of snow.

Flooding can also be exacerbated locally by the presence of impermeable surfaces due to buildings and pavement or lack of appropriately sized flood water detention basins.

Flooding in Gallia County can also be exacerbated if the flow of water is obstructed in some way such as by an undersized culvert or downed trees. This was issue addressed at the Mitigation Core Group meeting.

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.

There are a total of 1,704 structures in Gallia County considered to be at-risk due to flooding. Of this total number, 1093 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 V**. 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.

Previous Occurrences

Gallia County has a long history of flooding problems. The County has suffered damage from numerous major floods and localized flash flooding. **Appendix VI** lists all flooding events in Gallia County since 1994; the source of these data is the NCDC website. This data indicates that there have been 48 flooding events in the past 17 years.

Further research through the NCDC shows that there have been three major floods in Gallia County since 2004. All of these recent floods resulted in property damage; the causes and effects of these recent floods are described in Table 8.

Table 8: Recent History of Flooding

Date	Description
9/8/2004	The low pressure remains of Hurricane Frances caused about a 30 hour rain event, causing 4 to 7 inches of rain in the Ohio Valley near Gallia County. This event set the stage for a more widespread flood across southeast Ohio, to follow later in the month.
9/17/2004	Remnants of Hurricane Ivan dropped 4 to 6 inches of rain over an extended period of four days. In Gallia County, 6 homes had major damage with 1 home destroyed.
1/5/2005	A total of 3 to 5 inches fell across eastern portion of Ohio. The crest near Gallipolis, at the RC Byrd Lock and Dam was 50.3 feet around 1400E on the 9th. This was just over the 50 foot flood stage.

Probability of Future Flooding

In this plan, the term special flood hazard area is used rather than floodplain to clarify that the area under consideration is identified on the Flood Insurance Rate Maps as having at least a 1-percent chance of flooding in any given year. Historically, the area with a 1-percent chance of flooding in any given year has been called the "100-year floodplain" and the area with a 0.2-percent chance of flooding in any given year has been called the "500-year floodplain." As these terms can be misleading by suggesting that there will be a flood only every 100 or 500 years respectively they are not used in this plan.

The NCDC data indicates that there have been 48 events in the past 17 years. Therefore, the probability of future events is 48 / 17 = 2.82 or 100 percent chance annually.

Vulnerability Assessment – Flooding

Overview of Vulnerability

Flood vulnerability is described in terms of what community assets, structures, and infrastructure lay in locations where flooding is anticipated.

Table 9: Summary of Past Losses Due to Flooding

	Estimated Property Damages
Total Losses Due to Flooding (1994–2011)	$45,977,000
Average Annual Losses for 17 years	$2,704,529

According to NCDC, estimated significant property damage in Gallia County attributable to flooding during the years 1994 through 2011 is $45,977,000. Thus the average annual loss for these 17 years is $45,977,000 / 17 = $2,704,529.

Potential Impact of Flooding

Flooding can lead to property loss as well as to loss of life. Flooding damages structures, including homes and businesses, vehicles, and infrastructure, including roadways. People who are surrounded by flood waters can require evacuation placing their lives as well as the lives of rescuers in danger. Flooding can disrupt the operation of businesses and schools and recovery from flood damages can be time consuming and costly.

Identifying structures

Plan Update Notes

The initial version of this mitigation plan revealed that 1,704 structures in the County were located in Special Flood Hazard Areas. Current data compiled using the recently updated County GIS database show that 1,704 structures are located in Special Flood Hazard Areas and have at least a 1-percent chance of flooding in any given year.

Exposure of Existing Buildings to Damages Due to Flooding

Some structures and infrastructure in each participating jurisdiction are at risk of flood damage. The total number of at-risk structures for each jurisdiction in the 100-year floodplain and the estimated property values are shown on Table 10. At-risk values were estimated based off the value shown in Table 10 by averaging all structures within that jurisdiction.

Table 10: Jurisdictional Inventory of At-Risk Structures

Jurisdiction	At-Risk Structures	Estimated Property Value At-Risk
Centerville	0	$0
Cheshire	121	$8,065,825
Crown City	14	$663,696
Gallipolis	438	$32,966,962
Rio Grande	0	$0
Vinton	38	$1,606,137
Total	611	$43,302,620

The total number of at risk structures for each township in a 100-year flood is shown on Table 11.

Table 11: Township Inventory of At-Risk Structures

Townships	At-Risk Structures	Estimated Property Value At-Risk
Addison	232	$15,943,092
Cheshire	200	$10,064,068
Clay	101	$5,886,277

Townships	At-Risk Structures	Estimated Property Value At-Risk
Gallipolis	621	$62,897,671
Green	188	$7,093,661
Greenfield	25	$1,881,243
Guyan	26	$1,472,306
Harrison	14	$671,980
Huntington	71	$3,295,071
Morgan	6	$355,191
Ohio	68	$3,217,599
Perry	28	$1,726,462
Raccoon	22	$1,642,774
Springfield	44	$3,609,147
Walnut	58	$3,116,141
Total	1704	$122,872,685

A number of critical facilities are located in flood-prone areas. These include fire stations, police stations, schools, and office buildings. Other facilities including motels, churches, and retirement facilities that may also require special attention during times of flooding for evacuation purposes are also located in flood-prone areas. **Appendix VII** lists which critical facilities are located in Special Flood Hazard Areas. Because the county auditor does not assign a value to these facilities, an estimated value was given to these facilities on the expected damage each type of facility would endure in a 100-year flood. There are a total of 40 critical facilities within the floodplain in the county. The estimated damage value to these structures is $21.2 million for a 100-year flood. The estimated value is not the total price of the structure and is purely an estimate since values on these types of facilities are not documented.

Repetitive Loss Properties

Some structures in Gallia County have been flooded repeatedly and have received more than one payment through the National Flood Insurance Program (NFIP) for flood damages. A repetitive loss structure is defined as an NFIP-insured structure that has had at least two paid NFIP claims of more than $1,000 each in any 10-year period since 1978. As of May 2012, there are eleven structures in Unincorporated Gallia County that have been classified as repetitive loss structures and 35 total losses. In both Cheshire and Vinton there have been one repetitive loss structure and four total loss structures. The repetitive loss areas within the county are shown on the Multi-Hazards Maps in **Appendix V**.

Exposure of Future Buildings to Damages Due to Flooding

Current zoning and development regulations allow future development to occur within the Special Flood Hazard Area; this suggests that there is potential for additional loss due to flooding in the future. Special Flood Hazard Area development regulations relate to the base flood elevation, which is the estimated level of flooding that has a 1-percent chance of being equaled or exceeded in any given year. Because Special Flood Hazard Area or

floodplain development regulations specify that residential structures must be elevated to or above the base flood elevation and commercial structures must either be elevated or flood-proofed to or above this level, the degree to which future structures are exposed to flood damages should be minimal.

However, calculations of base flood elevations are based on models that rely upon data about previous flood events; should future floods be greater than those experienced in the past, the base flood elevation may not provide sufficient protection. Therefore, mitigation strategy of this plan includes that communities adopt more stringent Special Flood Hazard Area or floodplain development regulations causing future structures to be built with freeboard, i.e. above the current base flood elevation.

Estimating Potential Loss

Plan Update Notes

The 2004 plan had a method for estimating potential losses due to flooding using historical data from the NCDC. The method utilized in this update is based upon the same historical data updated to 2011, provided by NCDC.

Methodology

Damages due to one flooding event in the County have varied from no cost for damages to $25.0 million.

According to NCDC, estimated property damage in Gallia County attributable to flooding or flash floods over the period 1994 through 2011 is $45,977,000. Past losses provided in NCDC are used to estimate the potential for annual losses due to flooding.

Estimated Potential Dollar Losses

Since the total loss over these 17 years is $45,977,000, the average annual loss is $45,977,000 / 17 = $2,704,529.

Winter Storms Risk Assessment

Winter Storms Update

The list of previous occurrences of winter storms was updated for this 2012 plan update. Changes were made to descriptions of the location, extent, and probability of flooding in Gallia County; as well as this section being rewritten for greater clarity.

In this 2012 update, features of winter storms that may cause damage are treated separately; heavy snow or ice is discussed as one hazard because damage from either of these hazards is due to their weight on power lines and roofs. Damage caused by high winds, another potentially damaging feature of winter weather, is described in the section about severe storms. While temperatures during winter weather can be very low, Gallia County has no history of structural damages due to extremely cold temperatures, and cold temperature has never been considered a hazard for Gallia County.

Other than the reorganization of the presentation and re-writing for improved clarity, no changes have been made to the profile of winter storms.

Hazard Profile – Winter Storms

Location

Gallia County is located in the southeast portion of the state and is susceptible to winter storms, which encompass snow and ice. All of Gallia County is susceptible to the dangers associated with this winter storms.

Extent

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.

Anecdotal evidence indicates that ice storms in Gallia County can cause as much damage as traditional winter storms due to the ice built up on trees and utility wires. As recently as 2003, freezing rain resulted in the accumulation of 1to 2 inches of ice on power lines and tree limbs. Roads were blocked for several days.

Since 1994, there have been 27 recorded injuries and 4 recorded deaths due to winter storms and extremely cold temperatures. Because the number of winter events affecting Gallia County is relatively small but the intensity tends to be high, the potential for death and injury is moderate. As the population of the County continues to grow, the more potential there is 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 weather, such as driving on ice and snow and medical conditions relative to frost bite and hypothermia.

Previous Occurrences

According to the NCDC, there have been 20 winter storm events in Gallia County reported since 1994, with total property losses of $12.21 million and crop losses of $500,000. Since 1994 the average annual losses reported for the county have been approximately $718,000. The years 1994 and 2003 proved to be the most costly with losses totaling $11.3 million in property damage and $500,000 in crop damage from ice storms alone.

However, with the exception of the ice storm in February 2003, Gallia County has not suffered any property or crop damage since 1999 due to winter weather. Due to the intensity of the ice storms that hit the area, the susceptibility to property damage due to winter weather is moderate.

Probability of Future Winter Storms

Anecdotal evidence indicates that winter storms typically occur every year in Gallia County. The NCDC data supports this showing that there were two damaging ice storms and 18 significant snow storms for a total of 20 winter storms over the 17 years between 1994 and 2011. There were other snow storms or ice storms during this period for which no damages were reported. Thus, the average number of damaging winter storms in Gallia County is 1.2 storms per year. So the probability of the occurrence of a damaging winter storms in Gallia County in any given year is 100 percent.

Vulnerability Assessment – Winter Storms

Overview of Vulnerability

The most vulnerable structures are those that were poorly built or are dilapidated. The weight of winter storms may lead to structural collapse or to minor damage. Some shed roofs that protect township and borough road maintenance or firefighting equipment have large span roofs that may collapse under the weight of especially winter storms although none have collapsed due to recent winter storms.

Potential Impact of Winter Storms

Because snow and ice storms occur county-wide, the entire County's 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 temperatures and should prepare for such events prior to the winter months.

Sensitive populations defined by the Core Group include populations of persons that meet a defined criterion of sensitivity. For example, the elderly in a community may be considered a sensitive population because of their lack of mobility and some inability to receive warnings regarding incoming hazards such as tornadoes. Another sensitive population could be a large ethnic group speaking only their native language, which could hinder communication during a natural disaster. Along the Ohio River, there are large transient populations such as seasonal visitors or seasonal workers who are hard to locate if a hazardous event were to happen.

Vulnerability to the effects of winter storms on buildings is considered to be somewhat dependent on the age of a building because as building codes become more stringent, buildings are capable of supporting heavier loads and as building age, various factors may deteriorate their structural integrity. Vulnerability also depends upon the type of construction and the degree to which a structure has been maintained.

In Gallia County, accumulations of snow and/or ice during winter months are expected and normal. The most common detrimental effects of snow and/or ice are not collapsed structures but traffic accidents and interruptions in power supply and communications services.

Identifying Structures

Plan Update Notes

In this 2012 update of the mitigation plan, structures identified as potentially vulnerable to damage from winter storms are structures older than 50 years that may have deteriorated over time. Data on the age of structures was not available when the previous version of this plan was prepared, so an analysis of vulnerability was not completed.

Exposure of Existing Buildings to Winter Storms

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.

Structures identified as potentially vulnerable to damage from heavy snow and ice are structures older than 50 years that may have deteriorated over time. Data is only available for housing units. Therefore, only housing unit structures will be evaluated.

It is not necessarily the case that older structures are at greater risk of damage due to heavy snow or ice. There are 19.3 percent of structures standing in Gallia County that were built before 1949 and almost a third of the structures in the County are more than 50 years old, and these have withstood many heavy snow and ice storms. Nevertheless, for this review, because the National Trust for Historic Preservation identifies structures greater than 50 years old as being eligible for designation as historic, the assumption is made that structures built before 1960 are at some risk of at least minor damage due to

heavy snow and/or ice. There are 3,790 structures in the County that were built before 1960, thus the percent of structures considered to be particularly vulnerable to damage due to heavy snow or ice is 28.2 percent. Figure 2 shows the number of structures built in Gallia County and illustrates the fact that a large number of structures in the County are more than 50 years old.

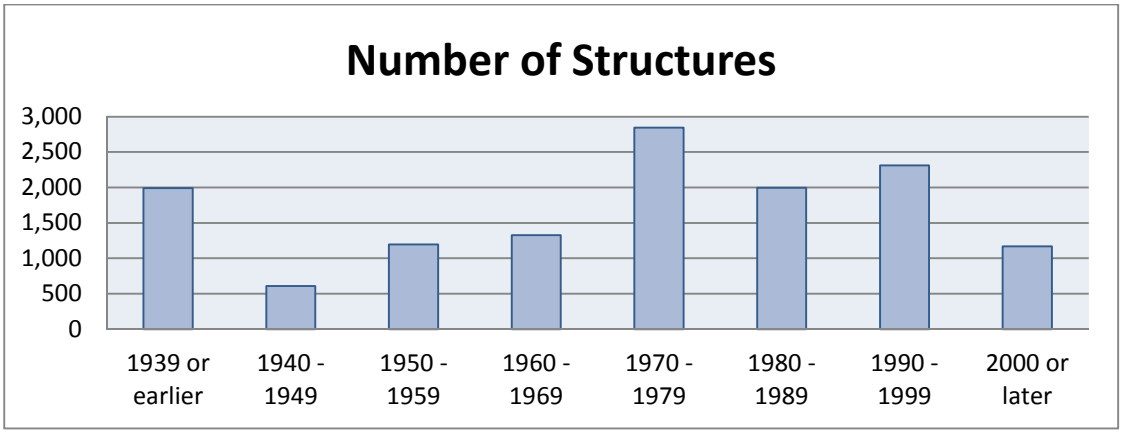


Figure 2: Numbers of Structures Built

To predict the structural cost associated to a worst case scenario snow storm, it will be assumed that all structures older than 50 years will be damaged significantly. This analysis is based on the perception that building codes have become more stringent and that new buildings can withstand the 30 pounds per square foot snow loads expected for Ohio. To estimate the non-residential values, the same percentage of structures will be assumed to be built over 50 years ago, which is 28.2%. With the total value of residential and commercial structures being $665 million and $317 million, the estimated maximum damage that is expected for a worst case scenario winter storm is $187 million and $89 million, respectively. This estimate does not represent the total cost associated with the winter storm, which will also include damaged utilities and emergency services.

Exposure of Future Buildings to Winter Storms

All structures and infrastructure in Gallia County will be exposed to heavy snow and ice. Yet, because all of Gallia County has adopted and enforced the 2009 International Building Code (IBC) and IRC, building yet to be constructed will be able to withstand the weight of winter storms.

Estimating Potential Loss

Plan Update Notes

The previous plan did not estimate potential loss from winter storms. For this plan, potential loss is estimated using NCDC data.

Methodology

According to NCDC, estimated property damage in Gallia County attributable to major heavy snow and/or ice storms over the period 1994 through 2011 is $12,210,000. Past losses provided in NCDC are used to estimate the potential for annual losses due to heavy snow and/or ice.

Estimated Potential Dollar Losses

Since the total loss over these 17 years is $12,210,000, the average annual loss is $12,210,000 / 17 = $718,235.29.

Severe Storms Risk Assessment

Severe Storms Update

The discussion about the severe storms hazard has been updated. The list of previous occurrences for severe storms was updated for the 2012 plan update. No substantive changes were made to the descriptions of the location, extent, and probability of severe storms occurring in Gallia County; however this section has been rewritten for greater clarity.

New data available through NCDC were incorporated into the hazard profile section. The new data that was incorporated from the NCDC allowed for an estimated potential loss section, which was not available in the old plan.

Hazard Profile – Severe Storms

Location

Severe storms can occur anywhere in Gallia County. Severe storms, which involve thunderstorms, high winds, and hail, can pose a threat to life and property in any part of Gallia County by creating conditions that disrupt essential services. High winds have destructive impacts to trees, power lines and other utilities, which ultimately impacts residents. Downed trees also block roadways throughout the county and have to be cleared quickly to ensure emergency response vehicles continued to have access. The damage and potential impacts from severe storms should not be underestimated. All citizens should become familiar with locations of shelters in which they can seek safety in the event of severe weather.

Since high wind and hail typically effect areas smaller than the county, 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.

Extent

Severe storms occur throughout the State of Ohio. All of Gallia County is exposed to the hazards associated with severe storms. Severe storms can occur throughout the year. These storms can contain hail, thunder and lighting, tornadoes, and high wind.

High winds from severe storms that move in a straight line can cause extensive damage, much like a tornado. High winds are defined as sustained wind speeds of 40 mph or greater lasting for 1 hour or more, or winds of 58 mph or greater for any duration.

Previous Occurrences

Gallia County is highly susceptible to severe storms, which encompasses thunderstorms, high winds, and hail.

According to the NCDC, there have been 126 severe storm events in Gallia County reported since 1950, with total property losses of $1.882 million.

Probability of Future Severe Storms

There were 63 thunder storm events in Gallia County over 36 years between 1975 and 2011. Thus the probability of a high wind event in the County in any given year is estimated to be 63/36 =1.75 or 100 percent because 63/36 is greater than 1.

The NCDC data lists five high wind events between 1993 and 2011 resulting in death, injury, or property damage is $630,000 in damages. Wind data for the 18-year period 1993 through 2011 are used in this plan to estimate probability of a damaging wind event. Thus the calculated probability of a damaging high winds in the County in any given year is 5/18 = .278, or 27.8 percent.

A total of 58 hail events occurred in the County over 61 years between 1950 and 2011. Thus the probability of a high wind event in the County in any given year is estimated to be 58/61 = 0.951 or 95.1 percent.

Vulnerability Assessment – Severe Storms

Overview of Vulnerability

For severe storms, aged and dilapidated structures or structures not built to applicable building codes are more susceptible to damage. Mobile homes and campgrounds are especially susceptible to damage due to severe storms. Strong winds can rip roofs off of any dilapidated structures and overturn mobile homes.

Potential Impact of Severe Storms

Vulnerability to the effects of severe storms is somewhat dependent upon the age of a structure because as building codes become more stringent, buildings are capable of enduring greater wind forces.

In Gallia County, high winds occur annually. The most common detrimental effects are interruptions in power supply and communications services due to downed wires and blocked roadways due to downed trees.

Identifying Structures

Plan Update Note

The methodology for identifying structures potentially at risk of damage due to severe storms is the same as the methodology used for identify structures potentially at risk of damage due to winter storms.

Exposure of Existing Buildings to Severe Storms

All structures and infrastructure might be exposed to the effects of high winds and hail. Depending upon the severity of a severe storm, any existing structures might be damaged to some extent. However, in Gallia County, there are 3,790 structures that were built before 1960. Thus the percentage of existing buildings considered at particular risk of damage due to severe storms is 28.2 percent.

To predict the structural cost associated to a worst case scenario for a severe summer storm (which could include wind, hail and lighting); it is assumed that all structures older than 50 years will be significantly damaged. This analysis is based on the perception that building codes have become more stringent and that new building will withstand all wind forces expected in Ohio. To estimate the commercial values, the same percentage of structures will be assumed to be built over 50 years ago, which is 28.2 percent. With the total value of residential and commercial structures being $665 million and $317 million, the estimated maximum damage that is expected for worst case scenario wind and hail damage is $187 million and $89 million, respectively.

Exposure of Future Buildings to Severe Storms

Any future structures might be exposed to severe storms as this hazard does not only occur in specific locations. However, future buildings will be somewhat protected from the effects of severe storms as they will meet the most current state building code requirements for bracing and roof design.

Estimating Potential Loss

Plan Update Notes

In the previous plan, data were not available to estimate potential loss due to severe storms. In this update, NCDC data are used to estimate potential loss.

Methodology

According to the NCDC, estimated property damage in Gallia County attributable to the three hazards associated with severe storms are thunderstorms, high winds, and hail account for $11,032,000 in damage. Damage attributable to thunderstorms from 1975 through 2011 is $267,000. Damage attributable to high winds from 1993 through 2011 is

$630,000. Damage attributable to hail from 1950 through 2011 is $985,000. This data is used to estimate potential annual dollar losses due to severe summer storms.

Estimated Potential Dollar Losses

Due to severe summer storms combining four hazards that have been historically documented over different periods of time, potential dollar losses from severe summer storms will be broken down into each specific hazard. The total loss for thunderstorms over 61 years is $267,000, the average annual loss is $267,000 / 36 = $7,416. The total loss for high winds over 18 years is $630,000, the average annual loss is $630,000 / 18 = $35,000. The total loss for hail over 61 years is $985,000, the average annual loss is $985,000 / 61 = $16,147. The majority of the costs associated with hail damages are contributed to two large hail events that caused excessive damage.

The total annual cost to include all severe storms is $58,563.

Landslide Risk Assessment

Landslide Update

The discussion of landslide has been re-organized and rewritten for great clarity.

Hazard Profile – Landslide

Location

A landslide is a natural geologic process that has played a large part in shaping the landscape in southeast Ohio. Landslide is a general term for mass movement of soil, rock, or a combination of materials down a slope. Any slope within the County is susceptible to landslide. Areas with steeper slopes and new construction on the sides of hills are at an increased risk for landslides.

Extent

Landslide velocity can vary from rapid to slow and the amount of material moving in a landslide can range from a relatively small amount to a large amount. Landslides can include falling, sliding, or flowing of rocks and soil or a combination of these different types of motion. Slow movement of landslides and gradual creep of rock and soil downslope can be as destructive as rapid landslides and debris flows but are not catastrophic, and cause less loss of life.

When slopes are saturated with water, landslides are much more likely to occur. A mudflow occurs when a slope is so heavily saturated with water that it rushes downhill as a muddy river, carrying down debris and spreading out at the base of the slope. They are faster than soil creeps but slower than landslides. The wetter the material, the faster it moves. Mudflows are the fastest, wettest flows, while the slowest, driest ones are earthflows. Earthflows occur on clay, silt, or sand slopes, when the wet ground breaks up and falls down a mountainside, making a rounded, tongue-like shape.

Gallia County's topographic and soil conditions lend itself to increased landslides along with the fact that flooding is their number one hazard and these two events typically occur at the same time. Based on information received from the ODNR, there are several areas where repetitive slides exist in Gallia County. Most of the landslides are caused from mine drainage, where water is collecting in open pits and saturating the surrounding soils. Occasionally, isolated landslides occur which may block a few roadways with mud and debris. This debris may block traffic but typically does not damage the structure of the road itself. Therefore, the impact to infrastructure is low for landslide hazards.

Previous Occurrences

There are no agencies within Gallia County or at the State level that document landslide occurrences. The only information that was able to be obtained was from the Core Groups' experiences with landslides. The Gallia Soil and Water Conservation District stated that landslides within Gallia County are not a serious occurrence as of yet, but may be in the future since people are starting to build in landslide prone soils. The recorded events of landslides occurring in Gallia County's history were not available nor where they documented by any source.

Probability of Future Damaging Landslides

Given that no damage due to landslide has been recorded in Gallia County for residential structures, the probability of a damaging landslide is insignificant. The probability of some rock falls from a steep slope, given that this occurred twice in the past 15 years, is 2/15 = 0.133 or about 13.3 percent.

Vulnerability Assessment – Landslide

Overview of Vulnerability

The County is located on steep slopes that pose a risk of damage due to landslide. A higher level of vulnerability is given to areas where there has been soil disturbance on steep slopes.

Potential Impact of Landslide

A landslide might cause a structure to collapse or might cause minor damages such as broken windows. A landslide might cause a roadway to be temporarily blocked.

Identifying Structures

Plan Update Notes

The Gallia County Emergency Management Agency along with the Mitigation Core Group recognize the need to coordinate better on identification of landslide prone areas and to work with local jurisdictions on preventing future problems with these designated areas by evaluating various mitigation alternatives such as bank stabilization techniques as well as recognizing the limitations of those areas.

Exposure of Existing Buildings to Landslide Damages

All buildings located on or directly beneath steep slopes are susceptible to a landslide. Any building located near a location where the slope of a hill has been undercut is at an even greater chance of being subject to a landslide occurrence.

To evaluate a landslide for a worst case scenario is almost impossible because there are no parameters to which a landslide have been recorded or predicted for a specific area. Therefore, to give a worst case scenario estimate for this disaster an arbitrary value of 10 houses will be used, for a value of $1,250,000. This value for a worst case scenario is based off previous occurrences, soil conditions, and the types of slopes that are in Gallia County and is only for the structural value only. Other expenses that occur from an event are not evaluated for this scenario, for example relocation and cleanup. Because this is only an estimate the value may be over or underestimated. Also for this scenario, it is assumed to occur near a residential neighborhood, however any structure in the county near a hillside is a risk of landslides.

Exposure of Future Buildings to Landslide Damages

Future structures on or near steep slopes may be a risk of damage due to landslide. While the potential for damage due to landslide is currently very low in Gallia County, were development on steep slopes to disturb the land and vegetation to an unprecedented degree, the potential for damage due to landslide may increase.

Estimating Potential Loss

Plan Update Notes

The previous plan did not estimate potential loss due to landslide. The estimate of losses presented in this update is based on information from the Mitigation Core Group.

With Gallia County's population remaining stable, the potential for property damage will remain low. According to the ODNR, if the landowner building in known slide prone areas induces landslides in Gallia County, the landowner will not receive funding from ODNR for damages incurred. These landowners may come into financial hardship depending upon the amount of damage incurred. However, much of this issue can be mitigated by landowner education.

Methodology

This updated plan estimates potential annual loss due to landslide using NCDC data, which show a $0.00 loss due to landslide in Gallia County, Ohio.

Historical information was not readily available from the Gallia County Soil and Water Conservation District (SWCD) or the ODNR regarding landslides. Therefore, frequency and probability of future occurrence could not be estimated.

Estimated Potential Dollar Losses

Estimated potential dollar loss is based on previous losses and is $0.00.

Tornadoes Risk Assessment

Tornadoes Update

The discussion about the tornado hazard has been updated. The list of previous occurrences for tornadoes was updated for the 2012 plan update. No substantive changes were made to the descriptions of the location, extent, and probability of tornadoes occurring in Gallia County; however this section has been rewritten for greater clarity.

In this update, extent of tornadoes is described using the Enhanced Fujita Scale, which has been used since 2007. No new data was available through NCDC since no new occurrences were observed. The existing NCDC data was used in the estimated potential loss section, which was not available in the old plan.

Hazard Profile – Tornadoes

Location

Tornadoes can pose a threat to life and property in any part of Gallia County by destroying most of everything in the path of one. Tornado forces have destructive impacts to trees, power lines and other utilities, which ultimately impacts residents. Downed trees also block roadways throughout the county and have to be cleared quickly to ensure emergency response vehicles continued to have access. All citizens should become familiar with locations of shelters in which they can seek safety in the event of severe weather that have the potential for developing tornadoes.

Since tornadoes typically present localized hazards, 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.

Extent

Tornadoes can occur anywhere in the State of Ohio. All of Gallia County is exposed to the hazards associated with tornadoes. Tornadoes can theoretically occur any time of the year, however the greatest chances of an occurrence is in the spring and summer months.

Since 2007 an Enhanced Fujita Scale (EF Scale) has been used in the United States to describe the magnitude of tornadoes. Prior to 2007, the Fujita Scale was commonly used to describe magnitude. This scale is based on new information about the relationship between wind speed given in miles per hour (mph) and corresponding damages. The EF Scale categorized tornadoes from EF0 to EF5 with EF0 being the most commonly occurring type of tornado. The most damaging and deadliest tornado recorded in Union

County was a category 3 or EF3 tornado. Table 12 shows the relationship between the Fujita and the Enhanced Fujita Scales.

Table 12: Enhanced Fujita Scale

Fujita Scale		Enhanced Fujita Scale	
F Number	3-Second Gust (mph)	EF Number	3-Second Gust (mph)
0	45–78	0	65–85
1	79–117	1	86–110
2	118–161	2	111–135
3	162–209	3	136–165
4	210–261	4	166–200
5	262–317	5	Over 200

Table 13 provides a description of the types of damages that can be expected with each category of tornado.

Table 13: Expected Tornado Damages

F or EF Scale	Examples of Possible Damage
0	Light damage. Some damage to chimneys; broken tree branches; shallow-rooted trees pushed over; damage to sign boards.
1	Moderate damage. Surface peeled off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
2	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
3	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
4	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
5	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked.

Previous Occurrences

Gallia County is moderately susceptible to tornadoes. According to the NCDC, there have been 7 tornado events in Gallia County reported since 1950, with total property losses of $9.15 million. The most powerful of which was an F5 that occurred back in 1968 and was the most injurious of all the tornadoes in the county with 17 injuries. The most damaging was the most recent, back in 2002, with a price tag of $3.5 million and had only a F2 magnitude.

Probability of Future Tornadoes

The NCDC data lists seven damaging tornadoes for Gallia County for the entire 1950–2011 period. Thus the calculated probability of a damaging tornado in the County in any given year is 7/61 = .115, or 11.5 percent.

Vulnerability Assessment – Tornadoes

Overview of Vulnerability

Since tornadoes can occur anywhere in the county, aged and dilapidated structures or structures not built to applicable building codes are more susceptible to damage. Mobile homes and campgrounds are especially susceptible to damage due to tornadoes. Strong winds can rip roofs off of any dilapidated structures and overturn mobile homes. Past experience with tornadoes in Gallia County shows that death and injury are indeed a possibility.

Potential Impact of Tornadoes

Vulnerability to the effects of tornadoes is somewhat dependent upon the age of a structure because as building codes become more stringent, buildings are capable of enduring greater wind forces. However, all parts of the county have the same probability of tornado touching down in the area.

In a worst case scenario summer storm, Gallia County could be hit with an EF-5 tornado that would travel through the two largest villages in the county. To predict the structural cost associated with a worst case scenario for a tornado; an analysis will be run with an EF-5 tornado traveling on a straight path through the most densely populated and developed areas within the county. This analysis assumes that the tornado were to completely encompass both Rio Grande and Gallipolis. If the tornado went through the heart of any of the villages within the county, then that village would be expected to be completely destroyed. This is due to all villages being relatively small compared to a footprint of an EF-5 tornado. Even with the current building codes, most buildings cannot handle the force an EF-5 is capable of. To perform this analysis the county auditor's information of the property values for each village were used. In Table 14, an assessment shows the total value loss that is expected per type of structure. It also shows the value of damage that is expected for this worst case scenario. Even though a tornado path covering these two villages is unlikely, if one of the villages were hit while an EF-5 passed through the entire county, then the expected damages could be very similar to this estimate. Apart from the devastation within the path of the tornado, large regions of the county can also be expected to be without power. Critical facility counts were based off the County Auditor's values for exempt properties because an accurate list of critical facility values has not been made. This assumption may overestimate the actual values.

Table 14: Damage Assessment for an EF-5 Tornado through Franklin County

Damage Assessment by Land Use and Appraised Value			
Rio Grande	Count	Average Value	Total
Residential	134	$83,119	$11,137,945
Non-Residential	25	$160,908	$4,022,698
Critical	49	$795,494	$38,979,198
Gallipolis			
Residential	1431	$75,267	$107,707,131
Non-Residential	444	$165,203	$73,350,264
Critical	148	$460,869	$68,208,574
Total			$303,405,808

Identifying Structures

Plan Update Note

The methodology for identifying structures potentially at risk of damage due to tornadoes is the same as the methodology used for identify structures potentially at risk of damage due to winter storms and severe storms. However, there may be less deviation between the amounts of damage from one age group to the other because of the destructive power a tornado can impose on a structure.

Exposure of Existing Buildings to Tornadoes

All structures and infrastructure might be exposed to the effects of a tornado. Depending upon the severity of a tornado, any existing structures can be damaged to some extent. However, in Gallia County, there are 3,790 structures that were built before 1960. Thus the percentage of existing buildings considered at slightly higher risk of damage due to tornadoes is 28.2 percent.

Exposure of Future Buildings to Tornadoes

Any future structures might be exposed to tornadoes as this hazard does not occur in specific locations. However, future buildings will be somewhat better protected from the effects of tornadoes as they will meet the most current state building code requirements for bracing and roof design.

Estimating Potential Loss

Plan Update Notes

In the previous plan, data was not used to estimate potential loss due to tornadoes. In this update, NCDC data is used to estimate potential loss.

Methodology

According to the NCDC, the estimated property damage in Gallia County attributable to tornadoes accounts for $9,150,000 in damage. This amount is attributed to seven occurrences and was observed from 1950 to 2011.

Estimated Potential Dollar Losses

The total costs due to tornadoes over 61 years is $9,150,000, therefore the average annual losses due to tornadoes is $9,150,000/ 61 = $150,000.

Mine Subsidence Risk Assessment

Mine Subsidence Update

The discussion of mine subsidence has been reorganized and re-written, but findings are not different from findings presented in the previous plan.

Mine subsidence, like an earthquake, is a geologic hazard that can strike with little or no warning and can result in very costly damage. However, unlike an earthquake, mine subsidence generally affects very few people. But, if a mine collapses under an interstate highway, many lives and industries are affected. Many underground mines and strip mines are located throughout Gallia County. As a result, the ODNR is part of an active reclamation program throughout the county. The discussion was validated and updated through a review of currently available data.

Hazard Profile – Mine Subsidence

Location

Mine subsidence has the potential to affect utilities, transportation, and all other forms of infrastructure, whether public or private constructed in and around underground mine locations. Since mine subsidence is a site-specific hazard, only infrastructure in areas susceptible to slides or subsidence is at risk.

Locations of underground and strip mines have been mapped throughout Gallia County and are shown on the Abandoned Underground Mines Map in Figure 3. The infrastructure located around these mine sites will be the most susceptible to any damage.

Extent

Based on information received from the ODNR, mine subsidence is not a major issue throughout Gallia County. Some old air shafts may open up, but typically not creating major subsidence problems. Some residents within Gallia County live above and below the coal seams associated with the old mines and do not suffer hardship from these mines. Therefore, the impact to infrastructure is low for mine subsidence. However, according to the Mitigation Core Group, the northeast portion of the County has had problems relating to subsidence due to Southern Ohio Coal using a long wall which removes all the coal, causing instability. If residents were to build in the area without knowing the dangers of mine subsidence, their property could become compromised.

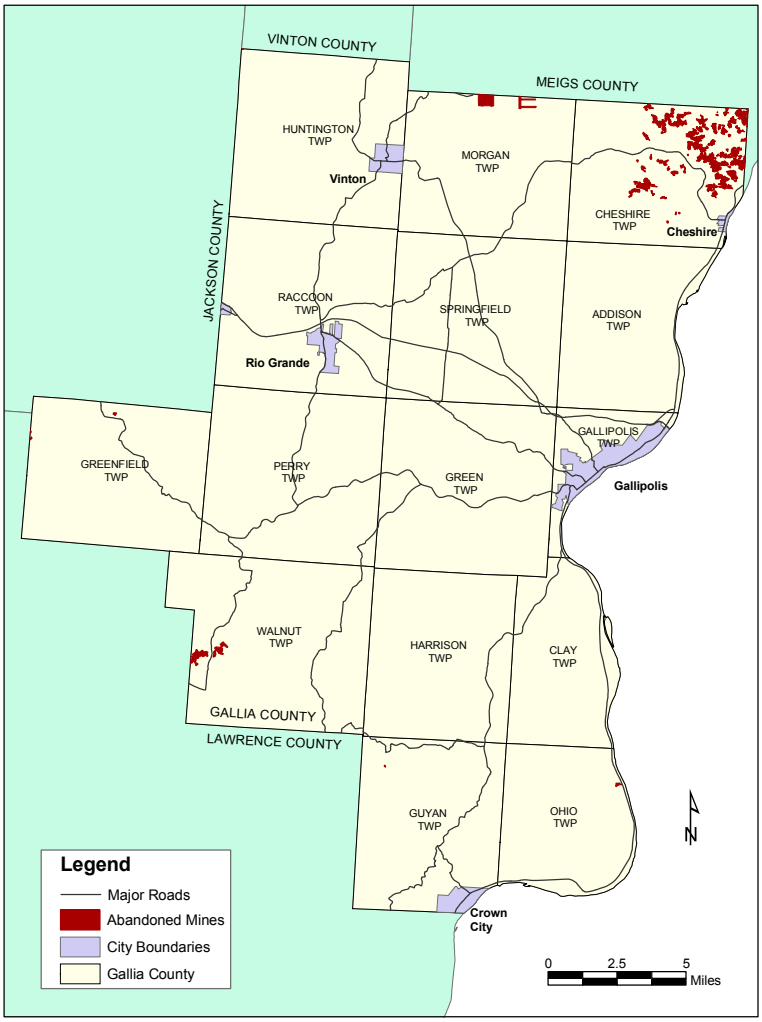


Figure 3: Abandoned Underground Mines

Previous Occurrences

Since mine subsidence is a site specific hazard, only those populations located in areas of underground and strip mines will be impacted. Since, no villages have been constructed in areas where any underground mines exist, only rural populations near abandoned mines will be susceptible to damage from mine subsidence and collapse in the County.

Probability of Future Damaging Mine Subsidence

Because there are no documented occurrences of mine subsidence in the County effecting structures, the probability of mine subsidence occurring in Gallia County is estimated to be less than 1 percent per year.

Vulnerability Assessment – Mine Subsidence

Overview of Vulnerability

This discussion has been reorganized and re-written since the previous plan was developed, but conclusions are not different from those presented in the previous plan. New data about degree to which specific locations within Gallia County have the potential for mine subsidence was the same as the previous plan.

Potential Impact of Mine Subsidence

Mine subsidence can affect the movement of surface water as well as of groundwater and can lead to contamination of water. Mine subsidence may lead to damage of roads or utility lines.

According to ODNR, structural damages due to subsidence range from slight damage requiring cosmetic repairs to severe damage requiring foundation replacement or other high cost repairs. However, because there is no history of mine subsidence in Gallia County, no impacts to structures or infrastructure are anticipated. If an occurrence were to happen involving a structure, then most likely it will be an isolated event and minimal structures will be involved.

Identifying Structures

Plan Update Notes

In the 2012 update, the same data from 2004 was leveraged to determine the susceptibility to mine subsidence.

Exposure of Existing Buildings to Mine Subsidence Damages

No villages have been constructed in areas where any underground mines exist. However, Cheshire, Morgan, and Walnut Townships have large areas of land where many underground mines exist. Since these populations are less concentrated than the villages, but these areas in the county are more susceptible to damage from mine subsidence and collapse than the jurisdictions located in the county.

Just like landslides, mine subsidence for a worst case scenario is almost impossible to predict because there are no parameters to which a mine subsidence have been recorded or predicted for a specific area. Therefore, to give a worst case scenario estimate for this disaster an arbitrary value of 3 houses will be used, for a value of $375,000. This value for a worst case scenario is based off previous occurrences, ground conditions, and the location of known mines that are in Gallia County and is only for the structural value only. Other expenses that occur from an event are not evaluated for this scenario, for example relocation and cleanup. Because this is only an estimate the value may be over

or underestimated. Also for this scenario, it is assumed to occur near a residential development, however any structure in the county near an abandoned mine is a risk.

Exposure of Future Buildings to Mine Subsidence Damages

Future buildings that will be constructed in Cheshire, Morgan, and Walnut Townships could be at risk of damage due to mine subsidence.

Estimating Potential Loss

Plan Update Notes

The previous plan did not estimate potential loss due to mine subsidence.

Methodology

The estimate of potential dollar losses is based on historical data which shows show zero losses in Gallia County.

Estimated Potential Dollar Losses

Estimate potential annual dollar loss in Gallia County due to mine subsidence is $0.00.

Earthquake Risk Assessment

Earthquake Update

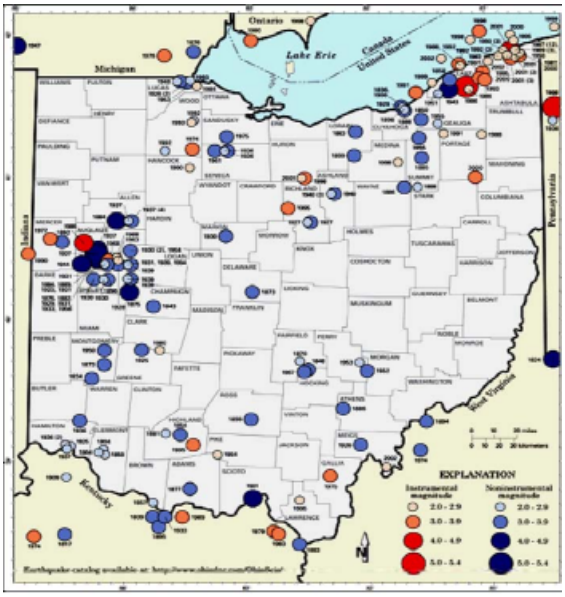
For the 2012 plan update, information about earthquake was re-written to improve clarity and so that the presentation is organized as it is for other hazards. The discussion was validated and updated through a review of currently available data but conclusions have not changed.

Hazard Profile – Earthquake

Location

As seen in the hazard profile and as determined by the Core Group, Gallia County has a very low risk of incurring damage from earthquakes. The county has had two epicenters within its boundaries, but an earthquake can occur anywhere in the county. The epicenter of the first earthquake that occurred in 1975 was approximately seven miles west-northwest of Gallipolis. In 2009, the second earthquake occurred approximately six miles west-northwest. The USGS database shows that the largest measured earthquake within 100 miles of Gallipolis was a Magnitude 3.6 in 1979 in Kentucky.

Extent



Epicenters of past earthquakes in Ohio.

Although Ohio is not thought of as an earthquake-prone state, at least 160 earthquakes with epicenters in Ohio have been felt since 1776. Most have been felt only locally and have caused no damage or injuries. The largest historic earthquake in the state occurred in 1937. This event had an estimated magnitude of 5.4 and caused considerable damage in the town of Anna and in several other western Ohio communities. Ohio is on the periphery of the New Madrid Seismic Zone, an area in Missouri and adjacent states that was the site of the largest earthquake sequence to occur in historical times in the continental United States. In 1980, an earthquake with a magnitude of 5.3 on the Richter Scale and centered in Sharpsburg, Kentucky, was strongly felt throughout Ohio and caused minor damage in communities along the Ohio River in southwestern Ohio. In 1998, a 5.2 magnitude earthquake occurred in western Pennsylvania and caused some damage in the epicenter area. Two regions of the state have been identified as susceptible to seismic activity, however neither Gallia County nor its contiguous counties are included in these regions.

There are two different ways of describing the magnitude of an earthquake. One way measures peak ground acceleration. Peak ground acceleration is the maximum horizontal ground acceleration measured in centimeters per second per second (cm/sec^2). Peak ground acceleration can range from zero for an earthquake that is noticed by very few people to 350, which would a catastrophic event. A peak ground acceleration of 10 cm/sec^2 means that the shaking is equivalent to about 1 percent of the acceleration due to gravity. Generally, ground acceleration must exceed 15 cm/sec^2 for significant damage to occur. According to the U.S. Geological Survey (USGS) Earthquake Hazard Program and as shown in Figure 4, peak ground acceleration in Gallia County during an earthquake would measure between 4 and 6 cm/sec^2, as it is located to the north of Charleston where the colors in the figure change from light blue to gray.

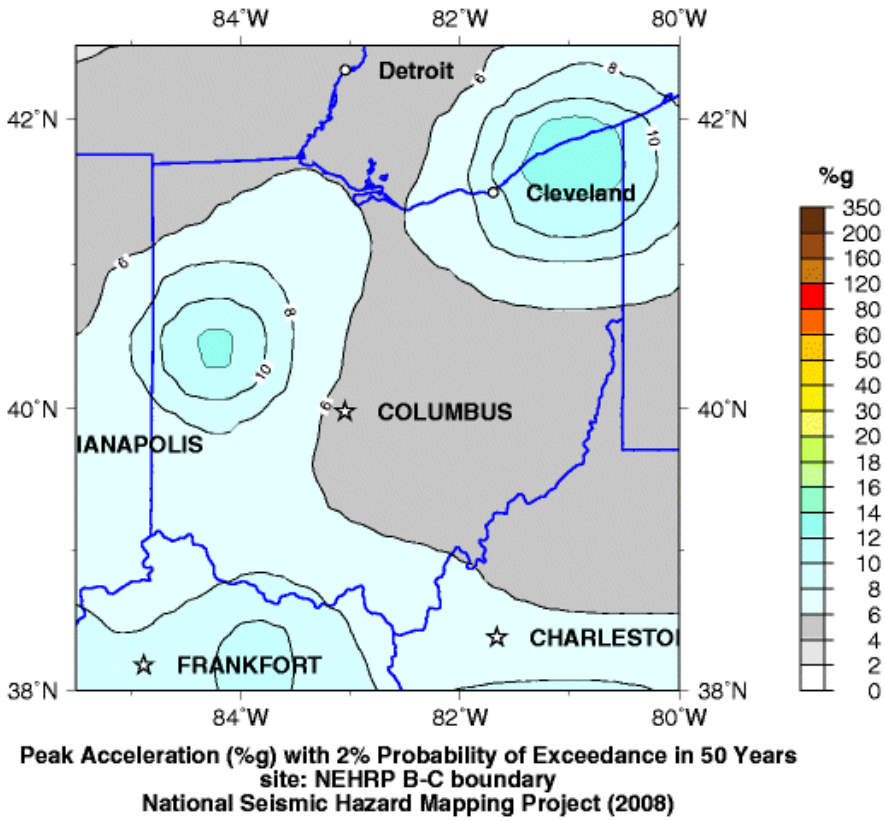


Figure 4: USGS Seismic Hazard Map – Ohio

Another way of measuring the intensity of an earthquake is the Modified Mercalli Intensity Scale. Measures on this scale range from 1, an earthquake that is not generally noticeable, to 12, an earthquake that causes complete destruction. Recent earthquakes in Pennsylvania have been measured from 4 to 6 on the Modified Mercalli Intensity Scale. On the Modified Mercalli Intensity Scale:

- A measure of 4 is a moderate earthquake that is felt indoors by many people and rattles dishes, windows, and doors.
- A measure of 5 is a rather strong earthquake that is felt outdoors by most people and causes some dishes and windows to break.
- A measure of 6 is a strong earthquake that frightens people, causes windows, dishes, and glassware to break, and overturns or moves some heavy furniture but that causes slight structural damage.

Previous Occurrences

ODNR and OhioSeis report that an earthquake happened on February 16, 1975 near Rodney, OH with a magnitude of 3.0. Another quake also occurred near Rodney, OH on April 24, 2009 with a magnitude of 3.3, and was felt over a several county area. The two earthquakes in the County's history are considered non-damaging. The USGS data show no damaging earthquakes in Gallia County or surrounding counties since 1776.

Due to the infrequency of earthquakes occurring in Gallia County, the impact on the County's infrastructure is quite low. The one quake that was recorded registered between 3.0 and 3.9 on the Richter scale. An earthquake of this magnitude is not expected to cause damage to infrastructure.

Probability of Future Damaging Earthquakes

Given that USGS lists zero damaging earthquakes occurring between 1776 and 2007, one might conclude that the probability of a damaging earthquake is less than 1 percent in any given year. The USGS database shows that there is a 0.685% chance of a Magnitude 5.0 earthquake within 31 miles (50 kilometers) of Bidwell within the next 50 years. This means that there is 0.0127% chance that a Magnitude 5.0 will occur in any given year.

The level of damage expected from an earthquake in Gallia County is very low. It would be expected to be on the order of a 3.0-3.9 magnitude quake, or lower, as registered on the Richter scale. A quake of this magnitude would be felt by most people and include some breakage of dishes, windows and plasters. For this plan, the estimated probability of a damaging earthquake affecting Gallia County in any given year is estimated at less than 1 percent per year.

As part of the 2012 Gallia County All Natural Hazards Mitigation Plan Update it was decided that utilizing HAZUS would benefit Gallia County and the other jurisdictions involved to determine loss estimates for this regional hazard. These loss estimates are utilized primarily to plan and stimulate efforts to reduce risks from natural hazards and to prepare for emergency response and recovery. Since an earthquake is a wide spread hazard HAZUS was utilized for this particular hazard in order to generate more accurate loss estimations for the planning effort.

Vulnerability Assessment – Earthquake

Overview of Vulnerability

All structures and infrastructure in Gallia County are equally at risk of experiencing an earthquake. However, in a mild earthquake of the magnitude typically experienced in Ohio, no structural damage is anticipated. In other cases, damages are expected to be limited and examples of anticipated damages are broken dishes and windows and toppled file cabinets.

Potential Impact of Earthquake

Based on historical occurrences of earthquakes in the County, the odds of an earthquake striking Gallia County in any given year would be less than 1% (0.01). Within the past 235 years, there has been only one epicenter recorded in Gallia County. However, scientists speculate that the New Madrid Fault line, which runs in close proximity to the State of Ohio, has a high probably of activity within the next 50 years.

A very large earthquake affecting Gallia County might cause structural damage in dilapidated structures or structures that do not meet current building codes. Roads and bridges might be damaged and trees and power lines might fall.

Thus the impact of an earthquake might range from negligible to catastrophic. Based on 300 years' experience in Gallia County, there will most likely be no damage or very slight damage. If in the worst case scenario a magnitude 5.4 earthquake, the strongest earthquake in Ohio's history, were to have an epicenter in the center of Gallia County, then moderate damage would be expected.

HAZUS estimates that there are 15,000 buildings in the region which have an aggregate total replacement value of 1,879 million dollars. For a 5.4 magnitude earthquake, HAZUS estimates that about 2,337 buildings will be at least moderately damaged. This is 15.0% of the total number of buildings in the scenario. There are an estimated 73 buildings that will be completely destroyed by having over 50% damage to the structure. Table 15, shows an estimated total damage for each occupancy type within Gallia County that can be expected.

Table 15: Building Exposure for a 5.4 Magnitude Earthquake

Occupancy	Expected Buildings Damaged				
	None	Slight	Moderate	Extensive	Complete
Single Family	5,837	1,902	852	201	46
Other Residential	3,211	1,149	847	150	17
Commercial	350	128	102	35	6
Industrial	91	27	22	7	1
Agricultural	70	18	14	5	1
Religion	51	18	13	4	1
Government	20	6	5	1	0
Education	16	5	4	1	0
Total:	9,646	3,253	1,859	405	73

The total building related economic losses are $158,900,000. For capital stock loses only, loses are $128,300,000; 58.5% of which was residential and 41.5% is non-residential. No damage is expected for critical facilities. However, functionality of these buildings will be limited. Of the 149 hospital beds available before the earthquake, only 52 hospital beds (35.0%) will be available after the event. Of the 3 police stations and 7 fire stations there will still be 1 (33.3%) and 6 (85.7%) stations, respectively, with greater than 50% functionality after day 1.

Please note that this is one data point and the use of HAZUS as part of the earthquake analysis generated slightly different number of structures within the region. It is still important to know that this tool is out there and can be updated to reflect the more accurate information contained in HAZUS.

Identifying Structures

Plan Update Notes

Structures identified as potentially at risk of damage due to an earthquake are older structures as assumed in the previous plan.

Exposure of Existing Buildings to Earthquake Damages

All existing buildings have the potential to experience an earthquake. Given no history of damage in Gallia County due to earthquake, damages are estimated to be limited to the more dilapidated structures and structures with unreinforced masonry.

Exposure of Future Buildings to Earthquake Damages

All future structures will also have the potential to experience an earthquake. However, some of the jurisdictions have adopted building codes to mitigate the potential for damage from an earthquake.

Estimating Potential Loss

Plan Update Notes

Potential loss estimates for damage due to earthquake have not changed from the previous plan and are very low.

Methodology

USGS data is used to identify losses due to earthquake over the 235 year period from 1776 to 2007, which total $0.00.

Estimated Potential Dollar Losses

Estimated potential dollar losses due to the type of very small earthquake anticipated for Gallia County are $0.00.

Drought Risk Assessment

Drought Update

The assessment of risk of damage due to drought has been re-written for the 2012 plan for greater clarity.

Hazard Profile – Drought

Location

Due to the nature of droughts, Gallia County will be affect by a drought countywide. During an average year in Ohio, an estimated 15,000 wildfires and natural fuel fires occur. Typically, a reported 1,000 wild land fires bum an average between 4,000 to 6,000 acres in Ohio each year.

Extent

According to the NCDC, there have been no recorded wild and forest fires in Gallia County from 1950 to 2004. Therefore, droughts have not been significant enough to cause any forest fires.

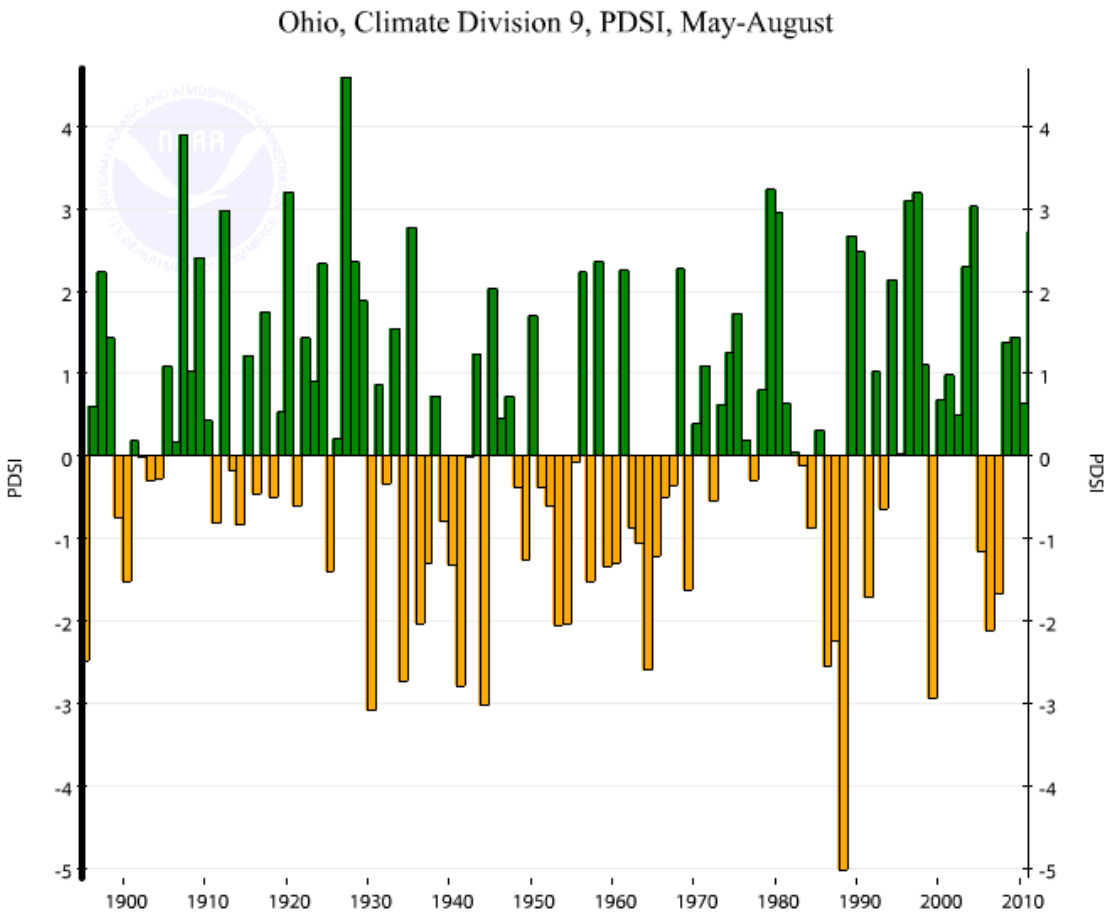
The Palmer Drought Severity Index is used to describe abnormally wet to abnormally dry conditions. Zero represents normal rainfall and temperature conditions; drought condition indices are described in Table 16.

Table 16: Palmer Drought Severity Index

Index	Description of Conditions
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

Data provided by NCDC show that drought conditions in Ohio Climate Division 9 have resulted in Palmer Drought Severity Index level as low as -5.02 for a four month period by in 1988. Figure 5, shows the PDSI for a four month period May-August between

1895-2011. Ohio has a generally temperate climate and infrequently has a severe drought experience over an extended period of time. Over the summer months when drought conditions are most severe and would have the greatest effect on crops, region 9 in Ohio where Gallia County is located, has only experienced 12 moderate drought conditions, 3 severe drought conditions and 1 of which was categorized as extreme drought.



1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	19
2.96	0.64	0.05	-0.12	-0.88	0.31	-2.56	-2.25	-5.02	2.67	2.48	-

Figure 5: Summer PDSI in Climate Division 9 for the past 115 years

Previous Occurrences

According to the NCDC, Gallia County has experienced three severe droughts of significance in the past 115 years. Drought conditions existed in Gallia County in 1999 from May through October, but only show up as a 2.94 on the PDSI, which classifies the event as a moderate drought, shown in Figure 6. Based on historical information, Gallia County can expect to endure on average a moderate drought every ten years. In 2007, according to the National Resource Inventory, 32% of the land in the County was crop land and 32% was pasture land. The Core Group 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.

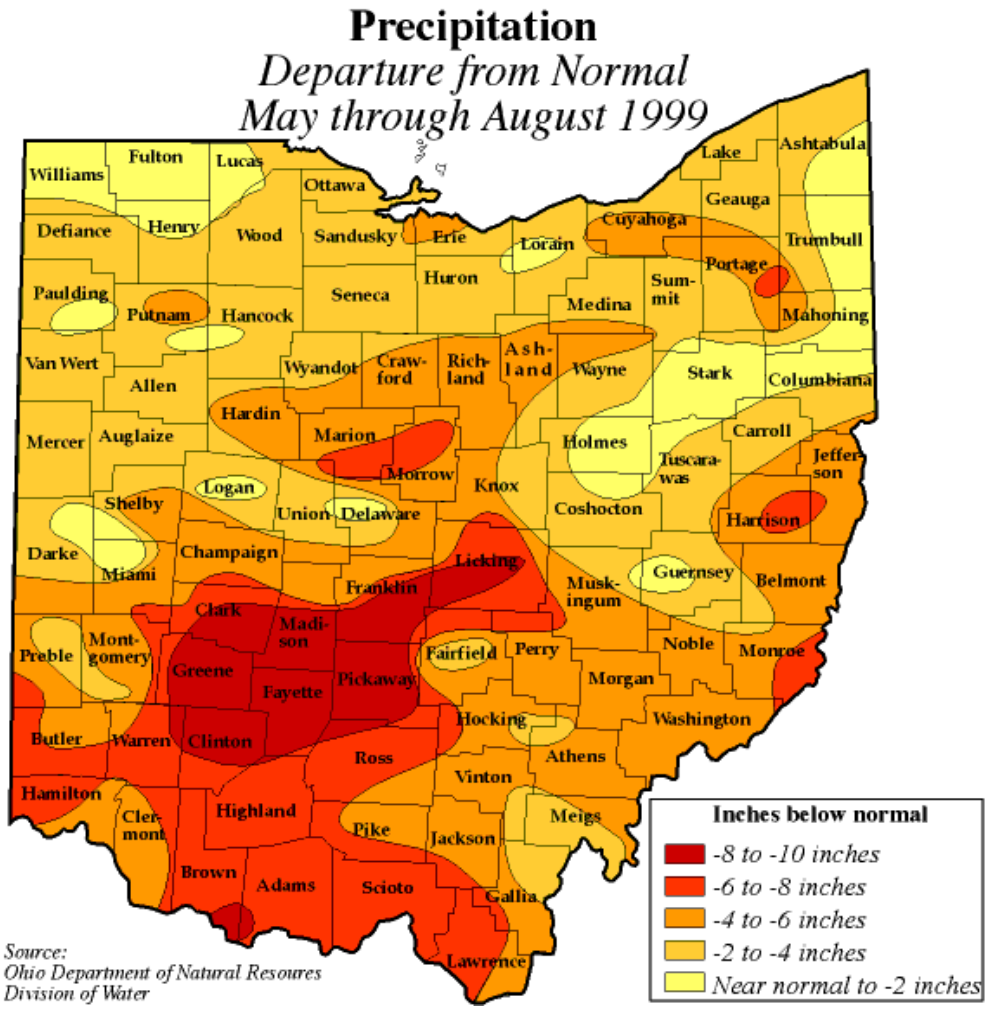


Figure 6: Precipitation for the summer of 1999

Probability of Future Damaging Drought

Having experienced 27 periods of at least mild drought conditions over the course of 115 years from 1896 to 2011, probability of a mild drought in any given year is estimated to be 27/115 = 0.23 or 23 percent. By looking at the 4 events of severe drought conditions over the course of 115 years, probability of a severe drought occurring in any given year is estimated to be 3/115 = 0.026 or 2.6 percent.

However, not all drought periods lasted for a full year. Figure 7 is from the National Drought Mitigation Center at the University of Nebraska Lincoln shows the locations of severe drought conditions between 1895 and 1995. It also shows that severe and extreme drought occurs in the Gallia County area in south Ohio between 5 and 9.99 percent of the

time. For the purpose of this plan, 5 to 9.99 percent chance will be used to evaluate this hazard.

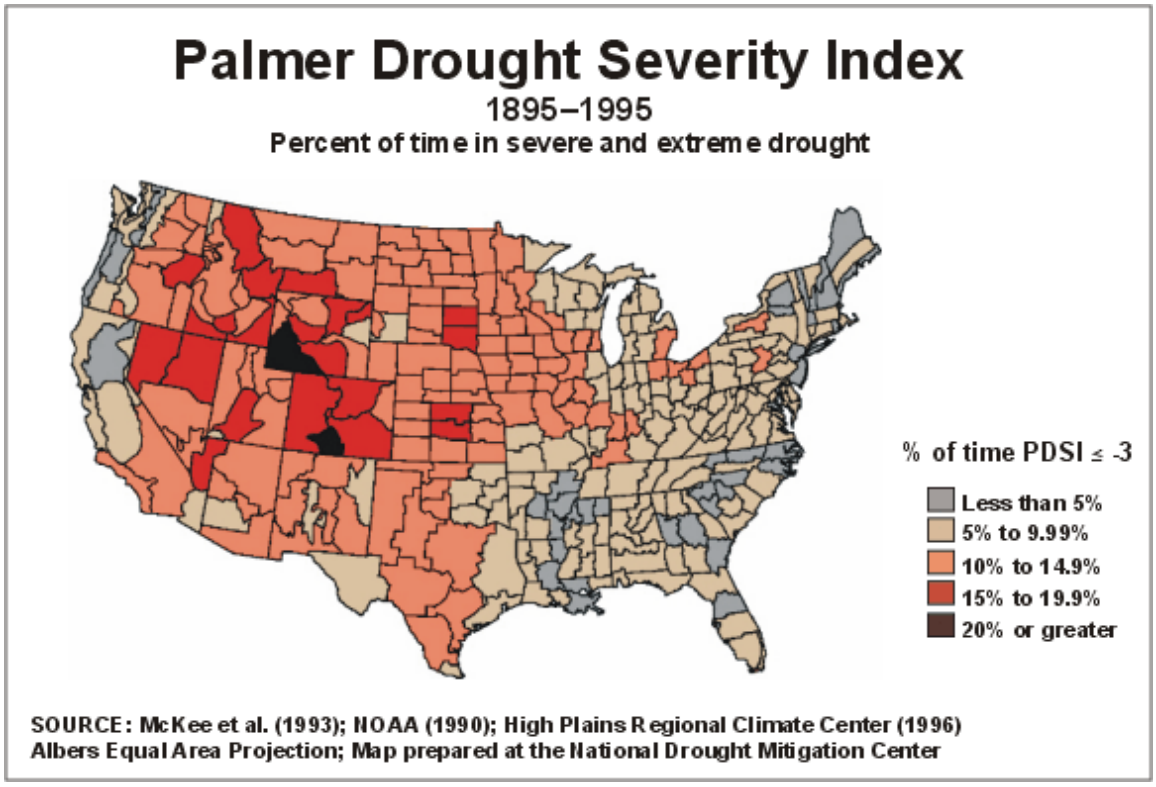


Figure 7: Percent of Time in Severe or Extreme Drought

Vulnerability Assessment – Drought

Overview of Vulnerability

A drought in Gallia County can have significant detrimental effect on the domestic water supply, especially for well-water, agriculture, and water-dependent recreational activities. Economic effects in Gallia County would include crop loss. No structural damage due to drought is anticipated in Gallia County.

Potential Impact of Drought

Negative impacts of drought would be experienced by agricultural interests, and the community would need to reduce its usage of water.

No damage to structures or infrastructure is anticipated due to drought.

Identifying Structures

No structures would experience damage due to drought.

Plan Update Notes

Since no structures would experience damage due to drought, this updated plan, like the previous plan, does not identify existing or future buildings at risk of loss due to drought.

Exposure of Existing Buildings to Damages Due to Drought

No existing buildings are exposed to damage due to drought.

Exposure of Future Buildings to Damages Due to Drought

No future buildings will be exposed to damage due to drought.

Estimating Potential Loss

Plan Update Notes

There is no change in this updated plan in the estimate of loss due to drought.

Methodology

Estimated potential dollar loss due to drought is based on damages provided from NCDC and USGS, which is $0.

Estimated Potential Dollar Losses

The estimate potential dollar loss annually in Gallia County due to structural damage due to drought is $0.00.

Summary of Risk Assessment Findings

The purpose of completing a rigorous assessment of risk is to inform decision-makers about the mitigation actions that are most appropriate for the County. Table 17 shows that Gallia County can expect the greatest losses from flooding. Annualized anticipated losses due to winter storms are more than ten times the losses anticipated due to severe storms. Annualized anticipated losses due to flooding are more than three times the anticipated losses due to winter and severe storms combined. However, this is due to using the best available data from NCDC, which captured multiple counties with larger disaster events. Because of this the top three hazards would have reduced estimated annual cost. The estimated losses for these hazards will still be great and that is why the majority of actions proposed in this mitigation plan address potential damage due to flooding, winter storms, and severe storms.

Table 17: Risk Assessment Findings

Hazard	Vulnerable Locations	Annual Probability of Occurrence in Gallia County	Estimated Annual Dollar Loss
Flood	Special Flood Hazard Areas	100%	$2,704,529
Winter Storms	Entire County	100%	$718,235
Severe Storms	Entire County	100%	$58,563
Landslide	Localized	13.3%	$0.00
Tornadoes	Entire County	11.5%	$150,000
Mine Subsidence	Localized	<1%	$0.00
Earthquake	Entire County	<1%	$0.00
Drought	Entire County	5-9.99%	$0.00

The conclusion of the risk assessment is that the greatest damages attributable to a single hazard occurring in Gallia County can be expected to be caused by flooding. Do to this case; the Core Group moved flooding to the number one hazard for Gallia County. Winter and severe storms still remain a large threat because they affect the entire county where as for flooding the damage is localized and expected when the hazard occurs. Since landslides do not have any historical damages record but have anecdotal evidence there is potential for high losses, landslides should remain in the same order for mitigation.

Thus, the hazards that will receive immediate attention and the greatest number of County resources will be flooding, winter and severe storms. Fewer resources will be directed toward reducing potential damages due to flooding, landslides, and tornadoes, and little resources will be used to mitigate the negative effects of the other hazards identified.

In the risk assessments worst case scenarios were performed for each hazard. A vulnerability analysis of these scenarios is shown in Table 17. Unlike the annual estimated losses, the total anticipated losses due to a worst case scenario cannot be compared due to the significance variations for each one of these hazards. For example, even though the damage value is on the same magnitude for flooding and earthquakes, the probability of a major flood event occurring is significantly higher than a catastrophic earthquake in Gallia County. It is also important to note that this table represents the total number of at-risk structures. Based off of multiple circumstances that are unpredictable in nature, the damage values may over/underestimate the actual damage if a worst case scenario were to happen. Table 18 demonstrates the worst case scenario potential damage as it relates to each hazard and delineates residential, non-residential and critical structures throughout Gallia County.

Table 18: Vulnerability Analysis

Hazards	Number of Structures At-Risk				Damage in Dollars ($1000)			
	Residential	Non-Residential	Critical	Total	Residential	Non-Residential	Critical	Total
Flooding	1,704		40	1,744	$122,873		$21,208	$144,081
Winter Storms	2,617	251	0	2,868	$187,000	$89,000	$0	$276,000
Severe Storms	2,617	251	0	2,868	$187,000	$89,000	$0	$276,000
Landslide	0	0	0	0	$0	$0	$0	$0
Tornadoes	1,565	469	197	2,231	$118,845	$77,373	$107,188	$303,406
Mine Subsidence	3	0	0	3	$375	$0	$0	$375
Earthquake	5,164	964	58	6,186	$92,957	$6,594,350		$158,900
Drought	0	0	0	0	$0	$0	$0	$0

Because critical facilities are tax exempt but not all exempt properties are critical facilities, the average value for critical facilities is based off all exempt properties within the Gallia County. For each hazard, aside from flooding, tornadoes and earthquakes, all critical facilities are assumed to withstand normal forces and events based on the hazards affecting Gallia County. This is assumed because these facilities are typically designed to meet building code and they are usually maintained by the personnel occupying the building. Therefore, no damages are assumed for these types of facilities. In the case of flooding, the estimated value for residential and non-residential is the total value of the structure and may be overestimated if only a portion of the building is damaged. For critical facilities the total average value of the determined structures was given which is an overestimation because not all of the structures will be totally damaged. To evaluate the amount of damage to critical facilities in the worst case scenario for a tornado, the total number exempt structures were used, making this value an overestimation. The same path that the other structures were evaluated on was used. The value for this item is merely an estimate and can greatly differ by the path of the tornado.

Mitigation Goals

Mitigation Goals Update

Goals express aspirations about long-term conditions rather than specific measures. The goals expressed in this plan regarding natural hazards are basically the goals that were established when the plan was initially developed for adoption in 2004, but the presentation of goals, objectives, and actions has been re-written.

Mitigation Planning Principles

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 Gallia 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 Mitigation Core Group agreed to goals that they wanted to achieve for each hazard. These goals are listed in the following section.

Goals

Flooding

Overall Goal: To save lives and property, reduce damage and to increase education (awareness) of community.

Severe Winter Storms – Snow & Ice

Overall Goal: To increase awareness of winter and ice storms and to reduce property damages.

Severe Storms – Thunderstorms, High Winds, Hail, Lightning

Overall Goal: To increase awareness of severe storms and to reduce property damages.

Landslides

Overall Goal: To reduce the potential loss of lives and to increase awareness.

Tornadoes

Overall Goal: To save lives, reduce potential damage, and to increase awareness of the hazards of tornadoes.

Mines Subsidence

Overall Goal: To reduce the potential loss of lives, damage of property, and to increase awareness of the hazards associated with underground mines.

Earthquakes

Overall Goal: To reduce potential loss of lives, damage of property, and to increase awareness.

Droughts (Severe)

Overall Goal: To reduce potential damage and to increase awareness of drought occurrences throughout Gallia County by increased preparedness.

Alternative Mitigation Actions

Mitigation Alternatives Update

Actions that were proposed in the previous mitigation plan were reviewed by the Gallia County EMA Director and members of the Mitigation Core Group to determine their status. These actions are recorded in this updated plan as having been completed, deleted, deferred, unchanged, or ongoing.

These actions were part of the review of a range of actions suggested for inclusion in this updated plan. Many of the actions proposed by the previous version of the mitigation plan are again proposed for implementation.

Review of Previously Proposed Mitigation Actions

Appendix VIII lists the 56 mitigation actions that were proposed in the previous version of the Gallia County mitigation plan that relate to natural hazards. **Appendix VIII** indicates the status of actions as completed, deleted, deferred, unchanged, or ongoing. All unchanged action items are due to a lack of funding.

Benefit Cost Review of Mitigation Alternatives

A number of different criteria were used during plan development to prioritize suggested mitigation actions. The Mitigation Core Group subjectively prioritized alternatives through an iterative process of document review during 2012 planning process until consensus was reached. A good example of how this worked correlates directly with the hazard alternatives.

Additional measures were taken to evaluate the benefit/cost of each of the alternatives. The review identified the degree to which suggested actions might provide economic and environmental benefits to the community as well as might be acceptable from an administrative, political or social standpoint. The Mitigation Core Group utilized a process recommended by FEMA called STAPLEE. The Mitigation Core Group modified their process somewhat and only utilized four considerations verses the seven suggested by STAPLEE. The STAPLEE method of prioritization is typically used for planning purposes; when a local jurisdiction applies for a Federal grant for project implementation.

STAPLEE stands for:

S – Social: Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the communities social and cultural values.
T – Technical: Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.

A – Administrative: Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political: Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support of the action.
L – Legal: It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economical: Budget constraints can significantly deter the implementation of mitigations actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.
E – Environmental: Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

For each criterion, the prioritization methodology assigned a 1 if there would be a benefit, a -1 if there would be a cost, and a 0 if no cost or benefit could be associated with the suggested action. For example, if an action might have a positive effect on the natural environment, the score for environmental impact would be 1; and if a proposed action might be met with public resistance, the score for social support would be -1.

However, because the risk assessment showed that estimated annual dollar losses due to flooding, winter storms, and severe storms would be substantial, the economic benefits of suggested actions for mitigating the effects of these hazards were assigned a weight. A weight of three (3) was given to economic impacts for flood mitigation actions because annualized flood damages are substantially higher than all hazards; a weight of two (2) was given to economic impacts of winter storms because annualized repair costs due to this hazard is the second most costly; a weight of one (1) was given to economic impacts of severe storms, landslides and tornadoes because annualized repair costs due to these hazards have a lower cost associated with them; and a weight of zero (0) was given to economic impacts of the remaining hazards mitigation actions because repairs due to these hazards have no reported cost associated with them.

Table 19 displays the results of this cost benefit review showing scores assigned to suggested mitigation actions for each of the four different evaluation criteria.

Table 19: Cost/Benefit Review of Mitigation Action Items

Hazard	Mitigation Alternative Considered	Economic Impact	Admin.	Polit./ Social	Enviro. Impact	Sum
Flooding	Many culverts in Gallia County are undersized. The County wants to perform a hydrological study to evaluate existing culvert sizes and determine capacities that culverts need to be to carry existing storm water flow. Modify undersized storm water culverts and channels to increase flow capacity to alleviate some of the water back up that contributes to flooding in different areas.	3	0	1	1	5
Flooding	Construct designated safe shelters on high ground in areas above the flood plains for residents in low lying areas to seek safety in the event of a flood.	3	0	0	1	4
Flooding	Gallia County's sewage treatment plants are unable to handle storm events resulting in raw sewage overflowing into waterways. The County wants to evaluate the existing plants' capacities and provide necessary improvements to increase plant capacities as needed.	3	-1	1	1	4
Flooding	Remove existing structures in floodplains that have been identified as repetitive loss structures according to FEMA.	3	-1	1	1	4
Flooding	The City of Gallipolis and the Village of Vinton become stranded during a flood event. The County wants to establish a flood escape route for these communities.	3	-1	1	0	3
Flooding	The County wants to define and map floodplain areas where repetitive loss structures are located to avoid future building in these areas.	3	-1	0	0	2
Flooding	Develop an educational outreach program to educate County residents on the dangers associated with flooding and the resulting cleanup activities as well as where to seek safety from flood waters.	3	-1	1	0	3
Flooding	Gallia County's township infrastructure and bridgeways are inadequate to handle flooding. The County wants to enlarge bridge decking on those structures identified to be inadequate.	3	-1	0	0	2
Flooding	Many residents in Gallia County are served by propane tanks. The County wants to establish regulations for propane tank tie down to avoid tanks floating down stream in flooding situations.	3	-1	-1	0	1
Winter Storms	Many communities throughout Gallia County have older, large trees growing near structures and power lines that could be severely damaged by fallen branches or uprooted trees. The County wants to develop a tree maintenance program to prune or remove those trees recognized to be hazards.	2	0	1	1	4

Hazard	Mitigation Alternative Considered	Economic Impact	Admin.	Polit./ Social	Enviro. Impact	Sum
Winter Storms	Construct designated safe shelters throughout the County that would provide protection from winter weather for sensitive populations.	2	0	1	0	3
Winter Storms	Provide large scale evacuation centers for County residents to seek safety. Provide evacuation centers with generators and necessities for survival in case of prolonged winter event.	2	0	1	0	3
Winter Storms	Gallia County needs more man power for disaster cleanup activities. The County wants to coordinate with correction institutions for recruitment of workers for cleanup.	2	0	1	0	3
Winter Storms	Gallia County lacks proper fuel supply to sustain necessary activities in an emergency. The County wants to coordinate with the OEMA to evaluate the community's need for additional fuel supplies during emergencies.	2	0	1	0	3
Winter Storms	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	2	0	1	0	3
Winter Storms	Gallia County's existing snow removal equipment does not have capability to remove deep snow in a safe, efficient manner. The County wants to obtain snow blowers for deep snow removal.	2	-1	0	0	1
Severe Storms	Provide an alternate power source, such as back-up generators, for those sensitive populations critical facilities that must have continuous power to preserve and protect human health.	1	1	1	0	3
Severe Storms	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	1	0	1	0	2
Severe Storms	Gallia County lacks the coverage of the Doppler radar through NOAA. The County wants to coordinate with NOAA to expand the coverage area of the Doppler radar to include Gallia County.	1	0	1	0	2
Severe Storms	Develop map of locations of existing designated shelter locations and evaluate each shelter to see if it has adequate supplies to sustain residents in the event of a severe weather event.	1	-1	1	0	1
Severe Storms	Develop and distribute public education flyer to County residents covering the use of lightning rods and the benefits of installation.	1	-1	1	0	1

Hazard	Mitigation Alternative Considered	Economic Impact	Admin.	Polit./ Social	Enviro. Impact	Sum
Landslides	In Gallia County, lumber companies engage in the practice of clear cutting, stripping areas of trees, depriving the soil of both anchor and protection from saturating rains. The County wants to petition the County commissioners to adopt new regulations for clear cutting in order to prevent landslides associated with this practice.	1	-1	1	1	2
Landslides	Gallia County wants to better coordinate efforts with logging companies and the logging industry to protect and maintain local roads.	1	-1	1	0	1
Landslides	Gallia County's mapping system lacks updated information concerning areas of potential landslides. Therefore, the County wants to develop an electronic map illustrating existing soil layers and known slip areas.	1	-1	1	0	1
Tornadoes	Gallia County lacks an adequate outdoor warning system throughout the County. Therefore, the County wants to install an interoperable, multi-purpose siren system that would alert residents of approaching severe weather.	1	0	1	0	2
Tornadoes	Construct designated safe shelters throughout the County that would provide protection from severe weather for County residents and at-risk populations such as mobile home parks and campgrounds where citizens could seek safety in the event of a tornado.	1	-1	1	0	1
Tornadoes	Since Gallia County lacks an adequate number of safe shelters for people to seek safety in tornadoes, the County wants to retrofit schools to be designated tornado shelters.	1	-1	1	0	1
Mine Sudsidence	Underground mines, some of which have been abandoned for years, can be found in different parts of Gallia County. The County wants to establish an enforceable permitting process for construction in areas affected by mines to limit the subsidence which causes landslides.	0	0	1	0	1
Mine Sudsidence	Due to the increased amount of sedimentation caused by subsidence, the information on the County's FIRM map is no longer accurate. Floodplains are not depicted accurately since streams, such as Kyger Creek, are not as deep due to increased sediment loading.	0	-1	0	0	-1
Earthquakes	Develop and distribute public education flyer to the County residents concerning the dangers of earthquakes and their rights to purchase earthquake insurance.	0	-1	0	0	-1

Hazard	Mitigation Alternative Considered	Economic Impact	Admin.	Polit./ Social	Enviro. Impact	Sum
Earthquakes	Gallia County has many mines located within its boundaries. The County wants to coordinate mitigation efforts with the mining industry concerning mining issues like long-wall problems that create tremors and earthquake conditions.	0	-1	0	0	-1
Droughts	Gallia County's water supply becomes depleted during mild and severe droughts. The County wants to establish designated back-up water sources for use during droughts.	0	-1	1	0	0
Droughts	Gallia County's fire department's wet hydrants are affected by drought conditions. The County wants to establish a dry hydrant system.	0	-1	1	0	0
Droughts	County residents rely on Rural Water for potable water. The County wants to provide an alternate power source, such as a back-up generator, for Rural Water so that they supply a continued source of water to residents.	0	0	1	0	1
Droughts	Gallia County's subdivision regulations do not address dry hydrants as a requirement in new developments. The County wants to provide an addendum to the current regulations that would require dry hydrant installation.	0	-1	1	0	0
Droughts	Provide emergency water supply tanks with each tank being designated to serve a particular area of the County.	0	-1	1	0	0
Droughts	Produce mapping of dry hydrant locations throughout the County.	0	-1	0	0	-1

After rating the actions relative to the 4 different feasibility criteria, the Mitigation Core Group reviewed the results and selected actions for inclusion in the plan ensuring that there would be actions directed toward mitigating the effects of each identified hazard, actions addressing existing structures, and actions addressing future structures. Alternatives that were not proposed below for implementation during the next 5 years may very well be proposed when this plan is next updated.

Prioritization Methodology

A number of different criteria were used during plan development to prioritize suggested mitigation actions. The Mitigation Core Group initially evaluated the 2004 mitigation activities. In 2004, the Mitigation Core Group chose a total of 56 potential mitigation activities. Of those 56 activities, 20 were labeled as "prioritized" activities based on the ranking process. The activities were initially ranked first taking into account the risk assessment ranking of hazards the Mitigation Core Group decided to continue to utilize this ranking process. The various hazards had been ranked according to past historical events and the cumulative costs of each potential disaster. The Mitigation Core Group subjectively prioritized alternatives through an iterative process of document review

during 2012 planning process until consensus was reached. The Mitigation Core Group reached consensus on the prioritization of the Action Items based directly on the prioritized ranking of the hazards themselves. For example, in Gallia County the hazard of flooding is their number one hazard and concern. The Mitigation Core Group felt that prioritizing those action items that fell under flooding should be ranked number one. The same goes for the next re-prioritized hazard winter storms. Winter storms are now ranked number two as it relates to their overall effect on the County and its participating jurisdictions so all the Action Items that fall under this hazard are affectively ranked number two. The updated matrix to the 2004 Action Item prioritization is displayed in **Appendix VIII**.

Proposed Mitigation Actions

Mitigation Actions Update

Mitigation actions that were proposed in the earlier version of this plan that have been completed are not included in this section of the plan. Mitigation actions that were proposed in the earlier version of this plan that have not been completed are once again proposed for implementation. A few previously proposed mitigation actions that are not relevant to mitigation have been deleted from the mitigation plan for the County. There are several mitigation actions that the Mitigation Core Group realized were not implementable on their own such as requesting back-up generators for public facilities. The Mitigation Core Group has decided to remove these mitigation actions as a stand-alone action item and will consider grouping these types of mitigation strategies with other implementable mitigation alternatives. New mitigation actions have also been identified and evaluated, and are proposed for implementation in this plan.

Selected Actions

Actions selected and proposed for implementation are grouped together as followed:

- Actions that reduce risk to human population.
- Actions that reduce risk to existing structures/infrastructure
- Actions that reduce risk to future structures/infrastructure
- Actions that address continued participation in the NFIP
- Actions that incorporate mitigation into other community plans
- Other proposed actions such as further study, outreach, or data collection

Some actions fit into more than one of these categories and are listed in more than one of the tables presented below.

Selected Actions Addressing Public Safety

Some mitigation actions address the public safety and reduce the potential to injury or death. The 10 actions listed in Table 20 will reduce the likelihood of harm to the county population.

Table 20: Actions Addressing Public Safety

Hazard	Proposed Mitigation Action
Flooding	Construct designated safe shelters on high ground in areas above the flood plains for residents in low lying areas to seek safety in the event of a flood.
Flooding	The City of Gallipolis and the Village of Vinton become stranded during a flood event. The County wants to establish a flood escape route for these communities.
Flooding	Develop an educational outreach program to educate County residents on the dangers associated with flooding and the resulting cleanup activities as well as where to seek safety from flood waters.
Winter Storms	Construct designated safe shelters throughout the County that would provide protection from winter weather for sensitive populations.
Winter Storms	The County lacks a permanent centralized safe shelter to serve as a main emergency operations center. Therefore the County wants to install a permanent multi-use safe shelter structure equipped with an emergency generator that would act as a central emergency operations command post.
Severe Storms	Provide NOAA radios for every household and educate residents on the radios for receipt of potential lifesaving information in the event of a severe storm.
Severe Storms	Develop and distribute public education flyer to County residents covering the use of lightning rods and the benefits of installation.
Tornadoes	Gallia County lacks an adequate outdoor warning system throughout the County. Therefore, the County wants to install an interoperable, multi-purpose siren system that would alert residents of approaching severe weather.
Tornadoes	Construct designated safe shelters throughout the County that would provide protection from severe weather for County residents and at-risk populations such as mobile home parks and campgrounds where citizens could seek safety in the event of a tornado.
Tornadoes	Since Gallia County lacks an adequate number of safe shelters for people to seek safety in tornadoes, the County wants to retrofit schools to be designated tornado shelters.

Selected Actions Addressing Existing Development

Some mitigation actions will provide further protection to existing structures and infrastructure. The seven actions listed in Table 21 will reduce the likelihood of damage due to natural hazards in existing structures.

Table 21: Actions Addressing Existing Development

Hazard	Proposed Mitigation Action
Winter Storms	Many communities throughout Gallia County have older, large trees growing near structures and power lines that could be severely damaged by fallen branches or uprooted trees. The County wants to develop a tree maintenance program to prune or remove those trees recognized to be hazards.
Winter Storms	Provide an alternate power source, such as back-up generators, for those sensitive populations critical facilities that must have continuous power to preserve and protect human health.
Severe Storms	Provide an alternate power source, such as back-up generators, for those sensitive populations critical facilities that must have continuous power to preserve and protect human health.
Flooding	Gallia County's township infrastructure and bridgeways are inadequate to handle flooding. The County wants to enlarge bridge decking on those structures identified to be inadequate.
Landslides	Gallia County is continuously threatened by potential landslides but lacks the equipment to aid in mitigating that threat. Therefore, the County wants to obtain a drilling machine and pile driver to mitigate continued threat of landslides.
Tornadoes	Provide an alternate power source, such as back-up generators, for critical facilities serving as tornado shelters that must have continuous power to preserve and protect human health.
Tornadoes	Since Gallia County lacks an adequate number of safe shelters for people to seek safety in tornadoes, the County wants to retrofit schools to be designated tornado shelters.

Selected Actions Addressing Future Development

Some proposed mitigation actions will affect the degree to which future structures and infrastructure are protected against damage due to natural hazards. Table 22 lists the two actions in this category.

Table 22: Actions Addressing Future Development

Hazard	Proposed Mitigation Action
Drought	Gallia County's fire department's wet hydrants are affected by drought conditions. The County wants to establish a dry hydrant system.
Drought	Gallia County's subdivision regulations do not address dry hydrants as a requirement in new developments. The County wants to provide an addendum to the current regulations that would require dry hydrant installation.

Selected Actions Addressing Continued Participation in the NFIP

All local jurisdictions in Gallia County participate in the NFIP. Nevertheless, flooding continues to threaten the safety and security of County residents. The six mitigation

actions displayed in Table 23 address participation in the NFIP beyond meeting the usual minimum NFIP standards.

Table 23: NFIP Continued Participation Proposed Actions

Hazard	Proposed Mitigation Action
Flooding	Remove existing structures in floodplains that have been identified as repetitive loss structures according to FEMA.
Flooding	The County wants to define and map floodplain areas where repetitive loss structures are located to avoid future building in these areas.
Flooding	Develop an educational outreach program to educate County residents on the dangers associated with flooding and the resulting cleanup activities as well as where to seek safety from flood waters.
Mine Subsidence	Due to the increased amount of sedimentation caused by subsidence, the information on the County's FIRM map is no longer accurate. Floodplains are not depicted accurately since streams, such as Kyger Creek, are not as deep due to increased sediment loading.

Selected Actions That Incorporate Mitigation into Other Plans

Some mitigation actions involve the incorporation of mitigation strategies into existing planning mechanisms. The proposed mitigation actions, not necessarily different from those listed elsewhere in this section, involve such incorporation.

Table 24 lists 19 proposed mitigation actions that will involve the incorporation of hazard mitigation actions into other planning mechanisms.

Table 24: Actions to Incorporate into Other Planning Mechanisms

Hazard	Proposed Mitigation Action	Related Planning Mechanism(s)
Flooding	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Emergency Operation Plan State of Ohio Park District Gallia County Soil and Water Conservation District
Flooding	Due to the large amount of log jams that occur within the County there is a need to evaluate the establishment of a Stream Maintenance Program.	Emergency Operation Plan Gallia County Soil and Water Conservation District
Flooding	Gallia County's sewage treatment plants are unable to handle storm events resulting in raw sewage overflowing into waterways. The County wants to evaluate the existing plants' capacities and provide necessary improvements to increase plant capacities as needed.	Emergency Operation Plan Wastewater Coordinator for Gallia County

Hazard	Proposed Mitigation Action	Related Planning Mechanism(s)
Flooding	The City of Gallipolis and the Village of Vinton become stranded during a flood event. The County wants to establish a flood escape route for these communities.	Emergency Operation Plan
Flooding	Because Gallia County is prone to landslides, the County wants to obtain a piling drilling machine to mitigate landslides resulting from flooding.	Emergency Operation Plan
Flooding	Many residents in Gallia County are served by propane tanks. The County wants to establish regulations for propane tank tie down to avoid tanks floating down stream in flooding situations.	Emergency Operation Plan NFIP
Winter Storms	Gallia County lacks emergency response vehicles that can navigate in snow. Therefore, the County wants to obtain 4-wheel drive emergency response vehicles for first responders.	Emergency Operation Plan
Winter Storms	Gallia County needs more man power for disaster cleanup activities. The County wants to coordinate with correction institutions for recruitment of workers for cleanup.	Emergency Operation Plan Gallia County 911
Winter Storms	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Emergency Operation Plan
Winter Storms	Gallia County's existing snow removal equipment does not have capability to remove deep snow in a safe, efficient manner. The County wants to obtain snow blowers for deep snow removal.	Emergency Operation Plan
Severe Storms	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Emergency Operation Plan
Severe Storms	Develop and distribute public education flyer to County residents covering the use of lightning rods and the benefits of installation.	Emergency Operation Plan Gallia County Soil and Water Conservation District Gallia County Red Cross
Severe Storms	As part of their maintenance program, utility companies use a chop and drop method for trees around power lines and above ground utilities. The County wants to coordinate with utility companies for timely removal of debris after chop and drop.	Emergency Operation Plan Meigs County Soil and Water Conservation District Gallia County Engineers Office

Hazard	Proposed Mitigation Action	Related Planning Mechanism(s)
Landslides	In Gallia County, lumber companies engage in the practice of clear cutting, stripping areas of trees, depriving the soil of both anchor and protection from saturating rains. The County wants to petition the County commissioners to adopt new regulations for clear cutting in order to prevent landslides associated with this practice.	Emergency Operation Plan Comprehensive Plan NFIP
Landslides	Gallia County feels that clear cutting practices do not receive the necessary attention in their County as well as in surrounding counties. Gallia County wants to establish a focus group of citizens from surrounding counties to address issues associated with clear cutting in the area.	Comprehensive Plan
Mine Subsidence	Underground mines, some of which have been abandoned for years, can be found in different parts of Gallia County. The County wants to establish an enforceable permitting process for construction in areas affected by mines to limit the subsidence which causes landslides.	State Regulations
Drought	Gallia County's water supply becomes depleted during mild and severe droughts. The County wants to establish designated back-up water sources for use during droughts.	Emergency Operation Plan
Drought	Gallia County's subdivision regulations do not address dry hydrants as a requirement in new developments. The County wants to provide an addendum to the current regulations that would require dry hydrant installation.	Emergency Operation Plan Soil and Water Conservation District
Drought	Provide emergency water supply tanks with each tank being designated to serve a particular area of the County.	Emergency Operation Plan

Other Selected Mitigation Actions

Some proposed mitigation actions call for further planning, community education efforts, or research. While these may eventually result in actions that will reduce the likelihood of damage due to natural hazards, the 16 actions displayed in Table 25 do not necessarily affect existing or future structures, do not augment participation in the NFIP, and do not involve other planning mechanisms.

Table 25: Additional Mitigation Actions

Hazard	Proposed Mitigation Action

Hazard	Proposed Mitigation Action
Winter Storms	Gallia County lacks proper fuel supply to sustain necessary activities in an emergency. The County wants to coordinate with the OEMA to evaluate the community's need for additional fuel supplies during emergencies.
Severe Storms	Provide NOAA radios for every household and educate residents on the radios for receipt of potential lifesaving information in the event of a severe storm.
Severe Storms	Gallia County lacks the coverage of the Doppler radar through NOAA. The County wants to coordinate with NOAA to expand the coverage area of the Doppler radar to include Gallia County.
Severe Storms	Develop map of locations of existing designated shelter locations and evaluate each shelter to see if it has adequate supplies to sustain residents in the event of a severe weather event.
Flooding	Many culverts in Gallia County are undersized. The County wants to perform a hydrological study to evaluate existing culvert sizes and determine capacities that culverts need to be to carry existing storm water flow. Modify undersized storm water culverts and channels to increase flow capacity to alleviate some of the water back up that contributes to flooding in different areas.
Landslide	Gallia County wants to better coordinate efforts with logging companies and the logging industry to protect and maintain local roads.
Landslide	Since clear cutting is an important issue in Gallia County, the County wants to evaluate other state's laws concerning clear cutting practices to see what may be enforceable in this area.
Landslide	Gallia County's mapping system lacks updated information concerning areas of potential landslides. Therefore, the County wants to develop an electronic map illustrating existing soil layers and known slip areas.
Tornadoes	Develop a large scale educational outreach program to teach County residents about the uses of a multi-use siren system and the different warnings to be sounded.
Tornadoes	Develop and distribute educational information to local school officials justifying multi-use siren systems and explaining the benefits to be reaped by the school and its students.

Implementation Strategies

This section of the plan provides an overview of the strategy that will be utilized in order to implement each of the proposed mitigation actions. For each action listed in **Appendix VIII**, the associated strategy identifies the agency or job title that will be responsible for initiating the work and potential sources of funding for the work. Each strategy also indicates when the action will happen. **Appendix VIII** identifies all of the parties responsible for implementation of each action.

Plan Maintenance

Plan Maintenance Update

An annual review of mitigation actions will be conducted. The process for evaluating the plan has been modified slightly from that presented in the previous version of the plan. The protocols for updating the plan and continued public involvement have been elaborated upon in this version of the plan.

Monitoring Mitigation Actions

The Gallia County EMA Director will monitor the progress made on the implementation of the identified action items annually at about the anniversary date of plan adoption. Monitoring will be accomplished by calling or e-mailing each County or municipal agency that, through adoption of the plan, has assumed the responsibility of implementing one or more mitigation actions.

By monitoring mitigation actions, when the plan is next updated, information about the status of proposed mitigation actions will be readily available. The updated plan will include a section explaining if previously proposed mitigation actions have been implemented, completed, or deferred. The updated plan will identify actions that are no longer appropriate for the community and should be deleted. The updated plan will identify obstacles to implementation that caused proposed actions to be deferred and will recommend strategies for overcoming those obstacles.

The Mitigation Core Group will not only monitor the implementation of mitigation actions proposed in this plan, but will also monitor actions of participating jurisdictions and surrounding communities that may affect the ability of Gallia County to withstand the effects of natural hazards or to recover from a disaster in the future. The method for gathering information about actions beyond those proposed in this plan will be informal; as active members of the Gallia County community, Mitigation Core Group members will bring their own knowledge of the area to monitoring meetings to provide information about actions of participating jurisdictions as well as of nearby communities.

Evaluating the Plan

One month after conducting the annual monitoring of mitigation actions, the Gallia County EMA Director will schedule an annual meeting of the Mitigation Core Group to evaluate the mitigation planning process, implementation of the plan, and conditions in Gallia County that suggest the need to modify either planning data or planning actions. Participating incorporated jurisdictions' and townships will be invited to attend the evaluation meetings. The evaluation meeting will include a presentation of the results of the monitoring of mitigation actions and will answer the following questions:

- Do mitigation goals and objectives reflect current community concerns as well as the finding of the risk assessment?
- Have conditions in the County changed so that findings of the risk assessment should be updated?
- What hazards have caused damage in the County since the plan was written? Were these anticipated and evaluated in the plan or should these hazards be added to the plan?
- Have conditions in the County changed so that the magnitude of risk as expressed in this plan has changed?
- Are new sources of data available that will improve the risk assessment?
- Are current resources sufficient for implementing mitigation actions?
- For each mitigation action that has not been completed, what are the obstacles to implementation? What are potential solutions for overcoming these obstacles?
- Is each completed mitigation action effective in reducing risk? What action is required to further reduce the risk addressed by the completed action?
- What mitigation actions should be added to the plan and proposed for implementation?
- Should any proposed mitigation actions be deleted from the plan? What is the rationale for deleting previously proposed actions from the plan?
- Based upon the evaluation, should the plan be updated as soon as possible or should the plan be updated as scheduled 5 years after it was adopted?

The Gallia County EMA Director will document the results of the annual evaluation meeting and submit the findings to each incorporated jurisdiction and townships in the County for review within 2 weeks. If the Mitigation Core Group determined that the plan should be updated as soon as possible, the Gallia County EMA Director will take action to initiate the plan update.

Updating the Plan

This plan must be updated within 5 years and again adopted by the County and participating jurisdictions in order to maintain compliance with the regulations stated in 44 CFR Part 201.6 and ensure eligibility for applying for and receiving certain Federal mitigation grant funds.

Monitoring and evaluation will identify necessary modifications to the plan including changes in mitigation strategies and actions that should be incorporated in the next update.

The update will have more current information about previous occurrences of hazards and improved information about wind speed for high wind events.

The Gallia County EMA Director will initiate the process of updating the plan no more than 3 years after the plan was adopted, or immediately upon a determination by the Mitigation Core Group that the plan should be updated sooner. This will allow approximately 1 year for securing funding and/or staff for updating the plan and 1 year for conducting research and writing the updated plan.

Continued Public Involvement

The Gallia County EMA Director will provide printed copies of the plan to key Gallia County offices including the public library in the County so that the public has access to printed copies of the plan. A copy of the adopted plan will be posted on the County Web site for 5 years so that the public has electronic access to the plan. The Web site will include contact information for anyone to provide comment so that residents, business owners, and others who read the plan will be able to provide a comment about the plan or about the mitigation strategies. The Gallia County EMA will maintain these comments and will provide them to the Mitigation Core Group for consideration at the annual plan evaluation meetings.

The Gallia County EMA Director will post notices of annual mitigation plan evaluation meetings using the usual methods for posting meeting announcements in the County to invite the public to participate. In addition to posting announcements on the County Web site, at least one newspaper press release will be published at the onset of the process of updating the plan inviting public participation.

The Gallia County EMA Director will document the number of people who participate in the annual meetings and the results of the meeting for inclusion in the plan when it is next updated. In this way, the public will have an opportunity to become involved in the planning process and to influence mitigation planning decisions.

The Gallia County EMA Director will provide a written report and/or make a presentation to the Gallia County Commissioners to advise them of the status of the plan and of proposed mitigation actions. In this way, the public will have another opportunity to become aware of local mitigation efforts.

List of Sources

American Association of States Climatologists. (http://www.stateclimate.org/)

Draft State of Ohio Enhanced Mitigation Plan, Ohio Emergency Management Agency

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List of Acronyms

ARC	American Red Cross
BFE	Base Flood Elevation
BMPs	Best Management Practices
CDBG	Community Development Block Grant
CRS	Community Rating System
DMA2K	Disaster Mitigation Act of 2000
EMA	Emergency Management Agency
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HUD	Housing and Urban Development
MORPC	Mid-Ohio Regional Planning Commission
NCDC	National Climate Data Center
NFIP	National Flood Insurance Rate Program
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
ODNR	Ohio Department of Natural Resources
OEMA	Ohio Emergency Management Agency
OSU	Ohio State University
SWCD	Soil and Water Conservation District
USDA	United States Department of Agriculture
USGS	United States Geological Survey

Appendix I
Sample Plan Adoption Resolutions

The Gallia County Commissioners as well as the incorporated areas of Centerville, Cheshire, Crown City, Gallipolis, Rio Grande, and Vinton will be passing a Resolution of Support for the Gallia County Natural Mitigation Plan after contingent approval from the State of Ohio EMA as well as FEMA.

An example of the Resolution of Adoption that will be presented to the Commissioners as well as the participating incorporated jurisdictions is provided on the following pages.

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RESOLUTION NO._____

ADOPTION OF THE GALLIA COUNTY NATURAL HAZARDS MITIGATION PLAN COUNTY NATURAL HAZARDS MITIGATION PLAN AND ESTABLISHMENT OF A GALLIA COUNTY NATURAL HAZARDS MITIGATION PLAN COUNTY HAZARD MITIGATION CORE GROUP

WHEREAS, on_____, the Gallia County Commissioners passed Resolution No. adopting the GALLIA COUNTY NATURAL HAZARDS MITIGATION PLAN (the Mitigation Plan) pursuant to _____which established goals to minimize and reduce stormwater 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 Gallia County 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 Gallia County. Further, by researching and planning for future natural hazards and implementing appropriate mitigation techniques, all of Gallia 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 Gallia County."; and

WHEREAS, on March 1st, 2013, the Gallia County Commission President approved the development of a Mitigation Plan; and

WHEREAS, a Mitigation Plan for Gallia County will be required beginning in June 1st, 2013 to receive any state or federal mitigation funding such as flood prone property improvement or buyout funds; and

WHEREAS, the County of Gallia 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 Gallia County Commissioners that:

1. GALLIA COUNTY NATURAL HAZARDS MITIGATION PLAN is hereby adopted as an official plan of Gallia 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

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recommended by the Gallia 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 Gallia County Board of Commissioners on

Vote:

Yes ____

No ____

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Signed Jurisdictional Resolutions

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Insert Signed Resolutions

Before FEMA approval

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Appendix II
Core Group Meeting

URS
277 W. Nationwide Blvd.
Columbus, OH 43215
Telephone: (614) 464-4500
Facsimile: (614) 464-0588
Architectural & Engineering Services

MEETING MINUTES

LOCATION: Gallia County Meeting Room, Health Department

BY: Kari Mackenbach

ATTENDEES: **Gallia Co. EMA**- Mike Null, Jill Simpkins
Gallia Co. Sheriff- Joe Browning
Gallia County- Lois Snyder, Melissa Clark,
Providence Access Group- Jason Sherrill
Village of Vinton- Joshua Whealdon
Village of Gallipolis- Randall Finney
URS- Kari Mackenbach, Bill Porteus

COPIES: Attendees (see above), Central Files, Centerville(*), Cheshire(*), Crown City(*), Rio Grande(*)

MEETING DATE: April 6, 2011 @ 6:00 p.m.

ISSUE DATE: April 7, 2011

PROJECT: Gallia County NHMP

JOB NO.: URS: 14577448

RE: Core Group Meeting

This report will confirm those items discussed and/or reached. Unless information to the contrary is received within five (5) working days, the writer will assume all participants agree with the contents of this memorandum.

The meeting was held at the Gallia County Health Department. Items discussed were as follows:

DISCUSSION ITEMS:

- **Introductions**
  - Exchange information
- **Mitigation Overview**
  - What is the Natural Hazards Mitigation Plan (NHMP)?
  - What are the current trends in Mitigation Planning?
  - FEMA fundable projects
- **Plan Overview**
  - Update process
  - What is the role of the core group?
  - Examination of existing mitigation action items
  - Discussion on existing plan
- **Next steps**
  - Information on historical disasters for next meeting.
  - Updates and proposed projects for updated version for next meeting
  - Update of critical facilities for next meeting
  - Gaps in core group membership
- **Establish Meetings and Important Dates**

MEETING MINUTES

Specific items of importance discussed at the meeting were as follows:

1) Introductions
   a) Vinton and Gallipolis are the only jurisdictions present
   b) Other key county personal were present
2) Mitigations Overview
   a) The Natural Hazards Mitigation Plan is a plan for counties to identify natural disasters to be better prepared for when they occur and to make the county and other jurisdictions available for federal funding.
   b) The Plan established projects that can be pre and post disaster funded.
   c) The state is launching a new program called State Hazard Analysis, Resource and Planning Portal.
   d) Larger projects are more likely to be funded than smaller projects.
3) Plan Overview
   a) The first task of the planning process is Data Collection and Updating any new Material
   b) The Core Group will help with additional material for plan.
      i) Gather Critical Facility Info
         (1) Update quantity for critical facilities (new churches, hospitals, etc.)
         (2) Assess and update value
   c) Examination of existing action items
      i) Core Group will take action items home to review and add additional items they believe should be addressed
   d) New Material for the Plan
      i) Earthquake- Epicenter in the county on April 24, 2009
      ii) Blue Stone Dam in West Virginia 570 BFE (Denny Tomcik-OEMA)
      iii) Water Vulnerability Analysis
      iv) No Reverse 911
      v) 17 Properties in Vinton were demolished, renovated, or relocated
      vi) Rt. 554- Fishin Twp.
      vii) New government building need to get backup power
      viii) Water level effects water/sewer infrastructure
      ix) Rescue boats is a desirable mitigation project
      x) Floodplain maps were just done first of the year- contact Nick Mills- Floodplain Administrator (446-6173)
      xi) Stream gauges North of Vinton on Raccoon Creek
      xii) Army Corps Hero Plan
      xiii) Project Viper- terrorist action group
      xiv) TSA- all modes of transportation
      xv) www.orba.org
4) Next Steps
   a) Action Items were briefly examined
      i) Send out link of Mitigation Best Practices to show examples of fundable projects to Core Group. Jill Simpkins will send out.
      ii) Use smarter communication to minimize meeting (email, etc.).
      iii) New project ideas will be sent back via email
   b) New formatting for plan was accepted by core group and approved by Mike Null

END OF MINUTES

Appendix III
Jurisdiction Meeting

URS
277 W. Nationwide Blvd.
Columbus, OH 43215
Telephone: (614) 464-4500
Facsimile: (614) 464-0588
Architectural & Engineering Services

MEETING MINUTES

LOCATION:	Gallia County Meeting Room, Health Department	**MEETING DATE:**	May 2nd, 2011 Monday @ 6:00 p.m.
BY:	Kari Mackenbach	**ISSUE DATE:**	May 6th, 2011 Friday
ATTENDEES:	**Gallia Co. EMA**- Mike Null, Jill Simpkins **Gallia Co. Sheriff**- Joe Browning **Gallia County**- Lois Snyder, Melissa Clark, Sherry Daines **Village of Vinton**- Joshua Whealdon **Village of Gallipolis**- Randall Finney **Village of Cheshire-** John Westfall **Village of Crown City-** Samp Johnson **Village of Rio Grande-** Matt Easter **Village of Centerville-** Gene Layton **Providence Access Group-** Jason Sherrill **URS**- Kari Mackenbach	**PROJECT:**	Gallia County NHMP
		JOB NO.:	URS: 14577448
		RE:	Jurisdictional Meeting
COPIES:	Attendees (see above), Central Files		

This report will confirm those items discussed and/or reached. Unless information to the contrary is received within five (5) working days, the writer will assume all participants agree with the contents of this memorandum.

The meeting was held at the Gallia County Health Department. Items discussed were as follows:

DISCUSSION ITEMS:

- **Introductions**
  - Exchange information
- **Mitigation Overview**
  - Went over last meeting's minutes (Core Group)
- **Plan Overview**
  - Update process
  - Jurisdictional participation requirements
  - Discussion on existing plan and updates
- **Next steps**
  - Updates and proposed projects
  - Update of critical facilities

- Jurisdictional Action Item Prioritization

MEETING MINUTES

Specific items of importance discussed at the meeting were as follows:

1) Introductions
   a) All jurisdiction's' were present except for the Village of Crown City and the Gallia County EMA office followed up with them afterwards to get their input in the meetings business.
   b) Other key county personal were present
2) Mitigations Overview
   a) The Natural Hazards Mitigation Plan is a plan for counties to identify natural disasters to be better prepared for when they occur and to make the county and other jurisdictions available for federal funding.
   b) The Plan established projects that can be pre and post disaster funded.
   c) The state is launching a new program called State Hazard Analysis, Resource and Planning Portal.
   d) Larger projects are more likely to be funded than smaller projects.
3) Plan Overview
   a) The first task of the planning process is Data Collection and Updating any new Material
   b) The jurisdiction's' are to read over their section of the plan and provide updates via e-mail. Updates should include at a minimum: action item progress and new development.
4) Gather Critical Facility Info
   (1) Update quantity for critical facilities (new churches, hospitals, etc.) This was cross-referenced with the jurisdictions as well.
   (2) Assess and update value
5) Examination of existing action items
   (1) The jurisdictions agreed with what the Core Group and the County came up with new action items. We reached consensus immediately.
   (2) Jurisdictional members also agreed upon accepting the County's action items prioritization as their own, due to jurisdictional capabilities and similarity to the County.
6) Next Steps
   a) Action Items
      i) Send out link of Mitigation Best Practices to show examples of fundable projects to Jurisdictions. Jill Simpkins will send out.
      ii) Use smarter communication to minimize meeting (email, etc.).
      iii) New project ideas will be sent back via email
      iv) New formatting for plan was introduced to jurisdictional members.
   b) New formatting for plan was introduced to jurisdictional members.

END OF MINUTES

Appendix IV
Public Involvement

FOR IMMEDIATE RELEASE:

Gallia County Emergency Management Agency Leading the Way in Updating the Gallia County Natural Hazard Mitigation Plan

Gallipolis, Ohio-Gallia County Officials are taking steps to make their community even disaster resilient by updating the Gallia County Natural Hazard Mitigation Plan (Mitigation Plan) according to the Disaster Mitigation Act of 2000 standards.

This allows Gallia County and its constituents to continue to be eligible for disaster mitigation funds and keeps Gallia County and its incorporated communities in good standing with the Federal Emergency Management Agency.

A Core Group of individuals from several of the incorporated areas of Gallia County have been tasked with leading the way to evaluate the current Mitigation Plan. The planning effort and the draft revised Mitigation Plan is underway and available for review by contacting the Gallia County EMA office.

Contact:

Ms. Sherry Daines
Interim EMA Director
Gallia County EMA Office
sherry911@zoomnet.net
(740) 446-0025

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https://www.facebook.com/#!/pages/Gallia-County-Emergency-
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Favorites
Gallia County Emergency Management Agency
facebook
Search for people, places and things
You are posting, commenting, and liking as Gallia County Emergency Management Ag
Gallia County Emergency M..
Note
Gallia County Emergency Manageme
Gallia County Emergency Management Agency's Notes
Gallia County Hazard Mitigation Plan
Tuesday, June 12, 2012
FOR IMMEDIATE RELEASE:
Gallia County Emergency Management Agency Leading the Way i
Gallia County Natural Hazard Mitigation Plan
Gallipolis, Ohio
-Gallia County Officials are taking steps to make their community even
more disaster resilient by updating the Gallia County Natural Hazard Mitigatio
to the Disaster Mitigation A...
View Full Note · Like · Comment

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Public Notices

July 16, 2012

NEWS RELEASE

As per the Ohio Open Meetings Act, The Gallia County Commissioners have scheduled a special meeting for Tuesday July 24, 2012 at 9:00 a.m. in the Commissioners Office of the Gallia County Courthouse in order to hold a Pre Closing Meeting with the USDA, the bonding agent and their legal representative.

June 21, 2012

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Appendix V
Multi Hazard Maps

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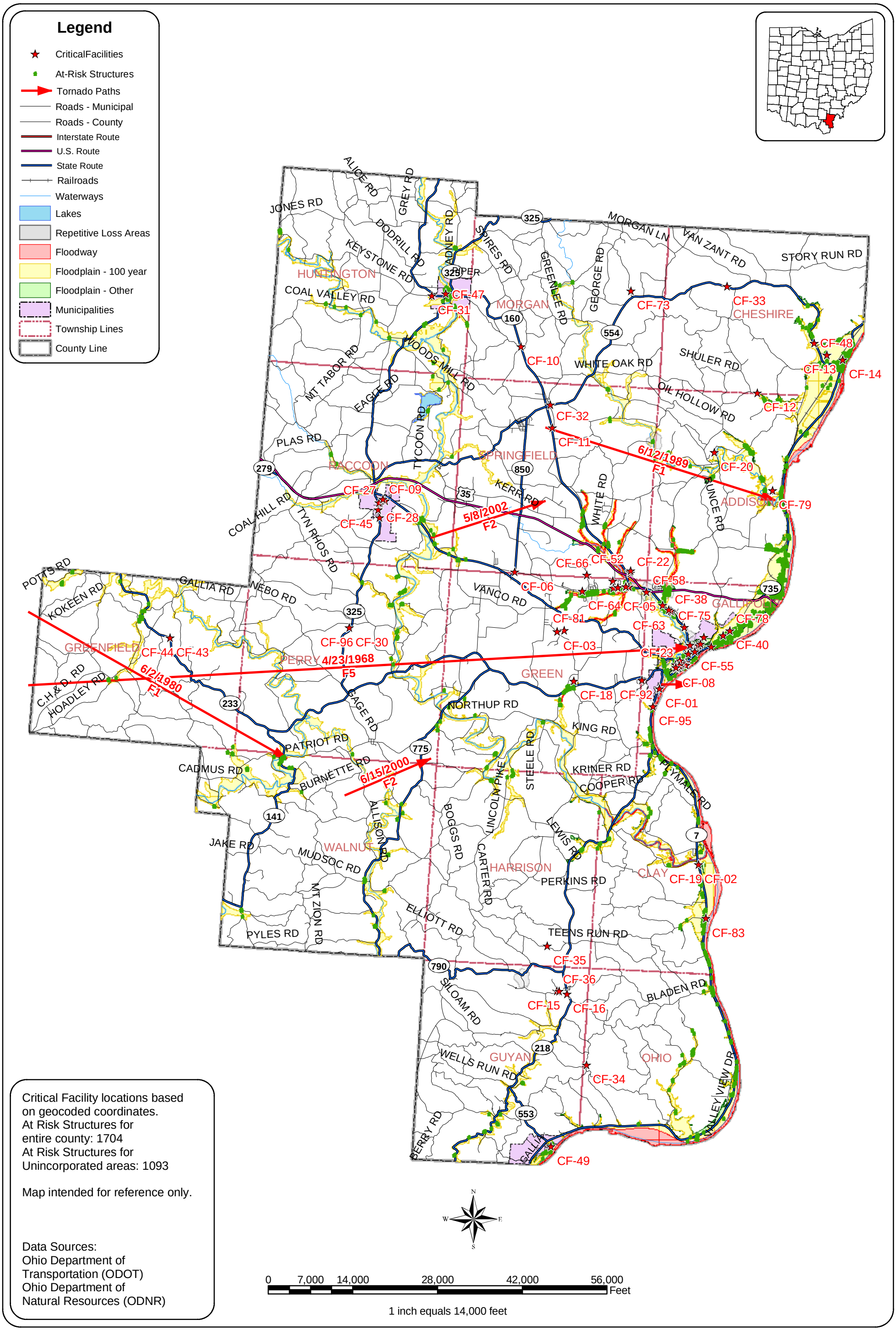
Gallia County Multi-Hazard Map



Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Unincorporated areas: 1093

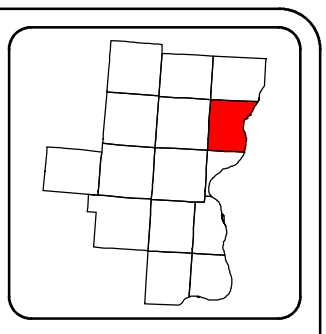
Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

Addison Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line



Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Addison Township: 232

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
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S

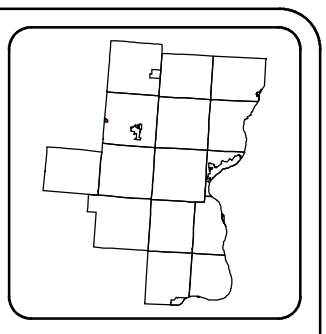
0 2,000 4,000 8,000 12,000 16,000 Feet

1 inch equals 4,000 feet

Centerville Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line



Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Centerville municipality: 0

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

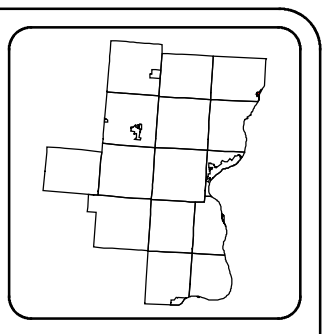
0 150 300 600 900 1,200 Feet

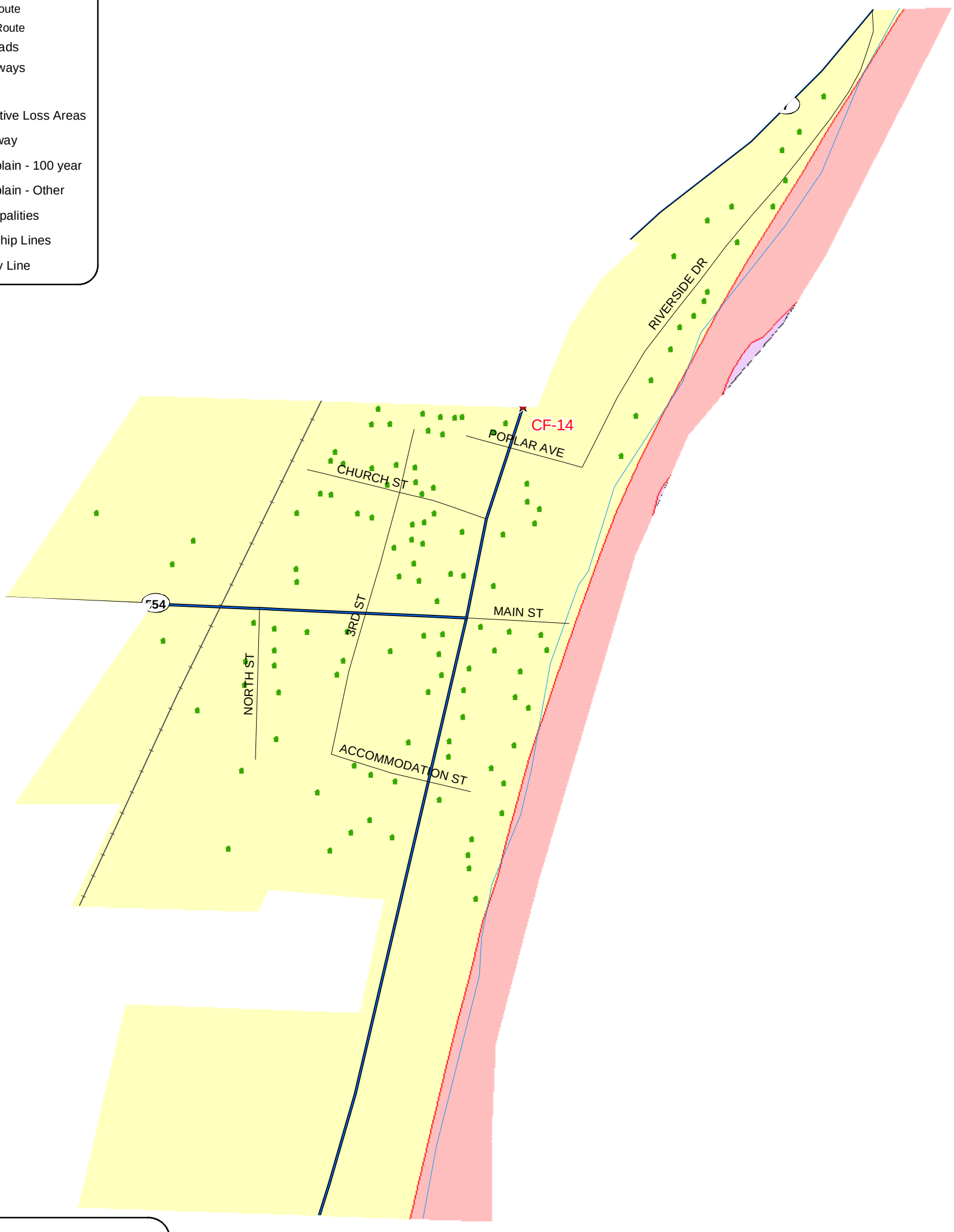
1 inch equals 300 feet

Cheshire Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Cheshire municipality: 121

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

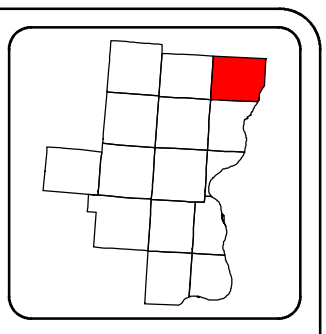
0 200 400 800 1,200 1,600 Feet

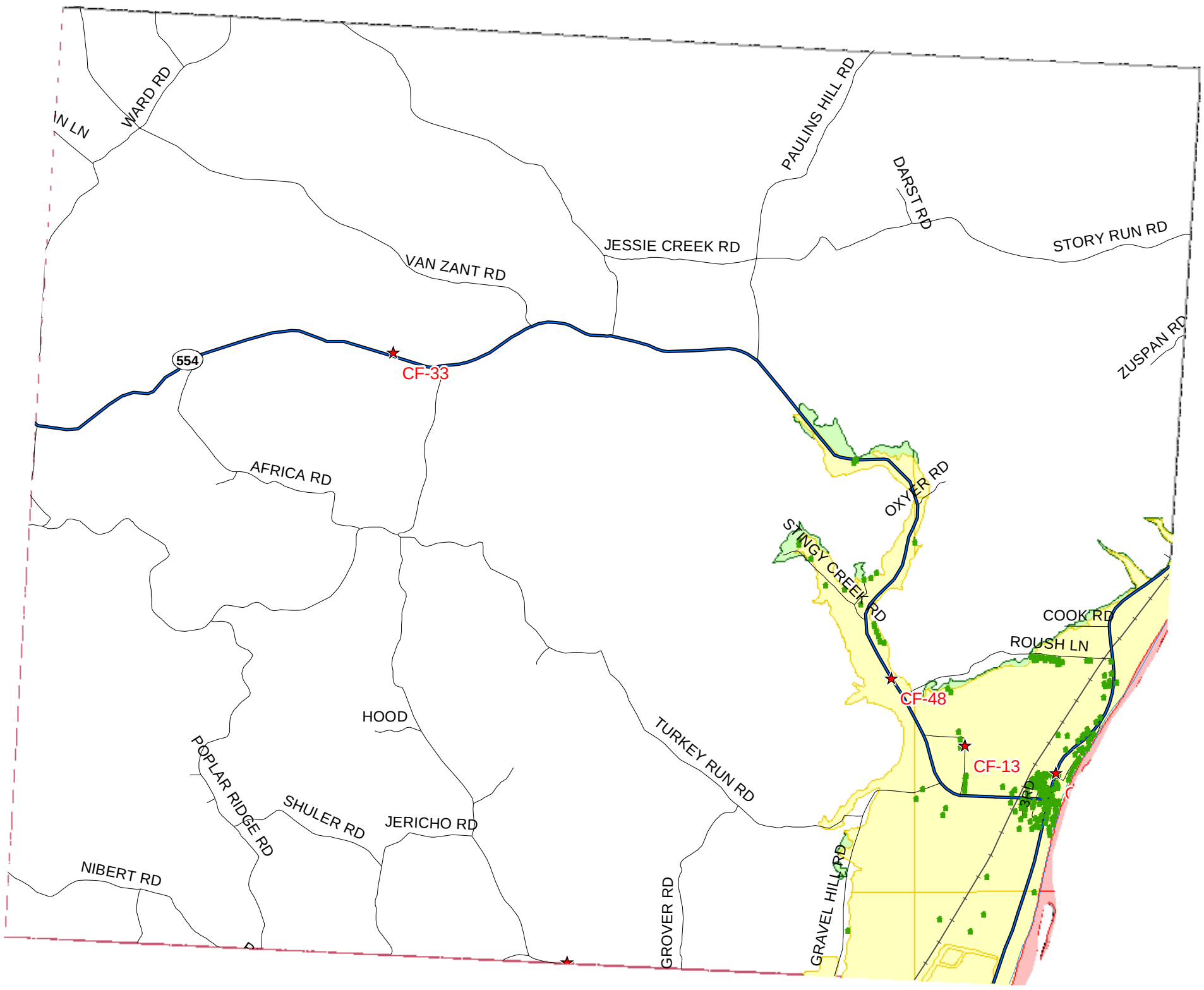
1 inch equals 400 feet

Cheshire Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Cheshire Township: 200

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

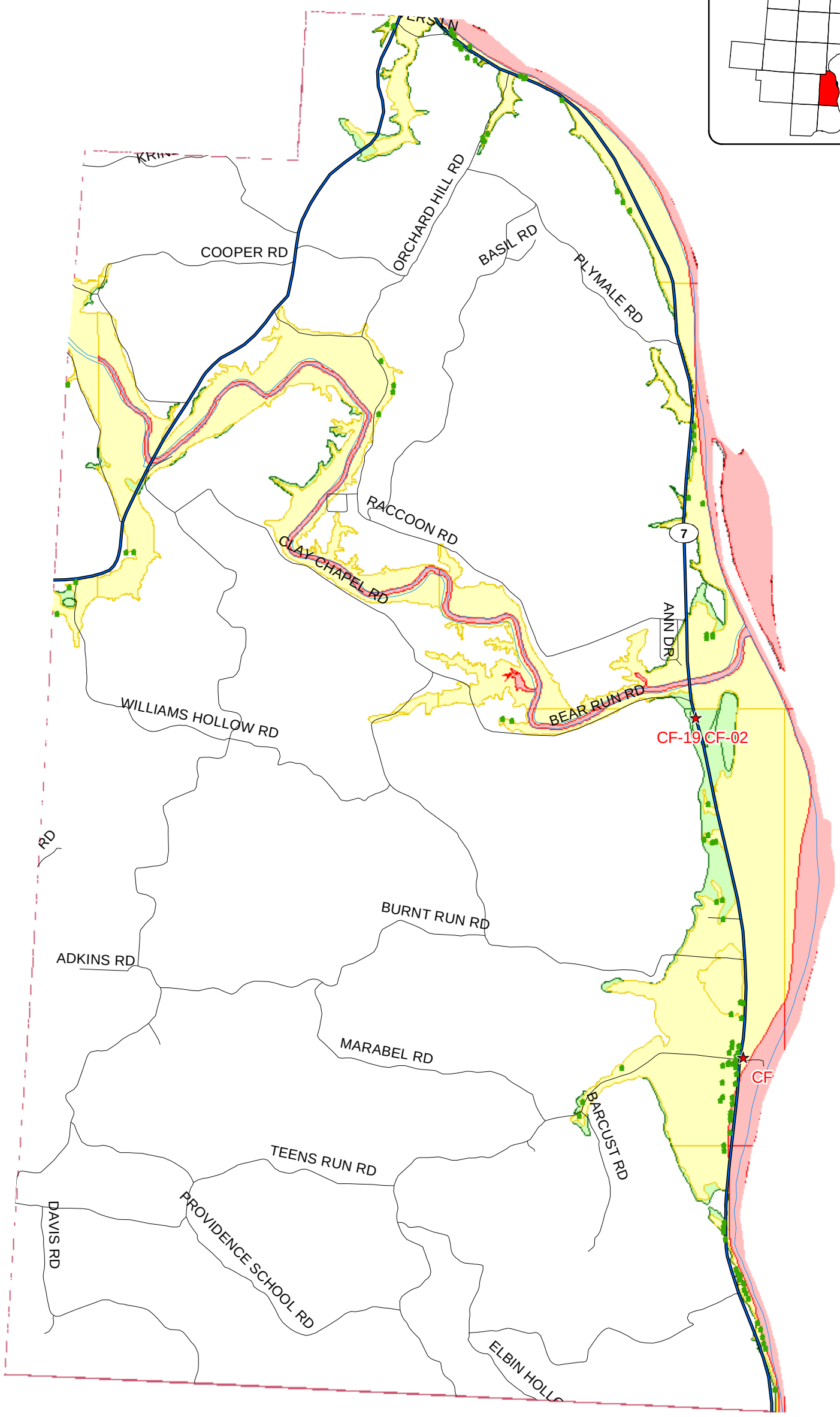
0 2,000 4,000 8,000 12,000 16,000 Feet

1 inch equals 3,500 feet

Clay Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line



Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Clay Township: 101

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

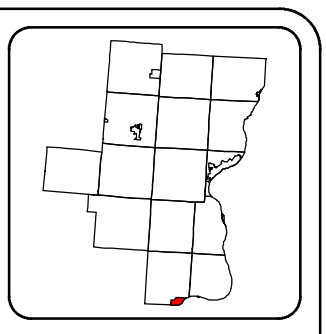
0 1,750 3,500 7,000 10,500 14,000 Feet

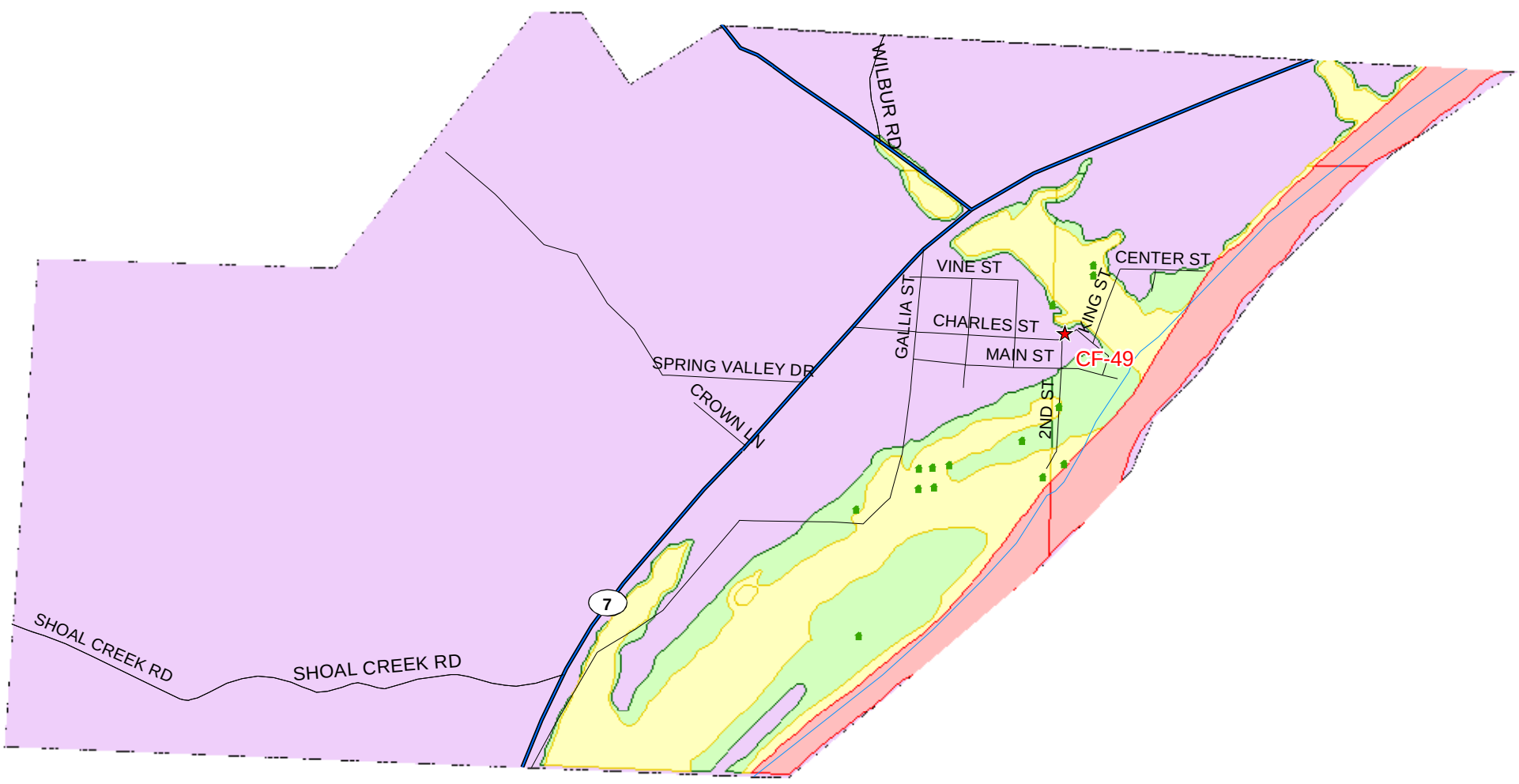
1 inch equals 3,000 feet

Crown City Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Crown City municipality: 14

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
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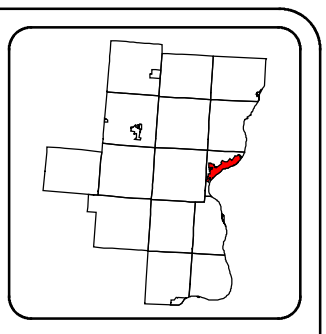
0 500 1,000 2,000 3,000 4,000 Feet

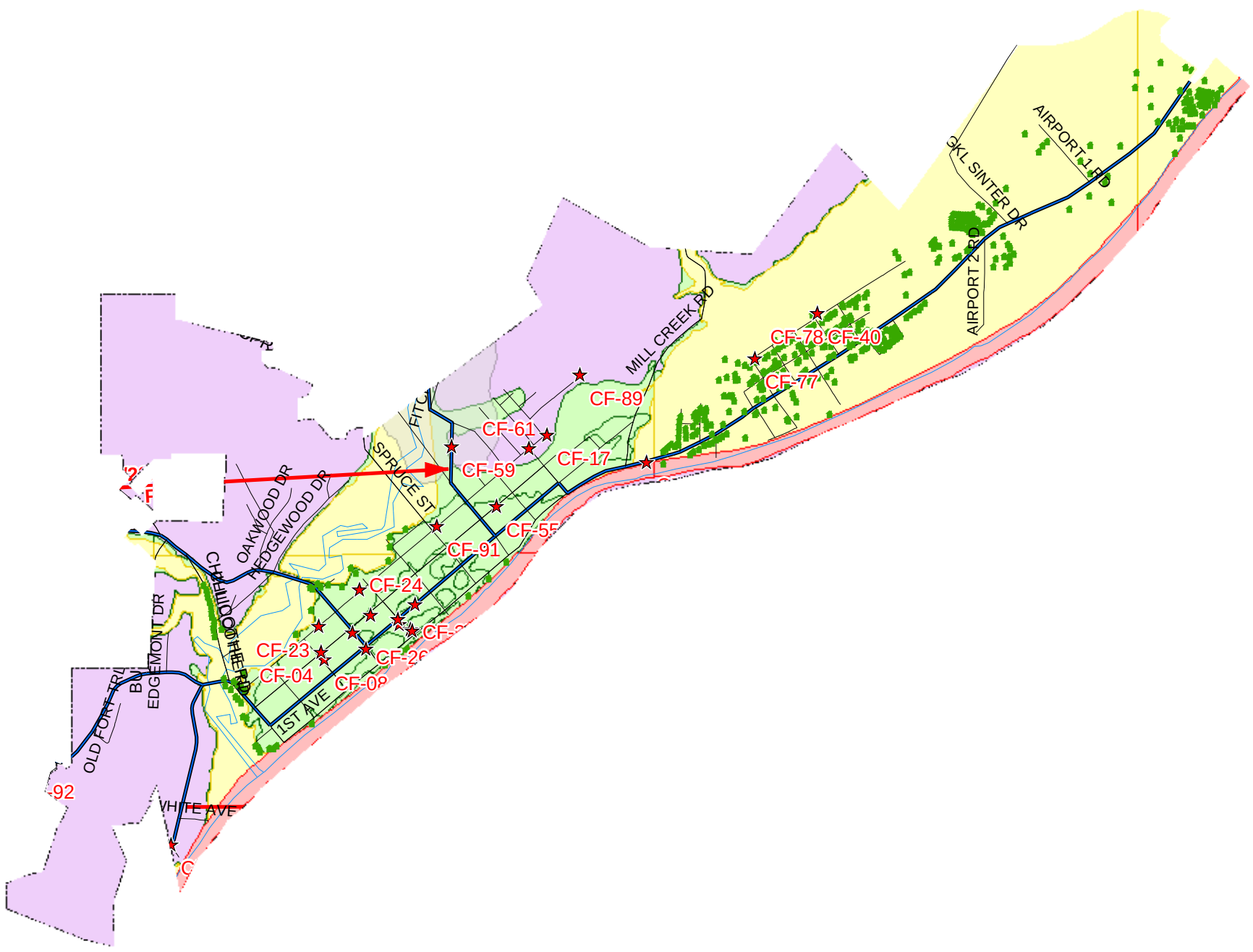
1 inch equals 1,000 feet

Gallipolis Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Gallipolis municipality: 438

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

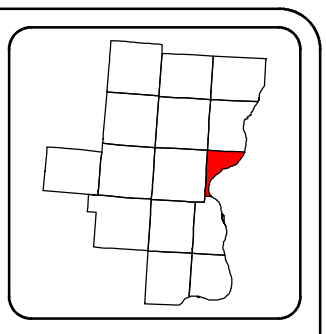
0 1,250 2,500 5,000 7,500 10,000 Feet

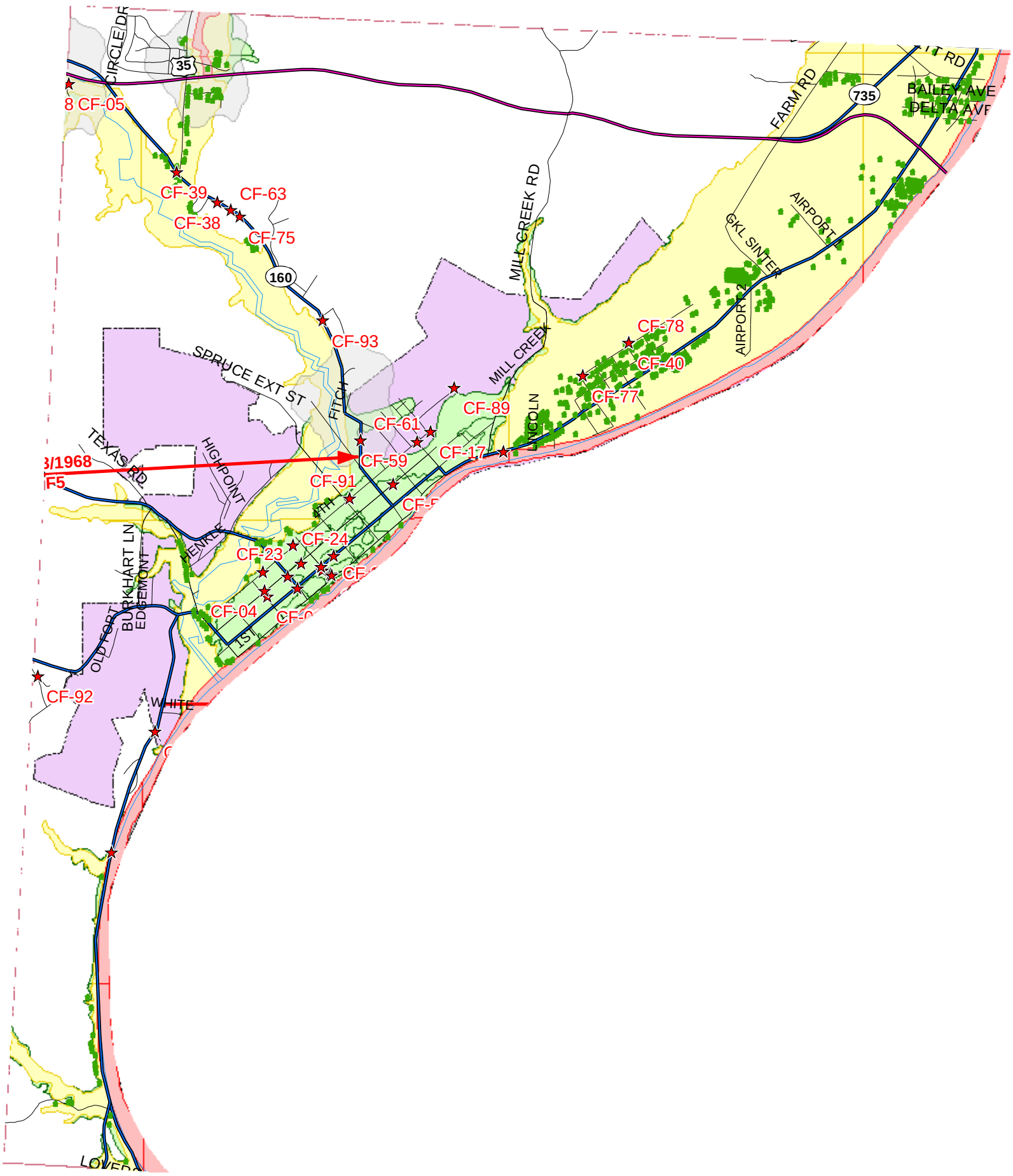
1 inch equals 2,500 feet

Gallipolis Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Gallipolis Township: 621

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

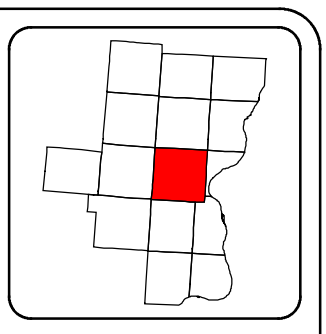
0 1,750 3,500 7,000 10,500 14,000 Feet

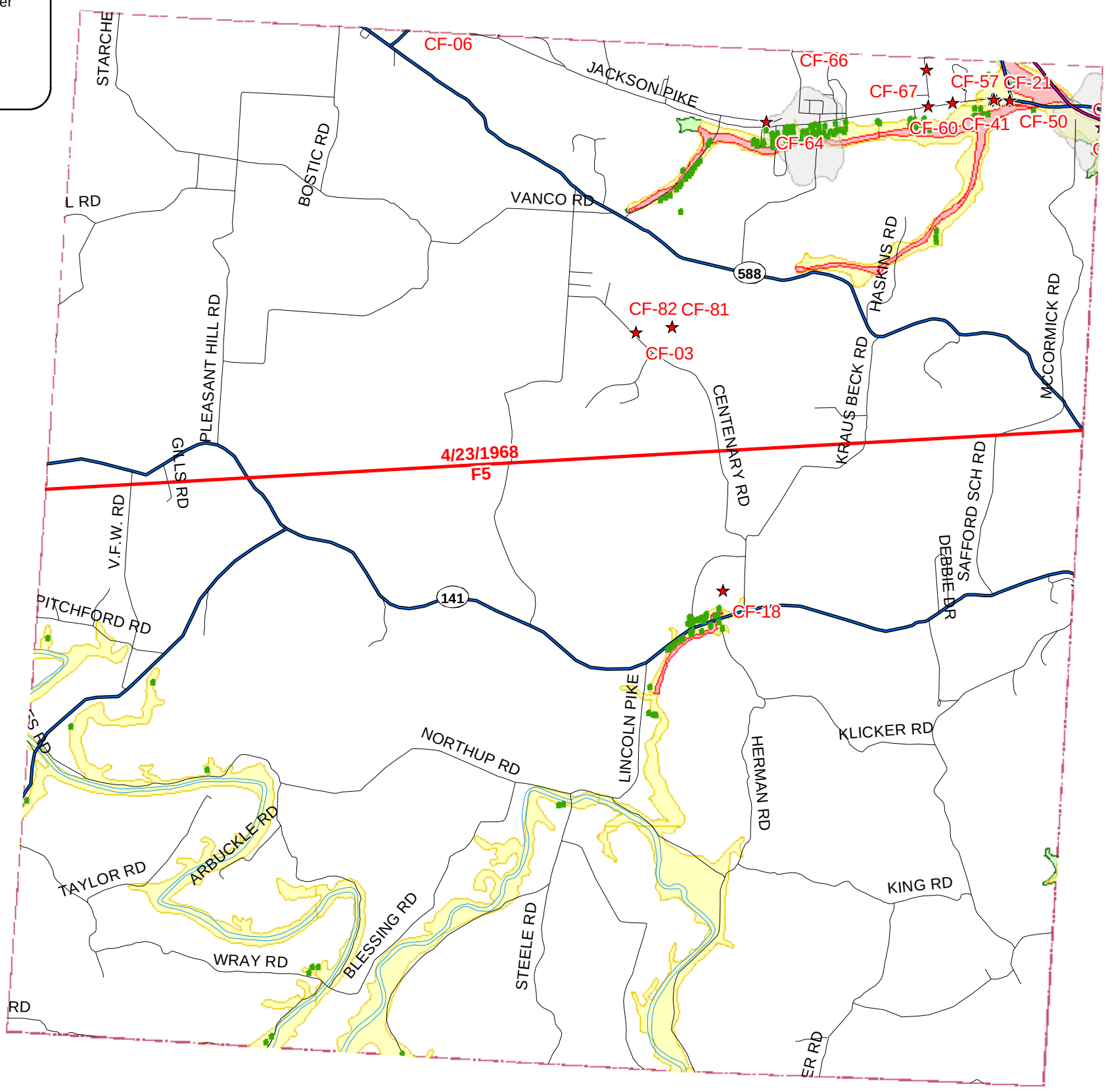
1 inch equals 3,000 feet

Green Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Green Township: 188

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

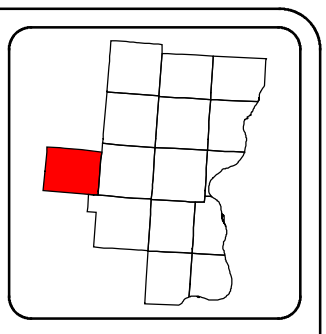
0 2,000 4,000 8,000 12,000 16,000 Feet

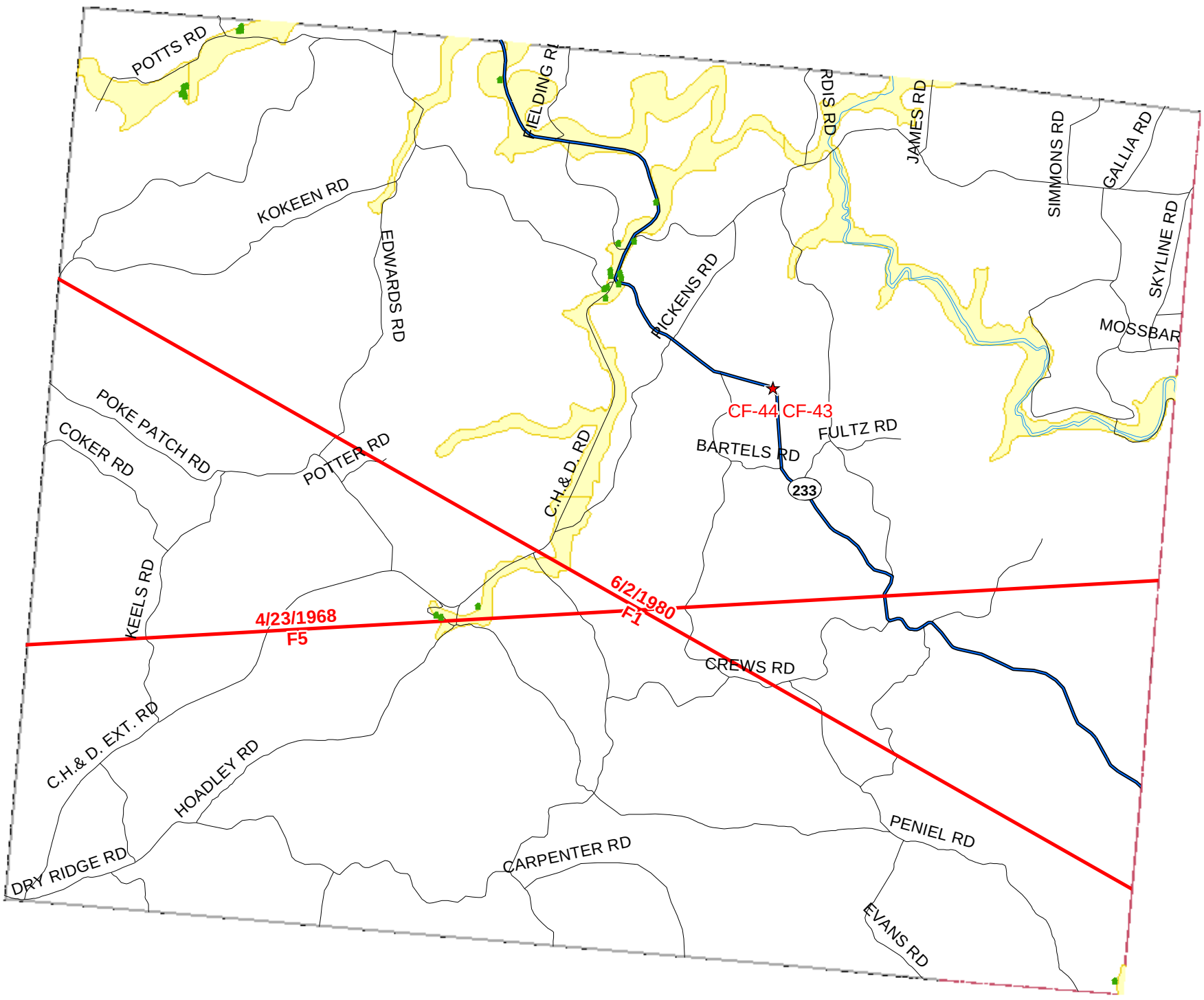
1 inch equals 4,000 feet

Greenfield Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Greenfield Township: 25

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

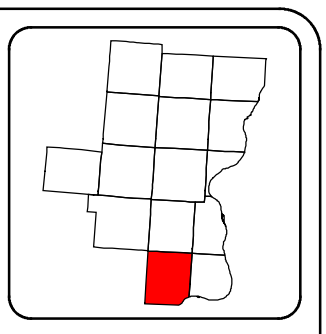
0 2,000 4,000 8,000 12,000 16,000 Feet

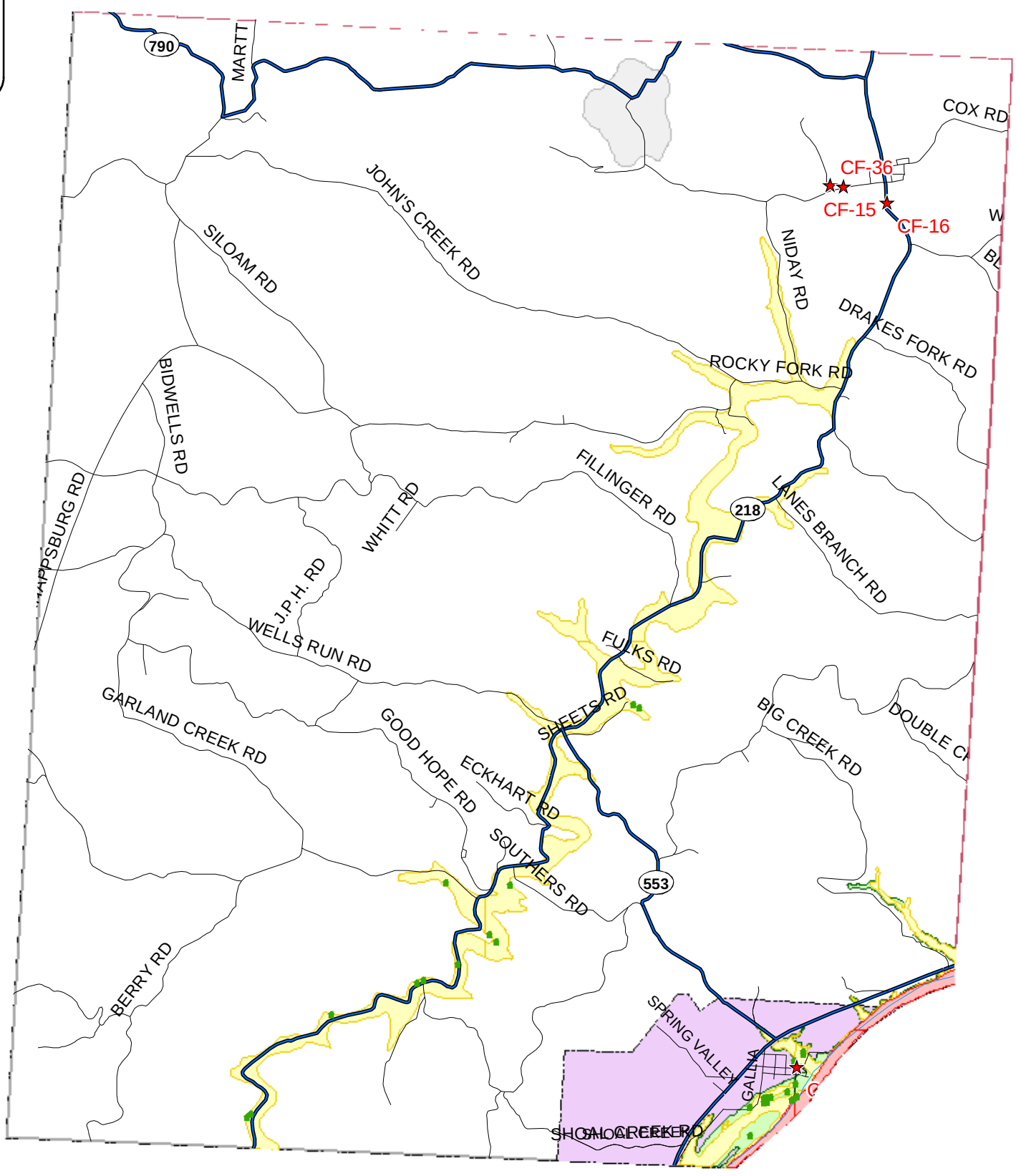
1 inch equals 4,000 feet

Guyan Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Guyan Township: 26

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

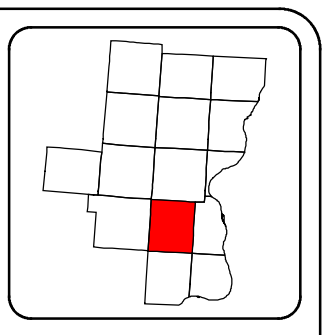
0 2,000 4,000 8,000 12,000 16,000 Feet

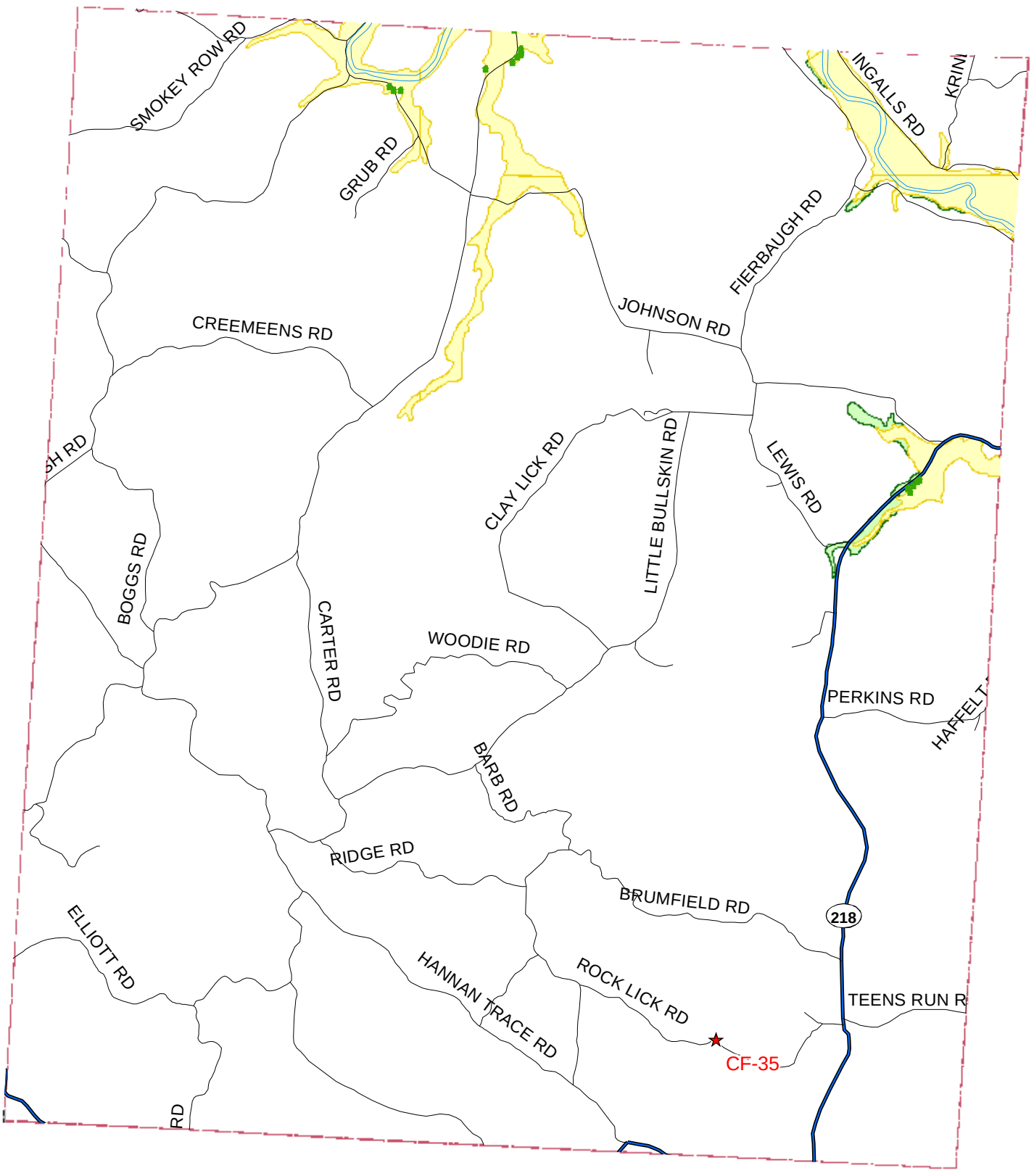
1 inch equals 4,000 feet

Harrison Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Harrison Township: 14

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

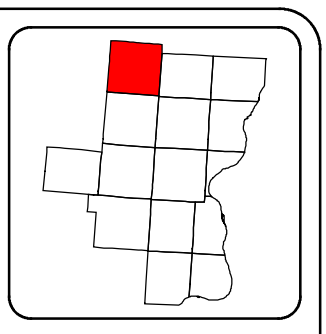
0 2,000 4,000 8,000 12,000 16,000 Feet

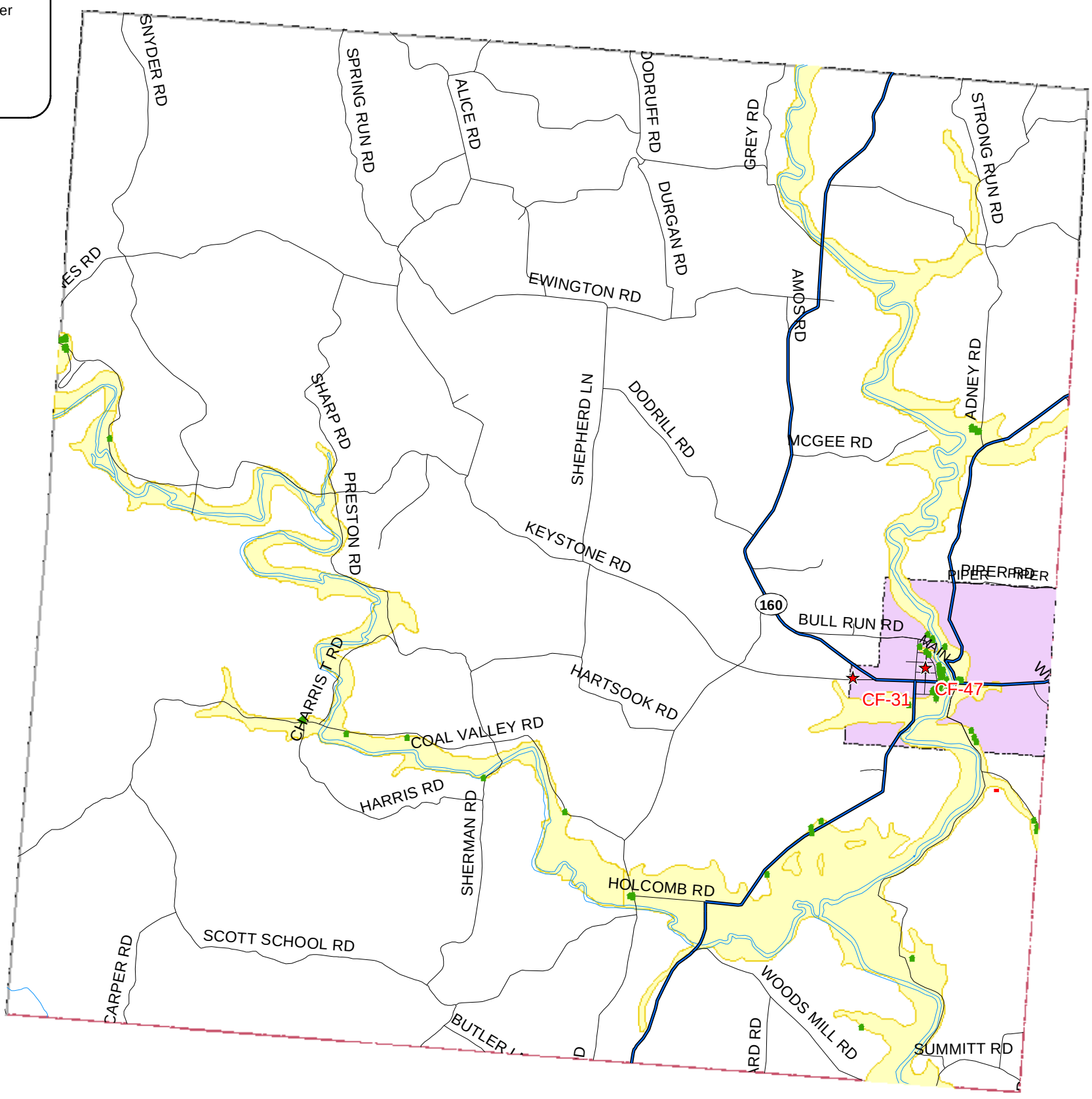
1 inch equals 4,000 feet

Huntington Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Huntington Township: 71

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N W E S

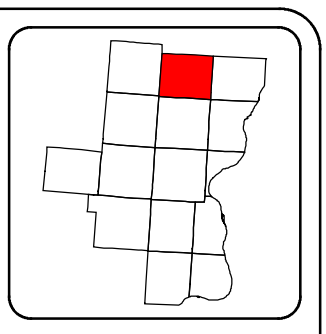
0 2,000 4,000 8,000 12,000 16,000 Feet

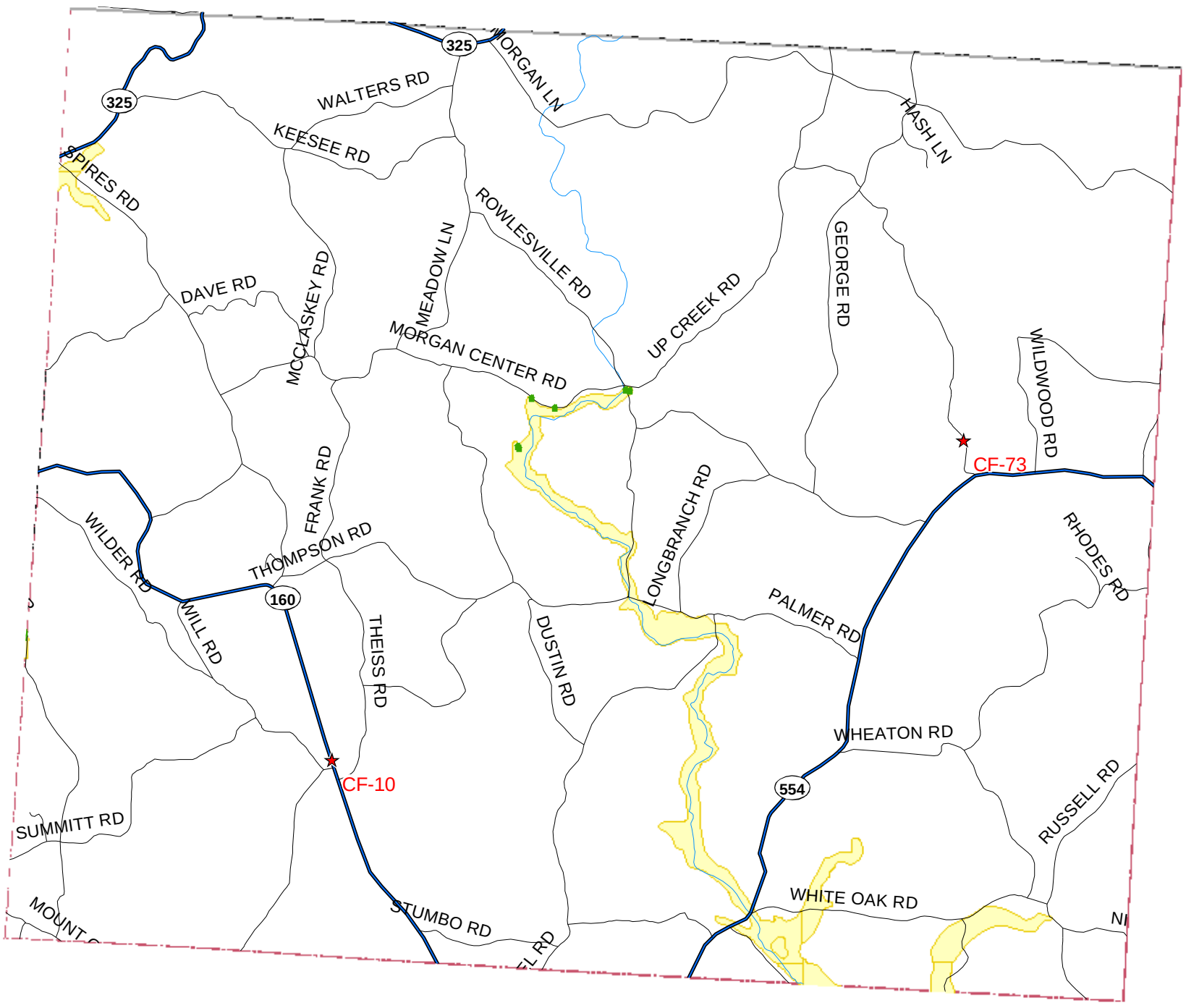
1 inch equals 4,000 feet

Morgan Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Morgan Township: 6

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

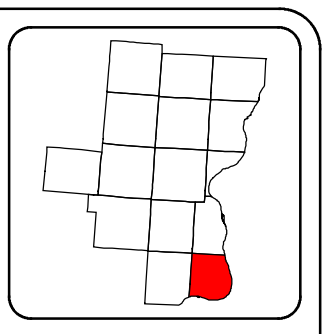
0 2,000 4,000 8,000 12,000 16,000 Feet

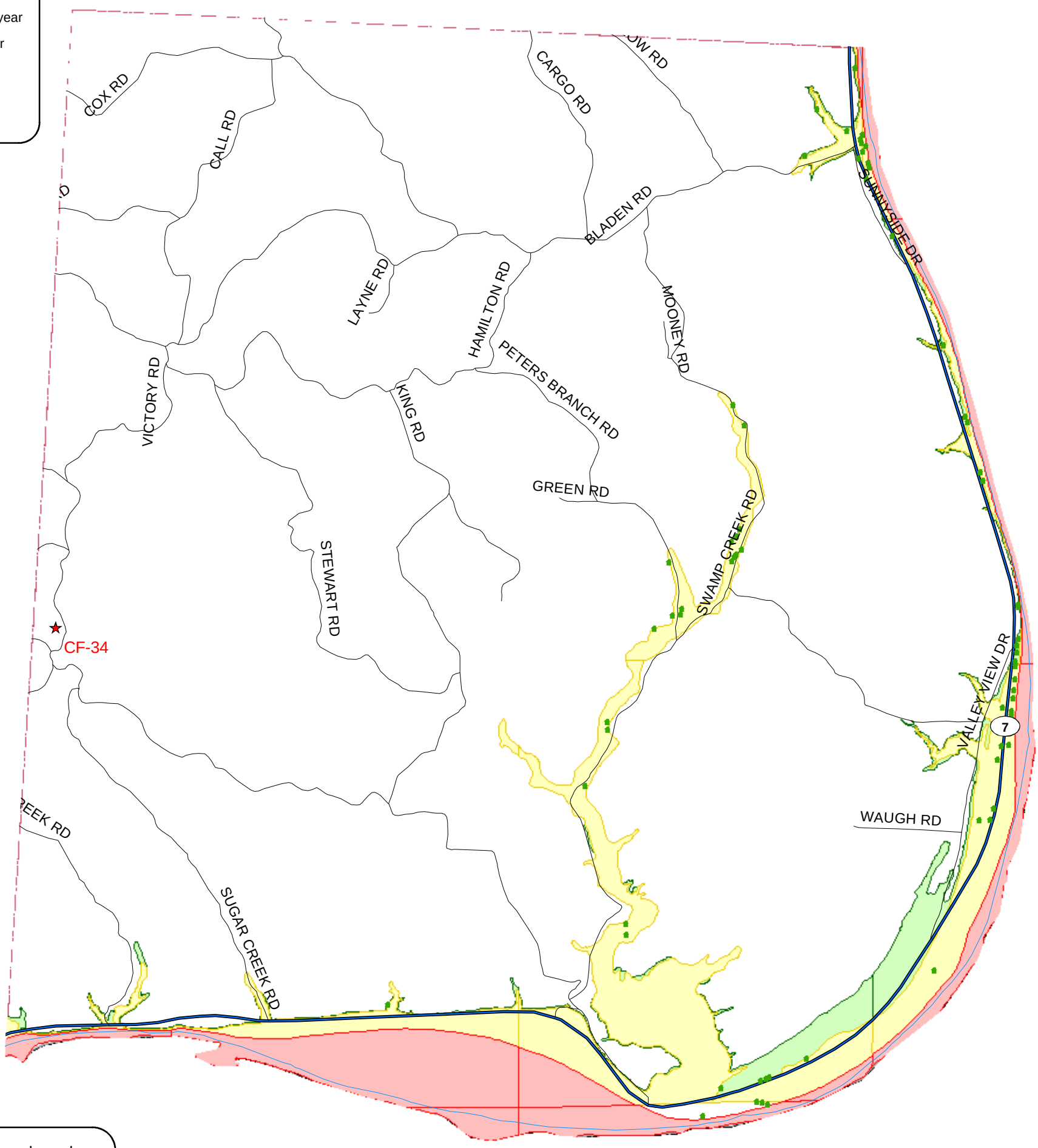
1 inch equals 4,000 feet

Ohio Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Ohio Township: 68

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N W E S

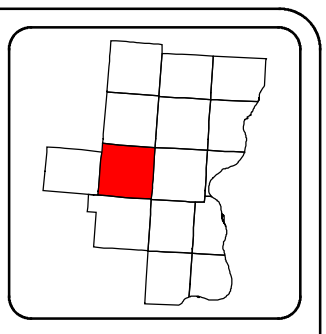
0 1,500 3,000 6,000 9,000 12,000 Feet

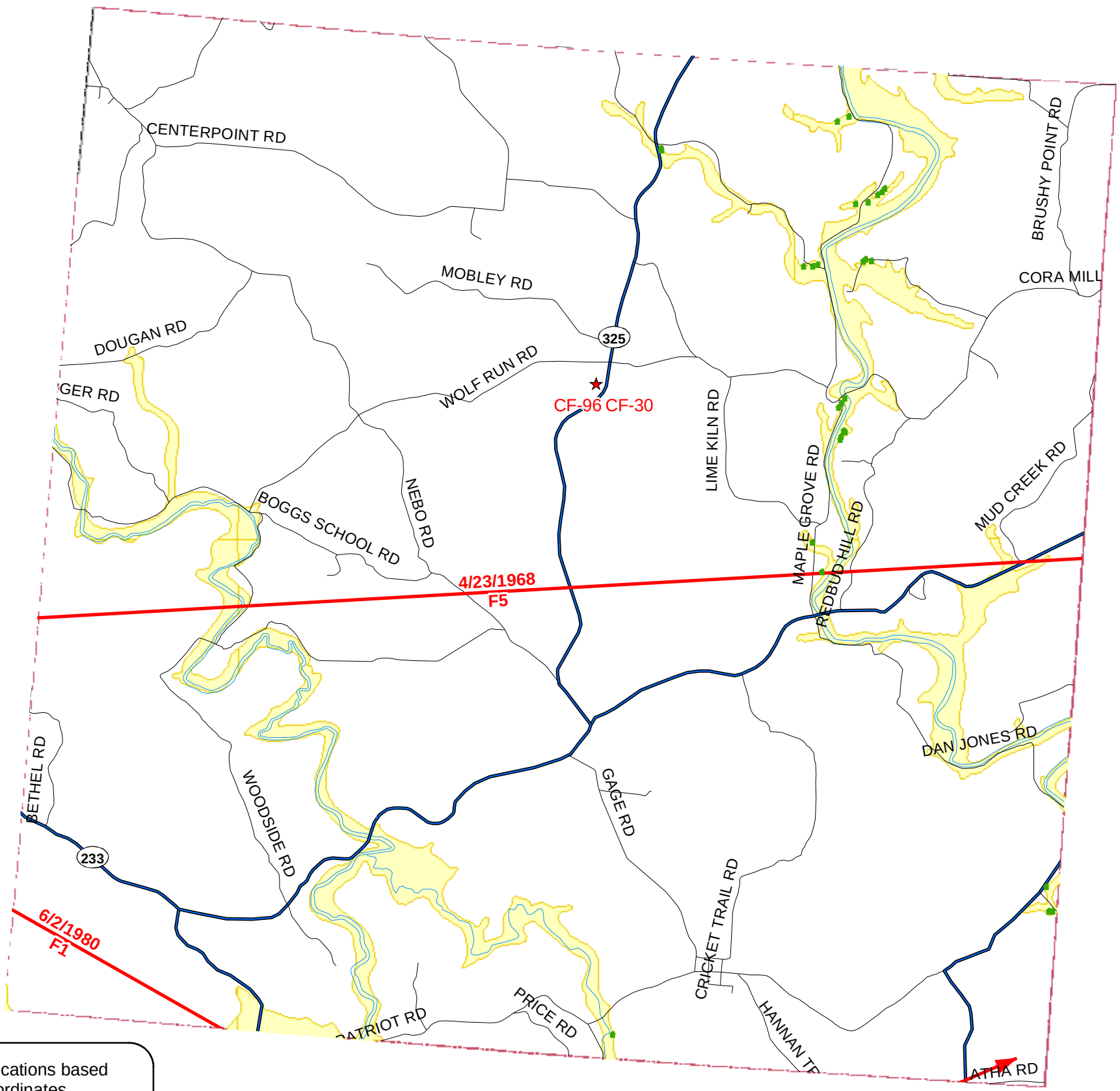
1 inch equals 3,000 feet

Perry Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Perry Township: 28

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N W E S

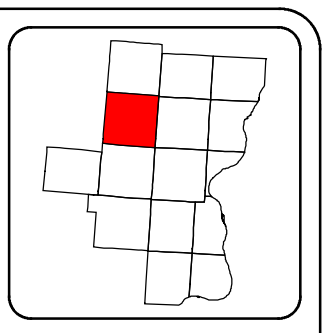
0 2,000 4,000 8,000 12,000 16,000 Feet

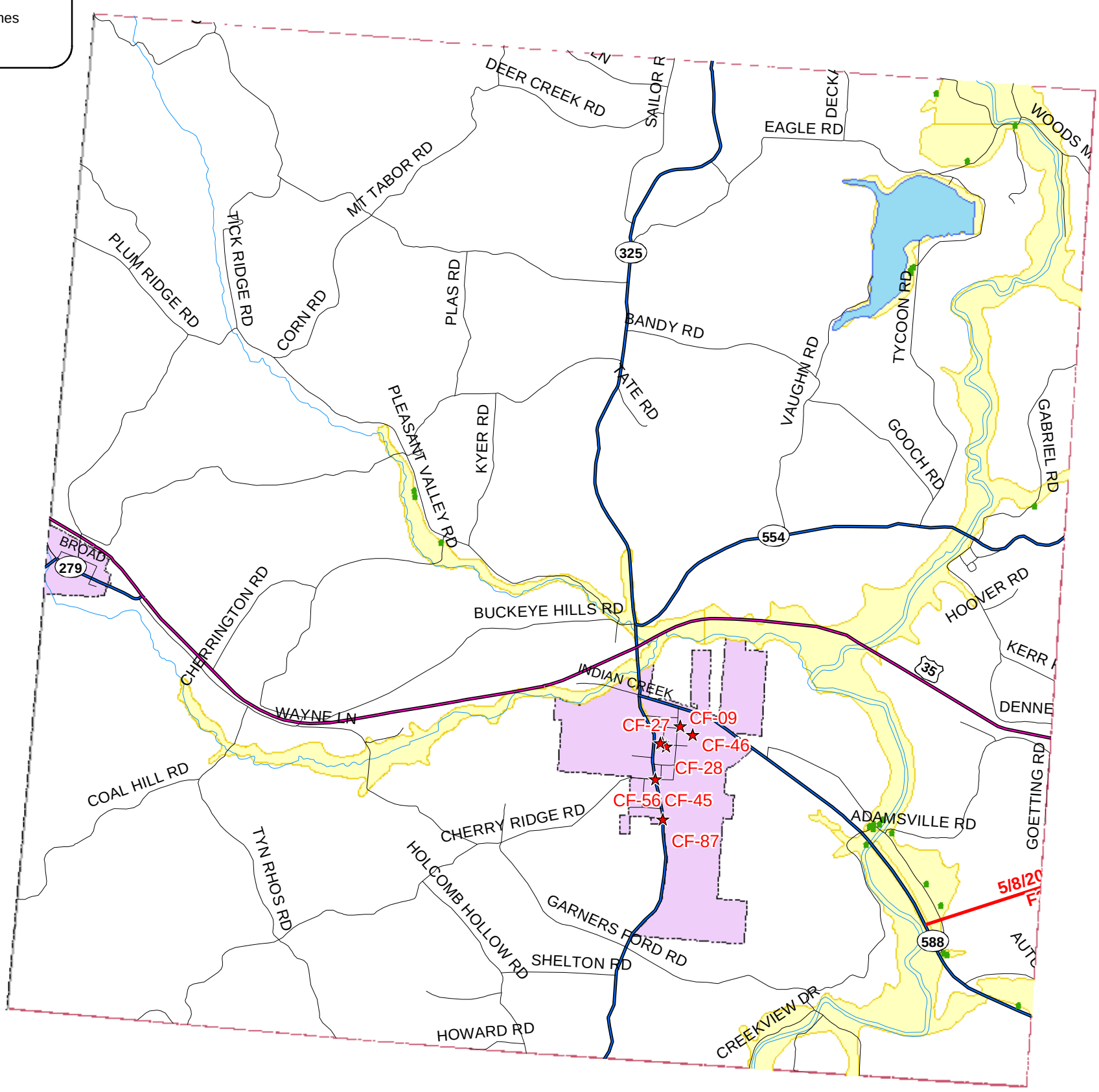
1 inch equals 4,000 feet

Raccoon Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Raccoon Township: 22

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

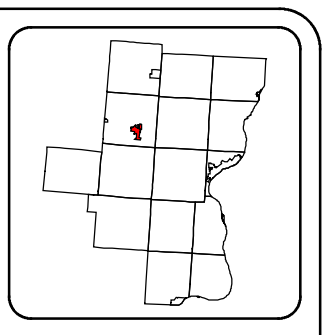
0 2,000 4,000 8,000 12,000 16,000 Feet

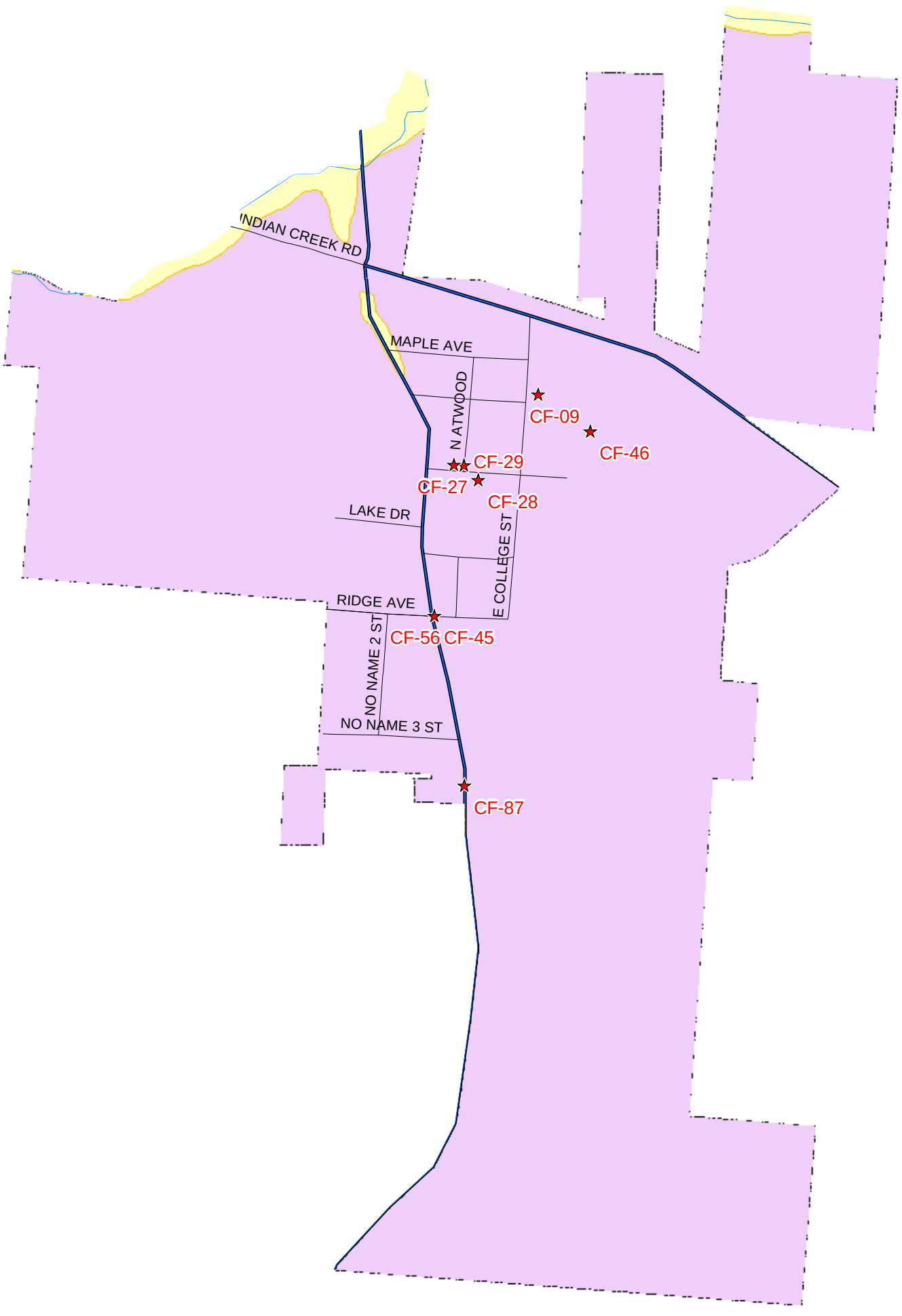
1 inch equals 4,000 feet

Rio Grande Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Rio Grande municipality: 0

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N W E S

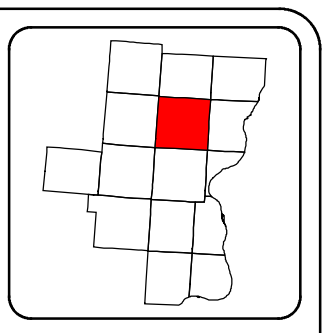
0 500 1,000 2,000 3,000 4,000 Feet

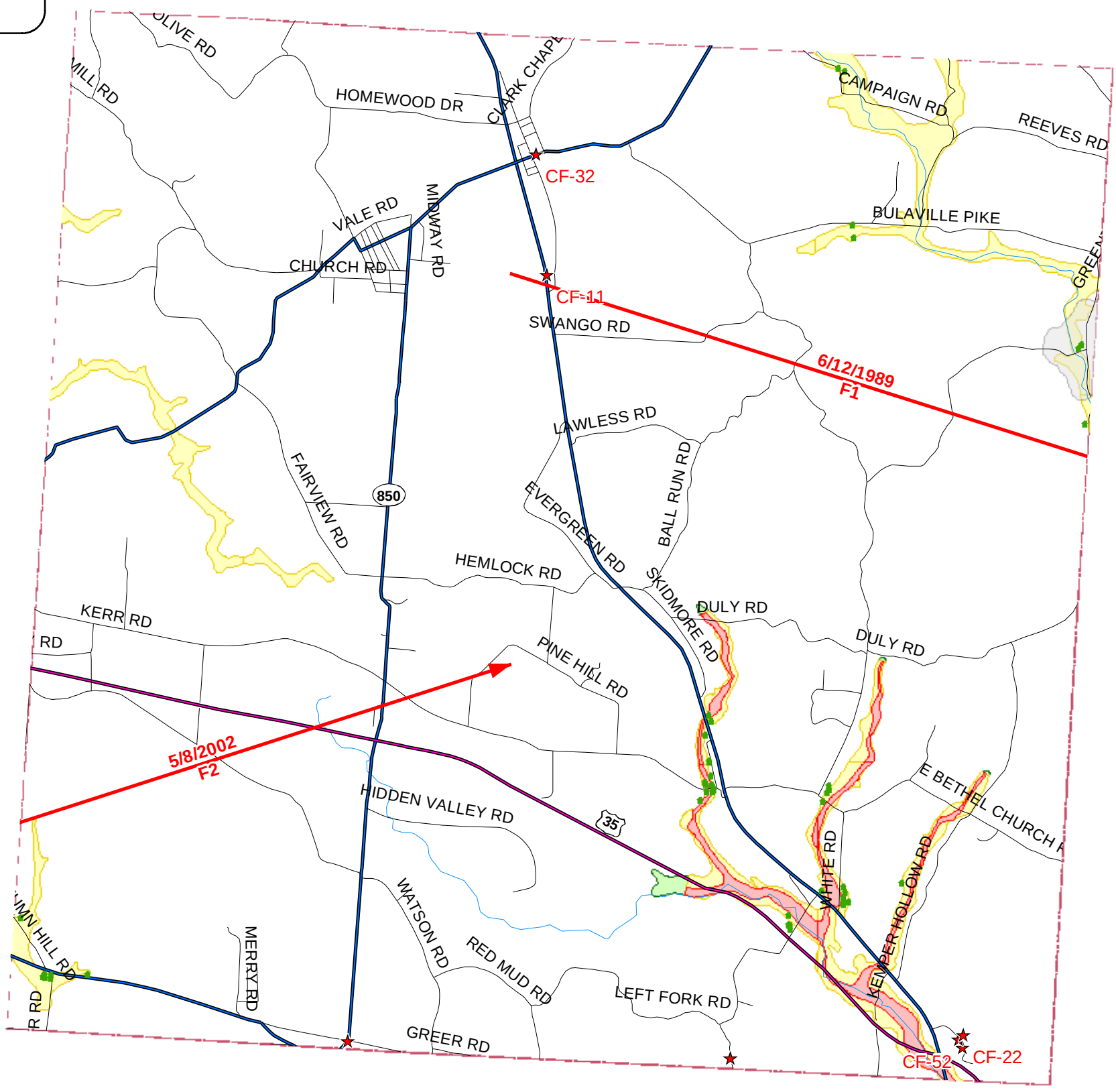
1 inch equals 1,000 feet

Springfield Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Springfield Township: 44

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

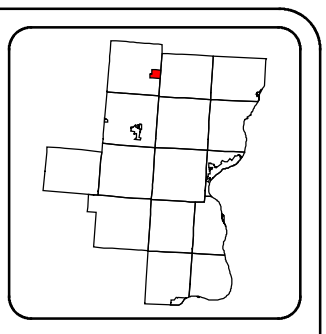
0 2,000 4,000 8,000 12,000 16,000 Feet

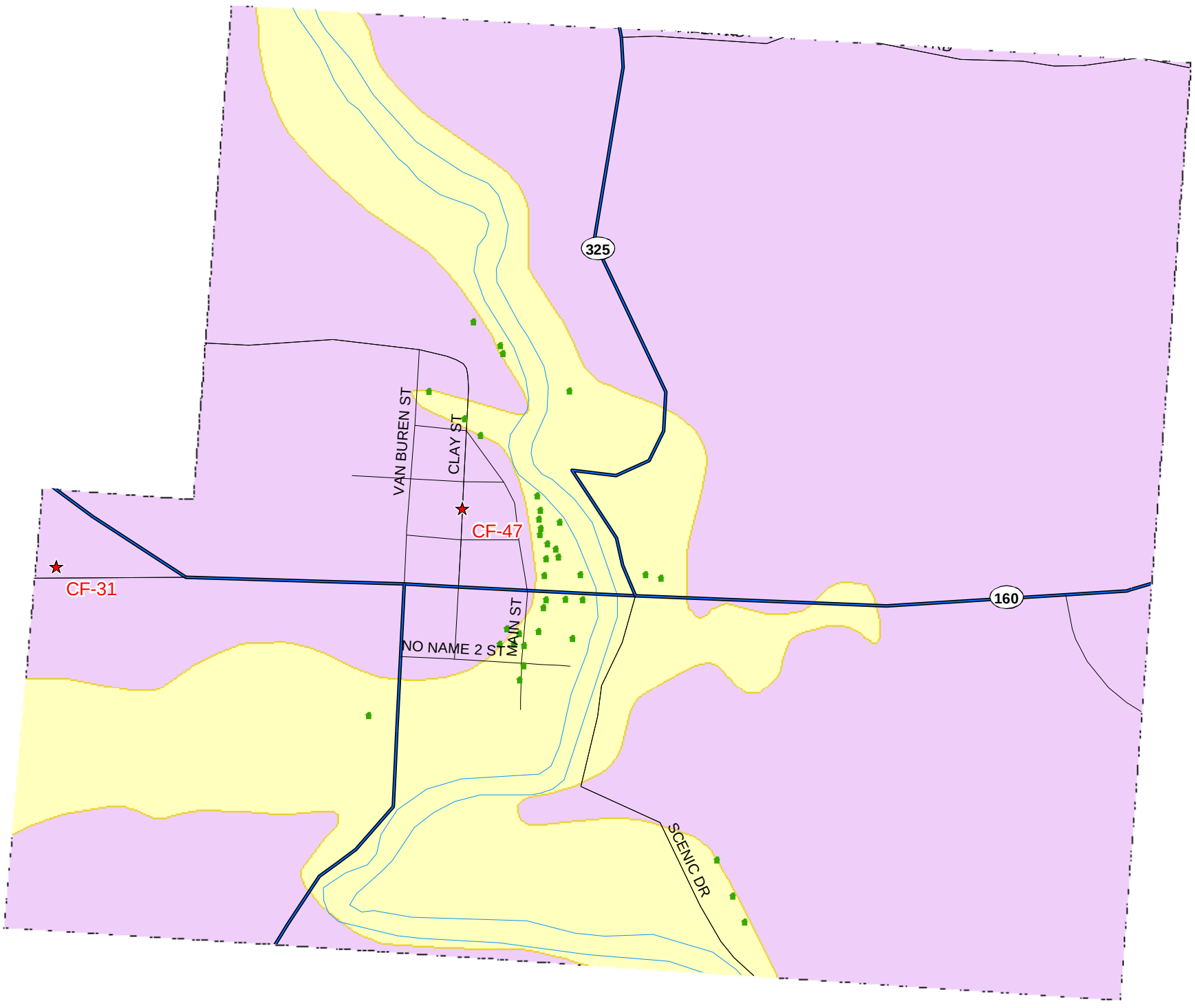
1 inch equals 4,000 feet

Vinton Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Vinton municipality: 38

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N
W E
S

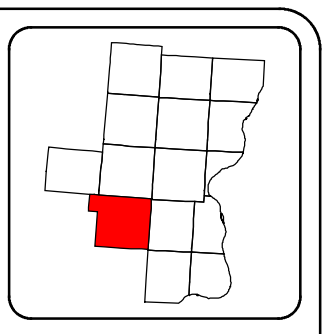
0 375 750 1,500 2,250 3,000 Feet

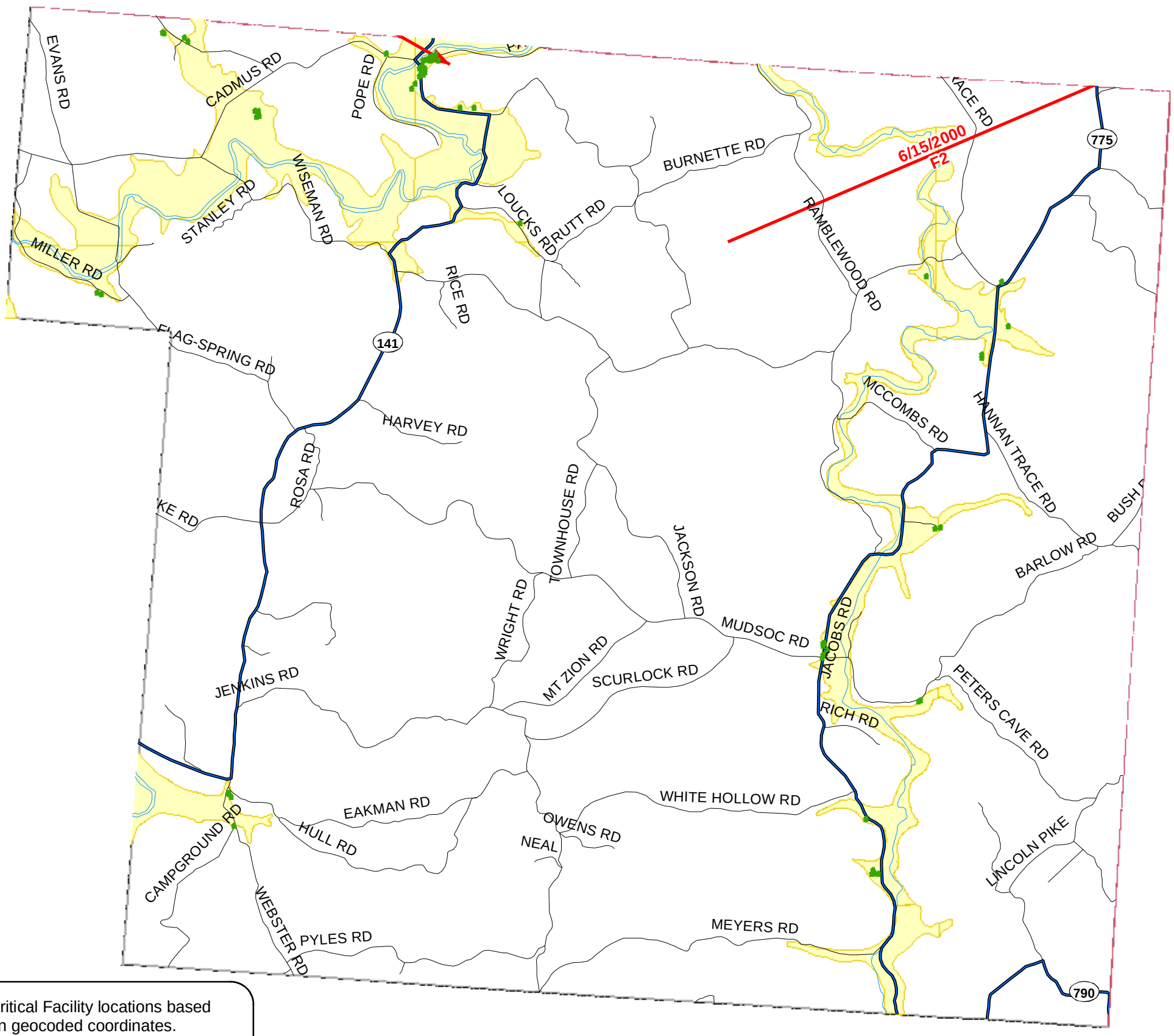
1 inch equals 750 feet

Walnut Township Multi-Hazard Map

Legend

- CriticalFacilities
- At-Risk Structures
- Tornado Paths
- Roads - Municipal
- Roads - County
- Interstate Route
- U.S. Route
- State Route
- Railroads
- Waterways
- Lakes
- Repetitive Loss Areas
- Floodway
- Floodplain - 100 year
- Floodplain - Other
- Municipalities
- Township Lines
- County Line





Critical Facility locations based on geocoded coordinates.
At Risk Structures for entire county: 1704
At Risk Structures for Walnut Township: 58

Map intended for reference only.

Data Sources:
Ohio Department of Transportation (ODOT)
Ohio Department of Natural Resources (ODNR)

N W E S

0 2,000 4,000 8,000 12,000 16,000 Feet

1 inch equals 4,000 feet

Appendix VI
NCDC Historical Events

Flooding History

48 Flood events were reported in Gallia County between 01/01/1994 and 04/30/2011.

Mag - Magnitude, Dth - Deaths, Inj - Injuries, PrD - Property Damage, CrD - Crop Damage

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Countywide	2/11/1994	1115	Flash Flood	N/A	0	0	5K	0
2 Countywide	5/7/1994	1715	Flash Flood	N/A	0	0	500K	0
3 Northern Portion	5/14/1995	330	Flash Flood	N/A	0	0	300K	0
4 GALLIA	5/17/1995	900	Flash Flood	N/A	0	0	0	0
5 Morgan Center	6/30/1995	1710	Flash Flood	N/A	0	0	0	0
6 Gallipolis	7/27/1995	1330	Flash Flood	N/A	0	0	0	0
7 OHZ076 - 085>087	1/20/1996	12:00 PM	Flood	N/A	0	0	1.7M	0
8 Countywide	1/24/1996	1:30 AM	Flash Flood	N/A	0	0	0	0
9 Southern Portion	6/23/1996	12:00 AM	Flash Flood	N/A	0	0	750K	0
10 Southern Portion	7/31/1996	2:30 AM	Flash Flood	N/A	0	0	50K	0
11 Countywide	3/1/1997	10:00 AM	Flash Flood	N/A	0	0	500K	0
12 Countywide	3/2/1997	2:00 AM	Flash Flood	N/A	0	0	750K	0
13 OHZ086	3/2/1997	8:00 AM	Flood	N/A	1	0	500K	0
14 Countywide	3/3/1997	4:00 AM	Flash Flood	N/A	0	0	10K	0
15 Countywide	3/4/1997	1:00 AM	Flash Flood	N/A	0	0	5K	0
16 Countywide	1/7/1998	8:00 PM	Flash Flood	N/A	0	0	10K	0
17 OHZ075 - 085>086	1/9/1998	12:00 AM	Flood	N/A	0	0	120K	0

DRAFT

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
18 Mercerville	6/14/1998	11:30 PM	Flash Flood	N/A	0	0	5K	0
19 Patriot	6/15/1998	5:30 PM	Flash Flood	N/A	0	0	10K	0
20 Patriot	6/16/1998	1:30 PM	Flash Flood	N/A	0	0	5K	0
21 OHZ067 - 076 - 085>086	6/28/1998	7:00 AM	Flood	N/A	0	0	50K	0
22 Countywide	2/18/2000	4:00 PM	Flash Flood	N/A	0	0	600K	0
23 OHZ075 - 085>087	2/19/2000	11:00 AM	Flood	N/A	1	0	50K	0
24 Mercerville	7/10/2000	5:45 PM	Flash Flood	N/A	0	0	5K	0
25 Gallipolis	8/9/2000	10:00 PM	Flash Flood	N/A	0	0	5K	0
26 South Portion	5/17/2001	10:30 PM	Flash Flood	N/A	0	0	100K	0
27 South Portion	5/18/2001	5:30 PM	Flash Flood	N/A	0	0	300K	0
28 Countywide	5/21/2001	6:00 PM	Flash Flood	N/A	0	0	20K	0
29 OHZ085>087	3/20/2002	2:00 AM	Flood	N/A	0	0	750K	0
30 OHZ083>084 - 086>087	4/21/2002	7:00 PM	Flood	N/A	1	0	40K	0
31 OHZ083>087	4/28/2002	3:30 AM	Flood	N/A	0	0	45K	0
32 OHZ083 - 086>087	5/10/2003	11:00 AM	Flood	N/A	0	0	450K	0
33 North Portion	6/19/2003	3:30 PM	Flash Flood	N/A	0	0	200K	0
34 Bidwell	8/11/2003	4:10 PM	Flash Flood	N/A	0	0	3K	0
35 OHZ086	9/2/2003	2:00 AM	Flood	N/A	0	0	20K	0
36 OHZ085>087	3/5/2004	9:00 PM	Flood	N/A	0	0	0	0
37 North Portion	5/27/2004	9:00 PM	Flash Flood	N/A	0	0	25K	0
38 OHZ066>067 - 075>076 - 083>087	9/8/2004	12:00 PM	Flood	N/A	0	0	3.5M	0
39 OHZ066>067 - 075>076 - 084>087	9/17/2004	8:15 AM	Flood	N/A	0	0	25.5M	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
40 OHZ066>067 - 075>076 - 084>087	1/5/2005	9:30 AM	Flood	N/A	1	0	9.0M	0
41 Cheshire	3/17/2007	18:00 PM	Flood	N/A	0	0	5K	0K
42 Hanersville	3/6/2008	12:00 PM	Flood	N/A	0	0	1K	0K
43 Gallipolis	4/4/2008	7:00 AM	Flood	N/A	0	0	0K	0K
44 Vinton	6/4/2008	14:00 PM	Flood	N/A	0	0	5K	0K
45 Ewington	8/2/2008	4:45 AM	Flash Flood	N/A	0	0	3K	0K
46 GALLIA	5/2/2010	15:00 PM	Flood	N/A	0	0	50K	0K
47 GALLIA	3/10/2011	10:00 AM	Flood	N/A	0	0	5K	0K
48 Peniel	4/22/2011	21:30 PM	Flood	N/A	0	0	25K	0K
				TOTALS:	4	0	45.97M	0

Winter Storms History- Snow & Ice

20 Events were reported in Gallia County between 01/01/1994 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Southeast Ohio	2/11/1994	100	Ice Storm	N/A	0	26	5.0M	500K
2 Southeast Ohio	3/2/1994	1700	Heavy Snow	N/A	0	0	5K	0
3 OHZ070>073 - 075>080 - 082>086	1/28/1995	600	Heavy Snow/ ice	N/A	0	0	600K	0
4 OHZ071>074 - 078>082 - 086	3/1/1995	1800	Heavy Snow	N/A	0	0	50K	0
5 OHZ023 - 033 - 039>041 - 048>050 - 057>059 - 066>069 - 074>076 - 083>088	3/8/1995	600	Heavy Snow	N/A	0	0	50K	0
6 OHZ066>067 - 075>076 - 083>087	1/6/1996	6:00 PM	Heavy Snow	N/A	0	0	5K	0
7 OHZ083>087	1/11/1996	10:00	Heavy	N/A	0	0	0	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
		PM	Snow					
8 OHZ086>087	2/2/1996	12:00 PM	Heavy Snow	N/A	0	0	0	0
9 OHZ075 - 083>087	2/3/1998	10:00 PM	Winter Storm	N/A	0	0	250K	0
10 OHZ066>067 - 075>076 - 083>087	2/12/1999	10:00 AM	Snow	N/A	0	0	0	0
11 OHZ066>067 - 075>076 - 083>087	1/20/2000	12:00 AM	Snow	N/A	0	0	0	0
12 OHZ083 - 086>087	1/29/2000	6:00 PM	Winter Storm	N/A	0	0	0	0
13 OHZ066>067 - 075>076 - 083>087	1/19/2001	10:00 AM	Snow	N/A	0	0	0	0
14 OHZ066>067 - 075>076 - 084>087	1/6/2002	7:00 AM	Snow	N/A	0	0	0	0
15 OHZ075>076 - 083>086	1/19/2002	5:00 AM	Snow	N/A	0	0	0	0
16 OHZ066>067 - 075>076 - 083>087	12/4/2002	7:00 PM	Snow	N/A	0	0	0	0
17 OHZ083 - 085>087	2/16/2003	2:00 AM	Ice Storm	N/A	0	0	6.3M	0
18 OHZ066>067 - 075>076 - 083>087	1/25/2004	12:00 PM	Winter Storm	N/A	0	0	0	0
19 OHZ083 - 085 - 086	2/20/2008	6:00 AM	Winter Weather	N/A	0	0	0K	0K
20 OHZ086	1/20/2011	14:00 PM	Winter Weather	N/A	0	0	0K	0K
				TOTALS:	0	26	12.210M	500K

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Severe Storms History- Thunderstorm, High Winds, & Hail

63 Thunderstorm Wind events were reported in Gallia County between 1/1/1975 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 GALLIA	5/30/1976	1800	Tstm Wind	0 kts.	0	0	0	0
2 GALLIA	5/14/1981	1700	Tstm Wind	0 kts.	0	0	0	0
3 GALLIA	6/21/1981	1445	Tstm Wind	56 kts.	0	0	0	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
4 GALLIA	3/13/1982	500	Tstm Wind	0 kts.	0	0	0	0
5 GALLIA	7/21/1983	2020	Tstm Wind	0 kts.	0	0	0	0
6 GALLIA	7/23/1983	1550	Tstm Wind	0 kts.	0	0	0	0
7 GALLIA	5/9/1988	1717	Tstm Wind	0 kts.	0	0	0	0
8 GALLIA	8/5/1989	1740	Tstm Wind	0 kts.	0	0	0	0
9 GALLIA	8/5/1989	1815	Tstm Wind	0 kts.	0	0	0	0
10 GALLIA	6/8/1990	2240	Tstm Wind	0 kts.	0	0	0	0
11 GALLIA	7/12/1991	1335	Tstm Wind	0 kts.	0	0	0	0
12 GALLIA	7/23/1991	1600	Tstm Wind	0 kts.	0	0	0	0
13 GALLIA	7/11/1992	1535	Tstm Wind	0 kts.	0	0	0	0
14 Vinton	6/19/1994	1625	Tstm Wind	0 kts.	0	0	5K	0
15 State Route 7	8/4/1994	1830	Tstm Wind	0 kts.	0	0	5K	0
16 Gallipolis	5/10/1995	1825	Tstm Wind	0 kts.	0	0	2K	0
17 West Jefferson	7/4/1995	1720	Tstm Wind	0 kts.	0	0	15K	0
18 Gallipolis	7/27/1995	1330	Tstm Wind	0 kts.	0	0	30K	0
19 Addison	4/23/1996	12:35 PM	Tstm Wind	0 kts.	0	0	0	0
20 Countywide	5/4/1996	5:00 PM	Tstm Wind	0 kts.	0	0	25K	0
21 Gallipolis	6/9/1996	4:45 PM	Tstm Wind	0 kts.	0	0	5K	0
22 Gallipolis	11/7/1996	7:15 PM	Tstm Wind	0 kts.	0	0	2K	0
23 Gallipolis	7/2/1997	8:16 PM	Tstm Wind	0 kts.	0	0	15K	0
24 Vinton	7/28/1997	3:40 PM	Tstm Wind	0 kts.	0	0	2K	0
25 Gallipolis	8/17/1997	1:40 PM	Tstm Wind	0 kts.	0	0	15K	0
26 Rio Grande	2/17/1998	1:55 PM	Tstm Wind	0 kts.	0	0	3K	0
27 Morgan Center	2/17/1998	2:00 PM	Tstm Wind	0 kts.	0	0	2K	0
28 Rio Grande	6/2/1998	1:35 PM	Tstm Wind	0 kts.	0	0	30K	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
29 Rio Grande	6/16/1998	1:30 PM	Tstm Wind	0 kts.	0	0	5K	0
30 Centenary	8/24/1999	7:00 PM	Tstm Wind	0 kts.	0	0	3K	0
31 Vinton	10/13/1999	5:25 PM	Tstm Wind	0 kts.	0	0	2K	0
32 Vinton	6/14/2000	6:56 PM	Tstm Wind	0 kts.	0	0	5K	0
33 Gallipolis	7/10/2000	4:25 PM	Tstm Wind	0 kts.	0	0	1K	0
34 Gallipolis	7/14/2000	5:40 PM	Tstm Wind	0 kts.	0	0	20K	0
35 Gallipolis	8/9/2000	6:45 PM	Tstm Wind	0 kts.	0	0	10K	0
36 Vinton	8/9/2000	11:37 AM	Tstm Wind	0 kts.	0	0	25K	0
37 Rio Grande	9/20/2000	10:00 PM	Tstm Wind	0 kts.	0	0	3K	0
38 Cheshire	6/6/2001	6:45 PM	Tstm Wind	0 kts.	0	0	2K	0
39 Gallia	6/4/2002	7:00 PM	Tstm Wind	0 kts.	0	0	1K	0
40 Bidwell	8/5/2002	5:00 PM	Tstm Wind	0 kts.	0	0	1K	0
41 Gallipolis	11/10/2002	9:00 PM	Tstm Wind	0 kts.	0	0	2K	0
42 Countywide	6/1/2004	3:55 PM	Tstm Wind	52 kts.	0	0	0	0
43 Rio Grande	7/25/2005	4:45 PM	Tstm Wind	50 kts.	0	0	2K	0
44 Rio Grande	7/4/2006	3:20 PM	Tstm Wind	50 kts.	0	0	0	0
45 Rio Grande	7/4/2006	3:58 PM	Tstm Wind	50 kts.	0	0	0	0
46 Rio Grande	6/13/2007	20:10 PM	Tstm Wind	50 kts.	0	0	0K	0K
47 Gallipolis	6/27/2007	20:30 PM	Tstm Wind	50 kts.	0	0	0K	0K
48 Gallipolis	7/17/2007	15:07 PM	Tstm Wind	50 kts.	0	0	8K	0K
49 Kyger	7/19/2007	14:00 PM	Tstm Wind	50 kts.	0	0	0K	0K
50 Patriot	8/25/2007	16:05 PM	Tstm Wind	50 kts.	0	0	0K	0K

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
51 Gallipolis	8/25/2007	16:45 PM	Tstm Wind	50 kts.	0	0	0K	0K
52 Cadmus	8/30/2007	14:05 PM	Tstm Wind	50 kts.	0	0	0K	0K
53 Gallia	1/29/2008	23:40 PM	Tstm Wind	50 kts.	0	0	0K	0K
54 Mercerville	1/29/2008	23:45 PM	Tstm Wind	50 kts.	0	0	2K	0K
55 Mercerville	6/28/2008	13:50 PM	Tstm Wind	50 kts.	0	0	0K	0K
56 Gallipolis	2/11/2009	17:48 PM	Tstm Wind	55 kts.	0	0	5K	0K
57 Eureka	5/29/2009	2:00 AM	Tstm Wind	50 kts.	0	0	2K	0K
58 Bladen	8/10/2009	18:05 PM	Tstm Wind	50 kts.	0	0	0K	0K
59 Gallipolis	8/10/2009	18:05 PM	Tstm Wind	50 kts.	0	0	0K	0K
60 GALLIA	6/2/2010	21:00 PM	Tstm Wind	50 kts.	0	0	5K	0K
61 GALLIA	10/26/2010	14:30 PM	Tstm Wind	50 kts.	0	0	1K	0K
62 GALLIA	10/26/2010	14:41 PM	Tstm Wind	50 kts.	0	0	1K	0K
63 Vinton	6/21/2011	17:40 PM	Tstm Wind	50 kts.	0	0	5K	0K
				TOTALS:	0	0	267K	0

5 High Wind events were reported in Gallia County between 01/01/1993 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 Gallipolis (5 Sw)	5/12/1993	1355	High Winds	0 kts.	0	0	5K	0
2 Southern Half	3/18/1994	1155	High Winds	0 kts.	0	2	500K	0
3 Parts Of West Central	11/11/1995	1015	High Winds	0 kts.	0	0	50K	0
4 OHZ066>067 - 075>076 - 083>087	3/9/2002	4:45 PM	High Wind	0 kts.	0	0	75K	0
5 OHZ066 - 075 - 083>086	12/7/2004	12:30 PM	High Wind	50 kts.	0	0	0	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
				TOTALS:	0	2	630K	0

58 Hail events were reported in Gallia County between 01/01/1950 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 GALLIA	4/23/1968	1500	Hail	2.75 in.	0	0	0	0
2 GALLIA	4/1/1974	1815	Hail	1.75 in.	0	0	0	0
3 GALLIA	7/8/1980	1705	Hail	1.75 in.	0	0	0	0
4 GALLIA	7/12/1980	1715	Hail	2.00 in.	0	0	0	0
5 GALLIA	7/10/1985	430	Hail	0.75 in.	0	0	0	0
6 GALLIA	5/7/1986	1900	Hail	0.75 in.	0	0	0	0
7 GALLIA	4/25/1989	2047	Hail	1.75 in.	0	0	0	0
8 GALLIA	6/12/1989	1510	Hail	2.50 in.	0	0	0	0
9 GALLIA	4/9/1991	1555	Hail	1.00 in.	0	0	0	0
10 GALLIA	8/19/1991	1235	Hail	1.25 in.	0	0	0	0
11 Swan Creek (0.5 N)	5/11/1993	1610	Hail	0.75 in.	0	0	1K	0
12 Gallia	4/15/1994	1235	Hail	1.75 in.	0	0	0	50K
13 Gallipolis	6/20/1994	2030	Hail	1.00 in.	0	0	5K	0
14 Gallipolis	6/21/1994	1935	Hail	1.25 in.	0	0	0	0
15 Crown City	7/29/1994	1445	Hail	0.85 in.	0	0	0	0
16 Ewington	5/10/1995	1645	Hail	1.00 in.	0	0	0	0
17 OHZ066 - 067 - 075 - 076 - 083 - 085 - 086 - 087	8/1/1995	1637	Hail	0.75 in.	0	0	0	0
18 Morgan Center	6/9/1996	6:50 PM	Hail	0.75 in.	0	0	0	0
19 Porter	6/2/1997	6:05 PM	Hail	0.75 in.	0	0	0	0
20 Rio Grande	6/2/1998	1:30 PM	Hail	1.25 in.	0	0	200K	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
21 Gallipolis	6/2/1998	1:45 PM	Hail	1.75 in.	0	0	750K	0
22 Gallia	6/10/1998	1:20 AM	Hail	1.75 in.	0	0	10K	0
23 Gallipolis	6/15/1998	2:38 PM	Hail	0.75 in.	0	0	0	0
24 Vinton	6/29/1998	12:11 AM	Hail	1.00 in.	0	0	0	0
25 Patriot	7/30/1999	4:25 PM	Hail	1.75 in.	0	0	0	0
26 Patriot	10/4/1999	1:10 AM	Hail	0.88 in.	0	0	0	0
27 Mercerville	5/24/2000	7:25 PM	Hail	0.75 in.	0	0	0	0
28 Gallipolis	5/18/2001	4:29 PM	Hail	0.75 in.	0	0	15K	0
29 Gallipolis	5/18/2001	5:17 PM	Hail	0.75 in.	0	0	0	0
30 Gallipolis	6/2/2001	5:45 PM	Hail	0.75 in.	0	0	0	0
31 Gallipolis	11/10/2002	10:14 PM	Hail	1.00 in.	0	0	0	0
32 Gallipolis	5/10/2003	5:10 PM	Hail	0.75 in.	0	0	0	0
33 Patriot	5/26/2004	11:43 AM	Hail	1.50 in.	0	0	0	0
34 Bidwell	5/27/2004	7:34 PM	Hail	0.75 in.	0	0	0	0
35 Mercerville	5/27/2004	7:55 PM	Hail	0.75 in.	0	0	0	0
36 Bidwell	5/27/2004	8:35 PM	Hail	0.75 in.	0	0	0	0
37 Patriot	6/14/2004	4:42 PM	Hail	0.88 in.	0	0	0	0
38 Vinton	8/10/2004	2:35 PM	Hail	0.75 in.	0	0	0	0
39 Patriot	5/14/2005	2:48 PM	Hail	0.88 in.	0	0	0	0
40 Gallipolis	7/27/2005	12:16 PM	Hail	0.88 in.	0	0	0	0
41 Gallipolis	12/28/2005	4:20 PM	Hail	0.88 in.	0	0	0	0
42 Gallipolis	7/14/2006	9:55 PM	Hail	0.75 in.	0	0	0	0

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
43 Gallipolis	3/14/2007	17:55 PM	Hail	0.88 in.	0	0	0K	0K
44 Cadmus	7/24/2007	16:43 PM	Hail	0.75 in.	0	0	0K	0K
45 Rodney	7/27/2007	15:45 PM	Hail	0.75 in.	0	0	0K	0K
46 Cheshire	6/23/2008	14:28 PM	Hail	0.88 in.	0	0	0K	0K
47 Crown City	6/2/2009	14:54 PM	Hail	1.00 in.	0	0	0K	0K
48 Patriot	6/2/2009	15:45 PM	Hail	0.88 in.	0	0	0K	0K
49 Crown City	6/2/2009	18:45 PM	Hail	0.88 in.	0	0	0K	0K
50 GALLIA	4/5/2010	22:45 PM	Hail	1.25 in.	0	0	0K	0K
51 GALLIA	4/5/2010	22:45 PM	Hail	1.75 in.	0	0	0K	0K
52 GALLIA	4/5/2010	22:45 PM	Hail	1.75 in.	0	0	0K	0K
53 GALLIA	4/5/2010	23:00 PM	Hail	1.00 in.	0	0	1K	0K
54 GALLIA	4/5/2010	23:00 PM	Hail	1.00 in.	0	0	1K	0K
55 GALLIA	4/5/2010	23:00 PM	Hail	1.25 in.	0	0	1K	0K
56 GALLIA	4/5/2010	23:02 PM	Hail	1.00 in.	0	0	1K	0K
57 Thurman	6/7/2011	14:11 PM	Hail	0.88 in.	0	0	0K	0K
58 Mercerville	6/23/2011	14:45 PM	Hail	0.75 in.	0	0	0K	0K
				TOTALS:	0	0	985K	50K

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Tornadoes History

7 Tornado events were reported in Gallia County between 01/01/1950 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 GALLIA	4/23/1968	1540	Tornado	F5	0	17	250K	0

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
2 GALLIA	6/2/1980	1745	Tornado	F1	0	0	2.5M	0
3 GALLIA	6/12/1989	1510	Tornado	F1	0	0	2.5M	0
4 Vinton	5/4/1996	5:00 PM	Tornado	F1	0	0	250K	0
5 Gallipolis	6/2/1998	1:50 PM	Tornado	F0	0	0	50K	0
6 Patriot	6/15/2000	4:42 PM	Tornado	F2	0	0	100K	0
7 Adamsville	5/8/2002	5:07 PM	Tornado	F2	0	3	3.5M	0
				TOTALS:	0	20	9.150M	0

Drought History

13 Drought events were reported in Gallia County between 01/01/1994 and 04/30/2011.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 OHZ083>087	5/1/1999	12:00 AM	Drought	N/A	0	0	0	0
2 OHZ075>076 - 083>087	6/1/1999	12:00 AM	Drought	N/A	0	0	0	0
3 OHZ066>067 - 075>076 - 083 - 085>087	7/1/1999	12:00 AM	Drought	N/A	0	0	0	0
4 OHZ066>067 - 075>076 - 083>087	8/1/1999	12:00 AM	Drought	N/A	0	0	0	0
5 OHZ066>067 - 075>076 - 083>087	9/1/1999	12:00 AM	Drought	N/A	0	0	0	0
6 OHZ066>067 - 075>076 - 083>087	10/1/1999	12:00 AM	Drought	N/A	0	0	0	0
7 OHZ066>067 - 075>076 - 083>087	9/1/2002	12:00 AM	Drought	N/A	0	0	0	0
8 OHZ086 - 087	6/8/2007	12:00 AM	Drought	N/A	0	0	0K	0K
9 OHZ086 - 087	7/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
10 OHZ086 - 087	8/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
11 OHZ083>087	9/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K

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Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
12 OHZ083>087	10/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
13 OHZ083>087	11/1/2007	12:00 AM	Drought	N/A	0	0	0K	0K
				TOTALS:	0	0	0	0

This historical weather data for Gallia County was collected from the national Climatic Data Center. The National Climatic Data Center is the world's largest active archive of weather data. The NCDC is part of the Department of Commerce, National oceanic and Atmospheric Administration (NOAA) and the National Environmental Satellite, Data and Information Services (NESDIS)

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Appendix VII
Critical Facilities

LOCATION	FACILITY	STREET ADDRESS	CITY	STATE	ZIP	Flood Prone
CF-01	Wee Care Daycare	109 Garfield Ave.	Gallipolis	OH	45631	Yes
CF-02	Heart of the Valley #2	11802 St. Rt. 7 South	Gallipolis	OH	45631	Yes
CF-03	TJ?s Child Care	1998 Centenary Road	Gallipolis	OH	45631	
CF-04	French City Childcare	300 Third Ave.	Gallipolis	OH	45631	Yes
CF-05	Heart of the Valley #1	3082 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-06	Toddler Tech & Infant Care	3615 Jackson Pike	Gallipolis	OH	45631	Yes
CF-07	Community Nursery School	51 State Street	Gallipolis	OH	45631	Yes
CF-08	French City Childcare #2	59 Court Street	Gallipolis	OH	45631	Yes
CF-09	Rio Grande Child Development Ctr	425 E. College Street	Rio Grande	OH	45674	
CF-10	Gallia Guarding Angels, Inc.	11818 St. Rt. 160	Vinton	OH	45686	
CF-11	Bidwell-Porter Elementary Sch	8779 State Route 160	Bidwell	OH	45614	
CF-12	River Valley HS	1428 Little Kyger Road	Cheshire	OH	45620	
CF-13	Kyger Creek Middle School	350 Watson Grove Road	Cheshire	OH	45620	Yes
CF-14	Gallco ? Guiding Hand School	8323 State Route 7	Cheshire	OH	45620	Yes
CF-15	South Gallia HS	266 Mercerville Road	Crown City	OH	45623	
CF-16	Hannan Trace Elementary Sch	9345 St. Rt. 218	Crown City	OH	45623	
CF-17	Ohio Valley Christian School (Elem)	1100 Fourth Avenue	Gallipolis	OH	45631	Yes
CF-18	Green School Elementary	113 Centenary Church Road	Gallipolis	OH	45631	
CF-19	Clay School	11802 St. Rt. 7 South	Gallipolis	OH	45631	Yes
CF-20	Addaville Elementary	1333 Brick School Road	Gallipolis	OH	45631	Yes
CF-21	Gallipolis Career College	176 Jackson Pike	Gallipolis	OH	45631	Yes
CF-22	Gallia Co. Board of Education	230 Shawnee Lane	Gallipolis	OH	45631	
CF-23	Gallia Academy HS	340 Fourth Avenue	Gallipolis	OH	45631	Yes
CF-24	Washington Elementary School	450 Fourth Avenue	Gallipolis	OH	45631	Yes
CF-25	Ohio Valley Christian School (HS)	455 Third Avenue	Gallipolis	OH	45631	Yes
CF-26	Gallipolis City School Board	61 State St	Gallipolis	OH	45631	Yes
CF-27	Rio Grande Elementary	102 Lewis Ave.	Rio Grande	OH	45674	
CF-28	University of Rio Grande	218 N College Ave	Rio Grande	OH	45674	
CF-29	Buckeye Hills Career Center	351 Buckeye Hills Road	Rio Grande	OH	45674	
CF-30	Southwestern Elementary	4834 State Route 325, Sou	Rio Grande	OH	45674	
CF-31	Vinton Elementary	123 Keystone Road	Vinton	OH	45686	
CF-32	Springfield Township VFD	13984 St. Rt. 554	Bidwell	OH	45614	
CF-33	Cheshire Police Dept.	119 St. Rt. 554	Cheshire	OH	45620	
CF-34	Crown City VFD	25516 St. Rt 7, South	Crown City	OH	45623	
CF-35	Harrison Township VFD	302 Rocklick Road	Crown City	OH	45623	
CF-36	District # 2 VFD	47 Old Hannan Trace Road	Crown City	OH	45623	
CF-37	Gallia County Sheriff's Dept	12 Locust St.	Gallipolis	OH	45631	Yes
CF-38	Gallia Co. EMS	1255 St. Rt. 160	Gallipolis	OH	45631	
CF-39	Gallia Co. 911 Center	1911 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-40	Gallipolis VFD	2018 Chestnut Street	Gallipolis	OH	45631	Yes
CF-41	Ohio State Highway Patrol	396 Jackson Pike	Gallipolis	OH	45631	
CF-42	Gallipolis Police Dept.	519 Second Ave.	Gallipolis	OH	45631	Yes
CF-43	Greenfield TownshipVFD	5370 St. Rt. 233	Patriot	OH	45658	
CF-44	Greenfield Fire Department	5370 State Rt.233	Patriot	OH	45650	
CF-45	Centerville VFD	311 Ridge Ave	Rio Grande	OH	45685	
CF-46	Rio Grande VFD	401 E. Lewis Avenue	Rio Grande	OH	45674	
CF-47	Vinton VFD	131 Clay Street	Vinton	OH	45686	

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LOCATION	FACILITY	STREET ADDRESS	CITY	STATE	ZIP	Flood Prone
CF-48	Community Action Agency of Meigs & Gallia C	8010 St. Rt. 7 North	Cheshire	OH	45620	Yes
CF-49	Crown City Village Town Hall	156 Charles St	Crown City	OH	45623	
CF-50	Gallia Co. Soil & Water Conservation Distri	111 Jackson Pike	Gallipolis	OH	45631	Yes
CF-51	Gallia County Courthouse	18 Locust St.	Gallipolis	OH	45631	Yes
CF-52	Gallia Co. Animal Shelter	186 Shawnee Lane	Gallipolis	OH	45631	
CF-53	Gallipolis City Municipal Bldg	518 Second Ave	Gallipolis	OH	45631	Yes
CF-54	Gallipolis Municipal Court	520 Second Ave.	Gallipolis	OH	45631	Yes
CF-55	Gallia Co. Department of Human Services	848 Third Ave.	Gallipolis	OH	45631	Yes
CF-56	Centerville Village Hall	311 Ridge Ave	Rio Grande	OH	45658	
CF-57	Holzer Hospital	100 Jackson Pike	Gallipolis	OH	45631	Yes
CF-58	Woodlands Center	3086 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-59	Southeast Ohio Emergency	415 Vinton Pike	Gallipolis	OH	45631	
CF-60	Gallia Co. Health Department	499 Jackson Pike, Ste D	Gallipolis	OH	45631	
CF-61	Holzer Clinic	4th Ave & Sycamore	Gallipolis	OH	45631	
CF-62	Holzer Clinic	90 Jackson Pike	Gallipolis	OH	45631	
CF-63	Gallia Co. Senior Resource Center	1167 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-64	Arbor's	170 Pine Crest Drive	Gallipolis	OH	45631	
CF-65	Wyn-Gate	300 Briarwood Drive	Gallipolis	OH	45631	
CF-66	Scenic Hills	311 Buck Ridge Rd.	Gallipolis	OH	45631	
CF-67	Holzer Senior Care	380 Colonial Drive	Gallipolis	OH	45631	
CF-68	SBC - Gallipolis	54-56 Locust St.	Gallipolis	OH	45631	Yes
CF-73	Gallia Co. Landfill ?????	497 Roush Hollow Rd.	Bidwell	OH	45614	
CF-75	Gallia Co. Highway Dept.	1107 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-76	Gallia Co. Engineer's Office	1167 St. Rt. 160	Gallipolis	OH	45631	Yes
CF-77	Gallipolis City Maintenanace Garage	1680 Chestnut St.	Gallipolis	OH	45631	Yes
CF-78	Gallipolis Water Treatment Plant	2020 Chestnut St.	Gallipolis	OH	45631	Yes
CF-79	Tara Estates WWTP	Carman Drive	Addison	OH	45610	
CF-81	Gallipolis WWTP	1547 Chatham Ave.	Gallipolis	OH	45631	
CF-82	Children's Home WWTP	83 Shawnee Lane	Gallipolis	OH	45631	
CF-83	Clearview WWTP	Ann Drive (Eureka, Oh)	Gallipolis	OH	45631	Yes
CF-87	Rio Grande WWTP	80 West College St.	Rio Grande	OH	45674	
CF-89	Gallipolis Developmental Center - MRDD	2500 Ohio Ave	Gallipolis	OH	45631	
CF-90	First Holzer Apts	553 Second Ave.	Gallipolis	OH	45631	Yes
CF-91	Frenchtown Apts	727 Fourth Ave.	Gallipolis	OH	45631	Yes
CF-92	Middleton Estates - MRDD	8202 Cliffside Drive	Gallipolis	OH	45631	
CF-93	General James M. Gavin Power Plant	7397 State Route 7 North	Cheshire	OH	45620	
CF-94	Gallia Co. Rural Water	1232 State Route 7 N	Gallipolis	OH	45631	Yes
CF-95	Ohio Valley Electric Corp.(Kyger Creek)	5758 St. Rt. 7 North	Gallipolis	OH	45631	Yes
CF-96	Buckeye Rural Electric Coop	4848 St. Rt. 325 South	Rio Grande	OH	45674	

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Appendix VIII

Gallia County Action Plan

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Gallia County Action Plan	Status		Selected Action Implementation Schedule(Year)		Funding	Responsible Agency		Status		Selected Action Implementation Schedule(Year)		Funding	Responsible Agency
1. Flooding							**1. Flooding**						
Many culverts in Gallia County are undersized. The County wants to perform a hydrological study to evaluate existing culvert sizes and determine capacities that culverts need to be to carry existing storm water flow. Modify undersized storm water culverts and channels to increase flow capacity to alleviate some of the water back up that contributes to flooding in different areas.	Ongoing 10% complete lack of funding	O	2015	HMGP, PDM, FMA	EMA, Gallia County Core Group, Gallia County Engineer		The City of Gallipolis and the Village of Vinton become stranded during a flood event. The County wants to establish a flood escape route for these communities.	Unchanged	P	2014 - 2015	HMGP, PDM, FMA, and Existing Budget	EMA, Gallia County Engineer
Construct designated safe shelters on high ground in areas above the flood plains for residents in low lying areas to seek safety in the event of a flood.	Unchanged	H	2020	HMGP, PDM, FMA	EMA, Gallia County Core Group Memebers		The County wants to define and map floodplain areas where repetitive loss structures are located to avoid future building in these areas.	Unchanged	N	2013	HMGP, PDM, FMA	EMA and Elected Officials
Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Completed	P	2006	Existing Budget	EMA		Develop an educational outreach program to educate County residents on the dangers associated with flooding and the resulting cleanup activities as well as where to seek safety from flood waters.	Unchanged	N	2014	Existing Budget	EMA
Gallia County lacks the mechanical equipment necessary for disaster clean up. The County feels that obtaining a bucket truck, shredder, rubber tire end loader and track hoe for post-disaster clean up would speed up the clean up process.	Deleted	-	-	HMGP, PDM, FMA	EMA, Gallia County Core Group and Gallia County Engineer		Because Gallia County is prone to landslides, the County wants to obtain a piling drilling machine to mitigate landslides resulting from flooding.	Deleted	-	-	Existing Budget	EMA, Gallia County Engineer
Due to the large amount of log jams that occur within the County there is a need to evaluate the establishment of a Stream Maintenance Program.	Completed	P	2007	HMGP, PDM, FMA	EMA, Gallia County Engineer, ODNR, Soil & Water Conservation		Gallia County's township infrastructure and bridgeways are inadequate to handle flooding. The County wants to enlarge bridge decking on those structures identified to be inadequate.	Ongoing 10% due to lack of funding	E	2015	HMGP, PDM, FMA	EMA, Gallial County Engineer
Gallia County's sewage treatment plants are unable to handle storm events resulting in raw sewage overflowing into waterways. The County wants to evaluate the existing plants' capacities and provide necessary improvements to increase plant capacities as needed.	Ongoing 20% completed	P	2014 - 2015	Ohio Dept. of Health, Ohio Dept. of Public Works	EMA, Health Dept., Gallia Co. County Commissioners, & Gallia County Engineer		Many residents in Gallia County are served by propane tanks. The County wants to establish regulations for propane tank tie down to avoid tanks floating down stream in flooding situations.	Ongoing 25% due to lack of funding	P	2013	Existing Budget	EMA, Planning Commission, NFIP Coordinator
Remove existing structures in floodplains that have been identified as repetitive loss structures according to FEMA.	Unchanged	N	2020	HMGP, PDM, FMA	EMA, and Elected Officials							
Gallia County lacks emergency response vehicles that can navigate in off-road conditions. Therefore, the County wants to obtain 4-wheel drive emergency response vehicles for first responders.	Deleted	-	-	HMGP, PDM, FMA, and Existing Budget	EMA and Gallia County Core Group							

Gallia County Action Plan	Status		Selected Action Implementation Schedule(Year)		Funding	Responsible Agency	Status		Selected Action Implementation Schedule(Year)		Funding	Responsible Agency
2. Winter Storm						**3. Severe Storms**						
Many communities throughout Gallia County have older, large trees growing near structures and power lines that could be severely damaged by fallen branches or uprooted trees. The County wants to develop a tree maintenance program to prune or remove those trees recognized to be hazards.	Unchanged	E	2013 - 2014	Existing Budget	Gallia Co. Core Group members, Electric Co.'s, Gallia Co. Engineer	Provide an alternate power source, such as back-up generators, for those sensitive populations critical facilities that must have continuous power to preserve and protect human health.	Unchanged	E	2014 - 2018	Existing Budget	EMA. Gallia County Core Group, Electric Co.'s, Gallia County Engineer
Gallia County lacks the mechanical equipment necessary for disaster clean up. The County feels that obtaining a bucket truck for post-disaster clean up would speed up the clean up process.	Deleted	-	-	HMGP, PDM	Gallia Co. Core Group and Gallia County Engineer	Provide NOAA radios for every household and educate residents on the radios for receipt of potential lifesaving information in the event of a severe storm.	Deleted	-	-	Existing Budget	EMA
Construct designated safe shelters throughout the County that would provide protection from winter weather for sensitive populations.	Unchanged	H	2015	HMGP, PDM	EMA, Gallia County Core Group members	Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Ongoing 50% complete	P	2014	Existing Budget	EMA
Provide an alternate power source, such as back-up generators, for those sensitive populations critical facilities that must have continuous power to preserve and protect human health.	Deleted	E	-	HMGP, PDM, and Existing Budget	EMA, Gallia County Core Group & Population Critical Facilites	Gallia County lacks the mechanical equipment necessary for disaster clean up. The County feels that obtaining a bucket truck, shredder, rubber tire end loader and track hoe for post-disaster clean up would speed up the clean up process.	Deleted	-	-	Existing Budget	EMA. Gallia County Engineer
Provide large scale evacuation centers for County residents to seek safety. Provide evacuation centers with generators and necessities for survival in case of prolonged winter event.	Unchanged	H	2014 - 2015	HMGP, PDM, and Existing Budget	EMA, Gallia County Core members, Red Cross	Gallia County lacks the coverage of the Doppler radar through NOAA. The County wants to coordinate with NOAA to expand the coverage area of the Doppler radar to include Gallia County.	Ongoing 75% complete	O	2013	Existing Budget	EMA, Media (radio and TV)
The County lacks a permanent centralized safe shelter to serve as a main emergency operations center. Therefore the County wants to install a permanent multi-use safe shelter structure equipped with an emergency generator that would act as a central emergency operations command post.	Completed	H	2004	HMGP, PDM	EMA	Develop map of locations of existing designated shelter locations and evaluate each shelter to see if it has adequate supplies to sustain residents in the event of a severe weather event.	Ongoing 75% complete	O	2013	Existing Budget	EMA, Red Cross
Gallia County lacks emergency response vehicles that can navigate in snow. Therefore, the County wants to obtain 4-wheel drive emergency response vehicles for first responders.	Deleted	-	-	HMGP, PDM, and Existing Budget	EMA, Gallia County Core members	Develop and distribute public education flyer to County residents covering the use of lightning rods and the benefits of installation.	Unchanged	P	2013	Existing Budget	EMA
Gallia County needs more man power for disaster cleanup activities. The County wants to coordinate with correction institutions for recruitment of workers for cleanup.	Ongoing 75% complete	P	2016 - 2017	Community Action	EMA, Gallia County Core Group & Sheriff's Office	As part of their maintenance program, utility companies use a chop and drop method for trees around power lines and above ground utilities. The County wants to coordinate with utility companies for timely removal of debris after chop and drop.	Completed	P	2004	Existing Budget	EMA, Gallia County Engineer and Utilities
Gallia County lacks proper fuel supply to sustain necessary activities in an emergency. The County wants to coordinate with the OEMA to evaluate the community's need for additional fuel supplies during emergencies.	Unchanged	O	2014 - 2015	Existing Budget	EMA						
Establish procedures and locations for excess debris to better manage clean up and disposal during and after an emergency.	Ongoing 50% complete	P	2014 - 2015	Existing Budget	EMA						
Gallia County's existing snow removal equipment does not have capability to remove deep snow in a safe, efficient manner. The County wants to obtain snow blowers for deep snow removal.	Unchanged	P	2014 - 2015	HMGP, PDM	EMA, Gallia County Engineer						

Gallia County Action Plan	Status		Selected Action Implementation Schedule(Year)	Funding	Responsible Agency		Status		Selected Action Implementation Schedule(Year)	Funding	Responsible Agency
4. Landslides						**5. Tornadoes**					
Gallia County is continuously threatened by potential landslides but lacks the equipment to aid in mitigating that threat. Therefore, the County wants to obtain a drilling machine and pile driver to mitigate continued threat of landslides.	Deleted	-	-	Existing Budget	EMA, Gallia County Engineer	Gallia County lacks an adequate outdoor warning system throughout the County. Therefore, the County wants to install an interoperable, multi-purpose siren system that would alert residents of approaching severe weather.	Ongoing 10% due to lack of funding	H	2014 - 2015	HMGP, PDM	EMA
When Gallia County suffers a landslide or slope failure, there is a lack of equipment to aid in clean up. The County wants to obtain a bucket truck to remove tree debris that is created because of landslides.	Deleted	-	-	HMGP, PDM, and Existing Budget	EMA, Gallia County Engineer	Construct designated safe shelters throughout the County that would provide protection from severe weather for County residents and at-risk populations such as mobile home parks and campgrounds where citizens could seek safety in the event of a tornado.	Unchanged	H	2015	HMGP, PDM	EMA, Gallia County Core Group
Gallia County wants to better coordinate efforts with logging companies and the logging industry to protect and maintain local roads.	Unchanged	O	2014 - 2015	Private Industries	EMA, Private Industries, ODNR, Gallia Co. Engineer, Soil & Water Conservation	Provide an alternate power source, such as back-up generators, for critical facilities serving as tornado shelters that must have continuous power to preserve and protect human health.	Deleted	-	-	HMGP, PDM, and Existing Budget	EMA, Gallia County Core Group
In Gallia County, lumber companies engage in the practice of clear cutting, stripping areas of trees, depriving the soil of both anchor and protection from saturating rains. The County wants to petition the County commissioners to adopt new regulations for clear cutting in order to prevent landslides associated with this practice.	Unchanged	P	2014 - 2015	Private Industries	EMA, Private Industries, ODNR, Gallia Co. Engineer, Soil & Water Conservation	Since Gallia County lacks an adequate number of safe shelters for people to seek safety in tornadoes, the County wants to retrofit schools to be designated tornado shelters.	Unchanged	E	2015	HMGP, PDM	EMA, Gallia County Core Group
Gallia County feels that clear cutting practices do not receive the necessary attention in their County as well as in surrounding counties. Gallia County wants to establish a focus group to citizens from surrounding counties to address issues associated with clear cutting in the area.	Deleted	-	-	Private Industries	EMA, Private Industries, ODNR, Gallia Co. Engineer, Soil & Water Conservation	Develop a large scale educational outreach program to teach County residents about the uses of a multi-use siren system and the different warnings to be sounded.	Deleted	-	-	Existing Budget	EMA
Since clear cutting is an important issue in Gallia County, the County wants to evaluate other state's laws concerning clear cutting practices to see what may be enforceable in this area.	Deleted	-	-	Private Industries	EMA, Private Industries, ODNR, Gallia Co. Engineer, Soil & Water Conservation	Develop and distribute educational information to local school officials justifying multi-use siren systems and explaining the benefits to be reaped by the school and its students.	Deleted	-	-	Existing Budget	EMA
Gallia County's mapping system lacks updated information concerning areas of potential landslides. Therefore, the County wants to develop an electronic map illustrating existing soil layers and known slip areas.	Ongoing 10% complete lack of funding	O	2013	Existing Budget	EMA, Planning Commission, Gallia County Engineer, Soil and Water Conservation						

Gallia County Action Plan	Status		Selected Action Implementation Schedule(Year)	Funding	Responsible Agency		Status		Selected Action Implementation Schedule(Year)	Funding	Responsible Agency
6. Mine Subsidence						**8. Droughts**					
Underground mines, some of which have been abandoned for years, can be found in different parts of Gallia County. The County wants to establish an enforceable permitting process for construction in areas affected by mines to limit the subsidence which causes landslides.	Unchanged	P	2013 - 2014	Existing Budget	EMA, ODNR	Gallia County's water supply becomes depleted during mild and severe droughts. The County wants to establish designated back-up water sources for use during droughts.	Unchanged	P	2014 - 2015	Existing Budget	EMA, Utility Companies
Due to the increased amount of sedimentation caused by subsidence, the information on the County's FIRM map is no longer accurate. Floodplains are not depicted accurately since streams, such as Kyger Creek, are not as deep due to increased sediment loading.	Unchanged	N	2014	HMGP, PDM	EMA, Floodplain Office, ODNR, Gallia County Engineer	Gallia County's fire department's wet hydrants are affected by drought conditions. The County wants to establish a dry hydrant system.	Unchanged	F	2016	HMGP, PDM	EMA, Soil and Water Conservation
						County residents rely on Rural Water for potable water. The County wants to provide an alternate power source, such as a back-up generator, for Rural Water so that they supply a continued source of water to residents.	Ongoing 20% completed	-	2014	Exisisting budgets and other private sources	EMA, Rural Water
						Gallia County's subdivision regulations do not address dry hydrants as a requirement in new developments. The County wants to provide an addendum to the current regulations that would require dry hydrant installation.	Ongoing 50% completed	P	2013	Existing Budget	EMA, Planning Commission
7. Earthquakes						Provide emergency water supply tanks with each tank being designated to serve a particular area of the County.	Unchanged	P	2015 - 2016	HMGP, PDM	EMA. Health Department
Develop and distribute public education flyer to the County residents concerning the dangers of earthquakes and their rights to purchase earthquake insurance.	Unchanged	H	2013	Existing Budget	EMA	Produce mapping of dry hydrant locations throughout the County.	New		2016	Existing Budget	Soil and Water, County Commisioner
Gallia County has many mines located within its boundaries. The County wants to coordinate mitigation efforts with the mining industry concerning mining issues like long-wall problems that create tremors and earthquake conditions.	Unchanged	-	2014 - 2015	Existing Budget	EMA. ODNR						