



Fayette County
Ohio

Fayette County, Ohio

Natural Hazards Mitigation Plan



September 2020

Fayette County, Ohio
Natural Hazards Mitigation Plan
 Updated September 2020

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Executive Summary

The Fayette County Mitigation Plan lays the road map to a safer community by identifying the natural hazards that may affect the county, assessing the impacts of these hazards on community assets – those things that are important to the residents of the county – and developing mitigation actions to lessen or eliminate the impacts on community assets.

Having a current mitigation plan allows the county to apply for mitigation funding – as it may become available. It also provides a mitigation action list for other sources of funding. Further, it provides information that may be used in other planning efforts and future development.

Through a quantitative process of analyzing hazards and impacts on our community, the Mitigation Planning Team identified six mitigation goals and developed twenty-seven mitigation actions to achieve the goals. Of these actions, thirty-seven actions were carried over from the previous plan, four actions were added, five actions were identified as being completed, and twelve actions were deleted.

The following summarizes these efforts:

- Hazards Identified and Analyzed in Rank Order
 - Severe Winter Storms
 - Pandemic
 - Severe Summer Storms
 - Power Outage
 - Tornadoes
 - Hazardous Material Release
 - Dam Failure
 - Cyber Attack
 - Droughts
 - Flooding
 - Earthquakes
 - Land Subsidence
- Goals Identified and Mitigation Actions Developed, Analyzed and Prioritized
 - Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure
 - Identify and map existing critical culverts and storm drainage ditches near residential areas, roadways and low-lying areas throughout the county.
 - Install warning signage along roadways that are susceptible to flooding.
 - Repair and replace bridges and levees that suffer damage from storm water.
 - Elevate roads above base flood elevations.
 - Install new infrastructure in areas susceptible to low level flooding and ponding, outside of the 100-year floodplain.
 - Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
 - Develop and implement a tree trimming program to help prevent damage from falling limbs.
 - Protect and restore natural flood mitigation features such as riverbanks, riparian buffers and vegetative buffers.
 - Relocate or retrofit critical facilities located within floodplains.
 - Mitigate water and wastewater treatment facilities located in flood hazard areas.
 - Mitigate structures at risk
 - Provide means for mass animal carcass disposal.
 - Rehabilitate dams known to be of high hazard potential.
 - Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
 - Upgrade water treatment plant carbon process and upgrade disposal.

- Increase the size of sewage lagoons to reduce probability of overflow.
- Provide timely warning
 - Implement a reverse-flow emergency notification system. Completed
 - Install/upgrade outdoor warning sirens. Unchanged
 - Provide NOAA All-Hazards Warning Radios for all critical facilities. Unchanged
 - Upgrade the public safety countywide radio communications system. Completed
 - Enhance emergency response capability
 - Establish a series of dry hydrants throughout the county. Unchanged
 - Construct additional water storage facility for emergency crop management and fire suppression. Unchanged
 - Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
- Plan for safe development
 - Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
 - Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes. Unchanged
 - Request update of Digital Flood Insurance Rate Maps (DFIRMS). Unchanged
 - Encourage the Villages of Bloomingburg and Octa to participate in the National Flood Insurance Program.
 - Participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).
 - Form partnerships to support floodplain management and environmental conservation between local, state and regional entities.
 - Develop notification platform for people to report potential land subsidence or sinkhole development.
 - Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop
 - Inspect utility poles to ensure they meet specifications and are wind resistant; bury power lines
 - Review, revise and adopt policies/ordinances to improve stormwater management.
- Create self sufficiency
 - Identify/upgrade facilities to be shelters.
 - Develop and maintain a system to identify vulnerable populations.
 - Install back-up generators for shelters and critical facilities.
 - Identify alternate potable water sources and develop a distribution system.
 - Identify facilities for use as temporary facilities for patients with non-life-threatening conditions to alleviate the overloading of medical facilities.
 - Develop a warehousing system for storing essential disaster supplies.
 - Provide designated locations/facilities to house displaced animals.
 - Develop and implement a volunteer management program.
 - Construct community safe rooms.
 - Construct residential safe rooms.
- Increase public awareness
 - Develop and implement an all-hazards public education program.

This plan will be reviewed and updated annually and undergo a complete review and rewrite within five years of adoption. Please address any questions, comments, mitigation action status or additional mitigation actions to the Fayette County Emergency Management Agency.

Section I – Introduction

I. Background & Purpose

There are two basic truths about hazards and community assets:

- *Hazards* will occur – there is little, if anything, we can do to prevent natural hazards from occurring.
- *Community assets* will be *impacted* by the occurrence of hazards to the extent of the assets' *vulnerabilities* to the hazards' *effects*.

Mitigation seeks to lessen or eliminate:

- The impact of hazards
- The vulnerability of assets to hazard impacts

As there are many impacts on community assets, impacts are ranked and mitigation actions cost-estimated using a quantitative analysis approach. Mitigation Actions may then be implemented in a cost-effective manner that resolves the greatest impact.

The purpose of this plan is to document the mitigation planning process conducted in Fayette County, Ohio, and provide that road map to a safer community.

II. Scope

This plan covers Fayette County, Ohio, and all its political subdivisions and municipalities.

III. Project Management

The Fayette County Emergency Management Agency (EMA) is the lead agency for this plan. RDI Solutions LLC was contracted to perform research, facilitate the process and assemble the plan to conform with the requirements of the Ohio Emergency Management Agency (Ohio EMA) and the Federal Emergency Management Agency (FEMA).

IV. Relationship to the Mitigation Plan Approved in 2015

As this is an updated plan, the previously approved plan was the point of departure. All information in it was reviewed and updated as needed.

V. The Mitigation Planning Process

The Fayette County Mitigation Planning Team worked together to update the 2015 Plan. The team used the Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook – March 2013*, as a guide.

Mitigation planning starts with profiling the community and identifying its assets – those things that are important to it. Next, hazards that potentially may affect these community assets are profiled – past and projected future occurrences and impacts. Then, mitigation actions are reviewed and updated and new ones developed that can either lessen or eliminate the impact of a hazard or the vulnerability of a community asset to the impact of a hazard are developed. These mitigation actions form the basis for making the community a safer place to live, work and recreate.

Throughout the process, those who have a stake – elected and appointed government officials, agencies providing services to people, the public – as well as those with pertinent information are advised, consulted and their input incorporated into the plan. *Section II – The Planning Process* describes and summarizes the results of this process.

VI. Integration of Results into Other Mechanisms

The county's process to integrate the data, information, and hazard mitigation goals and actions in other planning mechanisms is accomplished through specifically including select

positions in the planning process and are members of the Mitigation Planning Team. These include, but are not limited to:

- Fayette County Commissioners – consider incorporating mitigation actions when approving and funding county development projects.
- Fayette County and Municipal Floodplain Administrators – use the results of flooding hazard analysis and vulnerability assessments in refining floodplain regulations.
- Fayette County Planning Commission – use hazard analysis in approving land use proposals.
- Fayette County Emergency Management Agency (EMA) – use hazard analysis in focusing preparedness, response and recovery efforts on areas of higher risk.
- Fayette County Sheriff’s Office – use hazard analysis targeting response efforts in areas of higher risk for impending or ongoing incidents.
- Fayette County Engineer’s Office – use mitigation actions in performing maintenance or making repairs to lessen or eliminate damages caused by future hazard occurrences.
- Municipal Mayors and Councils – consider incorporating mitigation actions when approving and funding development and maintenance projects.

These individuals take information to their respective organizations that are charged with the development, maintenance, and on occasion, enforcement of rules, regulations, codes, ordinances, policies, plans, procedures and other administrative instruments. Information from the mitigation planning effort is presented to the leadership of these organizations, who then authorize the information to be added, to revise or update current administrative instruments. This allows for oversight, commitment of time, energy, and resources to change actions into projects.

VII. Other Uses for This Plan

While this plan focuses on mitigation actions, the results of the information gathered and analysis performed can be used for other purposes including:

- Already-identified mitigation actions for funding through other sources
- Assessing risk for other purposes

VIII. Sources Consulted

Many sources were consulted in the planning process. The major sources are shown in the following table.

Source	Used to Provide Information on
Federal Emergency Management Agency (FEMA)	National Flood Insurance Program Previous Disasters
National Oceanic and Atmospheric Administration (NOAA)	Hazards U.S. Multi-Hazard Climate, Weather & Drought History and Trends
Ohio Department of Natural Resources (ODNR)	Dams, Waterways & Drought History and Conditions Landslide Characteristics
United States Geological Survey (USGS) & Fayette County Soil & Water Conservation District	Slopes & Soils Affecting Public Safety and County Assets
Ohio Emergency Management Agency (Ohio EMA)	Mitigation Plan State-Wide Hazards History and Trends
Fayette County Emergency Management Agency (EMA)	Emergency Operations Plan Previous Disasters, Emergencies & Other Incidents
Fayette County Auditor	Property Values & Types; Property Ownership
Fayette County Engineer’s Office	Impacted Roadways and Cost Estimates

Fayette County Sheriff's Office	Public Safety Impacts: Location, Severity, Frequency
Fayette County Planning Commission	Planning Regulations and Development Trends

IX. Mitigation Action Changes as a Result of This Update

The following table indicates the status of the actions. Note that the actions in the 2015 plan were not numerically prioritized.

2015 Action	Status
Identify and map existing critical culverts and storm drainage ditches near residential areas, roadways and low-lying areas throughout the county.	Completed
Install warning signage along roadways that are susceptible to flooding.	Deleted
Repair and replace bridges and levees that suffer damage from storm water.	Deleted
Elevate roads above base flood elevations.	Deleted
Install new infrastructure in areas susceptible to low level flooding and ponding, outside of the 100-year floodplain.	Deleted
Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.	Unchanged
Develop and implement a tree trimming program to help prevent damage from falling limbs.	Unchanged
Relocate or retrofit critical facilities located within floodplains.	Deleted
Provide means for mass animal carcass disposal.	Deleted
Protect and restore natural flood mitigation features such as riverbanks, riparian buffers and vegetative buffers.	Deleted
Mitigate structures at risk	Unchanged
Mitigate water and wastewater treatment facilities located in flood hazard areas.	Unchanged
Implement a reverse-flow emergency notification system.	Completed
Install/upgrade outdoor warning sirens.	Unchanged
Provide NOAA All-Hazards Warning Radios for all critical facilities.	Unchanged
Upgrade the public safety countywide radio communications system.	Completed
Establish a series of dry hydrants throughout the county.	Unchanged
Construct additional water storage facility for emergency crop management and fire suppression.	Unchanged
Review, revise and adopt policies/ordinances to improve stormwater management.	Unchanged
Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.	Unchanged
Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.	Unchanged
Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.	Unchanged
Request update of Digital Flood Insurance Rate Maps (DFIRMS).	Unchanged
Form partnerships to support floodplain management and environmental conservation between local, state and regional entities.	Deleted
Develop notification platform for people to report potential land subsidence or sinkhole development.	Deleted
Inspect utility poles to ensure they meet specifications and are wind resistant; bury power lines	Deleted
Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop	Unchanged
Encourage the Villages of Bloomingburg and Octa to participate in the National Flood Insurance Program.	Deleted

2015 Action	Status
Participate in the National Flood Insurance Program’s (NFIP) Community Rating System (CRS).	Deleted
Identify/upgrade facilities to be shelters.	Unchanged
Develop and maintain a system to identify vulnerable populations.	Completed
Install back-up generators for shelters and critical facilities.	Unchanged
Identify alternate potable water sources and develop a distribution system.	Unchanged
Identify facilities for use as temporary facilities for patients with non-life-threatening conditions to alleviate the overloading of medical facilities.	Completed
Develop a warehousing system for storing essential disaster supplies.	Unchanged
Provide designated locations/facilities to house displaced animals.	Unchanged
Develop and implement a volunteer management program.	Unchanged
Construct community safe rooms.	Unchanged
Construct residential safe rooms.	Unchanged
Develop and implement an all-hazards public education program.	Unchanged

X. Progress Made

As this plan is an update to the 2015 plan, progress can be measured. Four actions have been completed.

XI. Plan Organization

This plan is organized into the following sections:

[Section I – Introduction.](#)

[Section II – Planning Process.](#) This section details the planning process; it provides the summary information and conclusions as a result of hazard analysis and details mitigation goals developed.

[Section III – Community Profile and Assets.](#) This section provides detailed information about Fayette County and its Assets.

[Section IV – Hazard Identification and Analysis.](#) This section lists the hazards likely to affect Fayette County and details the analysis conducted on each. It also summarizes the rankings of hazards and impacts.

[Section V – Hazard Profiles, Analyses and Vulnerable Assets.](#) This section documents profiles and analyses conducted. It then details the impacts to vulnerable community assets.

[Section VI – Mitigation Goals and Actions.](#) This section lists and details the mitigation goals and actions updated or developed.

[Section VII – Mitigation Action Identification & Analysis.](#) This section details each action and its analysis.

[Section VIII – Supplemental Information.](#) This section includes information meaningful to the overall plan development but not included in the preceding sections.

Section II – The Planning Process

This section describes and summarizes the steps and actions taken to update the 2015 Fayette County Mitigation Plan. Note that there are hyperlinks to the documentation for mentioned events/actions in *Section VIII – Supplemental Information*.

I. Inform and Involve Chief Elected Officials, Stakeholders and the Public

The Fayette County EMA Director met with the Board of County Commissioners on June 3, 2019, advising them of the mitigation plan update project and received their full support.

Request for public participation and input to the planning process was first announced on the Fayette County EMA Facebook page on August 27, 2019. The current plan was made available at the Carnegie Library in Washington Courthouse as well as on the Fayette County EMA web site. However, there was no participation by nor comments received from the public.

Throughout the plan development phase, stakeholders – businesses, industry, commercial ventures, private organizations, and the public – were invited to attend and participate in the Planning Team meetings. Locations, dates and times were made to the public and announcements were posted at meeting locations.

II. Form the Planning Team

The Fayette County EMA Director invited those individuals that were on the planning team to reconvene the team from the previous planning process along with additional individuals or organizations. This list included representatives from agencies involved in hazard mitigation activities, agencies with the authority to regulate development, and offices responsible for enforcing local ordinances were important members of the planning team.

III. Identify Participating Agencies

The following agencies and individuals participated in the development of this plan:

Community	Name	Position / Title	Agency / Organization
County Gov	Dan Dean	Commissioner	Fayette Co Board of Commissioners
County Gov	Jim Garland	Commissioner	Fayette Co Board of Commissioners
County Gov	Tony Anderson	Commissioner	Fayette Co Board of Commissioners
County Gov	Craig Breedlove		Fayette Co Bldg Dept
County Gov	Jay Myers		Fayette Co Bldg Dept
County Gov	Jim Garland		Fayette Co
EMA-State	Phillip Clayton	SW Supervisor	Ohio EMA
EMA-County	Thomas Breckel	Director	Clinton Co EMA
EMA-County	Melissa Havens	Director	Fayette Co EMA
EMA-County	David Bushelman	Director	Highland Co EMA
EMA-County	Deborah Sims	Director	Madison Co EMA
Engineering	Steve Luebbe	Engineer	Fayette Co Engineer's Office
Engineering	Ronnie Ward		ODOT Fayette Co
Development	Godwin Apaliyah		Fayette Co Economic Dev
Health	Megan Batson	Emergency Coordinator	Fayette Co Health Dept
Health	Corey Huffman	Safety Director	Fayette Co Memorial Hospital

Community	Name	Position / Title	Agency / Organization
Health	Doug Boedeker	Secretary	Fayette Co Memorial Hospital
Health	Leigh Cannon	Deputy Health Administrator	Fayette Co Public Health
GIS	Scott Cormany	Coordinator	Fayette County GIS
Soil & Water	Chet Murphy	Director	Fayette Co Soil & Water Cons Dist
Law Enf	Andy Bivers	Chief Deputy	Fayette Co Sheriff's Office
Law Enf	Vernon Stanforth	Sheriff	Fayette Co Sheriff's Office
Fire/EMS	Ron Huff	Chief	BPM Fire
Fire/EMS	Ralph Stegbauer	Chief	Concord/Green Fire Dept
Fire/EMS	Rob List	Chief	Fayette Co EMS
Fire/EMS	Dave Kellenbarger	Chief	Jefferson Twp Fire/EMS
Fire/EMS	Harold DeSanto	Chief	Pic-A-Fay Joint Fire Dept
Fire/EMS	Chris Wysong	Chief	Wayne Twp Fire Dept
Fire/EMS	Tim Downing	Chief	Washington CH Fire Dept
City Gov	Joe Denen	City Manager	Washington CH
Village Gov	Donald Fleak	Mayor	Village of Bloomingburg
Village Gov	Bob Kinzer	Mayor	Village of Jeffersonville
Village Gov	Bryan Riley	Administrator	Village of Jeffersonville
Village Gov	Bob Kinzer	Mayor	Village of Jeffersonville
Village Gov	Sue Burnside	Council	Village of Jeffersonville
Village Gov	Ron Anderson	Mayor	Village of Milledgeville
Village Gov	Vivian Wood	Mayor	Village of New Holland
Village Gov	Randy Kingery	Mayor	Village of Octa
Village Gov	Linda Turner	Council	Village of Octa
Twp Gov	Jeff Hoppes	Trustee	Jefferson Twp Fire/EMS
Twp Gov	Kenneth Kelly	Trustee	Paint Twp
Twp Gov	Scott Cook	Trustee	Paint Twp
Twp Gov	Clyde Fyffe	Trustee	Union Twp
Utilities	Quenten Matson		WCH Water Plant
Schools	Bill Franke		Miami Trace LSD
OSU	Ken Ford		OSU Ext
Business	Brian Crooks		Fayette Co LEPC; Red Collar
Business	Jason Manzo		WalMart Dist Center
NGO	Mary McCord		American Red Cross
Comm	Jim Scott		RACES
Consultant	David Pollinger	Consultant	RDI Solutions LLC

IV. Hold Meetings

A. Kick-Off Meeting

The Planning Team conducted their Kick-Off meeting on October 9, 2018, at the Fayette County Center for Economic Development. The RDI Solutions consultant presented an overview of mitigation as well as requirements and expectations for a successful planning process and approved plan.

B. Planning Meeting for Hazards

The Planning Team met on December 9, 2019 to identify and analyze hazards.

C. Planning Meeting for Goals & Actions

The Planning Team met on February 19, 2020 to establish goals, review actions from the 2015 plan, develop new actions and prioritize these actions.

D. Other Information Exchange

To maximize the effective use of time in meetings, drafted material was emailed to the Planning Team. Also, worksheets aimed at collecting information to be acted upon by the Planning Team were distributed ahead of the meetings. Information not available at meetings was gathered later and included in the planning process. Additionally, worksheets were sent to Planning Team members that could not attend as well as the various jurisdictions soliciting input on mitigation actions that would have application to them. Those returned were included in plan development. Phone calls were also used to clarify information gathered.

V. Gather Information

The Planning Team invited each jurisdiction's governing body to its planning meetings to gather information unique to each jurisdiction. The team also contacted agencies that have a mitigation-related role. This included the Fayette County Health Department, Fayette County Soil & Water Conservation District, Fayette County Engineer's Office, Fayette County Auditor's Office, Fayette County Sheriff's Office and Fayette County EMA.

The Planning Team reviewed existing plans and reports including Fayette County's Emergency Operations Plan, Soil Report, plat maps, and Planning Commission regulations.

The Planning Team performed extensive research from online resources such as Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), US and Ohio Departments of Transportation (USDOT/ODOT) and Ohio Department of Natural Resources (ODNR). The source is identified where this information is presented in this plan.

Due to the physical distancing requirements levied on public gatherings as a result of the COVID-19 pandemic, action prioritization was conducted by email, texting, and telephone calls. Participants are listed in [Section VIII – Supplemental Information](#).

VI. Draft the Updated Plan

A. Update Community Profile and Assets

The Planning Team updated the community profile and its assets based on data collected and is presented in [Section III – Community Profile and Assets](#).

B. Perform Hazard Analysis, Formulate Goals and Mitigation Actions

1. Hazard Identification

The Planning Team identified the following hazards, in rank order, considered to be credible threats to Fayette County's community assets.

- Severe Winter Storms

- Pandemic
- Severe Summer Storms
- Power Outage
- Tornadoes
- Hazardous Material Release
- Dam Failure
- Cyber Attack
- Droughts
- Flooding
- Earthquakes
- Land Subsidence

Refer to [Section IV – Hazard Identification and Analysis](#) and for details.

2. Hazard Profile, Vulnerability Assessment & Impacts

The Planning Team collected and reviewed hazard information, assessed the impacts and the community’s vulnerabilities. Refer to [Section V – Hazard Profiles, Analyses and Vulnerable Assets](#) for details.

3. Goals & Mitigation Actions

The Planning Team reviewed the vulnerabilities of impacted assets and decided on the following mitigation goals in priority order based on impact resolution.

The Planning Team selected the following goals:

- Reduce or eliminate impact on public safety, lives and property
 - Provide timely warning
 - Create self sufficiency
 - Plan for safe development
 - Increase public awareness
- The Planning Team first reviewed the 139 actions from the 2015 plan and found several issues that needed to be resolved as follows before continuing:

Issue	Count	Resolution
Normal maintenance item	2	Deleted
Not a mitigation action	15	Deleted
So close to another action as to be the same	61	Merged into another action
Local Emergency Planning Committee role	24	Deleted
None (Restated as necessary)	37	Carried Forward

- Refer to [Section VII – Supplemental Information](#) for a chart detailing these adjustments.
- The Planning Team then reviewed the adjusted current mitigation actions and added several new ones. Using Cost Benefit Review procedures, the planning team prioritized the actions. The following table depicts the mitigation actions developed and selected and the priority assigned. Note that priorities from the previous Plan were modified based on the results of this approach.

Priority	Mitigation Action
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.

Priority	Mitigation Action
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
6	Establish a series of dry hydrants throughout the county.
7	Identify/upgrade facilities to be shelters.
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
9	Upgrade water treatment plant carbon process and upgrade disposal.
10	Increase the size of sewage lagoons to reduce probability of overflow.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
16	Identify alternate potable water sources and develop a distribution system.
17	Mitigate structures at risk
18	Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop
19	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.
20	Rehabilitate dams known to be of high hazard potential.
21	Request update of Digital Flood Insurance Rate Maps (DFIRMS).
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
25	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
26	Construct additional water storage facility for emergency crop management and fire suppression.
27	Construct residential safe rooms.

Refer to [Section VI – Mitigation Goals and Actions](#) and [Section VII – Mitigation Action Identification & Analysis](#) for details.

4. Draft Plan

The RDI Solutions consultant drafted the plan, responded to comments, and made appropriate changes.

VII. Submit Plan to Ohio EMA and FEMA

The plan in its final form was submitted to Ohio EMA in September 2020.

On **Month Date, 2020**, FEMA determined this plan meets its requirements.

VIII. Adopt Plan

On **Month Date, 2020**, the Fayette County Board of Commissioners adopted this plan.

On **Month Date, 2020**, the City of Washington Courthouse adopted this plan.

On **Month Date, 2020**, the Village of Bloomingburg adopted this plan.

On **Month Date, 2020**, the Village of Jeffersonville adopted this plan.

On **Month Date, 2020**, the Village of Milledgeville adopted this plan.

On **Month Date, 2020**, the Village of New Holland adopted this plan.

On **Month Date, 2020**, the Village of Octa adopted this plan.

On **Month Date, 2020**, FEMA granted federal approval.

IX. Present Plan to the Public

The plan was placed in the Carnegie Library in Washington Courthouse and on the Fayette County EMA's website and a public notice was placed on the Fayette County EMA web site as well as through a social media (Facebook) post inviting residents to review and comment on the plan.

Additionally, a copy of the updated plan was sent to the EMAs of adjacent counties.

X. Monitor Plan Implementation

The Fayette County EMA Director monitors the implementation of this plan by periodic contact with lead agencies and presents status to the Planning Team and commissioners at each annual review.

The Fayette County EMA Director also provides a copy of this plan to all stakeholders and agencies with authorities related to mitigation actions and coordinates with them to assist in integrating mitigation goals and actions into their plans and actions.

XI. Keep Plan Up to Date

The Fayette County EMA Director monitors the implementation of this plan by having lead agencies provide updates as the status of their mitigation actions change.

The Fayette County EMA Director convenes the Planning Team annually to review the progress of this plan and propose any needed updates. This meeting is publicly announced and is open to the public; notices are posted on the Fayette County EMA's web site and Facebook page as well as announced in the various newspapers serving Fayette County. At this meeting, the team:

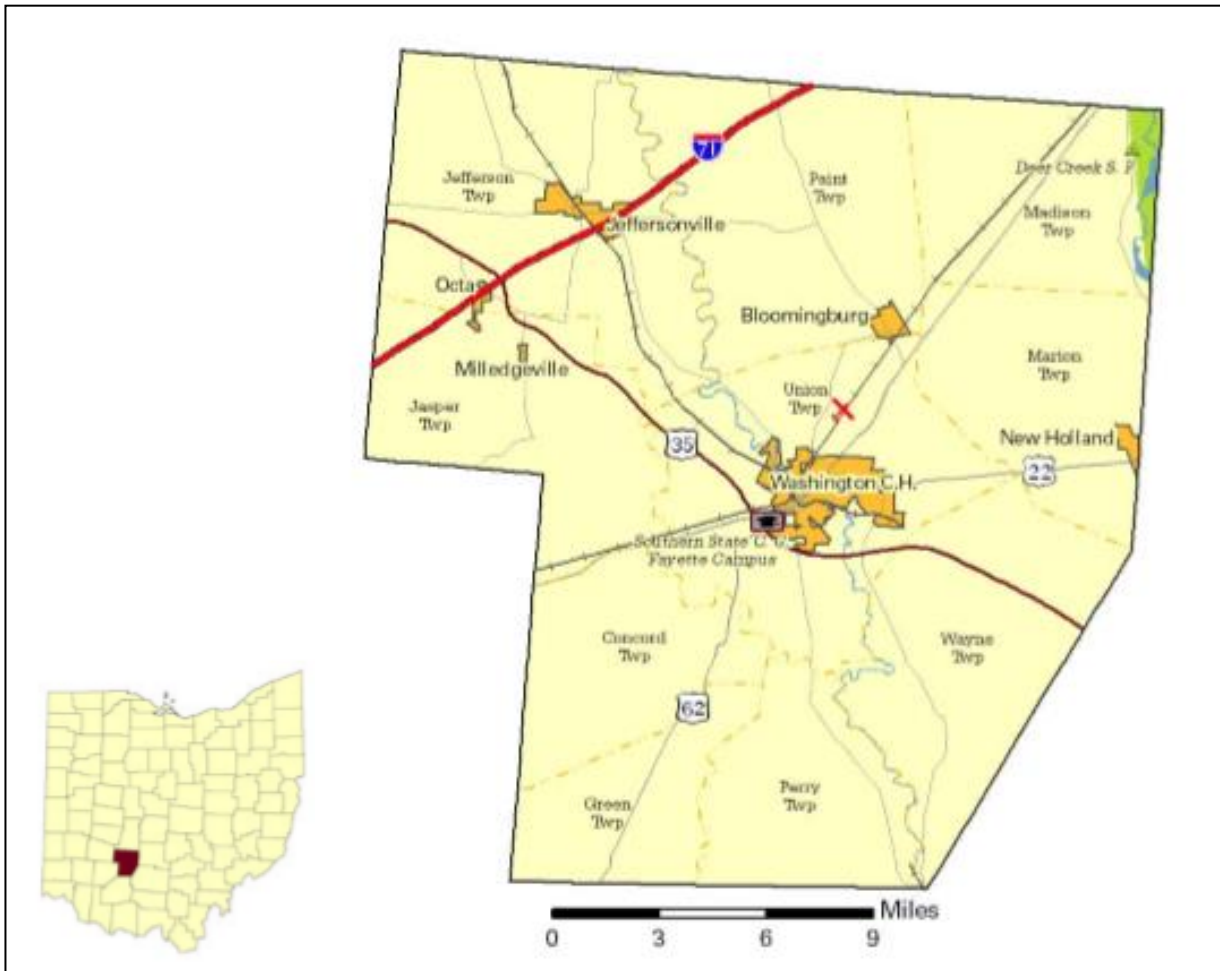
- Reviews the status of all mitigation actions.
- Assesses the progress toward achieving mitigation goals.
- Considers new related information as it becomes available. This includes recent hazard occurrences as well as changes in related planning documents. If this information would have an impact on goals or actions, the team proposes changes such as adding, changing or eliminating goals or mitigation actions.
- Presents proposed changes to the Board of County Commissioners and chief elected officials of affected jurisdictions for concurrence.
- Formally documents the proceedings, provides it to all stakeholders and makes it available with the current plan.

Once every five years, the Fayette County EMA initiates a formal plan update based on then current FEMA requirements and FEMA and Ohio EMA guidance.

The Fayette County EMA may process out-of-cycle updates by submitting changes to the Board of County Commissioners and the Ohio EMA.

Section III – Community Profile and Assets

I. Location and Geography



Fayette County is located in the south-central portion of the State of Ohio. It covers approximately 406.6 square miles. It is bounded by:

- Pickaway County to the east
- Ross County to the southeast
- Highland County to the southwest
- Clinton County to the south
- Greene County to the west
- Madison County to the north

II. Land Use

A. Land Use/Land Cover

The following chart depicts Fayette County's land use and cover¹:

Land Use/Land Cover	Percentage
Developed, Higher Intensity	5.34%
Developed, Lower Intensity	.82%

¹ <https://www.development.ohio.gov/files/research/C1025.pdf>

Land Use/Land Cover	Percentage
Barren (strip mines, gravel pits, etc.)	.03%
Forest	4.93%
Shrub/Scrub and Grasslands	.12%
Pasture/Hay	4.60%
Cultivated Crops	83.65%
Wetlands	.25%
Open Water	.27%

B. Major Waterways

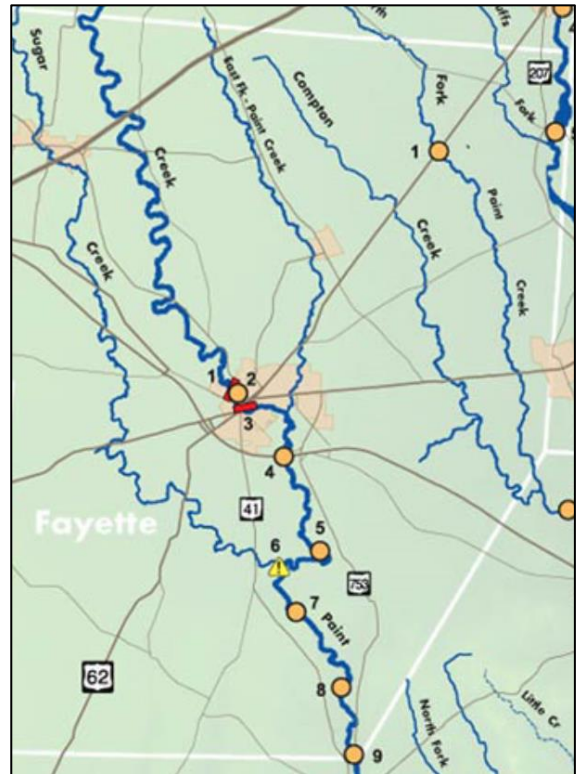
Paint Creek originates in Madison County and flows southerly into Fayette County, forming the boundary between Jefferson and Paint Townships, through Washington Courthouse, to the southeast corner of the county, forming the boundary between Perry and Wayne Townships and continuing between Highland and Ross Counties into the Paint Creek Lake.

Deer Creek originates in Madison County and flows southerly into Fayette County along its northeastern border into Deer Creek Lake – partially in Fayette and Pickaway Counties.

There are numerous tributaries – both continuous and intermittent – feeding into Deer or Paint Creeks, either in or out of the county.

C. State Lands²

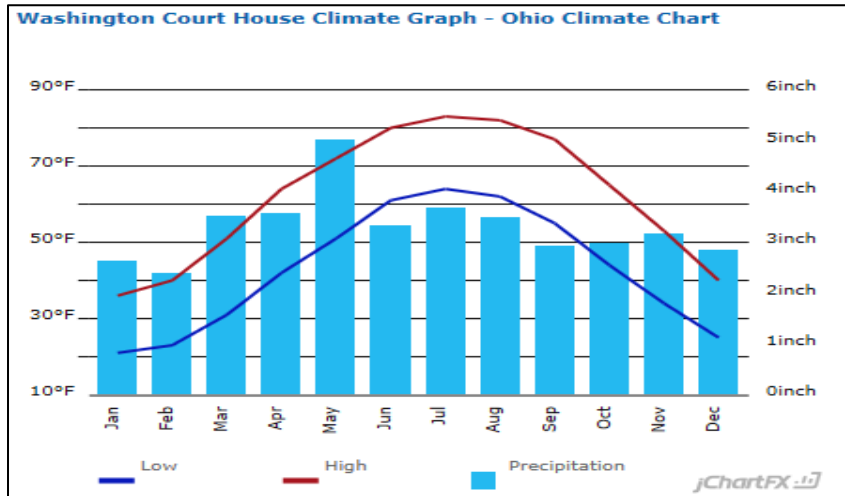
Deer Creek State Park is partially located in northeast Fayette County and in Pickaway County. Most amenities are located in Pickaway County.



² <http://ohiodnr.gov/>

III. Climate

The following chart depicts climate information for Fayette County³. The average temperature in Fayette County is 52 degrees. The county has temperature extremes from sub-zero in the winter to the mid-90s in the summer. Average wind is 7-12 miles per hour from the southwest. The average annual rainfall is 40 inches. Of this, the average snowfall is 21 inches.



IV. Jurisdictions and Populations

Fayette County is subdivided into ten townships, one city and five incorporated villages. Populations are 2018 estimates calculated by the Ohio Department of Development⁴



Jurisdiction	2018 Est	2010 Delta
Townships:		
Concord Township	883	-2.00%
Green Township	524	-1.50%
Jasper Township	577	-2.04%
Jefferson Township	1,390	-2.04%
Madison Township	1,099	-2.05%
Marion Township	646	-1.67%
Paint Township	1,021	-1.54%

³ <https://www.usclimatedata.com/climate/washington-court-house/ohio/united-states/usoh1002>

⁴ <https://www.development.ohio.gov/files/research/P5027.pdf>

Jurisdiction	2018 Est	2010 Delta
Perry Township	1,029	-2.00%
Wayne Township	1,354	-2.24%
Union Township	3,616	-1.87%
Townships Total	12139	-1.92%
Cities:		
Washington Court House	14,159	-0.56%
Cities Total	14,159	-0.56%
Villages:		
Bloomingsburg	919	-2.03%
Jeffersonville	1,176	-2.24%
Milledgeville	110	-1.79%
New Holland	105	-1.87%
Octa	58	-1.69%
Villages Total	2368	-2.11%
County Total	28,666	-1.27%

V. Demographics

The following information is a summary of information from the US Census Bureau⁵:

Population Trend. While the nation is growing at a 6% rate and Ohio at a 1.3% rate, Fayette County is losing population at a 1.5% rate (note the slight discrepancy between state and federal figures).

Diversity. With the exception of ethnicity and primary language (Fayette County is approximately 9% more European American, 7% less African American and 3% less Hispanic), Fayette County's diversity closely matches that of Ohio and the United States. This includes gender, age and family size.

Home Ownership. Fayette County's home ownership rate is 4% higher than the state and 6% higher than national averages.

Home Values. The average home value in Fayette County is \$120,900, 14% less than the state average and 41% less than the national average.

Education. Fayette County students graduate high school close to the national average. The number of residents with post-high school degrees is a little less than one half of the state and national averages.

Unemployment. Fayette County's unemployment rate is approximately 4%, similar to Ohio as a whole but about 1% above the national average.

Income. The per capita income is \$23,756, 22% lower than the state average and 27% lower than the national average. Eighteen percent of Fayette County's population live below the poverty line, 32% higher than the state and 54% higher than national levels.

For a comprehensive analysis of Fayette County's demographics, refer to the City-Data.com web site⁶.

⁵ <https://www.census.gov/quickfacts/fact/table/Fayettecountyohio,oh,US/PST045218>

⁶ http://www.city-data.com/county/Fayette_County-OH.html

VI. Congregate Care Populations⁷

Congregate Care facilities house people that typically require some form of assistance for daily activities. Challenges for emergency responders include assisting with evacuation and sheltering those in these facilities. The following list reflects population in the major congregate facilities:

Facility Name	Location	
Signature HealthCARE of Fayette County	375 Glenn Ave	Washington CH
St. Catherine’s Manor	250 Glenn Ave	Washington CH
Court House Manor	555 N. Glenn Ave	Washington CH
Four Season’s	201 Courthouse Parkway	Washington CH
Carriage Court Assisted Living	500 N Glenn Ave	Washington CH

VII. Major Community Events

The *Fayette County Fair* is held usually 3rd week in July at the Fayette County Fairgrounds. The fairgrounds are located east of Washington Court House between US 35, US 22, US 62 and Fairview Ave.

The *Scarecrow Festival* is held the 3rd weekend in September in downtown Washington Court House.

The *Toast to Summer* is held the last Saturday in June at the Fayette County Airport.

VIII. Structures Types and Values

For the purposes of mitigation planning, structures are classified as follows:

- *Residential.* These include single and multi-family dwellings, apartments, condominiums and the like. Congregate care facilities, such as nursing homes, are not included here.
- *Nonresidential.* Any structure not classified as Residential or Critical.
- *Critical.* These include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities and are not included in the above counts.

For the purposes of this plan, structure values are stated related to the replacement value, not the appraised or market value.

The following summaries the structure counts and values used in this plan⁸:

Structure Type	Inventory	Average Value
Residential	11,199	\$204,704
Nonresidential	1,075	\$787,403
Critical	25	\$450,000

IX. Major Transportation Routes

A. Highways

The major highways in Fayette County are:

I 71 traverses the county north-south from Pickaway County (Circleville) through Chillicothe to Pike County (Waverly).

US 35 traverses the county northwest to southeast from Fayette County (Washington Courthouse) through Chillicothe and Richmond Dale to Jackson County (Jackson).

⁷ Fayette County EMA

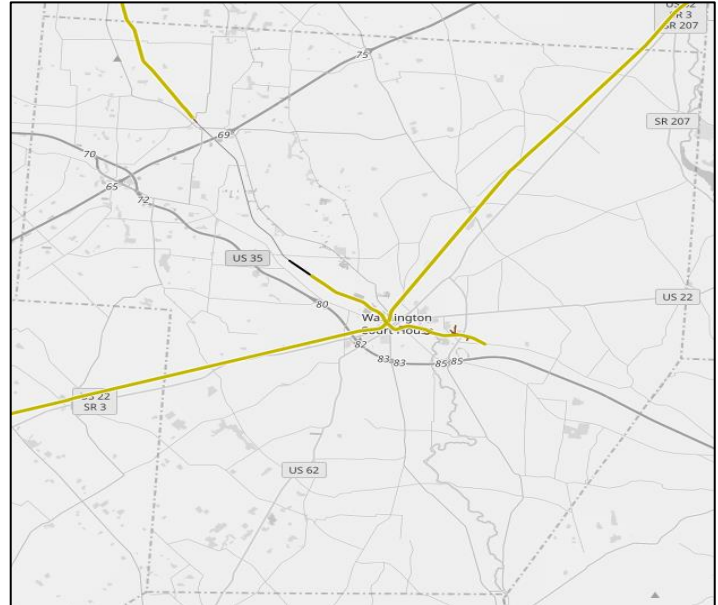
⁸ HAZUS Simulations discussed under Hazard Identification and Analysis

B. Airways

The Fayette County Airport is located northeast of Washington Courthouse off Old State Route 38 NE on Airport Rd NE.

C. Railways

Indiana & Ohio Railway Company (IORY) operates a railway that connects Washington Courthouse to Columbus, Springfield and Cincinnati. There are terminals near Washington Courthouse and Jeffersonville.⁹



X. Development Trends

A. Land Usage

Land usage hasn't changed significantly in recent years.

B. Economic Conditions

Fayette County is enjoying a steady decrease in unemployment – 15% in 2010 to currently 4.1%.

XI. Public Warning and Notifications Systems

A. NOAA Weather Radio All Hazards¹⁰

All county government facilities, local schools, hospitals and nursing homes are encouraged to have weather/all hazard alert radios.

B. Outdoor Warning Sirens

There are 17 outdoor warning sirens located in population centers around the county.

C. Public Safety Notification System

Fayette County employs Nixle, a notification system providing the capability to make emergency notifications to county residents via phone; cell phone users must register – approximately 20% of residents have registered.

XII. Authorities Affecting Mitigation Activities

A. Zoning and Building Regulations

Fayette County has a Planning Commission and countywide Comprehensive Plan which is and includes all townships and jurisdictions. Fayette County (covering unincorporated

⁹ <https://www.openrailwaymap.org/>

¹⁰ <http://www.nws.noaa.gov/nwr/>

areas) as well as all cities and villages have floodplain regulations formally adopted by resolution or ordinance. As of the Spring of 2005, all entities in Ohio now follow the State Building Code. There are no zoning ordinances in Fayette County. All health and safety regulations follow State of Ohio laws. Below is a summary of their capabilities:

Jurisdiction	Planning Commission	Comprehensive Plans	Floodplain Regulations	Building Codes	Zoning Ordinances	Capital Budget for Mitigation	Public Works Budget for Mitigation
Fayette County (Covers Unincorporated Areas)	Yes	Yes	Yes	Ohio Building Codes	No	No	Operating Funds In-Kind Wages
Washington Court House	Yes	No	Yes		Yes	No	Operating Funds In-Kind Wages
Bloomingsburg	No	No	Yes		No	No	In-Kind Wages
Jeffersonville	No	No	Yes		No	No	In-Kind Wages
Milledgeville	No	No	No		No	No	In-Kind Wages
New Holland	No	No	Yes		No	No	In-Kind Wages
Octa	No	No	Yes		No	No	In-Kind Wages

B. Floodplain Management

Fayette County floodplain regulations are maintained by the county commissioners and mayors of those cities and villages with such regulations. These regulations are the Special Purpose Flood Damage Reduction Regulations. Section 3.1 designates the position of Floodplain Administrator. Section 3.2 outlines the duties and responsibilities of this position. Duties include, but are not limited to enforcement of the regulations, routine monitoring of the flood zones and providing community assistance such as encouragement of owners to maintain flood insurance.

C. National Flood Insurance Program (NFIP)

The following table reflects participation in and compliance with the NFIP¹¹.

CID	Jurisdiction	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Sanction Date
390164	Fayette County	12/9/1977	6/1/1995	3/2/2004	6/1/1995	N/A
390166	Washington Court House	11/23/1973	8/18/1978	3/2/2004	8/15/1978	N/A
390281	Bloomingsburg		3/2/2004	3/2/2004	3/2/2005	N/A
390014	Jeffersonville	5/18/1974	3/5/1990	3/2/2004	3/5/1990	N/A
	Milledgeville	Chose not to participate – in FEMA-designated Area of Minimal Flood Hazard				
390448	New Holland	4/5/1974	7/22/2010	7/22/2010	1/18/1980	N/A
390560	Octa		3/2/2004	3/2/2004	3/2/2005	N/A

¹¹ <https://www.fema.gov/cis/OH.html>

D. Fayette County Health Department

The Health Department monitors and enforces regulations for septic systems and potable wells as well as deals with public health issues.

XIII. Mitigation Funding Sources

A. Operating Budgets

Funding for routine maintenance and improvements come from normal operating budgets. Mitigation Actions are considered when performing routine maintenance and improvements.

B. Grants

1. Community Development Block Grant Program¹²

The US Department of Housing and Urban Development's (HUD) Community Development Block Grant (CDBG) program is a flexible program that provides communities with resources to address a wide range of unique community development needs.

2. Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Act, as amended. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under the Presidential major disaster declaration, in areas of the State requested by the Governor.

3. Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 USC 5133. The PDM program is designed to assist States and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future major disaster declarations.

4. Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act (NFIA) of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

5. Other Mitigation Grants

Information on other grant programs is available on the Ohio EMA's State Hazard Analysis Resource and Planning Portal (SHARPP)¹³.

¹² http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

¹³ <http://ohiosharpp.ema.state.oh.us/OhioSHARPP/Grants.aspx#otherMitigationGrants>

Section IV – Hazard Identification and Analysis

I. Overview

The Fayette County Mitigation Planning Team identified hazards of credible threat and analyzed their impact using qualitative and quantitative methods. The team used the *FEMA Local Mitigation Planning Handbook, March 2013*¹⁴, as a guide for conducting analysis.

II. Hazard Identification

The Planning Team chose the natural hazards the Ohio EMA identified as those likely to impact the state of Ohio (as documented in the *2019 State of Ohio Hazard Mitigation Plan (SOHMP)*¹⁵, page 2-3) as the starting point for hazard identification. It then, based on a review of the community profile and historical records of hazards affecting south central Ohio, selected the natural hazards it considered to be credible threats to Fayette County’s assets. Eight of these hazards were identified for Hazard and Vulnerability Analysis.

Hazard from SOHMP	Significant Impact on Assets
Flooding	Yes
Winter Storms	Yes
Severe Summer Storms	Yes
Tornadoes	Yes
Drought	Yes
Earthquake	Yes
Dam/Levee Failure	Yes
Invasive Species	No – Day-to-day operations deals with these
Landslide	No – Not an issue
Land subsidence	Yes
Wildfire	No – No past impacts on assets
Coastal Erosion	No – No coastline

The Planning Team identified the following additional hazards that have had or would have significant impact on Fayette County:

- **Hazardous Materials Release.** This technological hazard has had impact on Fayette County in past with the potential to have major impact. This hazard was included in the ranking of hazards, hazard analysis, hazard profile and action development.
- **Pandemic.** The biological hazard would potentially have immeasurable impact. Illness and even deaths would cause a ripple affect all aspects of personal lives – physical, social, economic – as well as the community as a whole – medical assets, economic, policies and procedures, security to name a few. This hazard was included in the ranking of hazards, hazard analysis, hazard profile and action development.
- **Cyber Attack.** This man-made hazard has recently been experienced by the Fayette County government information systems with significant impact on operations relying on these systems as well as loss of productivity to restore the systems and to recreate lost information. As it is worth noting for others who may use the information in this plan for other purposes, this hazard was included in the ranking of hazards but not hazard analysis, hazard profile or action development.

¹⁴ <https://www.fema.gov/media-library/assets/documents/31598>

¹⁵ <https://sharpp.dps.ohio.gov/OhioSHARPP/Planning.aspx#SOHMP>

- **Power Outage.** This technological hazard has had significant impact on Fayette County in past. Although the primary contributing hazards – most notably Severe Winter Storms, Severe Summer Storms, and Tornadoes – are already addressed, this hazard was included in the ranking of hazards but not hazard analysis, hazard profile or action development.

III. Hazard and Vulnerability Analysis Methodology

The Planning Team profiled each of the eight natural hazards identified. It collected and reviewed hazard information, assessed the impacts and the vulnerabilities of the community’s assets. Events recorded in National Centers for Environmental Information (NCEI)¹⁶ data base as well as locally added events were considered occurrences. Criteria for NCEI event inclusion and categorization are contained in the *National Weather Service Instruction 10-1605*¹⁷

The team assigned risk factor values based on the criteria and adjusting factors established by the Ohio EMA.

Risk Factor	Criteria	Adjusting Factor
Frequency	If a hazard/event does not apply it is given a value of NA. If a hazard/event resulted in no local disaster declarations, it scored a one. If the hazard/event resulted in one – two local disaster declarations, it has a Low Probability of occurrence and scored a two. If it resulted in three – five declarations, it has a Medium Probability and numerical score of three. If the hazard/event resulted in six – eight local disaster declarations, it has a High Probability and scored a four. If the hazard/event resulted in nine or more declarations, it should receive an Excessive Probability rating and a score of five. It is important to note that frequency was considered a key factor in determining the hazard profile. To that end, an Adjusted Frequency score was added for this factor and multiplied by 1.5 to weight the score more importantly than other factors.	1.5
Response	Average Response Duration may be defined as "time on the ground" or the time-period of response to a hazard, or event. Transportation accidents may last a few hours whereas a tire fire may last a week or a flood several weeks. Duration, therefore, may not always be indicative of the degree of damage but it remains an important planning factor.	1
Onset	Average Speed of Onset may affect all other factors due to lack of warning or time to prepare for impact. The lead-time required protecting lives and property varies greatly with each event. For instance, a winter storm may develop so slowly that there is time to alert crews and emplace plows, but flash floods can occur with no warning.	1
Magnitude	Average Magnitude is the geographic dispersion of the hazard. For instance, how much of your community would be impacted by a flood or hazardous material incident? Similar to the Frequency, this factor is deemed more important and therefore received a weighted value of 1.25 above the raw score. The score is based on the percent of land area impacted by an event.	1.25

¹⁶ <http://www.NCEI.noaa.gov/stormevents/>

¹⁷ <https://www.ncdc.noaa.gov/stormevents/pd01016005curr.pdf>

Risk Factor	Criteria	Adjusting Factor
Business	The Impact on Business refers to enduring economic impact of the hazard on the community by an event. A score of one compares to a shutdown of critical facilities for less than 24 hours. Two equals a complete shutdown of critical facilities for one week. A score of three means a complete shutdown of critical facilities for at least two weeks. A score of four equals a complete shutdown of critical facilities for 30 days or more. This factor was developed and in keeping with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	1
Human	This factor relates to the number of lives potentially lost to a particular hazard agent. This factor can vary between jurisdictions based on economic, geographic, and demographics of the particular populations. Therefore, some generalization need be inflected on this factor. This factor was developed and in keeping with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	1
Property	This factor relates to the amount of property potentially lost to a particular hazard agent. This factor can vary between jurisdictions based on economics, geographic amount owned, and demographics of the particular populations. Therefore, some generalization need be inflected on this factor. This factor was developed and in keeping with the hazard analysis in the Ohio Standard Mitigation Plan developed by the Ohio EMA Mitigation Branch.	1

The team then estimated countywide structures at risk and associated damages for typical events using the following formula:

Structure Type	Inventory	Average Value	Percent at Risk	Number at Risk	Percent Damaged	Number Damaged	Percent Damages	Total Damages
Residential	38,473	\$76,246	0.5%	192.4	10.0%	19.2	10.0%	\$146,392
Nonresidential	4,920	\$114,407	1.0%	49.4	10.0%	4.9	10.0%	\$56,059
Critical	19	\$250,000	0.0%	0.0	0.0%	0.0	10.0%	\$0

The team estimated the percent of total or actual numbers of structures at risk, the percent of these or actual number of damaged in a typical event and the percent of structure or actual structural damage. Knowing the inventory and average value, total damages incurred for a typical event were then calculated. If numeric estimates were available, they were used in lieu of estimating by percentage.

IV. Hazard and Vulnerability Analysis Results

The following summarizes the analysis results. Details are contained in *Section V – Hazard Profiles, Analyses and Vulnerable Assets*.

A. Hazard Analysis

The following table consolidates and ranks the analysis of each hazard:

Hazard	Frequency	Response	Onset	Magnitude	Business Impact	Human Impact	Property Impact	Adjusted Total
Severe Winter Storms	4.5	2	3	5	0	1	1	16.5
Pandemic	1.5	5	1	0	4	4	0	15.5
Severe Summer Storms	4.5	2	2	3.75	0	0	1	13.25
Power Outage *	3	2	1	3.75	1	2	0	12.75
Tornadoes	3	1	3	1.25	0	2	2	12.25
Hazardous Material Release	3	2	4	0	0	2	0	11
Dam Failure	1.5	2	3	1.25	1	1	1	10.75
Cyber Attack *	1.5	3	4	0	0	0	0	8.5
Droughts	1.5	3	1	2.5	0	0	0	8
Flooding	3	1	2	1.25	0	0	0	7.25
Earthquakes	0	1	1	1.25	1	1	1	6.25
Land Subsidence	1.5	1	1	1.25	0	0	0	4.75

* These hazards were included in the ranking of hazards but not hazard analysis, hazard profile or action development.

B. Vulnerability Analysis

The following table consolidates the property impact analysis of each vulnerability:

Hazard	Structures at Risk				Damage in Millions of Dollars			
	Residential (Res)	Non-Res	Critical (Crit)	Total	Res	Non-Res	Crit	Total
Severe Winter Storms	280	27		307	0.158	0.053		0.211
Severe Summer Storms	336	32		368	0.069	0.013		0.081
Tornadoes	672	54		726	0.413	0.106		0.518
Hazardous Material Release								
Dam Failure					0.921			0.921
Droughts								
Flooding	11199	1075	26	12300	8.140			8.140
Earthquakes	11199	1075	26	12300	196.827	157.140	0.357	354.324
Land Subsidence								
Pandemic								

Section V – Hazard Profiles, Analyses and Vulnerable Assets

I. Severe Winter Storms

A. Description

A winter storm is an event in which the main types of precipitation are snow, sleet or freezing rain. Winter Storm hazards include wind chill, ice storms, heavy snow, and blizzard conditions.

Most deaths from winter storms are not directly related to the storm itself.

- People die in traffic accidents on icy roads.
- People die of heart attacks while shoveling snow.
- People die of hypothermia from prolonged exposure to cold.

Everyone is potentially at-risk during winter storms. The actual threat to you depends on your specific situation. Recent observations show that:

Of injuries related to ice and snow:

- About 70% occur in automobiles.
- About 25% are people caught out in the storm.
- Majority are males over 40 years old.

Of injuries related to exposure to cold:

- 50% are people over 60 years old.
- Over 75% are males.
- About 20% occur in the home.

Three basic ingredients are necessary to make a winter storm:

- Cold air. Below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.
- Lift. Something to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountainside.
- Moisture. To form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.

The severity may be measured in inches of snow or ice, but it's more the combination of freezing precipitation with the ambient and precipitation conditions just before the storm as well as the duration of freezing temperatures with temperatures hovering around freezing being an enhancer to the severity.

Wet Snow and Freezing Rain can weigh down power lines, tree limbs and roofs of structures. Wet snow compacts and can be difficult to dispose of.

Ice results for rain freezing or snow compacting. In addition to the effects of wet snow and freezing rain, ice can build up over time. As the temperature drops, it becomes harder and difficult to remove with snowplows; heavy equipment is usually needed. As the temperature rises above freezing, ice left on gravel roads, as are most township roads, will melt and seep into the roadbed causing the "bottom to drop out."

Dry Snow is usually not a significant problem as it can be plowed away.

There may also be flooding if the snow/ice accumulation is significant and the temperatures warm quickly.

Severe winter storms are those winter storms that have a significant impact. Source: NOAA¹⁸.

B. Extent of Hazard

The severity of winter storms is measured in terms of snowfall, wind and temperature. Generally, a severe winter storm adds at least 6 new inches of snow, has winds of 40 mph or greater, causes ice accumulation of ½ inch or more or has a wind chill factor or less than 0 degrees.

Significant events as recorded by NCEI and local sources are considered occurrences.

C. Historical Occurrence

The following major occurrences (injuries, deaths, total damage \$5,000 or greater) were recorded by the National Centers for Environmental Information (NCEI)¹⁹ and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Winter Storm	1/6/1996			500	
Cold/Wind Chill	2/1/1996			20	
Winter Storm	12/22/2004			96	

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	24	92	0.0	0.0	7	0	383%	3
Major Events	24	3	0.0	0.0	206	0	13%	96

- **Cold/Wind Chill - 1/2/1996**

Arctic high pressure brought the coldest air of the season to the Ohio Valley. Cincinnati broke its record low on the 4th with a temperature of 11 below zero. Cincinnati also experienced its record low maximum temperatures of 7 and 6 degrees on the 3rd and 4th respectively. The extreme cold was entrenched for 5 days, freezing and bursting numerous water pipes. There were at least 2 house fires indirectly related to the cold weather, as space heaters, which were thawing frozen water lines, caught on fire. On

¹⁸ <http://www.nssl.noaa.gov/education/svrwx101/winter/>

¹⁹ <http://www.NCEI.noaa.gov/stormevents/>

the 5th, six thousand customers were without power near Portsmouth as over usage caused outages. AAA motor club had an extremely high number of calls during this cold wave when cars would not start.

- **Winter Storm - 6/1/1996**

The Blizzard of '96 developed near the Gulf Coast and moved up the East Coast. This massive system produced the greatest total and 24-hour snowfall at Greater Cincinnati Northern Kentucky airport. This one storm brought 14.3 inches of snowfall to the airport which normally receives 23 inches for an entire season. The heaviest snow fell near the Ohio river in the extreme south. The worst blizzard conditions occurred over West Central areas as dry and powdery snow was blown around by high winds causing whiteouts. Some areas had more than 30 continuous hours of snowfall, and many people in Southern Ohio felt this was the worst winter storm since the Blizzard of '78. In Fayette county, the airport reported a wind gust to 56 mph during the height of the storm. By the end of the storm many homes and businesses had their roof collapse or partially collapse from the weight of the new snow, and snow from a storm earlier in the week. By late in the day on the 7th arctic air was pouring into the region. A 47-year-old man died of exposure under an overpass in Miami county. A 76-year-old man died of exposure on his front porch in Montgomery county.

- **Winter Storm - 12/22/2004**

A surface and upper level low pressure center tracked northeast across the Ohio Valley on Wednesday, December 22nd and exited the region on the 23rd. A swath of heavy snow cut through southeast Indiana and into the Miami Valley of Ohio. 24-hour storm totals in this narrow band exceeded 2 feet in Preble and Darke counties. Snowfall totals of 20 inches or more were found along a line generally running from Eaton to Greenville, Piqua, Sidney, and Bellefontaine. Along and west of the I-71 corridor between Cincinnati and Columbus...over 8 inches of snow fell. East of this line, warm air infiltrated the lower layers of the atmosphere and brought periods of freezing rain and sleet during the evening and overnight hours. A quarter inch or more of ice occurred along a line from Batavia to Hillsboro, to Circleville and Newark. Several communities in south central and central Ohio were crippled by power outages. Up to 236,000 electric customers were without power for several hours, some lasting up to a week before it was restored. At one point in time, 90% of Highland county was without power, and parts of Adams county were without water for a week. The Ohio Insurance Agency estimated the damage to all of Ohio from this storm to be on the order of 85 million dollars, including over 25 million dollars in property damage.

- **Frost/Freeze - 6/4/2007**

Unseasonably warm temperatures for an extended period of time in March allowed much of the Ohio Valley to begin its agricultural growing season early. In early April, a cold snap with low temperatures dropping into the low 20s threatened agricultural interests across the region. The full effect of these weather extremes is still yet to be known and will not be known until the fall harvest can be compared with yields from previous years. The initial estimate of 16.74 million in crop damage was split evenly between 31 Ohio counties.

D. Probability of Future Occurrences

With 92 occurrences in the past 24 years, the probability of such an occurrence in a given year is 383% or an average of one every 3 months.

With 3 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 24 years, the probability of such an occurrence in a given year is 13% or an average of one every 96 months.

E. Affected Locations

Severe winter storms affect the entire county.

F. Analysis

Factor	Ranking
Frequency	Medium: 3-5 Declarations
Response	< 1 Day
Onset	6-12 Hours
Magnitude	> 50% Land Area
Business	No Impact
Human	Minor Injuries
Property	< 10% Damaged

G. Vulnerable Community Assets

Asset	Impact
People	The primary impact on people would be isolation and not being able to travel at least on primary routes for about 12 hours after the storm subsided. Power outages would also be widespread.
Economy	Loss of power affect businesses both in loss of sales and refrigeration. Late season freezing and heavy snow may adversely affect crops.
Infrastructure	Electricity is likely to be out for a period of time. As this time increases, other utilities dependent on power will also likely fail.
Structures	Older structures and those with flat roofs would be most at risk by the weight of snow and ice on their roofs. The NWS's estimate of \$206,000 in damages per major event was used in this analysis.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704	2.5	280	5.5	15	5	\$157,608
Nonresidential	1,075	\$787,403	2.5	27	5.5	1	5	\$52,903
Critical	26	\$450,000	0	0	5	0	0	\$0

II. Pandemic

A. Description

Disease outbreaks are usually caused by an infection, transmitted through person-to-person contact, animal-to-person contact, or from the environment or other media. Occasionally the cause of an outbreak is unknown, even after thorough investigation.

A number of environmental factors influence the spread of communicable diseases that are prone to cause epidemics. The most important of these are:

- water supply
- sanitation facilities
- food
- climate

A lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food can all cause diarrheal diseases. These diseases are a major cause of suffering and death in an emergency situation.

Climate can affect disease transmission in a variety of ways. The distribution and population size of disease vectors can be heavily affected by local climate. Flooding after heavy rains can result in sewage overflow and widespread water contamination. In addition, there is some evidence to suggest that pathogens can be spread from one region to another along air streams or by wind.

Occasionally, an outbreak is seen in a population for which the cause is unclear. Such an outbreak may be due to a new or modified pathogen, a natural toxin, or it may be due to an initially undetected release of a chemical agent or over-exposure to ionizing radiation.

Source: World Health Organization²⁰

For transmission to occur, there must be a source (typically an infected person), susceptible person and a mode of transmission. Typical modes of transmission are:

- Contact moves germs by touching germs present on surfaces and then carry the germs on their hands and spread to a susceptible person when proper hand hygiene is not performed before touching the susceptible person.
- Sprays and splashes occur when an infected person coughs or sneezes, creating droplets which carry germs short distances (within approximately 6 feet). These germs can land on a susceptible person's eyes, nose, or mouth and can cause infection. Close range inhalation occurs when a droplet containing germs is small enough to breathe in but not durable over distance.
- Inhalation occurs when germs are aerosolized in tiny particles that survive on air currents over great distances and time and reach a susceptible person. Airborne transmission can occur when infected patients cough, talk, or sneeze germs into the air.
- Sharps injuries can lead to infections when bloodborne pathogens enter a person through a skin puncture by a used needle or sharp instrument.

Source: Centers for Disease Control and Prevention²¹

²⁰ https://www.who.int/environmental_health_emergencies/disease_outbreaks/communicable_diseases/en/

²¹ <https://www.cdc.gov/infectioncontrol/spread/index.html>

A pandemic is a disease outbreak that spreads across countries or continents. The most common and anticipated is an influenza pandemic. This is a global outbreak of a new influenza A virus that is very different from current and recently circulating human seasonal influenza A viruses. Influenza A viruses are constantly changing, making it possible on very rare occasions for non-human influenza viruses to change in such a way that they can infect people easily and spread efficiently from person to person.

B. Extent of Hazard

A major pandemic is measured by a count of occurrences that result in emergency or disaster declaration.

C. Historical Occurrences

1918-1920 – Spanish Flu. The 1918 Influenza (Spanish Flu) pandemic which lasted globally for two years. There are wildly conflicting estimates about how many people caught the flu and how many people died from it. The lack of records from the time (either due to wartime censorship or shortages) makes it hard to tell. The smallest estimate is that 17 million people died. The highest estimate is that 100 million people died, or 5% of the global population. The flu pandemic is believed to have infected 500 million people, or over a quarter of the world.

1949-1952 - Polio. Over 6,000 people die from polio in the United States, out of a reported 100,000 cases. This, followed by the development of the polio vaccine, prompts one of the first major drives to inoculate children in the U.S.

1957 – Asian Flu. The "Asian Flu," H2N2, comes to the United States from China. It originates from a mutant flu strain carried by ducks. It arrives in the U.S. in June. This influenza pandemic kills 116,000 people in the United States.

1968 – Hong Kong Flu. The "Hong Kong Flu" is the third of the three influenza pandemics of the 1900s. This flu had a much lower mortality rate than the other two, but still resulted in 33,000 deaths in the U.S.

1981-2007 – HIV/AIDS. Human immunodeficiency viruses (HIV) and the symptomatic Acquired Immunodeficiency Syndrome (AIDS) spreads across the country, especially infecting high rates of homosexual people, lower income people, and drug addicts. Treatment for the disease receives little funding and attention due to the groups it affects. The FDA approves new tests that can quickly detect HIV, and new treatments. In 2007, Timothy Ray Brown becomes the first man cured of HIV. By this time, at least 600,000 people have died of HIV/AIDS in the U.S. alone.

2009 – Swine Flu. In April, H1N1, also known as Swine Flu, broke out and quickly spread to more than 150 countries. The CDC reported that between April and October 22 million Americans had contracted the virus, 98,000 required hospitalization, and about 3,900 people died from H1N1-related causes. The WHO estimated that the final death toll worldwide ending up reaching nearly 300,000.

2020 – COVID-19. A new coronavirus, identified just as the novel coronavirus and then the 2019 Corona Virus Disease (COVID-19), claimed its first official victim in China. At least one American traveler returning from Wuhan contracted the disease before the city is isolated. The coronavirus outbreak reached the United States; the first U.S. victim died from the disease, prompting widespread panic. The coronavirus outbreak in the U.S. is officially declared a national emergency. The Director-General of the WHO declared the

disease to have grown from epidemic proportions to a pandemic. At the urging of health officials, different states began enforcing restrictions on businesses and public gatherings to contain the disease. The economy came to a virtual standstill and unemployment soared. Local, regional, state and federal health systems and government agencies are being stressed with rapidly changing conditions. The full effects and implications on how this virus will affect community assets will not be known for so time to come.

Of these occurrences, only the Spanish Flu and COVID-19 are considered major events.

D. Probability of Future Occurrences

The estimated risk of the future occurrence of a major infectious disease outbreak is once every 100 years or 1% in a given year.

E. Affected Locations

The entire county would be affected.

Note that the following rankings and assessments were developed before the ongoing COVID-19 pandemic. They will be updated at the next mitigation plan update.

F. Analysis

Factor	Ranking
Frequency	None: No Declarations
Response	> 1 Month
Onset	> 24 Hours
Magnitude	No Impact
Business	> 30 Days
Human	Multiple Deaths
Property	No Impact

G. Vulnerable Community Assets

Asset	Impact
People	Many people will develop life-threatening conditions; many will also die. Measures to contain the spread the disease may cause emotional hardships for many.
Economy	In a major pandemic, portions or even most all of the economy may be shutdown - even for a short period of time would cause ripple and long-term impacts.
Infrastructure	No direct impact.
Structures	No direct impact.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704		0		0		\$0
Nonresidential	1,075	\$787,403		0		0		\$0
Critical	26	\$450,000		0		0		\$0

III. Severe Summer Storms (includes Windstorms and Hail)

A. Description

A thunderstorm is a rain shower during which you hear thunder. Since thunder comes from lightning, all thunderstorms have lightning. A thunderstorm is the result of convection. Usually created by surface heating, convection is upward atmospheric motion that transports whatever is in the air along with it—especially any moisture available.

Damaging winds are often called “straight-line” winds to differentiate the damage they cause from tornado damage. Strong thunderstorm winds can come from a number of different processes. Most thunderstorm winds that cause damage at the ground are a result of outflow generated by a thunderstorm downdraft. Damaging winds are classified as those exceeding 50-60 mph.

Damage from severe thunderstorm winds account for half of all severe reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles.

Since most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft, anyone living in thunderstorm-prone areas of the world is at risk for experiencing this hazard. People living in mobile homes are especially at risk for injury and death. Even anchored mobile homes can be seriously damaged when winds gust over 80 mph.

Severe windstorms can have a devastating effect on a community. Winds can cause trees to fall and structures to fail. These can cascade into other impacts such as downed power lines, interrupting travel and power, and trees blocking roads and causing damage to close-by structures.

Hail is often produced by severe thunderstorms. Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice. Hail can damage aircraft, homes and cars, and can be deadly to livestock and people.

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Hailstorms frequently accompany thunderstorms, so their locations and spatial extents overlap. Hail can cause substantial damage to vehicles, roofs, landscaping, and other areas of the built environment. U.S. agriculture is typically the area most affected by hailstorms, which cause severe crop damage even during minor events.

Hail is usually pea-sized to marble-sized, but big thunderstorms can produce big hail.

B. Extent of Hazard

A thunderstorm is classified as “severe” when it contains one or more of the following: hail one inch or greater or winds gusting in excess of 50 knots (57.5 mph). Additionally, rainfall rates greater than 2 inches per hour or one that produces hail indicates a severe thunderstorm.

The severity of hailstorms is measured in hail size. Hail of .75-inch diameter is considered to be damaging.

Significant events as recorded by NCEI and local sources are considered occurrences.

C. Historical Occurrence

The following major occurrences (injuries, deaths, total damage \$5,000 or greater) were recorded by the National Centers for Environmental Information (NCEI)²² and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Thunderstorm Wind	6/16/1994			5	
Thunderstorm Wind	6/16/1994			5	
Thunderstorm Wind	6/17/1994			50	
Thunderstorm Wind	6/18/1994			5	
Thunderstorm Wind	8/4/1994			5	
Thunderstorm Wind	8/8/1996			5	
Thunderstorm Wind	11/7/1996			50	
Thunderstorm Wind	7/2/1997			20	
Thunderstorm Wind	7/19/1998			10	
Thunderstorm Wind	8/25/1998			5	
Thunderstorm Wind	9/7/1998			10	
Thunderstorm Wind	6/11/1999			8	
Thunderstorm Wind	10/13/1999	2		50	
Thunderstorm Wind	4/20/2000			5	
Hail	5/23/2000			100	
Thunderstorm Wind	6/14/2000			8	
Thunderstorm Wind	7/14/2000			5	
Thunderstorm Wind	7/14/2000			5	
Thunderstorm Wind	9/20/2000			5	
Thunderstorm Wind	9/20/2000			5	
Thunderstorm Wind	11/9/2000			5	
Thunderstorm Wind	3/13/2001			10	
Thunderstorm Wind	10/24/2001			5	
High Wind	3/9/2002			20	
Hail	4/28/2002			5	
Thunderstorm Wind	5/25/2002			10	
Thunderstorm Wind	8/27/2003			8	
Hail	7/25/2005			5	
Thunderstorm Wind	4/2/2006			20	
Thunderstorm Wind	4/2/2006			25	
Thunderstorm Wind	10/4/2006			15	

²² <http://www.NCEI.noaa.gov/stormevents/>

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
High Wind	12/1/2006			10	
Thunderstorm Wind	4/11/2007			5	
Thunderstorm Wind	5/15/2007			15	
Thunderstorm Wind	8/25/2007			10	
Thunderstorm Wind	1/9/2008			10	
Thunderstorm Wind	2/6/2008			25	
Hail	6/21/2008			15	
Thunderstorm Wind	7/26/2008			6	
High Wind	9/14/2008			3,300	
Thunderstorm Wind	6/4/2010			8	
Thunderstorm Wind	6/4/2010			15	
Thunderstorm Wind	8/14/2010			2	5
Thunderstorm Wind	9/7/2010			20	
Thunderstorm Wind	10/26/2010			5	
Thunderstorm Wind	3/23/2011			5	
Thunderstorm Wind	4/20/2011			20	
Thunderstorm Wind	4/20/2011			15	
Thunderstorm Wind	4/20/2011			20	
Thunderstorm Wind	5/26/2011			30	
Thunderstorm Wind	6/29/2012			10	
Thunderstorm Wind	6/29/2012			25	
Thunderstorm Wind	7/1/2012			10	
Thunderstorm Wind	4/29/2014			15	
Thunderstorm Wind	7/13/2014	1		20	
Thunderstorm Wind	7/11/2017			5	
Thunderstorm Wind	3/14/2019			100	

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	62	209	0.0	0.0	21	0	337%	4
Major Events	62	57	0.0	0.0	76	0	92%	13

- **Thunderstorm Wind - 6/17/1994**

Two barns were destroyed.
- **Thunderstorm Wind - 7/11/1996**

Numerous trees downed. On a local farm, winds blew a grain leg over the top of a drying bin which caused the roof to cave in. Roof was also blown off a barn. Glass was broken in the door of the Washington Court House police department.
- **Thunderstorm Wind - 10/13/1999**

A cold front pushed east from Illinois and Indiana during the afternoon hours and combined with a vigorous upper level disturbance that dropped into the Ohio Valley from the lower Great Lakes region. These factors prompted a squall line to develop ahead of the cold front that moved southeast through the Wilmington Ohio (ILN) county warning area before entering northeast Kentucky and southeast Ohio. A downburst from a thunderstorm blew a mobile home on its side causing minor injuries to the two occupants. Trees and utility poles were also uprooted and knocked across main roads and railroad tracks.
- **Hail - 5/23/2000**

Large hail fell causing damage at several local car dealerships. Around 200 vehicles received some damage.
- **Thunderstorm Wind - 3/13/2001**

A Semi truck was blown over along State Route 218 in Washington Court House and trees were knocked down in South Plymouth.
- **High Wind - 9/3/2002**

A widespread area of high winds blew down trees, power poles, and various other smaller structures and signs. At one time, approximately 100,000 people were without power. One man was killed when his semi tractor overturned, and several others were injured in automobile accidents, and when trees fell on the buildings that they were in. Two people were briefly trapped in a mobile home when a tree fell on it. The hardest hit area was just southwest of Columbus in Grove City where an 84 mph wind was recorded and several structures at the high school were damaged or destroyed.
- **Thunderstorm Wind - 2/4/2006**

A trailer and barn suffered significant damage. A carport collapsed at the same location. A semitruck was overturned on US Route 35.
- **Thunderstorm Wind - 2/4/2006**

A building and pole barn were destroyed along US Route 62. Additionally, the home on the property suffered some siding damage, and a truck sustained significant damage.
- **Thunderstorm Wind - 4/10/2006**

A line of severe thunderstorms affected central Ohio during the afternoon and evening ahead of a cold front.

A semi-trailer overturned along Interstate 71 near the Jeffersonville exit. A roof was peeled off of a mobile home along Prairie Road. Penny size hail occurred along State Route 41 northwest of Washington Court House.
- **Thunderstorm Wind - 5/15/2007**

Severe thunderstorms developed during the evening ahead of a cold front. A roof was taken off of a mobile home, and a barn was leveled along White Road.

- **Thunderstorm Wind - 6/2/2008**

A line of severe thunderstorms developed during the late evening ahead of a strong cold front. Persistent heavy rain caused flooding, especially across west central Ohio. Numerous trees and power poles were downed along Creek Road. A barn and a garage were destroyed, along with minor structural damage to the house on the property.

- **Thunderstorm Wind - 9/1/2008**

A thin convective band developed along a strong cold front during the late evening and overnight, producing isolated wind damage.

A small shed was blown onto a road near Bloomingburg. A tree fell onto a garage west of New Holland, producing minor damage to the roof and door.

- **High Wind - 9/14/2008**

The remnants of hurricane Ike raced northeast through the midwest and merged with a frontal boundary across the lower Ohio Valley Sunday morning. Abundant sunshine promoted deep mixing of the atmosphere, and warm, dry air aloft translated down to the surface. Gusty winds in excess of 70 mph persisted for a period of several hours, causing significant damage and widespread power outages.

Strong winds of 40 to 50 miles per hour were sustained for several hours. Gusts over 60 mph were common. Widespread damage occurred across the region, from trees being blown down on powerlines, to significant crop losses and structural damage.

- **Thunderstorm Wind - 4/6/2010**

Southwest to northeast convective lines saw explosive development during the late day and early evening hours. Boundary interactions helped to push many of these storms to severe limits.

Farm equipment was overturned, power poles were down, and trees were down due to damaging thunderstorm winds. One tree fell onto a home.

- **Thunderstorm Wind - 7/9/2010**

A cold front pushed into a thin area of instability that had developed due to the strong surface heating during the day. Convection never organized into complete lines, but some individual cells became strong to severe. Moisture had advected northward into the area in advance of the front. Motion of the storms was fairly quick and towards the east.

Trees were reported down around the area and a barn was destroyed due to damaging thunderstorm winds.

- **Thunderstorm Wind - 8/14/2010**

A warm and moist air mass was in place across the region during the afternoon hours. Temperatures were in the upper 80s to lower 90s with dewpoints in the low to middle 70s. A weak mid level short wave combined with residual boundaries allowed for scattered thunderstorm development through the mid afternoon hours. These thunderstorms continued into the early evening hours.

A few trees were uprooted and part of a bean field was flattened due to damaging thunderstorm winds.

- **Thunderstorm Wind - 10/26/2010**

A historically deep low pressure system sent a very strong cold front into a marginally unstable, but very sheared environment. A line of storms formed west of the area overnight and moved into the region during the peak heating hours of the day. Severe wind gusts occurred along the entire line with multiple tornadoes occurring around the region as well.

A large tree was reported down on a house due to damaging thunderstorm winds.

- **Thunderstorm Wind - 4/20/2011**

A line of storms moved through the area during the late night hours of April 19th and into the early morning hours of April 20th.

Silos, power poles, and trees were knocked down due to damaging thunderstorm winds. In addition, damage occurred to a building in the area. Several structures had windows blown in due to damaging thunderstorm winds. Structural damage was reported to homes due to damaging thunderstorm winds.

- **Thunderstorm Wind - 5/26/2011**

A strong low pressure system west of the Ohio Valley approached during peak heating on May 25th. This resulted in the development of widespread severe thunderstorms with large hail and damaging winds during the afternoon and evening hours. Later in the evening, a quasi-linear convective system swept west to east across the area. The result was straight line wind damage and a few tornadoes.

A barn was destroyed due to damaging thunderstorm winds.

- **Thunderstorm Wind - 6/29/2012**

A very hot and potentially unstable airmass interacted with northwesterly flow aloft to produce a derecho across northern Illinois. This derecho then moved rapidly east southeast across the Ohio Valley producing widespread straight line wind damage. This rare derecho affected nearly every county in southeast Indiana, northern Kentucky, and southwestern Ohio with severe winds. This caused widespread power outages that lasted several days in some locations. Isolated large hail also occurred with the stronger portions of the system.

A tractor trailer was blown over on Interstate 71 due to thunderstorm winds. A large 100-year-old tree was uprooted due to thunderstorm winds. Other trees and branches were downed in the area. Two semi-trucks were overturned on Interstate 71. This made a total of 3 semi-trucks overturned on the interstate.

- **Thunderstorm Wind - 4/29/2014**

Thunderstorms developed along and south of a warm front during the afternoon. Some of these storms had the potential to become severe. The main threats from these storms were damaging winds and sub severe hail.

A barn was destroyed on Miami Trace Road due to thunderstorm winds.

- **Thunderstorm Wind - 7/13/2014**

Scattered thunderstorms developed during the afternoon hours ahead of a slow-moving cold front. Some of the storms produced large hail, damaging winds and locally heavy rainfall.

A camper was rolled over and heavily damaged due to thunderstorm winds, injuring a man inside the camper. A semi-trailer truck was blown over on Interstate 71 near the intersection of SR 41. Numerous trees were also downed in the area.

- **Thunderstorm Wind - 11/7/2017**

A slow-moving frontal boundary combined with a moist environment to produce scattered severe storms and localized flash flooding.

A barn was destroyed on Bloomingburg New Holland Road.

D. Probability of Future Occurrences

With 209 occurrences in the past 62 years, the probability of such an occurrence in a given year is 337% or an average of one every 4 months.

With 57 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 62 years, the probability of such an occurrence in a given year is 92% or an average of one every 13 months.

E. Affected Locations

Severe summer storms affect the entire county.

F. Analysis

Factor	Ranking
Frequency	Medium: 3-5 Declarations
Response	< 1 Day
Onset	12-24 Hours
Magnitude	25-50% Land Area
Business	No Impact
Human	No Impact
Property	< 10% Damaged

G. Vulnerable Community Assets

Asset	Impact
People	The primary impact on people would be isolation and not being able to travel at least on primary routes for several hours – perhaps more on township roads that may be washed out. In some cases county roads, state routes and US highways may also be rendered impassible due to erosion damage. Injuries are possible from hail and other falling objects.
Economy	Loss of power affect businesses both in loss of sales and refrigeration. Heavy rain and hail may adversely affect crops.
Infrastructure	The primary vulnerable infrastructure assets are roads, culverts and bridges, damaged by erosion. Lightning may adversely affect electrical and communications systems.
Structures	All structures are at risk for rain water and hail damage. The Planning Team used the NWS's estimate of \$76,000 in damages per major event in this analysis.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704	3	336	2	7	5	\$68,774
Nonresidential	1,075	\$787,403	3	32	2	0	5	\$12,696
Critical	26	\$450,000	0	0	1	0	5	\$0

IV. Tornadoes

A. Description

A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

Source: NOAA²³

B. Extent of Hazard

The severity of winds storms is measured in wind speed. Severe windstorms are those whose sustained winds are at least 40 mph and gusts exceed 57 mph.

The severity of tornadoes is measured by the damaged it caused and relates it back to estimated three-second wind speed. The Enhanced Fujita Scale is used to rate tornadoes.

Significant events as recorded by NCEI and local sources are considered occurrences.

EF 0	65-85 mph
EF 1	86-110 mph
EF 2	111-135 mph
EF 3	136-165 mph
EF 4	166-200 mph
EF 5	Over 200 mph

C. Historical Occurrence

The following major occurrences (injuries, deaths, total damage \$5,000 or greater) were recorded by the National Centers for Environmental Information (NCEI)²⁴ and local records. Available narratives of major events follow the table.

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Tornado	11/16/1965	4		250	
Tornado	2/22/1971			25	
Tornado	5/2/1983			250	
Tornado	3/10/1986		1	2,500	
Tornado	9/14/1990			2,500	
Tornado	5/14/1997			30	
Tornado	10/13/1999			30	
Tornado	5/27/2004	1		50	
Tornado	10/26/2010			75	
Tornado	5/26/2011			35	
Tornado	5/26/2011			50	
Tornado	6/23/2016			110	10

²³ <http://www.nssl.noaa.gov/education/svrwx101/wind/>

²⁴ <http://www.NCEI.noaa.gov/stormevents/>

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	54	16	0.3	0.1	369	1	30%	41
Major Events	54	12	0.4	0.1	492	1	22%	54

- **Tornado - 5/14/1997**

A mini supercell spawned a tornado that moved out of Clinton county into Fayette county. A shed was destroyed, a barn and 2 houses were damaged, and 8 trees were downed.

- **Tornado - 10/13/1999**

A cold front pushed east from Illinois and Indiana during the afternoon hours and combined with a vigorous upper level disturbance that dropped into the Ohio Valley from the lower Great Lakes region. These factors prompted a squall line to develop ahead of the cold front that moved southeast through the Wilmington Ohio (ILN) county warning area before entering northeast Kentucky and southeast Ohio. A brief touchdown flipped over several pontoon boats, destroying at least one. Several utility poles and trees were knocked down along with well-anchored signs being ripped off of a local business.

- **Tornado - 5/27/2004**

A tornado touched down near Ghormley and traveled east into western Ross County. Three barns were severely damaged, with one man suffering injuries from being trapped in one of the damaged barns.

- **Tornado - 10/26/2010**

A historically deep low pressure system sent a very strong cold front into a marginally unstable, but very sheared environment. A line of storms formed west of the area overnight and moved into the region during the peak heating hours of the day. Severe wind gusts occurred along the entire line with multiple tornadoes occurring around the region as well.

Along the path of the tornado, several trees were snapped and several structures lost parts or all of their roofs. The heaviest damage occurred to a large storage facility which suffered major roof loss and total collapse of the northern half of the structure.

- **Tornado - 5/26/2011**

A strong low pressure system west of the Ohio Valley approached during peak heating on May 25th. This resulted in the development of widespread severe thunderstorms with large hail and damaging winds during the afternoon and evening hours. Later in the evening, a quasi-linear convective system swept west to east across the area. The result was straight line wind damage and a few tornadoes.

A National Weather Service storm survey confirmed a tornado about five miles north of Bloomingburg. The tornado damaged the flat metal roof of a small barn and a large section of roof from another barn.

- **Tornado - 5/26/2011**

A strong low pressure system west of the Ohio Valley approached during peak heating on May 25th. This resulted in the development of widespread severe thunderstorms with large hail and damaging winds during the afternoon and evening hours. Later in the evening, a quasi-linear convective system swept west to east across the area. The result was straight line wind damage and a few tornadoes.

A National Weather Service storm survey confirmed that a tornado touched down three miles west of Bloomingburg. Near the beginning of the path one barn was damaged and another barn was destroyed. Further along the path another barn was damaged.

- **Tornado - 6/23/2016**

A mesoscale convective system developed across Illinois and worked east then southeast across the region during the early morning hours of June 23rd. The first sign of tornadic damage was observed near the corner of Palmer Road NW and Harmony Road. Siding was removed from multiple sides of a two-story home, particularly on the southeast facing side. Large tree limbs were also knocked down near this residence. Damage continued to the southeast along Harmony Road and onto Burnett Perrill Road. Damage primarily affected hardwood trees, and several large branches were snapped from the trees. The orientation of the trees exhibited a convergent pattern to the damage. Siding was also removed from a garage at a residence on Burnett Perrill Road. Near the intersection of Burnett Perrill Road and Jasper-Coil Road, numerous evergreen trees were snapped or uprooted on the Jasper-Coil Road side. The tornado moved across a cornfield and then across Bush Cemetery on Bush Road. Tree damage at Bush Cemetery was extensive and consisted of both snapped and uprooted trees thrown in multiple directions. A well-defined swirl was noted in the cornfield to the southeast of Bush Cemetery. The most significant damage was observed along U.S. Route 22. Two homes along the 3700 block of US Route 22 suffered structural damage. One of the homes suffered partial uplift of the roof and a significant loss of the covering of the roof. The garage was also heavily damaged and the front porch was lifted. Leaf and other debris splatter was observed on all sides of the home. Spruce trees were uprooted and large limbs from other trees were broken. The residence located on the opposite side of U.S. Route 22 had shingles and siding removed. An un-attached one car garage was also destroyed. Damage in this area was estimated to be EF1 in nature, with maximum winds near 100 mph. To the southeast of this area, sporadic damage to trees and power poles was noted, however the damage was more consistent with straight-line winds. The survey also concluded that damage in the Jasper Mills area was also caused by straight-line winds.

D. Probability of Future Occurrences

With 16 occurrences in the past 44 years, the probability of such an occurrence in a given year is 30% or an average of one every 41 months.

With 12 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 54 years, the probability of such an occurrence in a given year is 22% or an average of one every 41 months.

E. Affected Locations

Tornadoes affect the entire county.

F. Analysis

Factor	Ranking
Frequency	Low: 1-2 Declarations
Response	< 1/2 Day
Onset	6-12 Hours
Magnitude	10% Land Area
Business	No Impact
Human	Some Injuries
Property	10-25% Damaged

G. Vulnerable Community Assets

Asset	Impact
People	The primary impact on people would be isolation and not being able to travel at least on primary routes for about 12 hours after the storm subsided. Power outages would also be widespread.
Economy	Loss of power affect businesses both in loss of sales and refrigeration.
Infrastructure	Electricity is likely to be out for a period of time. As this time increases, other utilities dependent on power will also likely fail.
Structures	Buildings under construction and mobile homes are highly susceptible to high winds could be damaged or destroyed. Buildings adjacent to large trees may be damaged by falling trees. Roofs and siding could also be damaged. Much of insured damages are not reported. The Planning Team used the NWS's estimate of \$500,000 in damages per major event was used in this analysis.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704	6	672	6	40	5	\$412,646
Nonresidential	1,075	\$787,403	5	54	6	3	5	\$105,807
Critical	26	\$450,000	0	0	5	0	0	\$0

V. Hazardous Materials Release

A. Description

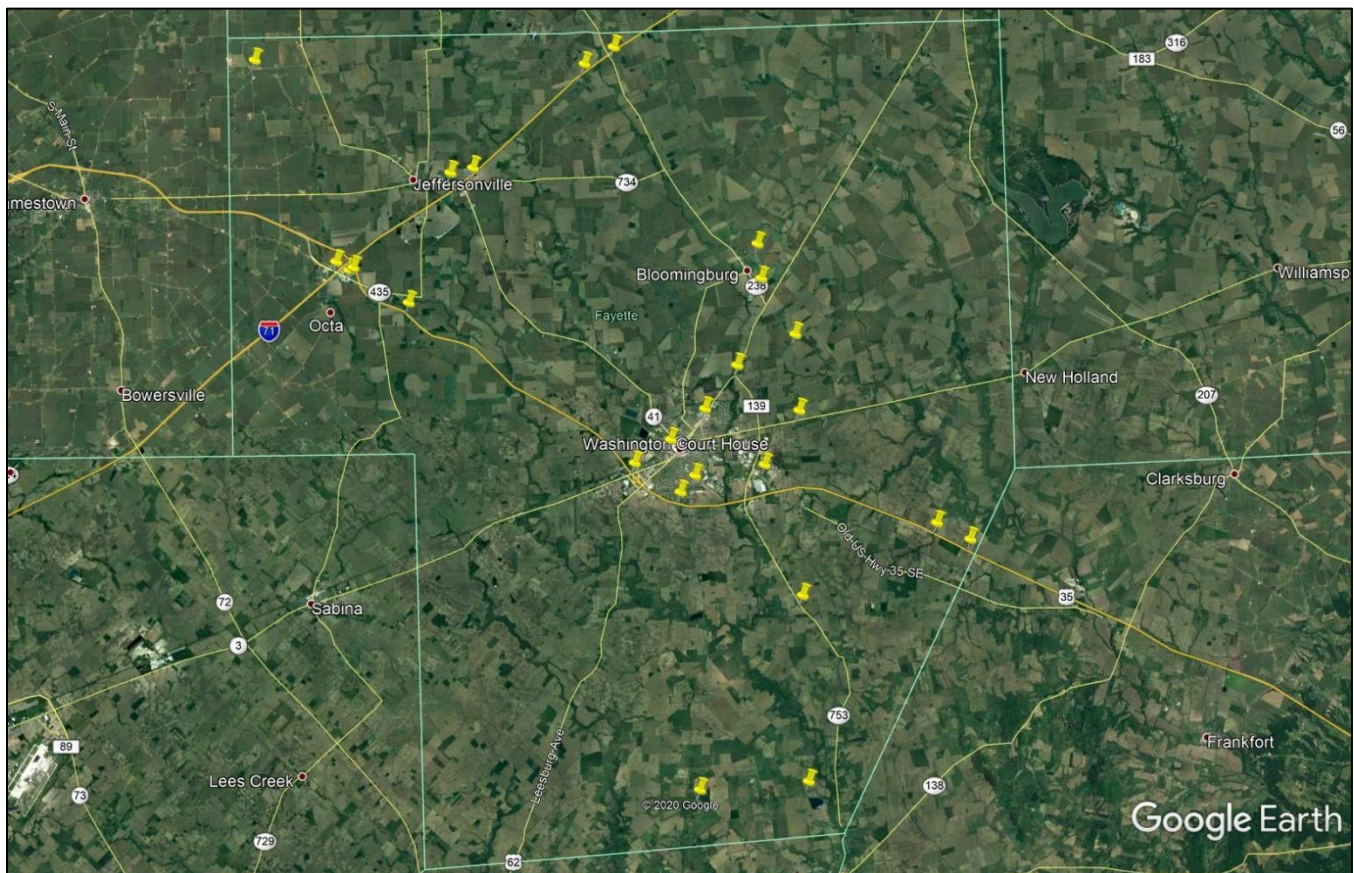
A Hazardous Material Release is an improper leak, spillage, discharge, or disposal of hazardous materials or substances (such as explosives, toxic chemicals, and radioactive materials) that poses a significant threat to human health and safety, campus property, and the surrounding environment. A release may occur at a fixed facility, pipeline or during transportation.

B. Extent of Hazard

An occurrence would be indicated by a spill reported to the EPA and any additional spills included by the Fayette County Local Emergency Planning Committee (LEPC).

C. Historical Occurrence

As recorded by the Ohio EPA Office of Emergency Response²⁵, the following spills occurred between May 2017 and August 2020, a 39-month span). No additional spills were included by the LEPC



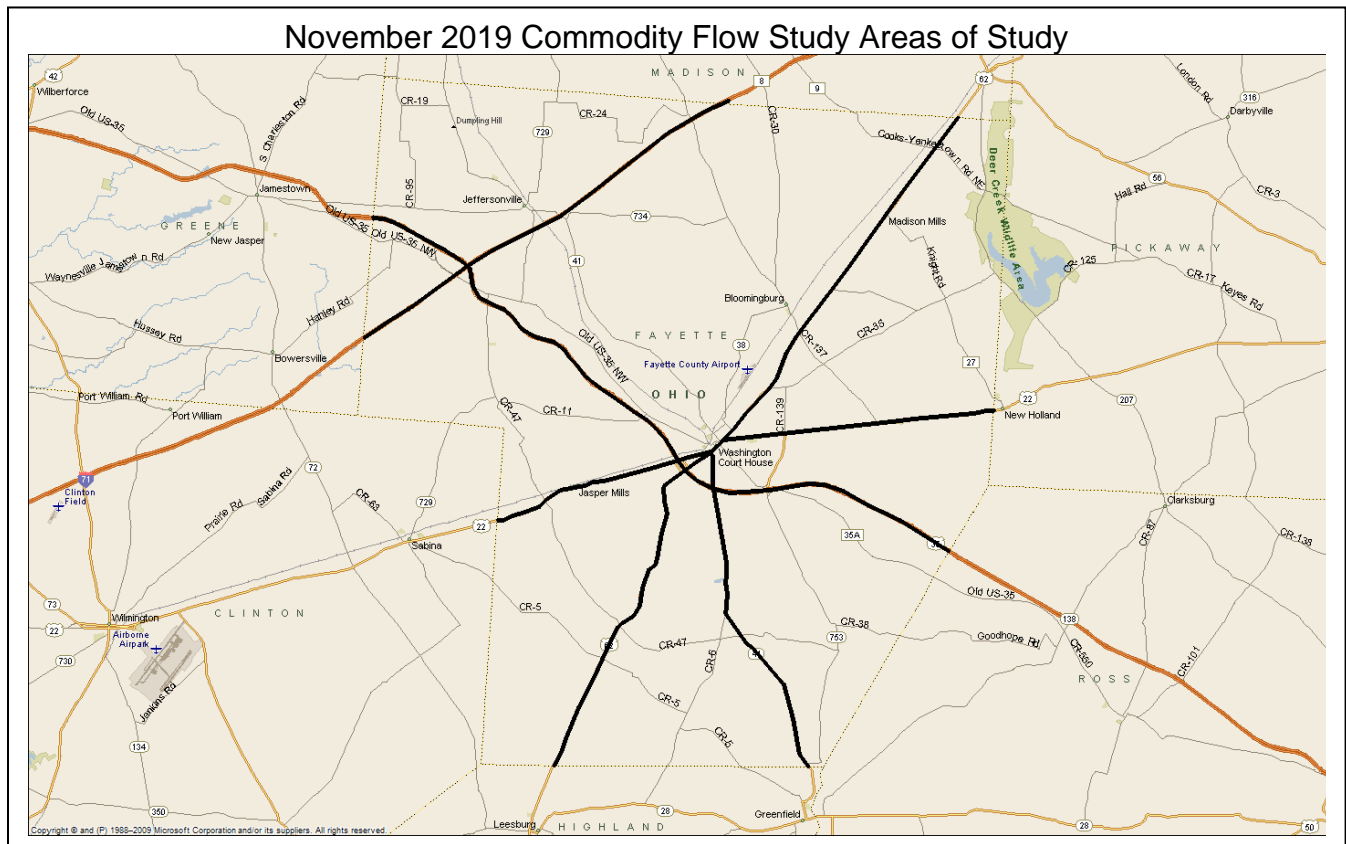
Date	Product Type	Gal	Latitude	Longitude	Jurisdiction
6/1/2017	Fuels (Combustible FP100F)	20	39.61994551	-83.6095748	Jeffersonville
6/16/2017	Fuels (Combustible FP100F)	50	39.485782	-83.295449	Wayne Twp
6/29/2017	Fuels (Combustible FP100F)	15	39.65221606	-83.5343832	Jefferson Twp
11/2/2017	Fuels (Combustible FP100F)	49	39.547752	-83.426112	Washington Court House
2/26/2018	Oils and Grease		39.4936	-83.3118	Wayne Twp
2/26/2018	Unknown/Undetermined		39.4936	-83.3118	Wayne Twp

²⁵ <https://epa.ohio.gov/dir/oer/#184995264-records-requests>

Date	Product Type	Gal	Latitude	Longitude	Jurisdiction
3/25/2018	Fuels (Combustible FP100F)		39.616103	-83.603343	Jefferson Twp
4/10/2018	Fuels (Combustible FP100F)	100	39.716108	-83.268427	Mt Sterling
6/4/2018	Compressed Gases		39.59756428	-83.3906684	Union Twp
7/17/2018	Fuels (Combustible FP100F)	40	39.52323995	-83.3980525	Washington Court House
7/18/2018	Other		39.70320654	-83.6422255	Jefferson Twp
7/20/2018	Fuels (Combustible FP100F)	75	39.617	-83.601	Jefferson Twp
9/16/2018	Fuels (Combustible FP100F)	300	39.54354027	-83.3774818	Union Twp
9/20/2018	Fuels (Combustible FP100F)	100	39.5288	-83.465	Union Twp
10/7/2018	Transformer Oil (Non-PCB)		39.46982366	-83.3847945	Wayne Twp
11/7/2018	Chemicals - Pesticides		39.57402173	-83.3758570	Union Twp
11/7/2018	Unknown/Undetermined		39.57402173	-83.3758570	Union Twp
2/13/2019	Fuels (Combustible FP100F)	10	39.68947168	-83.4716561	Paint Twp
2/13/2019	Fuels (Combustible FP100F)	50	39.39548516	-83.3907329	Perry Twp
3/25/2019	Fuels (Combustible FP100F)		39.56384125	-83.4073156	Union Twp
3/25/2019	Glycol		39.56384125	-83.4073156	Union Twp
3/25/2019	Oils and Grease		39.56384125	-83.4073156	Union Twp
4/7/2019	Fuels (Combustible FP100F)	400	39.69508163	-83.4556695	Paint Twp
5/24/2019	Chemicals - Fertilizers	300	39.39629868	-83.4472520	Perry Twp
5/24/2019	Other		39.39629868	-83.4472520	Perry Twp
5/27/2019	Oils and Grease		39.52156521	-83.4344766	Washington Court House
5/27/2019	Oils and Grease		39.52156521	-83.4344766	Washington Court House
6/5/2019	Glycol		39.51552107	-83.4428399	Union Twp
6/5/2019	Other		39.51552107	-83.4428399	Union Twp
6/18/2019	Fuels (Combustible FP100F)		39.65113324	-83.5463247	Jeffersonville
7/28/2019	Fuels (Combustible FP100F)	5	39.61994551	-83.6095748	Jeffersonville
9/28/2019	Crude Oil		39.5367808	-83.4453351	Washington Court House
9/28/2019	Sheen (hydrocarbon)		39.5367808	-83.4453351	Washington Court House
8/11/2020	Fuels (Combustible FP100F)	40	39.60096251	-83.5740488	Jasper Twp

The following categorizes and summarizes the above data.

Product Type	Percent
Fuels (Combustible FP100F)	50.00%
Oils and Grease	11.76%
Other	8.82%
Glycol	5.88%
Unknown/Undetermined	5.88%
Chemicals - Fertilizers	2.94%
Chemicals - Pesticides	2.94%
Compressed Gases	2.94%
Crude Oil	2.94%
Sheen (hydrocarbon)	2.94%
Transformer Oil (Non-PCB)	2.94%
Total	100.00%



The November 2019 Commodity Flow Study reflected this data, finding that 42% of traffic is carrying fuel or some other flammable liquid (Guide Number 128). In reviewing the amounts of the reported spilled gallons of Fuels, the higher percentage (50%) reflects the fact that most transport vehicles carry 50 to 100 gallons of fuel in their fuel tanks, potentially to be ruptured in any crash.

D. Probability of Future Occurrences

As there have been no reported incidents of spills at fixed facilities, the probability of such a spill is very low.

With 16 occurrences of transportation spills in 39 months, the probability in a given year is 1046% or an average of one every month.

E. Affected Locations

While a transportation spill could occur on any road within the county, the likely affected locations are on or adjacent to major highways, specifically I 71, US 22, US 35, US 62, SR 435, and SR 753. The November 2019 Commodity Flow Study validated these locations, showing the following rank order of highways conveying placarded vehicles:

- I 71
- US 22
- US 35
- US 62

F. Analysis

Factor	Ranking
Frequency	Low: 1-2 Declarations
Response	< 1 Day
Onset	< 6 Hours
Magnitude	No Impact
Business	No Impact
Human	Some Injuries
Property	No Impact

G. Vulnerable Community Assets

Asset	Impact
People	Direct impact on people would be contamination which could result in varying degrees of injury or death. Indirect impact would be evacuation and loss of use of residences.
Economy	Little or no impact
Infrastructure	There is potential for contaminating water supplies and inundating wastewater treatment facilities.
Structures	Little or no direct impact.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704		0		0		\$0
Nonresidential	1,075	\$787,403		0		0		\$0
Critical	26	\$450,000		0		0		\$0

VI. Dam Failures

A. Description

A dam is a barrier that impounds water or underground streams. The reservoirs created by dams not only suppress floods but provide water for various needs to include irrigation, human consumption, industrial use, aquaculture and navigability. Hydropower is often used in conjunction with dams to generate electricity. A dam can also be used to collect water or for storage of water which can be evenly distributed between locations. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees (also known as dikes) are used to manage or prevent water flow into specific land regions. Source: Wikipedia²⁶

A dam failure is partial, complete or catastrophic release of water held behind a dam that results in down-stream flash flooding. In Ohio, dams are classified by size and potential impact of failure: Class I, II, III and IV. Refer to OAC 1501:21-13-01(A)²⁷

The following Class I and II dams in Fayette County that are rated in the High or Significant Hazard Class as listed in the US Army Corps of Engineers’ National Inventory of Dams²⁸:

Dam Name	NIDID	Class I/II	Hazard Potential	River	City/Distance (mi)	Emergency Action Plan Status
Washington Court House UG No. 1 Dam	OH00627	I	High	Paint Creek - Offstream	Washington Court House 3.6	Approved
Washington Court House UG No. 2 Dam	OH03013	II	Significant	Tributary to Paint Creek	Washington Court House 3	None Approved

B. Extent of Hazard

An occurrence would be indicated by a failure of a Class I or II dam.

C. Historical Occurrence

There have been no Class I or II dam failures in Fayette County. According to the Stanford University’s National Performance of Dam Program (NPDP) Dam Incident database²⁹, there have been no dam incidents in Fayette County.

D. Probability of Future Occurrences

In the American Society of Civil Engineers *2009 Ohio Infrastructure Report Card – Dams Fact Sheet*³⁰, Ohio dams received a grade of C. One third of Ohio’s dams were rated Poor or worse and 60% were rated Fair or worse. Based on these high-level ratings, no direct conclusions could be drawn about the failure of Fayette County’s Class I and II dams. Because of this report, the planning team couldn’t assign a value of zero; the probability of a failure in a given year is less than 1%.

E. Affected Locations

Failure of either reservoir would impact Washington Court House. In reviewing the flood inundation plan and maps, some 140 homes and 250 residents as well as several parks,

²⁶ <https://en.wikipedia.org/wiki/Dam>

²⁷ <http://codes.ohio.gov/oac/1501:21-13-01>

²⁸ <https://nid.sec.usace.army.mil/ords/f?p=105:18:7533098219673::NO::>

²⁹ http://npdp.stanford.edu/dam_incidents

³⁰ http://ohioasce.org/sites/default/files/2009_Dams_Fact_Sheet.pdf

businesses and schools, and a wastewater treatment plant that are downstream of the reservoirs along Paint Creek are at risk.

F. Analysis

Factor	Ranking
Frequency	None: No Declarations
Response	< 1 Day
Onset	6-12 Hours
Magnitude	10% Land Area
Business	< 24 Hours
Human	Minor Injuries
Property	< 10% Damaged

G. Vulnerable Community Assets

Asset	Impact
People	Little or no impact; warning is expected to be sufficient for complete evacuation. An estimated 14,500 people would be without potable water for several hours until contingency plans can provide water to these people.
Economy	Little or no impact.
Infrastructure	A rail line in the inundation area would be washed out.
Structures	Approximately 30 residences are in the inundation area.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704		140	50	70	15	\$2,149,392
Nonresidential	1,075	\$787,403		12	50	6	15	\$708,663

VII. Drought

A. Description

Drought is characterized by a period of extreme dry weather usually complicated by warm temperatures. It is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones, from very wet to very dry. Drought is a temporary aberration from normal climatic conditions; thus it can vary significantly from one region to another. Drought is different than aridity, which is a permanent feature of climate in regions where low precipitation is the norm, as in a desert. Human factors, such as water demand and water management, can exacerbate the impact that drought has on a region. Because of the interplay between a natural drought event and various human factors, drought means different things to different people. In practice, drought is defined in a number of ways that reflect various perspectives and interests. Below are three commonly used definitions:

Meteorological Drought is usually defined based on the degree of dryness (in comparison to some “normal” or average) and the duration of the dry period. Drought onset generally occurs with a meteorological drought.

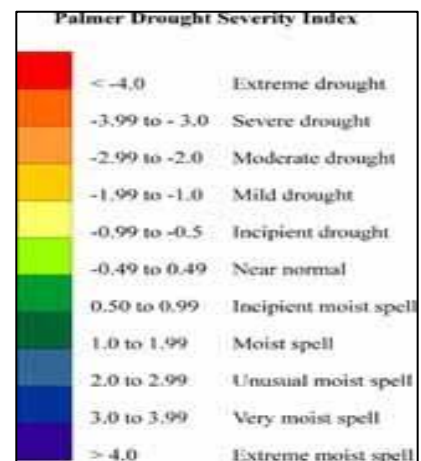
Agricultural Drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, soil water deficits, reduced ground water or reservoir levels needed for irrigation, and so forth.

Hydrological Drought usually occurs following periods of extended precipitation shortfalls that impact water supply (i.e., streamflow, reservoir and lake levels, ground water), potentially resulting in significant societal impacts. Because regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Source: NOAA³¹

B. Extent of Hazard

Drought severity is measured using the Palmer Drought Severity Index (PDSI). The PDSI uses readily available temperature and precipitation data to estimate relative dryness. It is a standardized index that spans -10 (dry) to +10 (wet). It has been reasonably successful at quantifying long-term drought. This table translates PDSI indices to plain language.

Droughts declared by the federal or state officials are considered occurrences.



C. Historical Occurrence

The following occurrences caused damage to community assets. Available narratives of major events follow. Primary Source: National Centers for Environmental Information (NCEI)³².

- **1988-1989 North American Drought**

The Western United States experienced a lengthy drought in the late 1980s. Much of California endured one of its longest droughts ever observed from late 1986 through

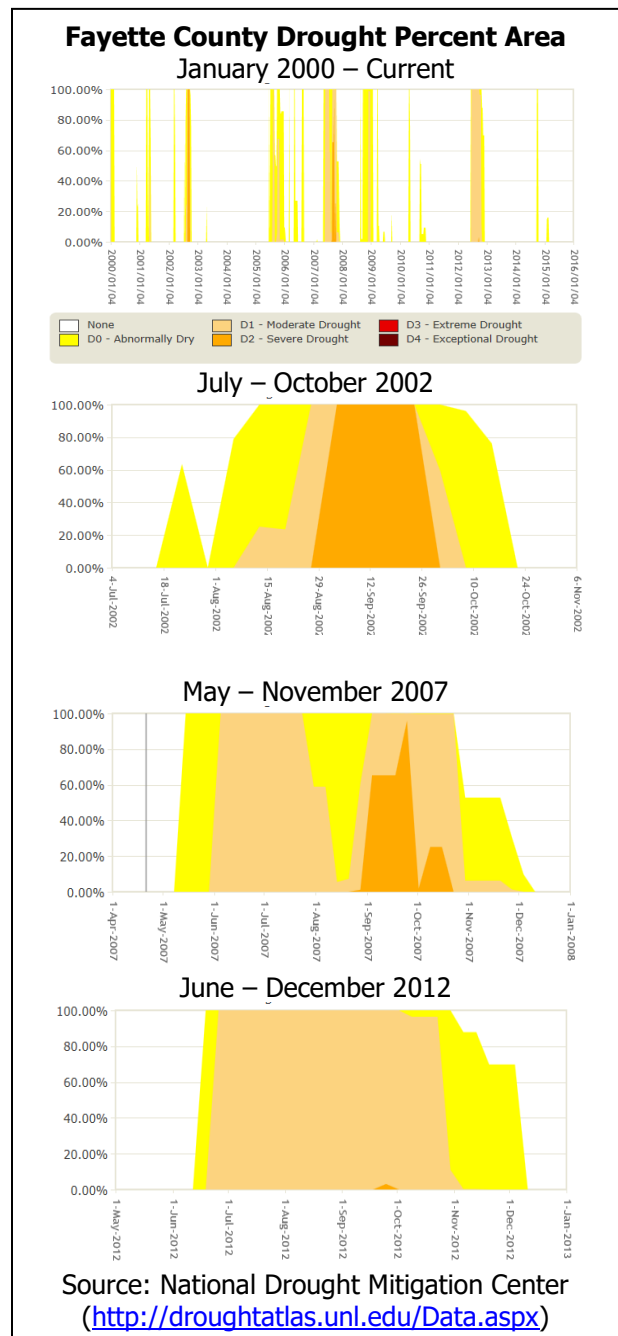
³¹ <http://www.nws.noaa.gov/os/brochures/climate/DroughtPublic2.pdf>

³² <http://www.NCEI.noaa.gov/stormevents/>

early 1991. Drought worsened in 1988 as much of the United States also suffered from severe drought. In California, the five-year drought ended in late 1991 as a significant El Niño event in the Pacific Ocean (and the eruption of Mount Pinatubo in June 1991) most likely caused unusual persistent heavy rains.

Following a milder drought in the Southeastern United States and California in 1987, this drought overspread the Mid-Atlantic states, Southeastern United States, Midwestern United States, northern Great Plains, and Western United States. Heat waves accompanied this widespread, unusually intense drought and killed around 4,800 to 17,000 Americans. The heat also killed livestock across the United States. Farmers perhaps cultivated marginally arable land, contributing to the damage from this drought. Pumping groundwater near depletion also contributed to damage. The drought destroyed crops almost nationwide; lawns of residents went brown, and many cities declared water restrictions. Wildfires in Yellowstone National Park burned many trees and created exceptional destruction in the area. This very catastrophic drought for multiple reasons continued across the Upper Midwest and northern Great Plains states during 1989, not officially ending until 1990. The conditions continued into 1989 and 1990, although the drought ended in some states, thanks to normal rainfalls returning to some portions of the United States. Dry conditions, however, increased again during 1989, affecting Iowa, Missouri, eastern Nebraska, Kansas and certain portions of Colorado. The drought also affected Canada in certain divisions.

The drought of 1988 ranks as the worst drought since the Dust Bowl a half-century earlier in the United States; estimates in 2008 put damages from the drought between \$80 billion and almost \$120 billion in damage (2008 USD). The state of Minnesota alone saw \$1.2 billion in crop losses. The drought of 1988 caused more devastation comparable to that which Hurricane Andrew in 1992 and Hurricane Katrina wrought. In Canada, drought-related losses added to \$1.8 billion (1988 Canadian dollars).



Source: Project Gutenberg Self-Publishing Press³³

- **Summer 1999 Drought**

Drought conditions existed in Fayette County for a five-month period during the summer of 1999.

May 1999. After a dry April, drought conditions resurfaced again during May, after being alleviated during the winter months. Total rains during May were only 1.25 to 2.5 inches. The community of Fayette had only 1.3 inches for the entire month, McArthur had 1.5 inches, while South Point measured 1.9 inches.

June 1999. The drought continued to spread and strengthen in southeast Ohio. A deterioration in stream flow and soil moisture was noted. Some showers at the end of the month temporarily helped the topsoil and the crops. Only 1 to 2 inches of rain fell in most areas during the entire month of June. Nelsonville observed the minimum, with just a half inch of rain. Temperatures peaked in the mid and upper 90s during the second week of the month. Beverly registered 98 degrees, while South Point had 97 degrees on the 10th.

July 1999. The drought strengthened during the first half of the month, then eased slightly during the last 2 weeks. The worst drought conditions remained in Athens, Lawrence, Gallia, Meigs, and Fayette Counties. In Lawrence County, an emergency drought declaration was issued. Delivery of water to residents with dry or contaminated wells continued in Lawrence County. The town of Rio Grande in Gallia County had to connect to another water system when their source was depleted. In Fayette County, filling stations were set-up for families that had problems with their wells.

The extreme heat depleted much of the moisture from the scattered showers. Preliminary data indicated Beverly of Washington County and South Point of Lawrence County both reached 102 degrees on the 30th.

August 1999. The drought eased during the month of August across southeast Ohio. Monthly rains were 3 to 6 inches. Temperatures were not as hot, as those felt during July. However, the drought still lingered at month's end.

September 1999. Drought severity either increased or remain about constant during the month. The rainfall during September was mostly between 1 to 2 inches. Yet, South Point of Lawrence County had even less rain, with just three quarters of an inch.

October 1999. The drought severity eased as monthly rainfall was near normal. Amounts of 2.5 to 3.0 inches were common. Ground water shortages were still a concern at the end of the month.

- **Summer 2002 Drought**

Two months moderate; two months severe. The emerging drought from August peaked during the first 2 weeks of September, as hot and dry conditions lingered. Rains of 1.5 to 2 inches, plus cooler temperatures, dampened the drought by the fourth week of the month.

- **Fall 2007 Drought**

Three months moderate; one month severe. In September, drought conditions crept north, as the month averaged warmer and drier than normal. The monthly rainfall was mostly between 1 and 2 inches.

³³ http://self.gutenberg.org/articles/1988%E2%80%939389_North_American_drought

A rare October heat wave, during the 1st and 2nd weeks of the month, helped peak the severity of the drought. On the 11th, Gallia County declared an emergency due to a water shortage. With the lowering of the water table, wells were becoming less productive. Morgan County officials reported that their wildlife was being stressed from the lack of available water. Deer were dying from the effects of the drought and a dry weather disease.

Much needed and widespread rain finally arrived on the 23rd and the 24th. Rain amounts of 2 to 3 inches were common. As the growing season ended and the autumn foliage peaked, drought conditions began to abate or ease.

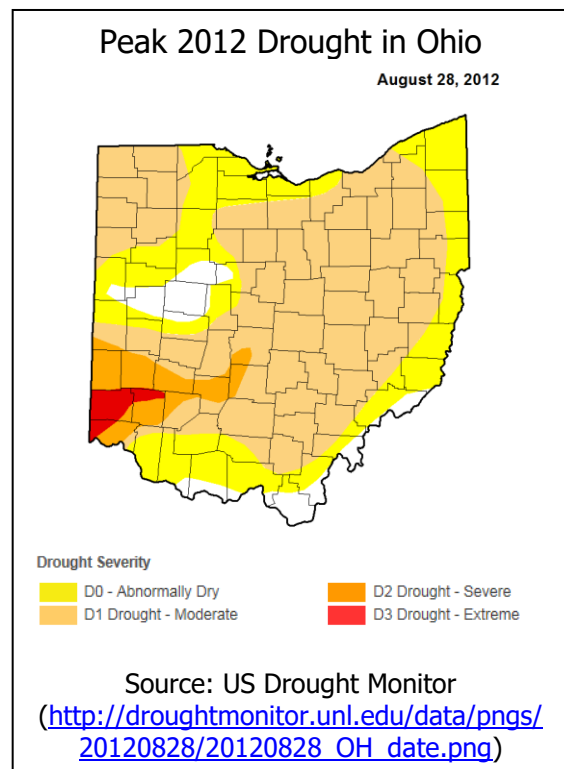
After peaking in early October, drought conditions continued to ease during the month of November. Monthly rainfall of 3 to 4 inches was common. By the end of November, the drought of 2007 was also coming to an end across southeast Ohio.

- **2012 North American Drought**

The 2012-2013 North American Drought was an expansion of the 2010-2012 United States drought which began in the spring of 2012, when the lack of snow in the United States caused very little melt water to absorb into the soil. The drought includes most of the United States and included Ohio. Among many counties, Fayette County was designated with moderate drought conditions by mid-June. It has been equaled to similar effects as droughts in the 1930s and 1950s, but it has not been in place as long. However, the drought has inflected, and is expected to continue to inflict, catastrophic economic ramifications. In most measures, the drought has exceeded the 1988-1989 North American Drought, which is the most recent comparable drought.

On July 30, 2012, the Governor of Ohio sent a memorandum to the United States Department of Agriculture's (USDA) Ohio State Executive Director requesting primary county natural disaster designations for eligible counties due to agricultural losses caused by drought and additional disasters during the 2012 crop year. The USDA reviewed and Loss Assessment Reports and determined that there were sufficient production losses in 85 counties to warrant a Secretarial disaster designation. On September 5, 2012, Fayette County was one of those designated counties. Source: Ohio EMA.

The 2012 North American Drought is the largest drought since the 1950's as reported by NOAA's National Climatic Data Center National Drought Report of 15 August 2012³⁴. At its peak in Ohio, Fayette County experienced "Moderate Drought Severity"



³⁴ <http://www.NCEI.noaa.gov/sotc/drought/201207#det-reg>

for four months. The University of Illinois at Urbana-Champaign reported a slightly elevated crop insurance loss ratio of 1.02 for 2012, indicating little insurance-reported crop loss during this period³⁵. Fayette County had no reported crop losses. Source: NCEI³⁶

D. Probability of Future Occurrences

With five major occurrences in the past 28 years, the probability of an occurrence in a given year is 18%. None resulted in recorded damages; the probability of a damaging occurrence in a given year is close to 0%.

E. Affected Locations

Drought affects the entire county. The Fayette County Health Department estimates that 30-40% of the county’s population uses private wells and that the county has plans for providing for the needs of this population during a drought. Public water supplies are generally considered to be adequate to withstand periods of drought. The greatest impact would be on water supplies for livestock and crops.

F. Analysis

Factor	Ranking
Frequency	None: No Declarations
Response	< 1 Week
Onset	> 24 Hours
Magnitude	10-25% Land Area
Business	No Impact
Human	No Impact
Property	No Impact

G. Vulnerable Community Assets

Asset	Impact
People	People relying on private wells may need to find alternate sources of potable water. 309-40% are on private water.
Economy	Agricultural impact - crops and livestock. Water-dependent businesses such as car washes.
Infrastructure	No impact.
Structures	No impact.

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704		0		0		\$0
Nonresidential	1,075	\$787,403		0		0		\$0
Critical	26	\$450,000		0		0		\$0

³⁵ <http://farmdocdaily.illinois.edu/2013/03/drought-crop-insurance-loss-2012.html>

³⁶ <http://www.NCEI.noaa.gov/stormevents/>

VIII. Flooding

A. Description

Flooding is an overflowing of water onto land that is normally dry. Floods can happen during heavy rains, when ocean waves come on shore, when snow melts too fast, or when dams or levees break. Flooding may happen with only a few inches of water, or it may cover a house to the rooftop. They can occur quickly or over a long period and may last days, weeks, or longer. Floods are the most common and widespread of all weather-related natural disasters.

Flash floods are the most dangerous kind of floods, because they combine the destructive power of a flood with incredible speed and unpredictability. Flash floods occur when excessive water fills normally dry creeks or riverbeds along with currently flowing creeks and rivers, causing rapid rises of water in a short amount of time. They can happen with little or no warning.

Areas near rivers are at risk from flash floods. Embankments, known as levees, are often built along rivers and are used to prevent high water from flooding bordering land. In 1993, many levees failed along the Mississippi River, resulting in devastating flash floods. The city of New Orleans experienced massive devastating flooding days after Hurricane Katrina came onshore in 2005 due to the failure of levees designed to protect the city.

Mountains and steep hills produce rapid runoff, which causes streams to rise quickly. Rocks and clay soils do not allow much water to infiltrate the ground. Saturated soil also can lead rapidly to flash flooding. Vacationing or recreating along streams or rivers can be a risk if there are thunderstorms in the area. A creek only 6 inches deep in mountainous areas can swell to a 10-foot deep raging river in less than an hour if a thunderstorm lingers over an area for an extended period of time.

Additional high-risk locations include low water crossings, recent burn [or logging] areas in mountains, and urban areas from pavement and roofs which concentrate rainfall runoff.

Ice jams and snowmelt can help cause flash floods. A deep snowpack increases runoff produced by melting snow. Heavy spring rains falling on melting snowpack can produce disastrous flash flooding. Melting snowpack may also contribute to flash floods produced by ice jams on creeks and rivers. Thick layers of ice often form on streams and rivers during the winter. Melting snow and/or warm rain running into the streams may lift and break this ice, allowing large chunks of ice to jam against bridges or other structures. This causes the water to rapidly rise behind the ice jam. If the water is suddenly released, serious flash flooding could occur downstream. Huge chunks of ice can be pushed onto the shore and through houses and buildings.

B. Extent of Hazard

The severity of flooding is measured in terms of inches of rain per hour, total inches per occurrence and the effect on community assets.

Significant events as recorded by NCEI and local sources are considered occurrences.

Major occurrences are those that caused injuries, deaths or total damage \$5,000 or greater.

C. Historical Occurrence

The following major occurrences (injuries, deaths, total damage \$5,000 or greater) were recorded by the National Centers for Environmental Information (NCEI)³⁷ and local records. Available narratives of major events follow the table.

³⁷ <http://www.NCEI.noaa.gov/stormevents/>

Event	Date	Injuries	Deaths	Property Damage x \$1000	Crop Damage x \$1000
Flash Flood	6/30/1997			5	0
Flash Flood	1/3/2000			10	
Flash Flood	5/18/2001			10	
Flash Flood	6/6/2001			5	
Flood	1/5/2005			20	
Flood	1/11/2005			10	
Flash Flood	10/4/2006			5	
Flood	3/19/2008			5	
Flash Flood	5/11/2011			10	

	Years	Events	Average Injuries	Average Deaths	Average Property Damage x \$1000	Average Crop Damage x \$1000	Annual Probability	Mean Time Between Occurrences (Months)
All Events	22	40	0.0	0.0	2	0	182%	7
Major Events	22	9	0.0	0.0	10	0	41%	29

- Flash Flood - 6/30/1997**
 Persistent heavy rainfall caused water to flood across Rt. 207.
- Flash Flood - 3/1/2000**
 Several hours of heavy rainfall caused water to flood across roads across the county.
- Flash Flood - 5/18/2001**
 Several hours of heavy rainfall caused flooded streets.
- Flash Flood - 6/6/2001**
 High water on US 62 and Washington Road.
- Flood - 5/1/2005**
 A stationary frontal boundary draped across the Ohio Valley was the focusing mechanism for an extended period of heavy rain across much of central and southern Ohio. Many locations received two to four inches of rain in a 24-hour period.
- Flood - 11/1/2005**
 A widespread area of showers and thunderstorms ahead of a warm front affected much of central and western Ohio. One to three inches of rain fell across the region, exacerbating existing flooding from previous rains and snowmelt.
- Flash Flood - 4/10/2006**
 A line of severe thunderstorms affected central Ohio during the afternoon and evening ahead of a cold front. Several creeks rose out of their banks from the heavy rainfall.

- **Flood - 3/19/2008**

Several waves of low pressure moved along a stationary front located across the Ohio Valley. The waves of low pressure brought an extended period of heavy rain, with three to six inches of rainfall across southwest and central Ohio.

Numerous roads were flooded throughout the county. Paint Creek rose out of its banks into Eyman Park in Washington Court House.

- **Flash Flood - 11/5/2011**

A very unstable airmass was in place south of a warm front in the area. This unstable airmass led to the development of widespread severe weather.

One family was evacuated from their residence due to flash flooding.

D. Probability of Future Occurrences

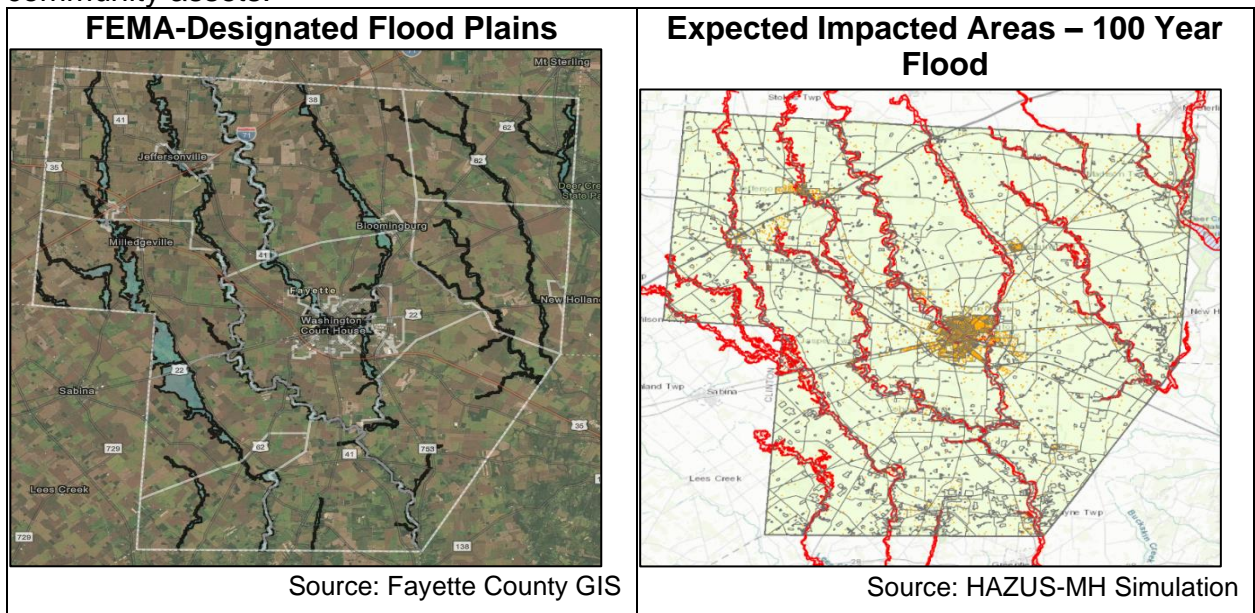
With 40 occurrences in the past 22 years, the probability of such an occurrence in a given year is 182% or an average of one every 7 months.

With 9 major occurrences (injuries, deaths, total damage \$5,000 or greater) in the past 22 years, the probability of such an occurrence in a given year is 41% or an average of one every 29 months.

E. Affected Locations

Flooding affects the entire county, primarily in the flood plains. There are mapped flood plain areas along Paint and Deer Creeks as well as many small and intermittent creeks. Areas not identified as being in a flood plain can experience flooding as well. The National Flood Insurance Administration estimates that one-third of the claims that they receive are for structures located outside of a mapped flood plain.

The FEMA HAZUS – Multi-Hazard Risk Assessment Program simulation³⁸ results for a 100-year flood affecting Fayette County was used to estimate damages and impact on community assets.



A **Repetitive Loss Property** is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any

³⁸ Provided by Ohio EMA, available in Fayette County EMA Office

rolling ten-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP.

A **Severe Repetitive Loss Property** any NFIP-insured residential property that has met at least 1 of the following paid flood loss criteria since 1978, regardless of ownership:

- 4 or more separate claim payments of more than \$5,000 each (including building and contents payments); or
- 2 or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property.³⁹

Structures that flood frequently strain the National Flood Insurance Fund. Community leaders and residents are also concerned with the repetitive loss problem because residents' lives are disrupted and may be threatened by the continual flooding. The primary objective of the repetitive loss properties strategy is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties.⁴⁰

There are no repetitive loss structures reported in Fayette County as of September 30, 2018⁴¹.

F. Analysis

Factor	Ranking
Frequency	Low: 1-2 Declarations
Response	< 1/2 Day
Onset	12-24 Hours
Magnitude	10% Land Area
Business	No Impact
Human	No Impact
Property	No Impact

G. Vulnerable Community Assets

Asset	Impact
People	Major flooding potentially affects a large portion of the population, either directly or indirectly. This includes structural damages, isolation from essential services, need for relocation or sheltering, injuries and possibly death. Causalities. HAZUS-MH estimates no causalities. Displaced and Sheltered. HAZUS-HM estimates 940 people would be displaced and 19 of the these would seek shelter in public shelters.
Economy	Flooded businesses would be out of business until clean up and repairs are completed and damaged inventory replaced. HAZUS-MH estimates \$53.05 million in economic losses.
Infrastructure	The primary vulnerable infrastructure assets are roads, culverts and bridges, damaged by erosion. HAZUS-MH doesn't simulate these damages.
Structures	The Planning Team used the results of FEMA's HAZUS-MH simulation of a 100-year flood for Fayette County. HAZUS-MH estimates the following structural damages. Critical facilities had no impact.

³⁹ https://www.fema.gov/pdf/nfip/manual201205/content/20_srl.pdf

⁴⁰ https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt

⁴¹ Ohio EMA

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	Total
Residential	11,199	\$204,704	100	11,199		79		\$31,220,000
Nonresidential	1,075	\$787,403	100	1,075		0	0	\$0
Critical	26	\$450,000	100	26		0	0	\$0
Total	12,300			12,300		79		\$31,220,000

The following tables from the HAZUS-MH simulation report were used in making the above estimates:

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0	0	0	0	0	0
Residential	29	37	45	57	4	5	1	1	0	0	0	0
Total	29		45		4		1		0		0	

Table 5: Expected Damage to Essential Facilities

Classification	# Facilities			
	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	6	0	0	0
Hospitals	1	0	0	0
Police Stations	2	0	0	0
Schools	16	0	0	0

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	8.14	2.09	1.84	0.60	12.68
	Content	3.58	6.59	4.03	3.49	17.69
	Inventory	0.00	0.25	0.51	0.10	0.85
	Subtotal	11.73	8.93	6.38	4.19	31.22
<u>Business Interruption</u>						
	Income	0.04	3.94	0.29	1.49	5.76
	Relocation	3.34	1.31	0.17	0.58	5.41
	Rental Income	1.07	0.97	0.04	0.03	2.12
	Wage	0.09	5.22	0.23	3.01	8.55
	Subtotal	4.54	11.44	0.74	5.12	21.83
ALL	Total	16.27	20.37	7.11	9.30	53.05

IX. Earthquakes

A. Description

An earthquake is caused by a sudden slip on a fault. The tectonic plates are always slowly moving, but they get stuck at their edges due to friction. When the stress on the edge overcomes the friction, there is an earthquake that releases energy in waves that travel through the earth's crust and cause the shaking that we feel.

Ohio is located near the New Madrid fault. Fayette County is in the part of Ohio that is designated with a Modified Mercalli Intensity (MMI) of VIII, which anticipates moderate damage. In spite of this, there has been little seismic activity near Fayette County.

B. Extent of Hazard

Earthquakes are typically measured on the Richter scale. The analyzed profile is a magnitude 5.0 earthquake with the epicenter in the City of Fayette scenario as modeled by the Hazards U.S. Multi-Hazard (HAZUS-MH) simulation performed and provided by Ohio EMA. The HAZUS-MH report used in this analysis is available from the Fayette County EMA.

The impact of earthquakes is measured on the Modified Mercalli Scale. The table at the right depicts the scale and its relationship to the Richter Scale.

Any recorded earthquake of magnitude 3 or more is considered an occurrence.

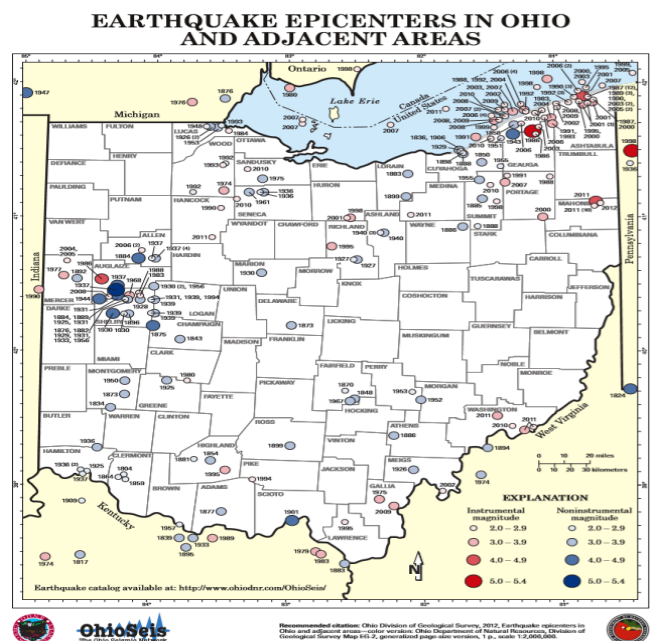
Modified Mercalli Scale		Richter Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibration like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some may awaken; dishes, windows, doors disturbed; autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; fall of walls, monuments, chimneys; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up in air	7

C. Historical Occurrence

The Ohio Department of Natural Resources map below indicates no seismic activity centered in Fayette. In 1995, there was an earthquake of a 3.5 magnitude centered in south east Highland County.

D. Probability of Future Occurrences

The USGS reports a 2% probability that Fayette County will be faced with a peak ground acceleration (PGA) of .06 within 50 years. While the USGS hasn't drawn a direct correlation between PGA and magnitude, the Laboratorio de Ingeniería Sísmica, Instituto de Investigaciones en Ingeniería,



Universidad de Costa Rica⁴², published research⁴³ estimating this relationship. A PGA of 2 to 3 relates to a Modified Mercalli Intensity of II and magnitude of 2, characterized as “Felt only by a few persons at rest, especially on upper floors of buildings.” Source: USGS⁴⁴.

There is less than a 1% probability of a significant damaging occurrence in any given year.

E. Affected Locations

Earthquakes would affect the entire county.

F. Analysis

Factor	Ranking
Frequency	Slight
Response	< 1/2 Day
Onset	> 24 Hours
Magnitude	10% Land Area
Business	< 24 Hours
Human	Minor Injuries
Property	< 10% Damaged

G. Vulnerable Community Assets

Asset	Impact
People	<p>Causalities. HAZUS-MH estimates that 111 people would receive minor injuries, 26 people would receive greater non-life-threatening injuries, 4 people would receive life-threatening injuries and 7 people would die. Estimates were computed by averaging the three representative time frames presented by HAZUS.</p> <p>Displaced and Sheltered. HAZUS-HM estimates 269 households would be displaced; of these, 169 people (less than 1% of the population) people would seek shelter in public shelters.</p> <p>Electric Service. HAZUS-MH estimates that 71% of households (8,066) would lose electricity at onset. After one week, 17% (1,914) would still be without electricity. Virtually all (less 10) would have electricity after three months.</p> <p>Potable Water. HAZUS-MH estimates that 3% of households (400) would lose potable at onset. Within one week, all would be restored.</p>
Economy	HAZUS-MH estimates a total economic loss of \$425.84 million.
Infrastructure	HAZUS-HM estimates all infrastructure would unaffected or operational within one day with the exception 3 bridges, all of which would operational within 1 week . It also estimates that 4 wastewater treatment systems would have moderate damage; all would be operational within 1 day. 1 of 3 communication systems would have be damaged and be restored in 1 week.
Structures	The Planning Team used the results of FEMA’s HAZUS-MH simulation of an earthquake of 5 magnitude, 5 km deep centered on Washington Courthouse. HAZUS-MH estimates the following structural damages.

⁴² <http://www.lis.ucr.ac.cr/index.php?id=Inicio>

⁴³ http://www.researchgate.net/profile/Lepolt_Linkimer/publication/228755080_Relationship_between_peak_ground_acceleration_and_Modified_Mercalli_intensity_in_Costa_Rica/links/0c960528bc84924b44_000000.pdf

⁴⁴ <http://earthquake.usgs.gov/learn/topics/mercalli.php>

Structure Type	Inventory	Average Value	At Risk		Damaged		Damages Total	
			%	Number	%	Number	%	
Residential	11,199	\$204,704	100	11,199		5,419		\$196,827,400
Nonresidential	1,075	\$787,403	100	1,075		617		\$157,139,516
Critical	26	\$450,000	100	26		14		\$356,684
Total	12,300			12,300		6050		\$354,323,600

The following tables from the HAZUS-MH simulation report were used in making the above estimates:

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	62.55	1.02	35.90	1.11	46.71	2.30	25.48	3.55	6.37	3.09
Commercial	183.94	3.01	139.56	4.32	180.13	8.88	94.21	13.14	29.15	14.13
Education	7.83	0.13	5.47	0.17	7.15	0.35	3.44	0.48	1.11	0.54
Government	6.12	0.10	4.12	0.13	5.57	0.27	2.42	0.34	0.76	0.37
Industrial	45.21	0.74	34.31	1.06	51.11	2.52	30.91	4.31	9.46	4.58
Other Residential	418.31	6.84	279.70	8.66	300.40	14.81	146.34	20.42	34.25	16.60
Religion	30.10	0.49	18.23	0.56	18.40	0.91	10.06	1.40	3.21	1.56
Single Family	5363.13	87.67	2713.09	83.99	1418.86	69.95	403.96	56.35	121.96	59.13
Total	6,117		3,230		2,028		717		206	

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	1	0	0
Schools	16	12	0	2
EOCs	0	0	0	0
PoliceStations	2	0	0	2
FireStations	6	1	0	2

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations_				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	38	0	0	38	38
	Bridges	116	4	0	113	116
	Tunnels	0	0	0	0	0
Railways	Segments	11	0	0	11	11
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	1	0	1	1
	Runways	1	0	0	1	1

Table 11: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	1.7203	10.9056	1.3122	0.6766	14.6147
	Capital-Related	0.0000	0.7332	8.8487	0.8032	0.2780	10.6631
	Rental	4.3783	3.2707	5.3330	0.4580	0.3845	13.8245
	Relocation	15.2670	2.3336	8.8770	1.9929	3.9363	32.4068
	Subtotal	19.6453	8.0578	33.9643	4.5663	5.2754	71.5091
Capital Stock Losses							
	Structural	22.3864	6.0859	15.7431	7.7581	5.8290	57.8025
	Non_Structural	89.6119	31.7819	38.5548	24.8944	12.6895	197.5325
	Content	37.0045	9.9668	21.7605	18.1439	7.5725	94.4482
	Inventory	0.0000	0.0000	0.8472	3.4807	0.2225	4.5504
	Subtotal	149.0028	47.8346	76.9056	54.2771	26.3135	354.3336
	Total	168.65	55.89	110.87	58.84	31.59	425.84

X. Land Subsidence

A. Description

Land subsidence is typically caused by underground voids caused by underground mining – particularly mines that have been abandoned – and Karst Topography.

Subsidence, in the context of underground mining, is the lowering of Earth's surface due to collapse of bedrock and unconsolidated materials (sand, gravel, silt, and clay) into underground mine voids. Mine subsidence can damage the foundations of homes, buildings and roads, disrupt underground utilities, and can be a potential risk to human life. Source: ODNR⁴⁵

Karst Topography is a landform that develops on or in limestone, dolomite, or gypsum by dissolution and that is characterized by the presence characteristic features such as sinkholes, underground (or Internal) drainage through solution-enlarged fractures (joints), and caves. Karst landforms and features can be a significant geologic hazard. Sudden collapse of an underground cavern or opening of a sinkhole can cause surface subsidence that can severely damage or destroy any overlying structure such as a building, bridge, or highway.

B. Extent of Hazard

Land subsidence is measured by a count of occurrences that cause damage to structures or restrict travel.

C. Historical Occurrence

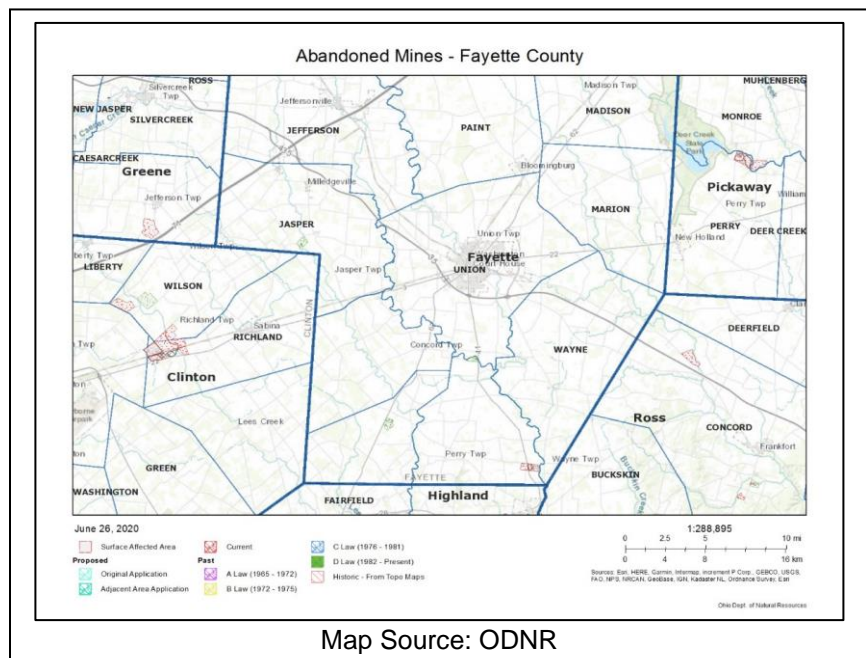
There is no record of structural damage or injuries caused by subsidence in Fayette County.

D. Probability of Future Occurrences

Land subsidence has occurred in Fayette County but impact on community assets has been minimal. Therefore, the estimated risk of the future occurrence of impacting subsidence is once in twenty years or 5% in a given year.

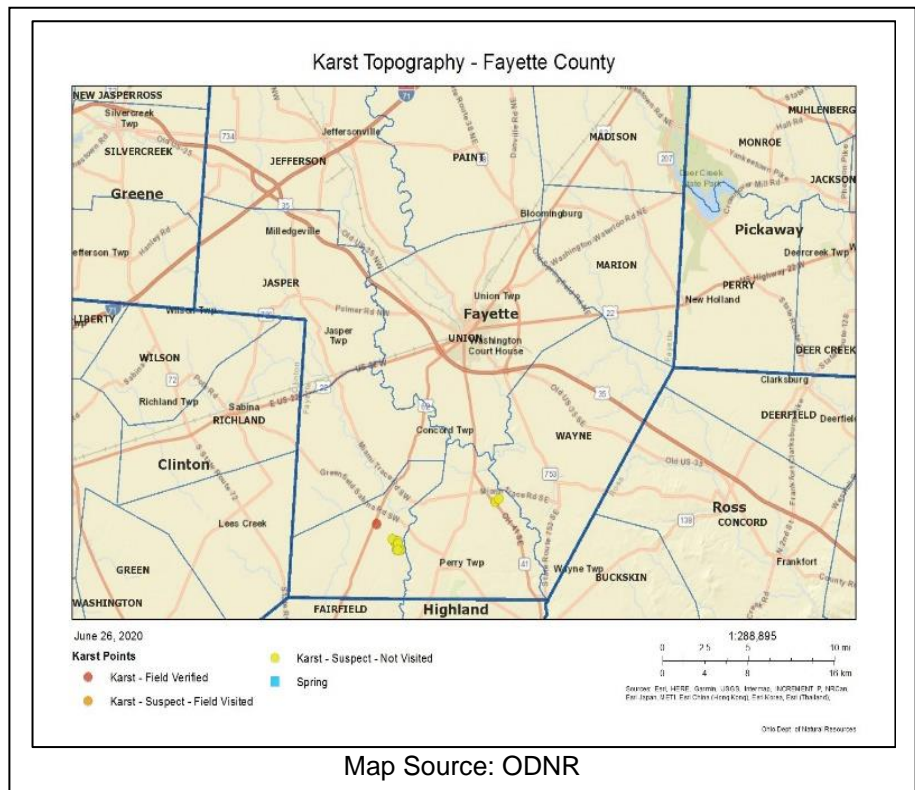
E. Affected Locations

There is an abandoned underground mine in the extreme southeast corner of the county.



⁴⁵ <http://geosurvey.ohiodnr.gov/geologic-hazards/abandoned-underground-mines/aum-home>

There is a confirmed location of karst topography (red dot) as well as several suspected locations (yellow dot) in the southern part of the county



F. Analysis

Factor	Ranking
Frequency	None: No Declarations
Response	< 1/2 Day
Onset	> 24 Hours
Magnitude	10% Land Area
Business	No Impact
Human	No Impact
Property	No Impact

G. Vulnerable Community Assets

Asset	Impact
People	Little or no impact.
Economy	Subsiding/subsided business locations would be adversely affected.
Infrastructure	Subsiding/subsided roads and other infrastructures would be adversely affected. Underground mines contain potentially contaminated water that may be released into the aquifer.
Structures	No structures are located in known risk areas.

Structure Type	Inven-tory	Average Value	At Risk %	At Risk Number	Damaged %	Damaged Number	Damages %	Damages Total
Residential	11,199	\$204,704		0		0		\$0
Nonresidential	1,075	\$787,403		0		0		\$0
Critical	26	\$450,000		0		0		\$0

Section VI – Mitigation Goals and Actions

I. Overview

The Fayette County Mitigation Planning Team identified hazards of credible threat and analyzed their impact using qualitative and quantitative methods. The team used the *FEMA Local Mitigation Planning Handbook, March 2013*, as a guide for conducting analysis.

II. Identification and Analysis Methodology

The Planning Team profiled each hazard. It collected and reviewed hazard information, assessed the impacts and the vulnerabilities of the community's assets. The team assigned risk factor values based on the criteria and adjusting factors established by the Ohio EMA.

The team then estimated structures at risk and associated damages.

III. Goals

The Planning Team selected the following mitigation goals:

- Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure
- Provide timely warning
- Enhance emergency response capability
- Plan for safe development
- Create self sufficiency
- Increase public awareness

IV. Actions

The Planning Team then reviewed the forty actions from the previous mitigation plan, noted eight as duplicate actions and two as not mitigation actions and one as normal maintenance, identified five as completed, deleted twelve, and added four new actions.

Goal/Action	Status	Note
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure		
Identify and map existing critical culverts and storm drainage ditches near residential areas, roadways and low-lying areas throughout the county.	Completed	
Install warning signage along roadways that are susceptible to flooding.	Deleted	1
Repair and replace bridges and levees that suffer damage from storm water.	Deleted	1
Elevate roads above base flood elevations.	Deleted	1
Install new infrastructure in areas susceptible to low level flooding and ponding, outside of the 100-year floodplain.	Deleted	1
Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.	Unchanged	
Develop and implement a tree trimming program to help prevent damage from falling limbs.	Unchanged	
Protect and restore natural flood mitigation features such as riverbanks, riparian buffers and vegetative buffers.	Deleted	1
Relocate or retrofit critical facilities located within floodplains.	Deleted	1
Mitigate water and wastewater treatment facilities located in flood hazard areas.	Unchanged	
Mitigate structures at risk	Unchanged	
Provide means for mass animal carcass disposal.	Deleted	1
Rehabilitate dams known to be of high hazard potential.	New	

Goal/Action	Status	Note
Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data	New	
Upgrade water treatment plant carbon process and upgrade disposal.	New	
Increase the size of sewage lagoons to reduce probability of overflow.	New	
Provide timely warning		
Implement a reverse-flow emergency notification system.	Completed	
Install/upgrade outdoor warning sirens.	Unchanged	
Provide NOAA All-Hazards Warning Radios for all critical facilities.	Unchanged	
Upgrade the public safety countywide radio communications system.	Completed	
Enhance emergency response capability		
Establish a series of dry hydrants throughout the county.	Unchanged	
Construct additional water storage facility for emergency crop management and fire suppression.	Unchanged	
Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.	Unchanged	
Plan for safe development		
Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.	Unchanged	
Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.	Unchanged	
Request update of Digital Flood Insurance Rate Maps (DFIRMS).	Unchanged	
Encourage the Villages of Bloomingburg and Octa to participate in the National Flood Insurance Program.	Deleted	2
Participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).	Deleted	2
Form partnerships to support floodplain management and environmental conservation between local, state and regional entities.	Deleted	2
Develop notification platform for people to report potential land subsidence or sinkhole development.	Deleted	1
Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop	Unchanged	
Inspect utility poles to ensure they meet specifications and are wind resistant; bury power lines	Deleted	2
Review, revise and adopt policies/ordinances to improve stormwater management.	Unchanged	
Create self sufficiency		
Identify/upgrade facilities to be shelters.	Unchanged	
Develop and maintain a system to identify vulnerable populations.	Completed	
Install back-up generators for shelters and critical facilities.	Unchanged	
Identify alternate potable water sources and develop a distribution system.	Unchanged	
Identify facilities for use as temporary facilities for patients with non-life-threatening conditions to alleviate the overloading of medical facilities.	Completed	
Develop a warehousing system for storing essential disaster supplies.	Unchanged	
Provide designated locations/facilities to house displaced animals.	Unchanged	
Develop and implement a volunteer management program.	Unchanged	

Goal/Action	Status	Note
Construct community safe rooms.	Unchanged	
Construct residential safe rooms.	Unchanged	
Increase public awareness		
Develop and implement an all-hazards public education program.	Unchanged	

Notes. Rationale for deleting actions:

1. Not feasible or currently applicable
2. Normal operations

V. Cost-Benefit Review

Cost-Benefit Review is used to determine the relative feasibility of mitigation actions, thus establishing a prioritized list. The Planning Team used *Using Benefit-Cost Review in Mitigation Planning – State and Local Mitigation Planning How-To Guide Number Five – FEMA 386-5, May 2007*⁴⁶, to conduct this review. Using qualitative methods (Method A), this Cost-Benefit Review methodology was emphasized in the prioritization process.

A. Review Benefits and Costs

This step is documented with each selected mitigation action. Refer to *Mitigation Action Analysis* section.

B. Prioritize Actions

The following summarizes the benefits and costs of each mitigation action and reflects the priority assigned by the Planning Team. Guiding criteria was:

- Impact on public safety (isolation and injuries)
- Impact on property damage
- Impact on other mitigation actions
- Acceptability of implementation by elected officials and voters
- Monetary costs

Priority	Mitigation Action	Benefits	Costs
1	Install back-up generators for shelters and critical facilities.	Decreased impact of utility outages Increased public safety	\$50k x 2 sites
2	Install/upgrade outdoor warning sirens.	Increased public safety Increased attractiveness to new businesses, visitors and residents	\$40k x 5 sirens
3	Develop and implement an all-hazards public education program.	Increased public awareness and preparedness	Staff costs
4	Develop a warehousing system for storing essential disaster supplies.	Immediate access to disaster supplies Increased self sufficiency	Staff costs

⁴⁶ http://www.fema.gov/media-library-data/20130726-1606-20490-3557/how_to_5_final_may_2007.pdf

Priority	Mitigation Action	Benefits	Costs
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.	Increased public safety Increased attractiveness to new businesses, visitors and residents	\$50 x 100 radios
6	Establish a series of dry hydrants throughout the county.	Decreased structural damage by fire Decreased response time Increased attractiveness to new businesses and residents	\$500 x 10 sites
7	Identify/upgrade facilities to be shelters.	Increased public safety	\$6.825m (schools)
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.	Eliminated potable and ground water contamination	\$750k x 2 sites
9	Upgrade water treatment plant carbon process and upgrade disposal.	Increased water treatment capability More efficient and safe method of disposal	\$500k
10	Increase the size of sewage lagoons to reduce probability of overflow.	Increased public health Decreased probability of ground water contamination	\$25k x 2 sites
11	Develop and implement a volunteer management program.	Relieving Incident Commanders of having to manage volunteers Increased response and recovery resources Community involvement	Staff costs
12	Provide designated locations/facilities to house displaced animals.	Increased public safety for those who would not evacuate without pets/animals	Staff costs
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.	Increased public safety Decreased response and recovery costs	Unknown
14	Review, revise and adopt policies/ordinances to improve stormwater management.	Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support

Priority	Mitigation Action	Benefits	Costs
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.	Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support Increased economic development costs
16	Identify alternate potable water sources and develop a distribution system.	Water available during droughts	\$50k
17	Mitigate structures at risk	Increased public safety Decreased response and recovery costs Community-owned green space	Buy-in and funding by elected officials and property owners
18	Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop	Increased public safety Increased attractiveness to new businesses, visitors and residents	Facility owner buy-in Increased facility costs
19	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.	Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support Increased economic development costs
20	Rehabilitate dams known to be of high hazard potential.	Reduced people, businesses, other assets at risk	Dam owner buy in Rehabilitation costs
21	Request update of Digital Flood Insurance Rate Maps (DFIRMS).	Up to date digital information on flood zones	\$250k
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.	Unity and synergy of effort	Agency buy-in
23	Construct community safe rooms.	Increased public safety Increased self-sufficiency	Community buy-in \$500k x 10 sites
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.	Increased public safety Decreased structure damage Decreased incident debris removal	\$50k
25	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data	Reduced people, businesses, other assets at risk	Dam owner buy in
26	Construct additional water storage facility for emergency crop management and fire suppression.	Decreased crop loss Decreased structural loss	\$500k

Priority	Mitigation Action	Benefits	Costs
27	Construct residential safe rooms.	Increased public safety Decreased response and recovery costs	Community education Home-owner buy-in and funding

Section VII – Mitigation Action Identification & Analysis

I. Goal: Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure

A. Action: Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
13	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Dam Failure, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Flooding

Jurisdiction(s) Affected: Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Engineer, Fayette County Soil and Water Conservation District

Funding Resource(s): Community Development Block Grant, Flood Mitigation Assistance Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant

Mitigation Action Type(s): Stormwater, Reconstruction, Minor Localized Flood Reduction

Vulnerability	Before Implementation	After Implementation	Difference
People - Isolation	Unknown Number	Fewer at Risk	Not Quantifiable
Roadways - Damaged or Destroyed	Unknown	Lessened or Eliminated	Fewer roads damaged

Benefits	Costs
Increased public safety Decreased response and recovery costs	Unknown

B. Action: Develop and implement a tree trimming program to help prevent damage from falling limbs.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
24	7/1/2020	6/30/2025	\$50k	Unchanged

Hazards Addressed: Tornado, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, Octa Village, Fayette County

Project Lead(s): Mayors

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant

Mitigation Action Type(s): Damage Avoidance

Vulnerability	Before Implementation	After Implementation	Difference
Structures - Damaged	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Decreased structure damage Decreased incident debris removal	\$50k

C. Action: Mitigate water and wastewater treatment facilities located in flood hazard areas.

Washington Courthouse: \$.5m; Good Hope: \$1m

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
8	7/1/2020	6/30/2025	\$15m	Unchanged

Hazards Addressed: Dam Failure, Flooding, Earthquakes, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Washington Court House City

Project Lead(s): Fayette County Facilities Management Dept

Funding Resource(s): Community Development Block Grant, Flood Mitigation Assistance Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Stormwater, Elevation, Minor Localized Flood Reduction

Vulnerability	Before Implementation	After Implementation	Difference
People - Loss of Potable Water	Occurrence Possible	Less Likely to Occur	Not Quantifiable
Environment - Contamination	Occurrence Possible	Less Likely to Occur	Not Quantifiable
Infrastructure - Damage to Facilities	Occurrence Possible	Less Likely to Occur	Not Quantifiable

Benefits	Costs
Eliminated potable and ground water contamination	\$750k x 2 sites

D. Action: Mitigate structures at risk

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
17	7/1/2020	6/30/2025	\$51m	Unchanged

Hazards Addressed: Flooding

Jurisdiction(s) Affected: Concord Township, Green Township, Jasper Township, Jefferson Township, Madison Township, Marion Township, Paint Township, Perry Township, Wayne Township, Union Township, Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): Community Development Block Grant, Flood Mitigation Assistance Grant, Hazard Mitigation Grant Program, Increased Cost of Compliance, Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Acquisition, Elevation, Planning, Reconstruction, Relocation, Retrofit, Stormwater

Vulnerability	Before Implementation	After Implementation	Difference
Structures - Damaged or Destroyed	25	0	-25

Benefits	Costs
Increased public safety Decreased response and recovery costs Community-owned green space	Buy-in and funding by elected officials and property owners

E. Action: Rehabilitate dams known to be of high hazard potential.

Rehabilitate dams to ensure integrity.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
20	7/1/2020	6/30/2025	Unknown	New

Hazards Addressed: Earthquakes, Severe Summer Storms/Thunderstorms, Dam Failure, Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Dam Owners

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Pre-Disaster Mitigation Grant

Mitigation Action Type(s): Planning, Reconstruction, Soil Stabilization, Stormwater

Vulnerability	Before Implementation	After Implementation	Difference
People - In Inundation Zones - Lack of Warning	Unknown Number	Fewer at Risk	Not Quantifiable

Vulnerability	Before Implementation	After Implementation	Difference
Other Community Assets - In Inundation Zones	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Reduced people, businesses, other assets at risk	Dam owner buy in Rehabilitation costs

F. Action: Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data

Ensure there is current inundation data on all Class I and Class II dams; update EAPs on required dams.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
25	7/1/2020	6/30/2025	Unknown	New

Hazards Addressed: Dam Failure, Earthquakes, Flooding, Severe Summer Storms/Thunderstorms

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Dam Owners

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning, Stormwater

Vulnerability	Before Implementation	After Implementation	Difference
People - In Inundation Zones	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Reduced people, businesses, other assets at risk	Dam owner buy in

G. Action: Upgrade water treatment plant carbon process and upgrade disposal.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
9	7/1/2020	6/30/2025	\$500k	New

Hazards Addressed: Hazardous Material Release, Flooding

Jurisdiction(s) Affected: Washington Court House City, Fayette County

Project Lead(s): Washington Courthouse Mayor

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Retrofit, Stormwater, Contamination Avoidance

Vulnerability	Before Implementation	After Implementation	Difference
Environment - Contamination	Occurrence Possible	Less Likely to Occur	Not Quantifiable

Benefits	Costs
Increased water treatment capability More efficient and safe method of disposal	\$500k

H. Action: Increase the size of sewage lagoons to reduce probability of overflow.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
10	7/1/2020	6/30/2025	\$50k	New

Hazards Addressed: Hazardous Material Release, Flooding

Jurisdiction(s) Affected: Washington Court House City, Fayette County

Project Lead(s): Washington Courthouse Mayor

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Reconstruction, Stormwater

Vulnerability	Before Implementation	After Implementation	Difference
Environment - Contamination	Occurrence Possible	Less Likely to Occur	Not Quantifiable

Benefits	Costs
Increased public health Decreased probability of ground water contamination	\$25k x 2 sites

II. Goal: Provide timely warning

A. Action: Install/upgrade outdoor warning sirens.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
2	7/1/2020	6/30/2025	\$200k	Unchanged

Hazards Addressed: Earthquakes, Severe Winter Storms, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Tornado, Hazardous Material Release, Dam Failure, Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County EMA

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Warning

Vulnerability	Before Implementation	After Implementation	Difference
People - Lack of warning	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	\$40k x 5 sirens

B. Action: Provide NOAA All-Hazards Warning Radios for all critical facilities.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
5	7/1/2020	6/30/2025	\$5k	Unchanged

Hazards Addressed: Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Earthquakes, Tornado, Hazardous Material Release, Dam Failure, Severe Winter Storms, Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County EMA

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Warning

Vulnerability	Before Implementation	After Implementation	Difference
People - Lack of warning	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	\$50 x 100 radios

III. Goal: Enhance emergency response capability

A. Action: Establish a series of dry hydrants throughout the county.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
6	7/1/2020	6/30/2025	\$5k	Unchanged

Hazards Addressed: Droughts,

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Jurisdictional Fire Chiefs

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Fire Suppression

Vulnerability	Before Implementation	After Implementation	Difference
Structures - Access to Fire Suppression Water	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Decreased structural damage by fire Decreased response time Increased attractiveness to new businesses and residents	\$500 x 10 sites

B. Action: Construct additional water storage facility for emergency crop management and fire suppression.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
26	7/1/2020	6/30/2025	\$500k	Unchanged

Hazards Addressed: Droughts

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Jurisdictional Fire Chiefs, Fayette County Soil and Water Conservation District

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Fire Suppression, Crop Resilience

Vulnerability	Before Implementation	After Implementation	Difference
Structures - Access to Fire Suppression Water	Unknown Number	Fewer at Risk	Not Quantifiable
Crops - Access to Water	Unknown Amount	Fewer at Risk	Not Quantifiable

Benefits	Costs
Decreased crop loss Decreased structural loss	\$500k

IV. Goal: Plan for safe development

A. Action: Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
22	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Flooding

Jurisdiction(s) Affected: Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Commissioners, Mayors

Funding Resource(s): In-Kind (Work or Labor)

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
Community Assets	Unknown	Fewer	Less Impact

Benefits	Costs
Unity and synergy of effort	Agency buy-in

B. Action: Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
15	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Earthquakes, Flooding, Tornado, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): In-Kind (Work or Labor)

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
Community Assets	Unknown	Fewer	Less Impact

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support Increased economic development costs

C. Action: Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
19	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County Commissioners

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
Community Assets	Unknown	Fewer	Less Impact

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support Increased economic development costs

D. Action: Request update of Digital Flood Insurance Rate Maps (DFIRMS).

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
21	7/1/2020	6/30/2025	\$250k	Unchanged

Hazards Addressed: Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Floodplain Managers

Funding Resource(s): In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
Community Assets	Unknown	Fewer	Less Impact

Benefits	Costs
Up to date digital information on flood zones	\$250k

E. Action: Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
18	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Tornado

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County Commissioners, Mayors

Funding Resource(s): In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning, Storm Shelter

Vulnerability	Before Implementation	After Implementation	Difference
People - In Vulnerable Structures	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	Facility owner buy-in Increased facility costs

F. Action: Review, revise and adopt policies/ordinances to improve stormwater management.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
14	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Flooding, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Severe Winter Storms

Jurisdiction(s) Affected: Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning, Stormwater

Vulnerability	Before Implementation	After Implementation	Difference
Community Assets	Unknown	Fewer	Less Impact

Benefits	Costs
Increased public safety Increased attractiveness to new businesses, visitors and residents	Elected official buy-in Public support

V. Goal: Create self sufficiency

A. Action: Identify/upgrade facilities to be shelters.

This includes existing facilities such as schools and community buildings.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
7	7/1/2020	6/30/2025	\$68m	Unchanged

Hazards Addressed: Dam Failure, Tornado, Flooding, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County EMA; Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Storm Shelter, Planning, Reconstruction, Retrofit

Vulnerability	Before Implementation	After Implementation	Difference
People - In Vulnerable Structures	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety	\$6.825m (schools)

B. Action: Install back-up generators for shelters and critical facilities.

Priority	Start Date:	End Date:	Estimated Cost:	Current Status:
1	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Earthquakes, Severe Winter Storms, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Tornado, Flooding

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Facility Owners

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Emergency Power

Vulnerability	Before Implementation	After Implementation	Difference
People - Needing Sheltering and Emergency Services	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Decreased impact of utility outages Increased public safety	\$50k x 2 sites

C. Action: Identify alternate potable water sources and develop a distribution system.

Such as drilling wells

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
16	7/1/2020	6/30/2025	\$50k	Unchanged

Hazards Addressed: Droughts

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County Department of Sanitary Services

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
People - Access to Water	Unknown Number	Fewer at Risk	Not Quantifiable
Crops - Access to Water	Unknown Amount	Fewer at Risk	Not Quantifiable

Benefits	Costs
Water available during droughts	\$50k

D. Action: Develop a warehousing system for storing essential disaster supplies.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
4	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Pandemic, Earthquakes, Flooding, Severe Winter Storms, Tornado

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County Health Department, Fayette County EMA

Funding Resource(s): In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
People - In Immediate Need of Supplies	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Immediate access to disaster supplies Increased self sufficiency	Staff costs

E. Action: Provide designated locations/facilities to house displaced animals.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
12	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Tornado, Hazardous Material Release, Dam Failure, Flooding, Earthquakes

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Planning, Animals

Vulnerability	Before Implementation	After Implementation	Difference
Animals - Displaced with No Place To Go	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety for those who would not evacuate without pets/animals	Staff costs

F. Action: Develop and implement a volunteer management program.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
11	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Flooding, Tornado, Earthquakes, Dam Failure, Hazardous Material Release, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Pandemic

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County EMA

Funding Resource(s): In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Planning

Vulnerability	Before Implementation	After Implementation	Difference
People - Wanting to Help but Not Knowing How	Unknown Number	Fewer at Risk	Not Quantifiable
People - Unfilled Incident-Related Resource Needs	Unknown Number	Fewer Unfilled	Not Quantifiable

Benefits	Costs
Relieving Incident Commanders of having to manage volunteers Increased response and recovery resources Community involvement	Staff costs

G. Action: Construct community safe rooms.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
23	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Severe Winter Storms, Earthquakes, Flooding, Tornado, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Concord Township, Green Township, Jasper Township, Jefferson Township, Madison Township, Marion Township, Paint Township, Perry Township, Wayne Township, Union Township, Washington Court House City, Bloomingburg Village, Jeffersonville Village, Milledgeville Village, New Holland Village, Octa Village, Fayette County

Project Lead(s): Fayette County Commissioners, Township Trustees, Mayors

Funding Resource(s): Community Development Block Grant, Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds, Pre-Disaster Mitigation Grant, State Funds

Mitigation Action Type(s): Storm Shelter, Planning, Reconstruction, Retrofit

Vulnerability	Before Implementation	After Implementation	Difference
People - In Vulnerable Structures	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Increased self-sufficiency	Community buy-in \$500k x 10 sites

H. Action: Construct residential safe rooms.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
27	7/1/2020	6/30/2025	Unknown	Unchanged

Hazards Addressed: Tornado, Severe Summer Storms/Thunderstorms/Wind Storms/Hail

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Individual Residents

Funding Resource(s): State Funds

Mitigation Action Type(s): Planning, Reconstruction, Retrofit

Vulnerability	Before Implementation	After Implementation	Difference
People - In Vulnerable Structures	Unknown Number	Fewer at Risk	Not Quantifiable

Benefits	Costs
Increased public safety Decreased response and recovery costs	Community education Home-owner buy-in and funding

VI. Goal: Increase public awareness

A. Action: Develop and implement an all-hazards public education program.

<i>Priority</i>	<i>Start Date:</i>	<i>End Date:</i>	<i>Estimated Cost:</i>	<i>Current Status:</i>
3	7/1/2020	6/30/2025	\$5k	Unchanged

Hazards Addressed: Tornado, Pandemic, Land Subsidence, Earthquakes, Hazardous Material Release, Flooding, Severe Summer Storms/Thunderstorms/Wind Storms/Hail, Severe Winter Storms, Droughts, Dam Failure

Jurisdiction(s) Affected: Fayette County

Project Lead(s): Fayette County EMA

Funding Resource(s): Hazard Mitigation Grant Program, In-Kind (Work or Labor), Local Funds

Mitigation Action Type(s): Wildfire, Stormwater, Storm Shelter, Retrofit, Relocation, Planning, Elevation, Acquisition

Vulnerability	Before Implementation	After Implementation	Difference
People - Unaware of Hazards and Actions to Take	50%	80%	-30%

Benefits	Costs
Increased public awareness and preparedness	Staff costs

Section VIII – Supplemental Information

I. Mitigation Acronyms, Terms and Definitions

Term	Acronym	Description
Community Development Block Grant Program	CDBC	The Community Development Block Grant program is a flexible program that provides communities with resources to address a wide range of unique community development needs.
Community Asset		The people, structures, facilities, and systems that have value to the community
Dam - Class I		Dams having a total storage volume greater than five thousand acre-feet or a height of greater than sixty feet shall be placed in class I. A dam shall be placed in class I when sudden failure of the dam would result in one of the following conditions: (a) Probable loss of human life. (b) Structural collapse of at least one residence or one commercial or industrial business. Reference: OAC 1501:21-13-01(A)(1)
Dam - Class II		Dams having a total storage volume greater than five hundred acre-feet or a height of greater than forty feet shall be placed in class II. A dam shall be placed in class II when sudden failure of the dam would result in at least one of the following conditions, but loss of human life is not probable. (a) Disruption of a public water supply or wastewater treatment facility, release of health hazardous industrial or commercial waste, or other health hazards. (b) Flooding of residential, commercial, industrial, or publicly owned structures. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. (c) Flooding of high-value property. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. (d) Damage or disruption to major roads including but not limited to interstate and state highways, and the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by the chief. (e) Damage or disruption to railroads or public utilities. (f) Damage to downstream class I, II or III dams or levees, or other dams or levees of high value. Damage to dams or levees can include, but is not limited to, overtopping of the structure. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property. Reference: OAC 1501:21-13-01(A)(2)
Dam - Class III		Dams having a total storage volume greater than fifty acre-feet or a height of greater than twenty-five feet shall be placed in class III. A dam shall be placed in class III when sudden failure of the dam would result in at least one of the following conditions, but loss of human life is not probable. (a) Property losses including but not limited to rural buildings not otherwise described in paragraph (A) of this rule, and class IV dams and levees not

Term	Acronym	Description
		<p>otherwise listed as high-value property in paragraph (A) of this rule. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property.</p> <p>(b) Damage or disruption to local roads including but not limited to roads not otherwise listed as major roads in paragraph (A) of this rule.</p> <p>Reference: OAC 1501:21-13-01(A)(3)</p>
Dam - Class IV		<p>Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less may be placed in class IV. When sudden failure of the dam would result in property losses restricted mainly to the dam and rural lands, and loss of human life is not probable, the dam may be placed in class IV. Class IV dams are exempt from the permit requirements of section 1521.06 of the Revised Code pursuant to paragraph (C) of rule 1501:21-19-01 of the Administrative Code.</p> <p>Reference: OAC 1501:21-13-01(A)(4)</p>
Emergency Management Agency	EMA	
Federal Emergency Management Agency	FEMA	<p>FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards.</p>
Hazards U.S. Multi-Hazard	HAZUS-MH	<p>The Hazards U.S. Multi-Hazard is a nationally applicable standardized method that estimates potential losses from earthquakes, hurricane winds, and floods. HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display hazard data and estimates of damage and economic loss to buildings and infrastructure.</p>
Impact		<p>The consequences or effects of a hazard on the community and its assets</p>
Mitigation		<p>Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect. Mitigation measures may be implemented prior to, during, or after an incident. Mitigation measures are often informed by lessons learned from prior incidents. Mitigation involves ongoing actions to reduce exposure to, probability of, or potential loss from hazards. Measures may include zoning and building codes, floodplain buyouts, and analysis of hazard related data to determine where it is safe to build or locate temporary facilities. Mitigation can include efforts to educate governments, businesses, and the public on measures they can take to reduce loss and injury.</p>
Modified Mercalli Intensity Scale		<p>The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced at that place.</p>

Term	Acronym	Description
		The lower numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage.
Natural Hazard		Source of harm or difficulty created by a meteorological, environmental, or geological event
National Flood Insurance Program	NFIP	The National Flood Insurance Program is aimed at reducing the impact of flooding on private and public structures. This is achieved by providing affordable insurance for property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of Risk Insurance in general, and National Flood Insurance in particular.
National Oceanic and Atmospheric Administration	NOAA	Science, Service, and Stewardship. Mission: To understand and predict changes in climate, weather, oceans, and coasts, To share that knowledge and information with others, and To conserve and manage coastal and marine ecosystems and resources.
National Weather Service	NWS	The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.
Ohio Department of Natural Resources	ODNR	
Per Capita		Per unit of population.
Repetitive Loss Property		Any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. The property may or may not be currently insured by the NFIP.
Risk		The potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.
Risk Assessment		Product or process that collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making.
Severe Repetitive Loss Property		A residential property that is covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

Term	Acronym	Description
Threat or Human-Caused Incident		Intentional actions of an adversary, such as a threatened or actual chemical or biological attack or cyber event
United States Geological Survey	USGS	The USGS serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.
United States Department of Housing and Urban Development	USHUD	HUD's mission is to create strong, sustainable, inclusive communities and quality affordable homes for all. HUD is working to strengthen the housing market to bolster the economy and protect consumers; meet the need for quality affordable rental homes; utilize housing as a platform for improving quality of life; build inclusive and sustainable communities free from discrimination and transform the way HUD does business.
Vulnerability		Characteristics of community assets that make them susceptible to damage from a given hazard

II. Meetings, Announcements and Correspondence

The Planning Team held public meetings to officially brief chief elected officials, gather data for inclusion in the updated plan, and make decisions on elements of the plan. The following are announcements and rosters of Planning Team meetings:

A. June 3, 2019 – Commissioners Endorsement of Mitigation Effort

DESIGNATION OF APPLICANT'S AGENT

RESOLUTION

BE IT RESOLVED BY the Commissioners OF Fayette County, Ohio
(Governing Body) (Public Entity)

THAT Melissa Havens, Director of Emergency Management
(Name of Incumbent) (Official Position)

is hereby authorized to execute for and in behalf of Fayette County
_____, a public entity established under the laws of the State of Ohio

this application and to file it in the appropriate State office for the purpose of obtaining certain Federal financial assistance under the Disaster Relief Act (Public Law 288, 23rd Congress) or otherwise available from the President's Disaster Relief Fund.

THAT Fayette County, a public entity established under the laws of the State of Ohio, hereby authorized its agent to provide to the State and to the Federal Emergency Management Agency (FEMA) for all matters pertaining to such Federal disaster assistance the assurances and agreements as listed in the Grant Agreement.

Passed and approved this 3rd day of June, 2019.

Tom Anderson County Commissioner
(Name and Title)

Dale Don County Commissioner
(Name and Title)

James D. Hamilton County Commissioner
(Name and Title)

CERTIFICATION

I, Dana Foor, duly appointed and Clerk of
(Title)
Fayette County Board of Commissioners, do hereby certify that the above is a true and correct copy of a resolution passed and approved by the Commissioners of Fayette County
(Governing Body) (Public Entity)

on the 3rd day of June, 2019.

Date: June 3, 2019


Administrative Clerk Dana Foor
(Official Position) (Signature)

*Name of Incumbent need not be provided in those cases where the governing body of the public entity desires to authorize any incumbent of the designated official position to represent it.

FEMA Form 90-83, MAR 81

B. October 2, 2019 – Kick-Off Meeting

1. Invitation



Fayette County
Emergency Management Agency
Local Emergency Planning Committee
Office of Homeland Security

133 S. Main Street, Suite L15, Washington C.H., Ohio 43160
 Phone: (740) 335-8264 • Fax: (740) 333-0002 • Email: fayema@fayette-co-oh.com

August 26, 2019

Fayette County is beginning an update to the Hazard Mitigation Plan.

You are cordially invited to attend the kickoff planning meeting scheduled for Wednesday, October 2 at 10:00 a.m. The meeting will be held at the Center for Economic Opportunity, 101 E. East Street, Washington C.H., OH 43160.

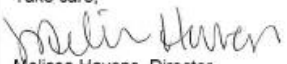
A hazard mitigation plan is a strategic guidance document used by an entity to reduce future risk to life and property. A hazard mitigation plan has the following elements:

- A *public participation* process for bringing together diverse stakeholders in the jurisdiction(s) to provide an array of input into the plan,
- A *risk assessment* to identify the hazards, determine the people and property subject to those hazards, and estimate vulnerability,
- A *mitigation strategy* that contains goals, objectives and an action plan to implement priority mitigation actions that reduce risk,
- A *maintenance process* to ensure the plan is reviewed, updated and does not sit idle, and
- An *adoption requirement* to ensure the participating jurisdictions support the plan.

Why you should attend this meeting:

- You are a vested member of this community, and your input could prove to be invaluable.
- Should you apply for federal grants to assist financially in addressing any item or issue that has been identified in this Plan as a "need," you will have a federally-approved document to support your financial request, which increases your likelihood of receiving said funding.
- Your attendance at this meeting will also be counted towards the County's "in-kind match" for the Grant used to cover the cost of the Contractor.

This is a great opportunity to have your voice heard on behalf of your jurisdiction/agency with issues directly related to us locally. Please plan to attend this planning meeting. Feel free to contact my office with any additional questions or concerns you may have. I look forward to seeing you in October!

Take care,

 Melissa Havens, Director

"Coordinating Emergency Services within Fayette County to protect Lives, Property, and the Environment by an all hazard approach of Mitigation, Preparedness, Response, and Recovery for Disasters and Emergencies"

2. Invitees


- | | |
|--|---|
| Village Mayors & Village Councils
FD & EMS Chiefs
Health Dept
Hospital
Engineer
GIS
Commissioners
City Mgr
City Council
Hamm Radio
Local paper
Soil & Water | OSU Extension
Red Cross
Highland County EMA
All water/wastewater departments
Floodplain Mgr
ODOT
Private Industry
Law Enforcement
Twp Trustees
Aiport
Economic Development
State folks (Luan & Phil) |
|--|---|

3. Sign-In Sheet

Fayette County Mitigation Plan Meeting October 2, 2019	
Print Name	Agency/Jurisdiction
Bandy Kingsley	Village of Oeta Mayor
RALPH STEGBAUER	CGFD
Rod List	FCEMS
Chet Murphy	FSWCD
Jay Myers	Building Dept
BOB KINZER	JEFFERSON MAYOR
Tim Downing	WCH F.D.
David Buschman	Highland EMA
THOMAS FRECKEL	CLINTON Co. EMA
BEN FORD	Fayette Co. OSU Extension
Godwom T. Apdijah	Fayette Co - Edco & Ose Edr
Deborah Sims	Madison Co EMA
Hinda Turner	Oeta Council
Patricia	Fayette
Scott Corning	GPS
Dana Kellenberger	JTFEMS
Harold De Santa	Pic-A-FAX Joint Fire District
Ligh Cannon	Franklin Co. Public Health
Melissa Havens	WV Co EMA

Meeting #1

C. August 27, 2019 – Public Note of Mitigation Plan Update



Fayette County Emergency Management Agency August 27, 2019

Fayette County is beginning an update to the Hazard Mitigation Plan. A hazard mitigation plan is a strategic guidance document used by an entity to reduce future risk to life and property. A hazard mitigation plan has the following elements:

- A public participation process for bringing together diverse stakeholders in the jurisdiction(s) to provide an array of input into the plan,
- A risk assessment to identify the hazards, determine the people and property subject to those hazards, and estimate vulnerability,
- A mitigation strategy that contains goals, objectives and an action plan to implement priority mitigation actions that reduce risk,
- A maintenance process to ensure the plan is reviewed, updated and does not sit idle, and
- An adoption requirement to ensure the participating jurisdictions support the plan.

A current copy is available at the Carnegie Public Library in Washington Court House at the Adult Circulation Desk for public review, or you can find it online at the Fayette County EMA website: www.fayette-co-oh.com/departments/emergency_management_agency under "Plans". Comments and suggestions can be made via email to Melissa.havens@fayette-co-oh.com, by phone 740-335-8264, or in person at the Plan Update Meeting scheduled for Wednesday, October 2, 2019 at 9am at the Center for Economic Opportunity, 101 E. East Street, Washington C.H., OH 43160.

D. December 9, 2019 – Hazards Meeting

Fayette County Mitigation Plan Meeting
December 9, 2019 Meeting #4

Print Name	Agency/Jurisdiction
Brian W Crooks	LEPC/Red collar
Melissa Havens	FAY CO EMA
Mary McCord	ARC
Bob East	FCEMS
Row HUFF	BPM FIRE
Jim Scott	RACES
Tom [unclear]	WCHFD
Dana Kellenberger	ITFEMS
David Borsari	FCMA
Chris [unclear]	Wayne Fire
Leigh Cannon	FCPH
Megan Batson	FCPH
VERNON STANFORTH	FCSO
Andy Bixens	FCSO
Steve Luebbe	FCSO
Dan Dean	Fay Commissioner's
Kenneth J. Kelly	Paint Twp
Bob Kinzer	Jville, Mayor
David Bushelman	Highland EMA
Cory Hoffman	FCMA
William T. Apaluyals	OSU Ext/Economic Devel.
Kamie Ward	ODOT Fayette County
RALPH STUBBINS	CGFD
Scott Community	GRS
Phillip Clayton	Ohio EMA
Tony Anderson	Commission
Jim GALLARD	CO [unclear]
Scott Cook	Paint Twp

E. February 19, 2020 – Actions Meeting

Fayette County Mitigation Plan Update Meeting
February 19, 2020 Meeting #4

Print Name	Agency/Jurisdiction
RALPH STUBBINS	CGFD
Jason Maroz	Walmart DC
Dana Kellenberger	ITFEMS
Megan Batson	FCMA
Sue Burnside	Village of Jeff
DAVID Bushelman	Highland EMA
Quenten Matson	WCH Water Plant
Bob Kinzer	Jeffersonville, Mayor
Chris [unclear]	Union Twp
Jim [unclear]	County Bldg Dept
Cy. K. Bantow	Patette Co. Bldg. Dept.
Jim GIBRELAND	FAY CO
Bill Franke	MIAMI TRACE LSD
Cory Hoffman	FCMA
Chet Murphy	Fayette SWCD
Tony ANDERSON	FAY CO Comm
Joe JENSEN	CITY WCH
Leigh Cannon	FCPH
Brian Gustin	Greene Twp
Godwin	Economic Dev.

F. March - April 2020 – Actions Prioritization

The following worksheet headings were filled out and returned by participants that had not attended a meeting as documented on a sign-in sheet:

- Ron Anderson, Mayor, Village of Milledgeville

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	MILLEDGEVILLE 0394 43142			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				
Identify and map existing critical culverts and storm				
Knowledge of specific hazard				

- Donald Fleak, Mayor, Village of Bloomingburg

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	Bloomingburg			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				
Identify and map existing critical culverts and storm				
Knowledge of specific hazard				

- Bryan Riley, Administrator, Village of Jeffersonville

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	Village of Jeffersonville, Bryan Riley, VA			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				
Identify and map existing critical culverts and storm				
Knowledge of specific hazard				

- Jeff Hoppes, Trustee, Jefferson Twp

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	Jefferson Twp			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				
Identify and map existing critical culverts and storm				
Knowledge of specific hazard				

- Randy Kingery, Mayor, Village of Octa

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	Village of Octa			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				

- Vivian Wood, Mayor, New Holland

Fayette County 2020 Mitigation Plan Update	Jurisdiction/Agency/Name			
Mitigation Action Prioritization Worksheet	Village of New Holland			
Goal/Action	Benefits	Costs	H/M/L	Priority
Reduce or eliminate impact of hazards on public safety, lives, property and infrastructure				

III. Mitigation Actions by Jurisdiction

Priority/Jurisdiction/Action	
Fayette County	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
6	Establish a series of dry hydrants throughout the county.
7	Identify/upgrade facilities to be shelters.
9	Upgrade water treatment plant carbon process and upgrade disposal.
10	Increase the size of sewage lagoons to reduce probability of overflow.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
16	Identify alternate potable water sources and develop a distribution system.
17	Mitigate structures at risk
18	Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop
19	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.
20	Rehabilitate dams known to be of high hazard potential.
21	Request update of Digital Flood Insurance Rate Maps (DFIRMS).
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
25	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
26	Construct additional water storage facility for emergency crop management and fire suppression.
27	Construct residential safe rooms.
Concord Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Green Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Jasper Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Jefferson Township	
17	Mitigate structures at risk

Priority/Jurisdiction/Action	
23	Construct community safe rooms.
Madison Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Marion Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Paint Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Perry Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Wayne Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
Union Township	
17	Mitigate structures at risk
23	Construct community safe rooms.
City of Washington Court House	
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
9	Upgrade water treatment plant carbon process and upgrade disposal.
10	Increase the size of sewage lagoons to reduce probability of overflow.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
Village of Bloomingburg	
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
Village of Jeffersonville	
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.

Priority/Jurisdiction/Action	
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
Village of Milledgeville	
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
Village of New Holland	
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
Village of Octa	
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.

IV. Mitigation Actions by Hazard

Priority	Action
Severe Winter Storms	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
23	Construct community safe rooms.
Severe Summer Storms/Thunderstorms/Wind Storms/Hail	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
7	Identify/upgrade facilities to be shelters.
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
11	Develop and implement a volunteer management program.
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
18	Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
27	Construct residential safe rooms.
Tornadoes	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
7	Identify/upgrade facilities to be shelters.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
18	Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop
23	Construct community safe rooms.
24	Develop and implement a tree trimming program to help prevent damage from falling limbs.
27	Construct residential safe rooms.

Priority	Action
Hazardous Material Release	
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
9	Upgrade water treatment plant carbon process and upgrade disposal.
10	Increase the size of sewage lagoons to reduce probability of overflow.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
Dam Failure	
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
7	Identify/upgrade facilities to be shelters.
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
20	Rehabilitate dams known to be of high hazard potential.
25	Update dam Emergency Action Plans; update inundation data for dams without EAPs or no current inundation data
Droughts	
3	Develop and implement an all-hazards public education program.
6	Establish a series of dry hydrants throughout the county.
16	Identify alternate potable water sources and develop a distribution system.
26	Construct additional water storage facility for emergency crop management and fire suppression.
Flooding	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
7	Identify/upgrade facilities to be shelters.
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
9	Upgrade water treatment plant carbon process and upgrade disposal.
10	Increase the size of sewage lagoons to reduce probability of overflow.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
13	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
14	Review, revise and adopt policies/ordinances to improve stormwater management.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
17	Mitigate structures at risk
19	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.

Priority	Action
21	Request update of Digital Flood Insurance Rate Maps (DFIRMS).
22	Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.
23	Construct community safe rooms.
Earthquakes	
1	Install back-up generators for shelters and critical facilities.
2	Install/upgrade outdoor warning sirens.
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
5	Provide NOAA All-Hazards Warning Radios for all critical facilities.
8	Mitigate water and wastewater treatment facilities located in flood hazard areas.
11	Develop and implement a volunteer management program.
12	Provide designated locations/facilities to house displaced animals.
15	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
23	Construct community safe rooms.
Land Subsidence	
3	Develop and implement an all-hazards public education program.
Pandemic	
3	Develop and implement an all-hazards public education program.
4	Develop a warehousing system for storing essential disaster supplies.
11	Develop and implement a volunteer management program.

V. 2015 Mitigation Action Adjustments

2015 Goal/ Action	Disposition	2020 Action
Winter and Summer Storms: To educate the County's citizens to increase awareness of severe storms and where to seek safety during storm events, to provide adequate shelters where citizens can seek safety from severe weather, to improve the warning system and radio communications throughout the County, to expedite the clean up process through coordination and equipment acquisition, to maintain operations of critical facilities and emergency services and to reduce property damage caused by severe weather.		
Install an inter-operable siren system that would alert residents of approaching severe weather or other emergencies.	Unchanged Merged	Install/upgrade outdoor warning sirens.
Upgrade the radio communication system throughout the County for all public safety services	Deleted Duplicate action - Merged	Upgrade the public safety countywide radio communications system.
Seek funding to acquire portable generators to loan out to critical facilities and shelters	Deleted Duplicate action - Merged	Install back-up generators for shelters and critical facilities.
Provide/encourage NOAA weather radios for all critical facilities within the County.	Unchanged Merged	Provide NOAA All-Hazards Warning Radios for all critical facilities.
Seek funding to purchase additional communication equipment for use by the EMA in communicating with relief workers.	Deleted Duplicate action - Merged	Upgrade the public safety countywide radio communications system.
Provide back-up generators for critical facilities, including shelters, which need to maintain continuous power to protect human health and life.	Unchanged	Install back-up generators for shelters and critical facilities.
Seek funding to provide an early warning system, such as reverse 9-1-1, to warn residents of emergency situations.	Deleted Duplicate action - Merged	Implement a reverse-flow emergency notification system.
Develop a public education program for informing residents of the hazards associated with severe weather (i.e., medical conditions, driving conditions, and necessary post-event activity.)	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Provide an alternate potable water source in the event that existing water supplies are disrupted or contaminated.	Unchanged	Identify alternate potable water sources and develop a distribution system.
Upgrade existing and provide additional shelters where residents, especially the medically fragile, can seek safety from severe weather. Coordinate with the Red Cross to provide at least one shelter for each jurisdiction.	Unchanged	Identify/upgrade facilities to be shelters.

2015 Goal/ Action	Disposition	2020 Action
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Increase manpower and equipment for Townships and Villages of Fayette County for snow and debris removal.	Deleted Not a mitigation action	
Provide temporary facilities for non-life-threatening emergencies to alleviate the overloading of medical facilities.	Unchanged	Identify facilities for use as temporary facilities for patients with non-life-threatening conditions to alleviate the overloading of medical facilities.
Develop a warehousing complex for storing essential disaster supplies (i.e., food, clothing, medical supplies), as well as processing donations, that would be distributed to shelters during and after an event.	Deleted Duplicate action - Merged	Develop a warehousing system for storing essential disaster supplies.
Provide permanent shelters for residents of mobile home parks and campgrounds, where citizens may seek safety.	Deleted Duplicate action - Merged	Identify/upgrade facilities to be shelters.
Develop public education program for residences and businesses concerning the dangers of fuel tanks (e.g. securing them to a permanent structure, ensuring adequate tank structure strength.)	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Provide designated locations/facilities to house displaced animals after severe storm events.	Unchanged	Provide designated locations/facilities to house displaced animals.
Develop a tree maintenance program for trimming and pruning trees to help prevent damage from falling limbs.	Unchanged	Develop and implement a tree trimming program to help prevent damage from falling limbs.
Seek funding to develop a Volunteer Reception Center for coordinating and/or training volunteers who are willing to help with the response of a severe weather incident.	Deleted Duplicate action - Merged	Develop and implement a volunteer management program.
Provide means for mass animal carcass disposal to prevent spread of disease after a severe weather event.	Deleted Duplicate action - Merged	Provide means for mass animal carcass disposal.
Seek funding to restore historical sites if they suffer severe damage from a severe weather event.	Deleted Not a mitigation action	

2015 Goal/ Action	Disposition	2020 Action
<p>Tornadoes: To educate the County's citizens to increase awareness of severe storms and tornadoes and where to seek safety during storm events, to provide adequate shelters where citizens can seek safety from severe weather, to improve the warning system and radio communications throughout the County, to expedite the clean up process through coordination and equipment acquisition, to maintain operations of critical facilities and emergency services and to reduce property damage caused by severe weather.</p>		
<p>Upgrade the radio communications system throughout the County for all public safety services.</p>	<p>Deleted Duplicate action - Merged</p>	<p>Upgrade the public safety countywide radio communications system.</p>
<p>Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shopping malls, or other vulnerable public structures.</p>	<p>Unchanged</p>	<p>Promote the construction and use of safe rooms by requiring construction of safe rooms in new schools, daycares, and nursing homes. Encouraging the construction and use of safe rooms in homes and shelter areas of manufactured home parks, fairgrounds, shop</p>
<p>Develop public education program for residences and businesses concerning the dangers of fuel tanks (e.g. securing them to a permanent structure, ensuring adequate tank structure strength.)</p>	<p>Deleted Duplicate action - Merged</p>	<p>Develop and implement an all-hazards public education program.</p>
<p>Seek funding to provide an early warning system such as reverse 9_1-1 to warn residents of emergency situations.</p>	<p>Deleted Duplicate action - Merged</p>	<p>Implement a reverse-flow emergency notification system.</p>
<p>Upgrade existing and provide additional shelters where residents, especially the medically fragile, can seek safety from flooding. Coordinate with the Red Cross to provide at least one shelter for each jurisdiction.</p>	<p>Deleted Duplicate action - Merged</p>	<p>Identify/upgrade facilities to be shelters.</p>
<p>Conduct outreach activities to increase awareness of tornado risk</p>	<p>Deleted Duplicate action - Merged</p>	<p>Develop and implement an all-hazards public education program.</p>
<p>Develop a warehousing complex for storing essential disaster supplies (i.e., food, clothing, medical supplies), as well as processing donations, that would be distributed to shelters during and after an event.</p>	<p>Deleted Duplicate action - Merged</p>	<p>Develop a warehousing system for storing essential disaster supplies.</p>
<p>Develop a public education program for informing residents of the hazards associated with tornadoes, such as medical conditions and driving conditions, as well as what to do after an event Occurs.</p>	<p>Deleted Duplicate action - Merged</p>	<p>Develop and implement an all-hazards public education program.</p>

2015 Goal/ Action	Disposition	2020 Action
Protect Power Lines and infrastructure by inspecting utility poles to ensure they meet specifications and are wind resistant, burying power lines to provide uninterrupted power after severe winds, considering both maintenance and repair issues and upgrading overhead utility lines (e.g., adjust utility pole sizes, utility pole span Widths, and/or line strength).	Unchanged	Inspect utility poles to ensure they meet specifications and are wind resistant; bury power lines
Promote or Require Site and Building Design Standards to Minimize Wind Damage.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Seek funding to increase manpower and equipment for Townships and Villages of Fayette Count for debris removal.	Deleted Not a mitigation action	
Provide means for mass animal carcass disposal to prevent spread of disease after a severe weather event.	Deleted Duplicate action - Merged	Provide means for mass animal carcass disposal.
Provide permanent shelters for residents of mobile home parks and campgrounds, where citizens may seek safety.	Deleted Duplicate action - Merged	Identify/upgrade facilities to be shelters.
Developing and maintaining a database to track community vulnerability to severe wind.	Unchanged	Develop and maintain a system to identify vulnerable populations.
Monitor Mitigation Plan Implementation by forming a plan implementation steering committee to monitor progress on local mitigation actions. Include a mix of representatives from neighborhoods, local businesses, and local government. Also by preparing a plan implementation monitoring schedule and outlining roles for those responsible for monitoring (i.e., local departments, agencies, and committees).	Deleted Not a mitigation action	
Require or encourage wind engineering measures and construction techniques.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Seek funding to restore historical sites if they suffer severe damage from a tornado event.	Deleted Not a mitigation action	

2015 Goal/ Action	Disposition	2020 Action
Use tax incentives and disincentives to promote hazard mitigation for new development and retrofiting.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Floods: To educate the County's citizens to increase awareness of flooding and where to seek safety during flood events, to provide adequate shelters where citizens can seek safety from severe weather and flooding, to improve the warning system and radio communications throughout the County, to expedite the clean up process through coordination and equipment acquisition, to maintain operations of critical facilities and emergency services and to reduce property damage caused by severe weather and flooding.		
Provide an early warning system, such as reverse 9-1-1, to warn residents of emergency situations.	Unchanged	Implement a reverse-flow emergency notification system.
Upgrade the radio communications system throughout the county for all public safety services.	Unchanged	Upgrade the public safety countywide radio communications system.
Limit or restrict development in floodplains.	Unchanged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Develop a public education program for informing residents of the hazards associated with severe weather and flooding (i.e., medical conditions, driving conditions and necessary post-vent activity.)	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Place signs of flooding such as "high water" and "road prone to flooding".	Unchanged	Install warning signage along roadways that are susceptible to flooding.
Identify and provide warning signage or roadway markings for roadways that are susceptible to repeated flooding regardless of the amount of rainfall.	Deleted Duplicate action - Merged	Install warning signage along roadways that are susceptible to flooding.
Develop a public education program for informing residents about the benefits of having NOAA radios and Family Disaster Plans, which will help them better respond to an emergency situation.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Conduct regular maintenance for drainage systems and flood control structures.	Deleted Day-to-day activity	
Upgrade existing and provide additional shelters where residents, especially the medically fragile, can seek safety from flooding. Coordinate with the Red Cross to provide at least one shelter for each jurisdiction.	Deleted Duplicate action - Merged	Identify/upgrade facilities to be shelters.
Relocate or retrofit the eight (8) critical facilities within floodplain to keep them in operation during flooding events.	Unchanged	Relocate or retrofit critical facilities located within floodplains.

2015 Goal/ Action	Disposition	2020 Action
Apply for review and update of existing Flood Insurance Rate Maps known as Digital Flood Insurance Rate Maps (DFIRMS).	Unchanged	Request update of Digital Flood Insurance Rate Maps (DFIRMS).
Develop a warehousing complex for storing essential disaster supplies (i.e., food, clothing, medical supplies) and processing donations that would be distributed to shelters during and after an event.	Unchanged	Develop a warehousing system for storing essential disaster supplies.
Increase manpower and equipment for Townships and Villages of Fayette County for debris removal.	Deleted Not a mitigation action	
Form partnerships to support floodplain management between local, state, and regional entities such as a regional watershed council.	Unchanged	Form partnerships to support floodplain management and environmental conservation between local, state and regional entities.
Develop public education program for residences and businesses concerning the dangers of fuel tanks (e.g. securing them to a permanent structure, ensuring adequate tank structure strength.)	Unchanged	Develop and implement an all-hazards public education program.
Repair and replace bridges and levees that suffer damage from severe storms/flooding events.	Unchanged	Repair and replace bridges and levees that suffer damage from storm water.
Identify, map and maintain existing critical culverts and storm drainage ditches near residential areas, roadways and low lying areas throughout the County.	Unchanged	Identify and map existing critical culverts and storm drainage ditches near residential areas, roadways and low-lying areas throughout the county.
Encourage the Villages of Bloomingburg and Octa to join in participating in the National Flood Insurance Program.	Unchanged	Encourage the Villages of Bloomingburg and Octa to participate in the National Flood Insurance Program.
Adopt and enforce new building codes and development standards to ensure structures can withstand flooding.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Provide access to all National, State and Local regarding Hazard Mitigation and Damage/Loss Prevention.	Deleted Not a mitigation action	
Begin actively participating in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).	Unchanged	Participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).
Partner with local environmental groups to make best use of areas prone to flooding that cannot be built upon.	Unchanged	Review, revise and adopt policies/ordinances to improve stormwater management.

2015 Goal/ Action	Disposition	2020 Action
Develop a Volunteer Reception Center for coordinating and/or training volunteers who are willing to help with the mitigation of a severe weather/ flooding incident.	Unchanged	Develop and implement a volunteer management program.
Incorporate flood mitigation into local planning (floodplain management, land use in floodplain and easements for temporary water retention and drainage).	Deleted Element of Mitigation Planning	
Improve stormwater management planning and adopt policies to reduce stormwater runoff including encouragement of Low Impact Development (LID) techniques	Unchanged	Review, revise and adopt policies/ordinances to improve stormwater management.
Apply/request from Army Corps of Engineers for updated inventory of levees within the County.	Deleted Not a mitigation action	
Consider identifying the need for storm sewers throughout the County.	Deleted Duplicate action - Merged	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
Review and revise existing storm water ordinances to address existing developments.	Deleted Duplicate action - Merged	Review, revise and adopt policies/ordinances to improve stormwater management.
Install new and upgrade existing detention basins to prevent flooding downstream of existing developments.	Unchanged	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
Develop a stream maintenance program.	Unchanged	
Provide permanent shelters for residents of mobile home parks and campgrounds, where citizens may seek safety.	Deleted Duplicate action - Merged	Identify/upgrade facilities to be shelters.
Discourage applications for construction or remodeling that include excess impervious surfaces.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Study existing problem flooding areas (and upstream areas) to see if new detention basins would alleviate the flooding problem.	Deleted Duplicate action - Merged	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.

2015 Goal/ Action	Disposition	2020 Action
Update the County Land Use Document to place greater restrictions on what can be built within the floodplain.	Unchanged	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.
Review Land Use Plan and suggest many suitable alternative locations for mobile homes.	Deleted Duplicate action - Merged	Update the County Land Use Document to place greater restrictions on what can be built within the floodplain and to suggest many suitable alternative locations for mobile homes.
Provide designated locations/facilities to house displaced animals after severe	Deleted Duplicate action - Merged	Provide designated locations/facilities to house displaced animals.
Elevate roadways that suffer repeat flooding to maintain traffic access to the area.	Unchanged	Elevate roads above base flood elevations.
Protect existing infrastructure (raising low-lying bridges, elevating roads and bridges above base flood elevations, and flood-proofing water and wastewater treatment) facilities located in flood hazard areas.	Unchanged	Mitigate water and wastewater treatment facilities located in flood hazard areas.
Investigate funding sources such as the Pre-Disaster Mitigation, Program, Hazard Mitigation Grant Program and the Flood Mitigation Assistance program in order to undertake mitigation actions.	Deleted Not a mitigation action	
Install new infrastructure in areas susceptible to low level flooding and ponding, outside of the 100-year floodplain.	Deleted Included in other actions	
Begin and enhance working relationships with membership associations that focus on issues such as floodplain management, watersheds and environmental conservation.	Deleted Duplicate action - Merged	Form partnerships to support floodplain management and environmental conservation between local, state and regional entities.
Hold annual or biannual educational sessions/workshops for public.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Protect and restore natural flood mitigation features such as riverbanks, riparian buffers, and vegetative buffers.	Unchanged	Protect and restore natural flood mitigation features such as riverbanks, riparian buffers and vegetative buffers.
Work diligently to adhere to all of the requirements of the National Flood Insurance Program.	Deleted Not an action	
Provide means for mass animal carcass disposal to prevent spread of disease after a severe weather/flooding event.	Unchanged	Provide means for mass animal carcass disposal.

2015 Goal/ Action	Disposition	2020 Action
Restore historical sites if they suffer severe damage from a flooding event.	Deleted Recovery activity	
Manage the floodplain beyond minimum requirements such as developing an educational flyer targeting NFIP policyholders on increased cost of compliance during post-flood damage assessments, annually notifying the owners of repetitive loss properties of Flood Mitigation Assistance funding, and offering incentives for building above the required freeboard minimum.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Droughts: To establish administrative controls to limit potential property damage, to educate the general public of the hazards associated with drought and extreme temperatures, to establish contingency plans for alternate water supply and to reduce potential damage through preplanning.		
Monitor local drought indicators in Fayette County.	Deleted Day-to-day operations	
Provide an alternate potable water source in the event that existing water supplies are disrupted or wells run dry.	Deleted Duplicate action - Merged	Identify alternate potable water sources and develop a distribution system.
Establish an enforceable open burning ban to be implemented during droughts.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Develop a public education program concerning the hazards associated with droughts and water restrictions during drought conditions.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Establish a series of dry hydrants throughout the county.	Unchanged	Establish a series of dry hydrants throughout the county.
Conduct landscape designs to control surface runoff and enhance rainwater collections.	Deleted Duplicate action - Merged	Control surface stormwater to alleviate flooding by installing/upgrading existing detention basins, landscaping to route stormwater away from roads and structures, installing/upgrading storm sewers.
Develop and implement a domestic water management/ conservation program.	Deleted Duplicate action - Merged	Identify alternate potable water sources and develop a distribution system.
Construct additional water storage facility for emergency crop management and fire suppression.	Unchanged	Construct additional water storage facility for emergency crop management and fire suppression.

2015 Goal/ Action	Disposition	2020 Action
Develop and implement a plan to process donations, acquire feeds and provide potable water supplies for livestock.	Deleted Duplicate action - Merged	Identify alternate potable water sources and develop a distribution system.
Identify the value of crops and property in Fayette County.	Deleted Not a mitigation action	
Earthquakes: To increase awareness of the hazards of an earthquake event, to maintain operations of critical facilities and emergency services, to improve the warning system and radio communications throughout the County and to expedite the cleanup process through coordination and equipment acquisition.		
Upgrade the radio communication system throughout the County for all public safety services.	Deleted Duplicate action - Merged	Upgrade the public safety countywide radio communications system.
Provide an early warning system such as reverse 9-1-1 to warn residents of emergency situations.	Deleted Duplicate action - Merged	Implement a reverse-flow emergency notification system.
Provide back-up generators for critical facilities, including shelters, which need to maintain continuous power to protect human health and life.	Deleted Duplicate action - Merged	Install back-up generators for shelters and critical facilities.
Provide an alternative potable water source in the even that existing water supplies are disrupted or wells run dry.	Deleted Duplicate action - Merged	Identify alternate potable water sources and develop a distribution system.
Encourage registration & participation in The Great Central U.S. Shake Out to help educate and prepare residents and businesses for an earthquake.	Completed	
Increase manpower and equipment for Townships and Villages of Fayette Count for debris removal.	Deleted Not a mitigation action	
Develop a public education program concerning the hazards associated with earthquakes, as well as educating the public on a homeowner's option to purchase earthquake insurance.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Seek funding to restore historical sites if they suffer severe damage from an earthquake event.	Deleted Not a mitigation action	

2015 Goal/ Action	Disposition	2020 Action
Develop Volunteer Reception Center for coordinating volunteers who are willing to help with the response of an earthquake event.	Deleted Duplicate action - Merged	Develop and implement a volunteer management program.
Karst Topography: To establish administrative controls to limit potential property damage, to educate the general public of the hazards associated with karst topography and extreme temperatures, to establish contingency plans for alternate water supply and to reduce potential damage through preplanning.		
Limit development in and around known areas of high-risk karst topography, including critical facilities and industrial uses.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Develop a public education program concerning the hazards associated with sinkholes and subsidence that form from karst topography.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Develop notification platform for people to report potential land subsidence or sinkhole development in coordination with Soil & Water Conservation District.	Unchanged	Develop notification platform for people to report potential land subsidence or sinkhole development.
Follow proper techniques and protocols to eliminate threats from existing sinkholes & land subsidence.	Deleted Duplicate action - Merged	Review and update laws and regulations to limit development in at risk areas and require minimum safe standards for structures.
Extreme Temperatures: To educate the County's citizens to increase awareness of temperature extremes, the effects and where to seek relief and assistance during long-tam, to provide adequate shelters where needed, to improve coordination and communications throughout the County, to maintain operations of critical facilities and emergency services and to reduce human, animal, crop and property damage caused by such events.		
Identify location of vulnerable populations. Collaborate with hospitals & retirement homes for the elderly to provide services to these vulnerable populations.	Deleted Duplicate action - Merged	Develop and maintain a system to identify vulnerable populations.
Educate the general public about the symptoms associated with dehydration and hypothermia or other illnesses that can result from extreme temperatures.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Conduct pre-season public information campaigns to educate people about how to respond to emergency situations.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.
Educate residents how to weatherproof and protect their property.	Deleted Duplicate action - Merged	Develop and implement an all-hazards public education program.

2015 Goal/ Action	Disposition	2020 Action
Set up a program for more regular inspections of endangered facilities during extreme temperature events.	Deleted Duplicate action - Merged	Develop and maintain a system to identify vulnerable populations.
Establish cooling centers in centralized locations to serve the largest populations.	Deleted Duplicate action - Merged	Identify/upgrade facilities to be shelters.
Man-Made Hazards: To increase awareness of the hazards of a technological hazard event, to maintain operations of critical facilities and emergency services, to improve the warning system and radio communications throughout the County and to expedite the cleanup/recovery process through coordination and equipment acquisition.		
Conduct a quarterly or yearly drill to prepare for a hazard involving the ethanol plant.	Deleted Local	
Conduct a yearly drill to prepare for a disaster involving hazardous materials.	Emergency	
Enforce existing antipollution laws.	Planning	
Inform the public about digging near pipelines.	Committee	
Continue communication from the plant with state and local authorities.	role	
Develop public education program to promote water conservation among residents and businesses.		
Report what hazardous materials are being handled on-site.		
Suggest a 500-foot buffer around the pipelines where no new critical facilities are.		
Educate farmers about and promote agricultural methods that use less water		
Ensure proper inspection and maintenance of pipelines.		
Implement a 1500 -foot buffer around the plant that no new critical facilities are constructed.		
Report if additional hazardous materials are added or removed to the site.		
Conduct a yearly drill to prepare for a hazard involving pipelines.		
Create or update a land use plan that prevents high-impact development and likely pollution sources in areas deemed vulnerable under DRASTIC, and a zoning code to implement and enforce this policy.		
Ensure the ethanol plant continues to operate in compliance of their facility.		
New facilities to report what hazardous materials are being handled onsite.		

2015 Goal/ Action	Disposition	2020 Action
Check the amount of hazardous materials onsite according to regulations.		
Create or update a land use plan that proscribes and/or simply promote agricultural runoff reduction measures, e.g. riparian zones, ram gardens, etc.		
Keep rails properly maintained on-site.		
Prohibit all forms of development on the Pipelines' right-of-way.		
Educate the public about the dangers of pipelines.		
Enact alternating lawn watering days ordinance for non-agricultural properties.		
Reduce spillage of agricultural plants and feed on-site.		
Recycle any byproducts from the ethanol production for alternative uses.		