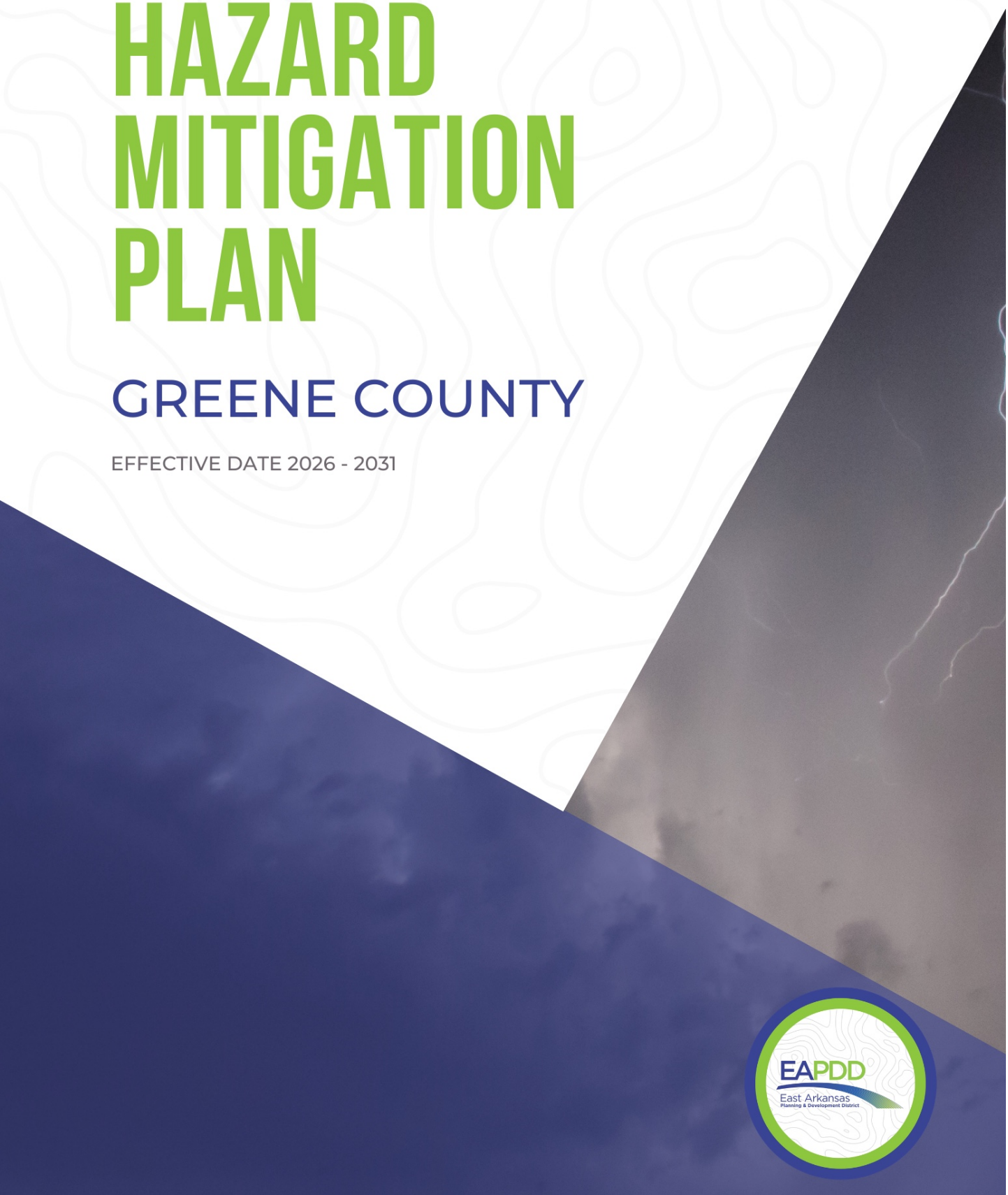
HAZARD MITIGATION PLAN

GREENE COUNTY

EFFECTIVE DATE 2026 - 2031



EAPDD
East Arkansas
Planning & Development District

Greene County Hazard Mitigation Plan
HMGP FEMA-4518-DR-AR Project #0004
Awarded March 24, 2023
Approved 2026 - 2031

Greene County Hazard Mitigation Plan Table of Contents

(LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE)

RESOLUTION NO. _____

A RESOLUTION OF (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE)
ADOPTING THE 2023 GREENE COUNTY HAZARD MITIGAITON PLAN

WHEREAS the (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) recognizes the threat that natural hazards pose to people and property within (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) ; and

WHEREAS the (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE)

WHEREAS the 2023 Greene County Hazard Mitigation Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the 2023 Greene County Hazard Mitigation Plan.

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE)

Section 1. In accordance with the (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) rule for adopting resolutions, the (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) adopts the 2023 Greene County Hazard Mitigation Plan. While content related to (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (LOCAL JURISDIITON, INCLUDING SPECIAL DISTRICTS), (STATE) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

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 Greene County Hazard Mitigation Plan is to provide guidance for hazard mitigation activities in Greene County. The Greene County Office 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 Greene 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.

Greene County initiated the Hazard Mitigation planning process by securing a FEMA HMGP grant to complete the Plan. Greene County hired East Arkansas Planning and Development District, Inc. (EAPDD) to author the plan. Greene County Judge's Office and EAPDD worked together to engage the county, cities, communities, and school districts in the planning process.

1.1.1 Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA 2000) is the latest legislation to improve this planning process. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). This new section emphasizes the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act establishes a pre-disaster hazard mitigation program (PDM) and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). It also requires that communities must have an approved hazard mitigation plan to receive Stafford Act assistance, excluding assistance provided pursuant to emergency provisions.

The goals of this Greene 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 Greene 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 Greene County Hazard Mitigation Plan is being developed to assess the ongoing natural hazard mitigation activities in Greene 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 covering all unincorporated areas

of Greene County and municipalities of Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

Formal adoption and implementation of a hazard mitigation plan presents many benefits to Greene County and its residents. By identifying problems and possible solutions in advance of a disaster, Greene County and 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 Greene County's eligibility for assistance from FEMA's Flood Mitigation Assistance (FMA) program. Greene 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, Greene 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.

1.1.2 Parts of the Plan

The Greene 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. References
7. Plan Adoption

This Hazard Mitigation Plan is multi-jurisdictional with a planning area that includes all unincorporated Greene County including Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke 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 Greene County Office of Emergency Management (OEM). 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.

1.1.3 Local Involvement

Greene County's mitigation planning process began on May 2, 2022; East Arkansas Planning & Development District (EAPDD) began facilitating the mitigation planning efforts on March 24, 2023. Greene County began working with EAPDD to schedule planning meetings and began gathering updated data. East Arkansas Planning & Development District served as facilitator while Greene County Judge and the OEM led the planning effort.

Once all participating cities and school districts, for which the Greene County OEM is responsible, formally agreed to participate, an initial planning team comprised of representatives from Greene County, citizens of the public and participating jurisdictions were organized. This initial team was instructed to solicit interested people from their community to participate on the planning team. This includes private entities, non-profit organizations, small business owners and future business owners. This solicitation also included meeting and speaking to constituents in the underserved and vulnerable populations. This was made a priority throughout the planning team to include those who may not have access to the internet, social media, phones, or those who may just be unaware of the subject. 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 public meetings. If a city or school district could not attend a meeting, all material presented in the meetings were either emailed or physically mailed to them. The Greene County Mitigation Planning Team also discussed mitigation actions, projects, and past hazard occurrences with EAPDD during conference calls.

Multiple planning events were scheduled throughout the planning process. Training events began the planning process. The East Arkansas Planning & 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.

Neighboring communities, local agencies; and regional agencies involved in hazard mitigation activities, emergency services, and other expertise were informed of LMPC and HMPT meetings. While some of these agencies consisted of those that have the authority to regulate development, many of the neighboring community attendees were individuals that contributed information relating to the complications of transportation and communications during regional hazard events. Participating stakeholders included but were not limited to: Greene County Sheriff's Office, Greene County Road Department, Greene County rural water districts, and other volunteers. The agencies and neighboring communities were requested by personal invitation from the Greene County OEM, EAPDD, or by a Local Mitigation Planning Committee (LMPC). Neighboring communities were also invited to participate in the public review of the draft hazard mitigation plan during the public review event from September 3-October 31, 2023.

1.1.4 Neighboring Community Involvement

During the Mitigation Planning Process for Greene 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 Greene County Judge's Office to attend planning meetings. Representatives from Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District attended the planning meetings.

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/Arkansas State Citizens Corps/Hazard Mitigation Planning Team Members.
- County engaged East Arkansas Planning & Development District (EAPDD), 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, assessing hazards, developing a mitigation plan, and implementing the plan and mentor progress.
- East Arkansas Planning & Development District staff attended workshops presented by FEMA and ADEM on the preparation of the mitigation plan.
- East Arkansas Planning & Development District staff also had numerous subsequent discussions about the planning process with ADEM staff. The EAPDD staff also discussed planning process issues with others in the state that were involved in other Planning and Development Districts.

The Planning Committee utilized the following technical documents.

- Arkansas State Hazard Mitigation Plan was used as a guidance tool for past occurrences and risk assessments
- EAPDD Comprehensive Economic Development Strategy
- National Oceanic Atmospheric (NOAA) Past Hazard Events
- FEMA's National Flood Hazard Layer
- Public feedback

Timeline

First Meeting 2023

Planning Grant was awarded March 24, 2023, as a HMGP under disaster FEMA-4518-DR-AR Project #0004

The first organized planning meeting was held June 5, 2023. Each person in attendance received a copy of the PowerPoint "Overview of the Mitigation Planning Process," worksheets from the FEMA's Local Mitigation Planning Handbook, and the grant signing documents.

- The information was presented, followed by time for question-and-answer session.
- The discussion consisted of minor updates to the previously attempted plan as well as including the new guidelines.

Planning Committee Meeting 2023

After the first meeting, the OEM and EAPDD collaborated to invite all participating jurisdictions as well as the public to attend the kick-off meeting on September 25, 2023.

1.1.5 Public Review

Greene County is dedicated to involving the public directly in the continual reshaping and updating of the Greene County Hazard Mitigation Plan. The Greene County Judge and the Office of Emergency Management are responsible for the annual monitoring, evaluation, and update of the plan. The public will be notified of the date(s), time(s), and location(s) of subsequent planning processes that are made available for public feedback and participation via public announcement in the local newspapers. Although the planning team represents the community to some extent, the public will have the opportunity to provide feedback about the plan by contacting their local planning team representative(s) or the Greene County Office of Emergency Management by phone, mail, email, or in-person.
Copies of the FEMA approved Greene County Hazard Mitigation Plan will be available at:

- www.eapdd.com
- Greene County Office of Emergency Management
- Greene County government website
- Greene County Public Library

City Halls of Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, and offices of the Paragould School District, Greene County Tech School District, and Marmaduke School District. Contained on the title page are the address, phone number, and e-mail address of the Director of the Greene County Office of Emergency Management, the primary point of contact for the plan.

1.1.6 Plan Developers

Team Member	Title(s)	Agency/Organization	Involvement
Rusty McMillon	Greene County Judge	Greene County	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Erik Wright	OEM Director Planning Team Chief	Greene County Office of Emergency Management (OEM), Greene County Hazard Mitigation Planning Team	Provided local data; assisted with mitigation actions; attended meetings; assists with project planning; and aided the development of the local hazard mitigation committee
Emily Sisco	Mayor	Town of Delaplaine	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Jeremy Farmer.	Mayor	City of Marmaduke	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Ralph Oglesby, Jr.	Mayor	Town of Lafe	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Rudy Garner	Mayor	Town of Oak Grove	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Josh Agee	Mayor	City of Paragould	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Greene County Tech	Superintendent	Scott Gerrish	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Paragould School District	Superintendent	Dr. Nick Jankoviak	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee
Marmaduke School District	Superintendent	Keith Richey	Attended meetings; provided local data; assisted with mitigation actions; and aided the development of the local hazard mitigation committee

Planning Team-

Point of Contacts

Greene County Judge, Rusty McMillon 320 W. Court Street, Paragould, AR. 72450
Greene County OEM Director, Erik Wright 320 W. Court Street, Paragould, AR. 72450

1.2 Plan Maintenance Process

1.2.1 Monitoring, Evaluation and Updating the Plan

Although FEMA regulations require a plan update within five years, Greene County has developed a method to ensure that monitoring, evaluation, and updating of the Greene 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 Greene 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 Greene County Office 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 ensure that each community will maintain a representative on the team.

During the update period, representatives of the Hazard Mitigation team will verify that information such as point of contact information for the jurisdictions and entities that are a part of this plan is still correct. Also, as events occur within the jurisdictions that are covered by this plan, it will be recorded in the appropriate sections throughout. If the planning team feels as if a new hazard is faced by the county and its jurisdictions, then this should be added and addressed in the plan. In the event Greene County receives a new presidential declaration, this information will be recorded in the appropriate sections of the plan. As mitigation actions are completed, this should be updated in the appropriate section as well.

The responsible party for overseeing and assuring plan updates is the Greene County Office 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 subcommittee will meet to review and evaluate each goal and objective to determine their relevance to changing situations in Greene County, as well as changes in state or federal policy, and to ensure that they are addressing current and expected conditions. The subcommittee 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 Greene County Office of Emergency Management will then have three months to update and make changes to the plan before submitting it to the subcommittee members and the State Hazard Mitigation Officer. If no changes are necessary, the State Hazard Mitigation Officer will be given justification for this determination. Comments and recommendations offered by subcommittee members and the State Hazard Mitigation Officer will be incorporated into the plan update.

In addition, the Greene 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.

Greene County is covered by the following plans either from a local level or regional level involvement. Once these plans are updated, the Greene County Mitigation Plan is expected to help facilitate the additional plans. Also, any relevant changes that may impact mitigation will also be incorporated from the following plans into the Greene County mitigation plan.

Land Use and Development Plans 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 unto

consideration and setting forth recommendations that influence development in a way that does not increase risks to life and property.

Transportation Plans can build community resilience by adopting policies that direct growth away from known hazard areas. Also, by ensuring that transportation systems and other critical infrastructure are designed to withstand the effect of known hazards, so they still function in the event of an emergency or disaster.

Housing Plans can help strengthen community resilience by ensuring that the location and design of new or improved housing complies not only with existing building codes, but with potential hazards. Opportunities to strengthen or replace structures unidentified as vulnerable to hazard can be promoted through existing maintenance or rehabilitation programs, and particularly through policies regarding non-conforming, substantially damaged, or substantially improved properties.

Economic Development Plans can promote commercial or industrial expansion in areas 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.

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 stormwater drainage improvements or the public acquisition of hazard areas for open space.

Natural Resource Protection Plans have policies designed to preserve or enhance environmental areas of concern, such as wetlands, riparian corridors, and floodplains, often include the added benefit of avoiding or minimizing development in hazard areas. These types of policies build community resilience by protecting lives and property and maintaining natural and beneficial functions of systems that act as buffers against hazardous events.

Historic Properties and Cultural Resources Plans are designed to protect and preserve historic and cultural sites, buildings, and other resources and can be linked with mitigation strategies to prevent damage and losses from hazardous events.

The Hazard Mitigation Plan will consider any changes to these plans and incorporate the information accordingly in its next update.

The Planning Committee will make every attempt to ensure the public will be 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 will inform the county citizens on any changes or revisions of the Greene County Hazard Mitigation Plan.

Since future plans and government regulations might need to be adopted into the Hazard Mitigation Plan, the Greene 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 Division of Emergency Management will be contacted as necessary for professional and technical advice as needed.

1.2.2. Incorporation into Existing Planning Mechanisms

Greene 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. Greene 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 Greene County Hazard Mitigation Plan will be available for public view on the East Arkansas Planning & Development District's website www.eapdd.com 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 Greene County Courthouse in Greene County and each participating jurisdiction's city hall.

The cities of Delaplaine, Lafe, Marmaduke, Oak Grove, Paragould, Greene County Tech School District, Marmaduke School District, and Paragould School District will adopt the approved Hazard Mitigation Plan in their existing plans. Any participant without previous plans in place will be encouraged to develop zoning plans and other land ordinance plans to incorporate mitigation strategies. 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 Greene County Hazard Mitigation Plan, each incorporating participant will be informed of the changes so they can reflect these changes in their plans also.

Greene County will be incorporating the Greene County Hazard Mitigation Plan into the Greene County Emergency Operations Plan and county land use ordinances and/or plans by following the laws set forth by the county government. Incorporating the plan into other plans will be done by vote at the regular quorum court meetings and passed by resolution.

Mitigation action will be adopted by the appropriate governing authority for each jurisdiction. This will also include current and future actions that may be added during the planning process. The county will adopt the action via resolution at the appropriate quorum court meeting at that time. Each city will adopt the actions via resolution at the appropriate city council meeting, and each school will update all appropriate actions via resolution at the appropriate school board meeting.

Paragould currently has a Comprehensive Plan, Emergency Response Plan, Capital Improvement Plan, Site Plan Review Requirements, Building Codes, Special Purpose Ordinance, Zoning Ordinance, Subdivision ordinance, and Economic Development Plan. The HMG Plan will be reviewed and integrated into the existing plan by approval from the Jacksonville City Council. The HMG Plan can be integrated into those Plans.

Marmaduke did not report any existing plans except for the previous Hazard Mitigation Plan. Any future Plans will be approved through the Marmaduke City Council. The HMG Plan can be integrated into those Plans. The HMG Plan can also be used when developing the City annual budget for Mitigation education and awareness, new and existing construction, infrastructure improvements and for prioritizing grant development projects which also would need approval from the City Council.

Lafe did not report any existing plans except for the previous Hazard Mitigation Plan. Any future Plans will be approved through the Lafe City Council. The HMG Plan can be integrated into those Plans. The HMG Plan can also be used when developing the City annual budget for Mitigation education and awareness, new and existing construction, infrastructure improvements and for prioritizing grant development projects which also would need approval from the City Council.

Delaplaine did not report any existing plans except for the previous Hazard Mitigation Plan. Any future Plans will be approved through the Delaplaine City Council. The HMG Plan can be integrated into those Plans. The HMG Plan can also be used when developing the City annual budget for Mitigation education and awareness, new and existing construction, infrastructure improvements and for prioritizing grant development projects which also would need approval from the City Council.

Oak Grove heights did not report any existing plans except for the previous Hazard Mitigation Plan. Any future Plans will be approved through the Oak Grove Heights City Council. The HMG Plan can be integrated into those Plans. The HMG Plan can also be used when developing the City annual budget for Mitigation education and awareness, new and existing construction, infrastructure improvements and for prioritizing grant development projects which also would need approval from the City Council

1.2.3 Continuous Public Involvement

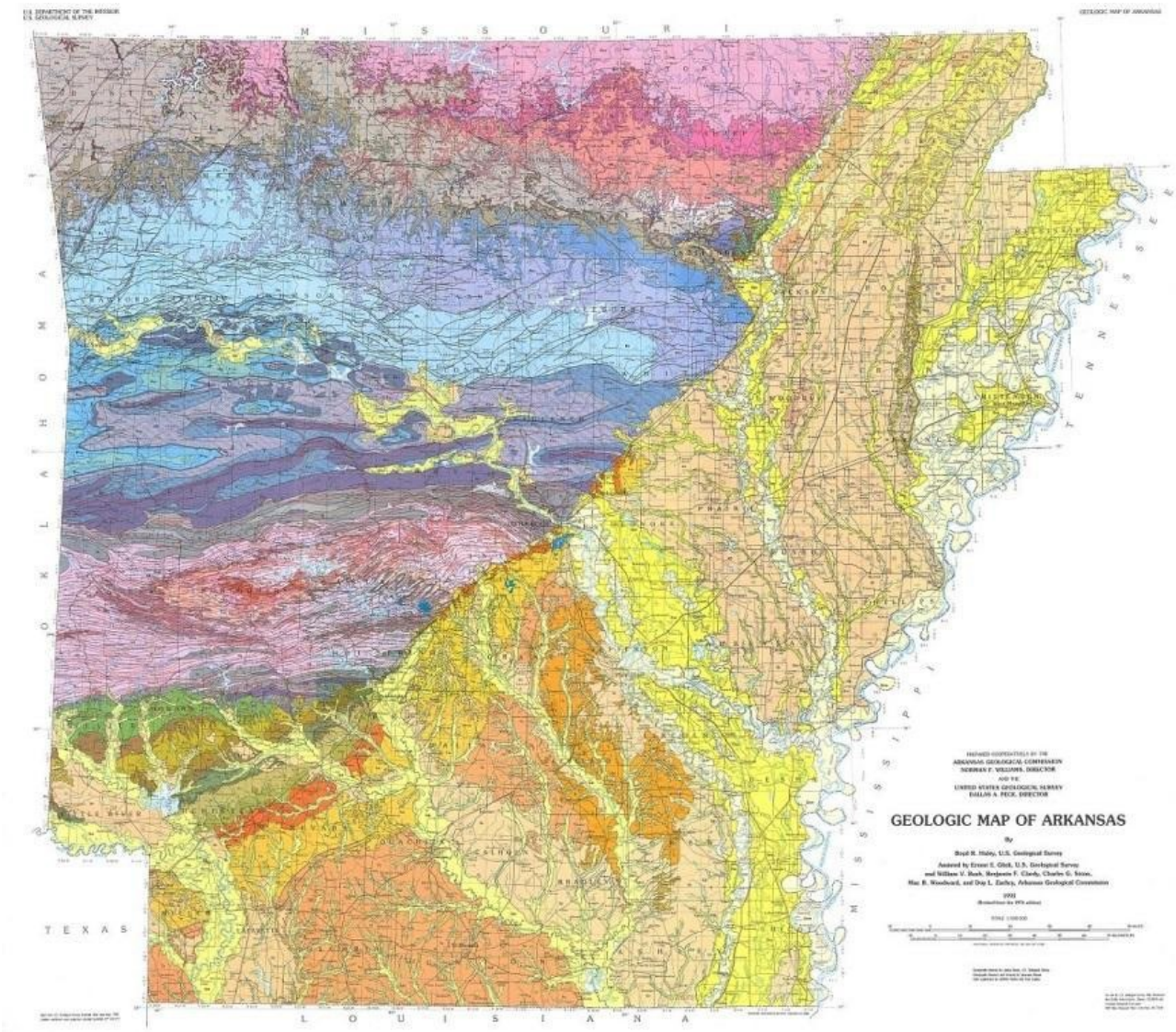
Greene County is dedicated to involving the public directly in the continual reshaping and updating of the Greene County Hazard Mitigation Plan. The Hazard Mitigation Plan Evaluation subcommittee members are responsible for the annual monitoring, evaluation, and update of the plan. Although they represent 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 Greene County Hazard Mitigation Plan will be available at www.eapdd.com. Contained in the plan are the address, phone number, and e-mail address of the Director of the Greene County Office 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 first calendar year LEPC meeting during which the Hazard Mitigation Planning subcommittee reviews and evaluates the plan in its entirety. This meeting invitation will also be extended to the public and underserved communities with a forum for which the public can express concerns, opinions, or ideas about the plan. The Greene County Office of Emergency Management and the Greene 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 Analyzing Development and Economic Trends

Land Use and Development trends are continuously improving throughout the county. Many cities have noted that populations have decreased following the results of the most recent census, but Greene County is an exception and has seen rapid growth. Covid-19 is the reason some cities have seen an increase in permanently closed businesses, causing a decrease in the tax basis as well as economic development in the area. Dependence on farmland has increased and is one of the main sources of income for many citizens and communities located within Greene County.

The City of Paragould has emphasized in their master plan revitalizing areas of downtown, improving roads, walking trails, and expanding housing in the area. The City of Marmaduke has been successful in expanding the new subdivisions that included large, single-family homes. Marmaduke has also improved their road systems by installing a roundabout through town

Planning and Regulatory Capabilities						
Demographics	*Greene County*	Delaplaine	Lafe	Marmaduke	Oak Grove	Paragould
Total Population	45,954	64	421	1513	386	*29,537*
Age						
Under 5 years	2,861	7	33	100	4	20
18 years and over	36,327	66	310	1122	271	268
62 years and over	10,212	16	84	310	119	44
Race						
White/Caucasian	41038	61	401	1133	333	25862
Black/African American	933	0	0	4	0	877
American Indian/Alaskan Native	163	0	3	1	3	123
Asian	181	0	1	02	0	156
Native Hawaiian/Other Pacific Islander	292	1	0	0	0	285
Other Race	699	0	0	15	5	576
Two or More Races	2,430	2	13	57	45	1596
Households						
Total Households	19,235	43	162	653	172	12,184
Median Household Income	$51,367	$60,625	$34,286	$46,500	$52,321	$49,977

[1] Information based on the 2022 ACS 5-Year Estimate Data Profile. Research information obtained from https://factfinder.census.gov.

2.2 NFIP Participation and Capability Assessment

Community Participation	**CID**	**HUC-8 Sub Basin**	**Located on Firm**
Delaplaine	050252	08020302	05055C0175E
Greene County, *Unincorporated Areas*	050435	08020203, 08020302, 11010007, 11010013	05055C0025E, 05055C0050E, 05055C0075E, 05055C0100E, 05055C0125E, 05055C0150E, 05055C0175E, 05055C0200E, 05055C0225E, 05055C0250E, 05055C0275E, 05055C0300E, 05055C0325E, 05055C0335F, 05055C0345F, 05055C0350F, 05055C0355F, 05055C0365F, 05055C0375F, 05055C0400E, 05055C0425E, 05055C0450E, 05055C0475E, 05055C0500F,
Lafe	050569	08020302	05055C0200E, 05055C0225E
Marmaduke	050346	08020203	05055C0225E, 05055C0250E
Oak Grove Heights	050510	08020203	05055C0200E, 05055C0225E, 05055C0335F, 05055C0355F
Paragould	050576	08020302	205055C0425E

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

Delaplaine
Init FHBM Identified: Unlisted
Init FIRM Identified: Unlisted
Curr Eff Map Date: Unlisted
Reg-Emer Date: Unlisted
Tribal: No

Delaplaine: Delaplaine has never enrolled in the NFIP. Currently, there are no active policies or claims on record. Although the community does not maintain an active policy at this time, future participation in the program is under review for potential future reinstatement. Local regulations are used to guide safe development in flood-prone areas, and the community continues to evaluate the benefits of NFIP participation to enhance flood risk management and resilience.

Lafe
Init FHBM Identified: 07/10/79
Init FIRM Identified: 06/16/79
Curr Eff Map Date: 06/16/09
Reg-Emer Date: 07/10/80
Tribal: No

The City of Lafe enrolled in the National Flood Insurance Program (NFIP) in 1979; however, it subsequently withdrew due to the absence of structures located within identified flood-prone areas. Local regulations are used to guide safe development in flood-prone areas, and the community continues to evaluate the benefits of NFIP participation to enhance flood risk management and resilience.

Marmaduke
Init FHBM Identified: 04/11/75
Init FIRM Identified: 06/01/87
Curr Eff Map Date: 06/16/09
Reg-Emer Date: Unlisted
Tribal: No

The City of Marmaduke joined the National Flood Insurance Program (NFIP) in 1987 but has since withdrawn from participation. Currently, there are no active policies or claims on record. Although the community does not maintain an active policy at this time, participation in the program is under review for potential future reinstatement. Local regulations are used to guide safe development in flood-prone areas, and the community continues to evaluate the benefits of NFIP participation to enhance flood risk management and resilience.

Oak Grove Heights
Init FHBM Identified: 12/13/77
Init FIRM Identified: 06/16/09
Curr Eff Map Date: 05/16/13
Reg-Emer Date: 07/27/11
Tribal: No

The City of Oak Grove Heights joined the National Flood Insurance Program (NFIP) in 2009. The community currently maintains seven active flood insurance policies, representing a total coverage value of approximately $1,291,000. Oak Grove Heights Local regulations are used to guide safe development in flood-prone areas, and the community continues to evaluate the benefits of NFIP participation to enhance flood risk management and resilience.

Paragould
Init FHBM Identified: 09/07/73
Init FIRM Identified: 06/15/73
Curr Eff Map Date: 05/16/13
Reg-Emer Date: 06/15/78
Tribal: No

The City of Paragould joined the National Flood Insurance Program (NFIP) in 1978. The community currently has 320 active flood insurance policies in force, with a total coverage value of approximately $44,603,000. Paragould Local regulations are used to guide safe development in flood-prone areas, and the community continues to evaluate the benefits of NFIP participation to enhance flood risk management and resilience.

Capability Assessment
Each community has a unique set of capabilities, including authorities, policies, programs, staff, funding, and resources to accomplish mitigation and reduce long- term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning committee identified capabilities that currently reduce disaster losses or could be used to reduce losses in the future. School Districts completed a capability assessment in March 2017, and that information is included at the end of this section.

Legal and Regulatory Capabilities
Subdivision ordinances offer an opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided. Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events.

Building Code
Building codes regulate construction standards and are developed for specific geographic areas of the country. They consider the type, frequency, and intensity of hazards present 45 in the region. Structures built to applicable building codes are inherently resistant to many hazards such as strong winds, floods, and earthquakes, up to certain levels of severity. Due to the location-specific nature of the building codes, they are very valuable tools for mitigation.

Zoning Ordinance
Zoning is a useful tool to consider when developing a mitigation strategy. It can be used to restrict new development, require low-density development, and designate specific uses, (e.g. recreational), in hazard-prone areas. Private property rights must be considered, but enacting a zoning ordinance can reduce or potentially eliminate damages from future hazard events. According to the Arkansas Multi-Hazard Mitigation Plan, all local communities in the State are encouraged to incorporate mitigation standards in
zoning and land use ordinances.

Subdivision Ordinance
Subdivision ordinances offer an opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided. Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events.

Special Purpose Ordinance
A special purpose ordinance is a form of zoning in which specific standards dependent upon the special purpose or use must be met. For example, many special purpose ordinances include basic development requirements such as setbacks and elevations. The community's floodplain management ordinance may be a special purpose ordinance. The special purpose ordinance is a useful mitigation technique particularly when implemented to reduce damages associated with flooding.

Growth Management Ordinance
Growth management ordinances are enacted to control the location, amount, and type of development in accordance with the larger planning goals of the jurisdiction. These ordinances often designate the areas in which certain types of development is limited and encourage the protection of open space for reasons such as environmental protection and limitation of sprawl.

Site Plan Review Requirements
Site plan review requirements are used to evaluate proposed development prior to construction. An illustration of the proposed work, including its location, site elevations, exact dimensions, existing and proposed buildings, and many other elements are often. included in the site plan review requirements. The site plan reviews offer an opportunity to incorporate mitigation principles, such as ensuring that the proposed development is not in an identified hazard area and that appropriate setbacks are included.

Comprehensive Plan
A comprehensive plan is a document which illustrates the overall vision and goals of a community. It serves as a guide for the community's future and often includes anticipated demographics, land use, transportation, and actions to achieve desired goals. Integrating mitigation concepts and policies into a comprehensive plan provides a means for implementing initiatives through legal frameworks and enhances the opportunity to reduce the risk posed by hazard events.

Capital Improvement Plan
Capital Improvement Plans schedule the capital spending and investments necessary for public improvements such as schools, roads, libraries, and fire services. These plans can serve as an important mechanism to manage development in identified hazard areas through limited public spending.

Economic Development Plan
Economic development plans offer a comprehensive overview of the local or regional economic state, establish policies to guide economic growth, and include strategies, projects, and initiatives to improve the economy in the future. Economic Development Plans, like Capital Improvement Plans, offer an opportunity to reduce development in hazard prone areas by encouraging economic growth in areas less susceptible to hazard events.

Emergency Response Plan
Emergency Response Plans provide an opportunity for local governments to anticipate an emergency and plan the response accordingly. In the event of an emergency, a previously established Emergency Response Plan can reduce negative effects of an event by pre-determining the responsibilities and means by which resources are deployed.

Post-Disaster Recovery Plan
A post-disaster recovery plan guides the physical, social, environmental, and economic recovery and reconstruction procedures after a disaster. Hazard mitigation principles are often incorporated into post-disaster recovery plans to reduce repetitive disaster losses. The post disaster recovery plan is included as a chapter of the comprehensive plan.

Administrative and Technical Capability
The ability of a local government to develop and implement mitigation projects, policies, and programs are contingent upon its staff and resources. Administrative capability is determined by evaluating whether there are an adequate number of personnel skilled in surveying and Geographic Information Systems. The checkmark (v/) indicates that the local government reported that they maintain a staff position for the given function.

Greene County Capability Assessment

Planning and Regulatory Capabilities										
Jurisdictions	Building Codes	Zoning Ordinances	Subdivision Ordinance	Special Purpose Ordinance	Growth Management Ordinance	Site Plan Review Requirements	Comprehensive Plan	Capital Improvements Plan	Economic Development Plan	Emergency Response Plan
Greene County			X	X			X	X	X	X
Paragould	X	X	X	X		X	X	X	X	X
Marmaduke										
Oak Grove Heights										
Lafe										
Delaplaine										
Paragould School District										X
Greene County Tech School District										X
Marmaduke School District										X

Financial Capabilities							
Jurisdictions	Fees for Utilities	Capital Improvements Project Funds	Community Development Block Grant	Federal Funding Program	State Funding Programs	Impact Fees for New Development	Authority to Levy Taxes
Greene County	X	X	X	X	X	X	X
Paragould	X	X	X	X	X		X
Marmaduke	X	X	X	X	X	X	X
Oak Grove Heights	X				X		X
Lafe	X				X		X
Delaplaine	X				X		X
Paragould School District	X		X		X		X
Greene County Tech School District	X				X		X
Marmaduke School District	X				X		X

Administrative and Technical Capabilities							
Jurisdictions	Non-Profit Organization Focused on Environmental	Ongoing Public Education or Program Information	Natural Disaster or Safety Related School Program	Public-Private Partnership Initiatives	Storm Ready Certifications	Non-Profit Organization Focused on Environmental	Ongoing Public Education or Program Information
Greene County		X		X	X	X	X
Paragould		X		X	X		X
Marmaduke		X		X	X	X	X
Oak Grove Heights		X		X	X		X
Lafe		X		X	X		X
Delaplaine		X		X	X		X
Paragould School District		X	X	X	X		X
Greene County Tech School District		X	X	X	X		X
Marmaduke School District		X	X	X	X		X

Improving Capabilities

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

- Expand Road Department budget to improve culverts and water crossings
- Work with schools to construct saferooms
- Purchasing NOAA weather radios for all public facilities
- Providing emergency preparedness mitigation information and resources for extreme weather conditions
- Mapping at Risk Structures using GIS mapping
- Acquiring properties that are in repetitive flood zones
- Conducting countywide community NFIP workshop for elected officials and the public

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. Greene County has identified several natural hazards that pose a threat to the county and its residents, and which 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
Drought	There have been 23 drought events between 1950 - 2023
Earthquake	There have been 0 earthquake events between 1950-2023
Extreme Heat	There have been 22 extreme heat events between 1950 - 2023
Flood	There have been 37 flash flood events and 7 flood events between 1950-2023
Thunderstorm	There have been 135 thunderstorm and thunderstorm wind events, 103 hail events, and 3 lightening events between 1950 - 2023
Tornado	There have been 33 tornadoes between 1950 - 2023
Winter Storms	There have been 25 winter storm events, 9 ice storm events, and 4 heavy snow events between 1950 - 2023

Presidential Disaster Declarations in Greene County from 1979 to Current Date		
Disaster Number	**Declaration Date**	**Incident Type**
DR4254	2/5/2016	Tornadoes/ Straight-Line Wings/Flooding
DR1975	5/2/2011	Tornadoes/Flooding
DR1872	2/4/2010	Severe Storms/Flooding
DR1845	6/16/2009	Tornadoes/ Flooding
DR1819	2/6/2009	Severe Winer Storms
DR1751	3/26/2020	Severe Storms/Tornadoes/Flooding

Source: FEMA Major Disaster Declarations, 2023.

3.2 Vulnerability and Risk Assessment by Hazard

The Greene 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 are affected by the hazard, and when possible, maps were used to illustrate the location. But for some hazards, such as tornadoes, 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. Probability was determined by using Poisson Distribution P(k)=(ʎ^k) (e^-ʎ)/k!

- ʎ=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)

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 addressed 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)

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

3.4 Hazards Affecting Greene County

This mitigation plan addresses the natural hazards that can affect the unincorporated areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District. The hazards which have affected Greene County in the past or could possibly affect Greene County in the near future are drought, extreme heat, earthquake, flooding, thunderstorms (lightening, hail and high winds), tornadoes, and winter storms.

We have omitted profiling wildfire, landslide, expansive soil, terrorism, and dam failure hazards after reviewing vulnerability maps and historical occurrence data from the USGS, Arkansas Forestry Commission, Arkansas Natural Resources Commission, NCDC, NWS, and USACE. These hazards were found not to be life threatening to Greene County and the jurisdictions of Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

3.4.1 Drought

3.4.1.1 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 hazards, 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. In addition, human actions and demands for water resources can accelerate drought-related impacts.

3.4.1.2 Location of Drought Events

All participating jurisdictions: Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District are equally likely to experience severe drought; there is no defined geographic hazard boundary.

3.4.1.3.a Extent, Magnitude or Severity of Drought

Periods of droughts can have significant environmental, agricultural, health, economic and social consequences. The effect varies according to vulnerability. Drought can also reduce water quality, because lower water flows reduce dilution of pollutants and increase contamination of remaining water sources. Common consequences of drought include:

- Diminished crop growth or yield productions
- Lack of water for households
- Lack of water for livestock

- Lack of water for irrigation
- Habitat damage, affecting both terrestrial and aquatic wildlife
- Drought provides too little water to support food crops
- Malnutrition, dehydration and related diseases
- Shortages of water for industrial users
- Social unrest
- Death of vulnerable population such as elderly and young people

Drought Severity Classification

Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Percent of Normal Precipitation	Standardize	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

All areas of Greene County, the cities, and Greene County school districts are equally likely to experience severe drought. There is no defined geographic hazard boundary; any area can experience a drought that is rated between a D0 and D4 classification in any given year.

D0-D4: The Drought Monitor summary map identifies general drought areas, labeling droughts by intensity, with D1 being the least intense and D4 being the most intense. D0, drought watch areas, are either drying out and possibly heading for drought, or are recovering from drought but not yet back to normal, suffering long-term impacts such as low reservoir levels.

The Drought Severity Classification has a variety of different ranges to measure drought severity.

- Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months.
- Climate Prediction Center Soil Moisture is used to monitor the soil moisture as a predictor in monthly and seasonal temperature and precipitation outlooks.
- USGS Weekly Steam flow is the average streamflow during the past 7 days. Averaging streamflow values over an entire week.
- Percent of Normal Precipitation is one of the simplest measurements of rainfall for a location. Analyses using the percent of normal are very effective when used for a single region or a single season. Percent of normal is also easily misunderstood and gives different indications of conditions, depending on the location and season. It is calculated by dividing actual precipitation by normal precipitation—typically considered to be a 30-year mean—and multiplying by 100%. This can be calculated for a variety of time scales. Usually, these

time scales range from a single month to a group of months representing a particular season, to an annual or water year. Normal precipitation for a specific location is 100%.

- Standardized Precipitation Index (SPI) is a toll which was developed primarily for defining and monitoring drought. It allows an analyst to determine the rarity of a drought event at any given time. It can also be used to determine periods of irregular wet events. The SPI is not a drought prediction tool.
- Satellite Vegetation Health Index is a satellite-based global VH System designed to monitor, diagnose, and predict long- and short-term land environmental conditions and climate-dependent socioeconomic activities. The System is based on satellite observations of the Earth, biophysical theory of vegetation response to the environment, set of algorithms for satellite data processing, interpretation, product development, validation, calibration, and applications.

3.4.1.3.b Climate Change

According to a recent survey, 60.5% of the population in Greene County believe that climate change is happening. That is 5.8% lower than the state average. Greene county has the 22nd lowest percentage of residents in the state who are worried about global warming. Currently, Greene County and all participating jurisdictions are at risk for drought. The impact of drought in Greene County is exacerbated by long term climate trends indicating increased frequency of dry periods and higher average temperatures. While the county has not seen significant financial or population impacts attributed directly to climate change, the agricultural sector remains highly vulnerable. Greene County's increasing dependence on farmland, combined with population growth and the expansion of residential areas in rural parts of the county, elevates exposure to water shortages. Vulnerable populations such as the elderly, children, and outdoor workers face health risks during extended dry periods. Though land development does not directly worsen drought, expanding land use without adequate water planning may strain already limited water resources.

3.4.1.4 Previous Drought Occurrences

There have been 22 drought events in Greene County between 1950 – 2023.

3.4.1.5 Probability of Future Drought Events

Overall, Greene County has 23% probability of a drought event in any given year. Although the probability of D2, D3, and D4 classified events are occasional in nature, and less likely to occur, it is still important to remember that it can happen in any given year. The probability of each drought classification can be found in Table 1.

Table 1. Drought Probability in Greene County

Classification	Probability Percentage	Probability Level	Estimated Length of Time	Likely Months
D4	5.00%	Occasional	1 to 8 weeks	July through September
D3	13.00%	Occasional	1 to 12 weeks	September through October
D2	2.00%	Occasional	1 to 2 weeks	September through November
D1	16.00%	Likely	1 to 8 weeks	January; August; and October through December
D0	26.00%	Likely	1 to 12 weeks	any Month

Greene County will most likely experience severe drought events between the months of June and August. Overall, a drought can occur at any time of the year, but an event is most likely to occur in the late summer, fall, and spring.

3.4.1.6 Impact of Drought

Drought impacts communities in several ways, spanning all regions, and can affect the economy as well as the environment. Specific impacts can include:

- Reduced crops and rangeland
- Increased livestock and wildlife mortality rates
- Reduced income for farmers and agribusiness
- Increased fire hazard

- Reduced water supplies for municipal/industrial, agricultural, and power uses
- Damage to fish and wildlife habitat
- Increased consumer prices for food
- Reduced tourism and recreational activities.
- Increased unemployment
- Reduced tax revenues because of reduced expenditures.
- Increased foreclosures on bank loans to farmers and businesses

The most direct impact of drought is economic per agriculture rather than loss of life or immediate destruction of property. Impacts experienced in the agricultural community include direct losses of both crop and livestock production due to a lack of surface and subsurface water; and increases in insect infestations, plant disease, and wind erosion.

In smaller communities, reduced flow in rivers and streams can have a significant effect on the water amount allowed for municipal use. Hot weather during the summer increases supply and demand. In turn, higher water demand can stress many smaller and obsolete treatment facilities to the point of collapse. Prolonged drought has a much greater impact on rural communities, which usually rely on relatively small watersheds and are especially vulnerable during such periods.

Water deficiencies can likewise influence firefighting capacities in both urban and rural settings through decreased water flows and pressures. Most droughts dramatically increase the danger of fires on wild land. When wild lands are destroyed by fire, the resulting erosion can cause heavy silting of streams, rivers, and reservoirs. Serious damage to aquatic life, irrigation, and power production then occurs. Although drought can have serious impact during winter months, it is most often associated with extreme heat. Wildlife, pets, livestock, crops, and humans are vulnerable to the high heat that can accompany drought. When temperatures reach 90 degrees and above, people and animals are more likely to suffer heatstroke, heat cramps, and heat exhaustion. The biggest strength of the planning area is the high level of preparedness and internal response for this type of event. Weakness for the planning area is external response and funding for mitigation activities.

3.4.1.7 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, and water supply. The most vulnerable population is those with underlying health conditions, the elderly, the very young, the homeless, and farmers or others who work outside or in dangerous heat.

3.4.1.8 Multi-Jurisdictional Risk Assessment

Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District are all equally subject to drought; there is no defined geographic hazard boundary. Damages from drought are generally economic. Water supply resources would become compromised and the vulnerable populations, which include farmers, would become affected.

Public health would be affected through lack of water supply, unsafe water in ponds and creeks, and airborne dust. Those affected most would be the homeless, children, those with health conditions, and the elderly. Thus, the threat is countywide and multi-jurisdictional.

3.4.2 Earthquake

3.4.2.1 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.

3.4.2.2 Locations affected by Earthquake and Previous Occurrences

There have been 0 recorded earthquake events within the boundaries of Greene County since 1950.

3.4.2.3.a Extent, Magnitude or Severity of Extreme Earthquake Events:

During a New Madrid Seismic Zone (NMSZ) earthquake, Greene County could experience a magnitude VI on the Mercalli Scale. All participating jurisdictions are equally likely to experience an earthquake and could see up to a VI, it's likely that they will experience between II-IV based on past occurrences. There are other seismic zones in addition to the NMSZ to the north and northwest of Greene County unrelated to the NMSZ as well.

Magnitude	Mercalli	Description	Earthquake Effects	Extent
2	I	Instrumental	Not felt except by a very few under especially favorable conditions.	*Weak*
	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 like 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.	*Moderate*
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.	*Severe*
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.	*Extreme*
	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.	

3.4.1.3b Climate Change

Climate change is not currently considered to influence earthquake frequency or severity. Population growth and land development, particularly in areas underlain by soft soils along Crowley's Ridge could increase the impact of an earthquake by placing more structures and residents, particularly those in vulnerable buildings such as unreinforced masonry and mobile homes, at risk. Although no significant earthquake events have occurred in Greene County since 1950, the proximity to the New Madrid Seismic Zone means that even minor increases in exposed assets from

development could result in higher future damages. Greene County's continued urban expansion without seismic design standards could amplify structural losses in the event of a seismic event.

3.4.2.4 Probability of Future Events

There have been 0 recorded earthquake events occurring in Greene County in the past, scoring a probability of 0%. This is since when using the Poisson Distribution equation it relies on past occurrences over a period to assign a numerical probability regarding what the probability of failure may be. This equation was used to assign probability to all hazards throughout this plan. A data deficiency exists and will be addressed as a mitigation action for in the event probability cannot be assigned due to an event not occurring. However, it is important to note, that while an earthquake may occur in another locality outside of Greene County its impacts could be devastating to the County and participating jurisdictions and school districts. Greene County officials have taken a pro-active approach to seismic hazard readiness in this spirit.

3.4.2.5 Impact and Vulnerability of Earthquake

The Arkansas State Mitigation Plan describes the regions with high probability of future earthquakes in the State of Arkansas that are along the New Madrid Fault. The portion of Arkansas that is likely to experience damage is in the northeast portion of the state. Greene County is located in this area and jurisdictions in Greene County have not experienced an earthquake since the Arkansas Geological Survey has been monitoring however damage still could occur in the event of a New Madrid Earthquake.

Using the Mercalli Scale and what it details for damage in regard to a VI event Greene County and participating jurisdictions could have heavy furniture moved and, in some cases, fallen plaster. Buildings in the areas, especially those constructed with unreinforced masonry may receive some significant damage. The severity of damage will depend upon the magnitude of the earthquake that is produced by the New Madrid Fault Line. Additionally, underground storage tanks and pipelines, roads and bridges, and other critical infrastructure will likely be compromised during a major seismic event.

In the State Hazard Mitigation Plan, it states that landslides have occurred in nearly every county in Arkansas, causing serious damage or loss of life. Based on the NRCS soil data, the state HMP graphically depicts Arkansas counties with soil susceptible to landslides. According to the vulnerability assessment, Greene County is considered to have an extremely low vulnerability. Both the State Deputy Geologist and the State Soil Scientist believe that Greene County and all participating jurisdictions are considered high risk due to the geological feature of Crowley's Ridge bisecting the county.

3.4.3 Extreme Heat

3.4.3.1 Description of Extreme Heat

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

3.4.3.2 Locations Affected by Extreme Heat

The entire planned area is uniformly affected by extreme heat. There is no geographical hazard boundary for extreme heat in this planning area. Extreme heat generally affects people rather than property. However, agriculture can be majorly impacted during events if not mitigated. All participating jurisdictions within the planning area are equally likely to experience an extreme heat event, especially between the months of June, July, and August. The location of extreme heat throughout the planning area is extensive.

3.4.3.3.a Extent, Magnitude or Severity of Extreme Heat Events

All participating jurisdictions, including the unincorporated areas of Greene County and the school districts of Greene County are affected seasonally by summer heat, with summer temperatures averaging 80 degrees and maximum

around 92 degrees. But in 2010 heat waves made extremely hot summers with temperatures in Greene County ranging from 100 degrees or greater. The past occurrences help predict that the participating jurisdictions mentioned above are likely to expect extreme heat up to 120 degrees Fahrenheit.
The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmosphere Administration (NOAA) this relationship is referred to as the "Heat Index" which is shown below. The Heat Index measures how hot it feels outside when humidity is combined with high temperatures.

NOAA's National Weather Service Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

	Caution- is the first level of intensity where fatigue due to heat exposure is possible
	Extreme Caution- indicates that sunstroke, muscle cramps or heat exhaustion are possible
	Danger- indicates that sunstroke, muscle cramps or heat exhaustion are likely
	Extreme Danger- indicates that heat stroke is likely

IMPORTANT: Since heat index values were devised for shady, light wind conditions, **exposure to full sunshine can increase heat index values by up to 15°F.** Also, **strong winds**, particularly with very hot, dry air, can be extremely hazardous.

The Heat Index shaded zone above 105°F (orange or red) shows a level that may cause increasingly severe heat disorders with continued exposure or physical activity. The colored zones indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. Based on the latest research findings, the National Weather Service has devised the "Heat Index" (HI), (sometimes referred to as the "apparent temperature"). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature. To find the HI, look at the Heat Index Chart. As an example, if the air temperature is 95°F (found on the top of the table) and the RH is 55% (found at the left side of the table), the HI-or how hot it really feels-is 110°F. This is at the intersection of the 95° row and the 55% column.

IMPORTANT: Since HI values were devised for shady, light wind conditions, exposure to full sunshine can increase hi values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Heat Index/Heat Disorders: Possible heat disorders for people in higher risk groups.

- Heat index of 130° or higher: heatstroke/sunstroke highly higher likely with continued exposure,
- Heat index of 105°- 130°: sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.

- Heat index of 90°- 105°: sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
- Heat index of 80° - 90°: fatigue possible with prolonged exposure and/or physical activity

Note on the HI chart the shaded zone above 105°F. This corresponds to a level of HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The "Heat Index vs. Heat Disorder" table (next to the HI chart) relates ranges of HI with specific disorders, particularly for people in higher risk groups.

3.4.3.3.b Climate Change

Climate change has resulted in a measurable increase in both temperature and heat wave frequency in the region, intensifying the impact of extreme heat events in Greene County. This trend is particularly dangerous given the county's population and socioeconomically vulnerable residents, including low-income households without reliable access to air conditioning. Population growth in urban areas like Paragould may exacerbate the urban heat island effect, compounding the hazard's impact. Land use changes also contribute to higher localized temperatures. These trends suggest that climate, population, and development changes are actively increasing the impacts of extreme heat across Greene County.

3.4.3.4 Previous Occurrences

There have been 22 occurrences in Greene County between 1950-2023.

3.4.3.5 Probability of Future Extreme Heat Events

According to data analysis, Greene County has a 22% chance of experiencing extreme heat in any given year. However, an extreme heat event is most likely to occur between 3 and 4 times in a year that experiences temperatures above 95ºF. Data indicates that Greene County is highly likely to experience extreme heat in the next five years.

3.4.3.6 Impact of Extreme Heat

Heat is the number one weather-related killer in the United States, resulting in hundreds of fatalities each year. On average, excessive heat claims more lives each year than floods, lightning, tornadoes, and hurricanes combined. Extreme heat, though not a serious threat to structures, can negatively affect agri-businesses, particularly poultry grow-out operations, thus affecting the local economy. Heat stress also adversely affects dairy and livestock production. Optimal temperatures for milk production are between 40 °F and 75 °F.

Extreme heat can also be a hazard to critical facilities that must be temperature controlled, such as hospitals, nursing homes, and communications facilities (due to the heat sensitive electronic equipment). A total power outage or brown-out during a time of extreme heat would create a very serious situation for facilities that do not have a backup power supply, such as a generator, to power air conditioning systems. An extreme heat event will extend throughout the entire planning area. As with drought, high temperatures strongly affect people of all types, but particularly the elderly, farmers, homeless, and youth. All agriculture crops, livestock, water supply, and forestlands are vulnerable to extreme heat. No area can be said to be immune from extreme heat. The most vulnerable population is the elderly, young, children, and those who are sick, overweight, live alone, or who work outside.

3.4.3.7 Vulnerability and Estimating Potential Loss by Jurisdiction to Extreme Heat

An extreme heat event can extend throughout the unincorporated areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech S, and Marmaduke School District. It affects people of all ages, primarily the elderly, children and the homeless. All agriculture crops, livestock, water supply and timber plantations are vulnerable to extreme heat. No area can be said to be immune from, or any more or less vulnerable to extreme heat. Heat exhaustion usually affects people who are working or exercising in a hot environment. Those at risk for heat exhaustion include:

- Infants and young children are at risk because their temperature regulation mechanisms are not fully developed. They also are dependent upon others for water and appropriate clothing. According to the most recent American Community Survey, 6.2% of the County's population is under the age of 5 years.

- The elderly are similarly at risk because of underlying medical conditions that limit the ability to sweat including poor circulation, skin changes, and chronic medication usage. According to the most recent American Community Survey, Greene County 16.2% of the County's population is over the age of 65 years.

Socioeconomic issues increase the risk of heat exhaustion if access to air conditioning is limited. During heat waves, large cities often open cooling centers to help minimize the risk of large numbers of people succumbing to heat-related illness. Certain medications may impair the ability of the body to sweat as well.

3.4.4 Flooding

3.4.4.1 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 Greene County. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

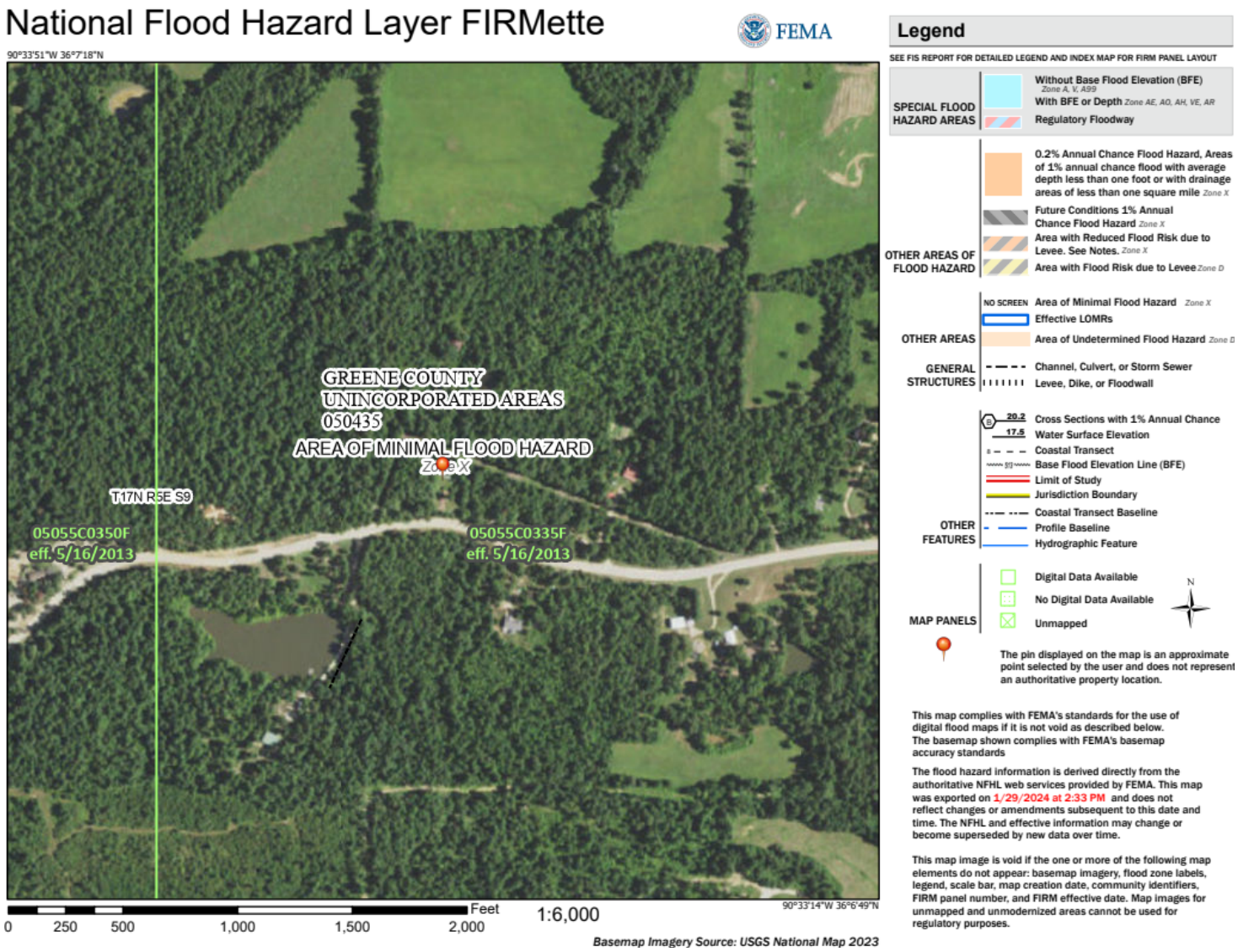
3.4.4.2 Location of Flooding Events

All parts of Greene County are subject to flash flooding. The Hazard Mitigation Planning Team has reviewed Greene 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. The County's floodplain maps were developed around 2010, and therefore the County's FIRMs do not provide an accurate picture of areas and structures most vulnerable to flooding. Due to the age of the FIRMS and the lack of information provided on them, updated maps are needed to gain a better understanding of what areas can be impacted by flooding and the various flooding inundation levels.

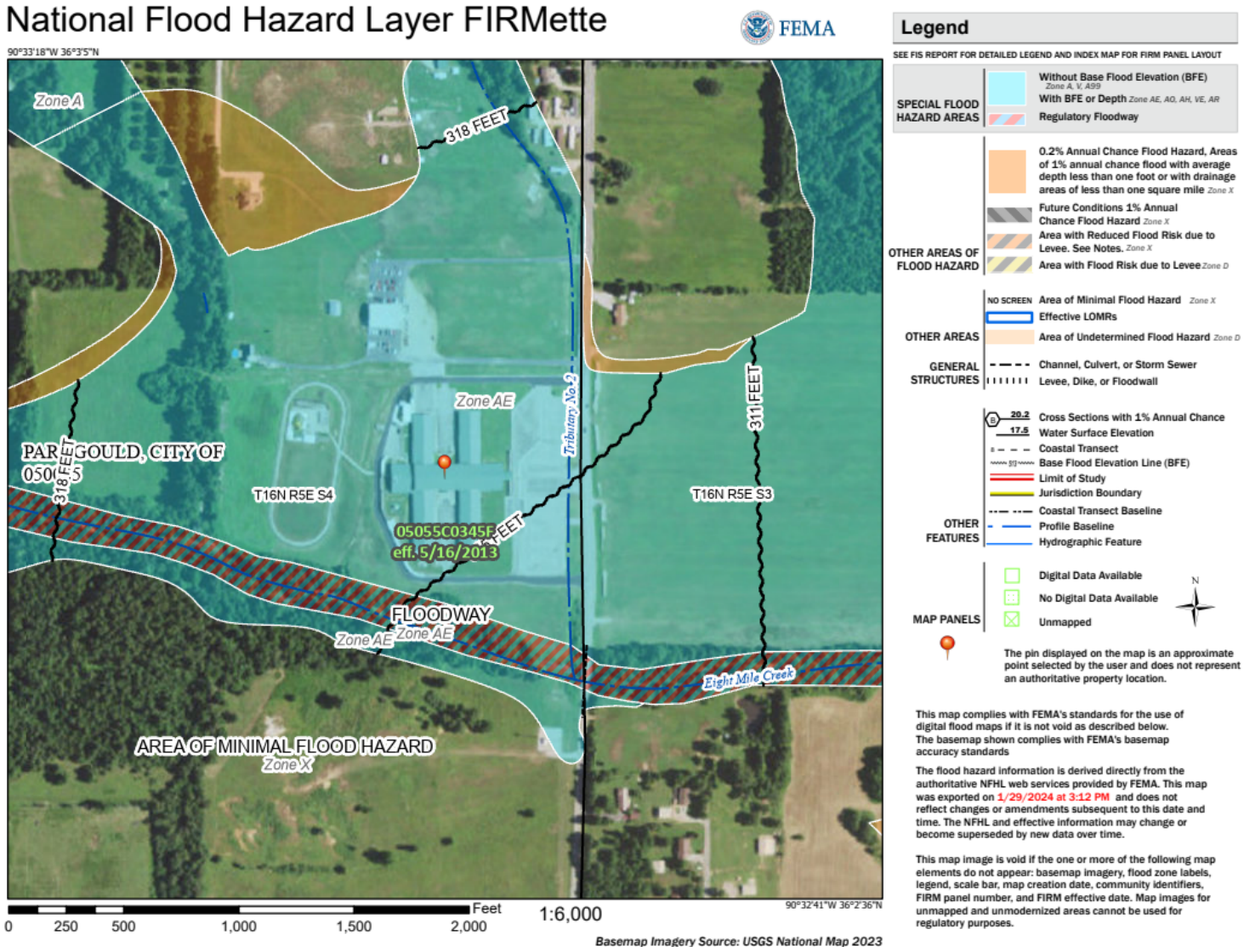
Zone	Description
A	Areas of 100-year Flood; Base flood elevations and flood hazard factors not determined
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundations are shown, but no flood hazard factors are determined.
AE	Base flood elevations 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	Ares of undetermined but possible flood hazards.

The following maps include FEMA Firm maps for Greene County, municipalities, and school districts of: Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

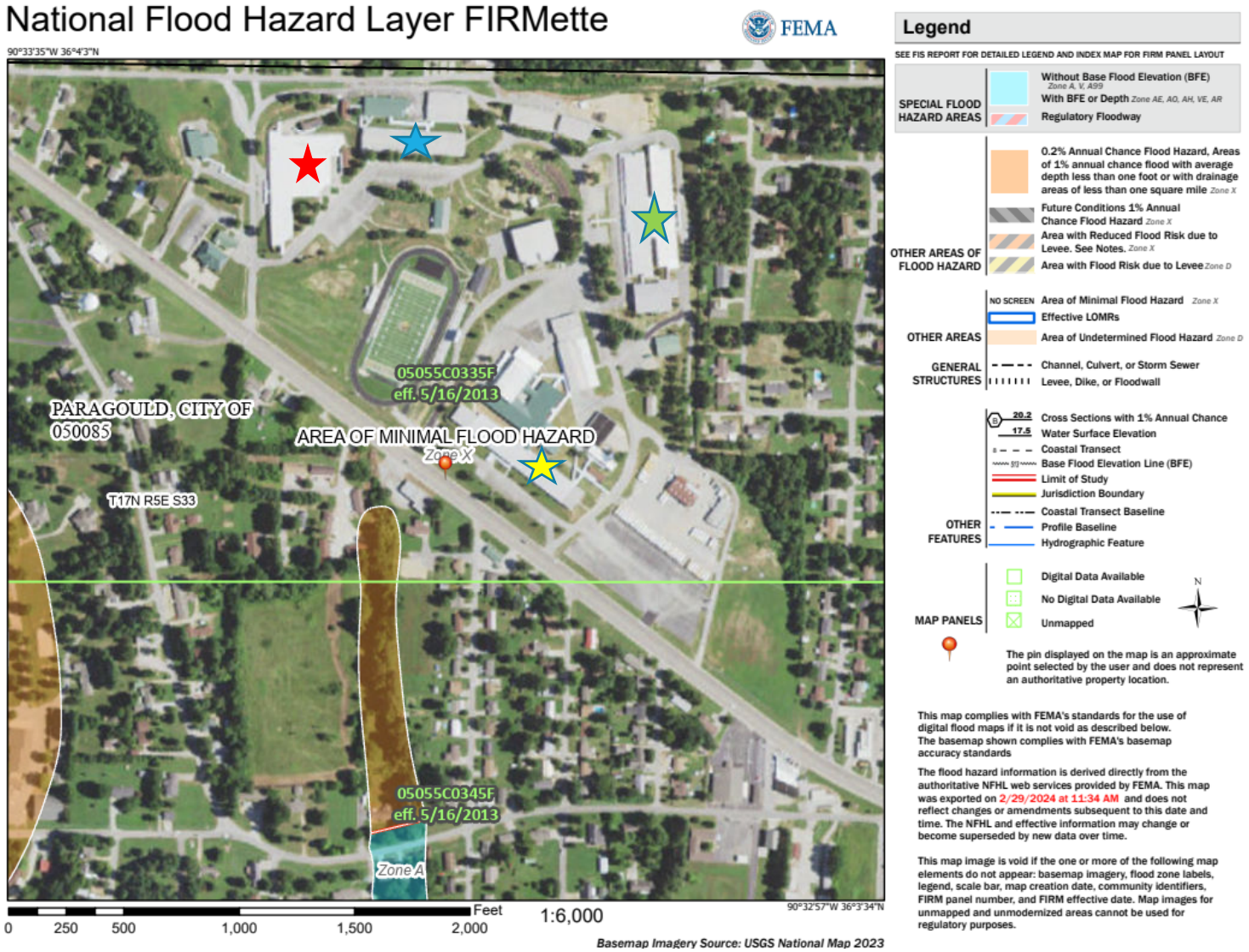
Greene County- FEMA Firm map



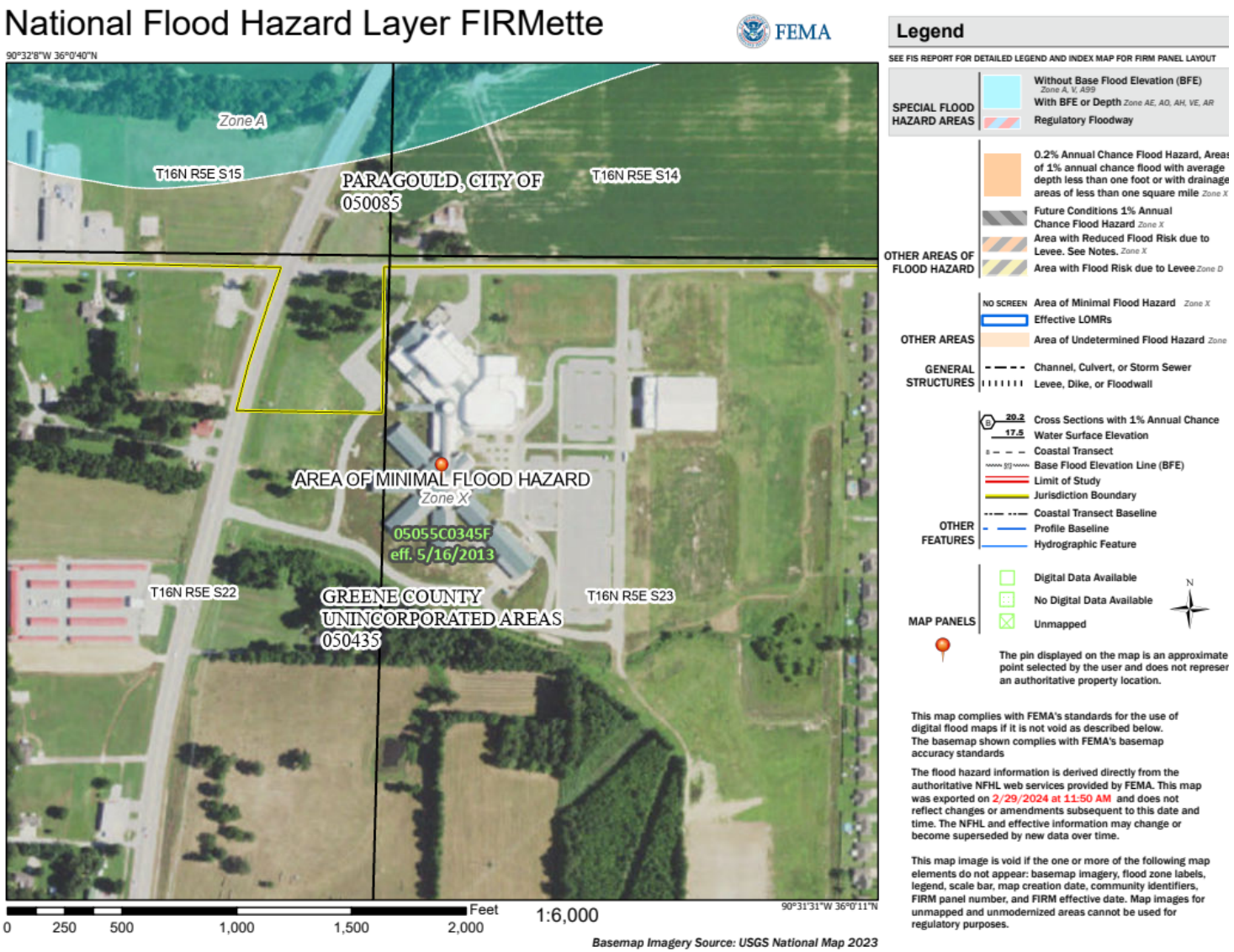
Greene County Tech Primary School - FEMA Firm map



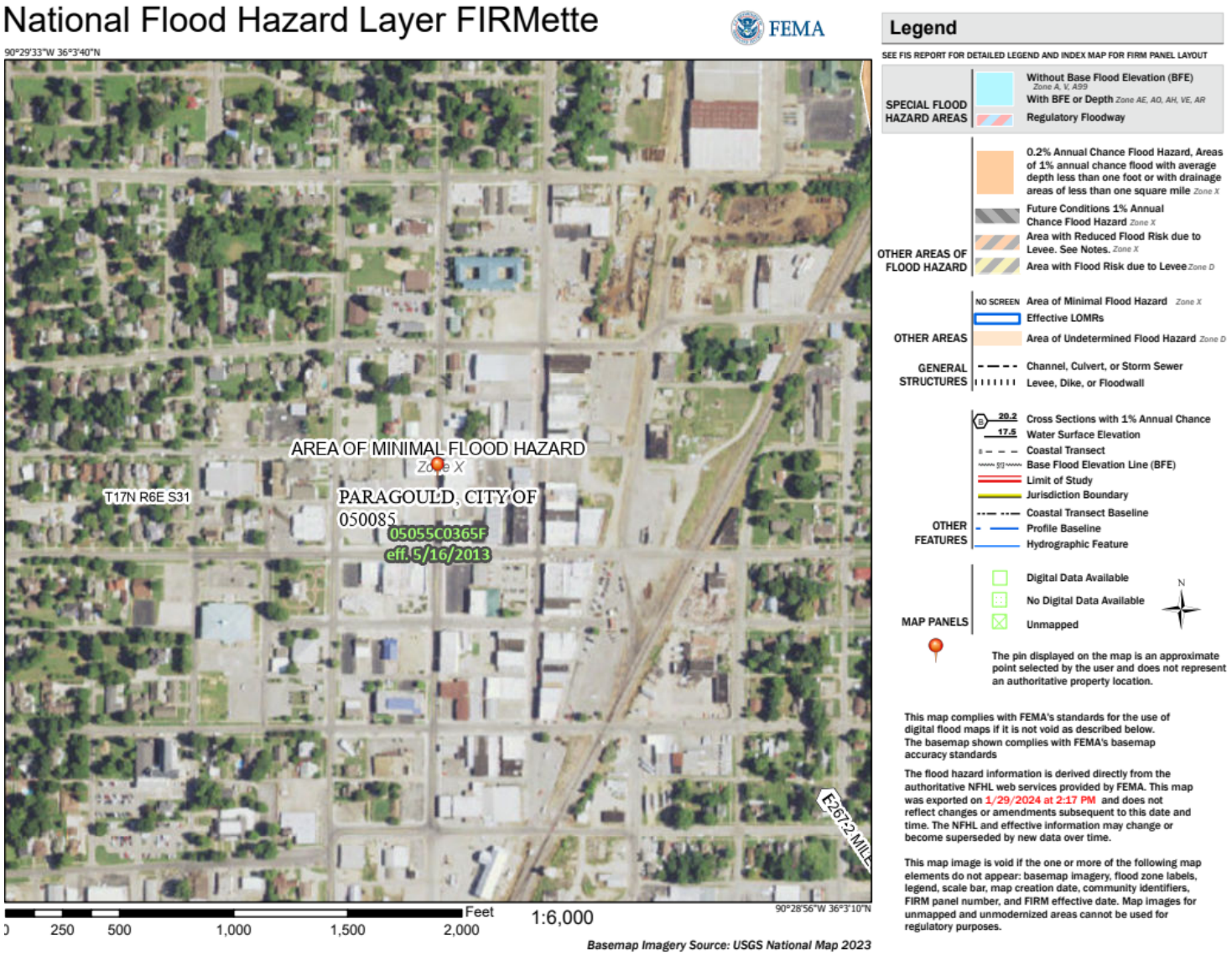
Greene County Tech Middle ★, Intermediate ★, Elementary ★, and Junior High Schools ★ FEMA Firm map



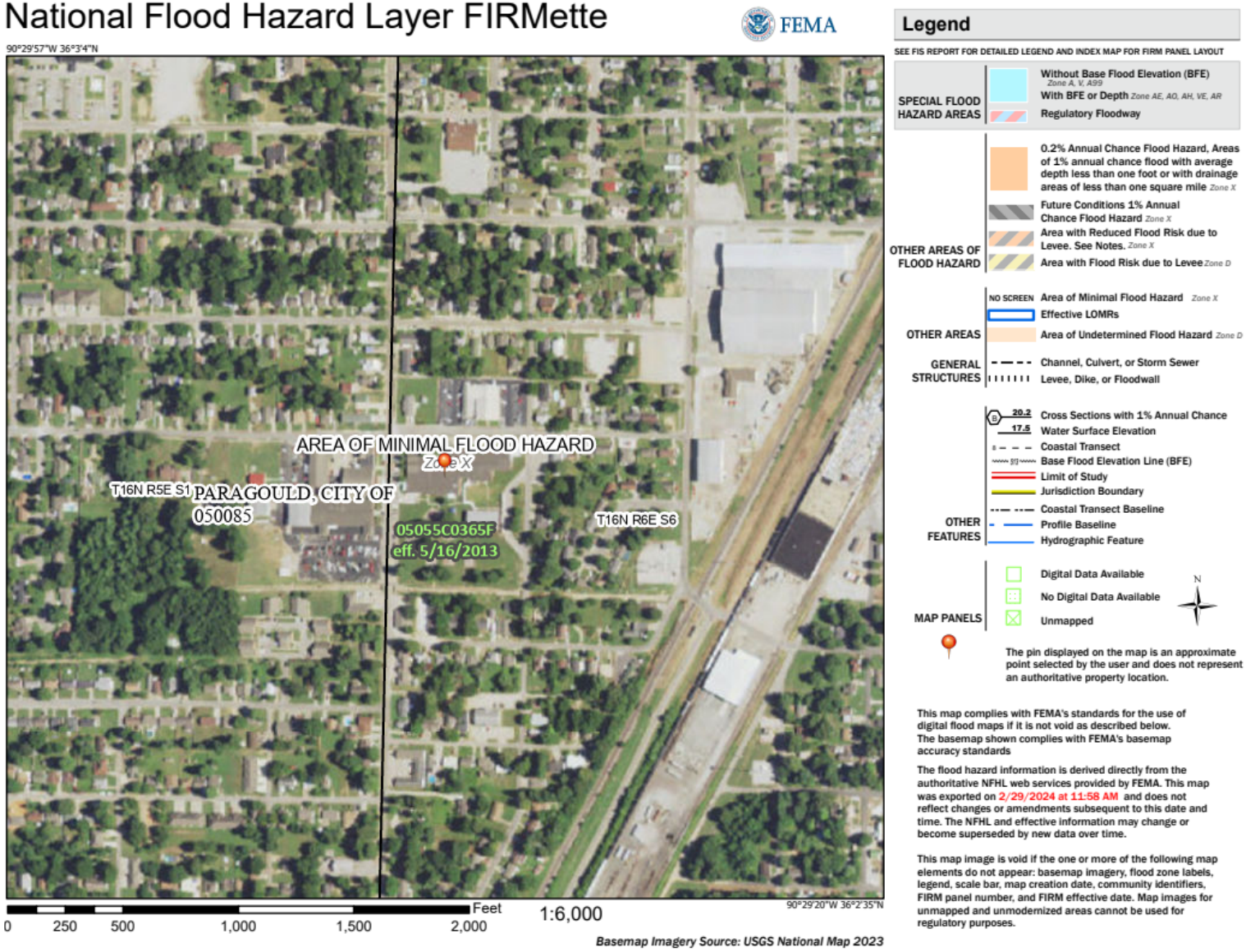
Green County Tech High School FEMA Firm map



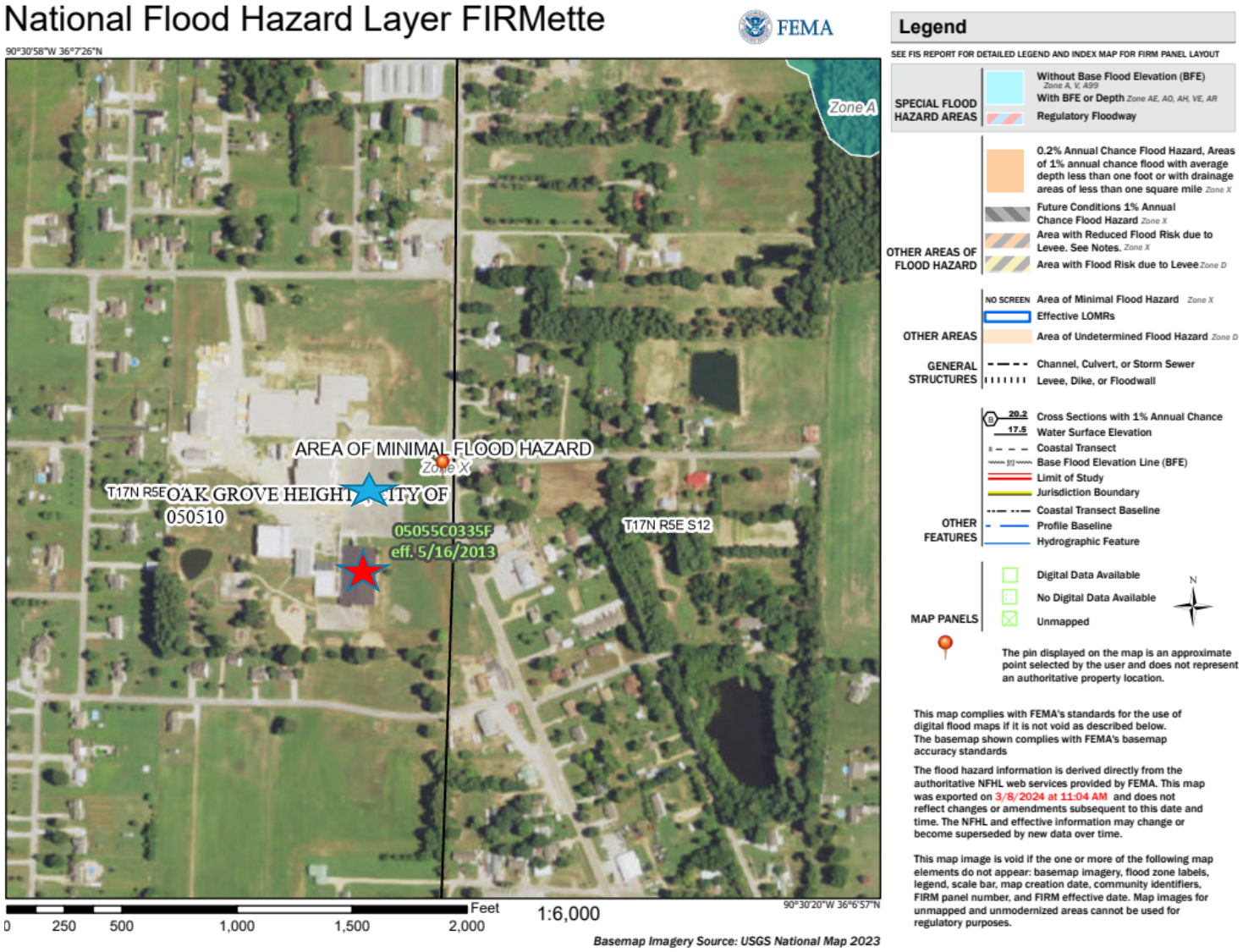
Paragould – FEMA Firm map



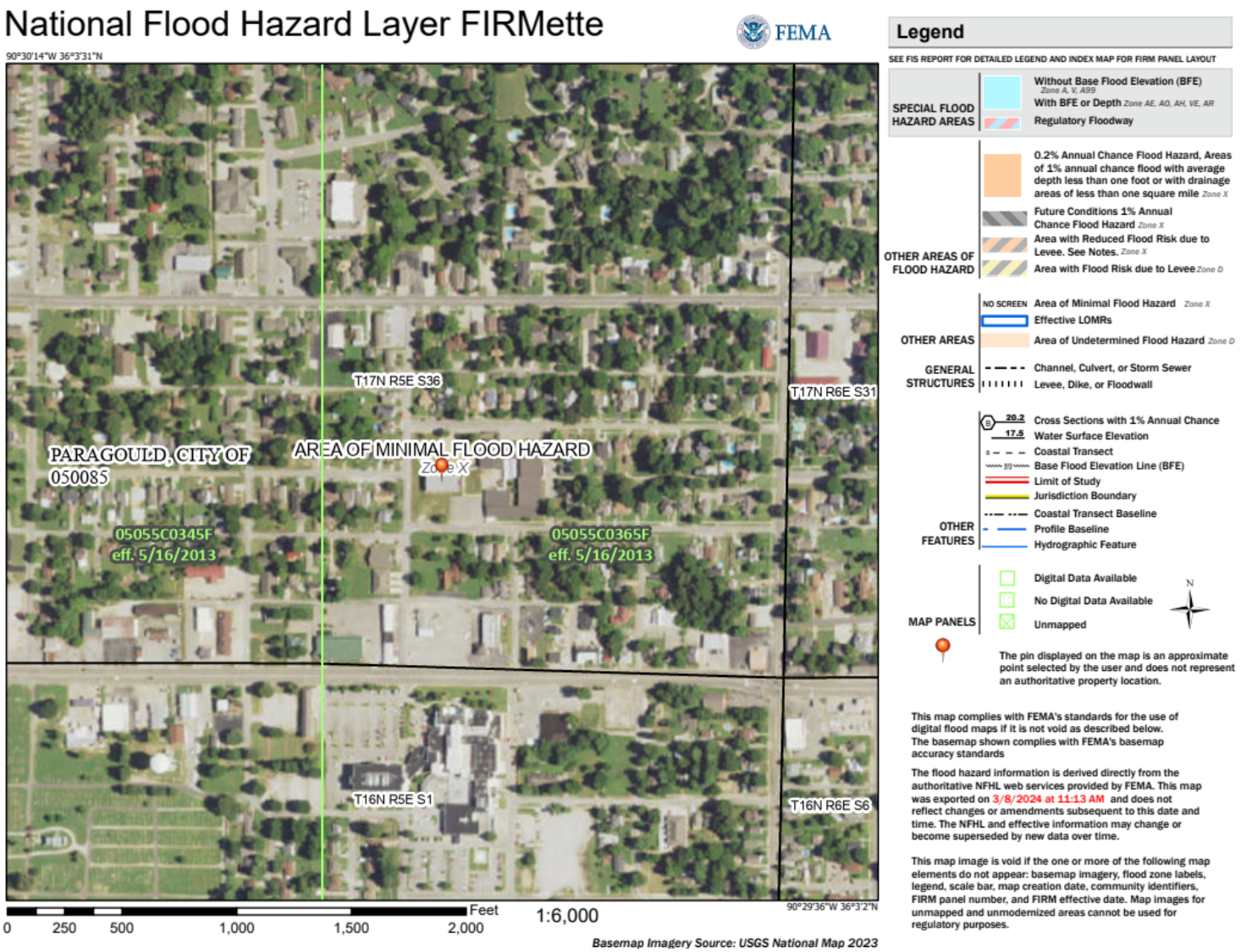
Paragould School District Baldwin Elementary- FEMA Firm map



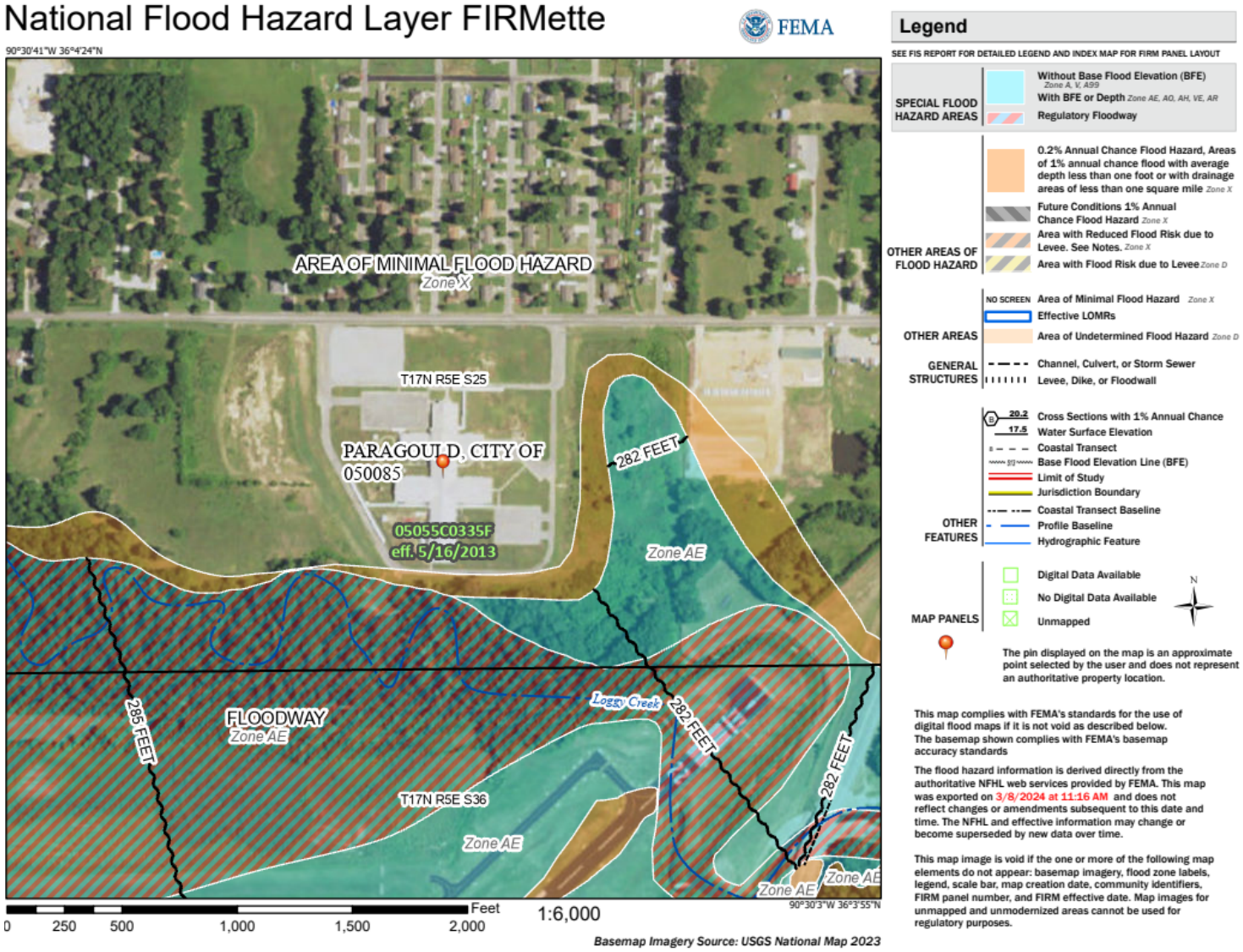
Paragould School District Oak Grove Middle and Oak Grove Elementary - FEMA Firm map



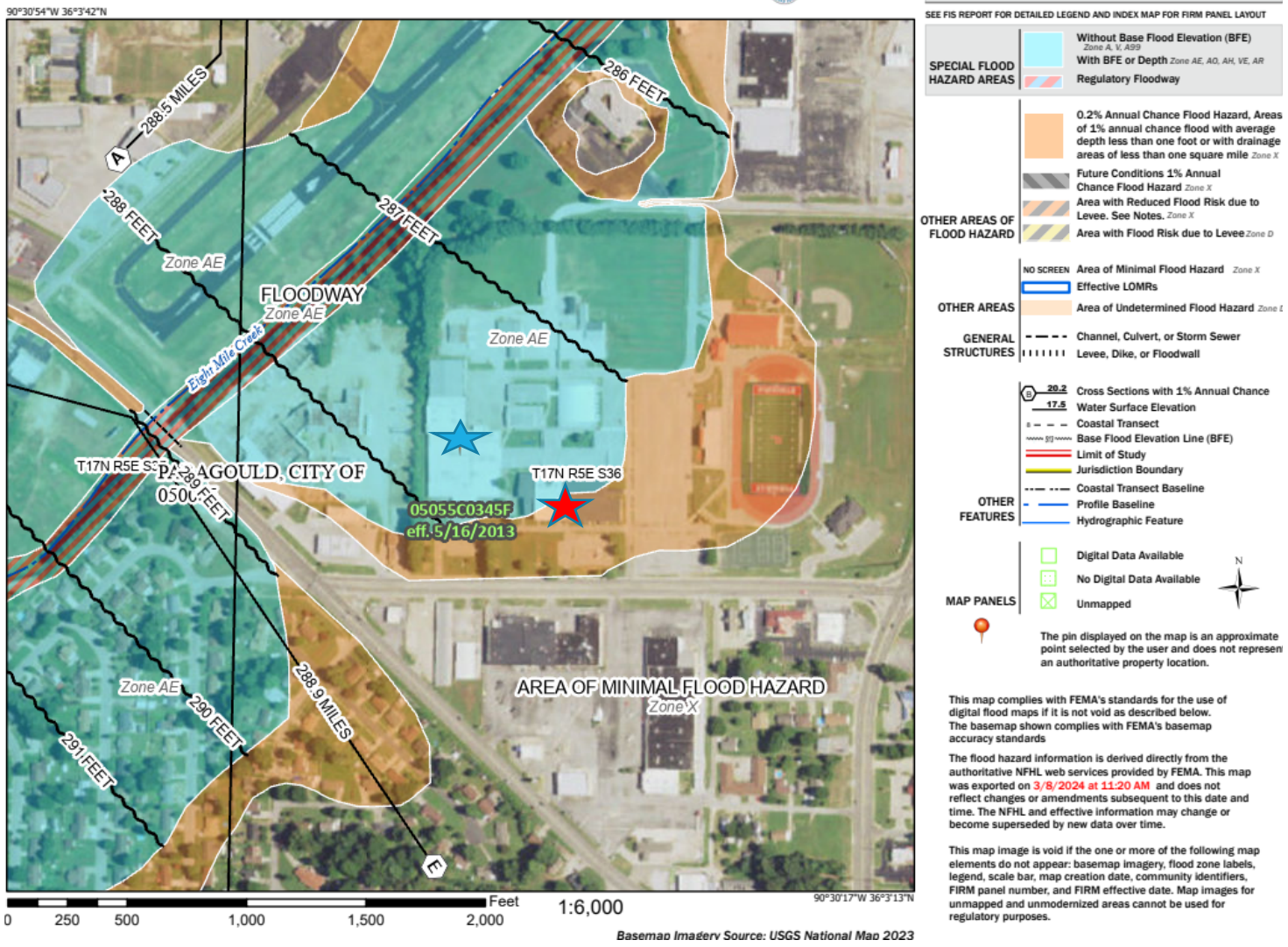
Paragould School District Woodrow Wilson Elementary - FEMA Firm map



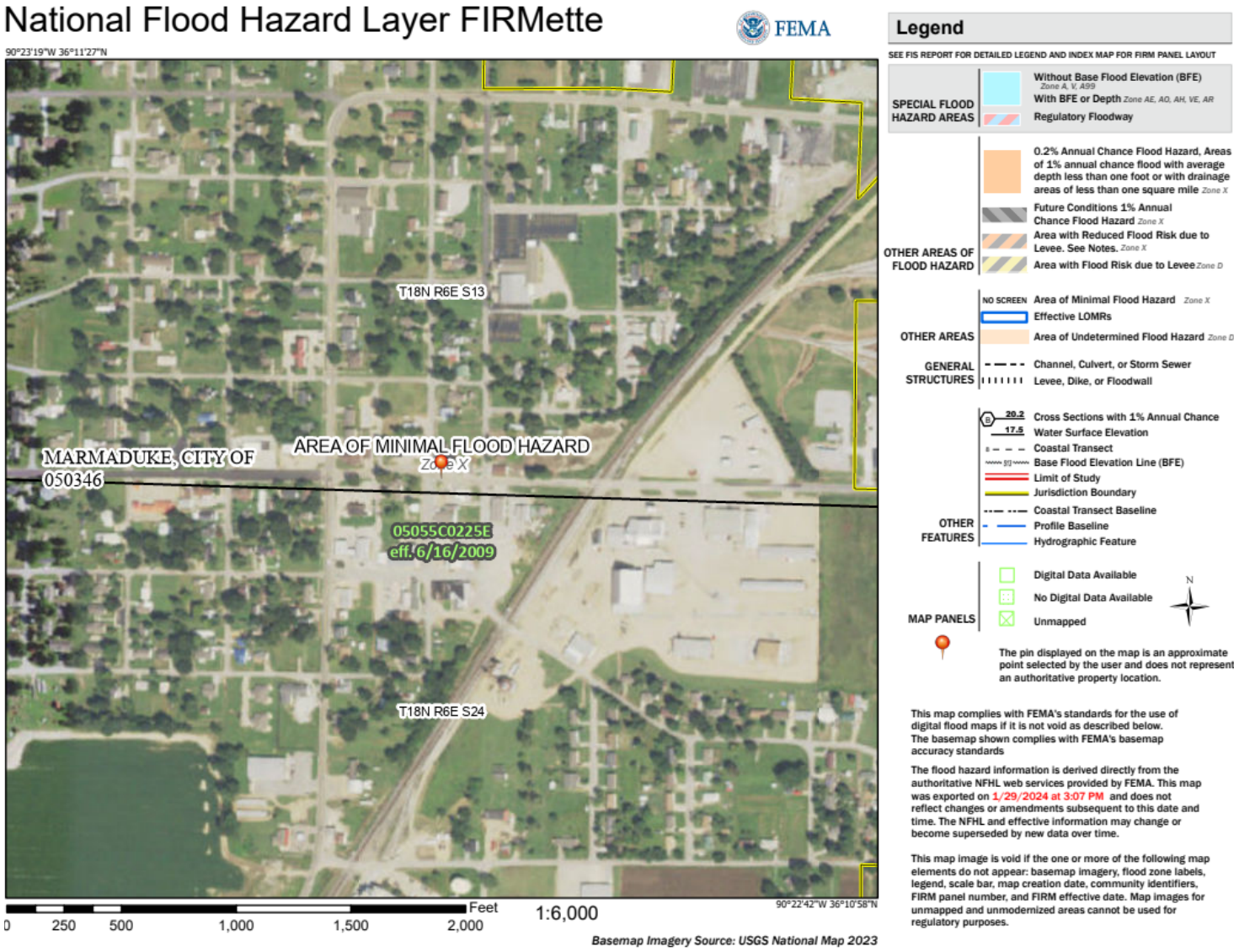
Paragould School District Primary School - FEMA Firm map



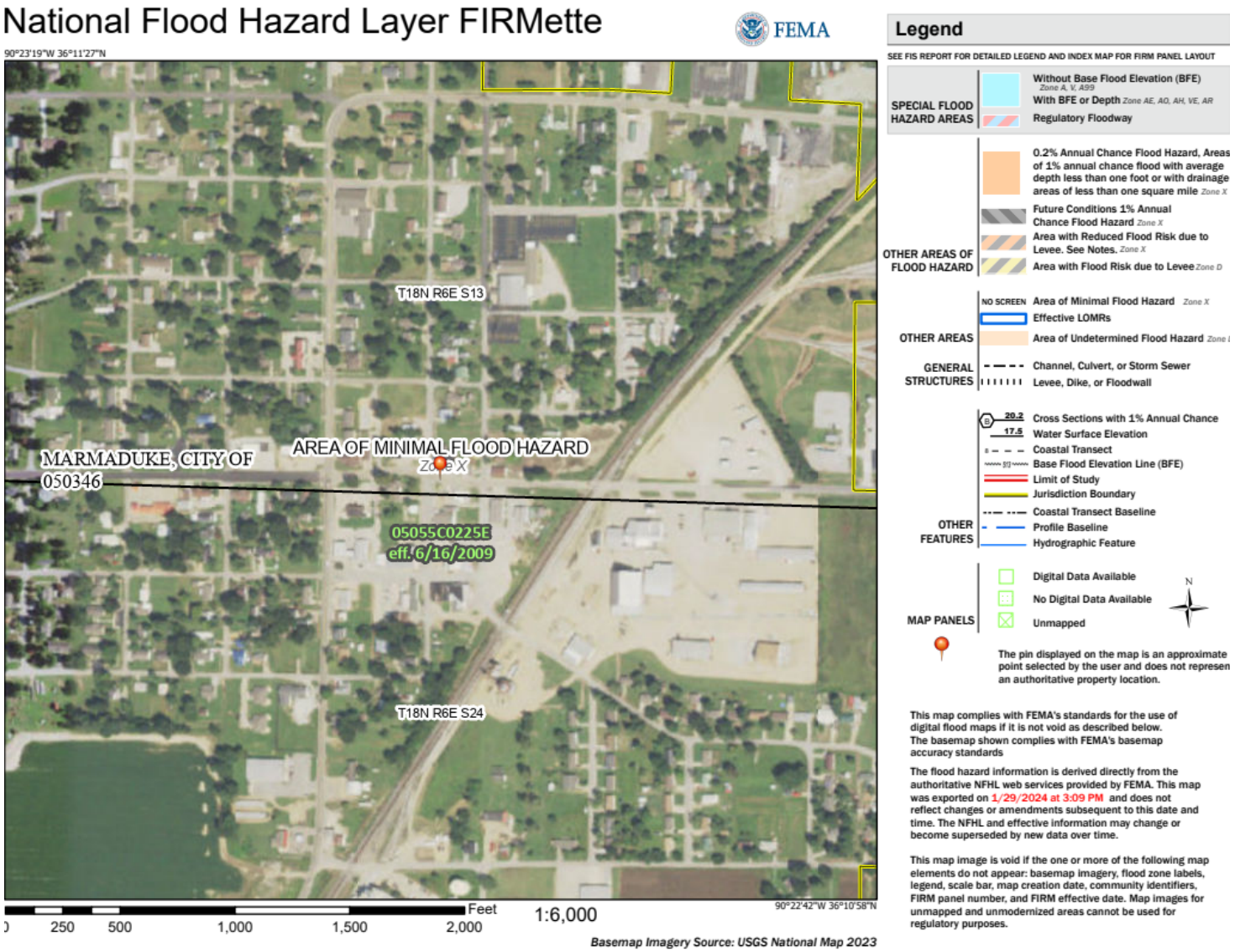
Paragould School District Junior High and High Schools - FEMA Firm map



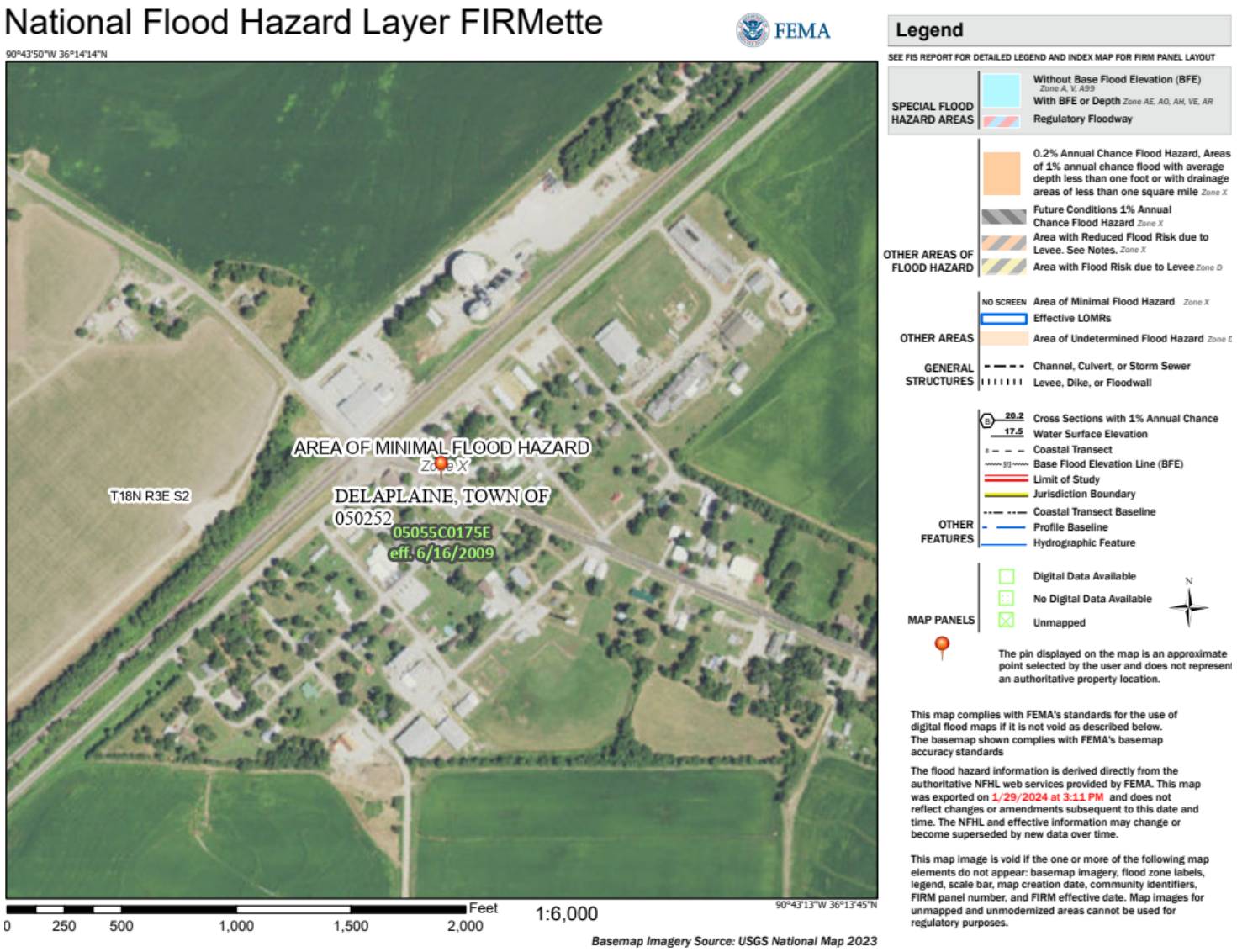
Marmaduke- FEMA Firm map



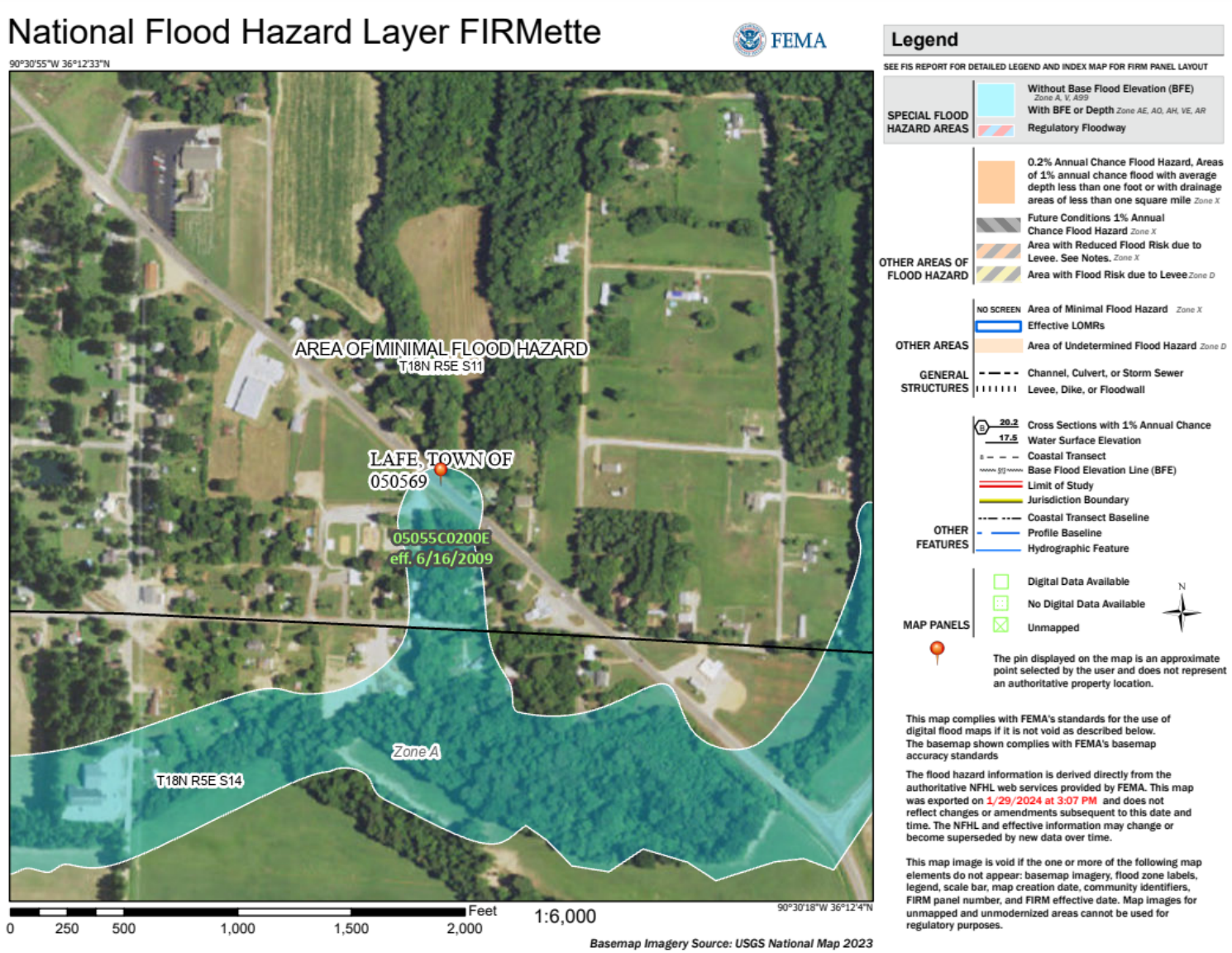
Marmaduke School District- FEMA Firm map



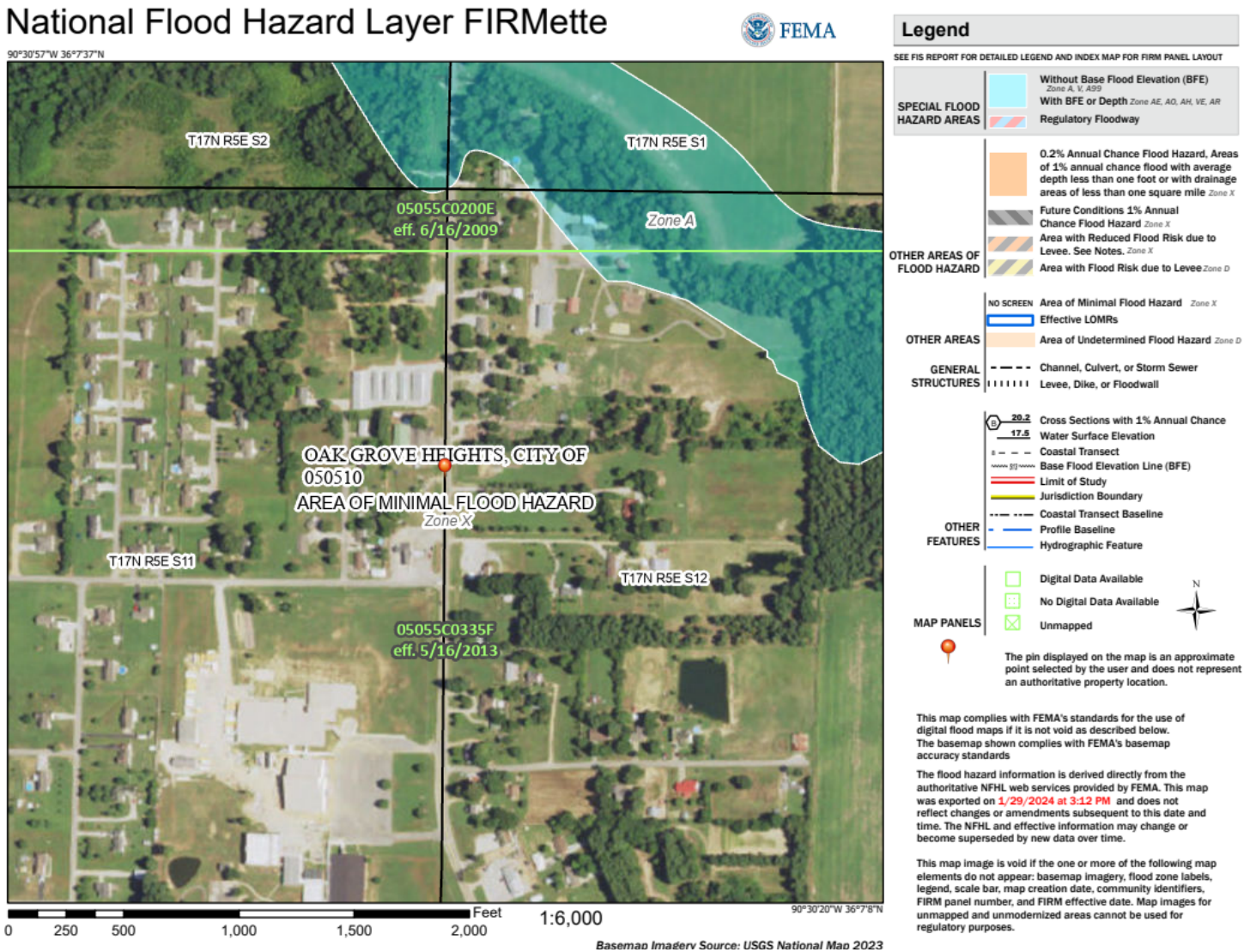
Delaplaine- FEMA Firm map



Lafe- FEMA Firm map



Oak Grove Heights- FEMA Firm map



3.4.4.3.a Extent, Magnitude or Severity of Flooding

Several cities in Greene County, including Oak Grove Heights, Paragould, and Marmaduke as well as the school districts Greene County Tech School District, Paragould School District, and Marmaduke School District can expect flash flooding events when receiving 3" or more of rainfall or at site-specific locations.

Paragould - East and West of US Hwy 49 N flooding can exceed a flood depth of 5 feet. North and South of West Kings Hwy the flood depth can exceed a flood depth of 5 feet.

Marmaduke - North of AR Hwy34 E flooding can exceed a flood depth of 5 feet. South of AR 34 Hwy E the flood depth can reach a depth between 3-4 feet.

Oak Grove Heights – East of Hwy 135 N flooding can exceed a flood depth of 5 feet. West of Hwy 135 N the flood depth can reach a flood depth of 3- 4 feet.

Lafe – No flood risk

Delaplaine – No flood risk

Greene County Tech School District-contains several areas historically affected by flooding with depths exceeding six feet. Documented flood-prone areas include:

- East of Lake Ditch Road and Levee Road – areas subject to deep flooding associated with overbank flow.
- West of Lake Ditch Road and south of County Road 901 along the St. Francis River – recurring flood impacts with depths exceeding six feet.
- Along the Village Creek Ditch between County Road 715 and County Road 920 – localized flooding documented in past flood events.
- Along Eagle Mill Creek between Bigl Road and Carroll Road – areas exhibiting high flood susceptibility.
- Between Highway 139 and County Road 834, north of County Road 835, and between Greene 846 Road and Highway 139 – locations where flood depths of six feet or greater have been observed.

Marmaduke School District- includes an area of historical flooding with depths exceeding six feet, located east of County Road 811.

Paragould School District - contains multiple areas historically affected by flooding with depths exceeding six feet.

- East of Highway 135 North along Jacks Creek and Johnson Creek, where recurring flood impacts have been recorded.
- West of Highway 49 North between Country Club Road and Medical Drive, exhibiting flood depths of six feet or greater.
- West of North Rocking Chair Drive between Fairview Road and north of Randles Road, where high-water depths have been observed.
- Both east and west of Highway 49 North between Road 523 North and County Road 841, identified as flood-prone areas during past flood events.

3.4.4.3.b Climate Change

Climate change has been addressed by scientists for many years as being a rising cause for flooding issue. According to the IPCC (Intergovernmental Panel on Climate Change) climate change has had a detectable influence on rainfall, snow melts, and floods. The Environmental Protection Agency has stated specifically, in the upcoming decades Arkansas will become warmer and the state will most likely experience more floods and droughts. These changes in climate are more likely to increase inland flooding particularly in areas like those in Greene County which run along major rivers. New housing developments, roads, and schools are increasingly susceptible to flash flooding, emphasizing how climate change, population shifts, and land use patterns are collectively heightening flood vulnerability. Currently, there is not enough data to support any mitigation measures that truly can have a large impact at this time.

3.4.4.4 Previous Flood and Flash Flooding Occurrences

There have been 37 flash floods and 7 flood events throughout Greene County since 1950. Greene County has experienced over 9 million dollars in property damages from all recorded flood and flash flood events. Flooding has also caused 30.00K in crop damage. Most of the crop damage can be located in the rural areas of Greene County. However, it is difficult to record all damages as they may not be reported for several reasons, including minor or unnoticeable deterioration of property. Some events can be found in detail below.

3.4.4.5 Probability of Future Flooding

Greene County has < 1% probability of a future flood event and 31% likelihood of a flash flood in any given year.

3.4.4.6 Impact and Vulnerability of Flooding

There are numerous ways that flooding could impact Greene 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 automobiles and homes are overtaken quickly by fast-rising flood waters. Homes, personal belongings, and businesses can be damaged or lost entirely because of the ravages of flooding. People may be unable to get to work, creating a loss of income and a lack of services they would provide.

There are multiple floodplain streams throughout the Greene County Planning Area. The major streams in the Greene County planning area are the Cache and St. Francis rivers as well as the Eight Mile Creek. Greene County's entire eastern and western boundaries are defined by the aforementioned rivers while the Eight Mile Creek helps to drain floodwaters from inside the City of Paragould.

Listed are other areas in which flooding can affect Greene 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 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 water 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.

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.

3.4.4.7 Addressing Repetitive Loss Properties

FNIP Participation Details as of January 2017						
Community	Community ID Number	Init FHBM Identified	Init FIRM Identified	Curr Eff Date	Reg-Emer Date	Tribal
Greene County	50435	12/13/1977	6/16/2009	5/16/2013	7/20/2011	NO
Paragould	50085	9/7/1973	6/15/1978	5/16/1978	6/15/1978	NO
Marmaduke	50346	4/11/1975	6/1/1978	6/16/2009	6/17/09(s)	NO
Lafe	50569	7/10/199	6/16/2009	6/16/2009	7/10/1980	NO
Oak Grove Heights	50510	12/13/1977	6/16/2009	5/16/2013	7/27/2011	NO
Delaplaine	-	-	-	-	-	-
Paragould SD	-	-	-	-	-	-
Greene County Tech	-	-	-	-	-	-
Marmaduke SD	-	-	-	--	-	-

Repetitive Loss Properties Type		
Community	Property Type	Number of Repetitive Losses
Paragould	Single Family Residency	4
Paragould	Non- Residential (Commercial)	1
Marmaduke	N/A	None
Lafe	N/A	None
Oak Grove Heights	N/A	None
Delaplaine	N/A	None

3.4.5 Thunderstorms

3.4.5.1 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, 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 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.

Thunderstorm Winds- Damaging winds are often called "straight-line" winds to differentiate the damage they cause from tornado damage. Strong thunderstorm winds can come from several different processes. Most thunderstorm winds that cause damage at the ground level 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 damaged path extending for hundreds of miles.

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

All areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District have experienced Thunderstorm events and are equally at risk.

3.4.5.3.a Extent, Magnitude or Severity of Thunderstorm, Lightning, Strong Winds and Hail Events

All jurisdictions of Greene County 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. Thunderstorms winds with a category 5 may be more than 70 mph.

Extreme Weather Madness Thunderstorm Criteria

Thunderstorm Types	Rainfall Rate/hr.	Max Wind Gust	Hail Size	Peak Tornado Possibility	Lightning Frequency (5 min Intervals)	Darkness Factor	Storm Impact
T-1 - Weak Thunderstorms or Thundershowers	.03"-.10"	<25 MPH	None	None	Only a few strikes during the storm.	Slightly Dark. Sunlight may be seen under the storm.	1. No Damage. 2. Gusty winds at times.
T-2 – Moderate Thunderstorms	.10"-.25"	25-40 MPH	None	None	Occasional 1-10	Moderately Dark. Heavy downpours may cause the need for car lights.	1. Heavy downpours. 2.Occasional lightning. 3. Gusty winds. 4. Very little damage. 5.Small Tree branches may break. 6. Lawn furniture moved around.
T-3 – Heavy Thunderstorms Singular or lines of Storms	.25"-.55"	40-57 MPH	¼" to ¾"	EF0	Occasional to Frequent 10-20	Dark. Car lights used. Visibility low in heavy rains. Cars may pull off the road.	1. Minor Damage. 2. Downpours that produce some flooding on streets. 3. Frequent lightning could cause house fires. 4. Hail occurs within the downpours 5. Small branches are broken. 6.Shingles are blown off roofs.
T-4 – Intense Thunderstorms Weaker supercells Bow Echoes or lines or Storms	.55"-1.25"	58-70 MPH	1" to 1.5"	EF0-EF2	Frequent 20-30	Very Dark. Car lights used. Some streetlights come on.	1. Moderate Damage. 2. Heavy rains can cause flooding to stream and creeks. Roadway flooding. 3. Hail can cause dents on cars and cause crop damage. 4. Wind damage to trees and buildings. 5. Tornado Damage. 6. Power outages
T-5 – Extreme Thunderstorms Supercells with Family of tornadoes. Derecho Windstorms	1.25"-4"	>70 MPH	1.5" to 4"	EF3-EF5	Frequent to Continuous >30	Pitch Black. Streetlights come on. House lights may be used.	1. Severe damage to trees and property. Damage is widespread. 2. Flooding rains. 3. Damaging Hail 4. Damaging wind gusts to trees and building. 5. Tornadoes F3-F5 or family of tornadoes can occur. Tornadoes can cause total devastation. 6. Widespread power outages.

AccuWeather.com by Sr. Meteorologist Henry Margusity

3.4.5.3.b Climate Change

Research in the last decade has shown that climate change is making the air warmer, which then increases moisture in the air, and with this combination of factors can boost the chance of thunderstorms, lightning, strong winds, and hail events. Population growth in mobile home communities and older housing stock without reinforced roofing or storm shelters elevates the risk of injury and property damage. The spread of development into formerly open areas also increases the number of utility lines, communication towers, and residential structures exposed to high wind damage. As such, climate, development, and demographic trends are all contributing to an increased impact of thunderstorm-related hazards on vulnerable populations and infrastructure.

Understanding Severe Thunderstorm Risk Categories

Thunderstorms	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 all 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
• Winds to 40 mph • Small hail	• Winds 40-60 mph • Hail up to 1" • Low tornado risk	• One or two tornadoes • Reports of strong winds/wind damage • Hail ~1", isolated 2"	• A few tornadoes • Several reports of wind damage • Damaging hail, 1-2"	• Strong tornadoes • Widespread wind damage • Destructive hail, 2"+	• Tornado outbreak • Derecho

*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.

3.4.5.4 Previous Thunderstorm, Lightning, Strong Winds and Hail Events

Event	Event Total	Fatalities	Injuries	Property Damage	Crop Damage
Hail	103	0	0	$1.11M	$0k
Lightning	3	2	4	$1.155M	$0
Thunderstorm Winds	135	0	1	$85.5K	$0

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

In any given year there is a 130% chance of a hail event, 11% chance of a lightning event, and a 115% chance of a thunderstorm wind event occurring.

3.4.5.6 Impact and Vulnerability of Thunderstorm Events

All structures in the County 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 break trees many times disrupting service, and structural fires. Lightning can possibly cause death and injuries. Wind and lightning can damage communication towers located throughout the County.

Hailstorms events are frequent in the County 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. The entire County is subject to thunderstorm events where usually high winds, lightning and hail are involved.

Greene County and all participating jurisdictions

There are concentrations of manufactured homes, unreinforced masonry homes, older construction types located in the unincorporated areas of Greene 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 no 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 Greene County.

The unincorporated areas of Greene County are concerned about the communication system and electric grid during thunderstorms. During thunderstorms, the community can lose power and communication capabilities. This threatens the safety of the community and hinders response operations. Thunderstorms also can cause crop damage which is also of concern to the communities.

3.4.6Tornado

3.4.6.1 Description of a Tornado

A tornado is a rapidly rotating vortex or funnel of air extending to the 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. Frequently, the weakest of hurricanes produce the most tornadoes (Bryant, 1991).

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.

3.4.6.2. Locations of Tornado Events

Because there is no defined geographic hazard boundary, all people and property in Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District are exposed to the risk of damage from Tornadoes. Based on the short 50-year dataset, no clear areas of high tornado occurrence occur at any County scale. Thus, although tornado risk appears to vary at a statewide scale, variable tornado risk at the County scale cannot be demonstrated. Thus, mapping variations in tornado risk at a local or County scale is not currently possible. For 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.

3.4.6.3.a 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. Since 2007, the EF Scale has been used to rate tornadoes.

3.5.8.3.b Climate Change

There is no doubt that the climate is changing, and the warmer temperatures are causing the United States to see a rise in storms and experiencing thousands of tornadoes each year. However, it was not until the mid-1990's that a Doppler radar network was created in the USA for the detection of tornadoes. The data that is needed to predict whether climate change will influence the frequency and power of tornadoes does not exist at this time. According to the national geographic scientists must first study the severe weather ingredients to determine if they support the development of

super cell thunderstorms and the effects of climate change. The growth of residential development especially mobile and manufactured homes in rural areas increases the number of vulnerable structures and residents exposed to tornado damage. Greene County's expanding population places additional strain on emergency services and shelter resources during such events. Without widespread access to safe rooms, especially in unincorporated and socioeconomically disadvantaged areas, the impact of tornadoes on life safety and housing is intensified.

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 100m (109 yd); cars thrown and large missiles generated; incredible phenomena will occur.

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

3.4.6.4. Previous occurrences

There have been a reported 33 tornadoes between 1950 and 2023, resulting in 2 Death and 62 injuries as well as $32.829M in property damage and $0.00k in crop damage.

3.4.6.5. Probability of Future Tornadoes

There is a 29% chance of a Tornado impacting Greene County in any given year.

3.4.6.6 Impact of Tornado

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

Residential Home Damage Classes		
Degree of Damage (DOD)		**Expected Wind Speed (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.gov

The methodology for the potential loss estimate was developed by using past hazard events data from the NCDC. The following are 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 occurred in Greene County in 1950 - 2023. A more detailed analysis is presented in the *Greene County Emergency Operations Plan, v.3*.

Craighead County Tornadoes											
Location	County/Zone	St	Date	Time	TZ	Type	Mag	Dth	Inj	PrD	CrD
Greene County	Greene County	AR	06/29/1954	14:10	CST	Tornado	F2	0	0	0.00K	0.00K
Greene County	Greene County	AR	04/03/1957	12:05	CST	Tornado	F2	0	0	0.25K	0.00K
Greene County	Greene County	AR	04/03/1957	12:05	CST	Tornado	F3	0	0	25.00K	0.00K
Greene County	Greene County	AR	01/24/1964	14:42	CST	Tornado	F2	0	2	250.00K	0.00K
Greene County	Greene County	AR	11/26/1965	19:30	CST	Tornado	F3	0	0	250.00K	0.00K
Greene County	Greene County	AR	04/13/1967	18:36	CST	Tornado	F2	0	2	2.500M	0.00K
Greene County	Greene County	AR	04/03/1968	19:44	CST	Tornado	F3	1	6	2.500M	0.00K
Greene County	Greene County	AR	09/28/1974	17:15	CST	Tornado	F1	0	0	25.00K	0.00K
Greene County	Greene County	AR	03/29/1976	17:20	CST	Tornado	F2	0	0	25.00K	0.00K
Greene County	Greene County	AR	03/19/1984	13:40	CST	Tornado	F1	0	0	250.00K	0.00K
Greene County	Greene County	AR	04/29/1984	18:35	CST	Tornado	F1	0	0	25.00K	0.00K
Walcott	Greene County	AR	07/05/1995	00:12	CST	Tornado	F0	0	0	10.00K	0.00K
Paragould	Greene County	AR	07/23/1995	15:25	CST	Tornado	F0	0	0	20.00K	0.00K
Fontaine	Greene County	AR	03/01/1997	16:45	CST	Tornado	F3	1	5	500.00K	0.00K
Light	Greene County	AR	05/09/1998	17:40	CST	Tornado	F1	0	0	50.00K	0.00K
Lafe	Greene County	AR	01/17/1999	16:30	CST	Tornado	F0	0	0	1.00K	0.00K
Bethel	Greene County	AR	01/17/1999	16:35	CST	Tornado	F1	0	0	25.00K	0.00K
Evening Star	Greene County	AR	01/21/1999	16:30	CST	Tornado	F1	0	0	75.00K	0.00K
Marmaduke	Greene County	AR	01/21/1999	20:50	CST	Tornado	F0	0	0	5.00K	0.00K
Schug	Greene County	AR	01/21/1999	21:50	CST	Tornado	F0	0	0	10.00K	0.00K
Evening Star	Greene County	AR	05/09/2000	15:05	CST	Tornado	F0	0	0	1.00K	0.00K
Lafe	Greene County	AR	10/18/2004	16:10	CST	Tornado	F0	0	0	1.00K	0.00K
Evening Star	Greene County	AR	10/18/2004	17:57	CST	Tornado	F0	0	0	5.00K	0.00K
Paragould	Greene County	AR	10/18/2004	18:10	CST	Tornado	F0	0	0	1.00K	0.00K
Delaplaine	Greene County	AR	04/02/2006	16:46	CST	Tornado	F3	0	47	25.000M	0.00K
Bard	Greene County	AR	06/13/2011	11:10	CST-6	Tornado	EF1	0	0	120.00K	0.00K
Marmaduke	Greene County	AR	03/25/2017	00:34	CST-6	Tornado	EF0	0	0	250.00K	0.00K
Finch	Greene County	AR	08/20/2018	16:27	CST-6	Tornado	EF1	0	0	500.00K	0.00K
Marmaduke	Greene County	AR	08/20/2018	16:51	CST-6	Tornado	EF0	0	0	50.00K	0.00K
Hooker	Greene County	AR	05/02/2019	15:29	CST-6	Tornado	EF0	0	0	30.00K	0.00K
Bard	Greene County	AR	03/28/2020	16:25	CST-6	Tornado	EF1	0	0	300.00K	0.00K
Marmaduke	Greene County	AR	07/01/2020	11:50	CST-6	Tornado	EF0	0	0	0.00K	0.00K
Gainesville	Greene County	AR	05/04/2021	01:09	CST-6	Tornado	EF0	0	0	25.00K	0.00K
							Totals:	**2**	**62**	**32.829M**	**0.00K**

3.4.6.7. Vulnerability and Estimating Potential Loss

All areas, residents, structures, and critical facilities in Greene County Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District are of high risk of tornado events. Because there is no defined geographic hazard boundary, all people and property in Greene County are exposed to the risk of damage from tornadoes. All structures in Greene County are vulnerable to tornadoes. The most vulnerable to tornadoes are wood frame structures and 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 and 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 childcare centers, individuals with disabilities, etc.) are in about every section of the County. Long term care facilities/nursing homes are in Greene County. There are numerous schools (public and private) and childcare centers (licensed and unlicensed) are located in Greene County.

The various Greene County school districts 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 by school closings.

All areas of Greene County, including cities of Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, and school districts within the County would be affected due to the lost power, water, sewer, gas, and communications as well as potential structural damage. 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.

3.4.7 Winter Storm

3.4.7.1 Description of Winter Storm

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

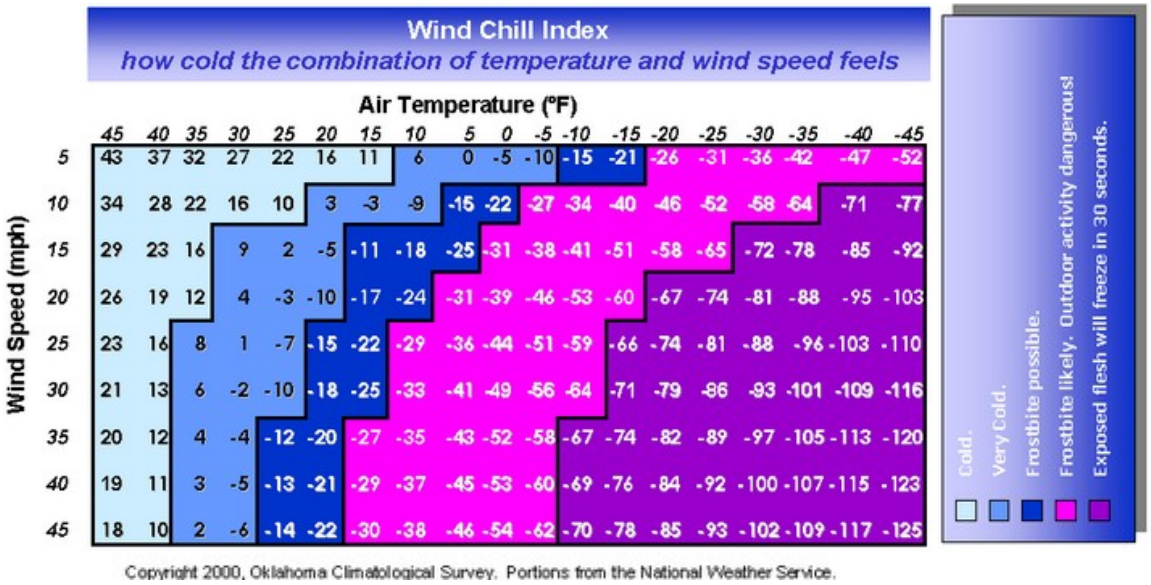
3.4.7.2 Location of Winter Storm Events

All areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District are equally susceptible to severe winter storms.

3.4.7.3.a Extent, Magnitude or Severity of Winter Storms

In past occurrences all areas of Greene County have experienced wind chill temperatures as low as -15 degrees Fahrenheit, can experience ice accumulation up to 1.25”, and snow accumulation up to 13”.

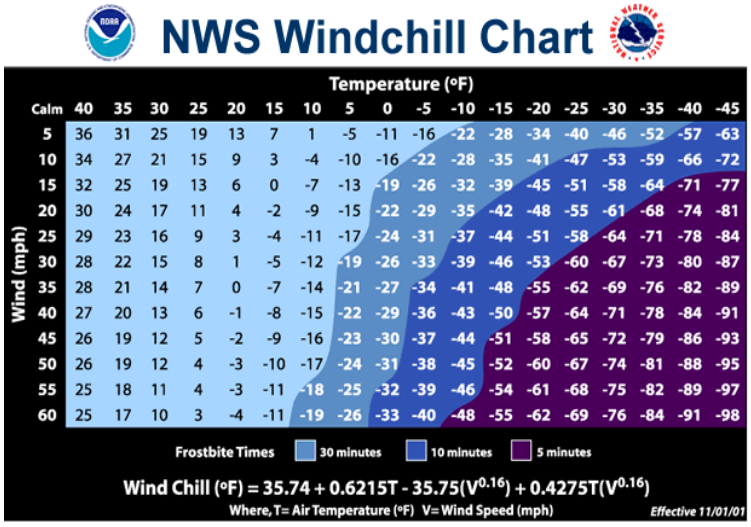
3.4.7.3.b Climate Change



There are many studies that have been completed such as Fosu et al., 2018, Trenberth et al., 2015, and Knutson et al., 2014. All of these studies attribute increases in winter storm risks directly associated to climate change. This data proves a warmer atmosphere holds more water, and storms supplied by climate change with increasing moisture have a chance of producing heavier rain and snow. Most of this evidence is centralized around the mid-west and not the mid-southern communities such as those in Greene County. Population changes have little impact on winter storm vulnerability; however, the aging population and reliance on overhead power infrastructure place more residents at risk of power loss and isolation during storm events. However, there is not enough data to provide a feasible way to mitigate this issue.

According to the National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in Greene 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. When severe winter storm events do occur (the worse typically associated with ice), they are usually wide-spread 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 boards in districts across Greene County report officials monitor and provide weather updates via television, radio, and internet regarding schools opening. If weather becomes hazardous, as determined by the superintendent or other authorized official, then appropriate actions are taken based on students being safely able to attend school. If weather is due to snow or ice, and either is forecasted to become hazardous, by the determination of the school official's school may be cancelled. If weather becomes hazardous after school has started school officials may dismiss school early if road conditions are safe to do so. Students may be kept inside by the determination of the building principals if there are extreme cold temperatures. Wind chill would be the determining factor in keeping students inside. Some districts initiate monitoring for wind chill is below 32 degrees, some 40 degrees.



Winter Storm Watch: severe winter conditions such as heavy snow and/or ice are possible within the next day or two.

Winter Storm Warning: severe winter conditions have begun or are about to begin in your area.

Blizzard Warning: snow and strong winds will combine to produce blinding snow (near zero visibility), deep drifts, and life-threatening wind chill.

Winter Weather Advisory: winter weather conditions are expected to cause significant inconveniences and may be hazardous. if caution is exercised, these situations should not become life- threatening. the greatest hazard is often to motorists.

Frost/Freeze Warning: below freezing temperatures are expected and may cause significant damage to plants, crops, or fruit trees. in areas unaccustomed to freezing temperatures, people who have homes without heat need to take added precautions.

3.4.7.4 Previous Occurrences

There have been 25 winter storm events, 4 ice storm events, and 9 heavy snow events from 1950 – 2022.

3.4.7.5 Probability of Future Winter Storms

In any given year there is a 24% chance of a winter storm, less than 1% chance of an Ice Storm, and 1% chance of heavy snow.

3.4.7.6 Impact of Winter Storms

Greene County experiences a major winter storm about every other year, with sometimes two occurring in a single year. Damage from of winter storms is often not reported to public agencies for recording in databases such as SHELDUS (Spatial Hazard Events and Losses Database for the United States / Arizona State University), typically because the damage is not widespread and usually amounts to no more than downed tree limbs and utility lines and closed schools and businesses caused by icy road conditions.

Based on experience, an estimated three to ten structures might be impacted in any given year by severe winter storm events, resulting typically in only minor damage to the structures, mainly due to limbs breaking and falling on roofs. Winter storms can immobilize an entire County. Six 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 problems during a winter storm. Winter storms can be accompanied by strong winds creating blizzard conditions 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 crop 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. People die of hypothermia from prolonged exposure to the cold. 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. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. 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. Large amounts of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, repairing damage, and loss of business can have large economic impacts on cities and towns.

3.4.7.7 Estimating Potential Losses by Jurisdiction to Severe Winter Weather

The methodology for the potential loss estimate was developed by using past hazard events data from the NCDC. The following are 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.

Winter Events 1950 - 2023	Fatalities	Combined Fatalities, Injuries and Property	Crop Damage
Winter Storm, Ice Storm, Heavy Snow	0	$8.81M in property damage and 0 hazard related injuries	$0

3.4.7.8 Multi-Jurisdictional Risk Assessment

The unincorporated areas of Greene County, and also the cities of Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, and school districts of Paragould School District, Greene County Tech School District, and Marmaduke School District are equally affected by winter storms. Winter Storms do not seem to be unique to areas of the County; the threat is Countywide with no significant variation at the County or jurisdiction levels.

All parts of Greene County are equally susceptible to severe winter storms events. The occurrence of severe winter storms can have a substantial impact on Greene County's buildings, utility systems, transportation systems, and agriculture. Heavy accumulations of ice or snow commonly result in the collapse of structural damage to buildings. Then damage may be caused directly by the excessive weight of the ice/snow accumulation, or by ice-laden trees or branches falling on structures. Homes, businesses, as well as weaker nonresidential structures are most vulnerable to this type of structural damage. The abundant wood structures and manufactured houses in the planning area are much more vulnerable than steel, concrete, or masonry structures. Past storms indicate that poultry houses are particularly vulnerable.

Heavy accumulations of ice from ice storms or heavy snow can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communication and power can be disrupted for days or weeks while utility companies repair the damage. Power and communication disruptions are common consequences of ice storms and heavy snow in Greene County. Winter Storms are sometimes accompanied by strong winds. These winds can knock down trees, utility poles and power lines.

Greene County's transportation systems are vulnerable to severe winter storms. These storms have rarely been hazardous to structural damage in the past, but accumulations of ice and snow can be extremely hazardous to motorists. Motorists in Greene County are not accustomed to driving on icy roads, causing an increase in traffic accidents. Travel is hampered by ice or heavy snow because Greene County lacks the necessary snow removal equipment due to the occurrence of severe winter storms.

The entire County is usually affected when a winter storm hits Greene County. Parts of the County may not be affected as badly as others, but when major roads are affected, it affects the travel flow and the availability of essential services throughout the County.

SECTION 4

Mitigation Strategy

The Greene County Hazard Mitigation plan includes a mitigation strategy that provides the Greene 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 Districts 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 Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District each are different in terms of staffing, funding, policies, and

programs 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 flood prone areas through land use planning, implement retrofit construction plans, brace equipment, and provide emergency preparedness information to area residents through FEMA, ADEM, and OEM-designed brochures.

Unincorporated areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District 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.

Greene County would need to seek outside financial resources for the development of a Countywide flood inundation study. This study would benefit the Unincorporated areas of Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District 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 Greene 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 Greene County believes is a long-term vision for reduction and enhancement of mitigation capabilities:

- Goal 1 - Reduce the potential for loss of life, injury and economic damage created by exposure to natural hazard for residents of Greene 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 of following disasters.
- Goal 3 - Seek grants for mitigation projects through the State and Federal funding.
- Goal 4 - Protect existing properties from natural disasters.

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 STAP 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 STAP.

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 Greene County Office of Emergency Management (OEM) 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 OEM 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 Greene County actions are the responsibility of the director of the Greene County Office of Emergency Management or the County Judge; local jurisdictional actions are the responsibility of their respective mayors. The Greene County school districts will be responsible for their school board administrations and/or superintendents.

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 developing the Greene 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)

4.3 Mitigation Actions/Projects

Mitigation Actions

Action: *Purchase heavy-duty generators to back-up and maintain electrical power for critical facilities, schools, and shelters and to maintain power and water supply during disasters.*
Associated Hazard(s): Earthquake, Extreme Heat, Flood, Thunderstorm, Tornado, 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 EMPG Funding
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Construct safe rooms within new and existing public buildings, such as schools, libraries, and community centers.*
Associated Hazard(s): Thunderstorm, 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 minimizes the effects post hazard events. Ranked high due to past storm events
Addresses New or Existing buildings: New and Existing
Cost Benefit: Benefits outweigh cost. Possible grants for construction
Timeline: 5 Years
Projected Resources: HMGP funding
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech, and Marmaduke School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Install hail resistant roofing and window coverings, shutters laminated glass in windowpanes with a focus on critical infrastructure.*
Associated Hazard(s): Thunderstorm (Hail), Tornado
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/ thunderstorms
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial, minimum cost to owner
Timeline: 5 Years
Projected Resources: Existing County and Local Resources
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech, and Marmaduke School District
Action adopted: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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

Associated Hazard(s): Extreme Heat, Winter Storms (Ice Storms), Thunderstorm and 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 minimizes the effects post hazard events. Ranked high due to past storm events
Addresses New or Existing buildings: Existing
Cost Benefit: Benefits outweigh cost. Possible grants for refurbishment
Timeline: 2 Years
Projected Resources: HMGP funding
Responsible Party: Emergency Management, County and City Governments Offices
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine

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Action: *Use designed failure mode for power line design to allow line to fall or fail in small sections rather than as a complete system to enable faster repairs.*
Associated Hazard(s): Winter Storms (Ice Storms), Tornado, Thunderstorm
Type of Action: Prevention Action
Contribution to Mitigation Objective: Prevents strong winds and ice causing trees from falling 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 rights-of-way either County or City
Timeline: 5 Years
Projected Resources: Existing County and Local Resources
Responsible Party: Local Utility Companies
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine

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Action: *Purchase of all-hazard NOAA weather radios and place in all schools, city halls, churches, assisted living facilities, hospitals, nursing homes, day care facilities, churches, businesses, industries, etc. where large numbers of people congregate; provide information to public on importance of having and how to acquire.*
Associated Hazard(s): Drought, Earthquake, Extreme Heat, Flooding, Thunderstorm, Tornado, 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 others 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: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, Marmaduke School District

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Action: *Implement Weather Warning early telephone warning system designed to automatically deliver targeted hazard notifications for the immediate threats within moments of being issued by the National Weather Service (NWS) or other official source throughout the County.*
Associated Hazard(s): Drought, Earthquake, Extreme Heat, Flooding, Thunderstorm, Tornado, 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 Local Resources
Responsible Party: Greene County
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Brace equipment (such as mechanical equipment, chillers, and emergency generators) whose failure may disrupt the operation of a critical facility, such as hospitals, government offices, and schools.*
Associated Hazard(s): Flooding, Tornado, Thunderstorm and Earthquakes
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 Years
Projected Resources: Existing County, State and Local Resources
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Apply window film to windows in public schools and public buildings as able to prevent shattering.*
Hazard Associated(s): Earthquake, Thunderstorm, Tornados.
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to injuries due to broken glass
Priority: Medium
Rationale for Priority: thunderstorm winds and tornados have been an issue several times in the past. There are possibilities for future earthquake events.
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
Timeline: 3 years
Projected Resources: County funds to develop plan HMPG funding
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine,
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine,

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Action: *Create a database within each fire district (rural and municipal) to track those individuals at high risk of death, such as the small children, elderly, shut-ins, homeless, and those requiring medical attention or medical equipment that require transportation to heating or cooling centers.*
Hazard Associated(s): Drought, Extreme Heat, Winter (Ice Storms)
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due extreme heat or winter/ice storms
Priority: High
Rationale for Priority: extreme heat and winter/ice storms have created problems in the past with the lack of cooling equipment or lack of electricity during winter/ice storms.
Addresses New or Existing buildings: N/A
Cost Benefit: Highly beneficial, at little cost.
Timeline: 1 year
Projected Resources: Little or no funding required
Responsible Party: Greene County and municipal/rural fire departments/districts
Action adopted by: Greene County

Action: *Provide emergency preparedness and mitigation information and resource for extreme weather conditions through an active education outreach program with specific plans and procedures for at risk populations*
Hazard Associated(s): Drought, Earthquake, Extreme Heat, Flooding (Flash Flooding), Thunderstorms (winds, lightning, hail) Tornado, and Winter (Ice Storms)
Type of Action: Public Education and Awareness

Contribution to Mitigation Objective: Prevent loss of life and property by preparing at risk population for possible future hazards.
Priority: Medium
Rationale for Priority: Action to inform the public prior to hazard events
Addresses New or Existing buildings: New and existing.
Cost Benefit: Highly beneficial, at little cost.
Timeline: 1 year
Projected Resources: FEMA, ADEM, OEM brochures/outreach material and methods and time
Responsible Party: Greene County Office of Emergency Management (OEM)
Action adopted by: Greene County

Action: *Use GIS to map hazard areas, at-risk structures, and associated hazards to assess high risk areas.*
Hazard Associated(s): Earthquake and Flood (Flash Flooding)
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due to hazard events
Priority: High
Rationale for Priority: Pinpointing areas that are high risk to earthquake, and flood flash/flood
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
Timeline: 1 year
Projected Resources: County funds
Responsible Party: Greene County Office of Emergency Management (OEM)
Action adopted by: Greene County

Action: *Develop a Countywide drought communication plan and early warning system to facilitate timely communication of relevant information to officials, decision makers, school administration, emergency management director, and the public on how to conserve water and other pertinent information.*
Hazard Associated(s): 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.
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

Action: *Pass a county ordinance to prioritize or control water use, particularly for emergency situations in order to make more water available for firefighting.*
Hazard Associated(s): Drought
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk due to water shortages
Priority: Medium
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: Greene County Quorum Court
Action adopted by: Greene County

Action: *Establish and/or maintain/update Memorandums of Understanding (MOUs) with adjacent communities designed to source additional sources of water or response to incidents affecting the county.*

Hazard Associated(s): Drought
Type of Action: Prevention
Contribution to Mitigation Objective: Reduces the risk to lives due to water shortages
Priority: Medium
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.
Responsible Party: Greene County Quorum Court
Action adopted by: Greene County

Action: *Create a local seismic safety committee to provide policy recommendations evaluate and recommend changes in seismic safety standards and give an annual assessment of local and statewide implementation of seismic safety improvements*
Hazard Associated(s): Earthquake
Type of Action: Prevention
Contribution to Mitigation Objective: Assist the risk of the hazard
Priority: High
Rationale for Priority:
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
Timeline: 2 years
Projected Resources: County funds to develop plan.
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

Action: *Establish school survey procedures and guidance documents to inventory structural and non-structural hazards in and around school buildings.*
Hazard Associated(s): Earthquake
Type of Action: Prevention
Contribution to Mitigation Objective: Actions that will keep problems from getting worse.
Priority: High
Rationale for Priority: Earthquake damage is possible
Addresses New or Existing buildings: New and existing
Cost Benefit: Highly beneficial, at little cost.
Timeline: 1 year
Projected Resources: Little or no additional funding required
Responsible Party: School districts
Action adopted by: Paragould School District, Greene County Tech School District, and Marmaduke School District.

Action: *Find alternate means to assign probability when no events have occurred.*
Associated Hazard(s): Earthquake
Type of Action: Prevention
Contribution to Mitigation Objective: Help planning team and community to understand risk.
Priority: Low
Rationale for Priority: Earthquake
Cost Benefit: NA
Timeline: 5 years
Projected Resources: no additional funding required
Responsible Party: Planning Team
Action adopted by: Greene County

Action: *Pass Ordinance requiring all critical facilities to meet requirements of Executive Order 11988 and be built 1-foot above the 500-year flood elevation.*

Associated Hazard(s): Flood (Flash Flooding)
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 pp. 259,345, B-797
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

Action: *Acquire properties that are in flood zones that have been deemed Repetitive or Severe Repetitive Loss Properties through grant funding.*
Associated Hazard(s): Flood (Flash flooding)
Type of Action: Structural
Contribution to Mitigation Objective: Protects life and property
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 out ways cost
Timeline: 3 Years
Projected Resources: Guidance from FEMA Resources/Publications FEMA and the NFIP
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine

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Action: *County and local road departments/public works 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(s): Flood (Flash Flooding)
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, County and City road departments/public works
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine

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Action: *Conduct countywide community NFIP workshops and for newly elected officials and public the National Flood Insurance Program Summary of Coverage FEMA F-679/November 2012.*
Associated Hazard(s): 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: Greene County is prone to flooding.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial at no cost.
Timeline: 1-2 years
Projected Resources: FEMA F-679 online free brochures, NFIP outreach material
Responsible Party: Greene County and City Floodplain Management
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine

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Action: *Install surge protection and/or lightning protection devices on all communications infrastructure and critical facilities.*
Associated Hazard(s): Thunderstorm (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: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech, and Marmaduke School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Provide public questionnaires and information concerning hazard mitigation for public engagement through various online media.*
Hazard Associated(s): Drought, Earthquake, Extreme Heat, Flooding (Flash Flooding), Thunderstorms (winds, lightning, hail) Tornado, and Winter (Ice Storms)
Type of Action: Public Outreach
Contribution to Mitigation Objective: Education and Research
Priority: High
Rationale for Priority: Proven to **s**ave lives and lessen property damage and gather public understanding.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly beneficial, low to no costs.
Timeline: 2 years
Projected Resources: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District
Responsible Party: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Disclosing the location of high-risk areas to buyers*. *Offering GIS hazard mapping online for residents and design professionals.*
Hazard Associated(s): Earthquakes and Flooding.
Type of Action: Prevention
Contribution to Mitigation Objective: Eliminates the fuel for wildland fires
Priority: Medium
Rationale for Priority: Proven to save lives and lessen property damage.
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: 5 Years
Project Resource: EMPG Funding
Responsible Party: Greene County
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Conduct research regarding repetitive and severe repetitive loss properties within Greene County and the cities of Aubrey, Haynes, LaGrange, Marianna, and Rondo*
Associated Hazard(s): 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: Greene County is prone to flooding.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial at no cost.
Timeline: 1-2 years
Projected Resources: FEMA F-679 online free brochures
Responsible Party: Greene County and City Floodplain Management
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District

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Action: *Conduct research regarding possible flood zones that are in unmapped NFIP unincorporated areas of Greene County and the cities of Aubrey, Haynes, LaGrange, Marianna, and Rondo*
Associated Hazard(s): Flood
Type of Action: Public education, awareness, and research.
Contribution to Mitigation Objective: Education residents on the need of flood insurance.
Priority: High
Rationale to Priority: Greene County is prone to flooding.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial and does cost.
Timeline: 1-2 years
Projected Resources: EMPG Funding
Responsible Party: Greene County and City Floodplain Management
Action adopted by: Greene County, Paragould, Marmaduke, Oak Grove Heights, Lafe, Delaplaine, Paragould School District, Greene County Tech School District, and Marmaduke School District.

Action: *Collaborate with the Mayor and county officials to review the feasibility and benefits of re-enrolling in the National Flood Insurance Program (NFIP).*
Associated Hazard(s): 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: Greene County is prone to flooding.
Addresses New or Existing buildings: New and Existing
Cost Benefit: Highly Beneficial at no cost.
Timeline: 5 years
Projected Resources: FEMA F-679 online free brochures
Responsible Party: Greene County and City Floodplain Management
Action adopted by: Delaplaine and Marmaduke

SECTION 5

Acronyms

ADA	Average Daily Attendance
ADEM	Arkansas Division of Emergency Management
BCA	Benefit-Cost Analysis
BMPs	Best Management Practices
GCOEM	Greene County Office of Emergency Management
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
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
STAP	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 Greene County Hazard Mitigation Plan.

6.1 Resolutions

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JAN 2 2 2026

PHYLLIS RHYNES
GREENE COUNTY CLERK

RESOLUTION NO. 2026-2

Greene County Multi-Jurisdiction Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR GREENE COUNTY, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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, Greene 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 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts.

NOW, THEREFORE, BE IT RESOLVED THAT the Greene County Quorum Court hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the **Emergency Management Director, Michael McCammon,** 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 20TH DAY OF JANUARY 2026.

APPROVED:

Rusty A. McMillon

Greene County Judge, Rusty A. McMillon

ATTEST:

Phyllis Rhynes

Greene County Clerk, Phyllis Rhynes

RESOLUTION NO. 2026-3

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE TOWN OF DELAPLAINE, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Town of Delaplaine desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Delaplaine City Council hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 January, 2026.

APPROVED:

Emily Sisco
Mayor of Delaplaine

ATTEST:

Mary King
Recorder/Treasurer

RESOLUTION NO. 2026-1

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE TOWN OF LAFE, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Town of Lafe desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Lafe City Council hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 February, 2026.

APPROVED:

Ralph Oglesby Jr.
Mayor of Lafe, Ralph Oglesby, Jr.

ATTEST:

Denise Knuckles
Recorder/Treasurer, Denise Knuckles

RESOLUTION NO. 01202026

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE CITY OF MARMADUKE, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Marmaduke desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Marmaduke City Council hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 20th day of January, 2026.

APPROVED:

Mayor of Marmaduke

ATTEST:

Betty Jackson
Treasurer/Recorder

RESOLUTION NO. 2026- 5

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE CITY OF PARAGOULD, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Paragould desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Paragould City Council hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 29th day of January, 2026.

APPROVED:

Josh Agee, Mayor

ATTEST:

Kylie Reynolds, City Clerk

RESOLUTION NO. 2026-193

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE TOWN OF OAK GROVE HEIGHTS, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Town of Oak Grove Heights desires to prepare and mitigate for such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Oak Grove Heights City Council hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 29th day of January 2026.

APPROVED:

Rudy Hanner

Mayor of Oak Grove Heights

ATTEST:

Susan Rollins

Recorder/Treasurer

RESOLUTION

Greene County Multi-Jurisdictional All-Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE GREENE COUNTY TECHNICAL SCHOOL DISTRICT, IN GREENE COUNTY, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Greene County Technical 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 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

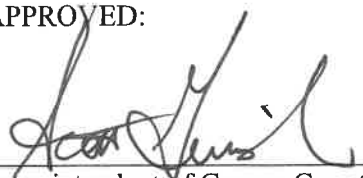
WHEREAS, to assist cities and counties in meeting this requirement, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically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

NOW, THEREFORE, BE IT RESOLVED THAT the Greene County Technical School District School Board hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

Appoints the Emergency Management Director, Michael McCammon, 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 19th day of February, 2026.

APPROVED:



Superintendent of Greene County Tech

ATTEST:

School Board President of Greene County Tech

RESOLUTION

Greene County Multi-Jurisdiction Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE PARAGOULD SCHOOL DISTRICT IN GREENE COUNTY, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Paragould 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 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Paragould School District hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

While content related to the Paragould School District may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the Paragould School District to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

APPROVED and ADOPTED on this 19th day of January, 2026, by a vote of:

7 in favor, 0 against, and 0 abstaining

APPROVED:

Nick Dankovich
Print Name

Signature

ATTEST:

Jeremy Hancock
Print Name

Signature

RESOLUTION NO. 011226

Greene County Multi-Jurisdiction Hazard Mitigation Plan

A RESOLUTION ADOPTING THE HAZARD MITIGATION PLAN FOR THE MARMADUKE SCHOOL DISTRICT IN GREENE COUNTY, ARKANSAS.

WHEREAS, certain areas of Greene County, Arkansas, 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 Marmaduke 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 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, Greene County, Arkansas, with the assistance of the East Arkansas Planning & Development District has initiated development of a multi-jurisdiction Hazard Mitigation Plan for the counties and all jurisdictions in the counties, specifically the cities and school districts;

NOW, THEREFORE, BE IT RESOLVED THAT the Marmaduke School District hereby adopts those portions of the Plan relating to and protecting its jurisdictional area against all hazards; and

While content related to the Marmaduke School District may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the Marmaduke School District to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

APPROVED and ADOPTED on this 12TH day of JANUARY 2026, by a vote of:

4 in favor, Ø against, and Ø abstaining

APPROVED:

Chuck Long
Print Name

Signature

ATTEST:

Bill Muse
Print Name

Signature

References

1. Source: Title 44 CFR §201.6
2. Source: Title 44 CFR §201.2 Mitigation Planning - Definitions
3. http://greenecounty.arkansas.gov/county-history
   County Source: 2015 Small Area Income and Poverty Estimates (SAIPE), https://www.census.gov/data/developers/data-sets/Poverty-Statistics.html?intcmp=serp; City Source: 2011-2015 American Community Survey 5-Year Profiles, https://www.census.gov/programs-surveys/acs/?intcmp=serp tps://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf
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5. Ark. Code Ann. § 14-268-101 et seq.
6. https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=ALL&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1950&endDate_mm=02&endDate_dd=28&endDate_yyyy=2018&county=GREENE%3A35&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=5%2CARKANSAS
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9. Subchapter 2 of Chapter 22 of Title 15 of the Arkansas Code of 1987, as amended, authorizes the Arkansas Natural Resources Commission to develop and enforce rules and regulations governing the design and operation of dams in the State., http://www.anrc.arkansas.gov/divisions/water-resources-management/dam-safety https://www.FEMA.gov/media-library-data/20130726-1803-25045-4819/st_broomelv.pdf
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