

Johnson County Hazard Mitigation Plan

HMGP FEMA-4160-DR-AR-#4

Awarded 04/21/2015

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Adoption Resolution
County, Participating Jurisdictions and School Districts

Sample Resolution

RESOLUTION #

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the City/County/School District desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of a County wide, multi-jurisdiction Hazard Mitigation Plan for the County and all jurisdictions in the County, specifically the cities and school districts;

SAMPLE

NOW, THEREFORE, BE IT RESOLVED BY THE City/Quorum/Board of City/County/School District.

That the City/County/School District, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this ____ day of ____, 2017

APPROVED:

Mayor/Judge/Superintendent

ATTEST:

Secretary

SECTION 1

Planning Process

1.1 Plan Introduction

Hazard mitigation is the cornerstone of emergency management. It is defined as any sustained action to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage.

The purpose of the Johnson County Hazard Mitigation Plan is to provide guidance for hazard mitigation activities in Johnson County. The Johnson County Department of Emergency Management has the responsibility to coordinate all local activities relating to hazard evaluation and mitigation and to prepare and submit to FEMA a Local Mitigation Plan following the criteria established in 44 CFR 201.4 and Section 322 of the Disaster Mitigation Act of 2000 (Public Law 106-390). The Disaster Mitigation Act of 2000 became law on October 30, 2000, and amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the “Stafford Act”) (Public Law 93-288, as amended). Regulations for this activity can be found in Title 44 of the Code of Federal Regulations Part 206, Subpart M.

This plan meets requirements for a local mitigation plan under Interim Final Rule 44 CFR 201.4, published in the Federal Register by the Federal Emergency Management Agency (FEMA) on February 28, 2002. Meeting the requirements of the regulations cited above keeps Johnson County qualified to obtain all disaster assistance including hazard mitigation grants available through the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended.

Johnson County initiated the Hazard Mitigation planning process by securing a FEMA HMGP grant to complete the Plan. Johnson County hired West Central Arkansas Planning and Development District, Inc. (WCAPDD) to author the plan. Johnson County Department of Emergency Management and WCAPDD worked together to engage the County, cities, communities and school districts in the planning process.

The Johnson County Hazard Mitigation Plan is being developed to assess the ongoing natural hazard mitigation activities in Johnson County, to evaluate additional mitigation measures that should be undertaken, and to outline a strategy for implementation of mitigation projects. This plan is a multi-jurisdictional plan with a planning area that includes all of unincorporated Johnson County and the municipalities within the County.

Formal adoption and implementation of a hazard mitigation plan presents many benefits to Johnson County and its residents. By identifying problems and possible solutions in advance of a disaster, Johnson County, participating communities and school districts will be in a better position to obtain pre- and post-disaster funding. Specifically, the Disaster Mitigation Act of 2000 establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It requires that states and communities have a FEMA approved hazard mitigation plan in place prior to receiving post-disaster HMGP funds. Adoption of this hazard mitigation strategy will also increase Johnson County’s eligibility for assistance from FEMA’s Flood Mitigation Assistance (FMA) program. Johnson County and participating communities will also gain additional credit points under FEMA’s Community Rating System (CRS) program, which provides discounts on National Flood Insurance Program (NFIP) flood insurance premiums for residents of communities that voluntarily participate in this program. Most importantly, Johnson County will be able to recover faster and more wisely from a disaster. Through planning and acting on local mitigation strategies, the city will reduce vulnerability to disasters and identify opportunities for mitigation. In addition, the communities may meet comprehensive planning and other planning requirements and achieve community goals. The priorities of the 2018 Johnson County Hazard Mitigation Plan remain consistent with that of the 2009 FEMA approved Johnson County Hazard Mitigation Plan. The priorities of the county have not changed.

The goals of the Johnson County Hazard Mitigation plan are to;

Goal 1: Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazard for residents of Johnson County due to natural disasters.

Goal 2: Provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize potential disasters and to employ mitigation in the recovery following disasters.

Goal 3: Seek grants for mitigation projects through the State and Federal funding.

Goal 4: Protect existing properties from natural disasters.

The Johnson County Hazard Mitigation Plan is being developed to assess the ongoing natural hazard mitigation activities in Johnson County, to evaluate additional mitigation measures that should be undertaken, and to outline a strategy for implementation of mitigation projects. This plan is multi-jurisdictional with a planning area that includes all of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar. This plan also includes the School Districts located in Johnson County; Clarksville School District, Lamar School District, and Westside School District.

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1.1.2 Parts of the Plan

The Johnson County Hazard Mitigation Plan is divided into sections to address FEMA requirements for a local multi-jurisdictional plan. These sections are;

1. Planning Process
2. Planning Area and Resources
3. Hazard Identification and Risk Assessment
4. Mitigation Strategy
5. Acronyms
6. Plan Adoption
7. Plan Adoption

1.1.3 Involvement of Local Government

This Hazard Mitigation Plan is multi-jurisdictional with a planning area that includes all of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar. This plan also includes the School Districts located in Johnson County; Clarksville School District, Lamar School District, and Westside School District.

All jurisdictions and school district listed above actively participated in the planning process from its inception. Each jurisdiction provided a representative to participate on the planning team or if a representative was unable to attend, they chose to be represented by the Johnson County Department of Emergency Management. Planning team members actively participated in meetings, solicited input from members of their communities, and ensured that all jurisdiction information was reflected in the plan.

1.1.4 Planning Process:

Johnson County's mitigation planning process was initiated in April of 2015, when the County, through the efforts of the Johnson County Department of Emergency Management (JCDEM), was awarded a Hazard Mitigation Grant Program (HMGP) grant by FEMA through ADEM, under Johnson County Judge Herman Houston. Johnson County negotiated a contract with West Central Arkansas Planning and Development District to facilitate their mitigation planning efforts. West Central Arkansas Planning and Development District served as facilitator and Josh Johnston, Director of the Johnson County OEM, led the planning effort.

Once all participating cities and school districts for which the Johnson County OEM is responsible formally agreed to participate, an initial planning team comprised of representatives from Johnson County and participating jurisdiction was organized. This initial team was instructed to solicit interested persons from their community to participate on the planning team. This solicitation led to the addition of several additional planning team members. The planning team members include representatives from County government, local city governments, public works officials, emergency management officials, fire districts, and school districts. All participating jurisdictions actively participated in the planning process through soliciting input from their communities and participation in meetings. If a city or school district could not attend a meeting, all minutes and materials were mailed out to the jurisdiction.

The Johnson County Mitigation Planning Team also discussed mitigation actions, projects, and past hazard occurrences with WCAPDD during conference calls.

Two planning events were scheduled throughout the planning process. Training events began the planning process. The West Central Arkansas Planning and Development District also utilized technical assistance provided by the Arkansas Department of Emergency Management by receiving training at workshops provided by ADEM and FEMA. Guidelines for the mitigation plan were discussed as well as training for entering data and how to locate and research the data needed for the mitigation plan. It was stressed to have public involvement and to work together with cities, schools, and County.

In summary, the planning process consisted of the following items:

- County appointed a planning committee consisting of mayors and city personnel, school personnel, fire department members, emergency workers, planning and development district employees, and LEPC/Citizens Corp/Hazard Mitigation Planning Team Members.
- County engaged West Central Arkansas Planning and Development District (WCAPDD), the regional planning organization, to provide staff support in conducting the planning process and preparing the plan.
- Meetings were held with committee members to understand and agree on planning processes and steps required, including organizing resources, assess hazards, develop a mitigation plan, and implement the plan and mentor progress.
- West Central Arkansas Planning and Development District staff attended workshops presented by FEMA and ADEM on the preparation of the mitigation plan.
- West Central Arkansas Planning and Development District staff also had numerous subsequent discussions about the planning process with ADEM staff. The WCAPDD staff also discussed planning process issues with others in the state that were involved in the preparation of other hazard mitigation plans such as other Planning and Development Districts.

The Planning Committee utilized technical documents such as;

- Arkansas Hazard Mitigation Plan as a guidance tool in the development of the mitigation plan.
- WCAPDD Comprehensive Economic Development Strategy will be used to review the plans Disaster and Resiliency procedures from natural disasters to help during the mitigation actions process.
- Johnson County Floodplain Ordinance, to maintain compliance of the NFIP ordinance during mitigation actions.
- Google Earth was used when looking at dams as well as geological information of the area.
- NOAA Storm Events Database was used to research previous natural hazard events.
- Southern Wildfire Risk Assessment tool was used for wildfire maps.

Timeline:

Planning Grant Awarded May 5th, 2017. A Memorandum of Understanding was signed May 15th, 2015 during a meeting with County Judge Herman Houston, Johnson County Department of Emergency Director Josh Johnston, and West Central Arkansas Planning and Development District Program Manager Karen Barlow. Discussion included the planning area, planning team and how to conduct an outreach strategy.

First organized planning meeting was held September 1, 2015 at the Johnson County Department of Emergency Management in the Johnson County Court House. Each person in attendance received a workbook containing a copy of the PowerPoint “Overview of the Mitigation Planning Process” Worksheets from the FEMA’s Local Mitigation Planning Handbook March 2013; Tasks 4- Community Capabilities, Task 5- Risk Assessment and Critical Facilities Task 6-Development a Mitigation Strategy and Task 7- Procedures to Keep Plan Updated. The PowerPoint was presented, then a time for question and answer session.

Second organized planning meeting occurred on April 26th, 2016. This meeting covered the variety of hazards that may be faced by Johnson County and the participating jurisdictions. Also discussed at this meeting were the benefits that the plan could offer and what type of mitigation actions should be included in the plan and planning process.

Natural Hazard Mitigation Questionnaires were distributed through the Johnson County Court House as well as the website of Johnson County Department of Emergency Management and a total of five were returned. The natural hazards that concerned the general public were: drought, floods, tornadoes, thunderstorm winds, lightning, hail, and winter storms. The information from these questionnaires was given to the planning members, and mitigation actions were developed from these natural hazards.

1.1.4 Neighboring Community Involvement

During the Mitigation Planning Process for Johnson County, neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development were informed of the meetings and invited personally by Johnson County DEM and WCAPDD to attend planning meetings. Representatives from Clarksville, Coal Hill, Hartman, Knoxville and Lamar and the school districts located in Johnson County; Clarksville School District, Lamar School District, Westside School District were on attendance at the planning meetings. The fire departments of Lamar and Knoxville had representatives at the planning meeting.

1.1.5 Public Review

After the completion of the planning meetings, the draft plan was provided on the West Central Arkansas Planning and Development District (WCAPDD) website www.wcapdd.dina.org for the Planning Team members and public to review. A notice was posted on WCAPDD website and Johnson County OEM Facebook for public comments. There were zero comments received from the public.

Planning members were made aware of the requirement that the Johnson County Hazard Mitigation Plan must be submitted to the Arkansas Department of Emergency Management for review prior to the State submitting plans to FEMA.

**1.1.6 Plan Developers
Planning Team-**

Jurisdiction	Participation/Involvement
Johnson County, unincorporated areas and state agencies	Judge Herman Houston - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts completed questioners. OEM Josh Johnston - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts completed questioners, provided hazard data, organized meetings.
City of Clarksville	Verla Clark- Mayors Office – Participated in correspondence with planning team, received mitigation worksheets, completed worksheets. Mayor Jon Simpson - received mitigation handouts
City of Coal Hill	Mayor Ronnie Garner - Participated in correspondence with planning team, received mitigation worksheets, completed worksheets.
City of Hartman	Mayor Rita Griffin - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts completed questioners.
City of Knoxville	Fire Chief Allen Brown - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts, and completed questioners.
City of Lamar	Fire Chief Kavin McCarley - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts, and completed questioners.
Clarksville School District	Superintendent Dr. David Hopkins - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts completed questioners.
Lamar School District	Superintendent Jay Holland - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts, and completed questioners.
Westside School District	Superintendent Shane Gordon - Attended planning meeting, participated in correspondence with planning team, received mitigation handouts, and completed questioners.
West Central Arkansas Planning and Development	Karen Barlow – Wrote Grant, gathered info (Retired) Delilah Welch – Scheduled first meeting (left WCAPDD) Cody Shreve - Conducted risk assessment, conducted research to support plan and information, participated in correspondence with planning team, worked on and completed plan, completed Qtr. reports

Point of Contacts – To be Completed after Initial Review

<p>Herman Houston Johnson County Judge (479) 754-2175 215 West Main Street Clarksville, AR 72830</p>	<p>Josh Johnston County Emergency Manager (479) 754-6383 P. O. Box 546 Clarksville, AR 72830</p>	<p>Jon Mark Simpson Mayor of Clarksville (479) 754-6486 205 Walnut CLARKSVILLE, AR 72830</p>
<p>Ronnie Garner Mayor of Coal Hill (479) 497-2204 P.O. Box 218 COAL HILL, AR 72832</p>	<p>Rita Griffin Mayor of Hartman (479) 497-2070 Drawer D HARTMAN, AR 72840</p>	<p>John Tyson Mayor of Knoxville (479) 885-6523 P.O. Box 130 KNOXVILLE, AR 72845</p>

Jerry Boen Mayor of Lamar (479) 885-6171 P.O. Box 700 LAMAR, AR 72846		
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1.2 Plan Maintenance Process

1.2.1 Monitoring, Evaluation and Updating the Plan

Although FEMA regulations require a plan update within five years, Johnson County has developed a method to ensure that monitoring, evaluation, and updating of the Johnson County Hazard Mitigation Plan occurs annually or as needed. The plan will be submitted to FEMA within five-years for review. The County will form a Hazard Mitigation Plan Evaluation Sub-Committee of the existing Johnson County Local Emergency Planning Committee (LEPC). The LEPC consists of members from fire service, health officials, emergency management, law enforcement, community groups, transportation, hospital personnel, school administration and emergency medical personnel, elected officials, and owners and operators of covered facilities. The Director of the Johnson County Department of Emergency Management will be the initial Chair of the sub-committee or Planning Team Leader. The Planning Team Leader will contact the planning team committee, set up meeting dates, and insure that each community will maintain a representative on the team.

The responsible party for overseeing and assuring plan updates is the Johnson County Department of Emergency Management. At this time, the maintenance procedures for the Mitigation Plan will be conducted at the LEPC meeting, which are held quarterly. Each community's representative will be responsible for monitoring and evaluating the progress of the mitigation strategies in the plan. The team members will monitor the plan by providing a mitigation planning update at each quarterly meeting.

During the last LEPC meeting of each year, the sub-committee will meet to review and evaluate each goal and objective to determine their relevance to changing situations in Johnson County, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions. The Sub-committee will also review and evaluate the risk assessment portion of the plan to determine if this information should be updated or modified. The parties or agencies responsible for the various implementation actions (identified in Section 4) will report on the status of their projects and will evaluate which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

The Johnson County Department of Emergency Management will then have three months to update and make changes to the plan before submitting it to the Sub-Committee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given a justification for this determination. Comments and recommendations offered by Sub-Committee members and the State Hazard Mitigation Officer will be incorporated into the plan update.

In addition, the Johnson County Hazard Mitigation Plan will be integrated into other plans. Integrating hazard mitigation into the local comprehensive plan thereby establishes resilience as an overarching value of a community and provides the opportunity to continuously manage development in a way that does not lead to increased hazard vulnerability.

The Hazard Mitigation Plan has taken into account any changes in plans and incorporates the information accordingly in its next update.

The Planning Committee made every attempt to ensure the public was able to directly comment on, and provide feedback about the Plan by posting the agenda and submitting meeting notice to the local media through newspaper articles, county website and postings in public locations. This process informed the county citizens on changes and revisions of the Johnson County Hazard Mitigation Plan.

Since future plans and government regulations might need to be adopted into the Hazard Mitigation Plan, Johnson County Quorum Court will be informed of any necessary changes to the plan by the Team Leader, to be adopted into

the Plan by county resolution. The Arkansas Department of Emergency Management will be contacted as necessary for professional and technical advice as needed.

1.2.2. Incorporation into Existing Planning Mechanisms

Johnson County and plan participants currently use state laws pertaining to compliance with the National Flood Insurance Program as well as state fire codes, to encourage compliance with its hazard mitigation programs. These existing mechanisms have hazard mitigation strategies integrated into them. Johnson County, as every other County in the State, has a current Emergency Operations Plan. The Hazard Mitigation Plan will become an annex of the EOP for future submissions. The Johnson County Hazard Mitigation Plan will be available for public view on the West Central Arkansas Planning and Development District's website www.wcapdd.org for any entity or citizen who wishes to view or make a copy of it. Copies will also be made available at public libraries, the Johnson County Courthouse in and each participating jurisdiction's city hall. The cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar and School Districts of Clarksville School District, Lamar School District, and Westside School District will be adopting the approved Hazard Mitigation Plan in their existing plans that are relevant to Hazard Mitigation.

Adoption of the Mitigation plan and the incorporation of the Mitigation Plan into other plans will be done through the legal process laid out by each entity. The county will adopt the plan through the Quorum Court via a resolution. The cities will adopt the plan and incorporate it into other planning mechanisms by vote and resolution at city council meeting. Schools and the College will adopt the plan via resolution at scheduled public board meetings. The previous plan was adopted however there is no record of it being incorporated into other plans however with this plan any participant without previous plans in place will be encouraged to develop zoning plans and other land ordinance plans to incorporate mitigation strategies. Participants incorporating the Johnson County Hazard Mitigation Plan pertain to them. After these discussions, each incorporating mechanism will follow their local laws or guidelines necessary for implementation through open forum public meetings. Each incorporating party will monitor the progress of any incorporated mitigation strategies and report the success or failure to the Emergency Operations Council for inclusion in its annual report. After each update of the Johnson County Hazard Mitigation Plan, each incorporating participant will be informed of the changes so they can reflect these changes in their plans also.

Johnson County will be incorporating the Johnson County Hazard Mitigation Plan into the Johnson County Emergency Operations Plan and County land use ordinances and/or plans by following the laws set forth by the County government via resolution adopted by the Quorum Court. Incorporating the plan into other plans will be done by vote at the regular quorum court meetings and passed by resolution. The schools will be incorporating the mitigation plan into the various plans that they have in place such as their continuity of operations plan. Incorporation into the continuity of operations plan for the schools will be done by a resolution at the regularly scheduled school board meeting. If the mitigation plan is incorporated into other plans that the school has then it will be done via the procedures that are in place for that particular plan in which it is being incorporated into.

In addition, the Johnson County Hazard Mitigation Plan will be integrated into other plans. Integrating hazard mitigation into the local comprehensive plan thereby establishes resilience as an overarching value of a community and provides the opportunity to continuously manage development in a way that does not lead to increased hazard vulnerability.

All participating jurisdictions will be incorporating the hazard mitigation plan into Land Use and Development Plans if they are available which will guide future growth and development away from areas with known hazards, or to ensure design standards for new or improved construction take potential hazards into account. Land use policies can build community resilience by taking information on location, frequency and severity of hazards into consideration and setting forth recommendations that influence development in a way that does not increase risks to life and property.

The Johnson County Hazard Mitigation Plan will be incorporated into the Economic Development Plans once completed for Johnson County which will have the hazard mitigation referenced so that it can promote commercial or industrial expansion in area that are not vulnerable to damage or disruption from hazard and by making community resilience a key feature in attracting, expanding and retaining businesses and industry. Incorporation into

the Economic Development Plan will be done via resolution by the board of directors responsible for the economic development plan.

Public Facilities and Infrastructure Plans policies can be adopted to ensure critical facilities such as police and fire stations, as well as key infrastructure such as water and wastewater treatment plants, are protected from the effects of hazards. This provides opportunities to establish goals and policies in support of mitigation projects such as storm water drainage improvements or the public acquisition of hazard areas for open space.

1.2.3 Continuous Public Involvement

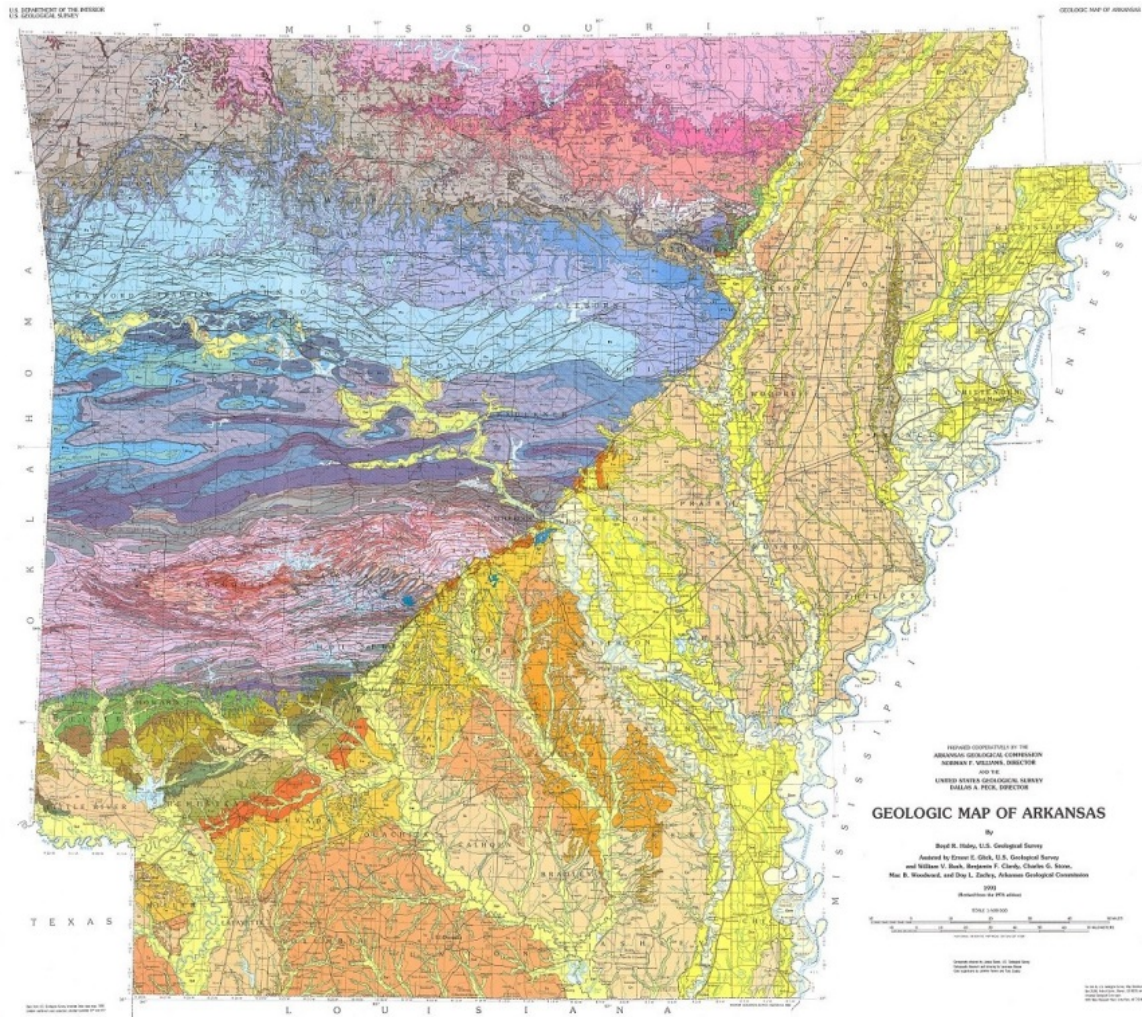
Johnson County is dedicated to involving the public directly in the continual reshaping and updating of the Johnson County Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation Sub-Committee members are responsible for the annual monitoring, evaluation, and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

Copies of the FEMA approved Johnson County Hazard Mitigation Plan will be available at www.wcapdd.org . Contained in the plan are the address, phone number, and e-mail of the Director of the Johnson County Department of Emergency Management, the primary point of contact for the plan.

A public announcement inviting all interested parties will be made prior to each quarterly LEPC meeting, including the December LEPC meeting during which the Hazard Mitigation Planning Sub-Committee reviews and evaluates the plan in its entirety. This meeting will provide the public a forum for which the general public can express concerns, opinions, or ideas about the plan. The Johnson County Department of Emergency Management and the Johnson County LEPC will publicize and host this meeting. Following the meeting, the evaluation committee will review the comments and make changes to the plan, as appropriate.

SECTION 2

Planning Area and Resources



2.1 General Land Use/Analyzing Development Trends

There has been no significant change in population or development that has increased the impact of natural disasters to the community's infrastructure, people, and economy. There have been changes in the area due to the mitigation actions in the previous mitigation plan. Where it is applicable, the changes in land use and development will be addressed in the hazard profile. If there is not a summary identifying the changes in land use and development trends, then there is no applicable change that affects the impact to the community's infrastructure, people, and economy in respect to that hazard.

2.2 Capability Assessment

Jurisdiction	Planning and Regulatory Capabilities														
	Comprehensive Master Plan	Capital Improvements	Economic Development Plan	Local Emergency Operations Plan	Continuity of Operations Plan	Transportation Plan	Stormwater Management Plan	Community Wildfire Management Plan	ISO Rating	Zoning Ordinance	Subdivision Ordinance	Floodplain Ordinance	Building Codes	Acquisition of land for open	BCEGS Score
Johnson County			X	X	X						X				
Clarksville	X		X	X	X	X			X	X	X	X	X	X	
Coal Hill				X											
Hartman				X					X						
Knoxville				X											
Lamar				X											
Clarksville School District	X	X		X	X	X									
Lamar School District	X	X		X	X	X									
Westside School District	X	X		X	X	X									
Jurisdiction	Administrative and Technical Capabilities														
	Johnson County Local Emergency Planning Committee	Planning Commission	Mutual Aid Agreements	Maintenance Programs to Reduce Risk	Floodplain Administrator	Emergency Manager	Community Planner / Grant Writers	GIS / HAZUS	Warning Systems	Civil Engineer	Hazard Data and Information				
Johnson County	X		X	X	X	X		X	X					X	
Clarksville	X	X	X	X	X	X		X	X					X	
Coal Hill	X				X									X	
Hartman	X			X	X				X					X	
Knoxville	X				X									X	
Lamar	X				X									X	
Clarksville School District			X	X		X				X				X	
Lamar School District			X	X		X				X				X	
Westside School District			X	X		X				X				X	

Jurisdiction	Financial Capabilities						
	Fees for water, sewer, gas, or electric services	Capital improvements project funding	Community Development Block Grant	Federal Funding Programs	State Funding Programs	Impact fees for new development	Authority to levy taxes for specific purposes
Johnson County	X		X	X	X	X	X
Clarksville	X		X	X	X	X	X
Coal Hill							
Hartman	X			X	X	X	X
Knoxville							
Lamar							
Clarksville School District		X		X		X	
Lamar School District		X		X	X	X	
Westside School District		X		X	X	X	
Jurisdiction	Education and Outreach Capabilities						
	Non-Profit Organizations focused on environmental protection, emergency preparedness, or access and functional needs populations	Ongoing Public Education Program or information program	Natural Disaster or safety related school programs	Firewise Communities Certification	Public-private partnership initiatives addressing disaster related issues	Storm Read Certification	
Johnson County	X	X	X		X		
Clarksville	X	X	X		X		
Coal Hill	X						
Hartman	X	X					
Knoxville	X						
Lamar	X						
Clarksville School District		X	X				
Lamar School District		X	X				
Westside School District		X	X				

2.2.1 Improving Capabilities

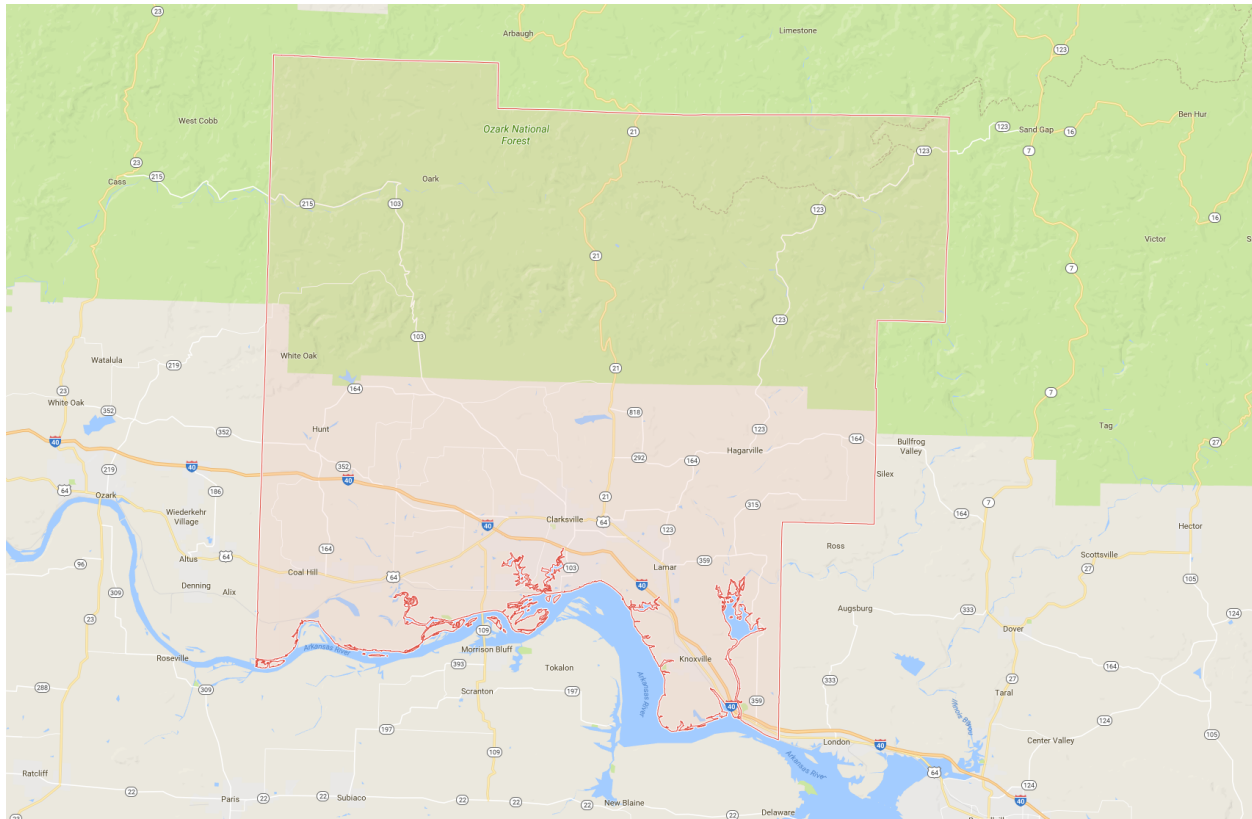
Leadership and representatives in all participating jurisdictions are very receptive to mitigation. The Johnson County Judge, Johnson County OEM, and leadership make mitigation a first priority. Representatives are actively seeking additional funding to improve the readiness and preparedness of their communities. Ways the communities are improving capabilities are:

- Expand upon education and outreach about mitigation activities.

- Work with schools to construct safe rooms.
- Exploring funding options for flood mitigation.
- Improving roadways and bridges against flooding.
- Improving levees within the county.
- Acquire properties that are deemed RLS and SRL properties
- Regularly attend state-wide full-scale exercises.
- Send representatives to attend training through ADEM and FEMA to include ICS and NIMS
- Seek funding for mitigation activities throughout the county.

2.2.1 NFIP Participation

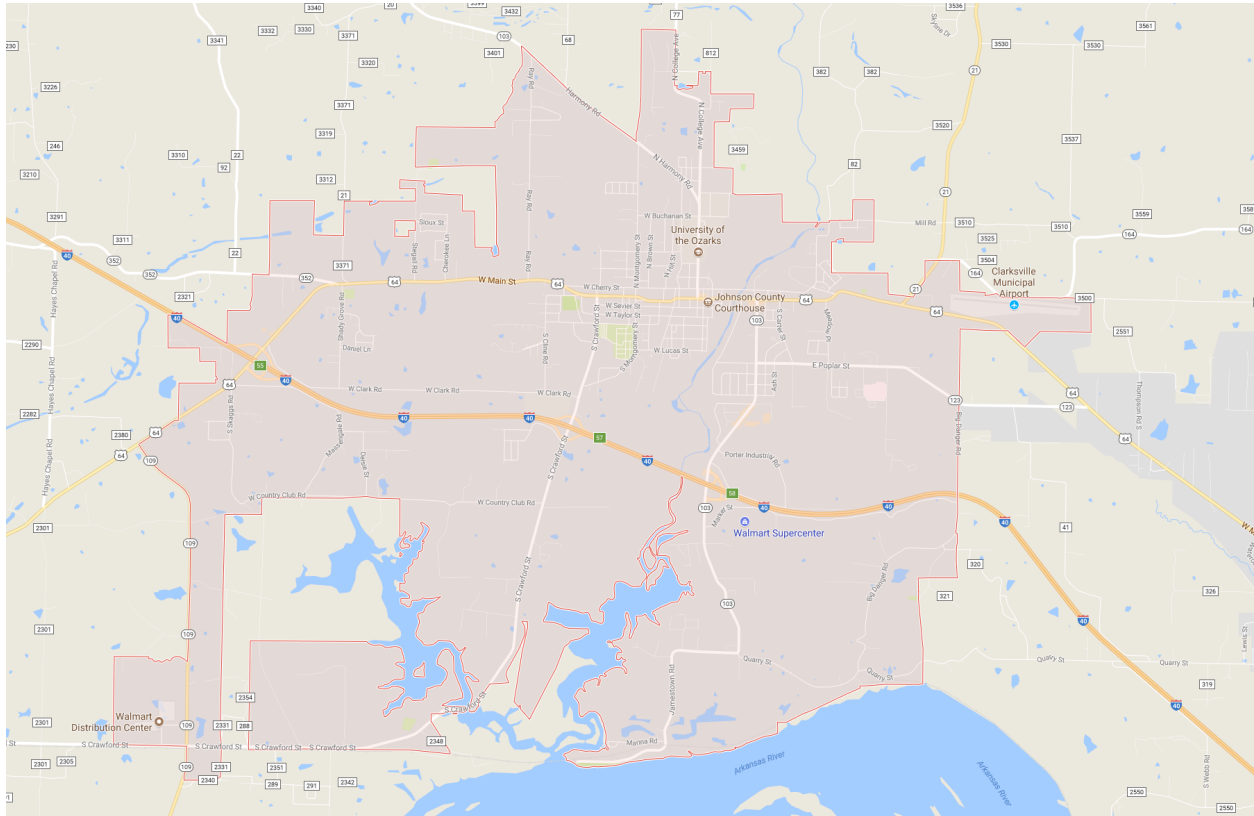
Johnson County



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
08/02/77	08/01/08	11/26/10	08/01/08

Johnson County will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The county will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The County stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The county floodplain manager is appointed by the county judge. The floodplain manager for Johnson County is the Johnson County Emergency Manager.

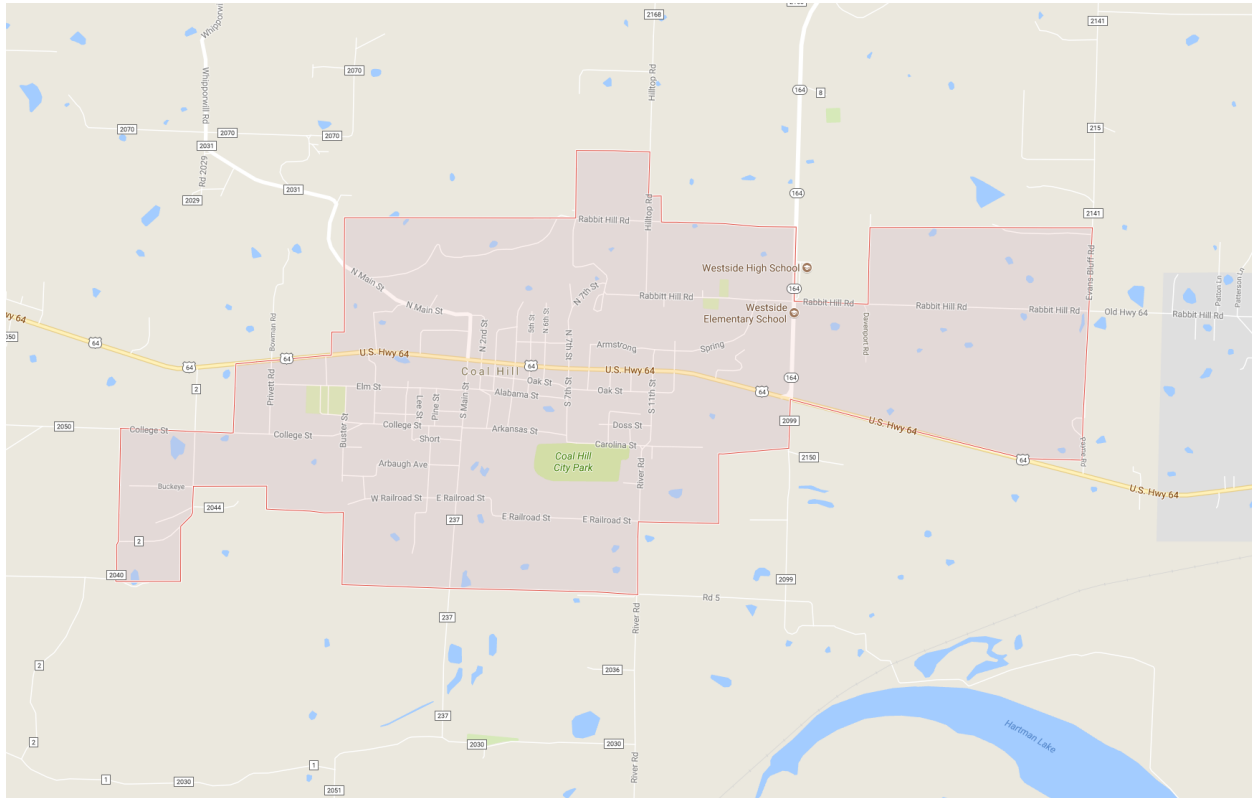
Clarksville



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
11/30/73	09/30/82	11/26/10	09/30/82

Clarksville will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The city will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The city stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The floodplain manager for the city of Clarksville is appointed by the mayor.

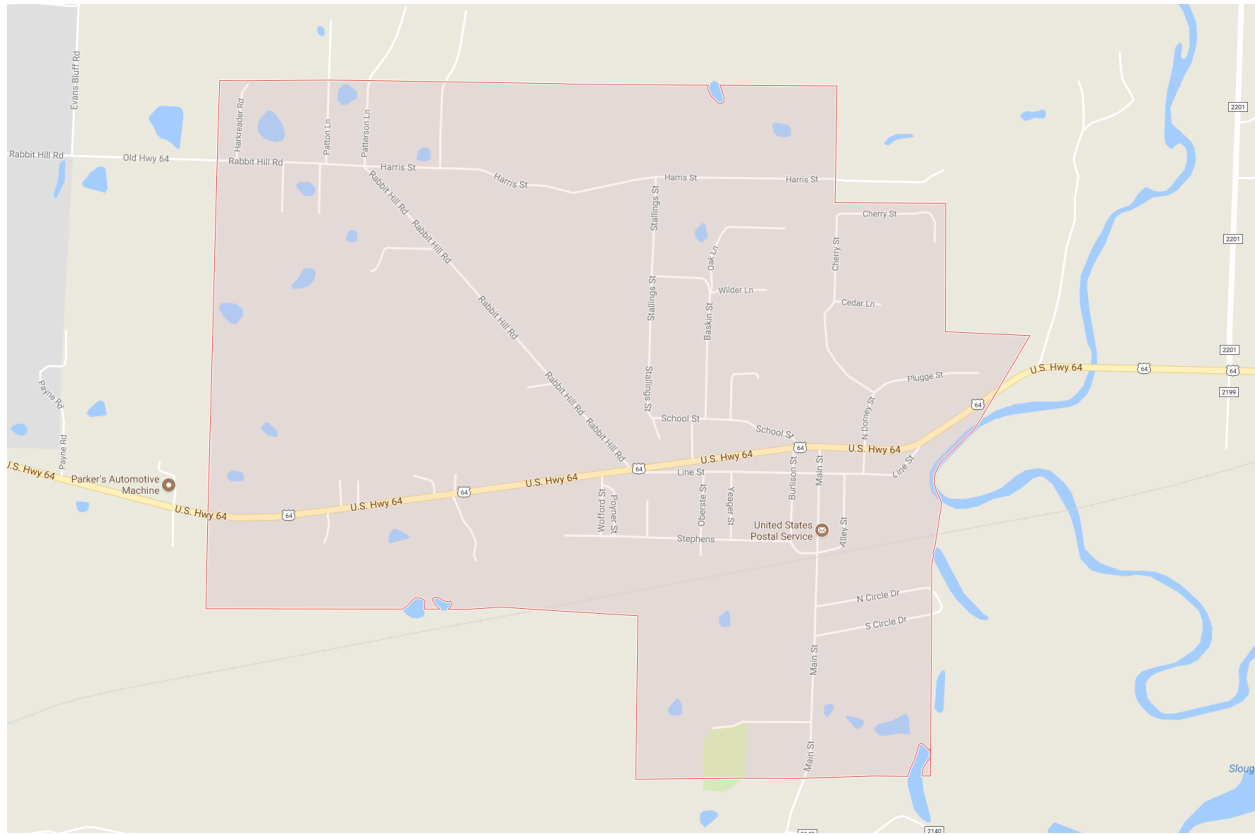
Coal Hill



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
01/10/75	05/04/82	11/26/10(M)	05/04/82

Coal Hill will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The city will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The city stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The floodplain manager for the city of Coal is the chief elected official being the mayor in this case.

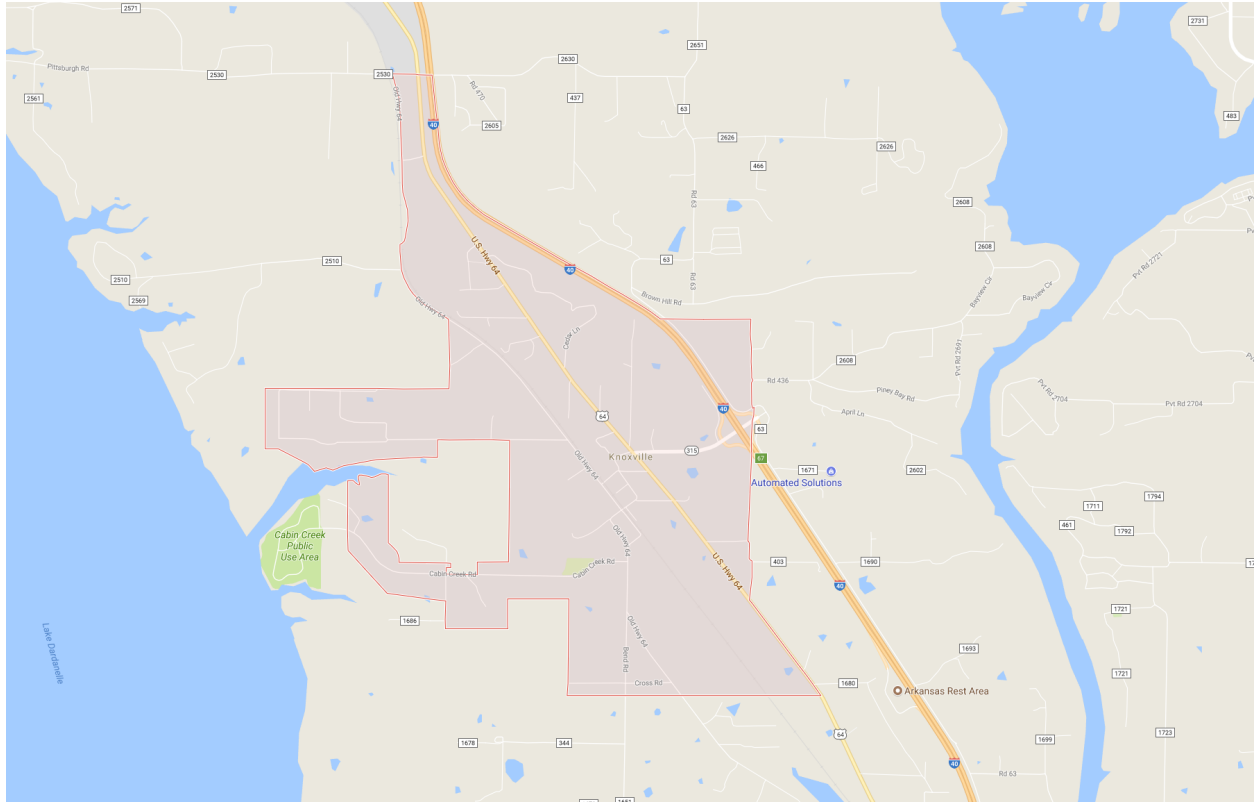
Hartman



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
10/29/26	11/26/10	11/26/10	11/26/10

Hartman will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The city will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The city stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The floodplain manager for the city of Hartman is the chief elected official being the mayor in this case.

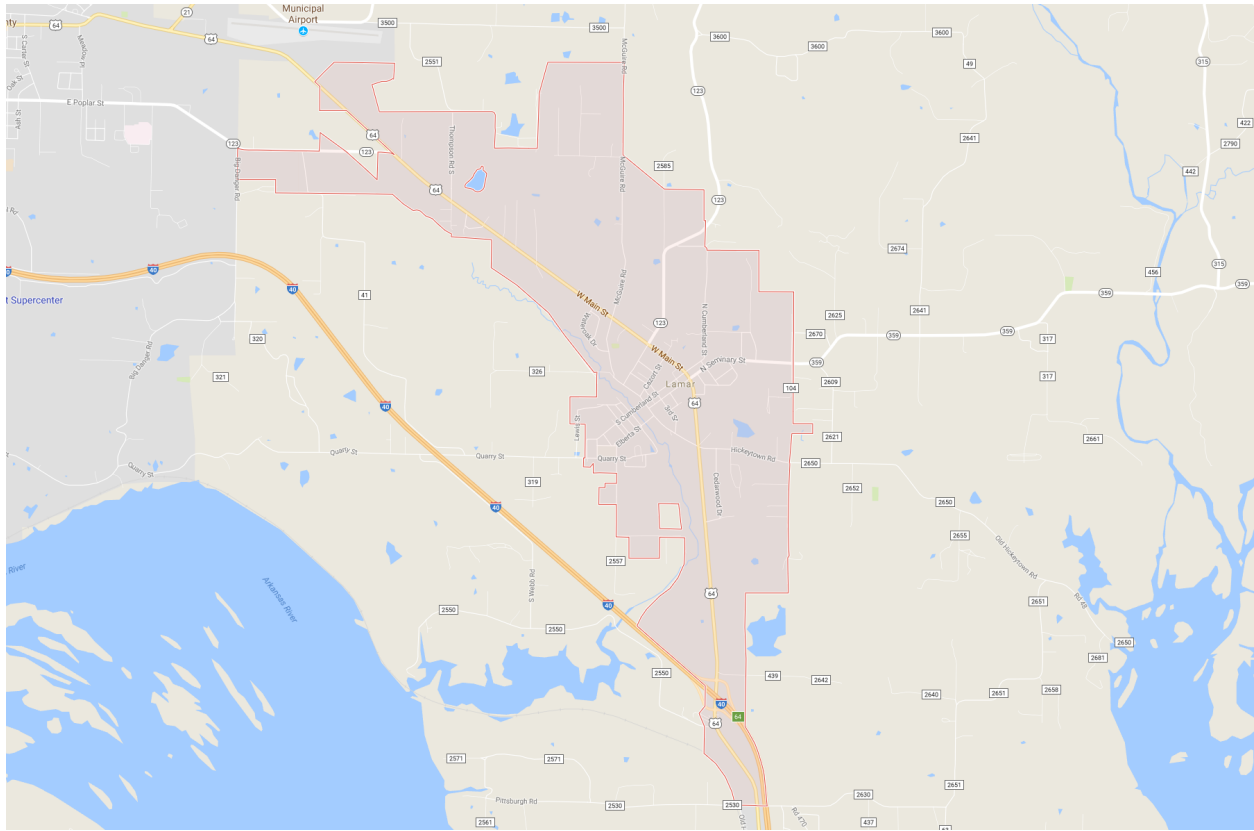
Knoxville



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
02/21/75	08/01/08	11/26/10(M)	08/01/08

Knoxville will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The city will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The city stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The floodplain manager for the city of Knoxville is the chief elected official being the mayor in this case.

Lamar



Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
05/05/74	07/01/87	11/26/10(M)	07/01/87

Lamar will assist residents with document completion for the NFIP and educates the citizens about the NFIP program. Permits are issued for those building in the floodplain, and then the floodplain manager monitors the construction process to insure compliance. The city will continue to participate through continuing floodplain education, and staying in compliance with the NFIP by participating in the Community Assistance Visit (CAV) with FEMA/ISO staff members and with members of the Arkansas Natural Resource Commission (ANRC). The ANRC provides technical assistance to the community assuring that the community is adequately enforcing its floodplain management regulations. The city stays in compliance with FEMA/ISO and ANRC by doing their recommendations that are determined at their visits. The floodplain manager for the city of Lamar is the chief elected official being the mayor in this case.

School Districts

The School Districts of Clarksville, Lamar, and Westside do not participate in the NFIP and are not required to by law; however, they are part of communities that participate in the NFIP.

***Note- Please see Arkansas State Legislature Act 754 of 2003 in regards to Floodplain management and Administration. <http://www.floodplain.ar.gov/>**

SECTION 3

Hazard Identification and Risk Assessment

3.1 Hazard Identification and Prioritization

Hazard identification, the process of identifying hazard that threatens a given area, is the first step in the risk assessment process. Johnson County has identified several natural hazards that, because they pose a threat to the County and its residents, have warranted a complete profile in this hazard mitigation plan.

The following hazards were identified from historical information provided by planning team members, newspapers, review of plans and reports, internet research, the State Mitigation Plan, and FEMA publication “Multi-Hazard-Identification and Risk Assessment”, and information provided by FEMA and ADEM.

Hazards	Hazard Events
Dam/Levee Failure	No dam/levee failures for Johnson County
Drought	There were 12 events between 1950 to 2016
Earthquake	There were 4 events between 1979 and 2016
Extreme Heat	There were 1 event between 1950 to 2016
Landslide	There are no previous occurrences for landslides therefore it will not be addressed in this plan.
Flood	There were 38 flash flood events and 3 flood events between 1950 to 2016.
Hail Storm	There were 160 events between 1950 and 2016.
Lightning	There were 5 events between 1950 to 2016.
Strong Winds	There were 206 events between 1950 to 2016.
Tornado	There were 34 events between 1950 to 2017.
Wildfire	There were 4 events between 1950 to 2016.
Winter Storms	There were 12 winter storm events and 5 ice storm events between 1950 to 2016.

Presidential Disaster Declarations in Johnson County

Johnson County			
FEMA ID	Declared Date	Incident Period	Disaster Type
FEMA-DR-4226	6/26/2015	5/7/2015 - 6/15/2015	Storm, Tornadoes, Flooding
FEMA-DR-4160	4/6/2014	12/18/2014	Winter Storm
FEMA-DR-4000	7/8/2011	5/24/2011-5/26/2011	Storms, Tornadoes, Flooding
FEMA-DR-1861	12/3/2009	10/29/2009 - 11/8/2009	Storm, Tornado, Flood
FEMA-DR-1819	2/6/2009	1/26/2009 - 1/30/2009	Winter Storm
FEMA-DR-1751	3/26/2008	3/18/2008 - 4/28/2008	Storm, Tornado, Flood
FEMA-DR-1516	5/7/2004	4/19/2004 - 5/18/2004	Storm, Landslide, Flood
FEMA-DR-1354	12/29/2000	12/12/2000 - 1/8/2001	Winter Storm
FEMA-DR-865	5/15/1990	5/1/1990 - 6/3/1990	Storm, Flood
FEMA-DR-817	11/23/1988	11/15/1988 - 11/20/1988	Storm, Tornado

3.2 Vulnerability and Risk Assessment by Hazard

The Johnson County Hazard Mitigation Plan includes a description or profile, location, and extent of all natural hazards that can affect each jurisdiction.

Description describes the natural hazard that can affect the jurisdictions in the planning area.

Location (Geographic Area Affected) is where geographic areas in the planning area that are affected by the hazard, and when possible maps were used to illustrate the location. But for some hazards, such as tornados, the plan stated that the entire planning area is equally at risk to that hazard.

Previous Occurrences of hazard events for each jurisdiction (44 CFR 201.6 (c)(2)(i) have been addressed.

Probability of Future Events means the likelihood of the hazard occurring in the future and may be defined in terms of general descriptors, historical frequencies, and statistical probabilities. Statistical probabilities often refer to events of a specific size or strength. Hazard likelihood can also be compared using general descriptions or rankings. For the purpose of this plan we will use the general descriptors to describe the likelihood of hazard events based on historical frequency.

- Note: Probability was determined by using Poisson Distribution $P(k) = \frac{\lambda^k}{k!} (e^{-\lambda})$
 - λ =average number of times the event happens in the past over the whole time period
 - k = average number of times the event happens in one year
 - $e=2.71828$
 - $k!$ =the Factorial of k . (exp. $1*2*3*4*...*8$)

A description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction.

Impact – is the consequence or effect of the hazard on the community and its assets. Impacts will be described by referencing historical disaster impacts and/or an estimate of potential future losses, such as percent damage of total exposure.

Vulnerability of Estimating Potential Loss- identifies structures, systems, populations or other community assets as defined by the community that are susceptible to damage and loss from hazard events. It is a list of key issues or problem statements that clearly describes the community's greatest vulnerabilities and that will be address in the mitigation strategy.

Repetitive Loss Properties and Severe Repetitive Loss Properties- addresses NFIP insured structures describing the types (residential, commercial, institutional, etc.) and estimates the number of repetitive loss properties located in the identified flood hazard areas. (44 CFR 201.6(c)(2)(ii)

3.4 Methodology used in Estimating Potential Loss

The methodology used in this plan for the potential loss estimate was developed by using past hazard events data from The National Climatic Data Center (NCDC) Storm Events Database, Southern Wildfire Risk Assessment, ANRC, and or FEMA FIRM maps

If we were unable to obtain information of a certain type past hazard event, we did not estimate a potential loss due to the lack of information.

3.5 Natural Hazards Affecting Johnson County

This mitigation plan addresses the natural hazards that can affect all of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar. This

plan also includes the School Districts located in Johnson County; Clarksville School District, Lamar School District, and Westside School District.

The Hazards which have affected Johnson County in the past or could possibly affect Johnson County in the near future are; Dam Failure, Drought, Extreme Heat, Earthquake, Flooding, Landslides, Thunderstorms (Lightening, Hail and High Winds), Tornadoes, Wildfire and Winterstorms.

3.5.1. Dam Failure

For the dam failure risk assessment, each dam will be described separately with their corresponding location, impact and overall summary of vulnerability due to the uniqueness of each dam and location. Note that all inundation areas depicted in the following maps if available were created in ArcMap have been estimated by following natural floodways using information of maximum discharge release, maximum capacity, and the drainage area acreage retrieved from the National Inventory of Dams. There are no previous occurrences of dam failure in all participating jurisdictions of Johnson County.

Low Risk Dams that are private, county or state owned dams not presenting a danger to individuals, structures, residential housing, county roads or state highways will not be addressed in this plan.

3.5.1.1 Description of Dam Failure

According to the Association of State Dam Safety Officials, the term dam is defined in the rules as “any barrier, including one for flood detention, designed to impound liquid volumes.” A dam failure is the collapse, breach, or other failure resulting in downstream flooding. A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-ft. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-ft. of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

According to the Arkansas Natural Resource Commission (ANRC) Title 7, Sections 705.3 – 705.4, the criteria for size classifications are based on height of dam and impoundment capacity, and hazard classifications, which are used in this plan to describe the level of risk and severity associated with dam failure. The term “height of dam” is defined as “the vertical distance from the effective crest of the dam to the lowest elevation on the downstream toe of the dam, including the natural stream channel.”

Section 705.5 provides detail on the hydrologic criteria for dams based on hazard classification. The classifications are shown in the table below:

Category	Maximum Storage (ac-ft)	Height (Feet)
Small	50 to 100	25-40
Intermediate	1000 and <50,000	40 and <100
Large	50,000	100

The following calculations do not reflect the physical conditions of the dams, but rather describe areas downstream of the dams that could be impacted in the event of failure. According to ANRC Title 7, the rate of risk for dam failure is calculated as follows:

Low Hazard Dams	No loss of life and minimal economic loss are expected. (No significant structures, pastures, woodland, or largely undeveloped land); less than \$ 100,000.
Significant Hazard Dams	Loss of life is possible, but not expected. Economic loss would be appreciable. (Significant structures, industrial, or commercial development, or cropland); \$100,000 to \$500,000.
High Hazard Dams	Loss of life is expected, and economic damage would be excessive. (Extensive public, industrial, commercial, or agricultural development); over \$500,000.

According to the Arkansas State Hazard Mitigation Plan, there are a total of 6 dams throughout the entire county of Johnson. There are 3 dams rated as a low hazard in the State plan, therefore they will not be profiled in the Johnson County Hazard Mitigation Plan update. There is 1 that is ranked significant and 2 ranked high in Johnson County according to the state hazard mitigation plan.

Horsehead Lake Dam: 35.5577, -93.6338



Horsehead Lake Dam is owned and operated by the Arkansas Fish and Game Commission. Horsehead Lake Dam is located in the Ozark National Forest in west central Johnson County. The area is uninhabited with vegetation. There is no housing in the surrounding area, 50% of the area has vegetation.

Extent

There can be advanced warning to no warnings at all for a dam failure event. At present, there is no history of a dam failure of any size occurring in Johnson County or its participating jurisdictions. Maintenance and structural information is confidential and therefore not available to the public and planning team. Since an inundation study is not available to the planning team it is unable to determine the extent at which the area may be impacted in the event

of a dam failure. The planning team cites a data deficiency related to extent, as there is currently no data available to indicate inundation areas, potential flood depths, volume of water or arrival times for a dam failure in Johnson County.

Ludwig lake Dam: 35.5333, -93.4558



Ludwig Lake Dam is located in a low-density housing area with 50% vegetation. Surrounded by picnic areas and cemeteries, it is located north of Ludwig community which has 49% to 74% housing density.

Extent

There can be advanced warning to no warnings at all for a dam failure event. At present, there is no history of a dam failure of any size occurring in Johnson County or its participating jurisdictions. Maintenance and structural information is confidential and therefore not available to the public and planning team. Since an inundation study is not available to the planning team it is unable to determine the extent at which the area may be impacted in the event of a dam failure. The planning team cites a data deficiency related to extent, as there is currently no data available to indicate inundation areas, potential flood depths, volume of water or arrival times for a dam failure in Johnson County.

Harris Pond Dam: 35.4183, -93.3783



Harris Pond Dam is a dam located in Johnson County and is owned by Bruce Harris according to the National Inventory of Dams. The NID storage for this dam is 315 and was completed in 1956.

Extent

There can be advanced warning to no warnings at all for a dam failure event. At present, there is no history of a dam failure of any size occurring in Johnson County or its participating jurisdictions. Maintenance and structural information is confidential and therefore not available to the public and planning team. Since an inundation study is not available to the planning team it is unable to determine the extent at which the area may be impacted in the event of a dam failure. The planning team cites a data deficiency related to extent, as there is currently no data available to indicate inundation areas, potential flood depths, and volume of water or arrival times for a dam failure in Johnson County.

3.5.1.2 Previous Occurrences

There have been no past occurrences of dam failures in Johnson County.

3.5.1.3 Probability of Occurrences

Since there have been no occurrences of dam failures in Johnson County in the past the probability of occurrence is unknown. This is due to the fact that when using the Poisson Distribution equation it relies on past occurrences over a period of time to assign a numerical probability in regards to what the probability of failure may be. This equation was used to assign probability to all hazards throughout this plan. A mitigation action will be implemented to address this data deficiency.

3.5.2 Drought

3.5.2.1 Description of Drought

A drought is a period of unusually persistent dry weather that persists long enough to cause serious deficiencies in water supply (surface or underground). Droughts are slow onset hazard, but over time they can severely affect crops, municipal water supplies, recreation resources and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impacts can be significant. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts.

3.5.2.2 Location of Drought Events

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are equally likely to experience severe drought, there is no defined geographic hazard boundary.

3.5.2.3 Previous Occurrences

There have been 12 events between 1950 and 2016.

3.5.2.4 Extent, Magnitude or Severity of Drought

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar as well as the Clarksville School District, Lamar School District, and Westside School District are equally likely to experience a D0 and D2 in any given year.

Drought Severity Classification								
		RANGES						
Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Percent of Normal Precip	Standardized Precipitation Index (SPI)	Satellite Vegetation Health Index
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9	21-30	21-30	<75% for 3 months	-0.5 to -0.7	36-45
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested	-2.0 to -2.9	11-20	11-20	<70% for 3 months	-0.8 to -1.2	26-35
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 to -3.9	6-10	6-10	<65% for 6 months	-1.3 to -1.5	16-25
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 to -4.9	3-5	3-5	<60% for 6 months	-1.6 to -1.9	6-15
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies	-5.0 or less	0-2	0-2	<65% for 12 months	-2.0 or less	1-5

3.5.2.5 Probability of Future Drought Events

There is a 15% chance that the county and participating jurisdictions will experience a drought in any given year.

3.5.2.7 Impact of Drought

Drought produces impacts that affect the social, environmental, and economical standard of living. Some direct impacts of drought are reduced crop, rangeland, and forest productivity; reduced water levees; increased fire hazard; increased livestock and wildlife death rates; and damage to wildlife and fish habitat. A reduction in crop productivity usually results in less income for farmers, retailers, and increased prices for food.

Environmental losses are caused by damages to plant and animal species. Wildlife habitat and air and water quality are usually damaged due to a lack of water and an increase in forest and range fires, insect infestations, plant disease and wind erosion. Most of the effects of drought are short-term, and as the drought comes to an end many problems are solved.

3.5.2.9 Vulnerability and Estimating Potential Loss

There is no evidence that drought has any kind of potential loss on building structures. It primarily affects agriculture, livestock, water supply, and timber plantations. The populations vulnerable to a drought event of the unincorporated areas of unincorporated Johnson County and the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are children under five years, the elderly over 65 years, disabled, those living below the poverty level, and farmers raising livestock, crops, hay, and timber. These populations are at risk of death and injury; except farmers are at risk of an economical loss. Buildings and infrastructure are not vulnerable to drought events.

The primary and most devastating effect for the unincorporated areas of Johnson County is the lack of water. As a dry period progresses and water supplies dwindle, existing water supplies are overtaxed and dry up. If the drought is long term, it may result in permanent changes in settlement, social, and living patterns in these jurisdictions. Cascading effects also include major ecological changes such as increased flash flooding and desertification.

Severe droughts will cause damage to timber plantations and elevate the potential to wildfires. There will be increased wildfire conditions in all participating jurisdictions. Pastures and crop ponds will dry up, and many cattle raisers will be forced to send their livestock to the market.

3.5.3 Earthquake

Description of Earthquake:

An earthquake is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane. The location below the earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the earth is called the epicenter.

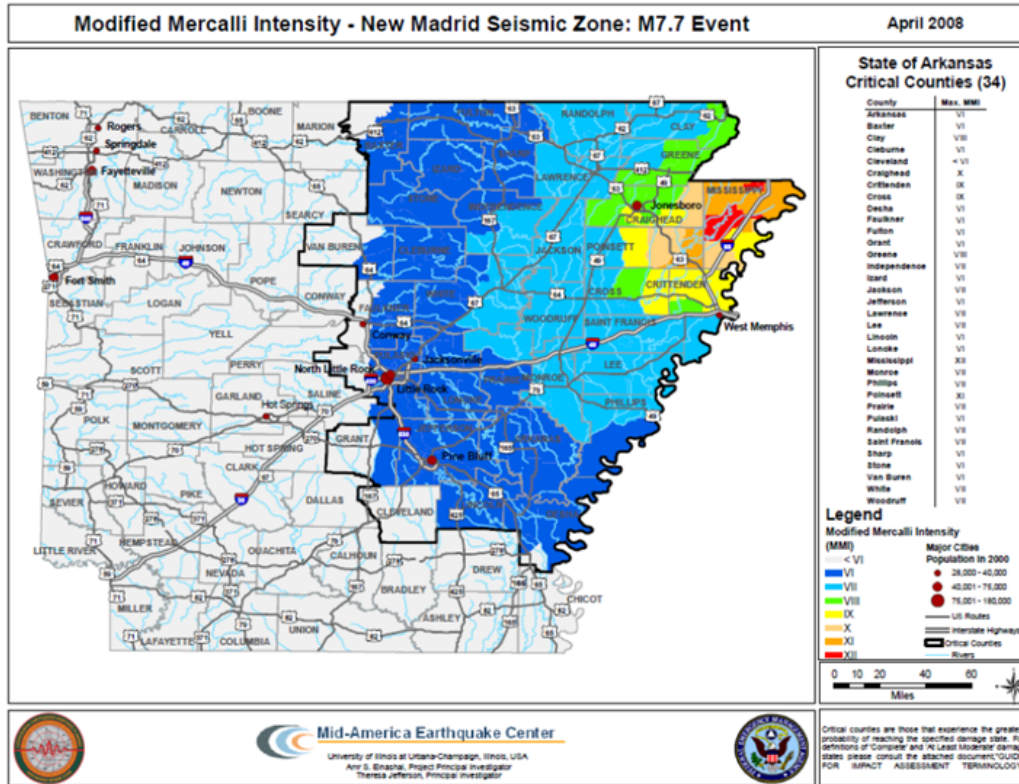
Sometimes an earthquake has foreshocks. These are smaller earthquakes that happen in the same place as the larger earthquake that follows. Scientists can't tell that an earthquake is a foreshock until the larger earthquake happens. The largest, main earthquake is called the mainshock. Mainshocks always have aftershocks that follow. These are smaller earthquakes that occur afterwards in the same place as the mainshock. Depending on the size of the mainshock, aftershocks can continue for weeks, months, and even years after the mainshock.

Locations affected by Earthquake

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District can experience an earthquake.

Extent, Magnitude or Severity of Extreme Earthquake Events

In past occurrences, Johnson County has experienced up to a 2.2 magnitude earthquake. According to the map on the following page Johnson County could be impacted up to a VI on the Mercalli scale in the event a magnitude 7.7 was to occur at the New Madrid Seismic Zone.



Magnitude	Mercalli	Description	Earthquake Effects
2	I	Instrumental	Not felt except by a very few under especially favorable conditions.
	II	Feeble	Felt only by a few persons at rest, especially on upper floors of buildings.
3	III	Slight	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
	IV	Moderate	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
4	V	Rather Strong	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5	VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
	VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6	VIII	Destructive	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls.

			Heavy furniture overturned.
7	IX	Ruinous	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
	X	Disastrous	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
8	XI	Very Disastrous	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
	XII	Catastrophic	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Previous Occurrences

There have been four past occurrences of earthquakes in Johnson County.

Probability of Future Events

There is a 5% chance of an earthquake occurring in any given year.

Impact and Vulnerability of Earthquake

The Arkansas State Mitigation Plan describes the regions with high probability of future earthquakes in the State of Arkansas are along the New Madrid Fault. The portion of Arkansas that is likely to experience damage is located in the northeast portion of the state. Johnson County is not located in this area. However, jurisdictions in Johnson County has experienced up to a 2.2 magnitude earthquake. The Arkansas Geological Survey confirms that damage is not a concern unless a quake has a V on the mercalli scale. In the event of a VI there may be slight damage to some of the structures that are in Johnson County and its participating jurisdictions. Damage may include broken windows, heavy furniture moved, and falling plaster.

3.5.4 Extreme Heat

Description of Extreme Heat:

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

Locations Affected by Extreme Heat:

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District can be affected by extreme heat events.

Past Occurrences

There have been 1 extreme heat event between 1950 and 2016.

Extent, Magnitude or Severity of Extreme Heat Events

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District can experience extreme heat events up to 110 degrees Fahrenheit in July and August.

Probability of Future Extreme Heat Events

The probability of future extreme heat events in any given year is 1%.

Impact and Vulnerability of Extreme Heat:

The populations vulnerable to an extreme heat event are the areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are children under five years, the elderly over 65 years, and those living below the poverty level. For children and elderly, prolonged exposure to temperatures above 100 degrees Fahrenheit can cause significant health-related ailments that include heat stroke and even death. Those living below poverty level will not have the budget for utility expenses during extreme heat conditions.

Unincorporated areas of Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar:

These communities are rural areas that depend on agricultural employers. The communities are concerned about the cattle farms, poultry farms, hog farms, hay, and timber plantations during extreme heat events. As temperatures rise, people and animals need more water to maintain their health. Many important economic activities like raising livestock and growing food crops require plenty of water. Farm Income from livestock and products sales contribute over \$123 million. This trend remains a vulnerability of the farmers and the economy that relies on the product sales during extreme heat events.

Heat waves directly threaten livestock. Heat stress can increase vulnerability to disease, reduce fertility, and reduce milk production. Pasture and feed supplies will deplete. Extreme heat will reduce the amount of quality forage available to grazing livestock. Animals that rely on grain will have a lack of feed. All the while, the prevalence of parasites and diseases will rise.

For timber plantations and forestry, the climate will influence the structure and function of forest ecosystems and plays an essential role in forest health. Increased temperature may worsen many of the threats to forests through the increase of pest outbreaks, fires, and drought.

These communities are concerned about the electrical grid. There are no cooling centers in these areas. If there is a blackout, then all populations and pets will suffer the extreme heat elements which could lead to heat injuries or death.

School Districts:

The Clarksville School District, Lamar School District, and Westside School District are concerned about the health hazards to students and staff. They are at risk to heat injuries during recess and transitioning from building to building. Also, athlete's practice and play games in the hot weather causing heat illness to student athletes. The Clarksville School District, Lamar School District, and Westside School District are concerned about the dependency of the HVAC system. Heat injuries could also affect students and staff in the event of HVAC failure during extreme heat weather.

3.5.4 Flooding

3.5.4.1 Description of Flooding

A flood is the partial or complete inundation of normally dry land. The various types of flooding include riverine flooding, and shallow flooding in Johnson County. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

3.5.4.2 Location of Flooding Events

All parts of Johnson County are subject to flash flooding. The Hazard Mitigation Planning Team has reviewed Johnson County's Flood Insurance Rate Maps (FIRMs) and worked with the County Floodplain Administrator to

compile a profile of the flooding hazard within the County. Research on flooding history in the County included newspaper accounts of major floods, data collected by the National Climatic Data Center and the National Flood Insurance Program, and interviews with individual County residents. Though the County’s floodplain maps were developed in 2010, the County’s FIRMs did provide a fairly accurate picture of areas and structures most vulnerable to flooding.

A variety of factors affect the type and severity of flooding within Johnson County, including topography, geology, urban development and infrastructure. Serious flooding in the mountainous areas is unusual because streams tend to be faster flowing and flood waters drain quickly. Also, the mountainous areas of the County are generally less populated and flooding that does occur is not as likely to threaten property or lives. Flash floods are most common in this area due to this area exhibiting high to moderate relief, steep to moderate slopes, and bedrock with low permeability. All factors facilitate rapid runoff and the consequent potential for flash floods. Development in this part of the County exacerbates the flash flooding problem. Intense rainfall events, often accompanying the large thunderstorms that occur in Johnson County several times a year, may result in water flowing rapidly from higher elevations into valleys, collecting in, and sometimes overtopping the valley streams. There have also been issues with the maintenance and clearing of drainage channels in this area that have resulted in obstructions restricting the flow of water during a storm.

FIRM Maps show flood zones in all jurisdictions.

Zone	Description
A	Areas of 100-year Flood; Base flood elevations and flood hazard factors not determined
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundations are shown, but no flood hazard factors are determined.
AE	Base flood elevations determined.
AH	Areas of 100 year shallow flooding where depths are between one (1) and three (3) feet; Base Flood Elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100 year flood; Base Flood Elevations and Flood Hazard Factors determined.
A-99	Areas of 100 year flood to be protected by flood protection system under construction; Base Flood Elevations and Flood Hazard Factors not determined.
AR	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100 year or greater level of flood protection.
V	The coastal area subject to a velocity hazard (wave action) where BFE’s are not determined on the FIRM.
VE	The coastal area subject to a velocity hazard (wave action) where BFE’s are provided on the FIRM.
B & X Shaded	Areas of moderate flood hazard, usually the area between the limits of the 100 year and 500 year floods. B zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from the 100 year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C & X Unshaded	Areas of minimal flood hazard, usually depicted on FIRMs as exceeding in 500 year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500 year flood.
D	Areas of undetermined but possible flood hazards.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 355 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:
 COMMUNITY NUMBER: 66441 0355 D
 JOHNSON COUNTY 66441 0355 D
 CLARKSVILLE CITY OF 68912 0355 D

MAP NUMBER
05071C0355D

EFFECTIVE DATE
NOVEMBER 26, 2010

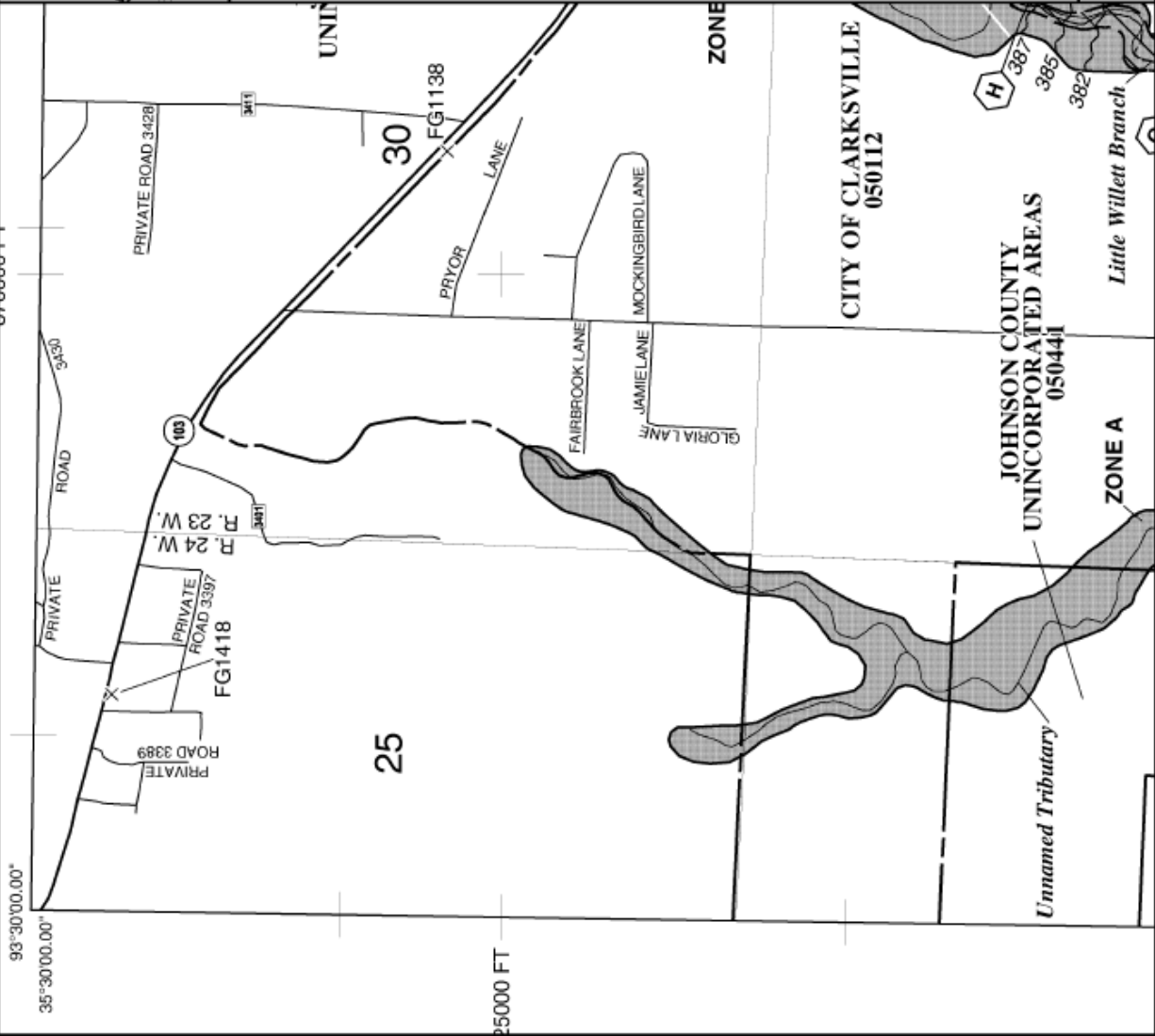
Federal Emergency Management Agency

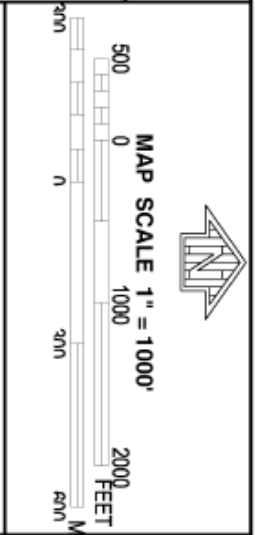
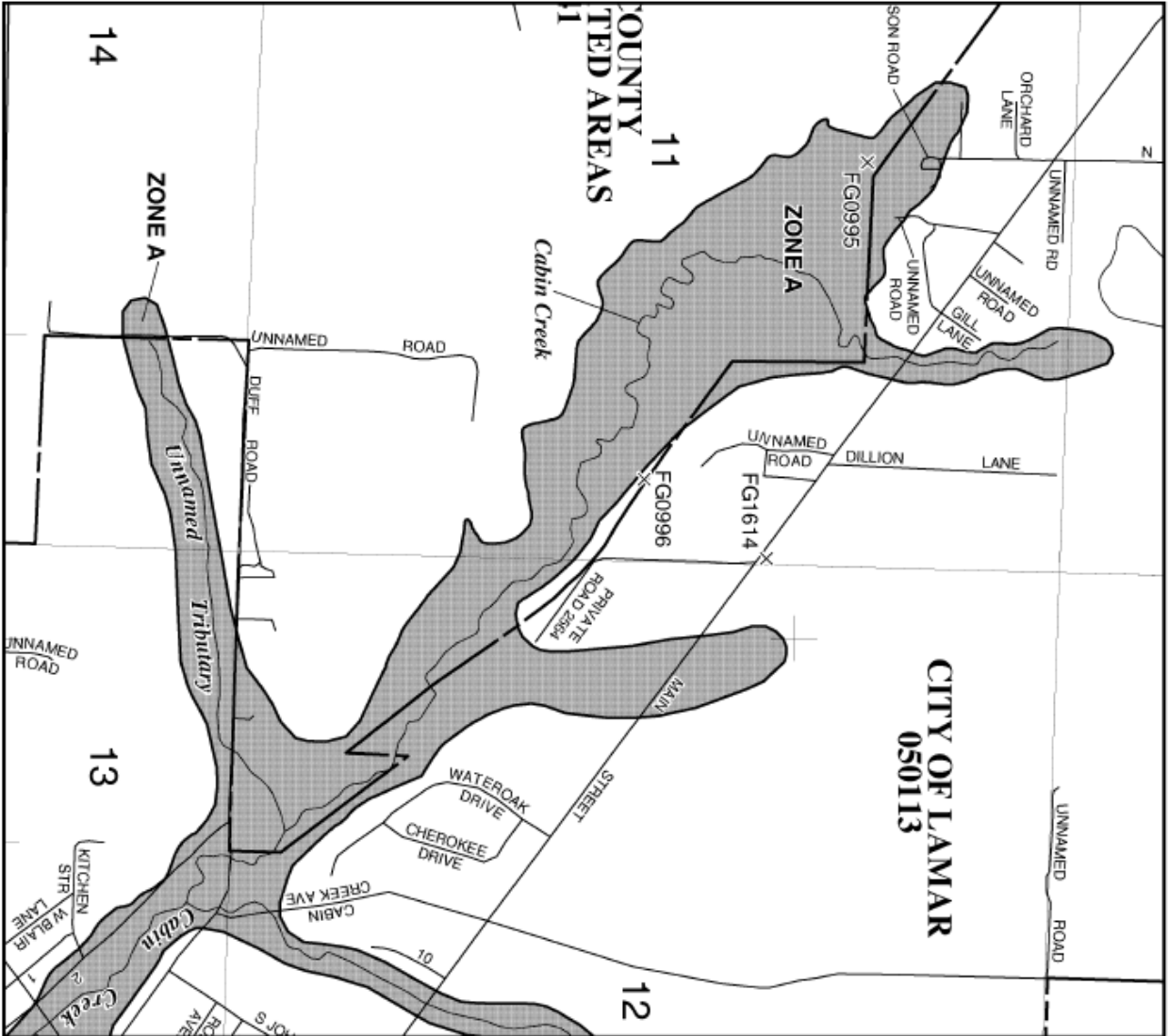
PANEL 0355D

MAP SCALE 1" = 1000'

Note to User: The Map Number shown below should be used when purchasing map orders; the Community Number shown should be used on insurance applications for the subject community.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS


PANEL 0360D

PANEL 360 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

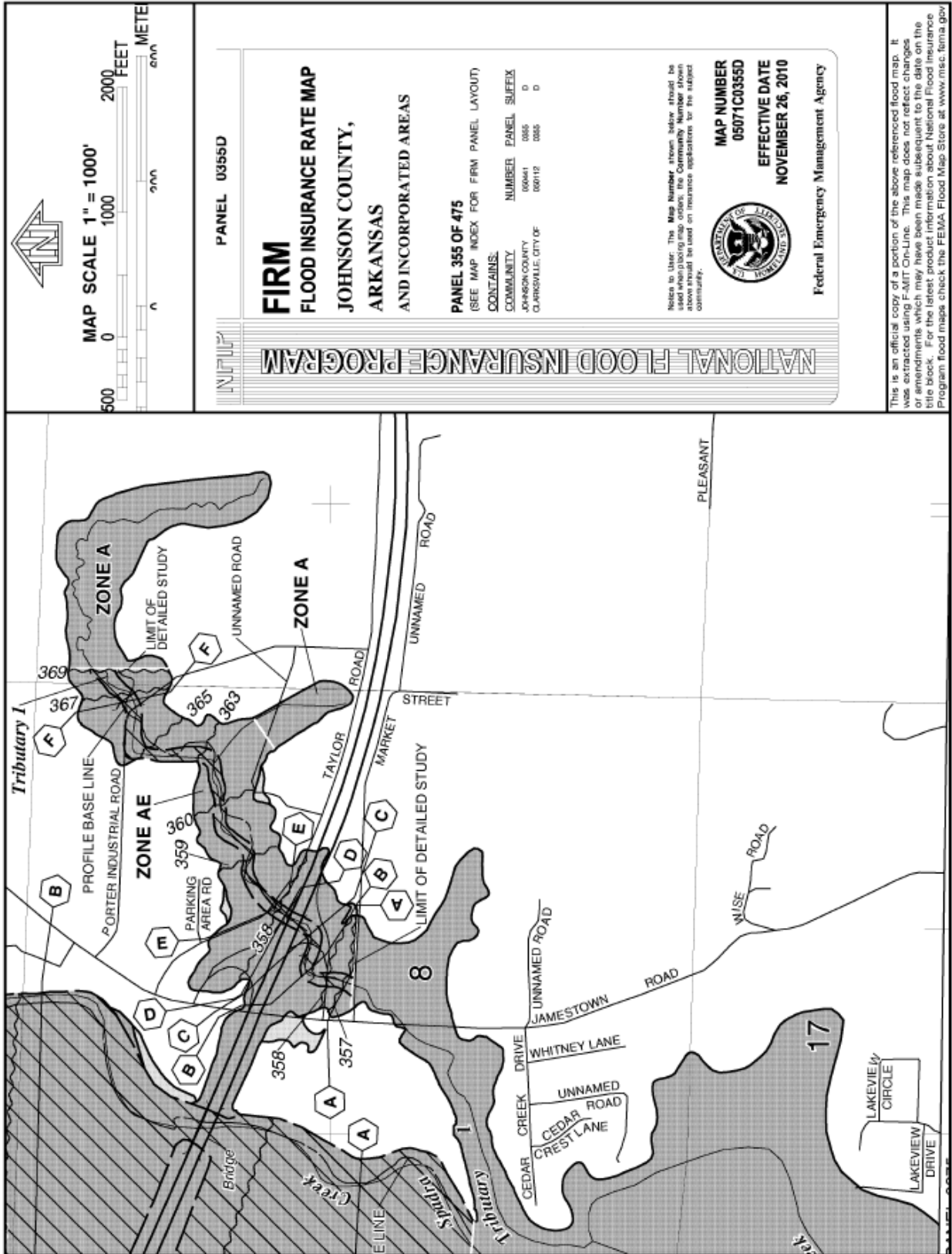
CONTAINS:

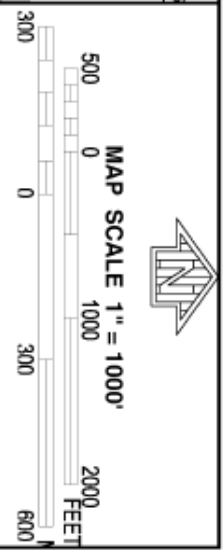
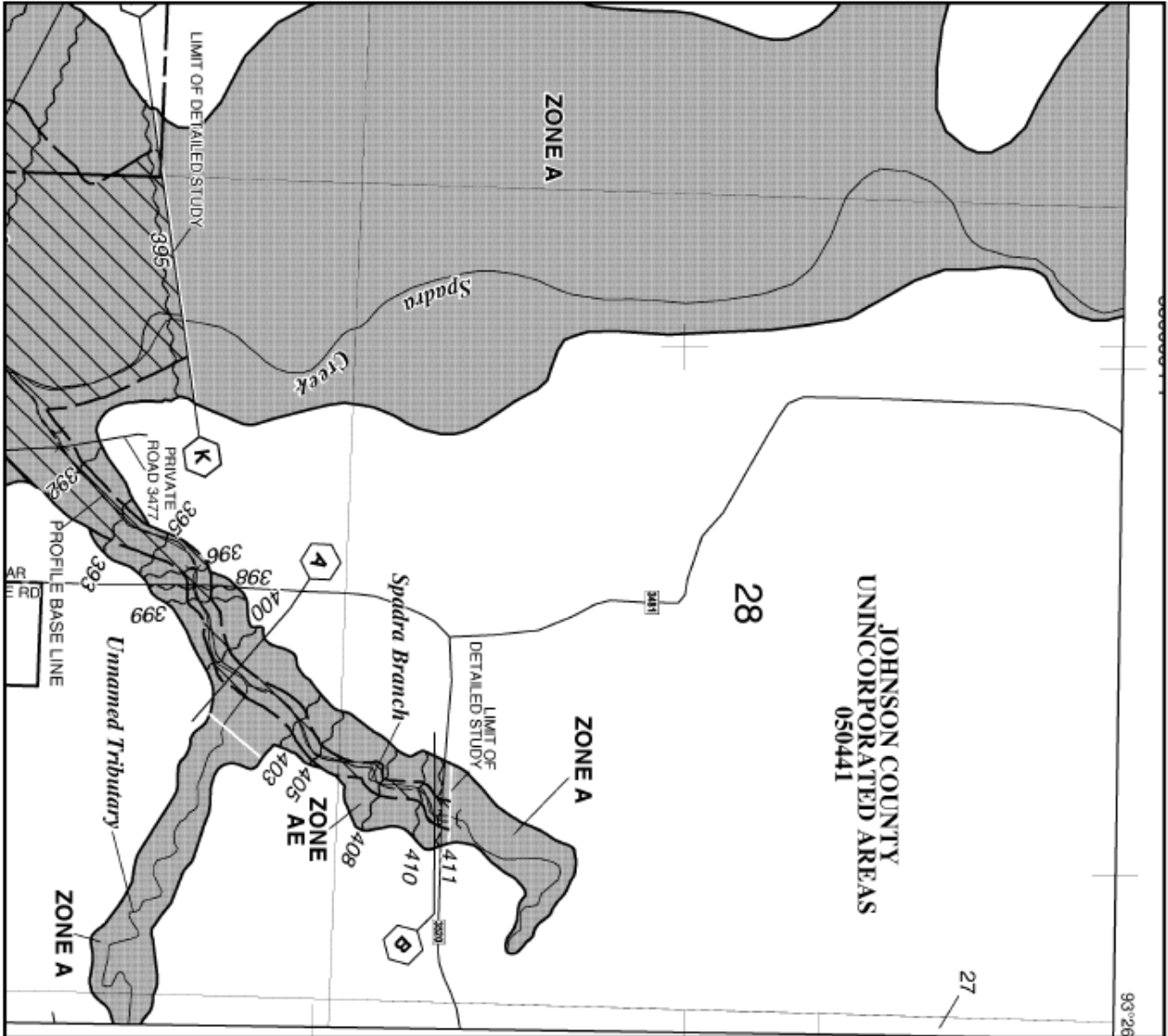
COMMUNITY	NUMBER	PANEL	SUFFIX
JOHNSON COUNTY	05041	0360	D
CITY OF LAMAR	05013	0360	D

Notes to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.


FEDERAL EMERGENCY MANAGEMENT AGENCY
MAP NUMBER
05071C0360D
EFFECTIVE DATE
NOVEMBER 26, 2010

This is an official copy of a portion of the above referenced flood map. It was extracted using F-Alert On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS


PANEL 0355D

PANEL 355 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

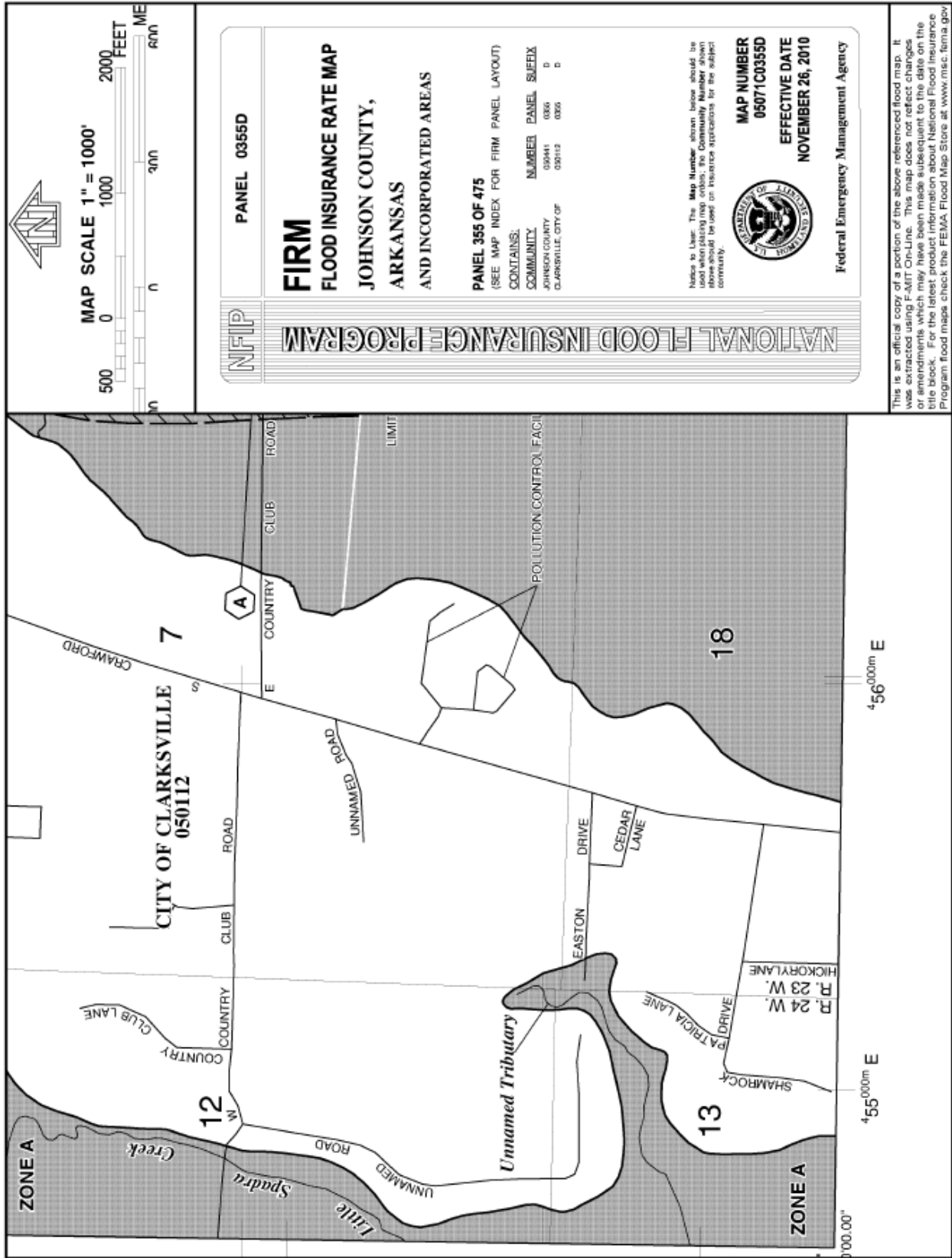
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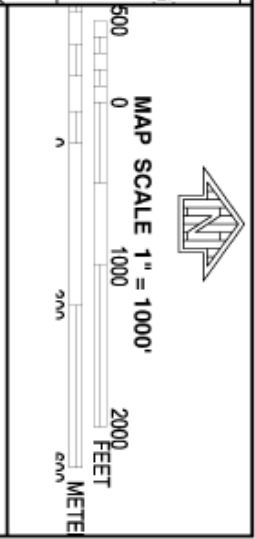
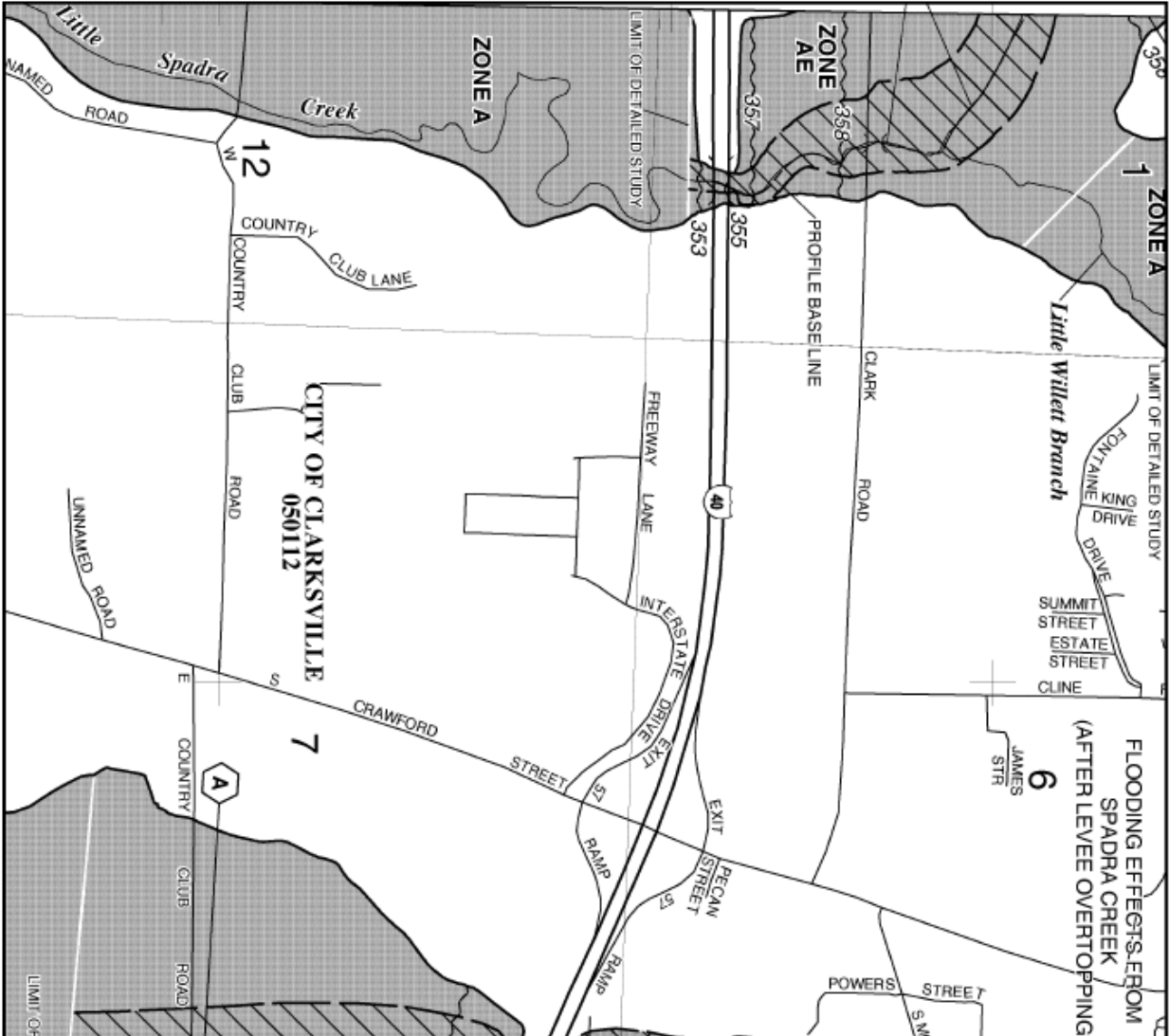
COMMUNITY	NUMBER	PANEL	SUFFIX
JOHNSON COUNTY	03541	0355	D
CLARKSVILLE CITY OF	03012	0355	D

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.


Federal Emergency Management Agency
MAP NUMBER
05071C0355D
EFFECTIVE DATE
NOVEMBER 26, 2010

This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 0355D

PANEL 355 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	NUMBER	PANEL	SUFFIX
JOHNSON COUNTY	03041	0000	0
CLARK COUNTY, CITY OF	030112	0000	0

MAP NUMBER
 05071C0355D

EFFECTIVE DATE
 NOVEMBER 26, 2010

Federal Emergency Management Agency

Notes to User: The Map Number shown below should be used when filing map orders. The Community Number shown above should be used on insurance applications for the subject community.

This is an official copy of a portion of the above referenced flood map. It was extracted using FAIR On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

NFIP **NATIONAL FLOOD INSURANCE PROGRAM**

PANEL 0355D

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS


PANEL 355 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS: **PANEL SUBSEX**
 JOHNSON COUNTY 03041 D
 CLARKVILLE CITY OF 03012 0355 D

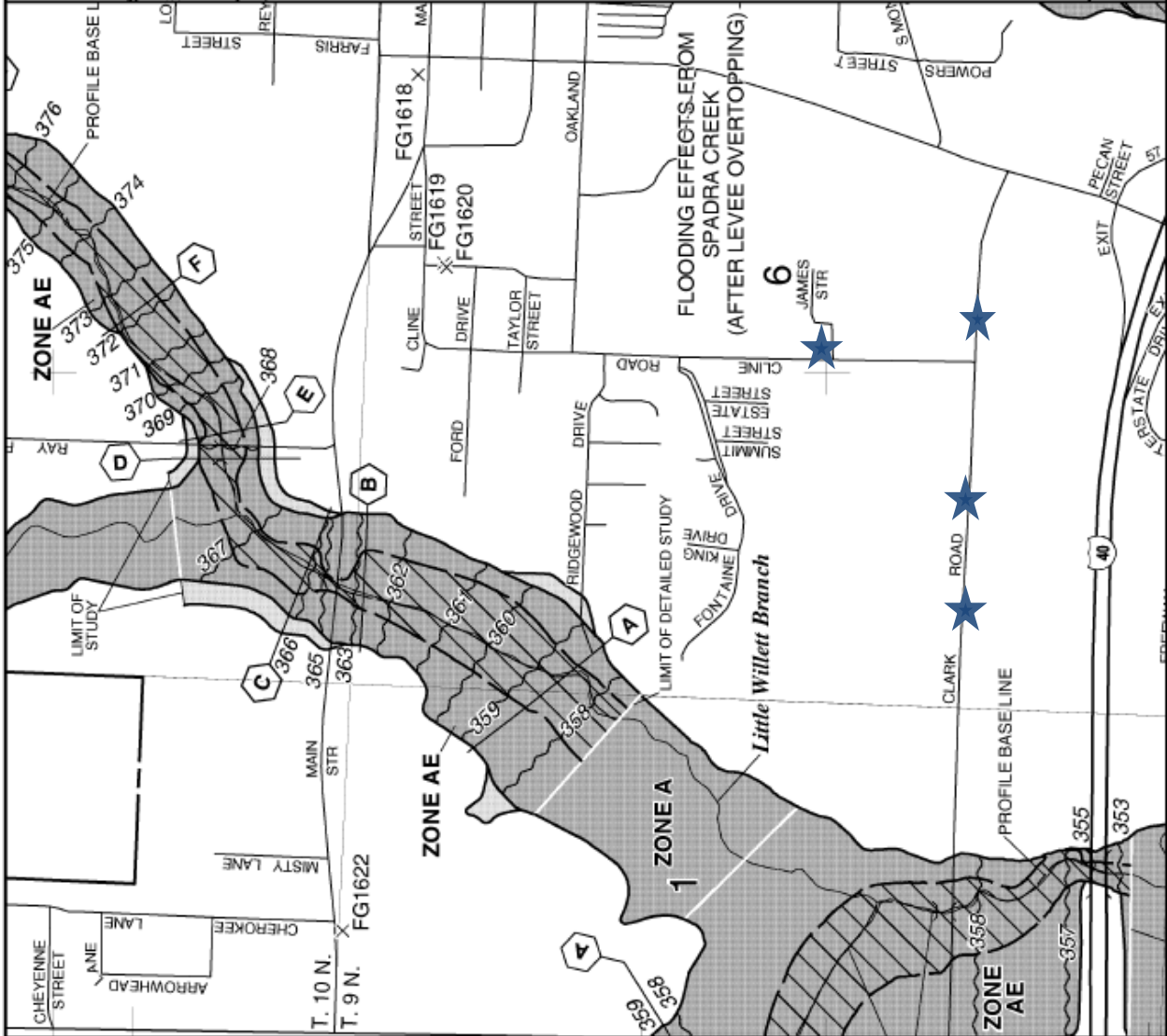
MAP NUMBER 05071C0355D
EFFECTIVE DATE NOVEMBER 26, 2010

Federal Emergency Management Agency

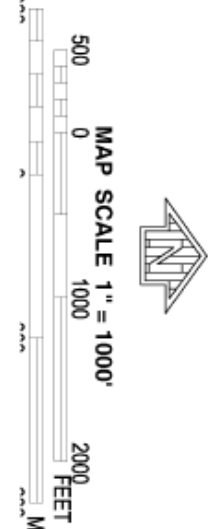
Notice to User: The Map Number shown below should be used in all correspondence and applications for the subject community.



This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program Flood maps check the FEMA Flood Map Store at www.msc.fema.gov



★ Clarksville School Buildings



NFIP

PANEL 0355D

FIRM

FLOOD INSURANCE RATE MAP

JOHNSON COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 355 OF 475

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY: JOHNSON COUNTY OF ARKANSAS

NUMBER: 0355

PANEL: D

SUFFIX: 0355D

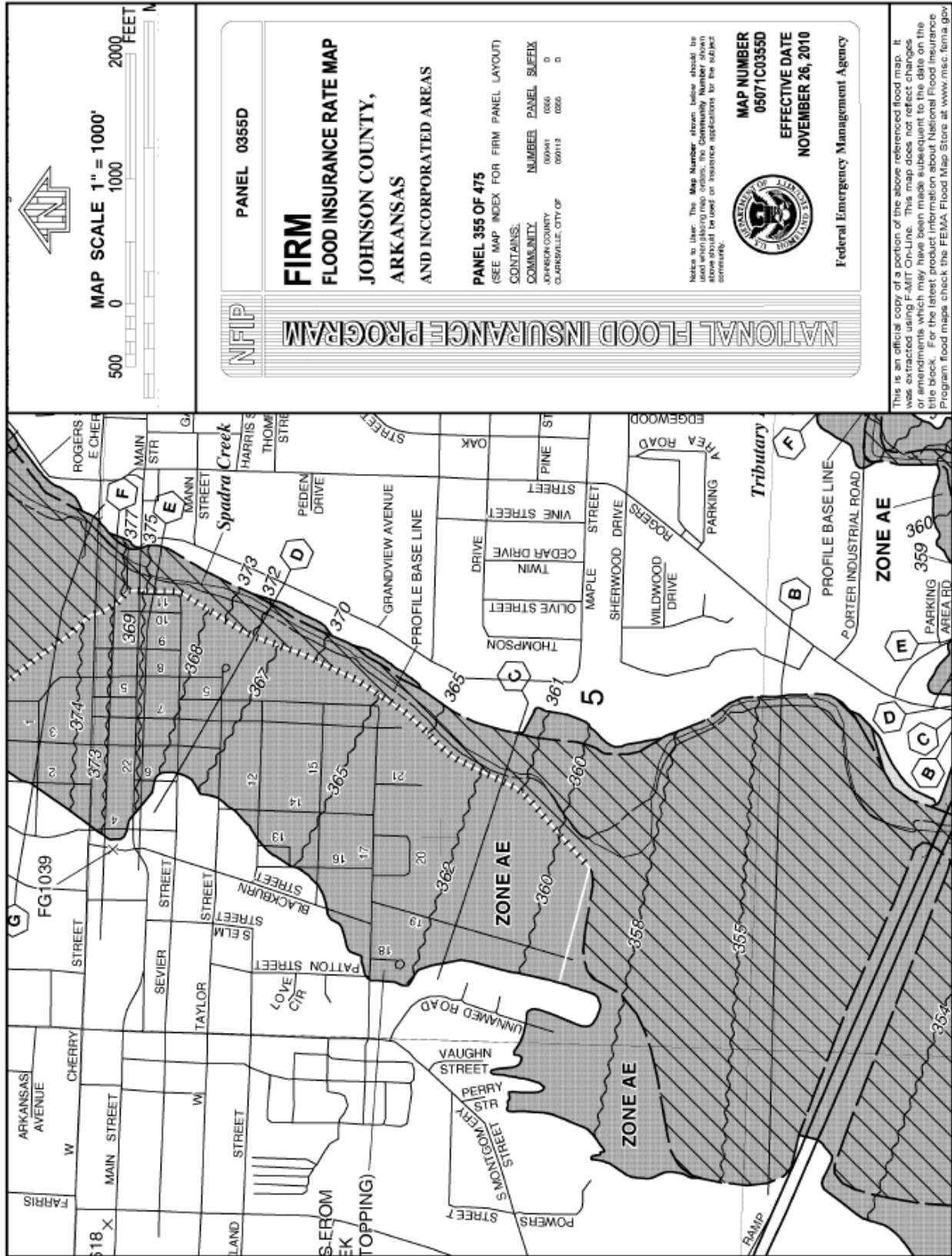
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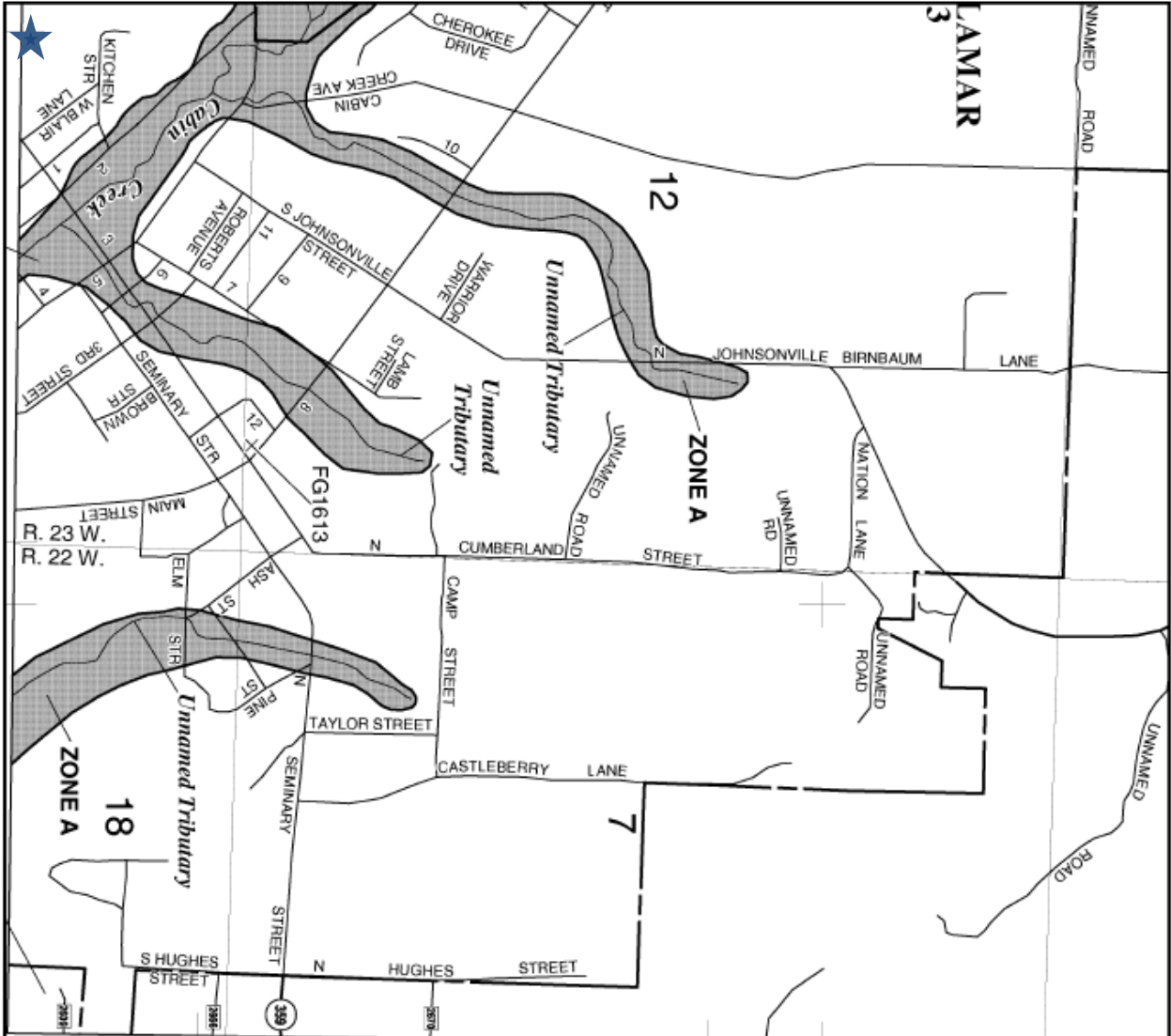
EFFECTIVE DATE: NOVEMBER 26, 2010

Federal Emergency Management Agency

Notes to Users: The Map Number shown below should be used when advertising from outside the Community Number shown above should be used on insurance applications for the affected community.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.nfip.fema.gov





NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 0360D

PANEL 360 OF 475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	NUMBER	PANEL	SUFFIX
JOHNSON COUNTY	00481	0360	0
JOHNSONVILLE CITY OF	00012	0360	0
LAMAR CITY OF	00013	0360	0

FEDERAL EMERGENCY MANAGEMENT AGENCY

MAP NUMBER
05071C0360D
EFFECTIVE DATE
NOVEMBER 26, 2010

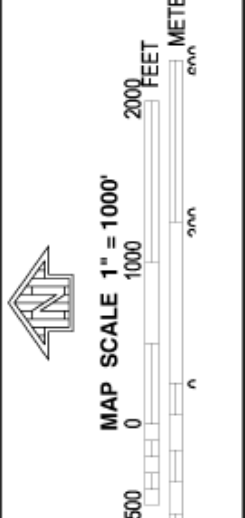
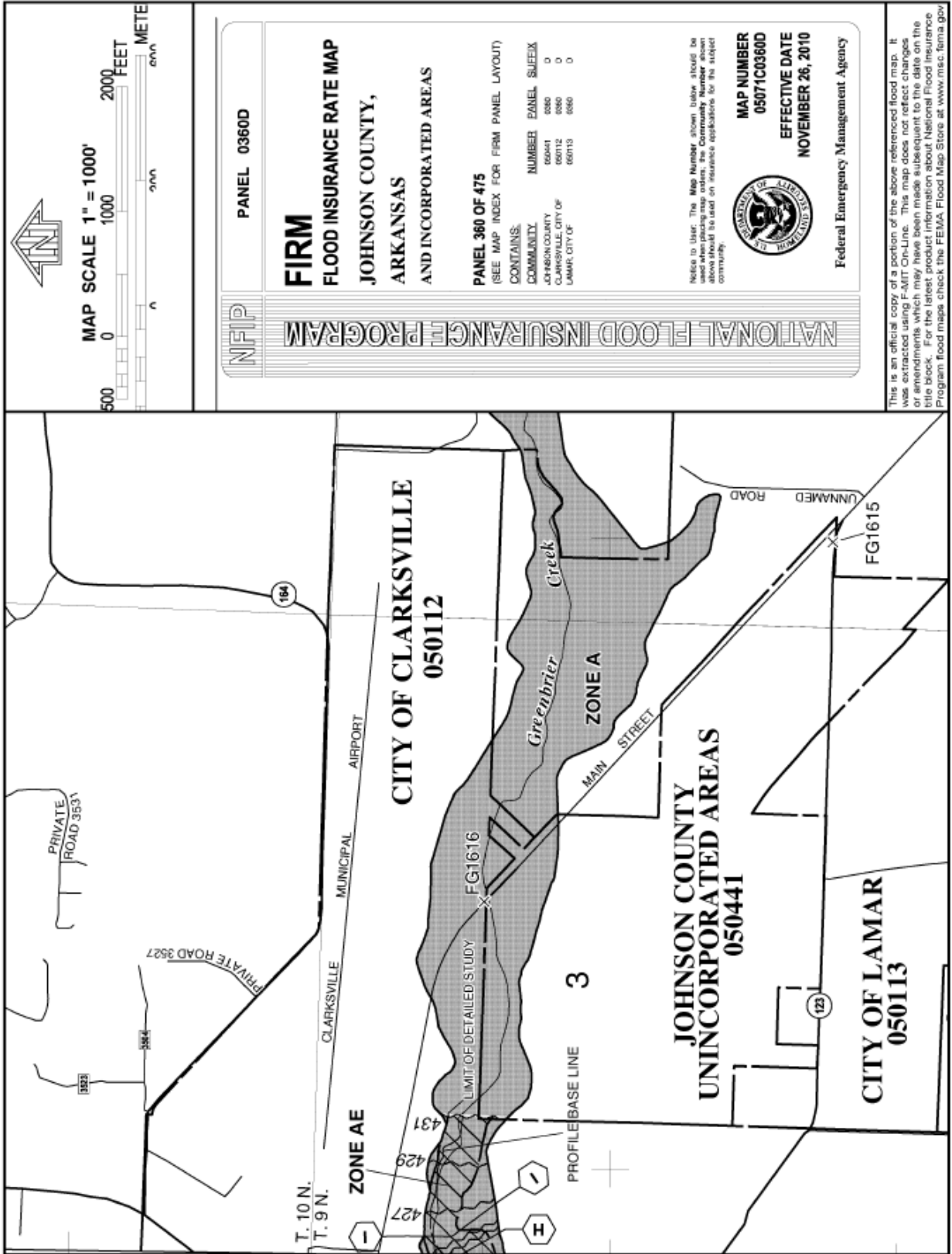
MAP SCALE 1" = 1000'

500
0
1000
2000
FEET

0
300
600
900
1200
METERS

This is an official copy of a portion of the above referenced flood map. It was extracted using F-4/RT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

★ Lamar School District



NFP

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 360 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JOHNSON COUNTY	050441	0360	D
CLARKSVILLE, CITY OF	050112	0360	D
LAMAR, CITY OF	050113	0360	D

MAP NUMBER
05071C0360D

EFFECTIVE DATE
NOVEMBER 26, 2010

Federal Emergency Management Agency


NATIONAL FLOOD INSURANCE PROGRAM

Notice to User: The Map Number shown below should be used in conjunction with the Flood Insurance Rate Map (FIRM) panel number to identify the Community Number shown above. The Community Number shown above should be used on insurance applications for the subject community.

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



FLOOD HAZARD
IS NOT SHOWN
MAP IN AREA
JOHNSON COUNTY



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0375D

FIRM

FLOOD INSURANCE RATE MAP


JOHNSON COUNTY, ARKANSAS

AND INCORPORATED AREAS

PANEL 375 OF 475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL SUFFIX
JOHNSON COUNTY	0375D	D
CITY OF JAMESTOWN	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D
UNINCORPORATED AREAS	0375D	D




Federal Emergency Management Agency

MAP NUMBER
05071C0375D

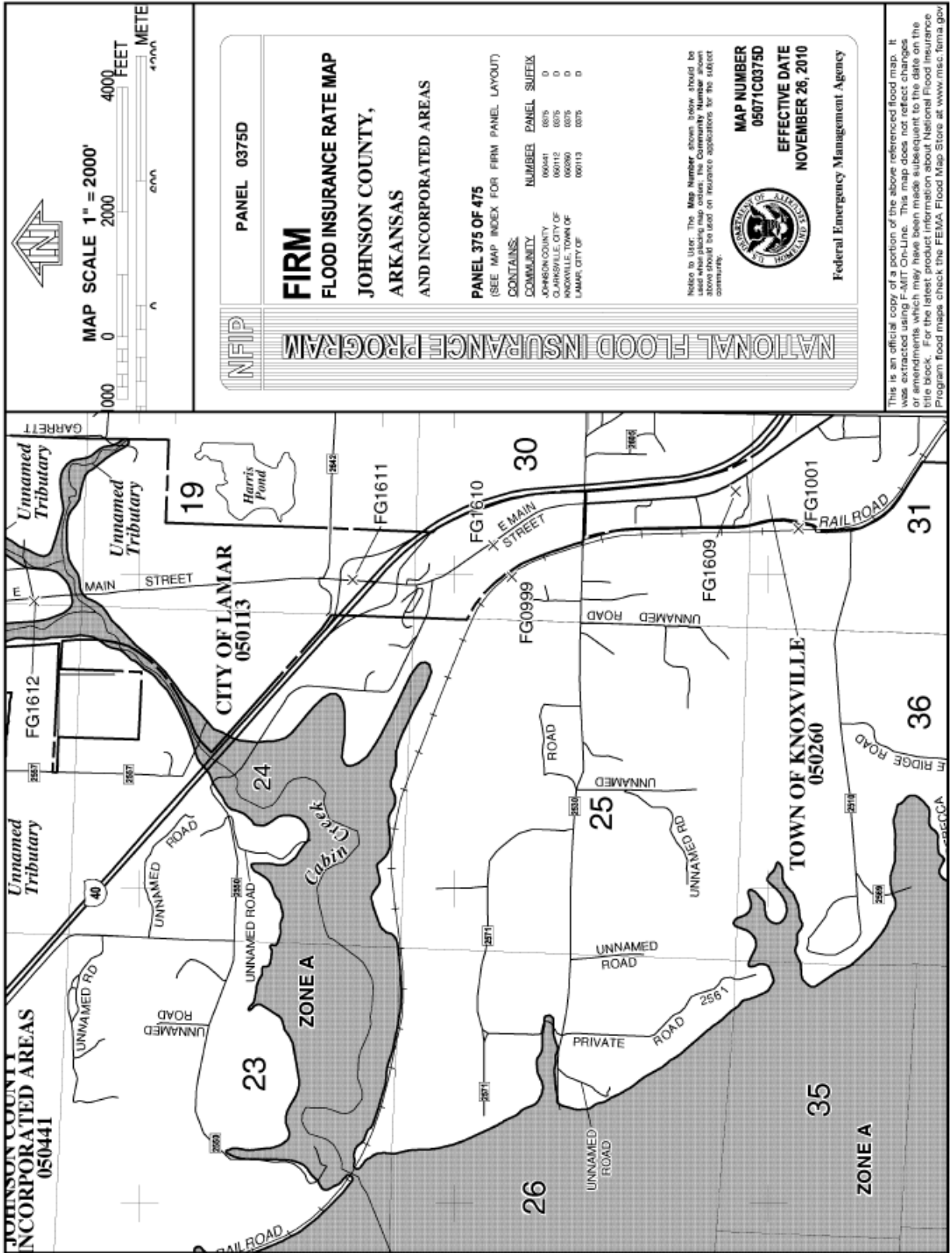
EFFECTIVE DATE
NOVEMBER 26, 2010

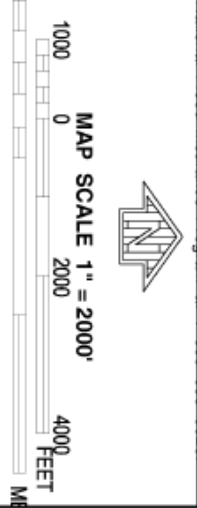
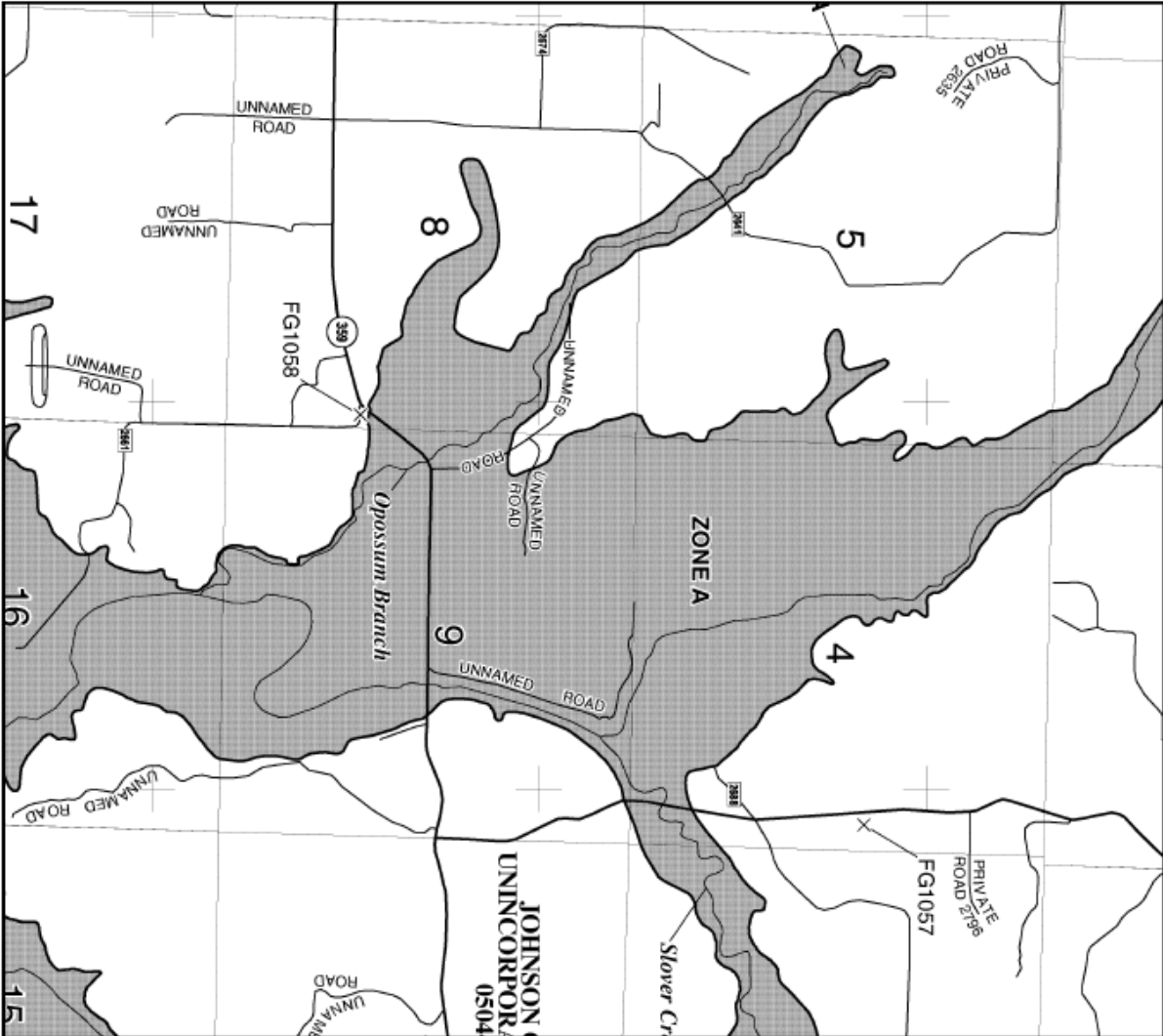
1000 0 2000 4000 FEET

MAP SCALE 1" = 2000'



This is an official copy of a portion of the above referenced flood map. It was extracted using FIRM-CUTLINE. This map does not reflect changes to the flood hazard areas since the date of the original map. For the latest product information about National Flood Insurance Program flood maps, check the FEMA Flood Map Store at www.msc.fema.gov.





NFIP PANEL 0400D

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 400 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	MEMBER	PANEL	SUFFIX
JOHNSON COUNTY	05041	0400	D
UNINCORPORATED AREAS	05042	0400	D
LAMAR CITY, AR	05013	0400	D

Notice to User: The **Map Number** shown below should be used when placing map orders. The **Community Number** shown above should be used on residence applications for the entire community.

MAP NUMBER
0507100400D

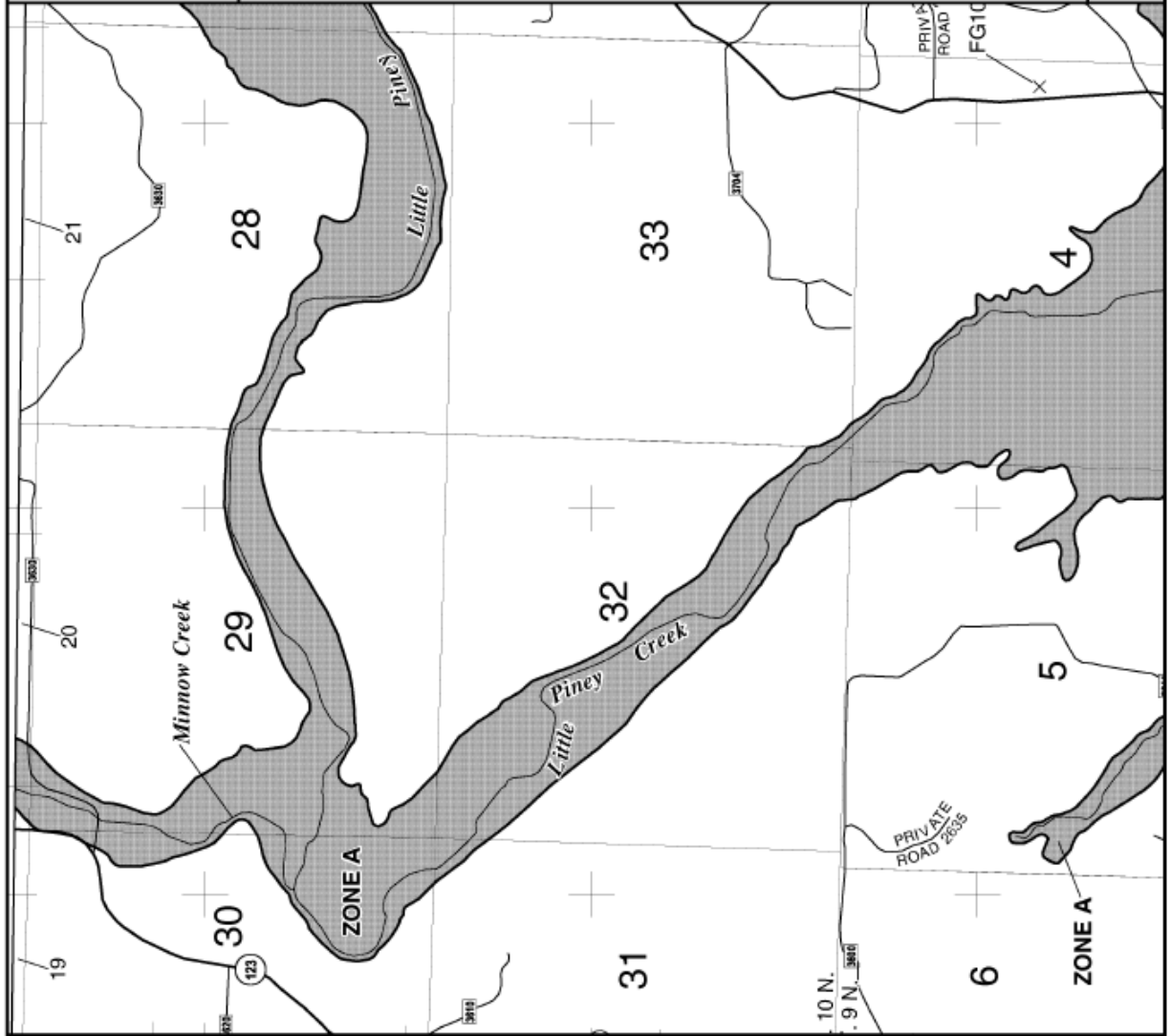
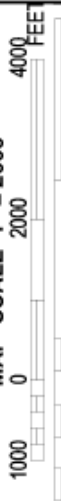
EFFECTIVE DATE
NOVEMBER 26, 2010

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-A-MT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.fema.gov



MAP SCALE 1" = 2000'



NFIP

PANEL 0400D

FIRM
FLOOD INSURANCE RATE MAP
JOHNSON COUNTY,
ARKANSAS
AND INCORPORATED AREAS

PANEL 400 OF 475
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)
 CONTAINS: **NUMBER** **PANEL SUFFIX**
 COMMUNITY: 050451 0400 D
 JOHNSON COUNTY 050500 0400 D
 ROCKVILLE, TOWN OF 050113 0400 D
 LAMAR, CITY OF

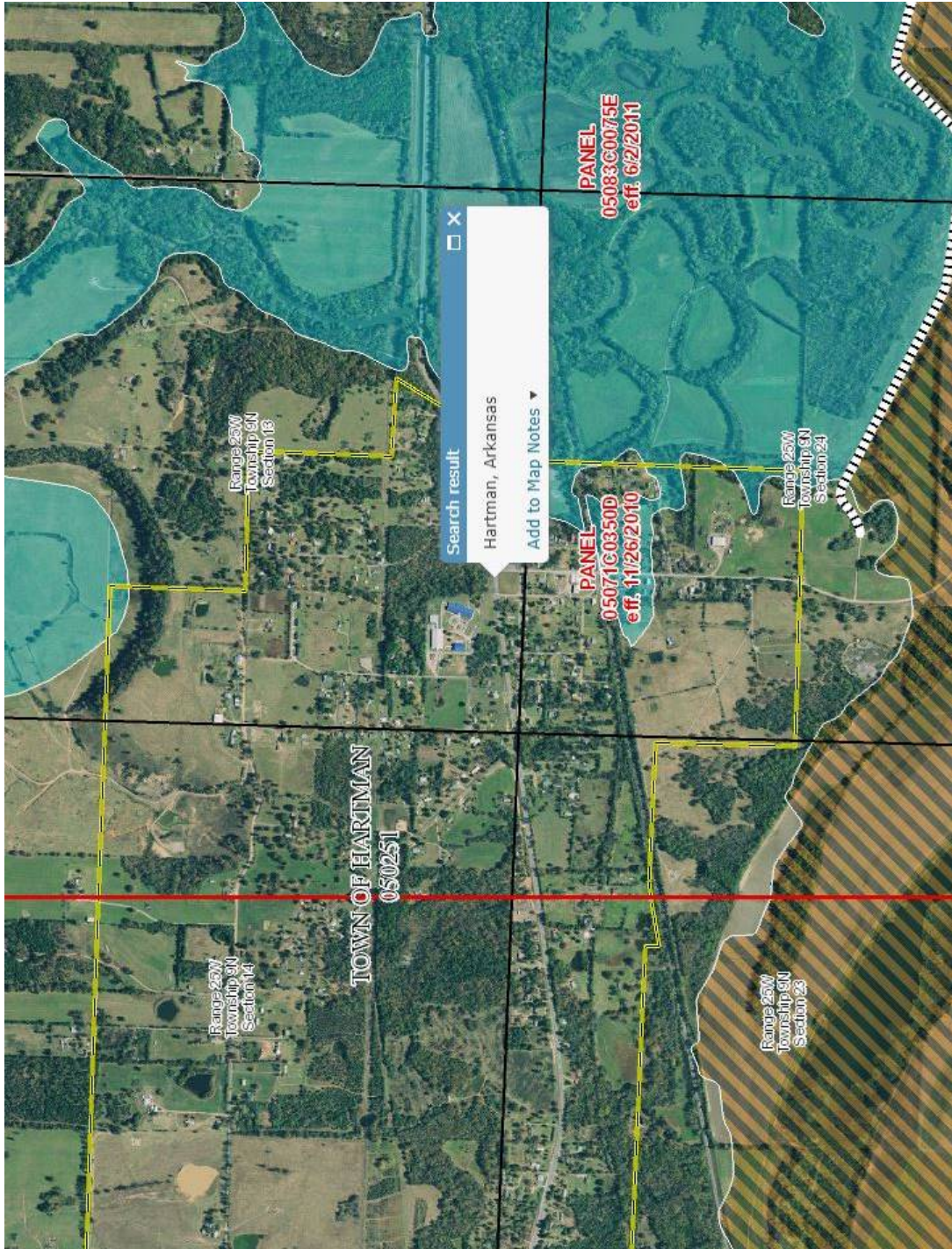


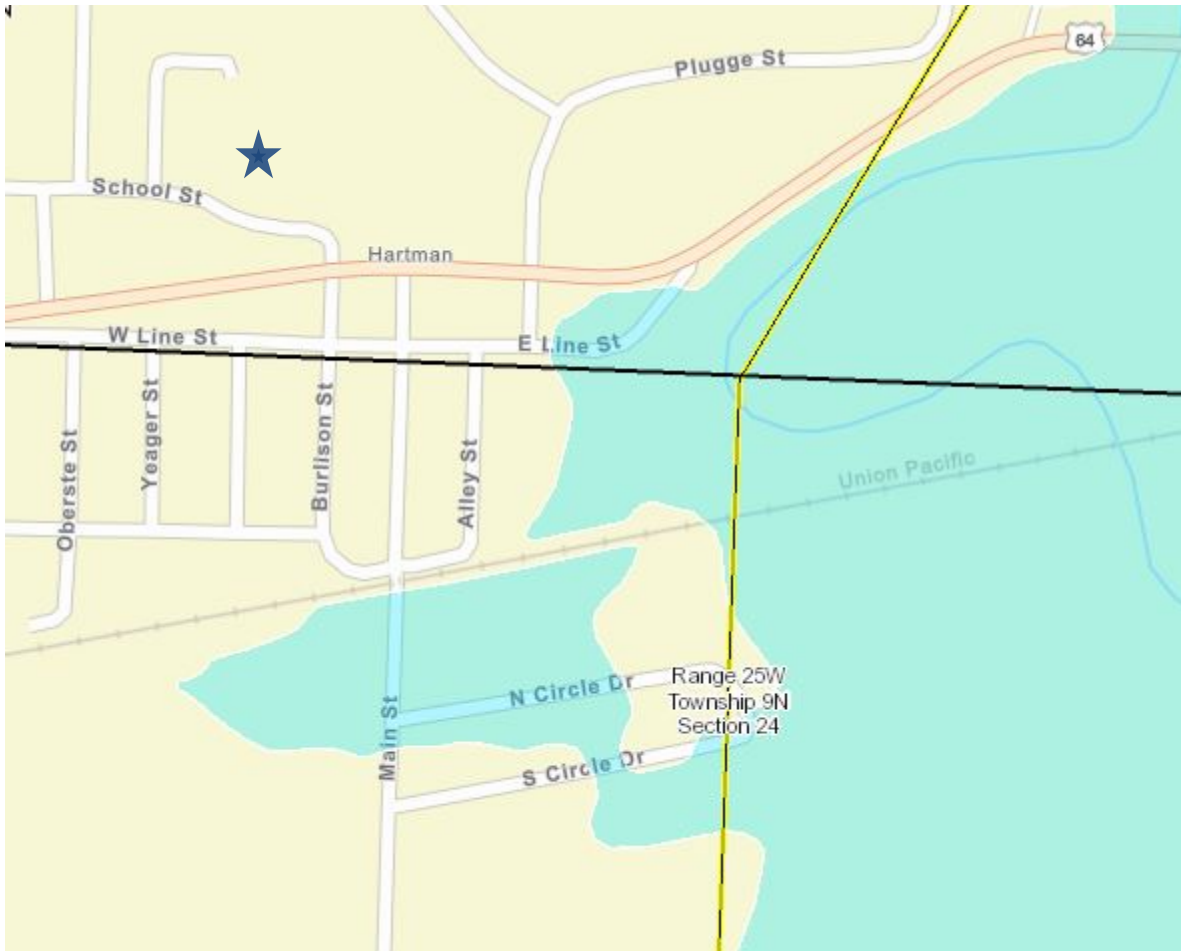
MAP NUMBER
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EFFECTIVE DATE
 NOVEMBER 26, 2010

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





Note: ★ Westside School is located in Hartman AR. According to data found on <https://fema.maps.arcgis.com> the school is located in **Zone X**.

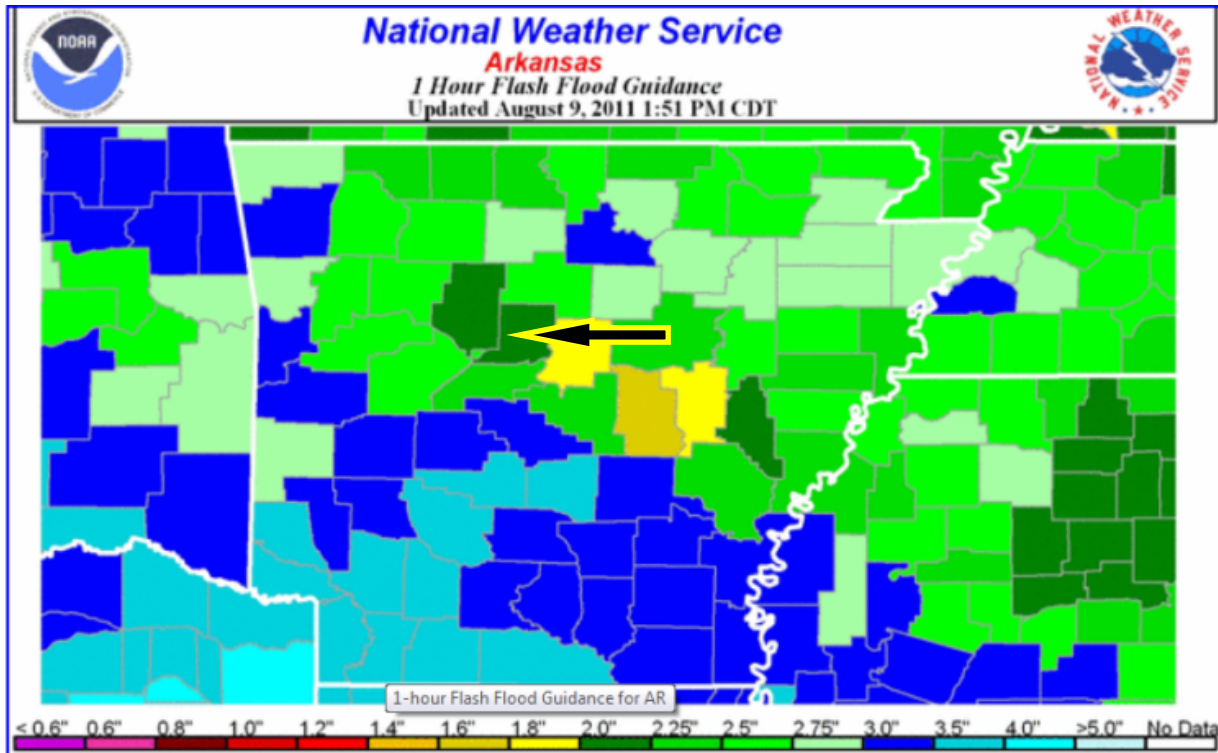
3.5.4.3 Extent, Magnitude or Severity of Flooding

Flood severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat.

Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience

Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.

Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.



According to the National Weather Service graphic for Johnson County two inches of rainfall in a one hour timeframe can produce flash flooding in areas of Johnson County. Lower amounts may cause flash flooding in urban or mountainous areas and will depend on the area itself. Below will be a list of streets that may be impacted by flooding or flash flooding in Johnson County for the City of Clarksville. In regards to Cities of Coal Hill, Hartman, Knoxville and Lamar a data deficiency exist because flood elevation information is not available on the current FIRM maps. However Johnson County is currently undergoing a Base Level Engineering study that that could provide these results for the next plan update. Data deficiency will be added as a mitigation action to correct for next update.

In regards to the Clarksville School District, Lamar School District, and Westside School District according to the FIRM maps that are located in this plan and available through the FEMA mapping services none of the schools physically sit within a flood zone however, disruptions can still occur because road may be blocked or the homes of student and staff could be affected in the event flooding or flash flooding was to occur.

City of Clarksville: Taylor Rd 358 ft. See map on pg. 35 line C, Interstate 40 - 4,000ft from exit 57 to the west 353-355 ft. see map on pg. 38, Main St. See map on pg. 39 line B 7 C, Ridgewood Drive Line A 359 ft. see map on pg. 39, Harmony Rd – see map on pf 40 405ft, Sevier St 372 line D and Cherry St 374ft line G – See pg. 41.

3.5.4.4 Previous Flood and Flash Flooding Occurrences

There were 38 flash flood events and 3 flood events between 1950 to 2016.

3.5.4.5 Probability of Future Flooding

There is a 32% chance of a flash flood events and a 4% chance of a flood event in any given year.

3.5.4.6 Impact of Flooding

There are numerous ways that flooding could impact Johnson County. Flooding causes traffic problems by cutting off streets, collapsing overpasses and bridges and causing traffic-light failures. Cars may stall and can even be carried off by flood waters. Flood waters interrupt gas, electricity and water services and contaminate the water supply, making drinkable water unavailable. Transportation systems may go off-line because buses, cars and trucks can't navigate the high water.

People can die in floods when their autos and homes are overtaken quickly by fast-rising flood waters. Homes, personal belongings and businesses can be damaged or lost entirely as a result of ravages of flooding. People may be unable to get to work, creating loss of income and a lack of services they would provide.

City of Clarksville

Flooding may disrupt road ways resulting in transportation problems. This can cause economic losses for citizens but also companies located in this area. When goods or services are unable to be performed revenue will be lost. Transportation delays can also cause other issues especially during an emergency. According to the firm maps there are many streets that could be impacted by flood waters.

Unincorporated areas of Johnson County, Cities of Coal Hill, Hartman, Knoxville and Lamar

All populations located in these areas could be at risk of death or injury due to flooding. There have been a few instances in the past where rescue operations for residents trapped in homes have been carried out. Many county roads and culverts was out resulting in repair expenses but also leaving people stranded in their homes or away from their homes depending where they are in the flooding occurs.

Clarksville School District, Lamar School District, and Westside School District

According to the FIRM maps there does not appear to be a direct threat of flooding to the school campuses and property however this does not mean that disruption may not occur to the services that the school depends on but also perform for the areas that they service. Roads being inundated and or washed out could possibly disrupt school but also what staff and students are able to make it to the campus depending on where they reside.

In all the above jurisdictions, flood waters could interrupt gas, electricity and water services and contaminate the water supply, making drinkable water unavailable. Homes, personal belongings and businesses could be damaged or lost entirely as a result of ravages of flooding. Residents and home owners who do not have flood insurance are vulnerable. They could suffer a great financial hardship from the expenses of clean up and rebuilding in the event of a flood.

Listed are other areas in which flooding can affect Johnson County;

Environmental -Flat areas that do not have trees or rocks to prevent erosion are often swept away. Farm fields, which typically are located in flat areas, become washed out and crops are lost. Contaminants from sewer back-ups and other waste may be washed into the water supply, resulting in water that is unsafe for residents to use. The shelters of animals in the area are also washed out, resulting in many homeless animals that can cause problems for their owners.

Economic- Residential loss or repair. Businesses also suffer, not only from the loss of property, but the lack of customers during the flood and for a while after during recovery. Farmers also suffer from the loss of their crops.

Financial- Some residents who do not carry flood insurance suffer a great financial hardship. Those who do have insurance get help with the clean-up, but some costs may still come out of pocket. Towns and cities that are impacted by a flood carry the financial burden of fixing the public buildings, roads and other structures damaged by the flood waters. People who are impacted by the flood may also lose wages because the business they work for suffered damages or they are unable to get to work.

Health- Flood waters can also damage the health of those living and working in the area. Because flood waters can wash dangerous waste into water supplies, tap water may become unsafe to use if the local authorities do not issue a boil advisory warning everyone to boil water before ingesting it. Mold is also likely to grow in homes and other buildings that were engulfed by the flood waters. It is important to search all homes for mold and remove it completely before moving back in. Breathing the mold spores is dangerous for your health. A flood can also contribute to other health problems from human waste that contaminates the ground.

Safety Once flooding begins, strong currents can pull a grown man beneath the water to drown. Once the flood waters have settled, it is still unsafe to wander through the water by car or on foot. Deep spots may be undetectable and there may be electric currents running through the water as well.

Timber Plantations Flooding can severely stress or even kill trees, depending on how deeply or how long they remain submerged. Floods kill trees that are completely covered by water and seedlings pushed over by the force of the water or buried under silt. Prolonged flooding can cause root rot, leading to tree death. Prior tree health plays a role in whether the trees survive after flooding.

Soil Flooding results in poor soil aeration, leading to poor plant growth. Soil becomes more acidic following flooding. In addition, flooding can lead to soil erosion or soil contamination from such man-made pollutants as oils (on roadways), fertilizers (in yards and farms) and paints.

Rural Impact Floods damage farmland by burying crops in silt, uprooting crops by the force of the water or drowning crops. Flood waters can drown livestock as well. Flooding devastates wetlands and other wildlife habitats by depositing massive amounts of silt or leaving behind toxic substances such as petroleum products, fertilizers and pesticides and other man-made chemicals. This can kill animals and lead to water and land pollution.

Disease Flooding increases human exposure to dysentery and other diseases. Flooded sewage treatment plants contaminate drinking water supplies. Contaminated drinking water is a greater problem in developing countries.

3.5.4.7 Addressing Repetitive Loss Properties

Based on data is from BureauNet, FEMA/NFIP database, there are no repetitive loss or severe repetitive loss properties in Johnson County or participating communities.

3.5.5 Thunderstorms

3.5.5.1 Description of Thunderstorm, Lightning, Hail and High Wind Events

A **thunderstorm**, also known as an **electrical storm**, a **lightning storm**, **thundershower** or simply a **storm**, is a form of turbulent weather characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere known as thunder. The meteorologically assigned cloud type associated with the thunderstorm is the cumulonimbus. Thunderstorms are usually accompanied by **strong winds**, heavy rain and sometimes snow, sleet, hail, or no precipitation at all. Those that cause hail to fall are called **hailstorms**. Thunderstorms may line up in a series or rainband, known as a squall line. Strong or severe thunderstorms may rotate, known as supercells. While most thunderstorms move with the mean wind flow through the layer of the troposphere that they occupy, vertical wind shear causes a deviation in their course at a right angle to the wind shear direction.

Lightning- Lightning is a channel of electrical charge called a stepped leader that zigzags downward in roughly 50-yard segments in a forked pattern. This step leader is invisible to the human eye, and shoots to the ground in less time than it takes to blink. As it nears the ground, the charged step leader is attracted to a channel of opposite charge reaching up, a streamer, normally through something tall, such as a tree, house, or telephone pole. When the oppositely-charged leader and streamer connect, a powerful electrical current begins flowing. A bright return stroke travels about 60,000 miles per second back towards the cloud. A flash consists of one or perhaps as many as 20 return strokes. We see lightning flicker when the process rapidly repeats itself several times along the same path. The actual diameter of a lightning channel is one-to-two inches.

Hail- 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.

According to data from the FEMA 1997 publication “Multi-Hazard - Identification and Risk Assessment,” Arkansas is within a part of the country that averages two to three hailstorms annually.

Strong Winds- 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.









3.5.5.2 Location of Thunderstorm, Lightning, Strong Winds and Hail Events

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District have experienced Thunderstorms, lightning, strong winds and hail events and are equally at risk.

3.5.5.3 Extent, Magnitude or Severity of Thunderstorm, Lightning, Strong Winds and Hail Events

All areas of unincorporated Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are equally subject to thunderstorms ranging from Marginal to Category 5- High on the chart below. This would result in lightning, hail from 2 to 4 in, and possible tornadoes up to an EF5. Thunderstorm winds with a category 5 may be in excess of 70 mph.

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					
* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.					
		National Weather Service www.spc.noaa.gov			

3.5.5.5 Previous Thunderstorm, Lightning, Strong Winds and Hail Events

Event	Event Total	Fatalities	Injuries	Property Damage	Crop Damage
Hail	160	0	0	\$0	0
Lightning	5	0	0	\$250.00K	0
Thunderstorm Winds	206	0	0	\$1.465M	0

3.5.5.6 Probability of Future Thunderstorm, Lightning, Hail and Strong Wind Events

In any given year there is a 26% chance of two hail events, 7% chance of a lightning event, and a 22% chance of three thunderstorm wind events occurring.

3.5.5.7 Impact of Thunderstorm, Lightning, Strong Winds and Hailstorm Events

All structures in the participating jurisdictions and their contents are vulnerable to damage by thunderstorms winds. Strong winds can down trees onto power lines, damage mobile homes that are not anchored, and rip off roofing. Winds can cause death and injuries by lifting unanchored objects creating flying missiles.

Lightning strikes have the power to fell trees many times disrupting service, and structural fires. Lightning can possibly cause death and injuries. Four injuries due to lightning have been reported. Wind and lightning can damage communication towers located throughout the participating jurisdictions.

Hailstorm events are frequent and can cause damage to all structures, mainly roof shingles which can lead to roof leaks and further damage to the structure interiors. All types of real and personal property are vulnerable to hailstorms, cars, trailers, boats, and crops. Hailstorms can cause bodily injury if caught outside without protection.

School Districts could be vulnerable to the impacts of a thunderstorm. Thunderstorm winds could damage the facilities depending on the strength of the winds. Disruptions could also occur even if the school districts sustain no damage. Tree may be fall blocking routes into and out of the school as well as knocking out power and other utilities that the school depends upon to operate. School buses could also be damages during a thunderstorm due to strong winds, hail and rare evens lightning strikes. All of these events can cause damage as well as the disruption of transportation and the operation of the school districts as well as the transportation departments.

3.5.5.8 Vulnerability and Estimating Potential Loss

There are concentrations of manufactured homes, unreinforced masonry homes, older construction types located in the unincorporated areas of Johnson County as well as the participating jurisdictions. These homes are susceptible to damage during high wind events and hail, and can easily be engulfed in fire if struck by lightning. There are few public safe rooms in these areas that offer protection to life during high wind events. Wooden, unreinforced masonry homes and older construction types are also susceptible to damage during high wind and hail. Lightning will destroy these homes by fire. Often, hail creates thousands of dollars of personal property in the unincorporated areas of Johnson County.

The unincorporated areas of Johnson County are concerned about the communication system, and electric grid during thunderstorms. During thunderstorms, the community can lose power and communication capabilities. This threatens safety of the community and hinders response operations.

3.5.6 Tornado

3.5.6.1 Description of a Tornado

A tornado is a rapidly rotating vortex or funnel of air extending ground ward from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere (Golden and Snow, 1991). When the lower tip of the vortex touches earth, the tornado becomes a force of destruction. Approximately 1,000 tornadoes are spawned by severe thunderstorms each year.

Tornadoes are related to larger vortex formations and therefore often form in convective cells such as thunderstorms or in the right forward quadrant of a hurricane, far from the hurricane eye. The strength and number of tornadoes are not related to the strength of the hurricane that generates them. Often, the weakest of hurricanes produce the most tornadoes (Bryant, 1991). In addition to hurricanes, events such as earthquake induced fire and fires from atomic bombs or wildfires may produce tornadoes.

The path of a single tornado generally is less than 0.6 mi (1km). The path length of a single tornado can range from a few hundred meters to dozens of kilometers. A tornado typically moves at speeds between 30 and 125 mph (50 and 200 km/h) and can generate internal winds exceeding 300 mph (500km/h). However, the lifespan of a tornado rarely is longer than 30 minutes.

3.5.6.2. Locations of Tornado Events

Because there is no defined geographic hazard boundary, all people and property in Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are exposed to the risk of damage from Tornadoes. Based on the short dataset, no clear areas of high tornado occurrence occur at any particular County scale. Thus, although tornado risk appears to vary at a statewide scale, variable tornado risk at the County scale cannot be demonstrated. For the purpose of this plan, all parts of this plan are considered equally likely to experience a tornado event. This is proven to be the case in tornadoes that have occurred in a wide variety of areas.

3.5.6.3. Extent, Magnitude or Severity of Tornado

The Enhanced Fujita (EF) Scale was devised by a panel of meteorologists and engineers convened by the Wind Science and Engineering Research Center at Texas Tech University. The Weather Channel's severe weather expert

Dr. Greg Forbes was on the team of experts who determined the revised wind speed ranges. Since 2007, the EF Scale has been used to rate tornadoes.

Enhanced Fujita Scale		
Category	Wind Speed	Potential Damage
EF0	105–137 km/h 65–85 mph	Light damage. Peels surface off roofs; some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; mobile homes pushed off foundations or overturned; sign boards damaged.
EF1	138–179 km/h 86–110 mph	Moderate damage. Roofs torn off frame houses; windows and glass doors broken; moving autos blown off roads; mobile homes demolished; boxcars overturned.
EF2	180–217 km/h 111–135 mph	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	218–266 km/h 136–165 mph	Severe damage. Some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	267–324 km/h 166–200 mph	Devastating damage. Well-constructed houses and whole frame houses completely leveled; structures with weak foundations blown away some distance; trees debarked; cars thrown and small missiles generated.
EF5	>324 km/h >200 mph	Incredible damage. Strong frame houses leveled off foundations and swept away; with strongest winds, brick houses completely wiped off foundations; automobile-sized missiles fly through the air in excess of 100 m (109 yd); cars thrown and large missiles generated; incredible phenomena will occur.

Johnson County could experience the entire range of tornadoes from and EF0 – EF5.

3.5.6.4. Previous occurrences

There have been a reported 34 tornadoes between 1950 and 2017, resulting in 150 injuries 4 deaths and \$27.047M in property damage.

3.5.6.5. Probability of Future Tornadoes

There is a 30% chance of a Tornado impacting Johnson County in any given year.

3.5.6.6 Impact of Tornado

The table below describes the impact of tornados to residential homes in the participating jurisdictions.

RESIDENTIAL HOME DAMAGE CLASSES		
Degree of Damage (DOD)		Expected Wind Speed Value (mph)
1	Threshold of visible damage	65
2	Loss of roof covering material (<20%), gutters, and/or Awning; loss of vinyl or metal siding	79
3	Broken glass in doors and windows	90
4	Uplift of roof deck and loss of significant roof covering material (>20%); collapse of chimney, garage doors; collapse inward, failure of porch or carport.	97
5	Entire house shifts off foundation	121
6	Large sections of roof structure removed; most walls remain standing	122
7	Exterior walls collapsed	132
8	Most walls collapsed, except small interior rooms	152
9	All walls collapsed	170
10	Destruction of engineered and/or well-constructed residence; slab swept clean.	200

Source: FEMA

The methodology for the potential loss estimate was developed by using past hazard events data from The NCDC. The following is the resources used in the loss estimation;

- Arkansas Hazard Mitigation Plan
- National Climatic Data Center (NCDC) Storm Events Database

The National Climatic Data Center provides historical details about past hazard events in the County. The chart shows a breakdown of the magnitudes of the tornadoes which have occurred in Johnson County from

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								4	150	27.047M	0.00K
JOHNSON CO.	JOHNSON CO.	AR	02/15/1954	20:18	CST	Tornado	F3	0	24	250.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	04/30/1954	12:30	CST	Tornado	F1	0	0	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	05/10/1955	17:00	CST	Tornado	F1	0	0	0.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	01/22/1957	06:45	CST	Tornado	F2	0	0	0.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	04/14/1960	21:00	CST	Tornado	F3	0	0	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	05/05/1960	23:30	CST	Tornado	F2	0	2	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	05/18/1960	21:00	CST	Tornado	F2	0	0	0.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	03/12/1961	17:30	CST	Tornado	F2	1	14	250.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	03/16/1965	21:30	CST	Tornado	F2	0	0	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	05/23/1971	18:30	CST	Tornado	F2	0	0	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	11/21/1973	18:30	CST	Tornado	F1	0	6	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	06/06/1974	22:00	CST	Tornado	F3	0	0	25.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	04/01/1979	15:45	CST	Tornado	F1	0	0	2.50K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	08/20/1979	19:10	CST	Tornado	F0	0	0	0.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	04/07/1980	19:18	CST	Tornado	F3	0	76	2.500M	0.00K
JOHNSON CO.	JOHNSON CO.	AR	05/14/1983	04:00	CST	Tornado	F2	0	0	250.00K	0.00K
JOHNSON CO.	JOHNSON CO.	AR	11/18/1985	19:33	CST	Tornado	F2	0	0	2.500M	0.00K
JOHNSON CO.	JOHNSON CO.	AR	11/15/1988	18:28	CST	Tornado	F2	0	9	2.500M	0.00K
Clarksville	JOHNSON CO.	AR	11/09/1994	06:15	CST	Tornado	F0	0	0	50.00K	0.00K
HAGARVILLE	JOHNSON CO.	AR	09/15/1996	17:50	CST	Tornado	F0	0	0	0.00K	0.00K
KNOXVILLE	JOHNSON CO.	AR	06/16/1997	05:49	CST	Tornado	F0	0	0	0.00K	0.00K
HARTMAN	JOHNSON CO.	AR	03/05/1999	17:30	CST	Tornado	F2	0	0	0.00K	0.00K
CLARKSVILLE	JOHNSON CO.	AR	03/05/1999	17:46	CST	Tornado	F1	0	0	0.00K	0.00K
HAGARVILLE	JOHNSON CO.	AR	05/04/1999	16:15	CST	Tornado	F0	0	0	0.00K	0.00K
CLARKSVILLE	JOHNSON CO.	AR	12/04/1999	17:10	CST	Tornado	F1	0	0	0.00K	0.00K
HUNT	JOHNSON CO.	AR	11/23/2001	19:46	CST	Tornado	F1	0	0	0.00K	0.00K
HUNT	JOHNSON CO.	AR	11/23/2001	19:47	CST	Tornado	F2	1	4	0.00K	0.00K
HUNT	JOHNSON CO.	AR	04/22/2004	21:26	CST	Tornado	F0	0	0	0.00K	0.00K
HAGARVILLE	JOHNSON CO.	AR	11/01/2004	06:58	CST	Tornado	F0	0	0	0.00K	0.00K
HAGARVILLE	JOHNSON CO.	AR	11/11/2004	01:05	CST	Tornado	F0	0	0	0.00K	0.00K
CLARKSVILLE	JOHNSON CO.	AR	04/27/2009	17:11	CST-6	Tornado	EF1	0	0	50.00K	0.00K
COAL HILL	JOHNSON CO.	AR	05/24/2011	23:15	CST-6	Tornado	EF2	1	11	5.500M	0.00K
NEW SPADRA	JOHNSON CO.	AR	05/24/2011	23:25	CST-6	Tornado	EF3	1	4	13.000M	0.00K
LAMAR	JOHNSON CO.	AR	03/01/2017	01:29	CST-6	Tornado	EF1	0	0	20.00K	0.00K
Totals:								4	150	27.047M	0.00K

3.5.6.7. Vulnerability and Estimating Potential Loss

All areas, residents, structures, and critical facilities in Johnson County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are of risk of tornado events. Because there is no defined geographic hazard boundary, all people and property in Johnson County are exposed to the risk of damage from tornadoes. All structures in Johnson County are vulnerable to tornadoes. The most vulnerable to tornadoes are wood frame structures and manufactured homes. An estimated 70% of structures within the Johnson County mitigation planning area are wood frame structures, 11% are

masonry/frame, and an estimated 19% are manufactured homes. Damage to residential structures could cause hundreds to be without shelter, or try to live in unsafe conditions.

Utilities most vulnerable to tornado winds are electrical power (e.g. power generation facility, above ground transmission lines and sub-stations) and communication structures (radio towers, cell phone towers). Most transportation systems such as highways, railways are not highly vulnerable to tornadoes, but downed power lines and trees and limbs can delay travel until roads are cleared. This would not only affect the day to day traffic but also critical services such as emergency police, fire, and ambulance.

Vulnerable populations (retirement homes, schools and child care centers), are located in about every section of the County. Long term care facilities/Nursing Homes are located in Johnson County. There are numerous schools and child care centers are located in Johnson County

The Clarksville School District, Lamar School District, and Westside School District could be closed for extended periods due to power and water outages, or possible damage to building structures on school campuses. The school buses are also disrupted due to damaged or destroyed roads and bridges. Employment would be affected from school closings.

All areas of Johnson County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar would be affected due to the lost power, water, sewer, gas, and communications. Power and water outages would cause food spoilage and sanitation problems for communities. Hospitals, grocery stores and other critical need and economically important facilities are damaged and closed for extended periods.

Businesses and local government infrastructure often suffer extensive damage in tornados as well as the death of people, wildlife and livestock. Employment is often affected because of businesses that close due to the tornado damage and loss of business. Even with the advances in meteorology, warning times may be short.

3.5.7 Wildfire Profile

3.5.7.1 Description of Wildfire

A wildfire is any outdoor fire that is not controlled, supervised, or arranged that spreads through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Naturally occurring and non-native species of grasses, brush, and trees fuel wildfires. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A Wildland-Urban Interface (WUI) fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels. Areas with a large amount of wooded, brush and grassy areas are at highest risk of wildfires. Additionally, areas anywhere that have experienced prolonged droughts or are excessively dry are also at risk of wildfires.

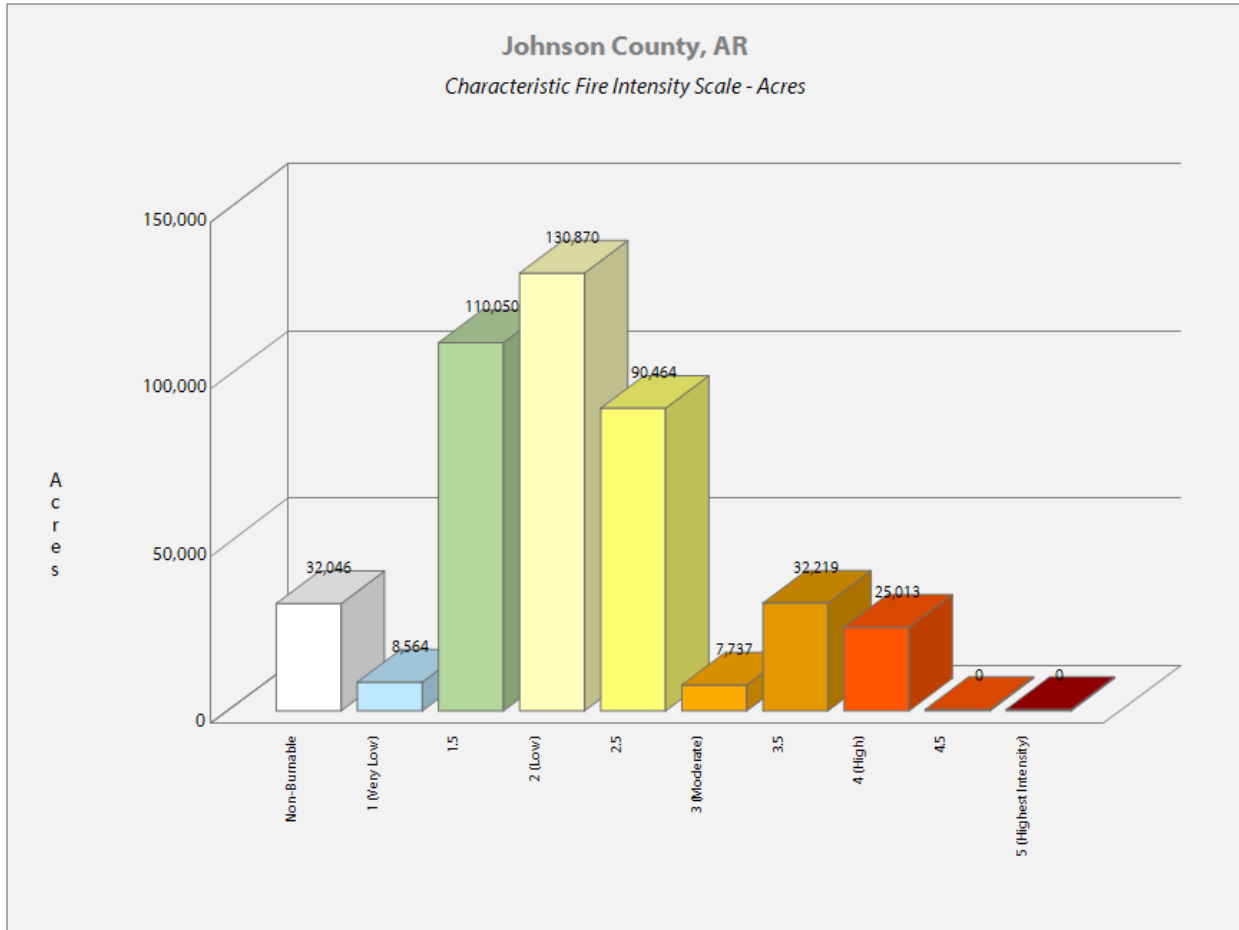
3.5.7.2 Location of Wildfire

The area most affected by wildfire would be wooded areas such as timber plantations. The entire County possesses some type of fuel, whether grass, agriculture, forestry, shrubs, structures, or other vegetation types. Areas of Johnson County that are covered by timber are the areas that are most susceptible to a wildfire occurring.

3.5.7.3 Extent, Magnitude or Severity of Wildfire

Burn Severity

From a landscape perspective, burn severity is defined as the degree of environmental change caused by fire. Heterogeneity in burn severity is a result of the spatial variation of factors such as fire intensity, topography and vegetation type. Burn severity can be broken down into several categories, useful in gauging post burn ecological responses:



3.5.7.4 Previous Occurrences

There have been 4 previous occurrences of wildfires in Johnson County between 1950 and 2016.

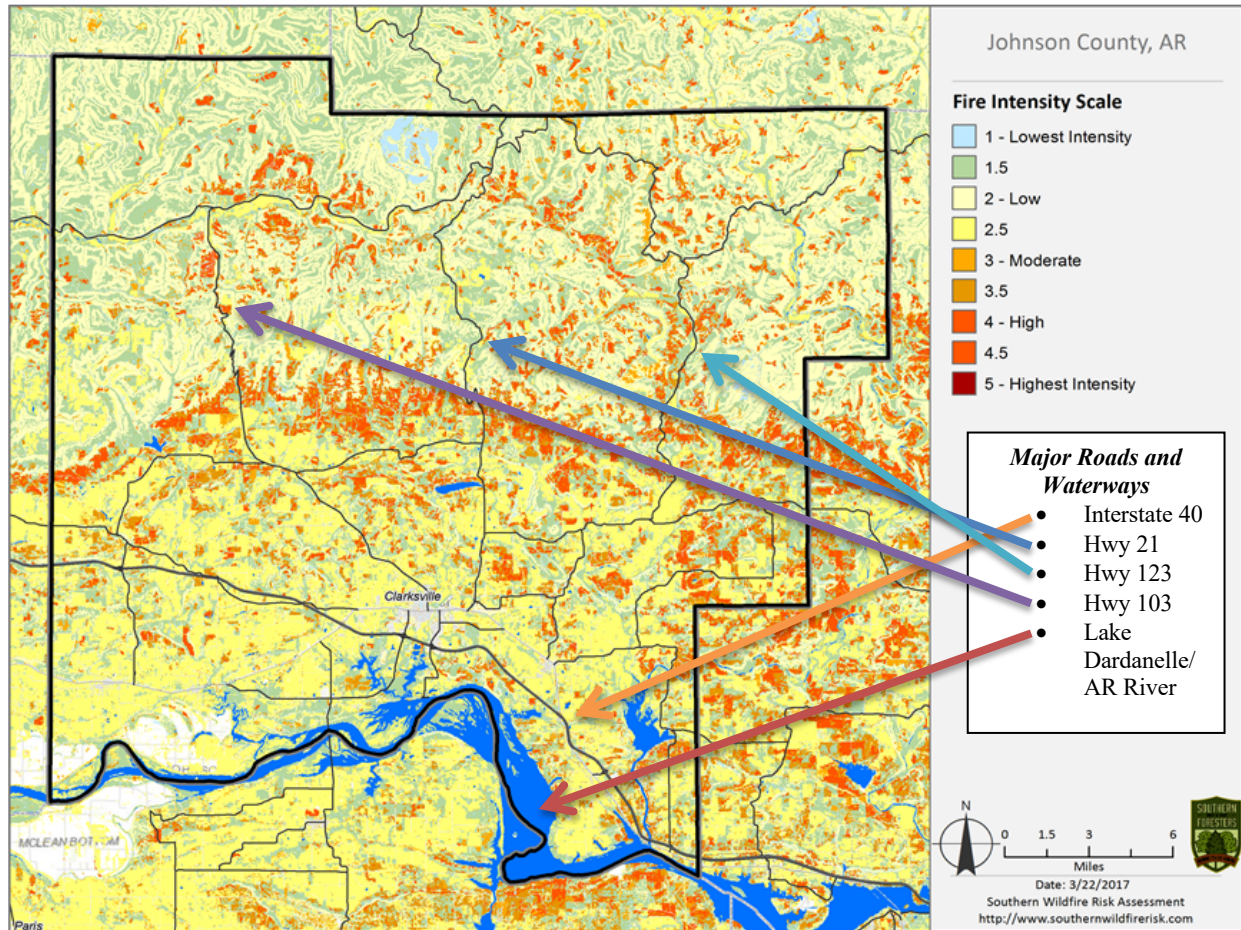
3.5.7.5 Probability of Future Wildfire Occurrences

There is a 5% chance of a wildfire occurring in any given year.

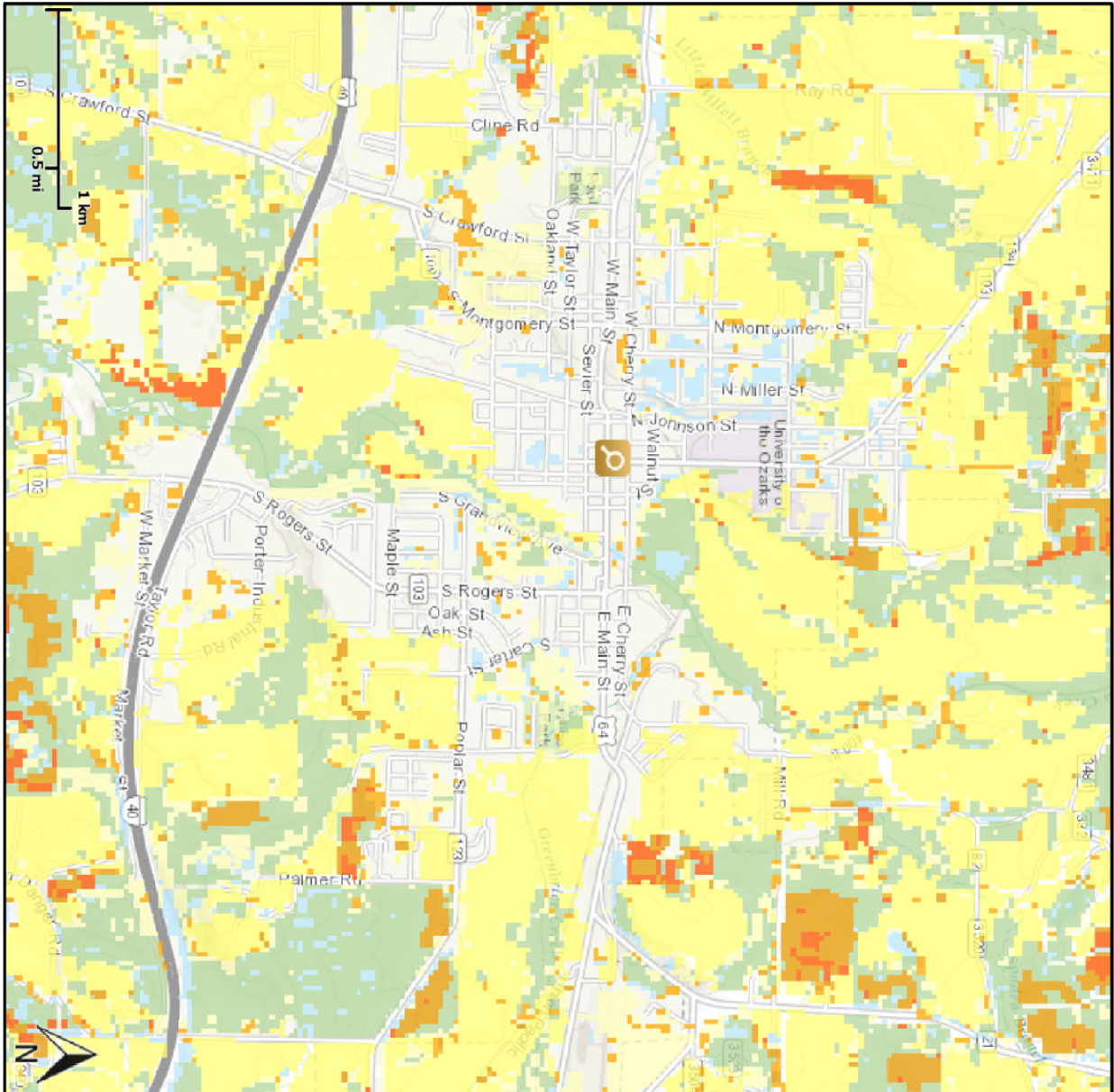
3.5.7.6 Impact of Wildfire

Wildland fires not only consume forest and rangeland vegetation, but impact wildlife habitat, recreation and tourism, water quality and supply and property values. Wildfires can cause extensive damage, both to property and human life.

In Johnson County, most rural residents depend on their local volunteer fire departments to protect their property from loss.



In drought conditions, wildfires can be easily started and are extremely dangerous. Protecting structures in the wildland from fires poses special problems, and put additional burdens on local firefighting resources. Weather conditions leading to wildfires can change rapidly. Thus, there are few measures, other than rapid-response, that can contain wildfires and limit their threat to property. Local economic impacts from catastrophic wildfires include disruptions to both consumption and production of local goods and services. Immediate effects may include decreased recreation / tourism and timber harvest in the fire region, as well as disruptions from evacuations and transportation delays. Increased use of local goods and services for fire protection also impacts local economies. Other effects include direct property losses (in the form of buildings, timber, livestock, and other capital), damage to human health, and possible changes in the long-term structure of the local economy. There are many secondary effects to wildfire. All vegetation may be destroyed as well as the organic material in the soil may be burned away or may decompose into water repellent substances that prevent water from absorbing into the soil. In effect, normal rainfall after a wildfire may result in unusual erosion or flooding from burned areas; depending on the topography of the burned area, heavy rain can produce destructive debris flows. Wildfires also have an effect on water supplies. The loss of ground-surface cover, such as pine needles and small branches, and the chemical transformation of burned soils make watersheds more susceptible to erosion from rainstorms.

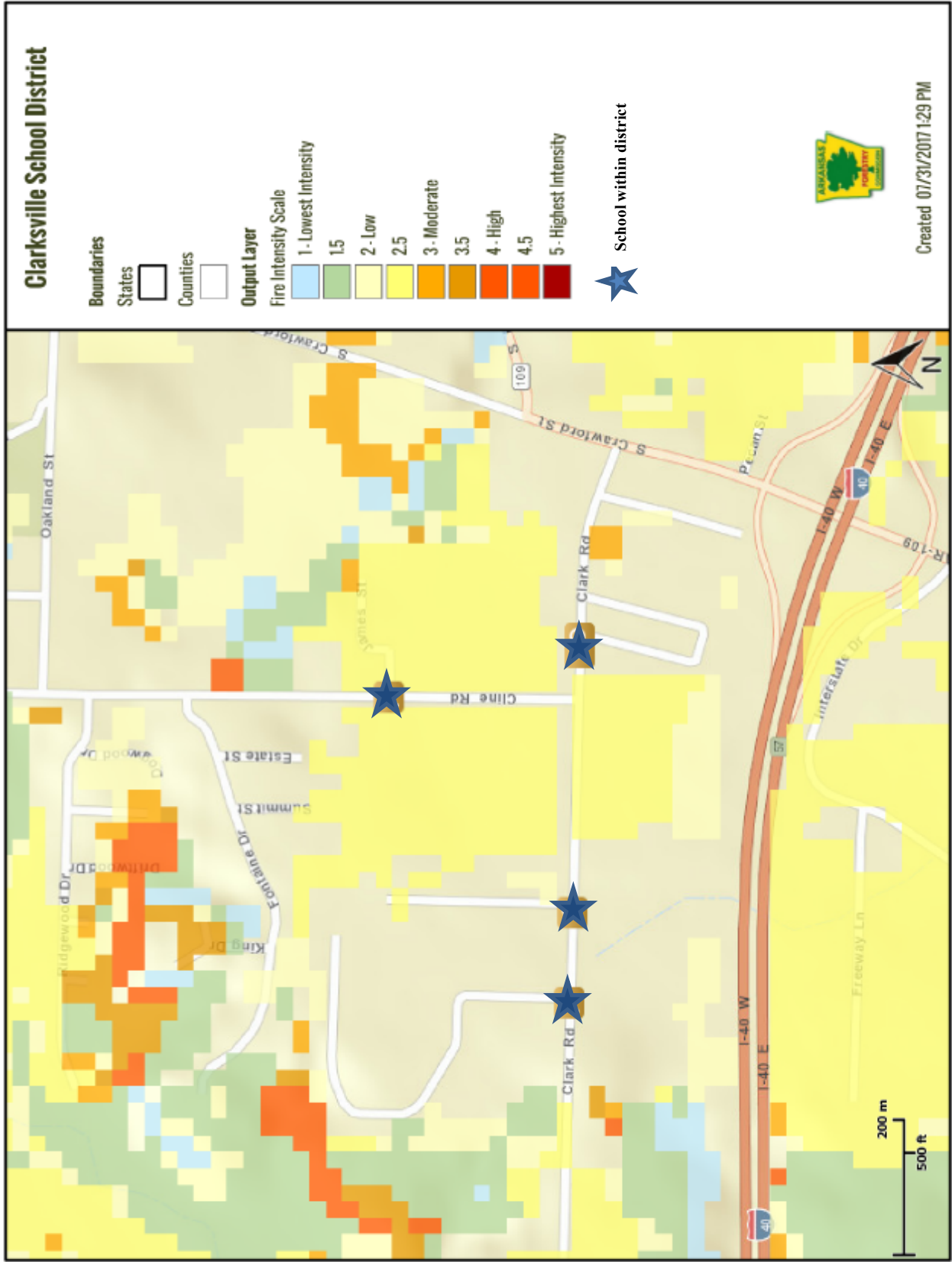


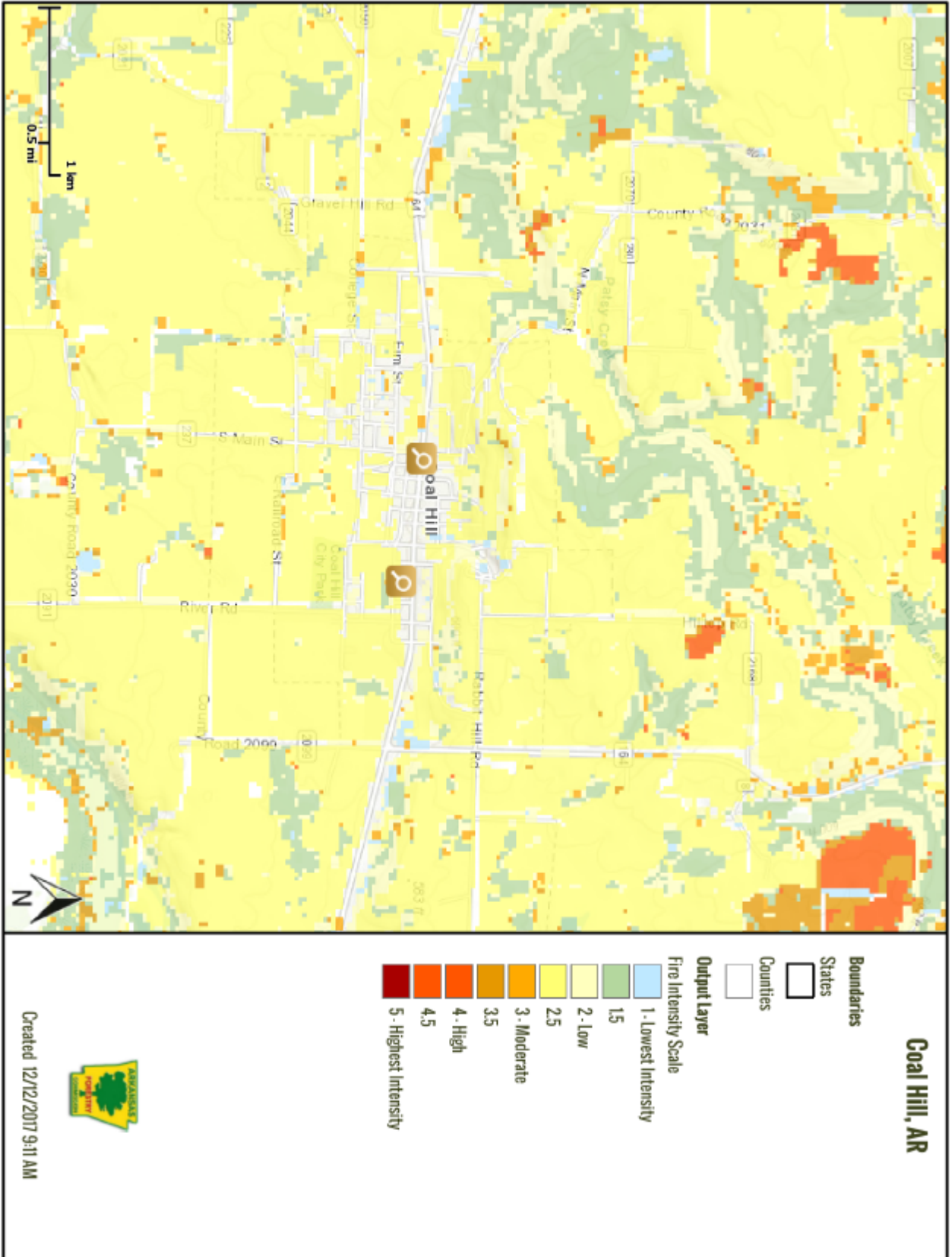
Clarksville, AR

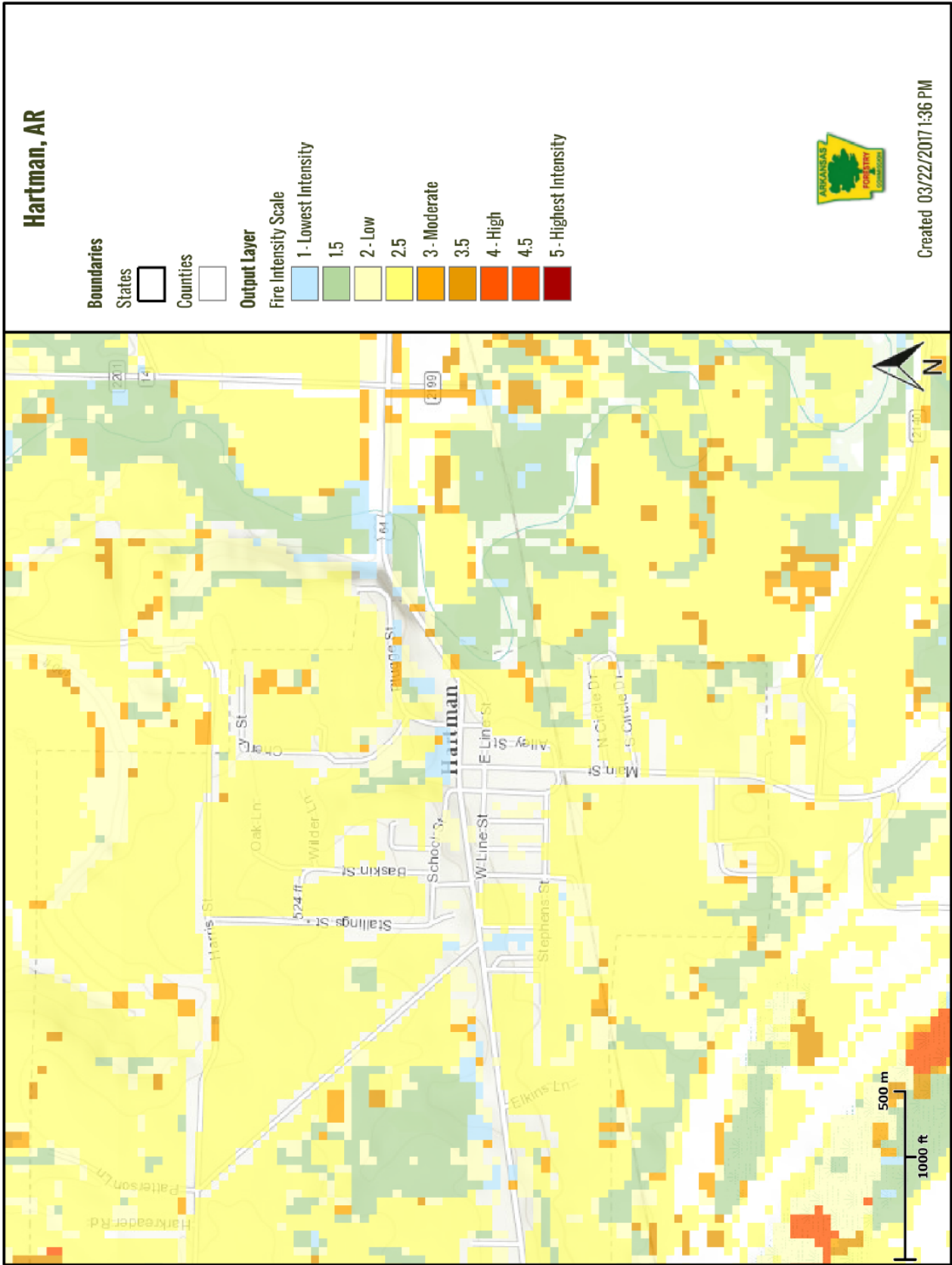
- Boundaries**
- States
- Counties
- Output Layer**
- Fire Intensity Scale**
- 1 - Lowest Intensity
- 1.5
- 2 - Low
- 2.5
- 3 - Moderate
- 3.5
- 4 - High
- 4.5
- 5 - Highest Intensity

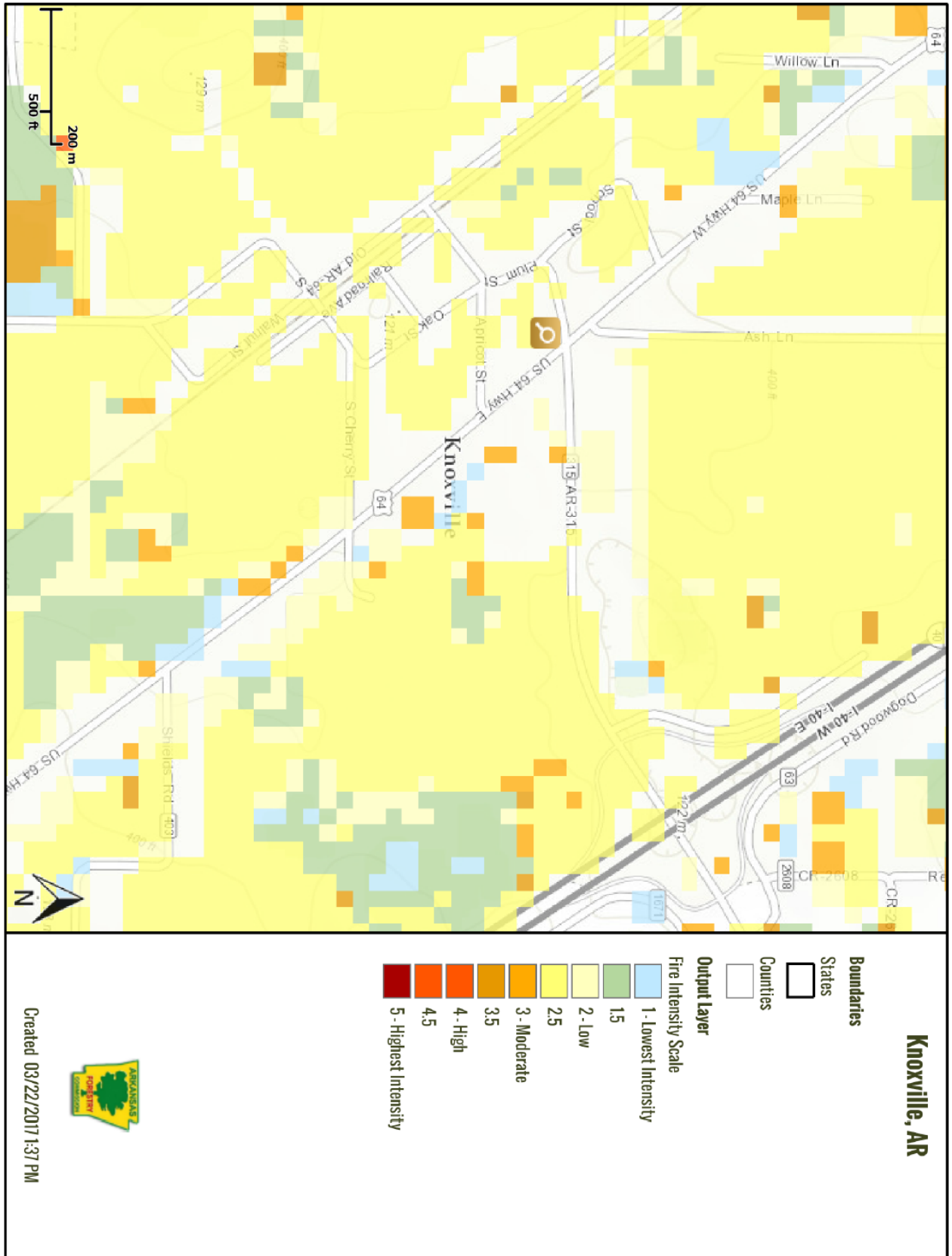


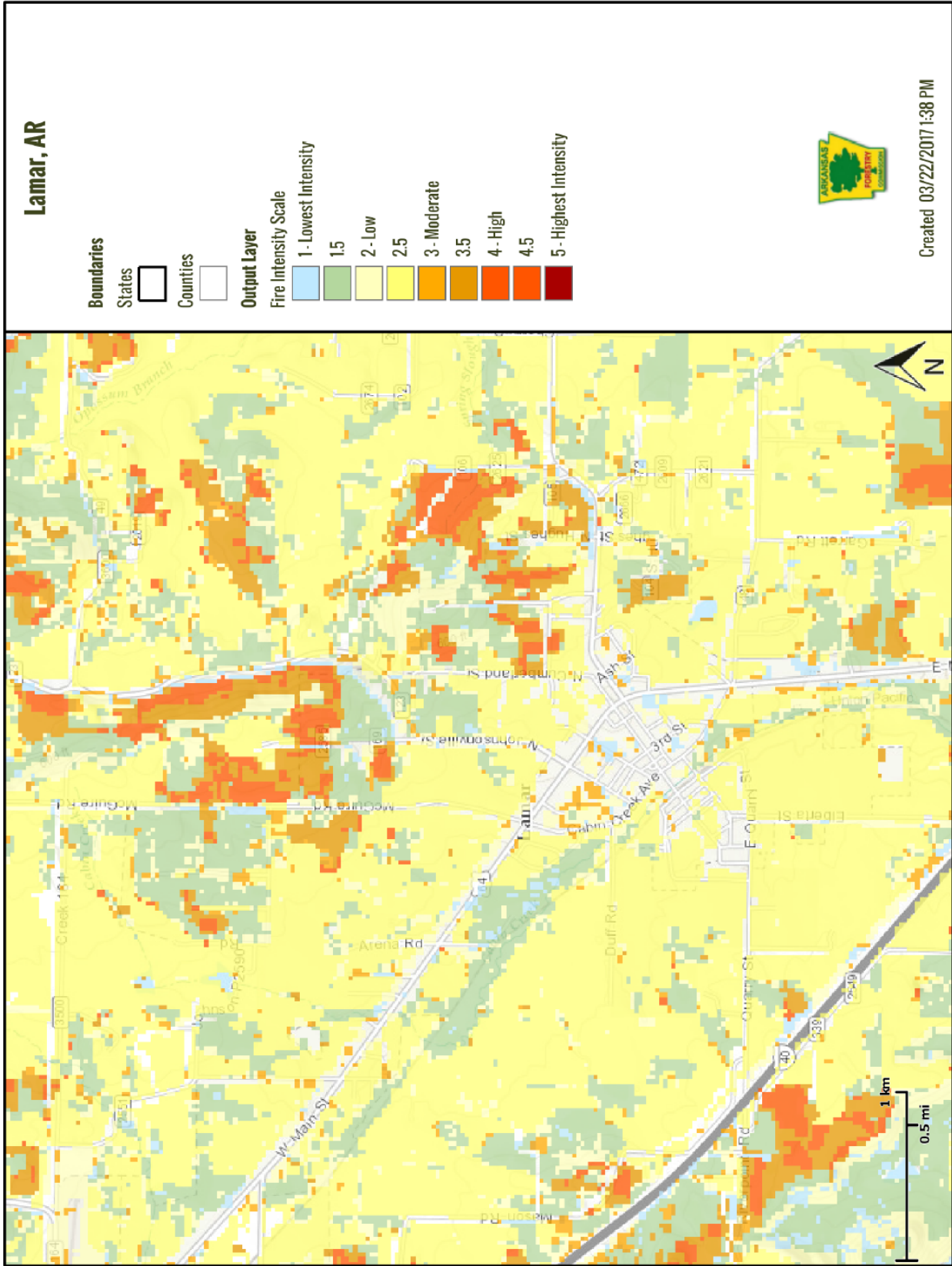
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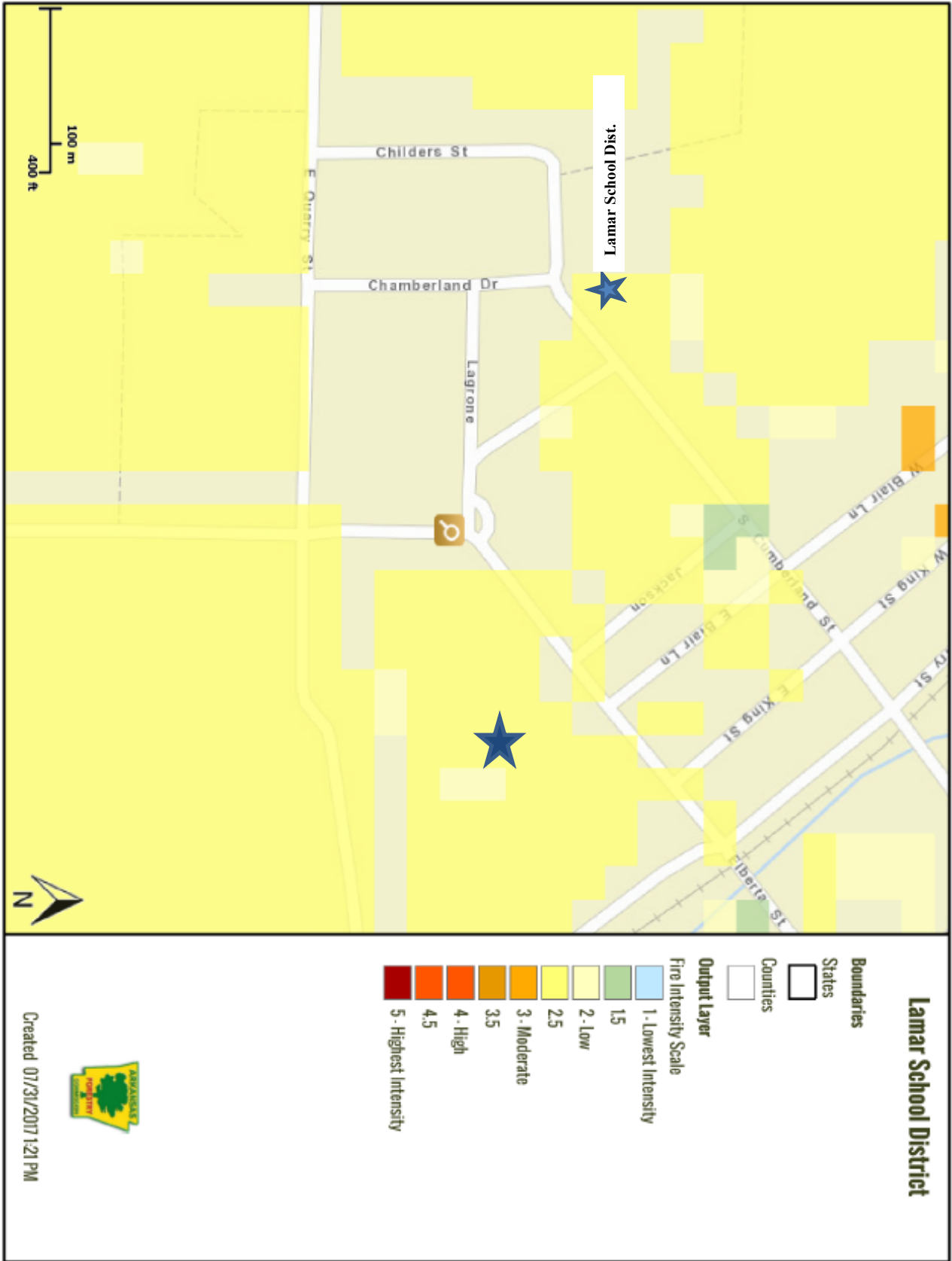


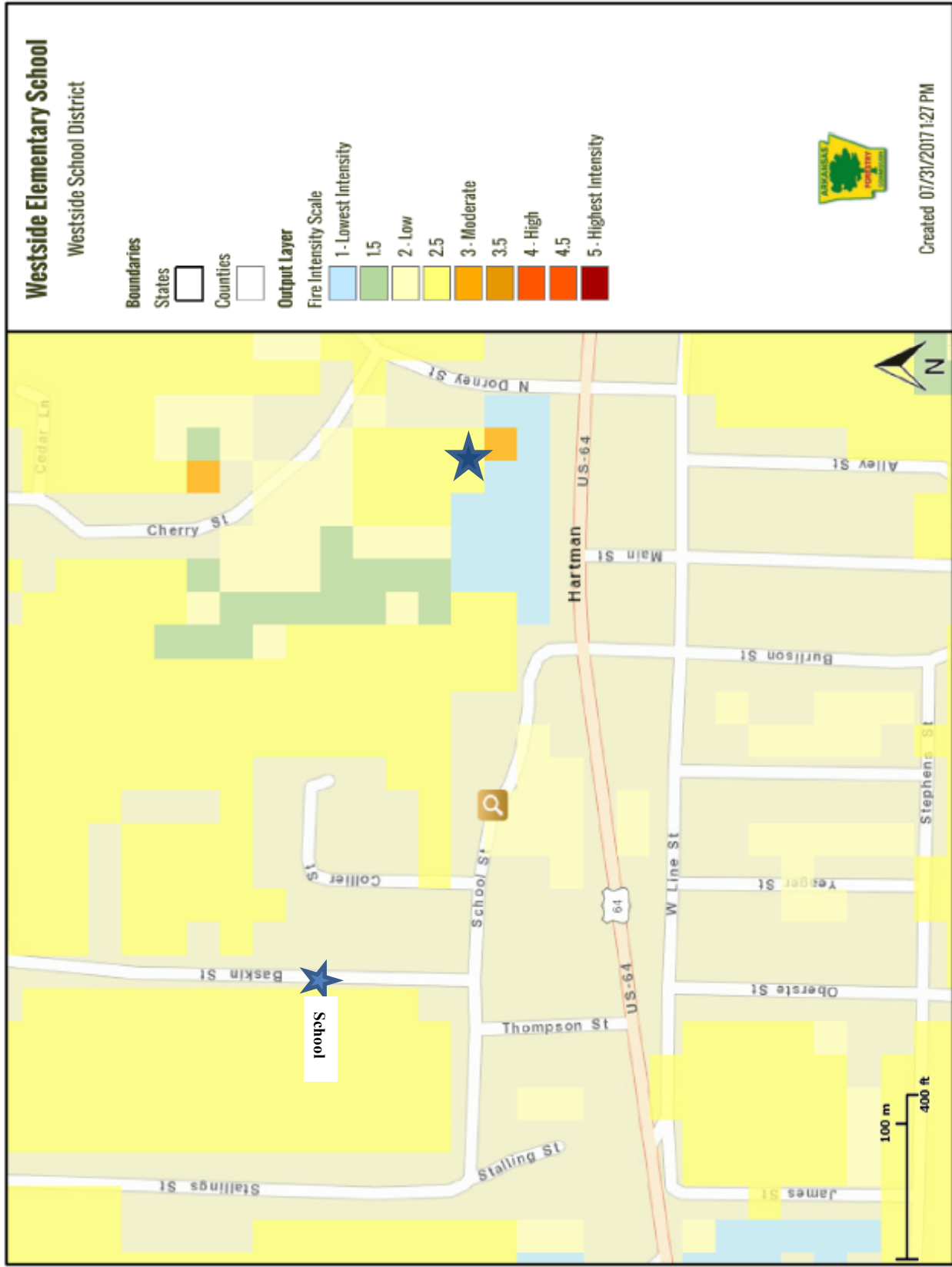


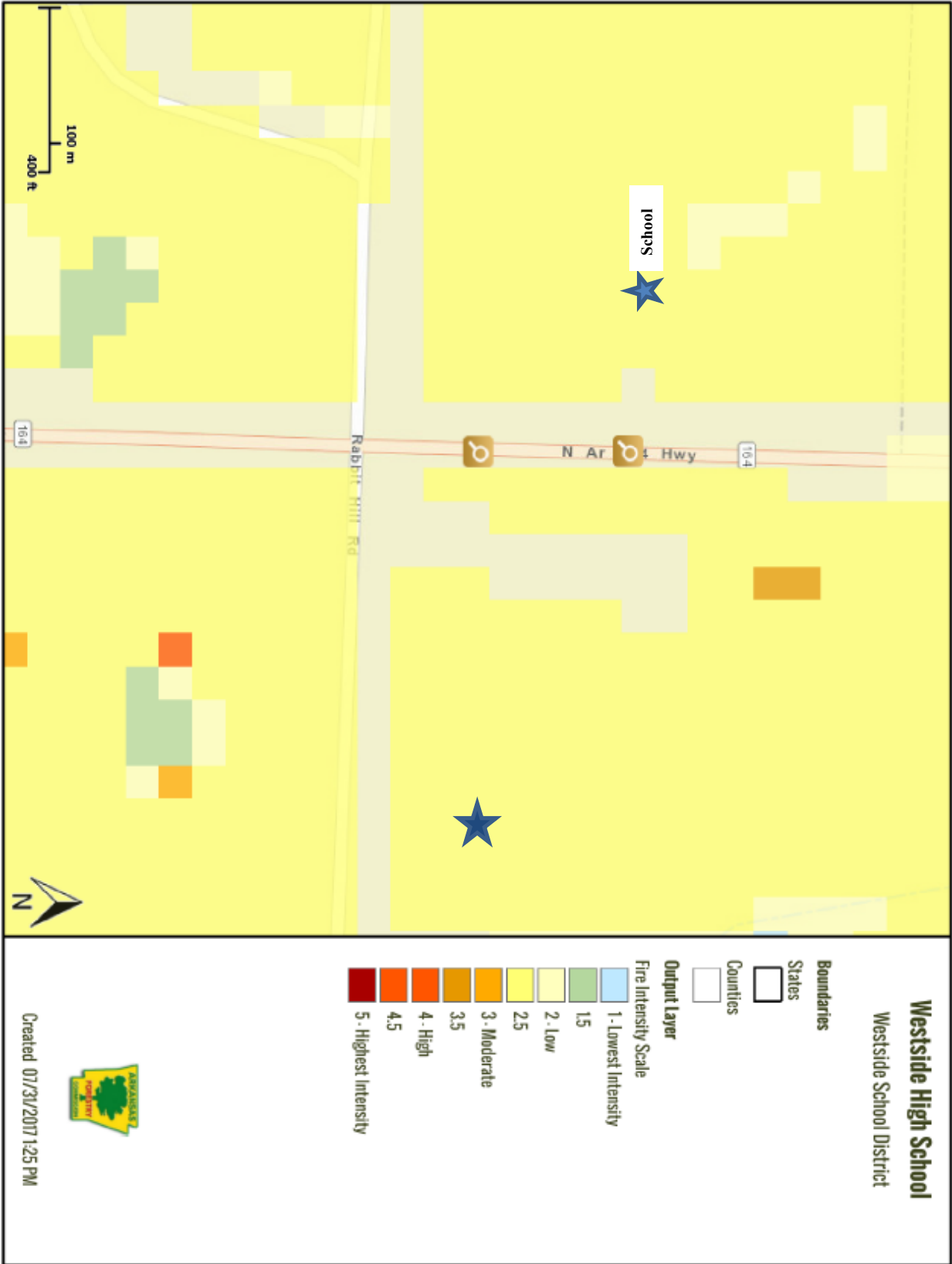












3.5.7.7 Vulnerability and Estimating Potential Loss

The most vulnerable populations during wildfire are the firefighters. Other vulnerable populations are the children under 5 and elderly over 65. Firefighters are at high risk to heat injuries. Children and elderly are more susceptible to heat exhaustion and smoke inhalation injuries. The most vulnerable structures are manufactured homes, wooden structures, and light construction. These structures will be damaged or completely destroyed by fire including all furniture and other items contained.

Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District have some risk of being impacted by a wildfire. Most of the area range from Low intensity with a few areas getting into the moderate intensity range. The maps on the previous pages details that various areas and the fire intensity that could be experienced in the event of a wildfire occurring.

Vulnerable assets that could be impacted at the county level would include but not limited to the Court House, Hospital, Health Department, Sheriff's Office, and Fire departments. Assets at for the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar would include City Hall, City Offices, Police Station, and Fire Departments as well as individual assets such as property and items that the county and each city may have including equipment.

Clarksville School District, Lamar School District, and Westside School District – Vulnerable assets would include the school buildings, busses, and any school property.

3.5.8 Winter Storm

3.5.8.1 Description of Winter Storm

Severe winter storms, which may include heavy snowfall, sleet, freezing rain, or a mix of these wintry forms of precipitation. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries

3.5.8.2 Location of Winter Storm Events

All areas of the unincorporated areas Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District are equally susceptible to severe winter storm events.

3.5.8.3 Extent, Magnitude or Severity of Winter Storms

According to National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in Johnson County during heavy snow and winter storm events ranges from 1 inch to 8 inches. Typical ice storm accumulations range from 1/10 of one inch to 1/2 of an inch. Only three severe winter storm events, the December 2000 Severe Winter Storm (FEMA 1354-DR), January 2009 Winter Storm (FEMA 1819-DR), and December 2014 Winter Storm (FEMA 4160-DR) has resulted in a Presidential Disaster Declaration in Johnson County. When severe winter storm events do occur (the worse typically associated with ice), they are usually widespread over the area and impede the movement of vehicles – limiting regular movement of traffic, causing accidents and limiting responsiveness of emergency services – and can down power and communications lines and seriously damage some structures, thus creating potentially critical conditions for the entire area.

The School Districts of Clarksville, Lamar, and Westside school officials monitor weather updates via television, radio and internet. If weather becomes hazardous, as determined by the superintendent, then appropriate actions are taken based on students being in school or getting ready to come to school. There is not an actual policy on implement weather; the school administrators use their judgment decision as to closing school due to implement weather.

3.5.8.4 Previous Occurrences

There have been 12 reported winter storm events resulting in \$1.35M in property damages and 5 ice storm events resulting in \$25.025M in property damages between 1950 and 2016..

3.5.8.5 Probability of Future Winter Storms

There is a 18% chance of a winter storm and a 7% chance of an ice storm occurring in any given year.

3.5.8.6 Impact of Winter Storms

Winter storms can immobilize an entire County. Three inches of unplowed snow can make roads impassable. Trees can be brought down by the weight of wet snow, snap power lines and damage buildings and houses when they fall. Winter storms can cut off heat, power and communications for several days or weeks. Death can occur from hypothermia.

Winter storms with freezing rain create a coating of ice which snaps tree branches, down power lines, ruin crops, and makes driving hazardous. Rural areas are most at risk of losing power and becoming isolated during a winter storm. Winter storms can be accompanied by strong winds with blinding wind driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.

Extreme cold often accompanies a winter storm; exposure to the cold can cause frostbite or hypothermia and be life-threatening. Infants and elderly people are most susceptible. Freezing temperatures can cause severe damage to crops and other vegetation. Pipes may freeze and burst in homes or businesses that are poorly insulated or without heat. Structure fires occur more frequently in the winter due to lack of proper safety precautions and present a greater danger because water supplies may freeze, and impede firefighting efforts.

Elderly people are most vulnerable to winter storms and account for the largest percentage of hypothermia victims largely due to improperly or unheated homes, but the leading cause of death during winter storms is from automobile or other transportation accidents. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Heavy snow can immobilize an area and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency services. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

3.6.8.7 Vulnerability of Winter Storms

Johnson County and the municipalities within the County including the Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar: These areas are rural and somewhat isolated from more developed areas without adequate supply of fuel, equipment, and food. Also, when the utilities and communication is disrupted during a winter storm event, these areas are the last to receive support or returned power because these areas are less populated. That means these populations could go a week or more without heat and fresh food. During very icy conditions residents in these areas are extremely vulnerable. They can be trapped at home without utilities or other services. The elderly are the most vulnerable and account for the largest percentage of hypothermia victims. House fires in these areas are common during winter storms from using alternate heating sources without caution. The rural areas also account for a large number of farms and livestock. The cold will damage vegetation and kill livestock. Poultry houses are vulnerable to loss of poultry products. As for structures, past experience proves that structures will be impacted by winter storm events, resulting in minor damage due to limbs breaking and falling on roofs. County roads could be impassible. The fire districts belonging to these jurisdictions may not be equipped with plows or other equipment for clearing roads and sidewalks. In these areas, water supplies may freeze, and impede firefighting efforts.

Clarksville School District, Lamar School District, and Westside School District: The buildings on these campuses may have freezing pipes due to lack of heating or insulations. Trees may fall and down power lines and

cause damage to rooves. Students attending and staff employed at these districts are vulnerable to the impacts of a winter storms. Cancellations will disrupt schedules and education programs.

SECTION 4

Mitigation Strategy.

The Johnson County Hazard Mitigation plan includes a mitigation strategy that provides the Johnson County's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

The following capabilities describe what the County, Cities and School District may or may not have to implement and maintain mitigation efforts, are addressed in the existing authorities, policies, programs and resources available to accomplish hazard mitigation;

Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar each are different in terms of staffing, funding, policies and program giving them the ability to carry out their local hazard mitigation goals. Each city has the capability to be an active member in the NFIP, to pass mitigation ordinances for their local government, regulate and limit the development in wildfire hazard areas and flood prone areas through land use planning implement retrofit construction plans, brace equipment, and provide emergency preparedness information to area residents through FEMA brochures.

Johnson County, cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar and the School Districts of Clarksville, Lamar and Westside would be dependent upon grant funding to assist with larger mitigation projects, such as safe rooms and heavy duty generators to back up and maintain electrical power for critical facilities. The Cities would need assistance in financing drought communication and early warning systems, heating and cooling centers. .

Johnson County would need to seek outside financial resources for the development of a countywide flood inundation study. This study would benefit the cities and schools for future land development. Funds would also be needed for flood inundation studies and conduct inspections, maintenance and enforcement programs on high risk dams in the County.

4.1 Mitigation Goals and Objectives for Each Hazard

Based upon the results of the local and State risk assessments, the Johnson County Hazard Mitigation Planning Team, with input from local jurisdictions and officials, developed hazard mitigation goals and objectives and selected those that were determined to be of greatest benefit. These goals and objectives represent what Johnson County believes is a long-term vision for reduction and enhancement of mitigation capabilities:

The goals of the Johnson County Hazard Mitigation plan are to:

- Goal 1: Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazard for residents of Johnson County due to natural disasters.
- Goal 2: Provide a framework and coordination to encourage all levels of government and public and private organizations to undertake mitigation to minimize potential disasters and to employ mitigation in the recovery following disasters.
- Goal 3: Seek grants for mitigation projects through the State and Federal funding.
- Goal 4: Protect existing properties from natural disasters.

Johnson County is currently participating in the Risk Map Program thorough FEMA. Currently, all NFIP participating communities follow local ordinances that require new and substantially improved structure to build 2 feet above the Base Flood Elevation (BFE). This ordinance also requires elevation (2 feet above BFE) or dry flood-proofing of new or substantially improved non-residential structures. These actions prohibit development in floodways.

4.2 Implementation of Mitigation Actions

The mitigation actions are prioritized based upon their effect on the overall risk to life and property. Ease of implementation, community and agency support and ease of obtaining funding. The County and participating jurisdictions have used the STAPLEE method to prioritize mitigation actions. This method has the benefit that the Mitigation actions are considered in discrete categories of Social, Technical, Administrative, Political, Economic and Environmental. Prioritization can therefore be made taking each of these categories into account, so that nothing is overlooked when considering which actions may be best for each jurisdiction to consider.

Criteria used for prioritization and review of mitigation actions based on STAPLEE

Evaluation Category	Sources of Information
Social	Members of Local governments and the County Government were members of the Hazard Mitigation Planning Team and had input throughout the planning process. It must be noted that many small town political leaders are also business or professional persons. They are also members of the LEPC. Existing community plans were and will be relied on wherever possible. Members of the media were contacted and invited to all attend all HMPT meetings.
Technical	The following persons/agencies were consulted as to the technical feasibility of the various projects: Arkansas Geological Commission, University of Arkansas Extension Service, Arkansas Soil and Water Conservation Commission, Arkansas Health Department, Arkansas Highway and Transportation Department, Arkansas Department of Environmental Quality, Arkansas Governor's Pre-Disaster Advisory Council, Arkansas Governor's Earthquake Advisory Council, and Arkansas Forestry Service. Arkansas Department of Emergency Management. All of these had their comments and suggestions incorporated.
Administrative	Staffing for proper implementation of the plan currently will rely largely on existing members of the various agencies involved. Technical assistance is available from various local and state agencies. Some local jurisdictions have incorporated Hazard Mitigation efforts into their Capital Improvement Plans. Operations costs are under discussion by the appropriate agency or department heads.
Political	The County Quorum Court has passed resolutions in support of mitigation activities involving floodplain ordinances, mitigation planning, and fire districts, among others. The Governor of Arkansas issued an Executive Order in August of 2004 (EO 04-02) instructing all state agencies to assist ADEM in mitigation planning and implementation of mitigation goals.
Legal	Members of the HMPT discussed legal issues, and it was their opinion that no significant legal issues were involved in the projects that were selected by the HMPT. However, where legalities may be an issue, this is noted.
Economic	Economic and benefit cost issues were the predominant topics discussed by all concerned. Each entity felt that the projects selected would have positive effects, but yet realized that actions often have costs, sometimes hidden, imposed on the community, residents and businesses. Funding for the various activities was a major concern as local budgets are always under pressures with existing and competing projects and activities. Where necessary, particularly for costly capital projects, outside grants would be relied on heavily.
Environmental	The Arkansas Geological Survey, Arkansas Department of Environmental Quality, Arkansas Forestry Commission, and Arkansas Soil and Water Conservation Commission were all consulted as to the environmental impact of the various projects and it was felt that there would be no negative impact. Local environmental issues and concerns were also taken into consideration.

The Johnson County Department of Emergency Management (JCOEM) will be responsible for evaluating actions among competing actions. The Planning Team prioritized the list of mitigation actions by conducting a cost-benefit review. This review was conducted by; first considering the number of people who would be affected by a chosen project, determining the area the project would cover, considering how critical the structures were within in the project area, and which structure were most critical, and finally how would it benefit the entire community. The JCOES shall evaluate actions based on funding availability, comparative value to mitigation objectives, and consideration of economic benefits and environmental concerns of the communities. Actions are prioritized in three different categories; **High need for immediate action**, **Medium need for action**, **Low lacking in urgency**.

All Johnson County actions are the responsibility of the director of Johnson County Department of Emergency Management. The Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar actions are the responsibility of their Mayors. The School Districts of Clarksville, Lamar, and Westside will be the responsibility of their School Board Administration.

The Responsible Agency for each mitigation action will identify resources. Their responsibility will be to examine resources from all levels of government. The responsible parties will integrate the requirements of the mitigation plan into other plans when appropriate. This also, includes funding and support for enacting and enforcing building

codes and zoning ordinances, and developing public education programs to alert residents to risks and how they can reduce hazard losses. Plans will be made to earmark resources for implementing these actions.

Each jurisdiction and school district within the County that participated in the planning process has at least two actions that will benefit the jurisdiction.

For the purpose of developing the Johnson County Hazard Mitigation Plan, mitigation actions are categorized into six groups;

- Actions that will keep problems from getting worse (Prevention).
- Actions that address individual buildings (Property protection)
- Actions that will inform the public (Public education and awareness)
- Actions that will protect natural resources (Natural resource protection)
- Actions that will protect emergency services before, during, and immediately after an occurrence (Emergency services protection)
- Actions that will control the hazard (Structural projects)

4.4 Mitigation Actions/Projects

Mitigation Actions

Conduct inspections, maintenance and enforcement programs on dams to ensure structural integrity. (NFIP consideration; CRS 330 Outreach, CRS 350 Flood Protection Information.

Associated Hazard: Dam Failure

Type of Action: Prevention

Contribution to Mitigation Objective: Prevent loss of life or property due to future dam and levee failure by correcting structural weakness

Priority: Medium

Rationale for Priority: Since there are no past dam failures in Johnson County, priority is not high, but failure is a possibility.

Addresses new or existing buildings: New and existing

Cost Benefit: Highly beneficial, low cost

TimeLine: 5 Years

Projected Resources: Existing County and Local Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Mitigation Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Adopting Ordinances that limit development in areas that could be affected by flooding caused by a dam failure.

Associated Hazard: Dam Failure

Type of Action: Prevention

Contribution to Mitigation Objective: Prevent the loss of lives and property by limiting the development in areas that could be destroyed or flooded during a dam failure.

Priority: Medium

Rationale for Priority: There have been no past dam failures to give a reason to rank high, but a failure is always a possibility.

Addresses New or Existing buildings: New

Cost Benefit: Highly beneficial, no cost

TimeLine: 5 Years

Projected Resources: FEMA, and NFIP Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Mitigation Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Conduct flood inundation study for high hazard dams; study will be used to develop mitigation measures such as facilitate acquisition projects, new zoning requirements, or elevation projects. Acquire reliable and current information relating to existing and new buildings and infrastructure, especially critical facilities located in or developed in the path of flooding from dam failure.

Associated Hazard: Dam Failure

Type of Action: Prevention

Contribution to Mitigation Objective: Seeks to protect citizens and property in path of dam failure by diverting flow from flood waters as a result of dam failure.

Priority: Medium

Rationale for Priority: No past dam failures, avoiding high priority

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly beneficial, low or minimal cost

TimeLine: 3 Years

Projected Resources: County, local resources and unidentified outside resources

Responsible Party: Johnson County Soil and City of Clarksville

Action adopted by: Johnson County, City of Clarksville

STAPLEE: Meets all Criteria

Develop a Countywide drought communication plan and early warning system to facilitate timely communication of relevant information to officials, decision makers, school administration, emergency manager and the general public.

Hazard Associated: Drought

Type of Action: Prevention

Contribution to Mitigation Objective: Reduces the risk to lives due to water shortages

Priority: High

Rationale for Priority: Drought has been an issue several times in the past.

Addresses New or Existing buildings: New and existing

Cost Benefit: Highly beneficial, at little cost.

TimeLine: 1 year

Projected Resources: County funds to develop plan. Possible grant funding.

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Pass a County ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc.

Hazard Associated: Drought

Type of Action: Prevention

Contribution to Mitigation Objective: Reduces the risk due to water shortages

Priority: High

Rationale for Priority: Drought has been an issue several times in the past.

Addresses New or Existing buildings: New and existing

Cost Benefit: Highly beneficial, at no cost.

TimeLine: 1 year

Projected Resources: County funds to publish Ordinance

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Mitigate future losses by regulating development in wildfire hazard areas through land use planning and address density and quantity of development, as well as emergency access, landscaping and water supply.

Hazard Associated: Wildfire

Type of Action: Prevention

Contribution to Mitigation Objective: Reduces the risk of wildfire due to land use

Priority: High

Rationale for Priority: Prior wildfire events

Addresses New or Existing buildings: Existing

Cost Benefit: Highly beneficial at no cost.

TimeLine: 2 Years

Projected Resources: Publish notice in paper at minimum expense

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Countywide ordinances to enforce burn bans during drought periods.

Hazard Associated: Wildfire

Type of Action: Prevention

Contribution to Mitigation Objective: Reduces the risk of wildfire due to land use

Priority: High

Rationale for Priority: Prior wildfire events during drought conditions.

Addresses New or Existing buildings: Existing

Cost Benefit: Highly beneficial at no cost.

TimeLine: 2 Years

Projected Resources: Publish notice in paper at minimum expense, and post on County web site at no cost.

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Implement a fuels management team using prescribed burning techniques to reduce hazardous vegetative fuels that threaten public safety and property on public lands and working with landowners on private land, and near essential infrastructure.

Hazard Associated: Wildfire

Type of Action: Prevention

Contribution to Mitigation Objective: Eliminates the fuel for wildland fires

Priority: High

Rationale for Priority: Proven to save lives and lessen property damage. Has experienced past wild fire events.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly beneficial, controlled burn would be under the direction of United States Forest Service and Arkansas Forest Service.

TimeLine: 2 Years

Projected Resources: County Fire Departments, USFS, ASFS and Fire Department of the Cities

Responsible Party: USFS or State Forestry to oversee, Fire Departments;

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

County and Local Road Departments implement retrofit construction plans to increase drainage or absorption capacities with detention and relief drains, extra culverts, and bridge modification where susceptible to flooding.

Associated Hazard: Flood

Type of Action: Prevention and Structural

Contribution to Mitigation Objective: Corrects current weaknesses and prevents any future structural damage.

Priority: High

Rationale for Priority: Protection of life

Addresses New or Existing buildings: N/A

Cost Benefit: Highly Beneficial. Benefit will outweigh any cost.

TimeLine: 3 Years

Projected Resources: Existing State, County and Local Resources

Responsible Party: State Highway Department and Johnson County Road Department

Action adopted by: Johnson County

STAPLEE: Meets all Criteria

Brace equipment (such as mechanical equipment, chillers, and emergency generators) whose failure may disrupt the operation of a critical facility, such as hospitals and schools.

Associated Hazard: Dam Failure, Earthquake, Flood, Thunderstorm Wind/Strong Wind, Tornado, Winter storms

Type of Action: Non Structural

Contribution to Mitigation Objective: Prevents damage to necessary operating equipment and injury to citizens

Priority: High

Rationale for Priority: Protection of critical operations equipment

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, minimum cost

TimeLine: 5 Year

Projected Resources: Existing County, State and Local Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Find alternate means to assign probability when no events have occurred.

Hazard Associated: Dam Failure

Type of Action: Prevention

Contribution to Mitigation Objective: Help planning team and community to understand risk.

Priority: Low

Rationale for Priority: Dam Failure

Addresses New or Existing buildings: New and existing

Cost Benefit: NA

TimeLine: 5 year

Projected Resources: no additional funding required

Responsible Party: Planning Team

Action adopted by: Johnson County

STAPLEE: Meets all Criteria

Provide emergency preparedness and mitigation information and resources for extreme weather events through an active educational outreach program with specific plans and procedure's for at risk population.

Associated Hazard: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunderstorm Wind/Strong Wind, Lightning, Hail, Tornado, Wild Fire, Winter storms

Type of Action: Public Education and Awareness

Contribution to Mitigation Objective: Education public how to be prepared to handle extreme temperatures and to be aware of those of high risk

Priority: High

Rationale for Priority: Prevent loss of life

Addresses New or Existing buildings: N/A

Cost Benefit: Highly Beneficial at no cost, free resources at FEMA website.

TimeLine: Ongoing

Projected Resources: FEMA brochures distributed by Johnson County Department of Emergency Management

Responsible Party: Johnson County Department of Emergency Management

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Require that all critical facilities to meet requirements of Executive Order 11988 and be built 2 foot above the 500-year flood elevation.

Associated Hazard: Flood

Type of Action: Prevention

Contribution to Mitigation Objective: Protect Critical Facilities

Priority: High

Rationale for Priority: Past flooding events and prevent loss of life and property.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial at no cost

TimeLine :1 Year

Projected Resources: Guidance from FEMA Resources/Publications FEMA p-259,345, B-797

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Conducting NFIP community workshops to provide information for property owners to acquire flood insurance.

Associated Hazard: Flood

Type of Action: Public Education and Awareness

Contribution to Mitigation Objective: Education residents on the need of flood insurance

Priority: High

Rationale to Priority: Johnson County is prone to flooding.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial at no cost.

TimeLine: ongoing

Projected Resources: FEMA brochures to be distributed by Johnson County Department of Emergency Management

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Implement to a higher standard of road elevation and culvert sizing on all County and city roads.

Associated Hazard: Flood

Type of Action: Property Protection

Contribution to Mitigation Objective: Prevent flood damage to residents and allow emergency personnel vehicles access to areas otherwise shut off due to flooding.

Priority: High

Rationale for Priority: Flooding is an issue in parts of Johnson County

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial

TimeLine: 10 year

Projected Resources: State, County and Local Resources

Responsible Party: County Road/City Street Departments

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Construct safe rooms within new and existing public buildings, such as schools, libraries, and community centers.

Associated Hazard: Winter storms, Thunderstorm Winds, Tornado

Type of Action: Structural Project

Contribution to Mitigation Objective: Prevent the loss of life by providing shelter during pre/post disasters.

Priority: High

Rationale of Priority: Prevents the loss of life during storms and also minimizes the effects post hazard events. Ranked high due to past storm events

Addresses New or Existing buildings: New and Existing

Cost Benefit: Benefits outweighs cost. Possible grants for construction.

TimeLine: 5 Year

Projected Resources: HMGP funding

Responsible Party: Emergency Management, School Districts, County and City Governments Offices

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Protect exceptionally vulnerable populations from the impacts of severe weather events through identifying specific at risk populations in the event of long-term power outages by establishing accessible heating and cooling centers.

Associated Hazard: Flood, Winter storms, Thunderstorm, Tornado, Wildfire, and Extreme Heat Events.

Type of Action: Structural Project

Contribution to Mitigation Objective: Prevent the loss of life by providing shelter during pre/post disasters.

Priority: High

Rationale of Priority: Prevents the loss of life during storms and also minimizes the effects post hazard events. Ranked high due to past storm events

Addresses New or Existing buildings: Existing

Cost Benefit: Benefits outweighs cost. Possible grants for refurbishment

TimeLine: 2 Years

Projected Resources: HMGP funding

Responsible Party: Emergency Management, School Districts, County and City Governments Offices

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Adopt regulations governing residential construction to prevent wind damage, by requiring tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes.

Associated Hazard: Tornado and Thunderstorm Winds

Type of Action: Public Education and Awareness

Contribution to Mitigation Objective: Prevent loss of life and property by securing mobile homes from becoming missiles during high winds and tornadoes.

Priority: High

Rationale of Priority: Past wind storm events and number of mobile homes in Johnson County.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly beneficial, no cost. Free info from fema.gov website

TimeLine: 4 Years

Projected Resources: FEMA brochures

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction. These plans should include a review of existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with plan recommendations.

Associated Hazard: Dam Failure, Thunderstorms, Tornados and Floods

Type of Action: Prevention

Contribution to Mitigation Objective: Prevent injury and loss of life by alerting residents to impending hazardous events.

Priority: High

Rationale of Priority: Past storm events throughout the County.

Addresses New or Existing buildings: N/A

Cost Benefit: Highly Beneficial

TimeLine: 3 Years

Projected Resources: Existing County and Local Resources

Responsible Party: Johnson Co. OEM, School Districts, City and County Government.

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Install hail resistant roofing and window coverings, shutters laminated glass in windowpanes with a focus on critical infrastructure.

Associated Hazard: Hail

Type of Action: Property Protection

Contribution to Mitigation Objective: Seeks to protect critical facilities from hail damages

Priority: Medium

Rationale for Priority: Past hail events

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, minimum cost to owner. Possible grant for funding

TimeLine: 5 Years

Projected Resources: Existing County and Local Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Install surge protection, lightning protection devices on all communications infrastructure and critical facilities.

Associated Hazard: Lightning

Type of Action: Property Protection

Contribution to Mitigation Objective: Will guard critical communication equipment from lightning strikes.

Priority: High

Rationale of Priority: Past lightning events, and the need for operable communication equipment before, during and after disasters.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, cost to owners of communications infrastructure and critical facilities.

TimeLine: 5 Years

Projected Resources: Existing County, Local and School District Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Burying or otherwise protecting electric and other utility lines to prevent disruption by protecting lines from ice, wind, or snow damage.

Associated Hazard: Winter Storms, Tornado, Thunderstorm Winds

Type of Action: Prevention Action

Contribution to Mitigation Objective: Prevents ice and trees from failing on power lines creating power outages to homes, critical facilities and communication systems.

Priority: High

Rationale of Priority: Past disasters

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, cost to the owner of right-of-ways either County or City

TimeLine: 10 Years

Projected Resources: Existing County and Local Resources

Responsible Party: Local Utility Companies, Cities, County, Schools

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Adopt a land use plan with zoning and development restrictions to protect residents from hazardous floodways.

Associated Hazard: Floods

Type of Action: Prevention

Contribution to Mitigation Objective: Prevent the building of homes in floodways which can result in death, injuries and loss of property.

Priority: Medium

Rationale of Priority: Building in the floodway is not a problem at this time, allowing time to develop a land use plan.

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, can be implemented by County/City officials.

TimeLine: 3 Years

Projected Resources: Existing County, and Local Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar
Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Purchase heavy-duty generators to back up and maintain electrical power for critical facilities, schools, and shelters to maintain power and water supply during disasters.

Associated Hazard: Earthquake, Extreme Heat, Flood, Lightning, Thunderstorm Winds, Tornado, Wildfire, Winter storms

Type of Action: Emergency Services Protection

Contribution to Mitigation Objective: Continuation of water service, and temperature control

Priority: High

Rationale of Priority: Past disasters

Addresses New or Existing buildings: New and Existing

Cost Benefit: Highly Beneficial, cost varies on size and type of generator.

TimeLine: 5 Years

Projected Resources: Existing County, Local and School Resources and possible grant funds

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Purchase of all-hazard NOAA weather radios in all schools, city halls, churches, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries where large numbers of people congregate; provide information to public on importance of having and how to acquire.

Associated Hazard: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunderstorm Wind/Strong Wind, Lightning, Hail, Tornado, Wild Fire, Winter storms

Type of Action: Prevention

Contribution to Mitigation Objective: Protect lives by alerting congregations of people of impending disasters

Priority: High

Rationale of Priority: Past Disasters

Addresses New or Existing buildings: New and Existing

Cost Benefit: If action proves effective in influencing other to obtain radios, benefits will greatly outweigh cost. (NFIP consideration: CRS 610 Flood Warning Program)

TimeLine: 3 Years

Projected Resources: Existing County, Local and School District Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Implement Code RED Weather Warning or other early telephone warning system designed to automatically deliver targeted weather notifications for the immediate threats of severe thunderstorm warnings, flash flood warnings and tornado warnings within moments of being issued by the National Weather Service (NWS) throughout the County.

Associated Hazard: Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Thunderstorm Wind/Strong Wind, Lightning, Hail, Tornado, Wild Fire, Winter storms

Type of Action: Prevention

Contribution to Mitigation Objective: Prevents the loss of lives by alerting citizens by landline or cell phone of approaching storms by physical address

Priority: High

Rationale of Priority: Past storm events

Addresses New or Existing buildings: N/A

Cost Benefit: Highly Beneficial, cost to County.

TimeLine: 3 Years

Projected Resources: Existing County and Possible Outside Resources

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Conduct Dam failure inundation studies with the creation of EAP or obtain EAP's that have already completed for existing dams in Johnson Co. Will provide information for extent and impact it may have on county, cities, and schools.

Hazard Associated: Dam Failure

Type of Action: Prevention

Contribution to Mitigation Objective: Help planning team and community to understand risk.

Priority: Low

Rationale for Priority: Dam Failure understanding

Addresses New or Existing buildings: New and existing

Cost Benefit: NA

TimeLine: 5 year

Projected Resources: grants

Responsible Party: Planning Team

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar, Clarksville School District, Lamar School District, and Westside School District

STAPLEE: Meets all Criteria

Conduct engineering studies on what are the best solutions for dealing with flooding.

Hazard Associated: Flooding

Type of Action: Prevention

Contribution to Mitigation Objective: Help planning team and community to understand risk.

Priority: Low

Rationale for Priority: Flooding

Addresses New or Existing buildings: New and existing

Cost Benefit: Highly Beneficial

TimeLine: 3 Years

Projected Resources: grants FMA Advanced Assistance

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Acquire properties through grant funding if they flood on a repetitive basis and create green space.

Hazard Associated: Flooding

Type of Action: Prevention

Contribution to Mitigation Objective: Help planning team and community to understand risk.

Priority: Low

Rationale for Priority: Flooding

Addresses New or Existing buildings: New and existing

Cost Benefit: Highly Beneficial

TimeLine: 3 Years

Projected Resources: grants

Responsible Party: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

Action adopted by: Johnson County, Cities of Clarksville, Coal Hill, Hartman, Knoxville and Lamar

STAPLEE: Meets all Criteria

Status of Previous Mitigation Actions

Mitigation Actions	Applicable to New/Existing Buildings and Infrastructure	Hazard Addressed	Countywide, Westside, Oark School Dist/	Clarksville/ Clarksville School Dist.	Coal Hill	Hartman	Lamar / Lamar School Dist.	Knoxville	Notes of Status of Previous Mitigation Actions
Conduct inspection, maintenance and enforcement programs on dam and levees to ensure continued structural integrity.	New and Existing	Dam Failure		√		√			Completed – will continue to be conducted
Increase public awareness of dam failure risks and signs of impending dam failure.	New and Existing	Dam Failure	√			√			Completed - will continue to be conducted
Acquire reliable and current information relating to existing and new buildings and infrastructure, especially critical facilities. Will undergo studies to find possible ways to mitigate flooding to State land from high hazard dams and any visitors that may be harmed	New and Existing	Dam Failure	√	√	√	√	√	√	Not Completed – will be included in dam inundation study
Citizens will conserve water by using an alternative water source in times of drought and will be notified via media announcements.	Existing	Drought		√	√	√	√	√	Not Completed – addressed as an action in plan
Distribute copies of FEMA’s “Earthquake Safety for Homeowners” through local county office of emergency services.	New and Existing	Earthquake	√	√	√	√	√	√	Completed
State and local highway departments should review construction plans for all bridges to determine their susceptibility to collapse. Retrofit problem bridges.	New	Earthquake		√					Status Unknown – Will not be included in update
Acquire capability to utilize research tools and software to determine potential for Earthquake in Johnson County	New and Existing	Earthquake	√	√	√	√	√	√	Completed - New Models were published by USGS relating to New Madrid
Purchase heavy-duty generators to maintain electrical power for Critical Facilities in times of emergencies.	New and Existing	Earthquake, Hailstorm, Severe Winter Storm, Severe Thunderstorm	√	√	√	√	√	√	Not Completed
Establish and promote accessible cooling centers/shelters for vulnerable, special needs, and at risk populations.	Existing	Extreme Heat	√	√	√	√	√	√	Completed – organization will continue to seek

										additional locations which is why it is still a relevant action in current plan.
County and Communities to encourage utility companies to offer special arrangements for paying of utility bills.	N/A	Extreme Heat		√	√	√	√	√	√	Completed
Provide emergency preparedness information and resources for extreme heat events through an active educational outreach program with specific plans and procedures for at risk population.	N/A	Extreme heat	√	√	√	√	√	√	√	Completed - ongoing
Develop and implement a system to keep track of deaths/injuries caused by extreme heat to ensure accurate data at the county level	N/A	Extreme Heat	√	√	√	√	√	√	√	Completed – Conducted by the Storm events database
Develop guidelines for management of development around flood prone areas and other areas of high flood mitigation values, such as, wetlands, floodplain corridors, upland storage, closed depressional basins and areas of high filtration potential.	New	Flood	√	√	√	√	√	√	√	Ongoing
Prepare and implement standard operating procedures for drainage system maintenance. Ensure storm drains and ditches are not blocked and are able to receive water in flood prone areas.	New and Existing	Flood		√						Completed
Initiate public outreach to educate residents on the benefits of purchasing flood insurance.	N/A	Flood	√	√	√	√	√	√	√	Completed – Ongoing due to fact if new residence moving to area as well as new development that may be done.
Implement road elevation and culvert sizing standards for construction upgrade on all county and city roads. Investigate current roadways located in flash flood-prone areas to ensure compliance with current standards for design year floods.	N/A	Flood		√	√			√	√	Not Completed
Construct safe rooms within new and existing public buildings, such as schools, libraries, community centers, and other public buildings where feasible.	New and Existing	Tornado-High Winds	√	√	√	√	√	√	√	Not Completed
Continue to promote the purchase and usage of NOAA weather radios in all schools, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries and the general public.	Existing	Tornado-High Winds	√	√	√	√	√	√	√	Ongoing
Host educational programs for installation contractors and mobile home owners with the help of the Home Builder Association on ways to stabilize existing and future mobile homes against straight-line and tornado force winds.	New and Existing	Tornado-High Winds		√	√	√	√	√	√	Not Completed – will be addressed under

										education and outreach in new plan.
Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction. These plans should include a review of existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with plan recommendations.	New and Existing	Tornado-High Winds		√	√	√	√	√		Not Completed
Install surge protection, lightning protection devices on all communications infrastructure and critical facilities.	Existing	Tornado-High Wind Thunderstorm -Lightning		√	√	√	√	√		Not Completed
To minimize damage to public and private buildings through structural bracing, shutters laminated glass in windowpanes, and hail resistant roof shingles.	New and Existing	Thunderstorm -Lightning Hail		√	√	√	√	√		Not Completed
Distribute brochures “Avoiding Wildfire Damage: A Checklist for Homeowners” for early prevention.	New and Existing	Wildfire		√	√	√	√	√		Not Completed
Inform residents Broadcast information through community services about fire watches and fire warnings.	New and Existing	Wildfire	√	√						Completed / Ongoing
Enact fire safety for prone burning subject to review by quorum court which requires burn permits and restricts campfires and outdoor burning.	N/A	Wildfire	√	√	√	√	√	√		Completed / Ongoing due to the fact depends on conditions of area
Educate the community of the benefits of joining the “Firewise program”	New and Existing	Wildfire	√	√	√	√	√	√		Completed – County is a member of Firewise
Local governments maintain adequate road and debris clearing capabilities.	New and Existing	Winter Storms		√	√	√	√	√		Completed
Burying or otherwise protecting electric and other utility lines can prevent disruptions by protecting lines from ice, wind, or now damage.	New and Existing	Winter Storms		√	√	√	√	√		Not completed
Maintain risk assessment data in GIS, including flood zones, tornado tracks, landslide threat areas, dam inundation areas, disaster events, and a comprehensive inventory of critical facilities within all jurisdictions.	New and Existing	Flooding, Tornado, dam failures	√							Completed – ongoing new info will be added as it occurs
Incorporate “best practices” mitigation measures in Johnson County’s current and future capital improvements program.	New and Existing	Tornadoes, Flood- Riverine/Flash, Dam Failure, Severe Thunderstorm , Severe Winter Storms, Earthquakes, High Straight Winds, Wildfire,	√	√	√	√	√	√		Completed – ongoing will continue to be done as more information is available.

		Extreme Heat.							
Work with communities at the County Level to improve database of inventory for structure types and vulnerabilities	New and Existing	Dam Failure, Drought, Earthquake, Extreme Heat, Severe Hailstorm, Winter storm, Thunderstorm, Wildfire, High Wind, and Tornado	√	√	√	√	√	√	Not Completed

SECTION 5

Acronyms

ADA	Average Daily Attendance
ADEM	Arkansas Department of Emergency Management
BCA	Benefit-Cost Analysis
BMPs	Best Management Practices
CFR	Code of Regulations
CRS	Community Rating System
DMA 2000	Disaster Mitigation Act of 2000
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information System
HMC	Hazard Mitigation Committee
HMGP	Hazard Mitigation Grant Program
IBC	Internal Building Code
IFR	Interim Final Rule
JCDEM	Johnson County Department of Emergency Management
LEPC	Local Emergency Planning Committee
MOU	Memorandum of Understanding
NFIP	National Flood Insurance Program
PDM	Pre-Disaster Mitigation Program
PGA	Peak Ground Acceleration
SHMO	State Hazard Mitigation Officer
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic
UCC	Uniform Construction Code
WUI	Wildland Urban Interface

SECTION 6

Plan Adoption

Attached are approved resolutions the County, cities and school districts passed after FEMA approved the Johnson County Hazard Mitigation Plan.

6.1 Resolutions

Johnson County – Plan Adopted April 12th, 2018

Clarksville – Plan Adopted April 9th, 2018

Coal Hill – Plan Adopted April 3rd, 2018

Hartman – Plan Adopted July 3rd, 2018

Knoxville – Plan Adopted July 10th, 2018

Lamar – plan Adopted April 2nd, 2018

Clarksville School District – Plan Adopted April 16th, 2018

Lamar School District – Plan Adopted April 16th, 2018

Westside School District – Plan Adopted April 10th, 2018

RESOLUTION # 307

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE COUNTY OF JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, Johnson County desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE Quorum Court of Johnson County.

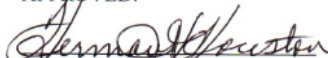
That Johnson County, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 12 day of April, 2018.

APPROVED:


Herman H. Houston, County Judge

ATTEST:


Michelle Frost, County Clerk

RESOLUTION # 18-1063

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY OF CLARKSVILLE, JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the City of Clarksville desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

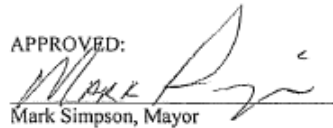
NOW, THEREFORE, BE IT RESOLVED BY THE City Council of the City of Clarksville, Arkansas:

That the City of Clarksville, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 9th day of April, 2018.

APPROVED:

Mark Simpson, Mayor

ATTEST:

Barbara Blackard, City Clerk/Treasurer

RESOLUTION # 04/03/18-2

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the City of Coal Hill, Johnson County, Arkansas, desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

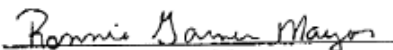
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF COAL HILL, ARKANSAS; THAT

The City of Coal Hill, Johnson County, Arkansas, adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards this 3rd Day of April; and


Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 3rd day of April, 2018


Ronnie D. Garner, Mayor

ATTEST:


Doris J. Davis, Recorder/Treasurer



RESOLUTION NO. 18-0001

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE
CITY OF HARTMAN JOHNSON COUNTY ARKANSAS

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the City of Hartman, Arkansas desires to prepare and mitigate for such circumstances; and

WHEREAS, UNDER THE Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE BE IT RESOLVED BY THE CITY OF HARTMAN, ARKANSAS.

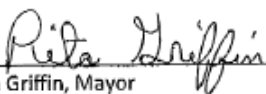
That the City of Hartman, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards July 3, 2018 and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan

APPROVED and **ADOPTED** on this 3rd day of July, 2018.

APPROVED:



Rita Griffin, Mayor

ATTEST:



Emma Lee Morrow, Recorder/Treasurer

RESOLUTION # 071018

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY OF KNOXVILLE, ARKANSAS, JOHNSON COUNTY.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the Knoxville City desires to prepare and mitigate for such circumstances; and **WHEREAS**, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL (ALDERMAN) FOR KNOXVILLE CITY.

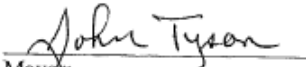
That the City of Knoxville, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards from (07/10/18) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 10th day of July, 2018:

APPROVED:


Mayor:

ATTEST:


Secretary:



RESOLUTION # 171-18

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY OF LAMAR, JOHNSON COUNTY, ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people’s properties within the area; and

WHEREAS, the City of Lamar desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of a County wide, multi-jurisdictional Hazard Mitigation Plan for the County and all jurisdictions in the County, specifically the cities and school districts;

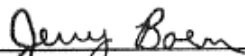
NOW, THEREFORE, BE IT RESOLVED BY THE LAMAR CITY COUNCIL that the City of Lamar, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 2nd day of April, 2018.

APPROVED:


Mayor Jerry Boen

ATTEST:


Recorder/Treasurer, Teri Chavers



RESOLUTION #

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the Clarksville School District desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE Clarksville School District.

That the Clarksville School District, in Johnson County Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 16th day of April, 2018

APPROVED:


David Hopkins, Superintendent

ATTEST:


Secretary

RESOLUTION #

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the Lamar School District desires to prepare and mitigate for such circumstances; and
WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE Board of City Lamar School District.

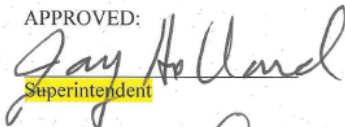
That the Lamar School District, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

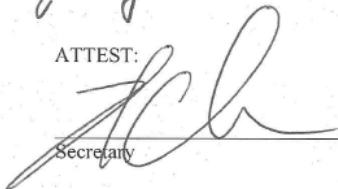
Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

APPROVED and ADOPTED on this 16th day of April, 2018

APPROVED:


Superintendent

ATTEST:


Secretary

RESOLUTION #

A RESOLUTION ADOPTING THE JOHNSON COUNTY HAZARD MITIGATION PLAN FOR THE CITY/COUNTY/SCHOOL DISTRICT JOHNSON COUNTY ARKANSAS.

WHEREAS, certain areas of Johnson County are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people's properties with the area; and

WHEREAS, the Westside School District Johnson County desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) required that local jurisdictions have in place a FEMA-approved Hazard Mitigation Action Plan as a condition of receipt of certain future Federal mitigation funding after November 1, 2004; and

WHEREAS, to assist cities and counties in meeting this requirement, Johnson County, with the assistance of West Central Arkansas Planning and Development District, has initiated development of County wide, multi-jurisdiction Hazard Mitigation Plan the County and all jurisdictions in the County, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED BY THE Westside School District Johnson County.

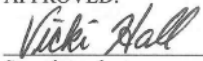
That the Westside School District Johnson County, Arkansas adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards (date) and

Appoints the Emergency Management Director to assure that the Hazard Mitigation Plan be reviewed at least annually and that any needed adjustment to the Hazard Mitigation Plan be developed and presented to the governing board for consideration; and

Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

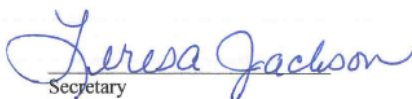
APPROVED and ADOPTED on this 10th day of April, 2018

APPROVED:



Superintendent

ATTEST:



Secretary