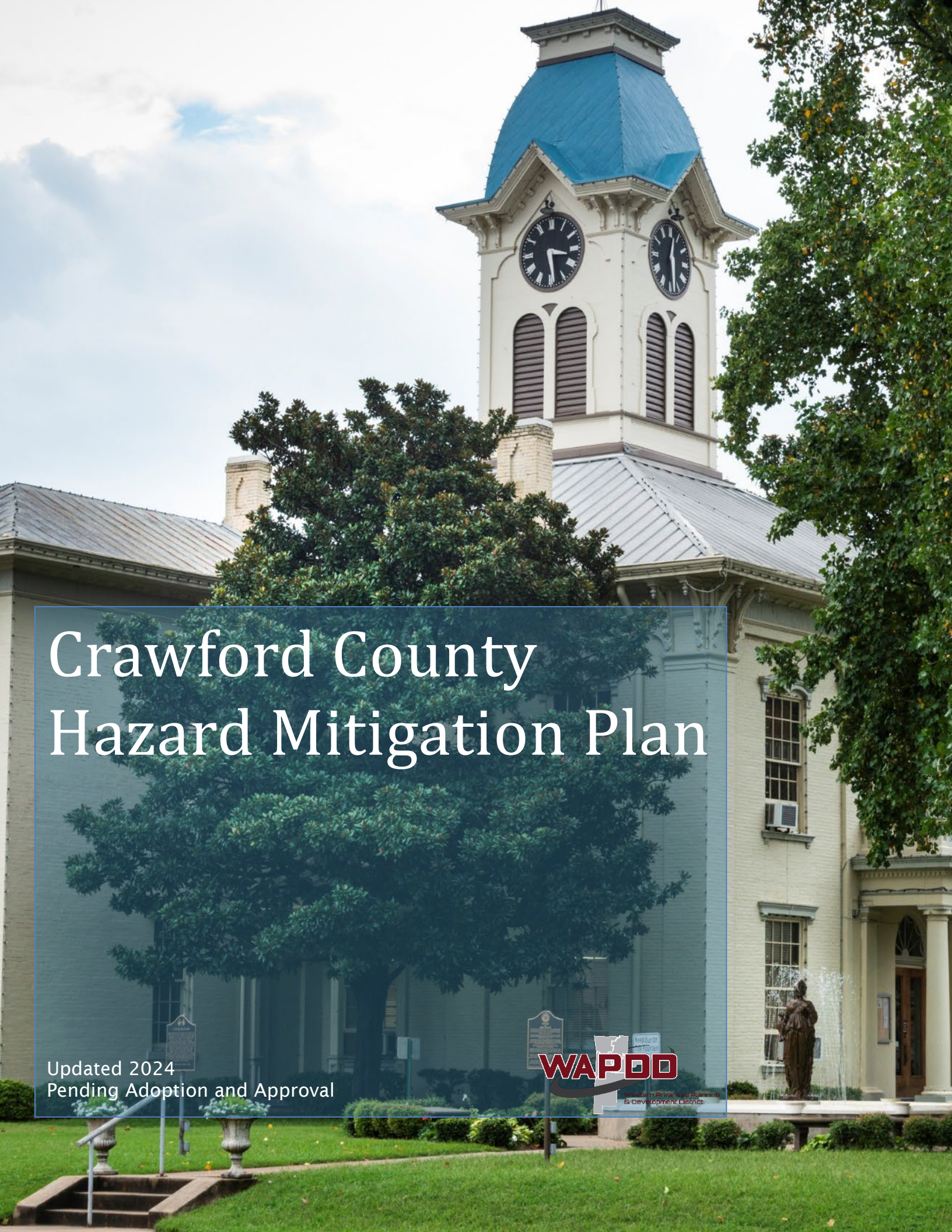


Crawford County Hazard Mitigation Plan

Updated 2024
Pending Adoption and Approval

WAPDD
Western Arkansas Planning & Development District

Table of Contents

Table of Tables

Table of Graphics

SECTION 1: Planning Process

1.1 Plan Introduction

Hazard mitigation is sustained action taken to reduce or eliminate long-term risk to people and their property from hazards. Hazard mitigation planning is the process State, Tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and property from future hazard events.

The occurrence of floods, hurricanes, tornadoes, winter storms, earthquakes, wildfires and other hazardous events are inevitable. These events can cause damage to the ecological environment; fire can destroy forests, high winds and tornadoes can uproot trees, earthquakes can alter the landscape, and floods can quickly reclaim natural floodplains.

We cannot prevent natural hazards; we do have some means to reduce some of their adverse consequences. We have tools and techniques which allow us to avoid the worst-case scenario when a hazard does occur. By managing the characteristic of the existing and future human environment in a community before a hazardous event occurs, we can mitigate many of its negative impacts so that a disaster is less likely to result or will at least be of diminished magnitude.

The Crawford 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. Risk Assessment
3. Mitigation Strategy
4. Plan Maintenance
5. Plan Update
6. Plan Adoption
7. Appendices

This plan is multi-jurisdictional with a planning area that includes all unincorporated Crawford County, municipalities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester and the school districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren.

All jurisdictions and school districts 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 Crawford County Office of Emergency Management. Planning team members actively participated in meetings, solicited input from members of their communities, and ensured that all jurisdiction information was reflected in the plan.

1.2 Schedule of Activities for Plan Development

Crawford County's planning process for this Hazard Mitigation Plan Update was initiated in October 2023, when the County contracted with Western Arkansas Planning and Development District to facilitate their mitigation planning efforts. Western Arkansas Planning and Development District served as facilitator and Crawford County Office of Emergency Management led the planning effort.

Multiple planning events were scheduled throughout the planning process. Meeting materials are available from WAPDD upon request.

November 2, 2023 - Kickoff Meeting. Each aspect of the Planning Process was discussed. Guidelines for the mitigation plan were discussed as well as 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. Participants were provided with worksheets to be completed by each jurisdiction.

Task 1: Determine Planning Area and Resources
Task 2: Build Planning Team and Create Outreach Strategy
Task 3: Review Community Capabilities
Task 4: Conduct Risk Assessment
Task 5: Develop Mitigation Strategy
Task 6: Review, Revise, and Submit Plan
Task 7: Adopt Plan

November 9, 2023 – Crawford County Intergovernmental Meeting. Crawford County Judge Chris Keith discussed the plan update, outreach efforts, and future meeting.

November 30, 2023 – Risk Assessment and Mitigation Strategy Meeting. A brief overview of the kickoff meeting was followed by a detailed discussion of the steps to be taken to conduct a Risk Assessment. Participants completed a Hazard Identification Worksheet to identify vulnerabilities and potential new mitigation actions.

February 8, 2024 – Crawford County Intergovernmental Meeting. A progress report regarding the plan update was given. There was additional discussion regarding Crawford County's High Risk Dams.

Individual meetings were held with each participating jurisdiction as needed.

November 13, 2023 – Meetings with Mayors of Alma and Cedarville
December 11, 2023 – Meeting with Mayor of Chester
January 25, 2024 - Meetings with Mayor of Kibler and Dyer city employees
February 5, 2024 – Conference call with Mayor of Rudy

1.3 Plan Developers

An initial planning team comprised of representatives from Crawford County and all participating jurisdiction was organized. This initial team was instructed to solicit interested people from their community to participate on the planning team. This solicitation led to the addition of several additional planning team members. The planning team members include representatives from county government, local city governments, public works officials, emergency management officials, fire districts, and school districts. All participating jurisdictions actively participated in the planning process through soliciting input from their communities, participation in meetings, and completion of worksheets. If a city or school district could not attend a meeting, all materials were mailed out to the jurisdiction.

Table 1 - Plan Developers

Jurisdiction	Participation/Involvement
Crawford County	Chris Keith/County Judge-Attended Meetings, Completed Forms Veronica Robins/Emergency Manager-Attended Meetings Tim Linthicum/Onin Staffing-Attended Meetings Sherry Marshall/Ms. AR. Sr. American Pageant-Attended Meetings Angela Volk/District 3 Fire-Attended Meetings
City of Alma	Jim Fincher/Mayor-Attended Meetings Cody Schindler/City Planner-Attended Meetings, Completed Forms Erica Holland/Stepping Stone School-Attended Meetings Teika Wilkins/Stepping Stone School-Attended Meetings
City of Cedarville	Deborah Pinkerton/Mayor-Attended Meetings, Completed Forms
Town of Chester	Lacy Hendrix/Mayor-Attended Meetings
City of Dyer	Lonnie Robins/Public Works-Attended Meetings, Completed Forms Riley Walker/Mayor's Assistant-Attended Meetings, Completed Forms
City of Kibler	Andrew Crow/Mayor- Attended Meetings, Completed Forms
City of Mountainburg	Susan Wilson/Mayor- Attended Meetings, Completed Forms
City of Mulberry	Steve Hurley/Mayor's Assistant- Attended Meetings, Completed Forms Dwayne Fields/Public Works- Completed Forms

Town of Rudy	James Jones/ Mayor – Participated in conference call with WAPDD
City of Van Buren	Joe Hurst/Mayor- Attended Meetings, Wally Bailey/City Planner- Attended Meetings, Completed Forms John Karstens/Street Department- Attended Meetings Kim Brewer/Allied Therapy- Attended Meetings Holli Willis/Legacy Heights- Attended Meetings Jamie Hammond/Police Chief- Attended Meetings
Alma School District	Travis Biggs/Assistant Superintendent of Operations & Support Services- Attended Meetings, Completed Forms
Cedarville School District	Dr. Kerry Schneider/Superintendent- Corresponded with WAPDD and Completed Forms
Mountainburg School District	Dr. Debbie Atwell/Superintendent- Attended Meetings, Completed Forms
Mulberry-Pleasant View School District	Dr. Lonnie Myers/Superintendent- Completed Forms
Van Buren School District	Frank Petray/Director of Transportation- Attended Meetings, Completed Forms Patrick Mays/Director of Technology- Attended Meetings, Completed Forms

1.4 Neighboring Community and Stakeholder Involvement

During the Mitigation Planning Process for Crawford 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 to attend planning meetings. The Van Buren and Alma Chambers of Commerce sent meeting invites to all of their members. These memberships include local businesses, educational providers, and non-profits. Additionally, organizations that serve vulnerable populations were invited to participate in the planning process.

Stepping Stone School – A comprehensive service provider to people with developmental disabilities and their families.

Allied Therapy – Provides developmental, speech-language, occupational, and physical therapy services to children with disabilities ranging in age from birth to 21 years old.

Legacy Heights --All-inclusive retirement community that provides quality home-cooked meals, weekly housekeeping, paid utilities, activities & more.

Memory Lane -- Alzheimer's Special Care Unit with 3 individual units providing 24 hour nursing care.
November 14, 2023 – Fort Smith Regional Alliance (FSRA) held its quarterly meeting. FSRA is made up of representatives from Crawford, Franklin, Johnson, Logan, Scott, and Sebastian Counties in Arkansas and Leflore and Sequoyah Counties in Oklahoma.

November 15, 2023 – Crawford County Broadband Committee held its first meeting. Attendees were provided with a brochure outlining the plan and asked to complete a survey.

December 13, 2023 – WAPDD held its quarterly meeting. Attendees were notified that the Crawford County Hazard Mitigation Plan was being updated and were provided with a brochure outlining the plan and asked to complete a survey. The WAPDD Board includes representatives from Crawford, Sebastian, Franklin, Logan, Scott, and Polk Counties.

February 13, 2024 – Public Meeting was held at Chester. Discussion included potential mitigation actions to address drainage and flooding issues.

1.5 Public Involvement and Review

Surveys were distributed to the public through various outlets. Draft of plan was also made available to the public via the Western Arkansas Planning and Development District website and other sources. The public was invited to view these materials and provide comments via Facebook and other social media, as well as pamphlets distributed throughout Crawford County. Utilizing its Workforce Development Department, WAPDD provided these materials to challenged populations like returning citizens, individuals with disabilities, veterans, homeless individuals, and individuals speaking English as a second language (ESL).

WAPDD and the participating jurisdictions distributed a survey during November-December 2023. These surveys assisted in identifying local hazards and assessing local risk. Much of the information used for determining flooding locations came from these responses. Additionally, comments regarding potential hazard mitigation actions were considered when developing the Mitigation Strategy element of this plan.

1.6 Incorporation of Existing Planning Mechanisms Into Plan

Existing plans, studies, reports, and technical information relevant to mitigation planning were collected and reviewed by planning team members. This information was used to identify existing, planned, and potential mitigation initiatives designed to reduce Crawford County's vulnerability to natural hazards.

A list of all the documents that were reviewed follows.

Table 2 - Incorporation of Existing Planning Mechanisms

Jurisdiction	Planning Mechanism and How Incorporated
Crawford County	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions Economic Development Plan-Mitigation Actions EOP-Critical Facilities and Risk Assessment COOP-Critical Facilities and Risk Assessment Stormwater Management Plan-Mitigation Actions Wildfire Protection Plan-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Maintenance Programs-Mitigation Actions
City of Alma	Capital Improvement Plan-Mitigation Actions EOP-Critical Facilities and Risk Assessment COOP-Critical Facilities and Risk Assessment Stormwater Management Plan-Mitigation Actions Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions
City of Cedarville	Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions
Town of Chester	Stormwater Management Plan-Mitigation Actions Wildfire Protection Plan-Mitigation Actions Building Codes-Mitigation Actions Planning and Zoning Maps-Risk Assessment Flood Maps-Flood Data and Risk Assessment Maintenance Programs-Mitigation Actions
City of Dyer	Comprehensive Master Plan-Mitigation Actions EOP-Critical Facilities and Risk Assessment Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions
City of Kibler	Capital Improvement Plan-Mitigation Actions Economic Development Plan-Mitigation Actions EOP-Critical Facilities and Risk Assessment COOP-Critical Facilities and Risk Assessment Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions

City of Mountainburg	Stormwater Management Plan-Mitigation Actions Wildfire Protection Plan-Mitigation Actions Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Maintenance Programs-Mitigation Actions
City of Mulberry	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions Economic Development Plan-Mitigation Actions COOP-Critical Facilities and Risk Assessment Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions
Town of Rudy	Flood Maps-Flood Data and Risk Assessment Maintenance Programs-Mitigation Actions
City of Van Buren	Economic Development Plan-Mitigation Actions EOP–Critical Facilities and Risk Assessment COOP-Critical Facilities and Risk Assessment Stormwater Management Plan-Mitigation Actions Building Codes-Mitigation Actions Flood Maps-Flood Data and Risk Assessment Planning and Zoning Maps-Risk Assessment Maintenance Programs-Mitigation Actions
Alma School District	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions School Emergency Plan-Critical Facilities
Cedarville School District	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions School Emergency Plan-Critical Facilities
Mountainburg School District	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions School Emergency Plan-Critical Facilities
Mulberry-Pleasant View School District	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions School Emergency Plan-Critical Facilities
Van Buren School District	Comprehensive Master Plan-Mitigation Actions Capital Improvement Plan-Mitigation Actions School Emergency Plan-Critical Facilities
All Jurisdictions	State of Arkansas All-Hazards Mitigation Plan (2018)-Reviewed for all Hazards Fourth National Climate Assessment (2018)-Extreme Heat Data Southern Wildfire Risk Assessment Summary Report-Wildfire Data USDA Census of Agriculture for Crawford County (2012, 2017)-Land Use Data

	Crawford County Forests and Forest Industry (2021)-Land Use Data USDA Drought Severity Monitor-Drought Data Arkansas Geological Survey- Earthquake Data National Performance of Dams Program-Dam Data US Army Corp of Engineers National Inventory of Dams-Dam Data Community Resilience Assessment Tool-Vulnerability EPA-Mitigation Actions, Climate Change FEMA Mitigation Ideas by Hazard Type-Mitigation Actions Simple Planning Tool for Arkansas Climate Hazards-Risk Assessment Southern Climate Impacts Planning Program (SCIPP)-Risk Assessment 2020 Census-Demographics

SECTION 2: Hazard Identification and Risk Assessment

2.1 Natural Hazards Affecting Crawford County

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

The Hazards which have affected Crawford County in the past or could possibly affect Crawford County in the near future are; Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flooding, Landslide, Thunderstorms, Tornado, Wildfire, and Winter Storms.

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.

A description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction is also included in the Crawford County Hazard Mitigation Plan.

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

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

Negligible: Less than 10 percent of planning area or isolated single-point occurrences
Limited: 10 to 25 percent of planning area or limited single-point of occurrences
Significant: 25 to 75 percent of planning area or consistent single-point occurrences
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed of onset or short duration of event resulting in little to no damage.
Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of service for days
Severe: Severe classification on scientific scale, fast speed of onset or long duration of event, resulting in devastating damage and loss of services for weeks or months.
Extreme: Extreme classification on scientific scale, immediate onset or extended duration of event, resulting in catastrophic damage and uninhabitable conditions.

Previous Occurrences of hazard events for each jurisdiction 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 will increase/decrease based on how future conditions affect locations and extent of the hazards.

Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.

Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.

Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of 1 year.

Overall Significance

Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazard with a minimal or unknown record or occurrences or for hazard with minimal mitigation potential.

Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometime used for hazards with a high extent rating but very low probability rating.

High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

2.1.1. Dam Failure

2.1.1.1 Description of Dam Failure

A dam failure is the collapse, breach, or other failure resulting in downstream flooding. A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

2.1.1.2 Location of Dams in Crawford County

There are 5 dams in Crawford County that carry a High Hazard Ranking. These High Hazard ranked dams will be profiled for their potential dam failure hazard impact and extent. Significant and Low Hazard dams are not being profiled.

Data Limitation: Updated Inundation Zone Studies have not been completed for the dam locations in Crawford County due to a lack of funding. Areas most likely to be impacted in the event of a dam failure at each of the High Hazard Dams have been described on the following pages. A mitigation action item has been included in this mitigation plan revision to complete inundation zone studies for dams in Crawford County.

Below is a table outlining High Hazard dam locations in Crawford County. Maps illustrating the locations of these High Hazard Dams are located in Section 7.2: Appendix B.

Table 3 - Location of Dams

Dam	Jurisdiction *Primary Location **Secondary Impact	Latitude	Longitude	Hazard Ranking
Little Clear Creek Site 1 (Lake Alma)	*City of Alma **Crawford County **Alma Schools	35.4950	-94.2216	High
Lake Fort Smith (Lower Fort Smith Dam)	*City of Mountainburg **Crawford County **Mountainburg Schools	35.659619	-94.150189	High
Flat Rock Creek Site 1 (Lake Cap Bedell)	*City of Van Buren **Van Buren Schools	35.45055556	-94.3422222	High
Little Mulberry Creek Site 1 (TJ House Reservoir)	*Crawford County **City of Mulberry	35.54333333	-94.0758333	High

Lee Creek	*City of Van Buren **Crawford County	35.484457	-94.394582	High

The following jurisdictions are not vulnerable to dam failure due to their location and lack of proximity to any of the High Hazard ranked dams:

City of Dyer
Town of Rudy
City of Kibler
Town of Chester
City of Cedarville
Cedarville School District
Mulberry School District

2.1.1.3 Extent, Magnitude or Severity of Dam Failure

Little Clear Creek Site 1 (Lake Alma Dam) is located in the City of Alma. This dam does not have significant development around the lake shore. The area below the dam, however, has significant infrastructure that could be damaged in the event of a dam failure. Residential, commercial, and other properties (including a senior citizens center) are located below the Lake Alma Dam. Also, Interstate 40 falls under the direct impact zone from a dam failure event. Lake Alma Dam would release 11,980 acre-feet of water into an undetermined inundation area in the event of a total dam failure.

Lake Fort Smith Dam (Lower Fort Smith Dam) is located just north of Mountainburg. A large volume of water is impounded at this lake. Mitigation measures by the City of Fort Smith include warning sirens and downstream alarms, which are sounded if a sudden release becomes possible. Lake Fort Smith Dam would release 140,000 acre-feet of water into an undetermined inundation area in the event of a total dam failure.

Little Mulberry Creek Site 1 Dam (TJ House Reservoir) is located to the north of the City of Mulberry. This dam does not have significant development around the lake shore. The area below the dam is also sparse in development. The City of Mulberry is located several miles downstream from the Little Mulberry Creek Dam. Damage from a dam failure would be minimal to the City of Mulberry based on this distance. Little Mulberry Creek Site 1 would release 14,350 acre-feet of water into an undetermined inundation area in the event of a total dam failure.

Lee Creek Dam is located directly in the Northwest section of the City of Van Buren. This dam does have significant residential development around the northeast lake shore and below the dam. There is a water treatment plant located below the dam that is exposed to a dam failure event, as well as the Pevehouse Cemetery, the Rena Road Bridge, and the Fort Smith Fire Station located at 2009 Pevehouse Road. Lee Creek Dam would release 7,118 acre-feet of water into an undetermined inundation area in the event of a total dam failure.

Flat Rock Creek Site 1 (Lake Cap Bedell) is located at the Van Buren City Park along City Park Road directly east of the Van Buren Boys and Girls Club. This dam does have

significant residential development south and east of the lake and below the dam. Impacts would include N. 20th Street, Maple Street, Taft Street, Woodrow Street, Harrison Street, N. 21st Street, N. 22nd Street, and Central Elementary School. Flat Rock Creek Site 1 Dam would release 509 acre-feet of water into an undetermined inundation area in the event of a total dam failure.

2.1.1.4 Previous Occurrences

Crawford County has no documented historical record of dam failure.

2.1.1.5 Probability of Future Dam Failure Events

Extreme water inflow from prolonged rainfall and flooding is one of the leading causes of dam failure. As discussed in a later section of this plan, the project area is experiencing an increase in flooding due to increased heavy rainfall events. More frequent and intense heavy-rainfall events could lead to increased risk of dam failure.

Table 4 - Probability of Future Dam Failure Events

Dam Name	Location	Maximum Probable Extent	Probability of Future Events	Overall Significance
Little Clear Creek Site 1 (Lake Alma)	City of Alma	Moderate	Unlikely	Low
Lake Fort Smith (Lower Fort Smith Dam)	Unincorporated Crawford County; just north of Mountainburg	Moderate	Unlikely	Low
Flat Rock Creek Site 1 (Lake Cap Bedell)	City of Van Buren	Moderate	Unlikely	Low
Little Mulberry Creek Site 1 Dam (TJ House Reservoir)	Unincorporated Crawford County; north of Mulberry	Weak	Unlikely	Low
Lee Creek Dam	City of Van Buren	Moderate	Unlikely	Low

2.1.1.6 Impact of Dam Failures

Table 5 - Impact of Dam Failures

Dam	Jurisdiction	Facilities to be Impacted
Little Clear Creek Site 1 (Lake Alma)	Crawford County City of Alma Alma Schools	Alma Aquatic Center Alma City Park Alma Community Center Alma Senior Citizens Center Alma Health and Rehab Alma Water/Wastewater Treatment Facility

		Commercial properties along Highway 71 Commercial and residential properties along Highway 64 Stepping Stone School Interstate 40 N. Mountain Grove Road Alma Middle School Alma High School
Lake Fort Smith Dam (Lower Fort Smith Dam)	Crawford County City of Mountainburg Mountainburg Schools	Entire City Limits of Mountainburg Mountainburg City Hall/ Community Center/Senior Center Mountainburg Police Station Mountainburg Fire Station God's Branch Road Doyel Road Lake Fort Smith Road Wellnitz Drive Warloop Road Mountainburg Elementary Middle, and High School
Little Mulberry Creek Site 1 Dam (TJ House Reservoir)	Crawford County City of Mulberry	Little Mulberry Road Slate Hill Road Privately owned agriculture land and poultry houses City of Mulberry Water/ Wastewater Treatment Facility
Lee Creek Dam	Crawford County City of Van Buren	Van Buren Water Treatment Facility Rena Road Bridge Fort Smith Fire Station on Pevehouse Road Park Ridge Campground Lee Creek Park Road
Flat Rock Creek Site 1 (Lake Cap Bedell)	City of Van Buren Van Buren Schools	N. 20th Street Maple Street Taft Street Woodrow Street Harrison Street N. 21st Street N. 22nd Street Central Elementary School.

Across Crawford County, the population is declining. Future impacts of dam failure are not expected to be impacted by changes in population due to decreasing population density and a lack of future development anticipated downstream from the dams.

2.1.1.7 Vulnerability and Estimating Potential Loss

As there have been no failures to date, future events are impossible to predict; however, based on Dam Classification Parameters, the area could expect to see the following in the event of a complete failure of each classification: Failure of a class A (low hazard) dam would see no loss of life, damages would be less than $100,000 and limited to the dam owners land and no structures should be affected; class B (significant hazard) dam failure would result in potential loss of life, between $100,000 and $500,000 in damages to nearby land, structures, and roads; class C (high hazard) dam failure would result in fatalities, over $500,000 in damages to land, structures, and roads, and would require major mitigation (if possible) to re-build.

Dam failure can be a life-threatening event. In the event of a dam failure, the energy of the water stored behind even a small dam can cause loss of life and great property damage if there are people downstream of the dam.

The Hazard Potential Table below shows potential losses for each class of dam and how each of the profiled dams is classified.

Table 6 - Hazard Potential of Dams

HAZARD POTENTIAL CLASSIFICATION FOR CIVIL WORKS PROJECTS			
CATEGORY	LOW (CLASS A)	SIGNIFICANT (CLASS B)	HIGH (CLASS C)
Direct Loss of Life	None expected (due to rural location with no permanent structures for human habitation)	Uncertain (rural location with few residences and only transient or industrial development)	Certain (one or more extensive residential, commercial, or industrial development)
Lifeline Losses	No disruption of services - repairs are cosmetic or rapidly repairable damage	Disruption of essential facilities and access	Disruption of critical facilities and access
Property Losses	Private, agricultural lands, equipment, and isolated buildings	Major public and private facilities	Extensive public and private facilities
Environmental Losses	Minimal incremental damage	Major mitigation required	Extensive mitigation cost or impossible to mitigate
Economic Losses	Less than $100K	Between $100K & $500K	Over $500K

Loss estimates were derived from the Hazard Class Definitions that the Arkansas Natural Resources Commissions assigns to all state regulated dams.

High Hazard – Potential for loss of human life and/or excessive public, industrial, commercial, or agricultural development in inundation areas. Losses could be over **$500,000**. Emergency Action Plans are required for all High Hazard Dams.

Significant Hazard – No potential for loss of human life. But, significant structures, industrial, or commercial development, or cropland in inundation areas. Losses could be **$100,000 to $500,000.**

Low Hazard – No potential for loss of human life. No significant structures in inundation areas. Primarily pastures, woodland, or undeveloped land. Losses expected to be less than **$100,000.**

With these definitions in mind, loss estimates were calculated for each county as follows:
($500,000) * the number of High Hazard Dams,
($250,000) * the number of Significant Hazard Dams, and
($50,000) * the number of Low Hazard Dams.

Table 7 - Dam Failure Loss Estimates

County	Loss Estimates
Crawford County	$2,600,000

2.1.1.8 Multi-Jurisdictional Risk Assessment and Impact

According to data from the Arkansas Soil and Water Conservation Commission Dam Safety Program, no failure of a permitted dam has occurred in Crawford County or anywhere in the State of Arkansas. Permitted dams are those that exceed 25 feet in height and impound at least 50 acre-feet of water. Smaller, non-permitted dams have failed or been overtopped on occasion in Arkansas, although records of these events are not kept. These non-permitted dams are generally low hazard dams that lacked engineering design and have not caused significant damage in the past. Based on this limited data and considering current design and inspection requirements, failure of permitted dams is an extremely unlikely event. Failure of small, non-permitted dams may occur, but the effects are not expected to be significant.

Crawford County, Alma, Alma School District, Mountainburg, Mountainburg School District, Mulberry, Van Buren, and Van Buren School District are the only jurisdictions with any vulnerability to dam failure. None of these jurisdictions have significant infrastructure or critical facilities within any area that could be affected by a dam breach. The section of land below most dams in Crawford County is extremely rural and undeveloped.

2.1.2 Drought

2.1.2.1 Description of Drought

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

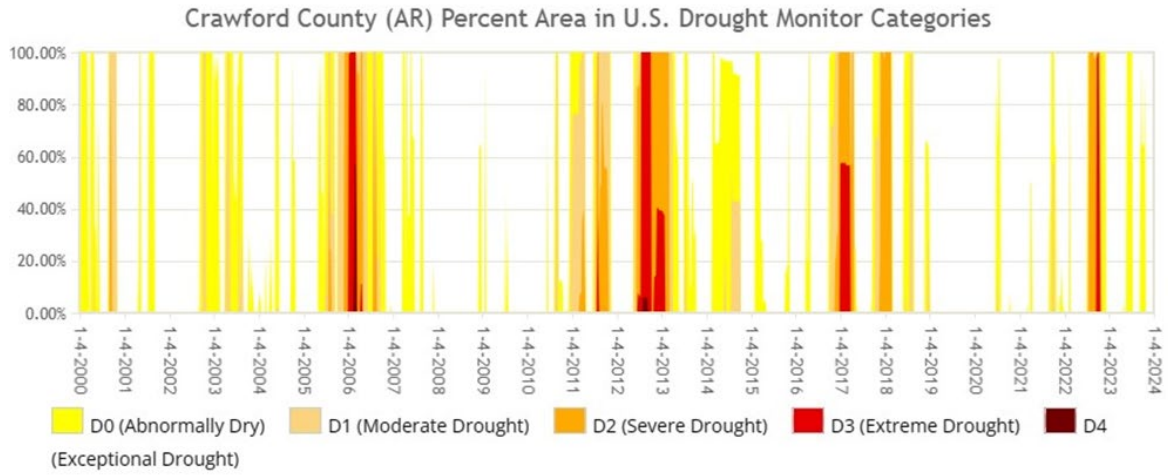
2.1.2.2 Location of Drought Events

All areas of the entire planning area are equally likely to experience severe drought, there is no defined geographic hazard boundary.

2.1.2.3 Extent, Magnitude or Severity of Drought

A useful measure of a particular area's drought severity at particular points in time is the Drought Severity Monitor, which is published by the U. S. Department of Agriculture. The Drought Monitor displays day-by-day drought conditions for areas within the U.S. and within individual states, using the following Drought Conditions table. As noted, "D0" represents abnormally dry, "D1" moderate, "D2" Severe, "D3" Extreme, and "D4" Exceptional. Since 2000, the entire planning area has experienced drought anywhere from D0 to D4 and can expect to experience similar droughts in the future based on previous drought occurrences.

Graphic 1 - Crawford County Drought Monitor



When drought begins, the agricultural sector is usually the first to be affected because of its heavy dependence on stored soil water. Soil water can be rapidly depleted during extended dry periods. If precipitation deficiencies continue, then people dependent on other sources of water will begin to feel the effects of the shortage. Those who rely on surface water (i.e., reservoirs and lakes) and subsurface water (i.e., ground water), for example, are usually the last to be affected. A short-term drought that persists for 3 to 6 months may have little impact on these sectors, depending on the characteristics of the hydrologic system and water use requirements.

The Palmer Index is most effective in determining long term drought–a matter of several months–and is not as good with short-term forecasts (a matter of weeks). It uses a 0 as normal, and drought is shown in terms of minus numbers; for example, minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought. The advantage of the Palmer Index is that it is standardized to local climate, so it can be applied to any part of the country to demonstrate relative drought or rainfall conditions.

Table 8 - Palmer Drought Severity Index

Palmer Drought Severity Index (PDSI)	
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

2.1.2.4 Previous Drought Occurrences

There have been 4 event(s) reported between January 1, 2019, and August 31, 2023. All 4 of these events occurred in 2022.

2.1.2.5 Probability of Future Drought Events

According to the NOAA National Centers for Environmental Information State Climate Summaries 2022, increases in evaporation rates due to rising temperatures may increase the rate of soil moisture loss and the intensity of naturally occurring droughts.

Location (All participating jurisdictions within the entire planning area)
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)

Weak: Limited classification on scientific scale, slow speed of onset or short duration of event resulting in little to no damage. Of the 4 drought events occurring since 2019, zero have resulted in death, injury, property or crop damage.

Probability of Future Events
Likely:10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Overall Significance
Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometime used for hazards with a high extent rating but very low probability rating.

2.1.2.6 Impact of Drought

Drought produces impacts that affect the social, environmental, and economical standard of living. Some direct impacts of drought are reduced crop, rangeland, and forest productivity; reduced water levees; increased fire hazard; increased livestock and wildlife death rates; and damage to wildlife and fish habitat. A reduction in crop productivity usually results in less income for farmers, retailers, and increased prices for food. The likelihood that businesses beyond row-crop agriculture operations would be seriously affected by drought is low, because municipal water impoundments in the county are large enough to continue supplying drinking and industrial process water through 100-year drought conditions.

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

In Section 5.1, Changes in Development, data from the Census of Agriculture shows that while Crawford County has seen a decrease in the number of farms since 2007, the average size of farms in Crawford County has been increasing. If this trend continues, the impacts of future droughts could be more severe. Other changes in development, such as increased residential or industrial developments could strain water systems in Crawford County, increasing the impacts of future droughts.

Severe drought can also affect air quality by making wildfires and dust storms more likely, increasing health risk in people already impacted by lung diseases, like asthma or chronic obstructive pulmonary disease (COPD), or with heart disease. According to County Health Rankings & Roadmaps, the population of Crawford County has been improving in health since 2011. If this trend continues, drought related health issues will become less severe in Crawford County.

2.1.2.7 Vulnerability and Estimating Potential Loss

Though the county is within a region of the country that is highly susceptible to severe drought, it would be unusual for the condition to pose serious, direct threats to structures. Extreme and prolonged drought conditions can result in soil constriction or shrinkage that can cause building foundations to settle, possibly cracking foundations and walls. It is not likely, however, that drought conditions would be so prolonged and severe to cause such damage.

Drought can seriously affect agricultural operations, the economic base for Crawford County. Farmers in the county that depend upon ground water (wells) and surface water (ponds & small lakes) for crop irrigation and livestock drinking water would be negatively impacted by a severe drought. Also, municipal water supplies in the area provide treated water for users in the cities and throughout the rural areas of the county.

Though most of these impoundments can produce an adequate yield throughout a yearlong drought period, water rationing would no doubt be implemented, which would affect all customers, including agricultural and other businesses dependent on water for production. Drought leading to serious water shortages would negatively affect the local economy.

2.1.2.8 Multi-Jurisdictional Risk Assessment

All participating jurisdictions are equally subject to drought, there is no defined geographic hazard boundary. Damages from drought are generally economic. Assets at risk would include open land that could become vulnerable to the wildfire hazard due to extended periods of low rain and high heat. Water supply resources would be affected and the vulnerable populations such as the farmers.

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, multi-jurisdictional.

Crawford County has 799 farms covering 122,319 acres. A majority of these farms, are cattle operations.

Drought would affect the 214,144 acres of forestland Crawford County; 128,486 acres being privately owned and 85,658 being publicly owned and primarily consisting of the Ozark National Forest. Drought conditions leave the forest land vulnerable to wildfire due to extended periods of low rain and high heat, and increases the infestation of insects.

Drought would affect the main agriculture crop in Crawford County, which is hay, and accounts for 340 farms and 22,742 acres.

Public Safety would be affected across the county, cities, and school districts, from the threat of fire, and contaminated water.

2.1.3 Extreme Heat

2.1.3.1 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.

2.1.3.2 Locations Affected by Extreme Heat

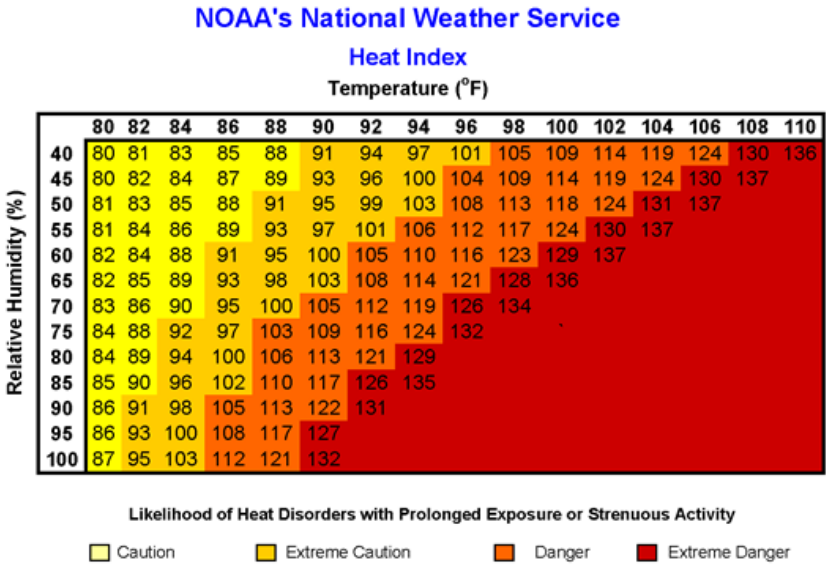
There is no defined geographic hazard boundary for extreme heat. Extreme heat generally affects people rather than property. All participating jurisdictions within the entire planning area are equally likely to experience an extreme heat event.

2.1.3.3 Extent, Magnitude or Severity of Extreme Heat Events

According to the third U.S. National Climate Assessment released in 2014, for Arkansas, there have been increasing numbers of days above 95 degrees F and nights above 75 degrees F and decreasing number of extremely cold days since 1970. (NCA, Ch. 17: Southeast)

Across the entire planning area, June, July, and August are the months most likely to experience Extreme Heat. The planning area experiences an average of 12 days above 90 degrees each June, 23 days above 90 degrees each July, and 22 days above 90 degrees each August. The entire planning area can expect similar temperatures in future years with some years having a higher number of excessive heat events.

Graphic 2 - Heat Index



2.1.3.4 Previous Occurrences

There have been 15 events reported between January 1, 2019, and August 31, 2023. Extreme Heat events occurred every year from 2019 to 2023; all during the months of June, July, and August.

2.1.3.5 Probability of Future Extreme Heat Events

Temperatures in Arkansas have risen by 0.5 degrees Fahrenheit since the beginning of the 20th century, less than a third of the warming for the contiguous United States, but the warmest consecutive 5-year interval was 2015-2019. (NOAA National Centers for Environmental Information State Climate Summaries 2022)

Location (All participating jurisdictions within the entire planning area.)
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed of onset or short duration of event resulting in little to no damage. Of the 15 extreme heat events occurring since 2019, zero have resulted in death, injury, property or crop damage.

Probability of Future Events
Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years.

Overall Significance
Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometime used for hazards with a high extent rating but very low probability rating.

2.1.3.6 Impact of Extreme Heat

Heat is the number one weather-related killer in the United States, resulting in hundreds of fatalities each year. In fact, 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. Crawford County has 132 poultry operations. Heat stress also adversely affects dairy and livestock production. Optimal temperatures for milk production are between 40 degrees F and 75 degrees F. Crawford County has 4 dairy farms.

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 those facilities that do not have a backup power

supply, such as a generator, to power air conditioning systems. Future development could further strain electrical systems.

Groups most at risk to heat include, but are not limited to children, older adults, people experiencing homelessness, people with pre-existing conditions, people with disabilities, indoor and outdoor workers, emergency responders, incarcerated people, low income communities, pregnant people, athletes, and more. While the population of Crawford County has been decreasing, the percentage of the population under the age of 5 has remained steady and the population over the age of 62 has been increasing.

Future developments that would increase the amount of paved surfaces in Crawford County could negatively impact the effects of extreme heat across the county. This could occur through larger scale industrial developments or additional road paving projects.

2.1.3.7 Vulnerability and Estimating Potential Loss by Jurisdiction to Extreme Heat

An extreme heat event will extend throughout all participating jurisdictions within the entire planning area.

It affects people of all ages, primarily the elderly, children and homeless. All agriculture crops, livestock, water supply and forestlands 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. In Crawford County 6.1% 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. In Crawford County 21.6% of the county's population is over the age of 62 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.

2.1.3.8 Multi-Jurisdictional Risk Assessment

Based on historical records for Crawford County, the region's location is within one of the country's highest exposures to an extreme heat index. All participating jurisdictions within the entire planning area will sometime in the near future face extreme heat. Extreme heat is equally dangerous to all jurisdictions, and school districts throughout the county. Extreme heat will not affect one area of Crawford County more than another.

2.1.4 Flooding

2.1.4.1 Description of Flooding

A flood is the partial or complete inundation of normally dry land. The various types of flooding include riverine flooding and flash flooding in Crawford County.

A riverine flood is a flood caused by precipitation, runoff or snowmelt over a relatively large watershed causing flooding over wide areas and cresting in over 8 hours. A flash flood is a flood caused by heavy precipitation or snowmelt over a limited watershed (typically less than 50 square miles), crests in eight hours or less, and generally occurs in hilly terrain. Riverine floods have relatively low velocity, cover a large area of land, and take longer to recede, whereas flash floods have a higher velocity and may recede quickly. A flash flood can also occur when extreme amounts of precipitation fall on any terrain if the precipitation accumulates more rapidly than the terrain can allow runoff.

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

Crawford County is subject to both riverine and flash flooding, with flash flood events occurring most frequently. Intense rainfall events, often accompanying the large thunderstorms that occur in the County several times a year, may result in water accumulating rapidly.

2.1.4.2 Location of Flooding Events

Crawford County is subject to flash flooding. The Hazard Mitigation Planning Team has reviewed Crawford County's Flood Insurance Rate Maps (FIRMs). Research on flooding history in the county included newspaper accounts of floods, data collected by the National Climatic Data Center and the National Flood Insurance Program, and interviews with individual county residents.

Floods are common along the Arkansas River corridor, which forms the southern boundary of the county. However, this flooding is typically not caused by river overflows but by upstream discharges to the river through the flat terrain in the southern portions of the county, where these discharges are sometimes inhibited by high river waters. These areas exhibit low relief and typically have flat, broad floodplains. The area surrounding the Arkansas River is also subject to flood damage because of the large amounts of rainfall it receives; the wide, flat floodplain in the southern part of the County and large amounts of wetland area and oxbow lakes in the southern portion of the county. There are few structures located in these floodplain areas.

An area of significance that does experience repeated flooding is in Van Buren along 28th Street in the Crawford County Industrial Park. Occurring about every five to ten years, exceptionally heavy rains cause the flooding of this street, which serves several businesses, resulting in blocked traffic and temporary business shutdowns. Also, two businesses have received minor flooding of their buildings.

The Hazard Mitigation Planning Team has reviewed Crawford County's Flood Insurance Rate Maps (FIRMs). These maps are located in Section 7.3: Appendix C.

Flood zones are geographic areas that FEMA has defined in terms of varying levels of flood risk. These zones are illustrated by a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. Following are explanations of the FEMA flood zone designations.

Table 9 - FEMA Flood Zones

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.

CRAWFORD COUNTY
Areas prone to flooding in the unincorporated areas of Crawford County include areas near Lee Creek and Frog Bayou. Highway 282 has multiple bridges which span Frog Bayou and have been underwater in the past. Recent areas impacted by flooding include Lancaster Road north of Alma, Schaberg Road northeast of Chester, Natural Dam Road and Highway 59 north of Cedarville, Old Uniontown Road, Fayetteville Road, and West Graphic Road.

CITY OF ALMA
Per residents, areas of flooding include West Main Street near city limit line, Alma School District Property south of West Main Street, Country Meadows Subdivision, Shelly Lane, Schoolhouse Prairie Subdivision, and Alma Housing Authority at north end of Harris and Chitwood Drives, Highway 282 and Hammer Road. Additional areas vulnerable to flooding are those within the floodplain: Areas along Little Frog Bayou including E. Cherry Street, Collum Lane including the Alma Senior Citizens Center and the Alma Aquatic Center, E. Main Street including the Alma Boys and Girls Club. The Alma School District Property south of West Main Street is prone to flooding.

CITY OF CEDARVILLE
Mill Pond Road in the southeast portion of the city has experienced flooding in the past. Flash flooding has impacted the Cedarville Elementary School and the library. Areas along Highway 59 are also prone to flooding. The Cedarville Elementary School has previously been damaged by flood waters.

TOWN OF CHESTER
Areas of flooding identified by residents include Highway 282/Front Avenue which passes through the middle of town. Additional areas prone to flooding are those within the floodplain along Clear Creek and Highway 282 and Front Avenue including Chester City Hall/Community Center.

TOWN OF DYER
Areas prone to flooding are those within the floodplain including Herd Branch Lane along Herd Branch off of Crooked Slough.

CITY OF KIBLER
Areas prone to flooding are those within the floodplain along Curry Branch and Prairie Branch including Redwood Drive, Otis Street, Arnold Acres Street, and W. Elm Boulevard.

CITY OF MOUNTAINBURG
Areas prone to flooding identified by residents include Ash Drive at Frog Bayou Creek - East approach washes out when creek floods, Pigeon Creek Road at Pigeon Creek (Corner of Pigeon Hollow Road) - Affecting Pigeon Creek Freewill Baptist Church, and Graham Street from Silver Bridge Road to West Willow Street. Additional areas prone to flooding are those within the floodplain where Highway 282 enters the city limits and meets Highway 71 and along Frog Bayou at Silver Bridge Road just outside the city limits.

CITY OF MULBERRY

Areas prone to flooding include Wire Road east of Graphic Road at the Silver Bridge, South of E. 3rd Street, and Alma Avenue north of 10th Street. Additional areas prone to flooding are those within the floodplain including Vine Prairie Park, Kirksey Park on Highway 215, and along the Little Mulberry Creek including Mulberry Wire Road.

TOWN OF RUDY

Highway 282 at the bridge over Frog Bayou has flooded in the past. Additional areas prone to flooding are those within the floodplain including Maxy Street south of Highway 282.

CITY OF VAN BUREN

Areas prone to flooding include Flat Rock Circle (Industrial Park Rd/Flat Rock Drive), Industrial Park & 28th St. to USA Truck, Industrial Park Road at Oak Grove Road, South 4th St. & Wood St. by Current Church, Yard Waste Recycle Facility (2844 S. Hwy 59), and Field of Dreams (1 Toothaker Dr). Other areas impacted by flooding have included Tailwater Park and Parkridge Campground near Rena Road, the sand and gravel companies along the Arkansas River, the marine terminals along the Arkansas River, Lee Creek RV Park, and mobile homes hear Lee Creek. Additional areas prone to flooding are those within the floodplain along Lee Creek and the Arkansas River.

2.1.4.3 Extent, Magnitude or Severity of Flooding

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

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

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

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

Local storm events typically average between one to six inches of rain falling within a short period of time, resulting in flash floods.

Crawford County considers three to four inches of heavy rainfall in a short period of time a severe event. During this amount of rainfall, flash flooding will start to occur, and the storm water drainage system will not accommodate the excess rainfall. Generally, the only flooding that occurs is in low-lying areas and the 100-year flood plain.

A variety of factors affect the type and severity of flooding within the County, including topography, geology, urban development and infrastructure. Flash floods are common across the county. Urban development in the County exacerbates the flash flooding problem.

Intense rainfall events, often accompanying the large thunderstorms that occur in the County several times a year, may result in water accumulating rapidly.

Flood is generally measured by the 100-year (base flood) level and is considered to be a flood with a 1% chance of occurring annually in areas with "Special Flood Hazard Areas" identified on FEMA Flood Insurance Rate Maps. Bridges, roads, and structures have been destroyed by this hazard.

A 1% (100 year) event is created by: 3.31"/hr; 7.86"/day; .863"/5min; 19.2"/mth.
Flash flooding is the bigger risk as it can occur across the entire planning area. Flash floods result from heavy or excessive rainfall in a short period of time, generally less than 6 hours and can occur within minutes or a few hours of excessive rainfall. Flowing at just 6 mph, water exerts the same force per unit area as air blowing at EF5 tornado wind speeds. Water moving at 25 mph has the pressure equivalent of wind blowing at 790 mph, faster than the speed of sound.

Alma flood maps indicate levels of flooding at 400 to 411 feet above sea level along Little Frog Bayou and 422 to 480 feet above sea level along Frog Bayou. Alma reports that 1.5"-2" per hour event would cause local street flooding. Alma has had as much as 2 feet of water on some local streets during such events.

Cedarville flood maps indicate limited areas of Zone A for which base flood elevations are not determined. Cedarville is susceptible to any stage of flooding but have generally experienced minor to moderate flooding in past occurrences with flood depths ranging from 0 in. to 6 in.

Chester flood maps indicate levels of flooding at 820 to 860 feet above sea level along Clear Creek.

Dyer flood maps indicate limited areas of Zone A for which base flood elevations are not determined. Dyer is susceptible to any stage of flooding but have generally experienced minor to moderate flooding in past occurrences with flood depths ranging from 0 in. to 6 in.

Kibler flood maps indicate levels of flooding at 400 to 438 feet above sea level along Curry Branch. Frog Bayou has previously crested at 16.99 feet near Kibler.

Mountainburg flood maps indicate levels of flooding at 703 to 758 feet above sea level down from Lake Fort Smith.

Mulberry flood maps indicate levels of flooding at 410 to 441 feet above sea level along Miller Branch and 392 to 410 feet above sea level along the Mulberry River.

Rudy flood maps indicate levels of flooding at 488 to 499 feet above sea level along Frog Bayou and the Highway 282 bridge. Frog Bayou has previously crested at 16.99 feet near Rudy.

Van Buren flood maps indicate levels of flooding at410 to 415 feet above sea level along the Arkansas River at Lee Creek, 396 to 476 feet above sea level at Flat Rock Creek, and 550 to 574 feet above sea level at Lake Lou Emma. Lee Creek has previously crested at 405 feet.

2.1.4.4 Previous Flood and Flash Flooding Occurrences

There were 29 flood/flash flood event(s) reported throughout the entire planning area between 1/1/2019 and 8/31/2023.

Fourteen of those were in unincorporated Crawford County, in the communities of Catcher, Stattler, Figure Five, Dean Springs, Smeltzer, Oak Grove, and Graphic.

Van Buren experienced 6 events. Mountainburg experienced 5 events. Chester and Rudy each experienced 2 events.

The 29 flood/flash flood events resulted in $160K in damages.

2.1.4.5 Probability of Future Flooding

West Central Arkansas has already seen a 15.72% increase in precipitation from 1900-2021. The project area is experiencing an increase in flooding due to increased heavy rainfall events. In Fort Smith and the surrounding area, 3 of the 5 wettest years since 1946 have occurred since 2015.

According to the National Climate Assessment, models show an overall increase in precipitation in Arkansas by the end of the century, with changes spread unevenly across the state. More frequent and intense heavy-rainfall events are also expected to increase the risk of flooding.

Location (All participating jurisdictions within the entire planning area)
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of service for days

Probability of Future Events
Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of 1 year.

Overall Significance
High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a signification to extensive portion of the planning area.

2.1.4.6 Impact of Flooding

Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities. This hazard can directly impact building inventory, people, infrastructure (roads, bridges), agriculture, and livestock that are in the inundation areas, as well as having indirect economic impacts. Water velocity is increased when severe flooding occurs, which can flood or completely wash away buildings of all construction types (masonry, wood, concrete, or metal), automobiles, and farm equipment; topple trees, destroy crops, erode bridges, and damage roads.

The 29 events throughout the entire planning area between 2019 and 2023 resulted in $160K in property damage, not counting the 2019 Arkansas River Flood that caused $3 billion in damage across multiple states. Most of the damage was from bridges and roads being washed out.

Businesses can suffer economic losses when buildings are damaged or roads are closed, as well as during times of forced closure to protect public health and safety if fresh water is unavailable or if fire safety poses a risk.

Crawford County has experienced 29 flooding events over the last 5 years. There is 1 repetitive flood loss structure in Crawford County listed on FEMA's Repetitive Flood Loss List and 3 in Van Buren. Damages to structures caused by flooding in recent years have not been widespread but specific to particular locations in the county.

Listed are other areas in which flooding can affect Crawford County:

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

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

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

Health- Flood waters can also damage the health of those living and working in the area. Because flood waters can wash dangerous waste into water supplies, tap water may

become unsafe to use if the local authorities do not issue a boil advisory warning everyone to boil water before ingesting it. Mold is also likely to grow in homes and other buildings that were engulfed by the flood waters. It is important to search all homes for mold and remove it completely before moving back in. Breathing the mold spores is dangerous for your health. A flood can also contribute to other health problems from human waste that contaminates the ground.

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

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

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

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

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

Future impacts of flooding could decrease due to a decreasing population in Crawford County. The Arkansas Economic Development Institute projects a continued decline in population for Crawford County. Future development is prohibited in the floodplain areas of Crawford County further decreasing future impacts of flooding.

2.1.4.7 Addressing Repetitive Loss Properties

Table 10 - Repetitive Loss Properties

Community Name	Community Number	County Name	# of Properties	Type of Property
Crawford County	050428	Crawford County	1	Residential
Van Buren (City)	050053	Crawford County	3	1 Residential 2 Commercial
Alma (City)	050236	Crawford County	0	N/A
Dyer (Town)	050408	Crawford County	0	N/A
Kibler (City)	050337	Crawford County	0	N/A
Mountainburg (City)	050051	Crawford County	0	N/A
Mulberry (City)	050354	Crawford County	0	N/A
Rudy (Town)	050053	Crawford County	0	N/A
Cedarville (City)	050505	Crawford County	0	N/A
Chester (Town)	050050	Crawford County	0	N/A

The above records indicate that Van Buren and unincorporated Crawford County each have repetitive loss properties in their jurisdiction.

According to the FEMA website:
"The primary objective of the Repetitive Loss Properties Strategy is to eliminate or reduce the damage to property and the disruption of life caused by repeated flooding of the same properties. A specific target group of repetitive loss properties is identified and serviced separately from other NFIP policies by the Special Direct Facility (SDF). The target group includes every NFIP-insured property that, since 1978 and regardless of any change(s) of ownership during that period, has experienced:

a) Four or more paid flood losses of more than $1,000 each; or
b) Two paid flood losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property; or
c) Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property."

"Severe Repetitive Loss Property Definition: The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a. An SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both a) and b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart."

As none of the properties are indicated as "SRL" (limited to "residential"), it is difficult to provide further details on the type of structure, foundation, and use of the property.

2.1.4.8 Vulnerability and Estimating Potential Loss

All participating jurisdictions within the entire planning area are vulnerable to flooding. Loss of life and injuries are possible, damage to residential and business structures, transportation systems, disruption of utility services, and major environmental damage.

Table 11 - Flood Events

	Events	Deaths	Injuries	Property Damage	Crop Damage	Total Damages
Total 2019-2023	29	0	0	$160K	0	$160K

2.1.4.9 Multi-Jurisdictional Risk Assessment

Crawford County has experienced 29 countywide flooding events (2019-2023) affecting the county as a whole. Property damages total $160K.

Though flooding, specifically flash floods, is a problem affecting all jurisdictions in the county at one time or another to varying degrees of seriousness, mitigation solutions are typically site specific and generally the responsibility of the specific jurisdictions within which the problems exist.

2.1.5 Thunderstorms

2.1.5.1 Description of Thunderstorm/Strong Wind, Lightning, and Hail Events

A thunderstorm, also known as an electrical storm, a lightning storm, thundershower or simply a storm, is a form of turbulent weather characterized by the presence of lightning and its acoustic effect on the Earth's atmosphere known as thunder. The meteorologically assigned cloud type associated with the thunderstorm is the cumulonimbus.

Thunderstorms are usually accompanied by strong winds, heavy rain and sometimes snow, sleet, hail, or no precipitation at all. Those that cause hail to fall are called hailstorms. Thunderstorms may line up in a series or rain band, 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.

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

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

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

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

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

2.1.5.2 Location of Thunderstorm/Strong Wind, Lightning, and Hail Events

All participating jurisdictions of the entire planning area have experienced thunderstorms, lightning, strong winds and hail events and are equally at risk.

2.1.5.3 Extent, Magnitude or Severity of Thunderstorm/Strong Wind, Lightning, and Hail Events

Based on historical data, the entire planning area could experience thunderstorm winds from 52 knots to 70 knots as well as hail from .75 to 2.50 inches placing thunderstorms in Crawford County in the TS3 to TS5 range of the thunderstorm criteria scale and H2 to H7 of the Hailstorm Intensity Scale.

The following are some characteristics of the different thunderstorm types.

TS1: WEAK - No tornadoes, no hail, winds less than 25 mph, only a few lightning strikes total, rainfall rates 0.03-0.10 of an inch per hour, no damage.

TS2: MODERATE - No tornadoes, no hail, winds 25-40 mph, 1-10 lightning strikes per five-minute interval, rainfall rates 0.10-0.25 of an inch per hour, little damage--mainly limited to breakage of small tree branches and movement of lawn furniture.

TS3: HEAVY - EF0 tornado possible, hail 0.25-0.75 of an inch in diameter, winds 41-57 mph, 10-20 lightning strikes per five-minute interval, rainfall rates 0.25-0.55 of an inch per hour, minor damage to small branches and roofs, with street flooding and lightning-sparked house fires possible.

TS4: INTENSE - EF1-EF2 tornado possible, hail 1.00-1.50 inches in diameter, winds 58-70 mph, 20-30 lightning strikes per five-minute interval, rainfall rates 0.55-1.25 inches per hour, moderate damage--wind damage to trees and buildings, possible tornado damage, hail dents in cars, damage to crops, power outages, and flooding along streams, creeks, and roadways.

TS5: EXTREME - EF3-EF5 tornado possible, hail larger than 1.50 inches in diameter, winds greater than 70 mph, more than 30 lightning strikes per five-minute interval, rainfall rates greater than 1.25 inches per hour, severe damage--significant, widespread damage to trees and property, flooding, hail damage to property and crops, EF3-EF5 tornado damage possibly devastating, and widespread power outages.

Table 12 - Modified NOAA/TORRO Hailstorm Intensity Scale

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or Grape	Significant damage to fruit, crops, vegetation

H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork dented, brick walls pitted
H5	Destructive	1.6-2.0	Silver Dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Egg	Aircraft bodywork dented; brick walls pitted
H7	Very Destructive	2.4-3.0	Tennis Ball	Severe damage to aircraft bodywork
H8	Very Destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.

2.1.5.4 Previous Thunderstorm/Strong Wind, Lightning, and Hail Events

There have been 20 Thunderstorm/Strong Wind events reported between 2019 and 2023 ranging from 52 kts.EG to 70 kts.EG resulting in $67K in property damages, but zero deaths and zero injuries.

Unusually gusty winds occur in Arkansas due to the pressure difference between low pressure to the northeast of the state and high pressure to the west. The difference in pressure between low pressure to the northeast of Arkansas and high pressure to the southwest of the state caused very windy conditions.

Lightning Events-There have been 0 lightning events reported between 2019 and 2023.

Hail Events-There have been 20 hail events reported between 2019 and 2023 ranging from .75 to 2.50 inches resulting in $305K in property damages, but zero deaths and zero injuries.

2.1.5.5 Probability of Future Thunderstorm/Strong Wind, Lightning, and Hail Events

Two key factors fuel the formation of severe thunderstorms: convective available potential energy (CAPE) and strong wind shear. There is evidence that climate change should increase CAPE by warming the surface and putting more moisture in the air through evaporation. The evidence suggests that the increase in CAPE will be the strongest in the Southeast, including Arkansas, leading to an increase in days favorable to severe thunderstorm formation.

Location (All participating jurisdictions within the entire planning area)
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, results in some damage and loss of services for days. There have been 40 Thunderstorm/Strong Wind, Lightning, and Hail events between 2019 and 2023 resulting in $372K in property damage.

Probability of Future Events
Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of 1 year.

Overall Significance
High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

2.1.5.6 Impact of Thunderstorm/Strong Wind, Lightning, and Hailstorm Events

Thunderstorm hazard can contribute to property damage and in some cases, injuries or fatalities. Across Crawford County, thunderstorm winds have resulted in large tree limbs being snapped and entire trees being uprooted or blown down blocking roads and damaging property. Thunderstorm winds have also been responsible for downed power lines resulting in loss of power for residences. Hail frequently occurs in conjunction with thunderstorms and has resulted in substantial damage to structures and vehicles in Crawford County.

Table 13 - Thunderstorm Threats

Severe Wind Threat Level	Threat Level Descriptions
Extreme	"An Extreme Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, there is an extreme likelihood (36% or greater) of severe wind, with storms capable of damaging wind gusts

	(greater than or equal to 58 mph) causing minor damage to major damage in the worst situations.
High	"A High Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, there is a high likelihood (26% to 35% probability) of severe wind, with storms capable of damaging wind gusts (greater than or equal to 58 mph) causing minor damage to major damage in the worst situations.
Moderate	"A Moderate Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, there is a moderate likelihood (16% to 25% probability) of severe wind, with storms capable of damaging wind gusts (greater than or equal to 58 mph) causing minor damage to major damage in the worst situations.
Low	"A Low Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, there is a low likelihood (6% to 15% probability) of severe wind, with storms capable of damaging wind gusts (greater than or equal to 58 mph) causing minor damage to major damage in the worst situations.
Very Low	"A Very Low Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, there is a very low likelihood (2% to 5%) of strong wind gusts (greater than or equal to 58 mph) causing minor damage to major damage in the worst situations.
Non-Threatening	"No Discernable Threat to Life and Property from Severe Wind Gusts Associated with Thunderstorms." Within 12 miles of a location, environmental conditions do not support the occurrence of severe wind gusts from thunderstorms.
Note: To be considered severe, associated wind gusts must be 58 mph or greater (50 knots or greater). Damaging Wind Gusts - Severe thunderstorm wind gusts between 58 mph and 74 mph (between 50 knots and 64 knots) causing minor damage, to severe damage with wind gusts of 90 to 150 mph (78 to 130 knots).	

Future impacts of increased thunderstorms are less likely to impact newer developments that are built to withstand stronger winds. The greater concern is for older structures. Thirty-five percent of the homes in Crawford County being constructed prior to 1980. Additionally, 10% of the housing units in Crawford County are mobile homes which are more susceptible to thunderstorms. Areas with higher population density are more at risk to all hazards,

including thunderstorms. The Arkansas Economic Development Institute projects a continued decline in population for Crawford County. With the population decreasing in Crawford County, the trend of lower population density can be expected to continue thus lessening the impacts of future hazards.

2.1.5.7 Vulnerability and Estimating Potential Loss

All participating jurisdictions within the entire planning area are equally likely to experience severe thunderstorms, lightning, high winds and hailstorm events. All structures in the county and their contents are vulnerable to damage by thunderstorms winds. High winds can down trees onto power lines, damage mobile homes that are not anchored, and rip off roofing. Winds can cause death and injuries by lifting unanchored objects creating flying missiles.

Lightning strikes have the power to fell trees many times disrupting service, and structural fires. Lightning can possibly cause death and injuries. Zero injuries due to lightning have been reported in Crawford County. Wind and lightning can damage communication towers located throughout the county. Hailstorms event are frequent in the county and can cause damage to all structures, namely 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.

Table 14 - Thunderstorm Events

Event	Events	Fatalities X $8M	Injuries X $1M	Total Fatalities, Injuries, Personal and Crop Damages	Average loss per event
Thunderstorm/ Strong Winds	20	$0	$0	$67K	$3,350
Lightning	0	$0	$0	$0K	$0
Hail Events	20	$0	$0	$305K	$15,250

The entire county is subject to thunderstorm events where usually high winds, lightning and hail are involved.

2.1.5.8 Multi-Jurisdictional Risk Assessment of Thunderstorms/Strong Wind, Lightning and Hailstorms

Severe thunderstorms do not seem to be unique to particular areas of the county. The threat is countywide and with no significant variation at the county or jurisdiction levels. However, certain facilities under county government control that are critical to the entire county are particularly at risk to thunderstorms. Specifically, this is the county's emergency operations center in Van Buren and also the E-911 dispatch center. Communications equipment and antenna towers, which are prone to damage by lighting, are integral components of these facilities. Protection of these facilities is a high priority.

2.1.6 Tornado

2.1.6.1 Description of a Tornado

A Tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings and particularly manufactured homes. Tornadoes are more likely to occur during the months of March through May and tend to form in the late afternoon and early evening.

2.1.6.2. Locations of Tornado Events

Because there is no defined geographic hazard boundary, all people and property within all participating jurisdictions within the entire planning area are exposed to the risk of damage from Tornadoes. Based on the short 65-year dataset, no clear areas of high tornado occurrence occur at any particular county scale. Thus, although tornado risk appears to vary at a statewide scale, variable tornado risk at the county scale cannot be demonstrated. Thus, mapping variations in tornado risk at a local or county scale is not currently possible. For the purpose of this plan, all parts of this plan are considered equally likely to experience a tornado event.

2.1.6.3. Extent, Magnitude or Severity of Tornado

While the entire planning area is susceptible to tornados, since 2019 Crawford County has experienced six tornados, with 1 classified as EF0 and 5 classified as EF1 on the Enhanced Fujita Scale. Due to the extreme unpredictability of tornados, it is not outside the realm of possibilities for any of the participating jurisdictions within the planning area to experience an EF5 tornado.

The Enhanced Fujita (EF) Scale was devised by a panel of meteorologists and engineers convened by the Wind Science and Engineering Research Center at Texas Tech University. The Weather Channel's severe weather expert Dr. Greg Forbes was on the team of experts who determined the revised wind speed ranges. Since 2007, the EF Scale has been used to rate tornadoes.

Table 15 - Enhanced Fujita Scale

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

2.1.6.4. Previous Occurrences

There were only 6 tornadoes reported between 01/01/2019 and 8/31/2023, 1 EF0 and 5 EF1 causing $15M in damages with no deaths or injuries reported.

2.1.6.5. Probability of Future Tornadoes

According to the Fourth National Climate Assessment, some types of extreme weather like rainfall and extreme heat can be directly attributed to global warming. Other types of extreme weather, such as tornadoes, are also exhibiting changes which may be linked to climate change, but scientific understanding isn't detailed enough to project direction and magnitude of future change. As western Arkansas becomes warmer and wetter the likelihood to have an effect on extreme weather events, including tornadoes, increases.

Location (All participating jurisdictions within the entire planning area)
Extensive: 75 to 100 percent of planning area

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Extreme: onset or extended duration of tornado event, resulting in catastrophic damage and uninhabitable conditions.

Probability of Future Events
Likely: 10 to 90 percent probability of tornado occurrence in the next year or a recurrence interval of 1 to 10 years.

Overall Significance
High: A tornado event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

2.1.6.6 Impact of Tornado

Tornadoes can cause significant damage to trees, building, and power infrastructure. They can cause fatalities, particularly when people are unable to get to a protective shelter. Associated hazards include:

Wind- Tornadoes consist of strong, often destructive winds that can uproot trees and damage buildings and cars.

Rain/Hail-Tornadoes are associated with thunderstorms and may be preceded or followed by heavy rainfall or hail. Depending on the hydrological conditions, flash flooding may occur.

Obstacles to Response- Damage or destruction of public facilities, including hospitals, can complicate emergency response efforts. Additionally, debris may block roadways, there may be extensive damage to electric and telephone lines, utility lines may be broken, and communication may be cut off because of damaged or destroyed cell, radio and television towers.

Crawford County has recorded 6 tornados since 2019, one EF0 and five EF1. These numbers indicate that Crawford County will experience at least 1 tornado every few years. There was $15M in property damages from the 6 tornados.

Future impacts of increased tornadoes are less likely to impact newer developments that are able to be built to withstand stronger winds. The greater concern is for older structures. Thirty-five percent of the homes in Crawford County were constructed prior to 1980. Additionally, 10% of the housing units in Crawford County are mobile homes which are more susceptible to tornadoes. Areas with higher population density are more at risk to all hazards, including tornadoes. The Arkansas Economic Development Institute projects a continued decline in population for Crawford County. With the population decreasing in Crawford County, the trend of lower population density can be expected to continue thus lessening the impacts of future hazards.

2.1.6.7. Vulnerability and Estimating Potential Loss

The National Climatic Data Center provides historical details about past hazard events in the county. The chart shows a breakdown of the magnitudes of the tornadoes which have occurred in Crawford County from 2019-2023.

Table 16 - Tornado Events

Magnitude of Tornadoes	NDCD Total Events- (-)
EF-0	1(2019)
EF-1	1 (2019), 4 (2021)
EF-2	0
EF-3	0
EF-4	0
EF-5	0
Total	6

Based on historical data, the average estimated losses per tornado is $2.5M.

Table 17 - Tornado Damages

	Events	Deaths	Injuries	Property Damage	Crop Damage	Total Damages
Total 2019-2023	6	0	1	$15M	$0	$15M

2.1.6.8 Multi-Jurisdictional Risk Assessment

Because there is no defined geographic hazard boundary, all people and property in Crawford County are exposed to the risk of damage from tornadoes. All structures in Crawford 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, 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) are primarily located in the incorporated cities and towns within Crawford County.

All participating jurisdictions within the entire planning area would be affected due to the lost power, water, sewer, gas, and communications. Power and water outages would cause food spoilage and sanitation problems for communities. Hospitals, grocery stores and other critical need and economically important facilities are damaged and closed for extended periods.

Businesses and local government infrastructure often suffer extensive damage in tornados as well as the death of people, wildlife and livestock. Employment is often affected because

of businesses that close due to the tornado damage and loss of business. Even with the advances in meteorology, warning times may be short.

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

2.1.7 Wildfire Profile

2.1.7.1 Description of Wildfire

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

2.1.7.2 Location of Wildfire

The area most affected by wildfire would be wooded areas such as forestland. The entire county possesses some type of fuel, whether grass, agriculture, forestry, shrubs, structures, or other vegetation types. Crawford County includes 214,144 acres of forestland, 56% of the land area in Crawford County.

According to the county emergency management coordinator and chiefs of the county's rural fire districts, wildfires occur often at various locations in rural areas of the county. Most at risk are structures in the rural and urban fringe areas of the county where vegetation fuels and development interface. Unlike some areas in western United States, such as California, rarely are there any threats to areas in the county with high concentrations of population. Generally speaking, the areas of the county most affected and threatened by wildfire are those outside the incorporated cities and typically related to open-field grass and brush fires.

Wildfires are scattered across Crawford County; to assess jurisdictions most at risk of wildland fires, one must consider the wildland-urban interface (WUI). Maps demonstrating each jurisdiction's Wildfire Hazard Potential are located in Section 7.4: Appendix D.

2.1.7.3 Extent, Magnitude or Severity of Wildfire

Based on historical data, the entire planning area experiences an average of 22 wildfires per year burning an average of 11 acres per fire and 242 acres per year.

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

Table 18 - Burn Severity

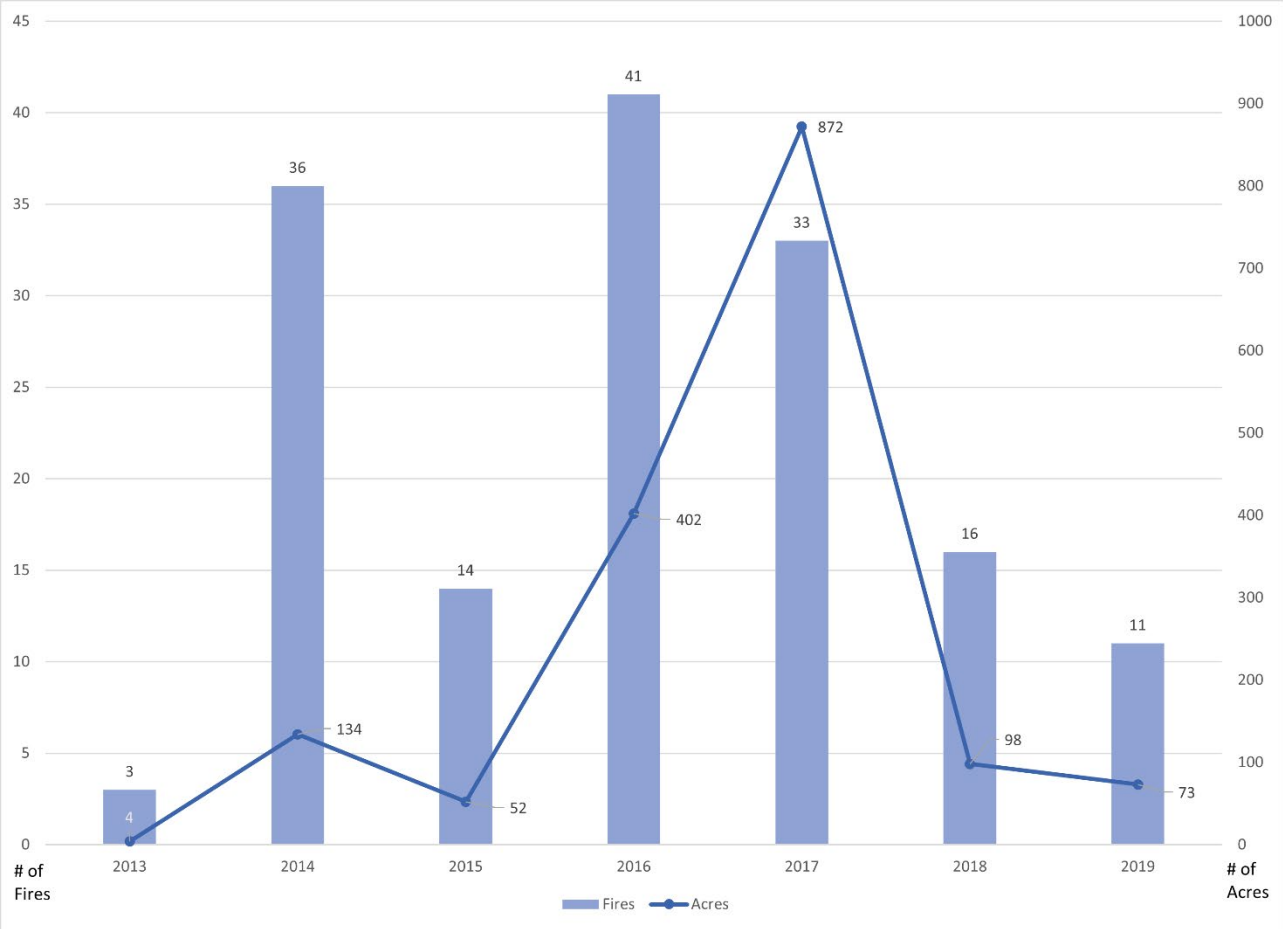
Rank	Burn Severity	Description	Characteristics
0	Unburned	Fire extinguished before reaching microsite	• Leaf litter from previous years intact and uncharred • No evidence of char around base of trees and shrubs • Pre-burn seedlings and herbaceous vegetation present.
1	Low Severity Burn	Surface fire which consumes litter yet has little effect on trees and understory vegetation.	• Burned with partially consumed litter present • Evidence of low flame heights around base of trees and shrubs (<0.5 m) • No significant decreases in overstory & understory basal area, diversity, or species richness from pre-burn assessments • Usually burning below 80 ° C
2	Medium-Low Severity Burn	No significant differences in overstory density and basal area, & no significant differences in species richness. However, understory density, basal area, and species richness declined.	• No litter present and 100% of the area covered by duff • Flame lengths < 2 m • Understory mortality present, little or no overstory mortality
3	Medium-High Severity Burn	Flames that were slightly taller than those of Medium-low intensity fires, but these fires had occasional hot spots that killed large trees, With significant reduction in the understory	• Soil exposure on l-50% of the area • Flame lengths <6m • High understory mortality with some overstory trees affected

4	High Severity Burn	Crown fires, usually a stand replacing burn with relatively high overstory mortality	• Soil exposure >50% • Flame lengths >6m • Higher overstory mortality >20% • Usually burning above 800 ° C

2.1.7.4 Previous Occurrences

The Arkansas Department of Agriculture reported the following data for 2013-2019.

Graphic 3 - Wildfire Events



Data represents wildfires and acreage across the entire planning area.

2.1.7.5 Probability of Future Wildfire Occurrences

According to the EPA, warmer and drier conditions in Arkansas are projected to cause an increase in the frequency and intensity of forest fires. Changing climate conditions may cause existing tree species to expand northward and be replaced by species from the south. Warmer conditions will also allow more pests to survive through the winter, threatening forest health throughout the state. Temperatures in Arkansas have risen by 0.5 degrees Fahrenheit since the beginning of the 20th century.

Location (Forest land accounts for 214,144 acres of forestland, 56% of the land area in Crawford County)
Significant: 25 to 75 percent of planning area or consistent single-point occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed on onset or short duration of even resulting in little to no damage.

Probability of Future Events
Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of 1 year.

Overall Significance
Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating.

2.1.7.6 Impact of Wildfire

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

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

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

In 2014, dry and breezy conditions contributed to the spread of a wildfire that burned about 40 acres near Alma in Crawford County. The fire damaged a mobile home and caused $25,000 in damages. Wildfires in neighboring Franklin County caused $250,000 in damage when 1000 acres burned in November 2016.

Those that reside in wood frame structures or manufactured homes, especially the elderly and children are especially susceptible to wildfires. While the population of Crawford County has been decreasing, the percentage of the population under the age of 5 has remained steady and the population over the age of 62 has been increasing. If this trend continues, the impacts of wildfires could increase. Thirty-five percent of the homes in Crawford County being constructed prior to 1980. Additionally, 10% of the housing units in Crawford County are mobile homes, making them more susceptible to wildfires. Future development in wildfire prone areas will be limited due to the fact that 60% of the forestland in Crawford County is privately owned and the major public owner is the Ozark National Forest. If Crawford County's low population density continues, this will also lessen future impacts of wildfires.

2.1.7.7 Vulnerability and Estimating Potential Loss

Crawford County is approximately 379,520 acres. Forest land accounts for 214,144 acres, or 56% percent of the land area in Crawford County. Crawford county also has 799 farms covering 122,319 acres.

For the Crawford County project area, it is estimated that 58,984 people or 95 percent of the total project area population (61,931) live within the WUI.

WUI – Population and Acres from the Southern Wildfire Risk Assessment Summary Report for Crawford County.

The majority of the planning area's population (29,930) is in a density area of 1 house/2 acres to 3 houses/1 acre, meaning the majority of the planning area's population is vulnerable to wildfire.

Structure location is the primary control on vulnerability to wildfire. Structures most vulnerable to wildfire are those located within the rural areas of the county where wildfire events typically occur and, to a less extent, in the rural-urban interface areas of the county. These are areas where structures and other human development meet or intermix with undeveloped or open rural land. These interfaces create an environment in which fire can move readily between structural and vegetation fuels. Its expansion over the past several years has increased the likelihood that wildfires will threaten structures and people. Although all building construction types within the interface are vulnerable, the most vulnerable construction type is wood frame, which comprises about three-fourths of the structures in the county. These wood frame structures are found at locations throughout the county.

Most vulnerable are wood frame structures and mobile homes in the rural and urban interface areas that are adjacent to land that is subject to wildfire, due namely to natural fuel characteristics in the vicinity. As a predominately rural county with small cities and numerous scattered home-sites and businesses, interface settings are found throughout the county

and affect all jurisdictions. Accordingly, all fire departments are mindful of fire conditions and threats in their service areas.

Fire fighters are the most vulnerable populations during wildfires. Fire fighters can face mortality due to heat exhaustion. Other vulnerable populations are those that live in a high intensity area, the population in the dense housing area referenced on the previous pages, and those that reside in wood frame structures or manufactured homes, especially the elderly and children.

Table 19 - Crawford County Vulnerable Populations

Crawford County (2020 Census)		
Total Population	Under 5 years	Over 62 Years
60,133	3,691 (6.1%)	13,018 (21.6%)

2.1.7.8 Multi-Jurisdictional Risk Assessment

Wildfires are more prevalent in the rural, unincorporated areas of the county and pose a greater threat to property and lives where structures interface with wildfire-prone conditions (such as high fuel grass lands and shrubbery). Though records on wildfires in the county have not always been well maintained, rural fire departments and the County Emergency Coordinator state that the risk of wildfire exists throughout the county and is not associated with any particular sector.

Throughout the country, associated with the risk of wildfire is the expansion of the wildfire/urban interface (WUI) in recent decades, which has significant implications for wildfire management and impact. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. Its expansion has increased the likelihood that wildfires will threaten structures and people. For this reason, the areas of greatest concern for wildland fire damages are those rural, urban-interface areas in the growing areas of the county outside the cities. In Crawford County, the growing areas are generally those in proximity to state highway corridors and main county roads. Crisscrossing the county, these corridors traverse much of the county and are not specific to one sector or another.

The risk for wildfire is thus much greater within jurisdictional areas of county government and less likely within areas under jurisdictional purview of the incorporated cities. For this reason, rural fire departments throughout the county, which are to some extent under the auspices of county government, play a central role in terms of mitigating against and responding to wildfire events.

2.1.8 Winter Storm

2.1.8.1 Description of Winter Storm

Severe winter storms, which may include heavy snowfall, sleet, freezing rain, or a mix of these wintry forms of precipitation. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries. Areas where such weather is uncommon, such as Arkansas, are typically disrupted more severely by severe winter storms than are regions that experience this weather more frequently.

The National Weather Service defines snow as a steady fall of snow for several hours or more. Heavy snow is defined as either a snowfall accumulating to 4 inches in depth in 12 hours or less, or snowfall accumulation to 6 inches or more in depth in 24 hours or less. A blizzard means that the following conditions prevail for a period of three hours or longer: 1) sustained wind or frequent gusts to 35 miles an hour or greater; and 2) considerable falling and/or blowing snow. Sleet is defined as pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes. These pellets of ice usually bounce after hitting the ground or other hard surfaces. Heavy sleet is a relatively rare event defined as the accumulation of ice pellets covering the ground to a depth of 0.5 inch or more. Freezing rain or freezing drizzle occurs when rain or drizzle freezes on surfaces such as the ground, trees, power lines, vehicles, streets, highways, etc. An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant ice accumulations are usually accumulations of 0.25 inches or greater.

2.1.8.2 Location of Winter Storm Events

All participating jurisdictions of the entire planning area are equally susceptible to severe winter storm events. Not all areas of Arkansas are equally affected, Crawford County is affected less often by severe winter events than the northwestern corner of the state.

2.1.8.3 Extent, Magnitude or Severity of Winter Storms

Per National Climatic Data Center (NCDC) and National Weather Service Data, typical snow accumulations in Crawford 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. Since 2019, 6 severe winter storm events, including one ice storm have occurred in Crawford County. When severe winter storm events do occur (the worst 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.

Future winter storm events in Crawford County can be expected to yield 1 to 8 inches of snow across the planning area. Future ice storms can be expected to yield 1/10 of an inch to 1/2 an inch of ice with isolated storms producing larger amounts.

2.1.8.4 Previous Occurrences

There have been 6 winter storm events, including 1 ice storm event reported between 01/01/2019 and 8/31/2023. Winter Storm events have occurred every year except 2019. Combined, these storm events caused $70K in damage, $50K from the 2020 ice storm and $20K from the 5 winter storm events in 2021, 2022, and 2023.

2.1.8.5 Probability of Future Winter Storms

According to EPA, total snowfall has decreased in many parts of the country since widespread observations became available in 1930, with 57 percent of monitored stations showing a decline. Among all of the stations, the average change is a decrease of 0.19 percent per year. The Fort Smith Regional Airport station saw a decrease of 0.47 percent per year. The 20th century had many winters with widespread patterns of unusually low temperatures, including a particularly large spike in the late 1970s. Since the 1980s, though, unusually cold winter temperatures have become less common, particularly very cold nights.

Location (All participating jurisdictions of the entire planning area.)
Extensive: 75 to 100 percent of planning area or consistent single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Moderate: Moderate classification on scientific scale, moderate speed of onset or moderate duration of event, resulting in some damage and loss of services for days. Since 2019, 6 events have resulted in $70K in damages.

Probability of Future Events
Highly Likely:10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 year. Winter Storm events occurred 4 out of the 5-year period from 2019 to 2023.

Overall Significance
High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

2.1.8.6 Impact of Winter Storms

Crawford County experiences a major winter storm nearly every year. However, severe winter storms, such as heavy ice or snowstorms causing anything more than moderate disruptions of people's lives, are infrequent. Severe events – those causing millions of dollars in widespread damage – seem to occur only about every ten years to fifteen years. Also, the county is not located in a region of the country that is prone to frequent severe winter storms. Damage from of winter storms is often not reported to public agencies for recording in databases such as SHELDUS, 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 past experience, an estimated ten to twenty 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, typically residential.

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 isolated 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 crops and other vegetation. Pipes may freeze and burst in homes or businesses that are poorly insulated or without heat. Structure fires occur more frequently in the winter due to lack of proper safety precautions and present a greater danger because water supplies may freeze, and impede firefighting efforts. 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 damages, and loss of business can have large economic impacts on cities and towns.

School officials with each of the school districts in Crawford County monitor weather updates via television, radio and internet. If weather becomes hazardous, then appropriate actions are taken based on students being in school or getting ready to come to school. If weather due to snow or ice is forecasted to become hazardous, by the determination of the school officials, 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 if there are extreme cold temperatures. Wind chill would be the determining factor in keeping students inside.

While the population of Crawford County has been decreasing, the percentage of the population under the age of 5 has remained steady and the population over the age of 62 has been increasing. This trend could result in more severe future impacts from winter storms. Winter storms frequently result in power outages. Future development could further strain electrical systems. Future residential, industrial, and agricultural developments could also strain municipal and rural water systems which are also susceptible during winter storms.

2.1.8.7 Vulnerability and Estimating Potential Loss

Heavy accumulations of ice or snow commonly result in collapse of structural damage to buildings. The 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, business, 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. Experiences from past storms indicate that poultry houses are particularly vulnerable. Heavy accumulations of ice from ice storms or heavy snow can also bring down trees, electrical wires, telephone poles and lines, and communication towers.

The National Climatic Data Center provides historical details about past hazard events in the county.

Table 20 - Winter Storm Events

Winter Events 2019-2023	Fatalities	Injuries x $1 M	Combined Fatalities, Injuries Personal Property, and Crop Damage Value	Average Cost per Event
6	0	0	$70K	$11,666

2.1.8.8 Multi-Jurisdictional Risk Assessment

All participating jurisdictions within the entire planning area are equally affected by winter storms. Winter storms do not seem to be unique to particular areas of the county; the threat is considered to be countywide with no significant variation at the county or jurisdiction levels.

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

2.1.9 Earthquake

2.1.9.1 Description of Earthquake

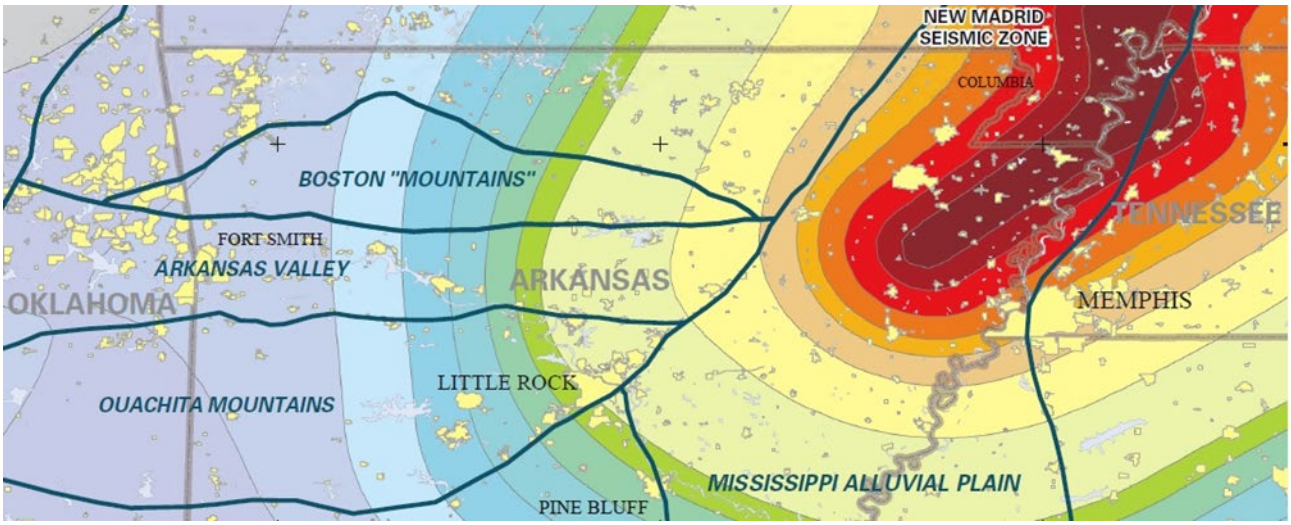
An earthquake is naturally induced shaking of the ground, caused by the fracture and sliding of rock within the Earth's crust. Magnitude is determined by the dimensions of the rupturing fracture (fault) and the amount of displacement that takes place - the larger the fault surface and displacement, the greater the energy. In addition to deforming the rock near the fault, this energy produces shaking and a variety of seismic waves that radiate throughout the Earth.

2.1.9.2 Location of Earthquake Events

Earthquake activity will follow a fault line. Per the USGS, the New Madrid Fault Line runs through the north-east section of Arkansas. Crawford County is in the north-west section of Arkansas and does not fall on the fault line.

Earthquake distributions can be misleading because, unlike other hazards, the event does not have to occur in a jurisdiction for that jurisdiction to be affected by it.

Graphic 4 - Earthquake Potential



2.1.9.3 Extent, Magnitude or Severity of Earthquakes

Crawford County is in an area with a .05 to .10 peak ground acceleration (pga) coefficient, which means it has some possibility of seismic hazard. Though Crawford County is vulnerable to the effects of a major earthquake in the region, it is unlikely that an earthquake will affect the area at a significant level.

Earthquakes are measured by intensity and magnitude. The Richter scale is used for magnitude measurement to describe the energy released while the Modified Mercalli Intensity scale measures intensity to demonstrate the effects of the event.

The United States Geological Survey developed an Instrumental Intensity scale, which maps peak ground acceleration and peak ground velocity on an intensity scale similar to the felt Mercalli scale. These values are used to create shake maps by seismologists around the world. Based on Sebastian County's PGA, earthquakes across the entire planning area would most likely fall into category V on the Mercalli scale.

Table 21 - Instrumental Intensity Scale

Instrumental Intensity	Acceleration (g)	Velocity (cm/s)	Perceived shaking	Potential damage
I	< 0.000464	< 0.0215	Not felt	None
II-III	0.000464 – 0.00297	0.135 – 1.41	Weak	None
IV	0.00297 – 0.0276	1.41 – 4.65	Light	None
V	0.0276 – 0.115	4.65 – 9.64	Moderate	Very light
VI	0.115 – 0.215	9.64 – 20	Strong	Light
VII	0.215 – 0.401	20 – 41.4	Very strong	Moderate
VIII	0.401 – 0.747	41.4 – 85.8	Severe	Moderate to heavy
IX	0.747 – 1.39	85.8 – 178	Violent	Heavy
X+	> 1.39	> 178	Extreme	Very heavy

Table 22 - Modified Mercalli Intensity Scale

Mercalli Intensity	Damage Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably by people indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing cars may rock slightly. Vibrations are like the passing of a truck. Duration estimated.
IV	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 motorcars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys. Damage slight

VII	Everybody runs outdoors. 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. Noticed by people driving cars.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage is great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. People driving cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes are broken.
X	Some well-built wooden structures were destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed and slopped over banks.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines are completely out of service. Earth slumps and land slips in soft ground. The rails bent greatly.
XII	Damage total. Waves seen on the ground. Lines of sight and level are distorted. Objects thrown into the air.

Table 23 - Richter Scale

Descriptor	Richter Magnitudes	Earthquake Effects	Frequency of Occurrence
Micro	Less than 2.0	Microearthquakes, not felt.	About 8,000 per day
Very Minor	2.0-2.9	Generally not felt but recorded.	About 1,000 per day
Minor	3.0-3.9	Often felt, but rarely causes damage.	49,000 (estimated) per year
Light	4.0-4.9	Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.	6,200 (estimated) per year
Moderate	5.0-5.9	Can cause major damage to poorly constructed buildings over small regions. At most, slight damage to well-designed buildings.	800 per year
Strong	6.0-6.9	Can be destructive in areas up to about 100 miles across populated areas.	120 per year
Major	7.0-7.9	Can cause serious damage over larger areas.	18 per year

Great	8.0-8.9	Can cause serious damage in areas several hundred miles across	1 per year
Rare Great	9.0 or greater	Catastrophic damage	1 per 20 years

2.1.9.4 Previous Occurrences

Crawford County's only recorded earthquake occurred October 31, 1978.

2.1.9.5 Probability of Future Earthquakes

Future earthquake events will depend on the amount of stress on the fault line. According to NASA, the amount of stress is impacted by both increased surface water and drought. When there is heavier rainfall, this precipitation and any subsequent flooding increases stress and decreases seismicity. When the season dries up and there's less water, the weight on the Earth's crust decreases and this can lead to micro-seismicity. Participating jurisdictions are expected to experience increases in both precipitation and intensity of naturally occurring droughts.

Location (All participating jurisdictions of the entire planning area.)
Negligible: Less than 10 percent of planning area or isolated single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed of onset or short duration of event resulting in little to no damage.

Probability of Future Events
Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.

Overall Significance
Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area.

2.1.9.6 Impact of Earthquakes

This hazard can directly impact building inventory (especially Unreinforced Masonry Buildings), people (from being displaced to causing fatalities), infrastructure (damage to bridges, railroads, highways, and runways), livestock, as well as indirect economic impacts.

Businesses can suffer economic losses when roads are closed, buildings are damaged, as well as forced closure to protect public health and safety if fresh water is unavailable or when gas leaks are present.

Per 2020 Census Data, Crawford County has 25,300 housing units, 71.2% of which are owner occupied. According to 2023 Esri Data, the median home value in Crawford County is $150,273, 18% lower than the state of Arkansas.

Due to low probability of earthquakes in Crawford County due to its location and rural nature, changes in population and land use/development are not expected to affect the impacts of this hazard.

2.1.9.7 Vulnerability and Estimating Potential Loss

To date, among the seven States in the New Madrid Seismic Zone (NMSZ), four (Arkansas, Indiana, Kentucky, and Tennessee) have statewide building codes as minimum requirements. In the States where statewide building codes are mandatory, a local jurisdiction still must introduce ordinances to adopt and enforce the State building codes for the jurisdiction.

Effective January 1, 2023, Arkansas follows the 2021 AR Fire Prevention Code based on the 2021 IFC, IBC and IRC. Arkansas currently adopts the 2018 AR Plumbing Code based on the 2018 IPC and the 2018 AR Fuel Gas Code based on the 2018 IFGC. Effective July 1, 2022, Arkansas adopted the 2021 IMC.

The State code is mandatory and applicable to all buildings. It is required that local codes must be in accordance with the State code, and only more stringent amendments are allowed by local adoption. The State only oversees code enforcement for state capital investments. Local authorities have jurisdiction over private, district, municipal and county constructions.

This legislation attempts to make public buildings and bridges safer; however, in a major event, inventory will still suffer heavy losses.

Earthquake's Safest & Most Dangerous Buildings
Small, Wood-frame House - Safest (most widely used in US)
Steel-Frame (used in US)
Reinforced Concrete (used in US)
Unreinforced Masonry (widely used in US)
Adobe - Most Dangerous (not widely used in US)
In the United States, Unreinforced Masonry (URM) is the most dangerous building structure type where earthquakes are concerned.

All structures in the planning area are vulnerable to damage by a large magnitude earthquake. In general terms, the building types most vulnerable to ground shaking are those constructed of unreinforced masonry and concrete. Infrastructure most vulnerable to earthquakes includes all utility distribution lines (water, wastewater, natural gas) and facilities. Transportation infrastructure most vulnerable to earthquakes includes highway bridges and railway bridges.

2.1.9.8 Multi-Jurisdictional Risk Assessment

Earthquakes are not unique to any area of the county; the threat is countywide with no significant variation at the county or jurisdiction levels. Jurisdictions with the most infrastructures carry the biggest vulnerability to and earthquake event. Three-story buildings and interstate locations can cause vast damage and destruction during an earthquake event. With no recorded earthquake event in recent history, its potential magnitude and severity are considered negligible.

2.1.10 Landslide

2.1.10.1 Description of Landslide

A landslide is a downward movement of materials under the force of gravity. Landslides include ground movement such as rockfalls, deep failure of slopes, shallow debris flows and mudflows.

The type of movement that occurs and the type of material involved classify landslides. The types of movement are slides, flows, lateral spreads, falls and topples. The types of material involved in landslides include bedrock and soil (including artificial fill). Soils are described as material that is either predominantly coarse (debris) or predominantly fine (earth). A combination of two or more of the principal types of flows is referred to as a complex movement.

Slides: One of the most common types of movements is sliding, which involves downward displacement along one or more failure surfaces (also referred to as a discontinuity, rupture or slip surface). The material from the slide may be broken into several pieces or remain as a single, intact block. Sliding can be translational or rotational. Rotational motion involves movement turning about a specific point, where translational sliding is movement down slope on a path roughly parallel to the slip surface. The most common example of a rotational slide is a slump, which has a strong, backward rotational component and a curved upwardly concave failure surface. Slides and slumps are common throughout Arkansas, especially along streams and highways. Slides are commonly initiated when the bottom of a slope is removed (by running water or human activity), thereby steepening the overall slope to the point that a landslide will occur.

Flows: Flows consist of a slurry of loose rocks, soil, organic matter, air and water moving down slope in the manner similar to a viscous fluid. They are distinguished from slides by having high water content and are thoroughly deformed internally during movement. While flows can dominate the failure, they are commonly observed as a minor component or extension of the toe (bottom of the landslide) of a slide or fall. Although flows are not as severe a problem in Arkansas as in some of the western states, they are common in all areas of the State, especially along the slopes of Crowley's Ridge (Cronin, 1992; see McFarland, 1992). A type of flow known as soil creep is an extremely slow and steady process that may persist over long periods of time. It is commonly observed in weathered bedrock and soil on steep slopes throughout Arkansas.

Lateral Spreads: The slow-to-rapid lateral extensional movements of rock or soil masses on almost level ground are known as lateral spreads. In fine-grained soils, such as quick clays, lateral spreading occurs if the soils are remolded or disturbed by construction or grading. Loose, granular soils commonly produce lateral spreads through the process of liquefaction. Liquefaction is the transformation of a granular material from a solid state into a liquefied state as a biproduct of increased water pressure in the spaces between the grains of sand. Liquefaction is caused by vibration of the earth produced by a strong earthquake.

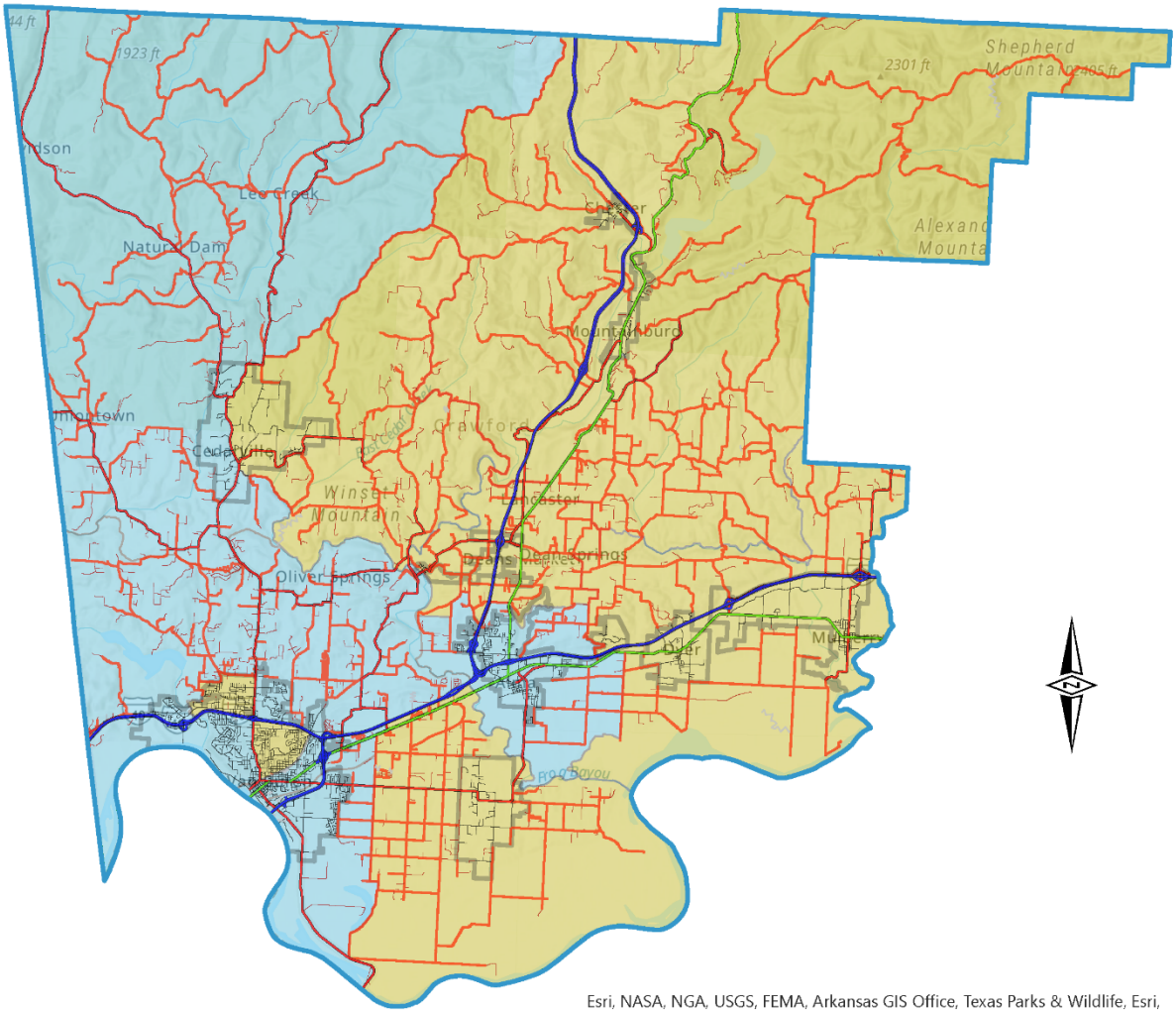
Falls and Topples: Falls occur when masses of rock or other material detach from a steep slope or cliff and descend by free fall, rolling, or bouncing. Topples consist of the forward rotation of rocks or other material about a pivot point on a hill slope. Topples generally develop in rock slopes divided into blocks by vertical fractures or joints oriented parallel to the slope face. Falls and topples can be triggered by an earthquake or erosion at the base of the affected slope. In Arkansas, falls and topples are infrequent in occurrence and are restricted to the rock outcrops of the Ouachita and Ozark Mountains, and the bluff faces of the Arkansas River valley.

2.1.10.2 Location of Landslide Events

Although a landslide may occur almost anywhere, from man-made slopes to natural, pristine ground, most slides often occur in areas that have experienced sliding in the past. Landslides may also be triggered by other natural hazards. For example, the safety of a dam can be severely compromised by upstream landslides or collapse of slopes bordering the reservoir or dam abutments. Landslides and flooding are closely related because both involve precipitation, runoff, and ground saturation. Debris flows usually occur in small, steep channels and are often mistaken for floods. Landslides and lateral spreads often result from seismic activity. The simultaneous or sequential occurrence of interactive hazards may produce cumulative effects that differ significantly from those expected from any one event.

The following map shows areas of Crawford County and their susceptibility to landslides and lateral spread. According to the map, Crawford County falls into zones of moderate and low susceptibility with areas primarily along the western border experiencing moderate susceptibility to landslides and areas in central and eastern Crawford County experiencing low susceptibility to landslides. Chester, Mountainburg, Mountainburg School District, Rudy, Mulberry, Mulberry-Pleasant View School District, Dyer and Kibler are all located in the area of low susceptibility. Cedarville, Cedarville School District, Van Buren, Van Buren School District, Alma, and Alma School District all have areas that fall into both moderate and low susceptibility.

Graphic 5 - Landslide Potential



Legend

National Risk Index by Census Tract

Landslide - Hazard Type Risk Index Rating

No Rating | Relatively Low | Relatively Moderate | Relatively High | Very High

Crawford County, AR

Landslide Potential by Census Tract
FEMA Risk Index Data

0 2 4 8 12 Miles

1 inch equals 4 miles

2.1.10.3 Extent, Magnitude or Severity of Landslide

Because of the limited significant landslide events that have affected the county, the extent or severity of the landslide hazard in not well known. Because of the low frequency of significant landslides – and the likeliness they would be isolated events if they did occur – this event's potential magnitude is considered negligible and its severity negligible.

The landslides that have been recorded in Crawford County have typically been a couple hundred feet across. Neighboring Franklin County experienced a slide of 700 linear feet that caused 3.2 miles of road closure.

Based on best available data from Crawford County slides, as well as neighboring Franklin County, Crawford County and all participating jurisdictions can expect to experience a landslide up to 700 linear feet, but typically see slides averaging two hundred to three hundred linear feet.

2.1.10.4 Previous Occurrences

Between 2019 and 2023, there have been 2 recorded landslides in Crawford County. In October 2019, a landslide closed one lane of traffic on State Highway 220 in Crawford County. In June 2012, a landslide was reported at Lake Fort Smith. It occurred about a mile and a half from the dam on the lake. The landslide is reported to be about 150 feet wide.

2.1.10.5 Probability of Future Landslide

With water and wildfires being two of the leading causes of landslides, future conditions could lead to more frequent and severe landslides. As previously mentioned, more frequent and intense heavy-rainfall events are expected across the planning area. As described in a later section of this plan, warmer and drier conditions in Arkansas are projected to cause an increase in wildfires.

Location (All participating jurisdictions of the entire planning area.)
Limited: 10 to 25 percent of planning area or limited single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage.

Probability of Future Events
Occasional:1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.

Overall Significance
Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area.

2.1.10.6 Impact of Landslide

Landslides have occurred in nearly every county in Arkansas. They have destroyed or damaged roads, railroads, bridges, mining facilities, parks and recreational areas, residential and commercial buildings, sewers, dams, reservoirs, forests, fisheries, and farms. Damage caused directly by landslides is largely undocumented or often misreported. The devastating effects of landslides often are attributed to triggering events such as a flood, earthquake, or storm.

Based on the best available data, observed conditions, and past occurrences, the probable impact of landslide on the life, safety, and health of the citizens of Crawford County would be little or no impact. This is based on the lack of exposure of any structure or facility critical to the safety and health of the citizens of the county.

Roads are the primary target of impact and would cause traffic disruptions should the slide affect the roadway. There are some minor roads (local dirt roads) that could be impacted.

Due to low probability of landslides in Crawford County due to its location and rural nature, changes in population and land use/development are not expected to affect the impacts of this hazard.

2.1.10.7 Vulnerability and Estimating Potential Loss

Per the earlier map, created by UALR, landslide risk within Crawford County varies. Location, rather than structure type, is the primary control on the vulnerability of structures to landslide events. Landslides can destroy or damage roads, railroads, bridges, residential and commercial buildings, sewers, dams, reservoirs, pipelines, and other structures. Most landslides in the State are human induced and result from cutting into the lower slope of a previously stable hill. The most vulnerable structures are therefore those buildings, roads, distribution lines, and other structures adjacent to slope cuts. All types of building stock (wood, steel, masonry, etc.) are equally vulnerable to the effects of landslides.

Roads within Crawford County that are prone to landslides are Highway 71 north of Mountainburg near Lake Fort Smith, Highway 59 near Van Buren, Interstate 49 near Chester, God's Ranch Road north of Mountainburg, Hurricane Creek Road in northeast Crawford County, and Pecan Grove Road near Alma.

Larger slides or those on major highways can be quite costly. Recent landslides in Franklin County cost the Arkansas Department of Transportation $2.3 million for repairs to Interstate 40 and $1.8 million for repairs to Highway 23.

2.1.10.8 Multi-Jurisdictional Risk Assessment

Landslide risk is not unique to any area of the county; the threat is countywide with no significant variation at the county or jurisdiction levels. Jurisdictions with higher infrastructure density make up the landslide high risk zone as they carry a higher exposure to a landslide event in Crawford County.

Based on USGS data, the south-western quarter of the county has more landslide exposure that the other locations.

Economic loss due landslides has not been well documented. The Arkansas State Highway and Transportation Department (AHTD) has estimated that during the five-year period of 1986-1990, it spent about $600,000 per year statewide for road repairs damaged by landslides. Landslide loss statistics have not been kept at the county level by AHTD, so it is impossible to say how much of this was spent in Crawford County.

2.1.11 Expansive Soil

2.1.11.1 Description of Expansive Soil

Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When they absorb water they increase in volume. The more water they absorb the more their volume increases. Expansions of ten percent or more are not uncommon. This change in volume can exert enough force on a building or other structure to cause damage.

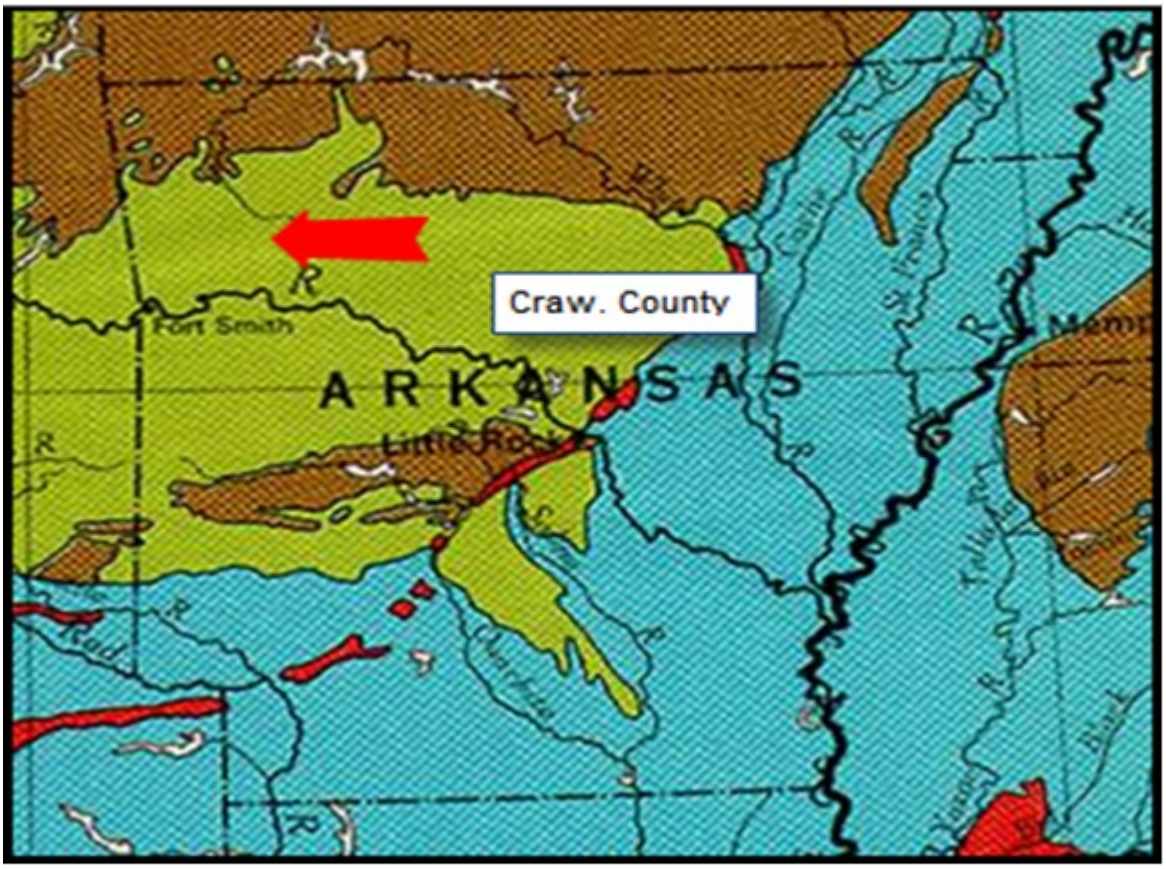
Cracked foundations, floors and basement walls are typical types of damage done by swelling soils. Damage to the upper floors of the building can occur when motion in the structure is significant.

Expansive soils will also shrink when they dry out. This shrinkage can remove support from buildings or other structures and result in damaging subsidence. Fissures in the soil can also develop. These fissures can facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures.

2.1.11.2 Location of Expansive Soil Events

Expansive soils exist in the county; however, they are not geographically pervasive. Occurrences of damages related to expansive soils are isolated. The presence of expansive soils can be determined by professionally conducted soils test; the tests, however, are not always required nor performed for lower-cost, privately financed structures, such as single-family residential houses.

Graphic 6 - Expansive Soil Potential



MAP LEGEND	
	Unit contains abundant clay having high swelling potential
	Part of unit (generally less than 50%) consists of clay having high swelling potential
	Unit contains abundant clay having slight to moderate swelling potential
	Part of unit (generally less than 50%) consists of clay having slight to moderate swelling potential
	Unit contains little or no swelling clay
	Data insufficient to indicate clay content of unit and/or swelling potential of clay (Shown in westernmost states only)

2.1.11.3 Extent, Magnitude or Severity of Expansive Soil

Unlike other natural hazards discussed in this plan, expansive soil is a long-term condition that often causes incremental damage to a structure over a period of many years. It therefore cannot easily be attributed to an event or occurrence. When there is a significant natural or human induced excursion in expansive soil moisture content near a structure, accelerated damage may occur.

Although little noticed, soil expansion and contraction in the state is a high frequency & high probability event as it occurs daily and therefore causes damage to structures daily. However, this incremental damage is not known to lead to significant damages in this county. Also worth noting, a study by Olive and others published in 1989 places western Arkansas in an area of slight to moderate clay swelling potential, which means the county generally has a modest likelihood for having expansive soils as compared to other areas of the U.S.

Because no significant expansive soil events are known to have affected the county, the severity of this hazard is not well known. Because of the low frequency of significant reported events, the potential severity of this hazard is negligible and the potential magnitude negligible.

The entire area of Crawford County carries a standard Expansive Soil ranking. Based on USGS data, Part of Crawford County (generally less than 50%) consists of clay having slight to moderate swelling potential. This is not expected to change over time.

2.1.11.4 Previous Occurrences

Although expansive soils are present throughout much of Crawford County, the soils are rarely highly expansive; therefore, the average citizen does not notice their effects. The one expansive soil event was in the form of a landslide in 2005. This landslide event was probably caused by improper land-fill techniques from construction practices, along with heavy rains. not from a naturally occurring expansive soil hazard.

2.1.11.5 Probability of Future Expansive Soil

While unlikely, future conditions could potentially affect the probability of expansive soil in Crawford County either through higher rain totals which can contribute to the swelling behavior of these soils or during prolonged drought when these soils can become very hard, causing shrinkage.

Location (All participating jurisdictions of the entire planning area.)
Limited: 10 to 25 percent of planning area or limited single-point of occurrences

Maximum Probable Extent (Magnitude/Strength based on historic events or future probability)
Weak: Limited classification on scientific scale, slow speed of onset or short duration of event, resulting in little to no damage.

Probability of Future Events
Occasional:1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.

Overall Significance
Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area.

2.1.11.6 Impact of Expansive Soil

Expansive soils cause differential movement and horizontal pressure on structures resulting in cracked driveways, cracked sidewalks and basement floors, heaving of roads and highway structures, and disruption of pipelines and sewer lines. Damage to homes can range from hairline plaster cracks and sticking doors to condemnation or complete destruction. Expansive soils occurring on slopes can also result in slow but damaging down slope movement of material (creep) or even landslides.

The impact that expansive soils create can be significant although they have, for the most part, been recognized and mitigated in urbanized areas. Expansive Soil locations do not usually cause widespread damage. However, they can disrupt supply lines (i.e. roads, power lines, railways, and bridges) and damage structures. Expansive soils do not change size quickly; observing damage in real-time can sometimes be difficult. Although the damage might not occur in a matter of minutes, it still has the potential to severely damage structures and roads over a matter of time if not sufficiently mitigated.

Climate change may reduce the ability of soil to absorb water. And that could have serious implications for groundwater supplies, food production and security, stormwater runoff, biodiversity and ecosystems.

Extreme and prolonged drought conditions can result in soil constriction or shrinkage that can cause building foundations to settle, possibly cracking foundations and walls. It is not likely, however, that drought conditions would be so prolonged and severe to cause such damage.

Due to low probability of expansive soils in Crawford County due to its location and rural nature, changes in population and land use/development are not expected to affect the impacts of this hazard.

2.1.11.7 Vulnerability and Estimating Potential Loss

Although not well known to the general public, expansive soils are responsible for major economic losses. Various studies estimate that expansive soils result in somewhere between $2 and $11 billion in annual losses in the United States, significantly more than other natural hazards. Other studies have suggested that approximately 10% of the new homes constructed annually in the United States are subjected to significant damage during their useful lives by expansive soils, and an additional 60% of homes sustain minor damage.

2.1.11.8 Multi-Jurisdictional Risk Assessment

Expansive soils are a problem in the county but one that is not wide-spread or severe in terms of high levels of property damage in the county or in any jurisdiction. There are no discernible concentrations in the county or any jurisdiction of damage due to expansive soils. However, soils types do vary throughout the county, with some soils consisting of abundant clay with high swelling potential, but there appears to no significant variations in this condition among jurisdictions.

Expansive Soils risk is not unique to any area of the county; the threat is considered to be countywide with no significant variation at the county or jurisdiction levels. Jurisdictions with higher infrastructure density make up the expansive soil high risk zone as they carry a higher exposure to a landslide event in Crawford County

SECTION 3: Mitigation Strategy

3.1 Capability Assessment

Table 24 - Capability Assessment

Planning and Regulatory Capabilities															
	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Comprehensive/ Master Plan	✓	✗	✗	✗	✓	✗	✗	✓	✗	✗	✓	✓	✓	✓	✓
Capital Improvement Plan	✓	✓	✗	✗	✗	✓	✗	✓	✗	✗	✓	✓	✓	✓	✓
Economic Development Plan	✓	✗	✗	✗	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Local EOP	✓	✓	✗	✗	✓	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗
COOP	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓
Stormwater Management Plan	✓	✓	✗	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗
Wildfire Protection Plan	✓	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗
Building Code	✗	✓	✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
Zoning Ordinance	✗	✓	✗	✓	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Subdivision Ordinance	✓	✓	✓	✗	✓	✗	✗	✓	✗	✓	✗	✗	✗	✗	✗
Floodplain Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗
FIRM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗
Planning and Zoning Maps	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Hazard Specific Ordinance	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Watering Restrictions Ordinance	✗	✓	✓	✓	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗
Illegal Dumping Ordinance	✓	✓	✓	✓	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗

Administrative and Technical															
	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Planning Commission	✗	✓	✓	✗	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Maintenance Programs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mutual Aid Agreements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗
Building Inspector	✗	✓	✗	✗	✓	✗	✗	✓	✗	✓	✓	✓	✓	✓	✓
Floodplain Administrator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗
Emergency Manager	✓	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗
GIS Coordinator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Community/ Economic Developer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warning Systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Financial															
	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Capital Improvements Funding	✗	✓	✗	✗	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓	✗
Authority to Levy Taxes for Specific Purposes	✗	✓	✓	✗	✓	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓
Fees for Water, Sewer, Gas, or Electric Services	✗	✓	✗	✓	✓	✗	✓	✗	✗	✓	✗	✗	✗	✗	✗
Impact Fees for New Development	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

Financial	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Storm Water Utility Fee	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗
Incur Debt Through General Obligation Bonds or Special Tax Bonds	✗	✓	✗	✗	✗	✗	✓	✗	✗	✓	✓	✓	✓	✗	✗
Incur Debt Through Private Activities	✗	✓	✗	✗	✗	✗	✓	✗	✗	✗	✓	✓	✓	✗	✗

Education and Outreach	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Ongoing Public Education Program	✗	✓	✗	✗	✗	✗	✓	✗	✗	✓	✓	✓	✓	✓	✓
Natural Disaster Related School Programs	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✓	✓
Storm Ready Certification	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
Fire Wise Certification	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Local Citizens Groups or Nonprofit Organizations Relevant to Hazard Mitigations	✓	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓	✗

3.1.1 Improving Capabilities

Leadership and representatives in all participating jurisdictions are very receptive to mitigation. The Crawford County Judge and Crawford County OEM make mitigation a priority. All participating jurisdictions receive revenue from taxes, millage, and/or other revenue. Representatives are actively seeking additional funding to improve the readiness and preparedness of their communities. Each jurisdiction could qualify for a variety of grants to improve financial capabilities. The Western Arkansas Planning and Development District assists all the jurisdictions with community and economic development activities including grant assistance. Ways the jurisdictions could improve capabilities are:

- Becoming Storm Ready Certified
- Becoming Fire Wise Communities
- Attending state-wide full-scale drills for evacuation
- Participating in Great Arkansas Shake Out
- Increasing GIS capabilities
- Expanding the County Road and City Street Department Budgets to improve culverts, box tiles, and water crossings
- Attending training through ADEM and FEMA to include ICS and NIMS
- Adopting additional regulatory ordinances
- Developing Stormwater Management and Wildfire Protection Plans
- Developing Comprehensive/Master Plans
- Expanding Maintenance Programs

3.2 NFIP Participation

Table 25 - NFIP Status

Jurisdiction	NFIP	Community ID Number	Init FHBM Identified	INIT FIRM Identified	Current Effective Map Date	Reg-Emergency Date	Community Adoption
Crawford County	Yes	050428	6/17/77	8/5/91	12/3/10	8/5/91	Ord. 21-2010 10/19/2010
Alma	Yes	050236	8/8/75	4/1/81	3/16/09	04/1/81	Ord. 2017-12 4/20/2017
Cedarville	Yes	050505		3/16/09	3/16/09	6/26/06	Ord.001-2009 2/28/2009
Chester	Yes	050050		8/5/91	3/16/09	8/5/91	Ord.
Dyer	Yes	050408	7/11/75	8/5/91	3/16/09	1/30/04	Ord.
Kibler	Yes	050337	6/25/76	8/5/91	12/3/10	11/30/06	Ord.
Mountainburg	Yes	050051	5/3/74	4/15/81	3/16/09	4/15/81	Ord.
Mulberry	Yes	050354	11/26/76	4/1/81	3/16/09	5/27/81	Ord. 2009-01 1/20/2009
Rudy	Yes	050052	12/20/74	6/25/76	3/16/09	6/25/76	Ord.
Van Buren*	Yes	050053	11/16/73	11/16/77	12/3/10	11/16/77	Ord. 42-2023 12/18/2023

*The city of Van Buren is the only participating jurisdiction to partake in the Community Rating System incentive program.

Alma School District: The School District has no jurisdiction over floodplain areas, as it is the responsibility of the County and/or municipalities to regulate them. All schools are within Alma city limits.

Cedarville School District: The School District has no jurisdiction over floodplain areas, as it is the responsibility of the County and/or municipalities to regulate them. All schools are within Cedarville city limits.

Mountainburg School District: The School District has no jurisdiction over floodplain areas, as it is the responsibility of the County and/or municipalities to regulate them. All schools are within Mountainburg city limits.

Mulberry-Pleasant View School District: The School District has no jurisdiction over floodplain areas, as it is the responsibility of the County and/or municipalities to regulate them. The School District has facilities in Mulberry and Franklin County.

Van Buren School District: The School District has no jurisdiction over floodplain areas, as it is the responsibility of the County and/or municipalities to regulate them. All schools are within Van Buren city limits.

Table 26 - NFIP Compliance

NFIP Members	
Crawford County	Crawford County joined NFIP in 1991. **Participation:** Crawford County participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for Crawford County then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of Crawford County's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There are 20 policies in force with a total coverage of $5,236,000. **Staff Resources:** Crawford County has a Certified NFIP Coordinator. The floodplain management is an auxiliary function. Crawford County has not had any barriers running an effective NFIP program. **Compliance History:** Crawford County is in good standing with NFIP and there are no outstanding compliance issues.
Alma	Alma joined NFIP in 1981. **Participation:** Alma participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Alma then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of City of Alma's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant.

	Insurance Summary: There are 28 policies in force with a total coverage of $6,398,300. **Staff Resources:** Alma has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Alma is in good standing with NFIP and there are no outstanding compliance issues.
Cedarville	Cedarville joined NFIP in 2006. **Participation:** Cedarville participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Cedarville then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of City of Cedarville's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** **Staff Resources:** Cedarville has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Cedarville is in good standing with NFIP and there are no outstanding compliance issues.
Chester	Chester joined NFIP in 1991. **Participation:** Chester participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for Town of Chester then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of Town of Chester's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant.

	Insurance Summary: There are 2 policies in force with a total coverage of $142,000. **Staff Resources:** Chester has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Chester is in good standing with NFIP and there are no outstanding compliance issues.
Dyer	Dyer joined NFIP in 2004. **Participation:** Dyer participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Dyer then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of City of Dyer's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There are 2 policies in force with a total coverage of $402,000. **Staff Resources:** Dyer has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Dyer is in good standing with NFIP and there are no outstanding compliance issues.
Kibler	Kibler joined the NFIP in 2006. **Participation:** Kibler participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Kibler then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of City of Kibler's flood insurance program. Continued

	participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There are 2 policies in force with a total coverage of $215,000. **Staff Resources:** Kibler has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Kibler is in good standing with NFIP and there are no outstanding compliance issues.
Mountainburg	Mountainburg joined the NFIP in 1981. **Participation:** Mountainburg participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Mountainburg then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of City of Mountainburg's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There are 2 policies in force with a total coverage of $402,000. **Staff Resources:** Mountainburg has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Mountainburg is in good standing with NFIP and there are no outstanding compliance issues.
Mulberry	Lavaca joined the NFIP in 1981. **Participation:** Mulberry participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Mulberry then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing

	education for the director of City of Mulberry's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There are 1 policy in force with a total coverage of $350,000. **Staff Resources:** Mulberry has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Mulberry is in good standing with NFIP and there are no outstanding compliance issues.
Rudy	Rudy joined the NFIP in 1976. **Participation:** Rudy participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for the Town of Rudy then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing education for the director of Town of Rudy's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** **Staff Resources:** Rudy has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Rudy is in good standing with NFIP and there are no outstanding compliance issues.
Van Buren	Van Buren joined the NFIP in 1977. **Participation:** Midland participates in the NFIP by assisting with filling out documents for the NFIP and educating citizens about the NFIP program. If a person wishes to build in a floodplain, there is a permit that must be completed for City of Van Buren then the CFM will monitor the construction process to ensure compliance. Permitting applies to new construction as well as substantially improved or damaged buildings. Most of the work done by CFM is assisting citizens in completing letters of map amendments and continuing

	education for the director of City of Van Buren's flood insurance program. Continued participation will include ongoing floodplain education and remaining NFIP compliant. **Insurance Summary:** There is 93 policies in force with a total coverage of $22,925,100. **Staff Resources:** Van Buren has a Certified Floodplain Manager. The NFIP administrative services include floodplain maps, permit review, and inspections. **Compliance History:** Van Buren is in good standing with NFIP and there are no outstanding compliance issues.

3.3 Mitigation Goals

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

Goal 1: Reduce the potential for loss of life and personal injury from natural disasters.

Goal 2: Protect existing and future properties from natural disasters.

3.4 Implementation of Mitigation Actions

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

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

Table 27 - STAPLEE Criteria

Evaluation Category	Sources of Information
Social	Members of Local governments and the Sebastian 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 people. 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, 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 pressure 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 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. Actions are prioritized in three different categories; High need for immediate action, Medium need for action, Low lacking in urgency.

All Crawford County actions are the responsibility of the director of Crawford County Office of Emergency Management and the County Judge. The City's actions are the responsibility of the Mayor. The School District's actions will be the responsibility of their School Board Administration.

The Responsible Agency for each mitigation action will identify resources. Their responsibility will be to examine resources from all levels of government. The responsible parties will integrate the requirements of the mitigation plan into other plans when appropriate. This also, includes funding and support for enacting and enforcing building codes and zoning ordinances, and developing public education programs to alert residents to risks and how they can reduce hazard losses. Plans will be made to earmark resources for implementing these actions.

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

For the purpose of developing the Crawford 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)

3.5 Mitigation Actions

Table 28 - Mitigation Actions

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Alma, Mountainburg, Van Buren, Mulberry	Dam Failure, Flooding	Conduct inspections, maintenance and enforce programs on dams to ensure structural integrity. (NFIP consideration; CRS 330 Outreach, CRS 350 Flood Protection Information)	County Judge and OEM, Mayors and Public Works Dept.	Corps of Engineers, NRCS	5 years	Unknown	County and Cities, Corps of Engineers, NRCS
Crawford County, Cities of Alma, Mountainburg, Van Buren, Mulberry	Dam Failure, Flooding	Adopting Ordinances that limit development in areas that could be affected by flooding caused by dam failure.	County Judge and Quorum Court, Mayors and City Council	None	1 year	None	None required
Crawford County, Cities of Alma, Mountainburg, Van Buren, Mulberry, School Districts of Alma,	Dam Failure, Flooding	Complete a detailed flood inundation study for all current dam locations	County Judge and OEM, Mayors and Public Works Dept, Superintendents	Engineering, Consultants	5 years	Extensive	FEMA

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Mountainburg, and Van Buren							
Crawford County, Cities of Alma, Mountainburg, Van Buren, Mulberry, School Districts of Alma, Mountainburg, and Van Buren	Dam Failure, Flooding	Educate public and developers of hazards that can be caused by flooding caused by dam failure	County Judge and OEM, Mayors and Public Works Dept, Superintendents	NRCS, Corps of Engineers	5 years	Minimal	County, Cities, Schools, NRCS, Cooperative Extension Services
Cities of Mountainburg, Dyer, Rudy, and Mulberry	Drought	Pass ordinances to prioritize or control water, particularly for emergency situations to make more water available for firefighting	Mayors, City Councils	None	1 year	None	None required
City of Dyer	Drought	Issue emergency permits for water use during periods of drought	County Judge and OEM, Mayor and Public Works Dept.	Rural Water Associations	5 years	None	None required
City of Chester	Drought	Acquire low-flow faucets and fixtures for new or existing buildings and/or for public facilities	Mayor, Public Works Dept.	None	5 years	Minimal	City funds

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
All Jurisdictions	Drought	Develop a countywide drought emergency plan	County Judge, Mayors, Superintendents	None	1 year	None	None required
Cities of Alma, and Mountainburg, School Districts of Mountainburg and Van Buren	Drought	Design and implement leak detection programs	Mayors, Public Works Departments and Superintendents, Maintenance Staff	None	5 years	Minimal	Cities and Schools
Cities of Alma, Dyer, and Van Buren	Drought	Establish MOU with adjacent communities designed to source additional sources of water	County Judge and OEM, Mayors	Rural Water Associations	3 years	Minimal	County, Cities, Rural Water Associations
Cities of Dyer and Chester	Drought	Educate agricultural interests, public, and business/commercial entities on water rights and water use policies	Mayors	Cooperative Extension Service	5 years	Minimal	Cites, Cooperative Extension Service
Crawford County	Drought	Implement an outreach program directed at agricultural community to include programs that educate farmers on benefits of buying crop insurance and thus	County Judge and OEM	Cooperative Extension Service	5 years	Minimal	County, Cooperative Extension Service

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
		mitigating the economic effects of prolonged drought					
Crawford County and Cities of Dyer, Chester, and Van Buren	Drought	Form partnership with Cooperative Extension Service and AR Natural Resources Commission to promote awareness of drought and maintain better records of local events and losses	County Judge and OEM, Mayors	Cooperative Extension Service, ANRC	5 years	Minimal	County, Cities, Cooperative Extension Service, ANRC
Cities of Alma, Chester, Van Buren	Earthquake, Thunder-storm, Tornado	Pass ordinance requiring wind clips for roofs	Mayors, City Councils	None	1 year	Minimal	Cities
School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV,	All Hazards	Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in an around school buildings.	County Judge and OEM, Superintendents and Maintenance Staff	ADEM, FEMA	5 years	Minimal	County, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
and Van Buren							
Cities of Cedarville, Chester, and Van Buren	Earthquake	Adopt and enforce updated building code provisions to reduce earthquake damage	Mayors, City Councils, Building Inspectors	None	5 years	Minimal	Cities
All Jurisdictions	All Hazards	Use GIS to map hazard areas, at-risk structures and associated hazards to assess high risk areas	County Judge and OEM, Mayors and Public Works Depts., Superintendents and Maintenance Staff	WAPDD	5 years	Minimal	County, Cities, Schools
School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Drought, Expansive Soil, and Wildfire	Develop reseeding plans for losses due to hazard events	Superintendents and Maintenance Staff	Cooperative Extension Service	5 years	Minimal	School, Cooperative Extension Service
Crawford County and Cities of Alma, Dyer, Kibler, Mulberry,	Expansive Soil	Develop a brochure describing risk and potential mitigation techniques	County Judge and OEM, Mayors and Public Works Dept.	ADEM, Arkansas Geological Survey	5 years	Minimal	County and Cities, Cooperative Extension Services

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Rudy, Cedarville, and Chester							
Crawford County, Cities of Alma, Dyer, Kibler, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren	Expansive Soil	Participate in mapping studies to determine extent of expansive soils	County Judge and OEM, Mayors and Public Works Depts., Public School Superintendents and Maintenance Staff	Arkansas Geological Survey	5 years	Unknown	County, Cities, Schools
School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren	Expansive Soil, Flood	Modify existing structures and make improvements to allow proper draining of excess rainwater away from the facility, such as installing a French Drain	Superintendents and Maintenance Staff	Contractors	5 years	Unknown	School
School Districts of Alma, Cedarville,	Expansive Soil	Use sub-surface drain tile or perforated pipe wrapped in fabrics or graded granular filters	Superintendents and Maintenance Staff	Contractors	5 years	Unknown	School

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Mountainburg, Mulberry-PV, and Van Buren		below the edges of pavements.					
Crawford County and Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, and Chester	All Hazards	Notifying property owners located in high-risk areas	County Judge and OEM, Mayors and Public Works Dept,	Rural Fire Districts	5 years	Minimal	County, Cities, Rural Fire Districts
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Extreme Heat and Winter Storm	Establish and promote accessible heating/cooling centers/shelters for vulnerable, special-needs, and at risk population	County Judge and OEM, Mayors, Superintendents	Area Churches	5 years	Minimal	County, Cities, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Extreme Heat and Winter Storm	Create a database to track those individuals at high risk of death, such as the elderly, homeless, and sickly, etc.	County Judge and OEM, Mayors, Superintendents	Area Churches, Home-health agencies	5 years	Minimal	County, Cities, Schools
Crawford County, Cities of Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV,	Earthquake, Extreme Heat, Thunderstorm, Tornado, Winter Storm,	Acquire power generators to service buildings used as food supply and warming/cooling centers and schools, critical facilities and water supplies during power outages due to extreme weather conditions	County Judge, Mayors, Superintendents	Engineering	5 years	Unknown	County, Cities, Schools, FEMA, AEDC-Rural Services, AEDC-CDBG, USDA

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
and Van Buren							
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	All Hazards	Provide emergency preparedness information and resource for extreme weather conditions through an active education outreach program with specific plans and procedures for at-risk population	County Judge, Mayors, Superintendents	FEMA, Red Cross, Firewise	5 years	Minimal	County, Cities, Schools
School Districts of Van Buren, Cedarville, Alma, Mountainburg, and Mulberry-PV	Flood, Winter Storm	Include safety strategies for severe weather in driver education classes and materials	County Judge and Sheriff, Mayor and Police Dept., Superintendent, Drivers Ed. instructor	Arkansas State Police	5 years	Minimal	County, City and School
City of Alma	Dam Failure, Flood	Enact ordinance requiring one extra foot of freeboard for any building proposed in the	Mayors, City Councils, Building Inspectors	None	5 years	None	None

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
		floodplain or inundation area					
City of Van Buren	Flood	Require all new public buildings be elevated above the 0.2% or 500-year flood level	Mayors, Building Inspectors, Superintendent	None	5 years	Unknown	City
Crawford County and City of Alma	Flood	Enact ordinance requiring the separation of storm and sanitary sewage systems as well as higher engineering standards for drain and sewer capacity	County Judge, Quorum Court, Mayors, City Councils	Engineering	5 years	Unknown	Cities
City of Dyer	Flood	Adopt a land use plan with zoning and development restrictions that require floodplains to be kept as open space and prohibit fill in floodplains to protect residents from hazardous floodways	Mayor, City Council	WAPDD	3 years	Minimal	City
Cities of Dyer and Chester	Flood	Develop a stream buffer ordinance to protect water resources and limit flood impacts	Mayor, City Council	Conservation District	1 year	Minimal	City
Crawford County, Cities of Dyer, Rudy, and Cedarville	Flood	Implement and retrofit construction plans to modify low water bridges	County Judge, OEM, and Road Department, Mayor and	Engineering	5 years	Varies for each bridge	City, FEMA, AEDC

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
		in the area that are susceptible to flooding	Street Department				
Crawford County, City of Van Buren	Flood	Lower CRS rating by addressing 611.b Activity Credit Criteria outlined in CRS Coordinator's Manual	County Judge and OEM, Mayor, Public Works Department, Floodplain administrator	Unknown	5 years	Unknown	City
City of Alma	Flood	Enact ordinance governing large scale commercial development to include a retention/detention pond to mitigate effects of water run-off during flash floods	Mayor and City Council, Building Inspector and Planning Dept.	None	1 year	Minimal	City
Crawford County, Cities of Dyer, Kibler, Mulberry, and Rudy	Flood	Prepare and adopt a stormwater drainage plan	Crawford County Judge and OEM, Mayor, Public Works Department	Engineering	1 year	Minimal	County, Cities
Crawford County, Cities of Dyer, Van Buren, Alma, Kibler, Rudy, Mountainburg,	Flood and Landslide	Regulate development in upland areas to reduce stormwater run-off; examples of such erosion control techniques that may be employed within	County Judge and OEM, Mayor and Planning Depts.	Engineering	5 years	Unknown	City

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Mulberry, Cedarville		a watershed are include proper bank stabilization with sloping or grading techniques, planting vegetation on slopes, terracing hillsides, or installing riprap boulders or geotextile fabric					
Crawford County and School Districts of Van Buren, Alma, Mulberry-PV, Cedarville, and Mountainburg	Flood and Dam Failure	For critical facilities and public buildings-keep water out by strengthening walls, sealing openings, and/or using waterproof compounds or plastic sheeting on walls	County Judge, Superintendent	AHPP, if historic	5 years	Varies for each structure	County, School, AHPP
Crawford County, Cities of Dyer and Chester and School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV,	Flood	Increase capacity of storm drainage system to include detention and retention ponds	County Judge, OEM, and Road Department, Mayors, Public Works Depts.	Engineering	3 years	Unknown	County, Cities,

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
and Van Buren							
Crawford County, Cities of Alma, Dyer, Chester, Van Buren, Kibler, Mountainburg, Mulberry, and Rudy	Flood	Implement a higher standard of road elevation and culvert sizing when upgrading roads, bridges, and similar infrastructure	County Judge, Road Department and Mayors, Street Dept.	Engineering	5 years	Varies for each project	County, Cities
Crawford County, Cities of Alma, Dyer, Chester, Van Buren, Kibler Mountainburg. Mulberry, Cedarville, and Rudy	Flood and Dam Failure	Acquire/relocate and/or acquire/demolish structures built within the floodplain or inundation area	Mayor, Floodplain Manager	FEMA	5 years	Varies for each structure	City, FEMA
Crawford County	Flood and Dam Failure	Retrofit or elevate utilities built within the floodplain or inundation area	County Judge and OEM	Engineering, Utility Companies	5 years	Varies	County
Crawford County, Cities of Dyer,	Flood and Dam Failure	County and local road department implement retrofit construction plans to increase drainage or	Crawford County Judge and Road Department, Mayor and	Engineering	5 years	Varies for project	County and City, ADEM, FEMA, AEDC-

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Chester, and Van Buren		absorption capabilities with detention and relief drains, extra culverts, and bridge modification where susceptible to flooding	Street Departments				CDBG for LMI areas
Cities of Dyer, Chester, and Van Buren	Flood and Dam Failure	Determine and enforce acceptable land uses to alleviate the risk of damage by limiting exposure in flood hazard areas.	Mayors and Planning Departments	WAPDD	5 years	Unknown	City
Crawford County and Cities of Dyer and Van Buren	Flood	Conduct NFIP community workshops to provide information for property owners to acquire flood insurance	County Judge and OEM, Mayors, Floodplain Managers	NFIP, Insurance Agents	5 years	None	County and Cities
City of Chester	Flood	Provide packets with information for developers to use as guidelines when working in floodplains	Mayor, Floodplain Manager	NFIP	5 years	Minimal	City
Crawford County and City of Van Buren and School Districts of	Landslide	Completing an inventory of locations where critical facilities, other buildings, and infrastructure are vulnerable to landslides	County Judge and OEM, Mayor	WAPDD	5 years	Minimal	County, CIty

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Cedarville, Mountainburg, and Van Buren							
Cities of Van Buren, Chester, and Mulberry & School Districts of Alma, Cedarville, Mountainburg, and Van Buren	Landslide	Define steep slope/high risk areas in land use and comprehensive plans and create guidelines on restricting new development in those areas	Mayor, Planning Department	AHTD	1 year	Minimal	City
Crawford County and Cities of Van Buren, Alma, Rudy, Mountainburg, Mulberry, and Cedarville	Landslide	Study areas where riparian landslides may occur	County Judge and OEM, Mayor and Planning Dept.	Engineering, Consultant	3 years	Unknown	County and City
City of Alma and Chester and School Districts of Alma, Cedarville,	Landslide	Restricting or limiting construction activity that would strip slopes of essential top soil	Mayor, City Council, Planning Dept.	None	5 years	Unknown	City

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Mountainburg, Mulberry-PV, and Van Buren							
City of Alma, Mountainburg, Rudy, and Cedarville, School Districts of Alma, Cedarville, Mountainburg, and Van Buren	Landslide	Install catch-fall nets for rocks at steep slopes near roadways	Mayor, Street Dept., Superintendent, Maintenance Staff	AHTD	3 years	Varies	City, AHTD, Schools
Crawford County	Landslide	Install gabion baskets in areas where riparian landslides may occur	County Judge, OEM, and Road Department	AHTD	3 years	Varies	County, AHTD
Crawford County, Cities of Chester and Van Buren	Landslide, Wildfire	Assessing vegetation in wildfire-prone area to prevent landslides after fires (e.g. encourage plants with strong root systems).	County Judge, OEM and Mayor, Public Works, Fire Department	Firewise, US Forestry	5 years	Unknown	County, Cities
Crawford County, Cities of Dyer, Kibler,	Thunder-storm	Install and maintain lightning protection devices and surge	County Judge, Mayors, Superintendents	None	1 year	Varies	County, Cites, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren		protectors at critical facilities					
Crawford County and Cities of Alma, Chester, Van Buren and Mulberry Schools	Thunder-storm	Install hail resistant roofing, siding, and window coverings, shatterproof glass in window panes with a focus on critical infrastructure.	County Judge, OEM, Mayor, Public Works	None	5 years	Unknown	County, City
Cities of Alma, Chester, and Van Buren	Tornado, Thunder-storm	Pass ordinance requiring occupied RV's and mobile homes to be tied down to safe standards	Mayor, City Council	None	1 year	None	City
All Jurisdictions	Tornado and Thunder-storm	Construct free standing saferooms and/or saferooms within new	County Judge, Mayors, Superintendents	FEMA, Engineering, WAPDD	5 years	$1M per saferoom	FEMA, AEDC, County,

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
		and existing public buildings					Cities, Schools
Crawford County, Cities of Cedarville and Van Buren, Cedarville Schools	Earthquake, Wildifre, Tornado, Thunder-storm	Apply window film at public schools and public buildings to prevent shattering	County Judge, Mayors, Superintendents	FEMA, EAPDD	5 years	Varies	FEMA, County, Cities, Schools
Cities of Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Chester, and the School Districts of Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Dam Failure, Thunder-storm, Tornado	Install warning sirens across planning area	County Judge, Mayors, Superintendents	WAPDD	5 years	Varies	AEDC-Rural Services, USDA
City of Chester	Dam Failure, Thunder-storm, Tornado	Create account to help county maintain and update existing siren warning system	Mayor	None	5 years	Unknown	City

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Dyer, Kibler, Mountainburg, Mulberry, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Winter Storm, Tornado, Thunder-storm	Establish standards for all utilities regarding tree pruning around power lines	County Judge, Mayor, and Superintendents	Utility Companies	5 years	None	None
Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Rudy, Cedarville, Chester, and the School Districts of Alma,	Winter Storm, Tornado, Thunder-storm	Inspect utility poles to ensure they meet specifications and are wind resistant and for signs of rot	County Judge, Mayor, and Superintendents	Utility Companies	5 years	None	None

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Cedarville, Mountainburg, Mulberry-PV, and Van Buren							
City of Van Buren	Wildfire	Mitigate futures losses by regulating development in wildfire hazard areas through land use planning and address density and quantity of development, as well as emergency access, landscaping and water supply.	Mayor and Planning Department	None	5 years	Minimal	City
Crawford County	Wildfire	Educate public on dangers of wildfire and how to prevent them	County Judge and OEM	Firewise, US Forestry, Rural Fire Departments	5 years	Minimal	County
City of Chester	Wildfire	Employee the use of goats to reduce the amounts of underbrush in wildfire-prone areas.	Mayor, Public Works	Cooperative Extension Services, 4H, FFA	5 years	Minimal	City
Cities of Chester Mountainburg, Dyer and Van Buren Schools	Wildfire	Create a defensible space around public buildings by reducing the amount of brush near buildings, and also by	County Judge and OEM, Mayors, Superintendent	Firewise, US Forestry, Rural Fire Departments	5 years	Minimal	Cities, School

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
		using fire-friendly vegetation.					
Crawford County, Cities of Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Wildfire	Provide free technical assistance brochures and pamphlets from FEMA, FireWise, and ADEM on potential mitigation activities for homeowners	County Judge and OEM, Mayors, Superintendent	Firewise, FEMA, ADEM, US Forestry	5 years	Minimal	County, Cities, Schools,
Crawford County, Cities of Alma, Dyer, Mountainburg, Van Buren, Cedarville, Chester, Rudy, and Mulberry	Wildfire	Maintain and update thorough records and documentation relating for wildfire events and acreage/structures impacted to better identify areas with the most hazard potential.	County Judge and OEM, Fire Chiefs	Rural Fire Departments	5 years	Minimal	County, Cities, Rural Fire

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	Thunder-storm, Tornado, Winter Storm	Planning for and maintain adequate road and debris clearing capabilities	County Judge and OEM, Mayors, Superintendents	None	5 years	Minimal	County, City, Schools
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Cedarville, Mountainburg, Mulberry-PV,	Winter Storm	Educate citizens that all fuel burning equipment should be vented to the outside	County Judge and OEM, Mayors, Superintendents	Firewise	5 years	Minimal	County, City, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
and Van Buren							
Cedarville School	Winter Storm	Using 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.	Superintendents	Local Utilities	5 years	Unknown	School, Utilites
Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	All Hazards	Prepare and adopt an Outdoor Warning Sirens Plan, including consideration of the unique geographical locations, technical requirements, system types and operational procedures of each local jurisdiction. These plans will include a review of existing outdoor warning siren coverage and recommend new locations if and where there are coverage gaps. Install new warning sirens in accordance with plan recommendations.	County Judge and OEM, Mayors, Superintendents	ADEM	5 years	Unknown	County, Cities, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Alma, Dyer, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	All Hazards	Implement Code RED Weather Warning early telephone warning system designed to automatically deliver targeted weather notifications for the immediate threats of severe weather events within moments of being issued by the National Weather Service (NWS) throughout the county.	County Judge and OEM, Mayors, Superintendents	Code RED	5 years	Unknown	County, Cities, Schools
Cities of Alma and Van Buren	Thunder-storm, Tornado, Winter Storm	Burying or otherwise protecting electric and other utility lines or prevent disruption by protecting lines from ice, wind, or snow damage.	Mayors, Public Works	Local Utilities	5 years	Unknown	Cities, Utilities
All Jurisdictions	All Hazards	Install NOAA weather radios in all public buildings where large numbers of people congregate	County Judge and OEM, Mayors, Superintendents	FEMA	5 years	Unknown	County, Cities, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	**Hazard**	**Action**	**Jurisdiction's Responsible Department or Personnel**	**Required Outside Resources**	**Length of Project**	**Cost Estimate (if avail.)**	**Funding**
Crawford County, Cities of Dyer, Mountainburg, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry-PV, and Van Buren	All Hazards	Use newspapers, local radio stations and websites to promote the use of Weather Apps for iPhone and smart phones.	County Judge and OEM, Mayors, Superintendents	Local Newspapers and radio stations	5 years	Minimal	County, Cities, Schools
Crawford County, Cities of Dyer, Mountainburg, Rudy, Cedarville, Chester, and the School Districts of Cedarville, Mountainburg, Mulberry-PV,	All Hazards	Host a yearly community outreach and educate public on hazards and mitigation plan and set up at community functions/ festivals to boost awareness	County Judge and OEM, Mayors, Superintendents	Local churches and non-profits, other community groups	5 years	Minimal	County, Cities, Schools

Actions Selected for Implementation in 2024 Plan Update Note: The term "All Jurisdictions" refers to Crawford County, Cities of Alma, Dyer, Kibler, Mountainburg, Mulberry, Van Buren, Rudy, Cedarville, Chester, and the School Districts of Alma, Cedarville, Mountainburg, Mulberry, and Van Buren. The term "All Hazards" refers to Dam Failure, Drought, Earthquake, Expansive Soil, Extreme Heat, Flood, Thunderstorm, Landslide, Winter Storm, Tornado, and Wildfire.							
Implementing Participating Jurisdiction	Hazard	Action	Jurisdiction's Responsible Department or Personnel	Required Outside Resources	Length of Project	Cost Estimate (if avail.)	Funding
and Van Buren							

SECTION 4: Plan Maintenance

4.1: Continuous Public Involvement

Crawford County is dedicated to involving the public directly in the continual reshaping and updating of the Crawford County Hazard Mitigation Plan. The Crawford County Judge and Office of Emergency Management 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 Crawford County Hazard Mitigation Plan will be available in digital and print formats through each of the participating jurisdictions and WAPDD. Contained in the plan are the address, phone number, and e-mail address of the Director of the Crawford County Office of Emergency Management, the primary point of contact for the plan. Public comments will be solicited via the Crawford County and WAPDD websites/social media accounts and through public notice prior to any plan maintenance or plan updates.

Public notice regarding the plans availability and opportunities to participate in maintenance and implementation activities will be posted in local post offices and libraries in addition to the county courthouses and city halls. Notices will also be published in the Times Record, and Press Argus newspapers.

Crawford County and WAPDD will also ask the public to report any impacts from natural hazards after events occur so that the Crawford County Hazard Mitigation plan may be updated with any new data that may affect future updates or future mitigation actions.

4.2: Monitoring, Evaluating, and Updating the Plan

Although FEMA regulations require a plan update within five years, Crawford County has a method to ensure that monitoring, evaluation, and updating of the Crawford County Hazard Mitigation Plan occurs annually or as needed. The plan will be submitted to FEMA within five years for review.

The responsible party for overseeing and assuring plan updates is the Crawford County Judge and Crawford County Office of Emergency Management. At this time, the monitoring procedures for the Mitigation Plan will be conducted at a yearly meeting of all the participating jurisdictions and WAPDD. Each participating jurisdiction will be responsible for monitoring and evaluating the progress of the mitigation strategies in the plan. The jurisdiction's representative will monitor the plan by providing a mitigation planning update at the annual meeting.

A list of public officials will be maintained so that when there is a change in leadership, new officials can be informed of the plan and the planning process. County, city, and school officials will be asked to provide updated staff information on an annual basis. New staff will then be informed of the plan, planning process, and their role in the process.

The County, with assistance from WAPDD, will conduct an annual monitoring of the Plan utilizing FEMA's Plan Update Evaluation Worksheet. Each participating jurisdiction will be asked to participate in the annual monitoring by providing an update on the progress of each mitigation action item as it pertains to their jurisdiction. WAPDD also developed a progress report and an evaluation form to assist the participating jurisdictions in not only updating the progress of the mitigation actions, but also for reporting any damages or new data that could impact the Crawford County Hazard Mitigation Plan. The planning team will be asked to evaluate the monitoring and evaluation process to determine how it can be improved.

During the annual meeting, the participating jurisdictions and WAPDD will meet to monitor and evaluate each goal and objective to determine their relevance to changing situations in Crawford County, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions.

The participating jurisdictions 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 3) 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.

Participating jurisdictions will also be asked to report on the status of other planning mechanisms so that any changes can be incorporated into the Hazard Mitigation Plan. Capabilities and critical infrastructure will also be reassessed so that any changes can be reflected and addressed in the plan update.
Should a participating jurisdiction fail to participate in the annual meeting or otherwise fail to provide the required information in a timely manner, they will be notified that they are at risk of being removed from the plan.

Following the annual meeting, the Crawford County Office of Emergency Management and WAPDD will then have three months to update and make changes to the plan before submitting to the participating jurisdictions and the State Hazard Mitigation Officer for review. If no changes are necessary, the State Hazard Mitigation Officer will be given justification for this determination. Comments and recommendations offered by participating jurisdictions and the State Hazard Mitigation Officer will be incorporated into the plan update.

The planning team will make every attempt to ensure the public will be able to directly comment on and provide feedback about the Plan by posting meeting information throughout the participating jurisdictions, in local newspapers, local websites, and social media. Public participation will be altered as needed to address new threats such as COVID-19. Virtual meetings and online engagement will be more prevalent than in previous years. This process will also inform the county citizens of any changes or revisions of the Crawford County Hazard Mitigation Plan.

4.3: Integration of the Plan Into Other Planning Mechanisms

The Crawford County Hazard Mitigation Plan will be integrated into other plans.

All participating jurisdictions currently use state laws pertaining to compliance with the National Flood Insurance Program, if applicable, as well as state fire codes, to encourage compliance with its hazard mitigation programs. These existing mechanisms have hazard mitigation strategies integrated into them. Crawford County, like 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.

All participating jurisdictions will be integrating the approved Hazard Mitigation Plan into their existing plans that are relevant to Hazard Mitigation. After passage of the Crawford County Hazard Mitigation Plan in 2018, participating jurisdictions integrated the Plan into their budget to plan for future mitigation actions and into disaster response plans, and floodplain management programs for those jurisdictions participating in NFIP, the same will be done with the passage of this update.

Table 29 - Plan Integration

	Planning Mechanisms and Integration of Hazard Mitigation Plan
Crawford County	**Plans**: The HMP will be annexed into the County's EOP, COOP, Comprehensive Master Plan, Capital Improvement Plan, Economic Development Plan, Stormwater Management Plan, and Wildfire Protection Plan. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs.
Alma	**Plans**: The HMP will be annexed into the City's Capital Improvement Plan, Stormwater Management Plan, EOP and COOP.

	Budget: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in order to increase the structure's resiliency to the specified hazards. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Cedarville	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Chester	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in order to increase the structure's resiliency to the specified hazards. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs.
Dyer	**Plans**: The HMP will be annexed into the City's EOP, and Comprehensive Master Plan. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in

	order to increase the structure's resiliency to the specified hazards. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Kibler	**Plans**: The HMP will be annexed into the City's EOP, COOP, Capital Improvement Plan and Economic Development Plan. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in order to increase the structure's resiliency to the specified hazards. **Planning and Zoning:** The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Mountainburg	**Plans**: The HMP will be annexed into the City's Stormwater Management and Wildfire Protection Plans. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in order to increase the structure's resiliency to the specified hazards.
Mulberry	**Plans**: The HMP will be annexed into the City's COOP, Comprehensive Master Plan, Capital Improvement Plan, and Economic Development Plan. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in

	order to increase the structure's resiliency to the specified hazards. **Planning and Zoning:** The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Rudy	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs.
Van Buren	**Plans**: The HMP will be annexed into the City's EOP, COOP, Economic Development Plan, and Stormwater Management Plan. **Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Building Codes**: The risk assessment will identify the type, frequency, and intensity of hazards present in specific geographic areas. The building codes will in turn use this information to develop and regulate construction standards in order to increase the structure's resiliency to the specified hazards. **Maintenance Programs to Reduce Risk**: Current maintenance programs will continue, and the risk assessment will guide decisions made regarding additional or expanded programs. **Planning and Zoning**: The risk assessment will provide an opportunity to account for the natural hazards prior to the development of land.
Alma School District	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Plans:** The HMP will be annexed into the School's Comprehensive Master Plan, Capital Improvements Plan, and School Emergency Plan.
Cedarville School District	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Plans**: The HMP will be annexed into the School's Comprehensive Master Plan, Capital Improvements Plan, and School Emergency Plan.
Mountainburg School District	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Plans**: The HMP will be annexed into the School's Comprehensive Master Plan, Capital Improvements Plan, and School Emergency Plan.
Mulberry-Pleasant View School District	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Plans**: The HMP will be annexed into the School's Comprehensive Master Plan, Capital Improvements Plan, and School Emergency Plan.

Van Buren School District	**Budget**: The Mitigation Strategy will guide budgeting for funding hazard mitigation goals and objectives. **Plans**: The HMP will be annexed into the School's Comprehensive Master Plan, Capital Improvements Plan, and School Emergency Plan.

Table 30 - Plan Adoption/Integration Process

Local Jurisdiction's Adoption/Integration Process			
Jurisdiction	Role	Authority	Process Mechanism
Crawford County	Local Government	Quorum Court	Voting
Alma	Local Government	City Council	Voting
Cedarville	Local Government	City Council	Voting
Chester	Local Government	City Council	Voting
Dyer	Local Government	City Council	Voting
Kibler	Local Government	City Council	Voting
Mountainburg	Local Government	City Council	Voting
Mulberry	Local Government	City Council	Voting
Rudy	Local Government	City Council	Voting
Van Buran	Local Government	City Council	Voting
Alma School District	School Administration	School Board	Voting
Cedarville School District	School Administration	School Board	Voting
Mountainburg School District	School Administration	School Board	Voting
Mulberry-Pleasant View School District	School Administration	School Board	Voting
Van Buren School District	School Administration	School Board	Voting

SECTION 5: Plan Update

5.1: Changes in Development

The following table shows the changes in population and housing units for Crawford County based on the 2010 Census and the 2020 Census:

Table 31 - Updated Census Information

	Population		Housing Units	
	2010 Census	2020 Census	2010 Census	2020 Census
Crawford County	61,948	60,133	26,115	25,300
City of Alma	5,419	5,852	2,188	2,416
City of Cedarville	1,394	1,424	569	574
Town of Chester	159	144	67	55
City of Dyer	876	722	348	298
City of Kibler	961	1,005	404	417
City of Mountainburg	631	528	315	263
City of Mulberry	1,655	1,543	765	753
Town of Rudy	61	130	28	58
City of Van Buren	22,791	23,218	9,247	9,464

The number of farms in Crawford County has been declining, but the average size of the farms has gotten larger:

Table 32 - Agricultural Changes

Crawford County			
Year	2007	2012	2017
Number of Farms	1,026	886	799
Land in Farms (acres)	119,227	125,292	122,319
Ave. Size of Farm (acres)	116	141	153

Table 33 - Business Development

Major New Business Locations/ Expansions, 2012-2021			
Business	Location	Announcement	Investment & Number of New Jobs
Alma Healthcare and Rehabilitation	Alma	2013 expansion 10,800 sf	20 jobs, $2.4 mil.

American Vegetable Soybean and Edamame Inc.	Mulberry	2013 new plant announced	100 jobs, $5.2 mil.
Tankersley Food Service	Van Buren	2013 expansion 28,000 sf	40 jobs, $4 mil.
Bekaert	Van Buren	2018 expansion 100,000 sf	40 jobs, $16 mil.

These changes in development have not affected any of the jurisdictions overall vulnerability.

5.2: Progress in Mitigation Efforts

The following table indicates the status of previously identified mitigation action items. Some actions relating to dam failure have been removed upon determining certain jurisdictions were not at risk. Any actions indicated as being Still Interested, Keep in Plan, Ongoing, or In Progress have been moved to the current list of mitigation actions to be undertaken by the jurisdictions.

Table 34 - Progress in Mitigation Efforts

Table Key:

C – Completed
IC - Incomplete
NLP – No Longer Priority, Remove
NF – Not Feasible, Remove
SI – Still Interested, Keep in Plan
OG – Ongoing
IP – In Progress

- Does not apply

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Purchase and install emergency back-up generators in all public buildings.	SI	C	C	SI	SI	SI	SI	SI	SI	OG	IP	SI	SI	SI	SI
Apply window film to prevent shattering.	SI		IC							SI		SI			
Participate in mapping studies to determine extent of expansive soils.	SI	SI	SI	SI	SI	SI	NLP	SI	SI	OG	SI	SI	SI	SI	SI
Develop a brochure describing risk and potential mitigation techniques.	SI	SI	SI	SI	SI	SI	NF	SI	SI	NLP					
Modify existing structures and make improvements to allow proper draining of excess rainwater.											IP	SI	SI	SI	SI
Use sub-surface drain tile or perforated pipe wrapped in fabrics or graded granular filters below the edges of pavements.											OG	SI	SI	SI	SI
Notifying property owners located in high-risk areas.	OG	SI	OG	SI	SI	SI	SI	SI	SI	OG					
Establish and promote accessible heating/cooling centers/shelters.	IP	SI	IC	OG	SI	NLP	SI	IP	SI	OG	NF	SI	SI	SI	SI
Create a database to track those individuals at high risk.	SI	SI	SI	SI	SI	NF	SI	SI	SI	IC	NF	SI	SI	SI	SI

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Provide emergency preparedness information through an active education outreach program.	OG	SI	C	SI	SI	NF	SI	SI	SI	IC	OG	SI	SI	OG	SI
Include safety strategies for severe weather in driver education classes and materials.	SI			NF	NF				SI		OG	SI	SI	OG	SI
Install green roofs on public buildings.										NF					
Enact ordinance requiring one extra foot of freeboard for any building proposed in the floodplain or inundation area.		SI								C					
Setting the design flood elevation at or about the historical high-water mark if it is above the mapped base flood elevation.		C													
Enact ordinance requiring the separation of storm and sanitary sewage systems as well as higher engineering standards for drain and sewer capacity.	SI	SI													

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Adopt a land use plan with zoning and development restrictions that require floodplains to be kept as open space and prohibit fill in floodplains.					SI										
Elevate all new public buildings above the 0.2% or 500yr flood level.										SI					
Implement and retrofit construction plans to modify and/or raise low water bridges.	SI		OG		SI	NF		NF	SI						
Enact ordinance governing large scale commercial development to include a retention/ detention pond to mitigate effects of water run-off during flash floods.		SI													
Prepare and adopt a stormwater drainage plan.	OG	C			SI	SI		SI	SI	C					
Regulate development in upland areas to reduce stormwater run-off.	SI	OG	SI		SI	SI	SI	SI	SI	OG					
Acquire and relocate/demolish structures within the floodplain					SI										
For critical facilities and	SI										OG	SI	SI	SI	SI

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
public buildings, keep water out by strengthening walls, sealing openings, and/or using waterproof compounds or plastic sheeting on walls.															
Increase capacity of storm drainage system to include detention and retention ponds.	SI			SI	SI				SI		SI	SI	SI	SI	SI
Increase the sizing of all culverts when upgrading roads, bridges, and similar infrastructure.	O G	O G		O G	SI	SI	SI	IP	SI	OG					
Retrofit or elevate utilities built within the floodplain or inundation area.	O G														
Develop a stream buffer ordinance.				SI	SI										
Identify local repetitive loss properties and aid owners to participate in NFIP voluntary buy-out programs.	SI				SI					OG					
Implement a higher standard of road elevation and culvert sizing on city roads and school drives.	SI					SI	SI								
County and local road depts. implement/retrofit construction plans to increase drainage or	O G			O G	SI					OG					

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
absorption capabilities.															
Determine and enforce acceptable land uses to alleviate the risk of damage by limiting exposure in flood hazard areas.		C		SI	SI					OG					
Conduct NFIP community workshops to provide information for property owners to acquire flood insurance.	OG				SI					SI					
Provide packets with information for developers to use as guidelines when working in floodplains.				SI											
Complete an inventory of locations where critical facilities and infrastructure are vulnerable to landslides.	OG	C								IC	NLP	SI	SI	NLP	SI
Define steep slope/high risk areas in plans and create guidelines on new development in those areas.		C		SI				SI		IC	OG	SI	SI	NLP	SI
Study areas where riparian landslides may occur.	OG	SI	SI			NF	SI	SI	SI	IC					
Restricting or limiting industrial activity that would strip slopes of essential topsoil.		SI		SI							SI	SI	SI	SI	SI

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Install catch-fall nets for rocks at steep slopes near roadways.		SI	SI			NF	SI	NF	SI	NLP	SI	SI	SI	NLP	SI
Install gabion baskets in areas where riparian landslides may occur.	SI														
Assess vegetation in wildfire-prone area to prevent landslides after fires.	OG			SI						OG					
Install and maintain lightning protection devices and surge protectors at critical facilities.	OG	C	OG	SI	SI	SI	SI	OG	SI	OG	OG	SI	SI	OG	SI
Install hail resistant roofing, siding, and window coverings, shatterproof glass with a focus on critical infrastructure.	SI	IC		SI						IC				SI	
Improve roof sheathing to prevent hail penetration on all critical infrastructure.	SI	IC		SI											
Pass ordinance requiring occupied RVs and mobile homes to be tied down to safe standards.				SI											
Require tie-downs and ground anchors		IC								OG					

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
for manufactured homes.															
Construct free standing saferooms and/or saferooms within new and existing public buildings.	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI
Install warning sirens across planning area.	C	C	C	SI	SI	SI	SI	SI	SI	OG	C	SI	SI	SI	SI
Establish standards for all utilities regarding tree pruning around power lines.	OG	C	OG	SI	SI	SI	SI	IP	SI	NLP	OG	SI	SI	SI	SI
Inspect utility poles to ensure they meet specifications.	SI	IC	OG	SI	SI	SI	SI	OG	SI	NF	OG	SI	SI	SI	SI
Mitigate futures losses by regulating development in wildfire hazard areas.										SI					
Educate public on dangers of wildfire and how to prevent them by providing free technical assistance.	OG														
Employ the use of goats to reduce the amounts of underbrush in wildfire-prone areas.				SI											
Create a defensible space around public buildings by reduce the amount of brush near buildings.	NLP			SI	SI		SI								SI

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Provide free technical assistance brochures and pamphlets from FEMA, Firewise, and ADEM.	O G	C	O G	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI	SI
Maintain and update thorough records and documentation relating to wildfire events and acreage/ structures impacted.	O G	O G	O G	SI	SI	NF	SI	SI	SI	SI					
Ensure the development and enforcement of building codes for roof snow loads.		C													
Install NOAA weather radios in all public buildings.	SI	SI	O G	SI	SI	SI	SI	SI	SI	IC	SI	SI	SI	SI	SI
Educate citizens that all fuel burning equipment should be vented to the outside.	O G	O G	SI	SI	SI	NF	SI	SI	SI	OG	NF	SI	SI	SI	SI
Using 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.												SI			
Plan for and maintain adequate road and debris clearing capabilities.	O G	O G	C	SI	SI	NF	SI	O G	SI	SI	OG	SI	SI	SI	SI

Mitigation Item	Crawford County	City of Alma	City of Cedarville	Town of Chester	City of Dyer	City of Kibler	City of Mountainburg	City of Mulberry	Town of Rudy	City of Van Buren	Alma School District	Cedarville School District	Mountainburg School District	Mulberry-Pleasant View School District	Van Buren School District
Prepare and adopt an Outdoor Warning Sirens Plan.	C	SI	C	SI	SI	NF	SI	OG	SI	OG	IP	SI	SI	SI	SI
Implement Code RED Weather Warning early telephone warning system.	SI	SI	SI	SI	SI	NF	SI	SI	SI	OG	SI	SI	SI	SI	SI
Bury or otherwise protect electric and other utility lines to prevent disruption.		IC								OG					
Use local media to promote the use of Weather Apps.	SI	C	SI	SI	SI	NF	SI	NLP	SI	SI	OG	SI	SI	SI	SI
Host a yearly community outreach and educate public on hazards and mitigation plan.	OG	IC	SI	SI	SI	SI	SI	SI	SI	NF	NF	SI	SI	SI	SI

5.3: Changes in Priorities

As demonstrated in the previous table, some mitigation action items have been removed from the Crawford County Hazard Mitigation Plan due to a change in priorities.

SECTION 6: Plan Adoption

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

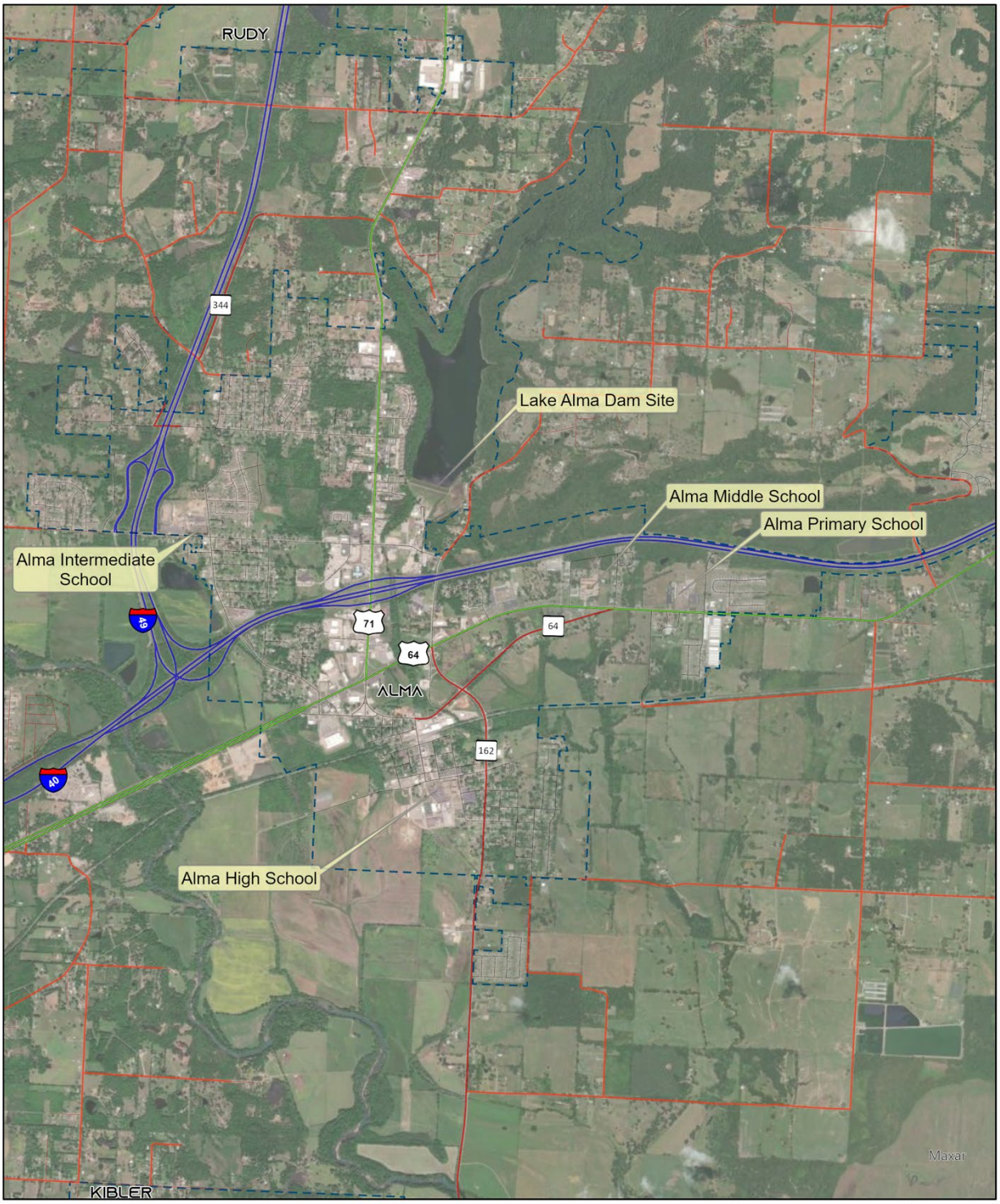
6.1 Resolutions

SECTION 7: Appendices

Appendix A: Acronyms

ADA	Average Daily Attendance
ADEM	Arkansas Department of Emergency Management
BCA	Benefit-Cost Analysis
BMPs	Best Management Practices
CCOEM	Crawford County Office of Emergency Management
CCOES	Crawford County Office of Emergency Services
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
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic
UCC	Uniform Construction Code
WUI	Wildland Urban Interface

Appendix B: Dam Location Maps

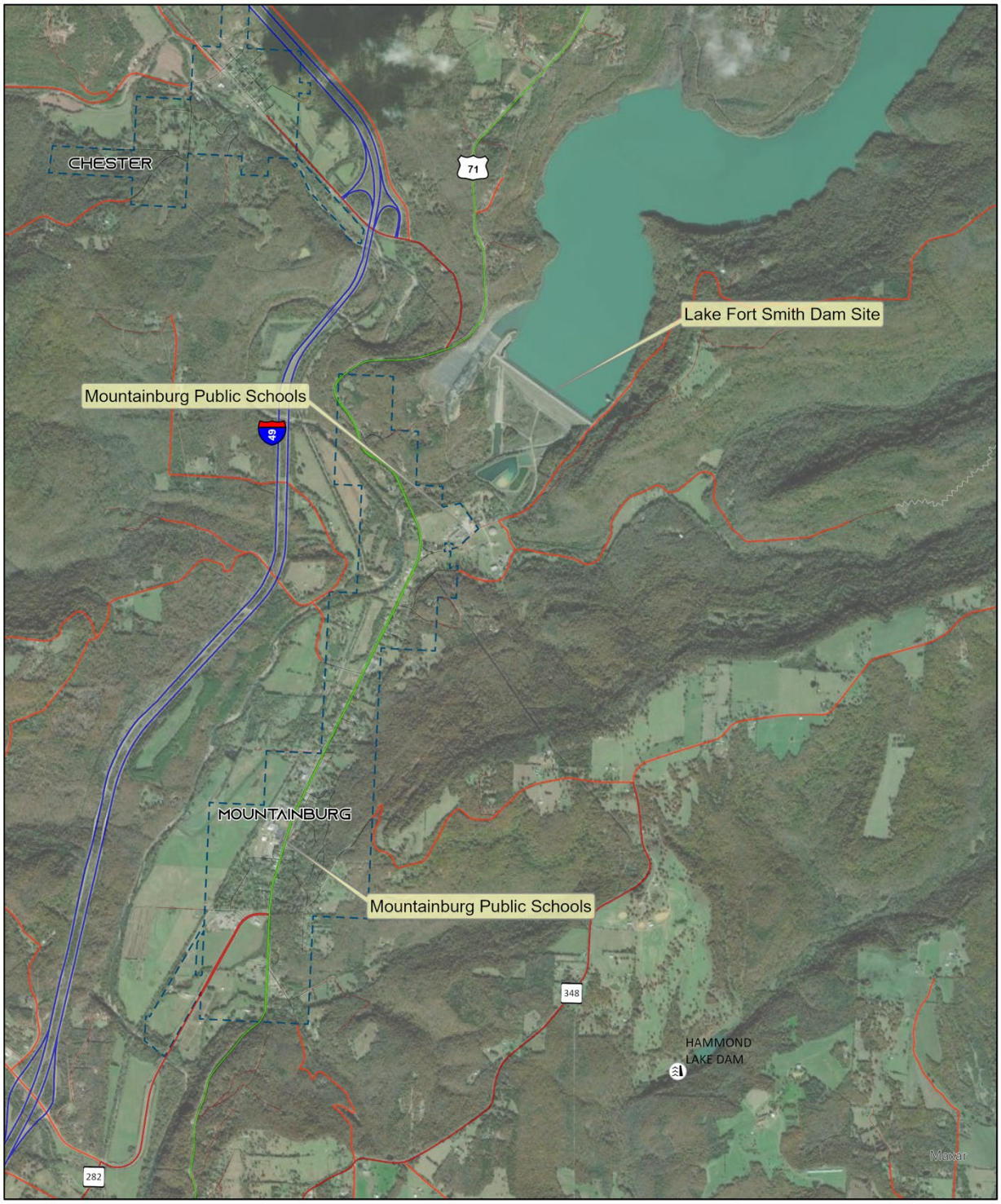


Alma Schools &
Lake Alma Dam
Location Map
Crawford County, Arkansas

Western Arkansas Planning & Development District Inc
1109 S 16th ST ~ Fort Smith, AR 72902
479-785-2651 ~ Fax 479-785-1964

1 inch equals 3,000 feet
0 500 1,000 2,000 3,000
US Feet
Date Exported: 2/21/2024 5:04 PM

N
W E
S

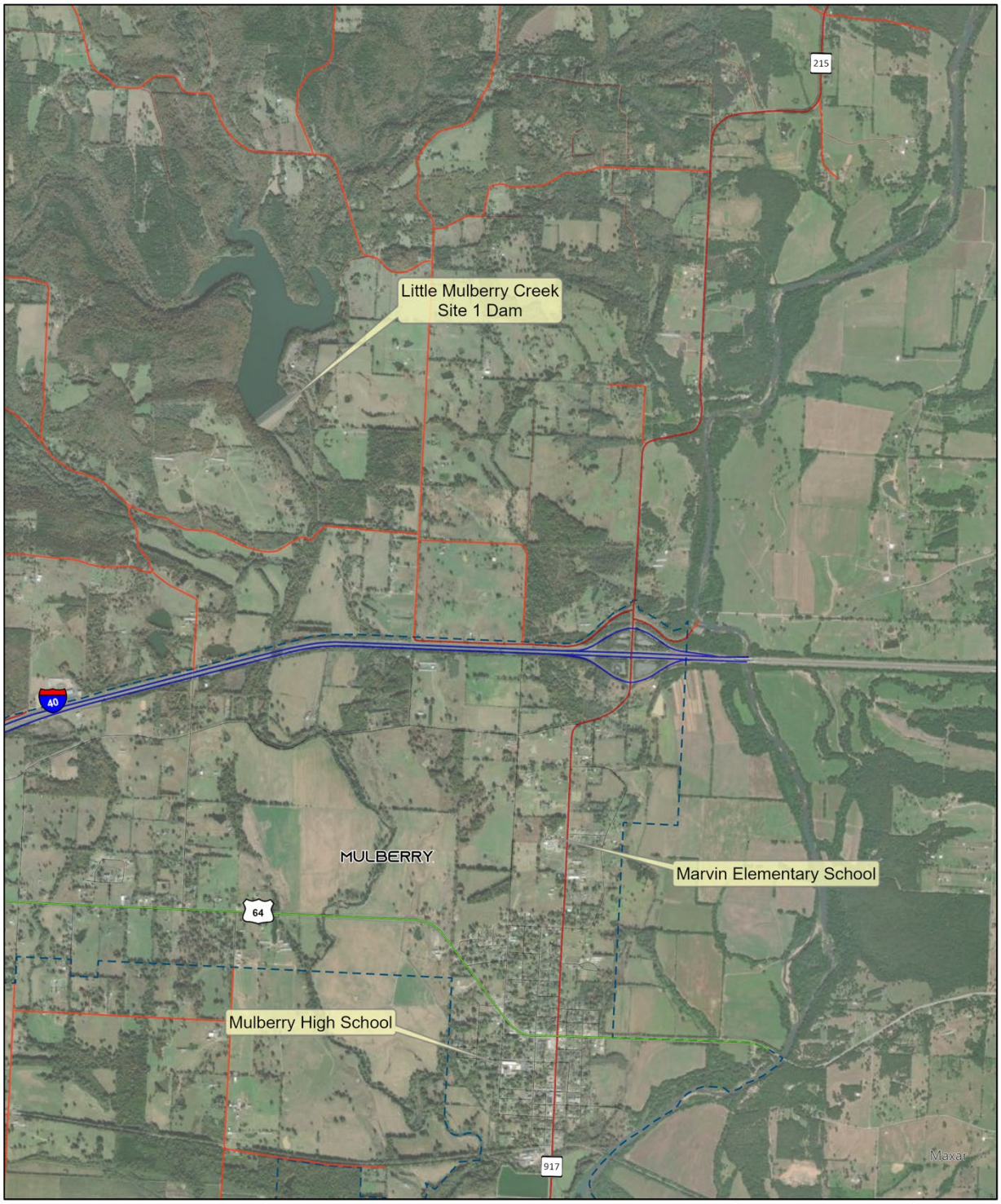


Mountainburg Schools &
Lake Fort Smith Dam
Location Map
Crawford County, Arkansas

Western Arkansas Planning & Development District Inc
1109 S 16th ST ~ Fort Smith, AR 72902
479-785-2651 ~ Fax 479-785-1964

1 inch equals 3,000 feet
0 500 1,000 2,000 3,000
US Feet
Date Exported: 2/21/2024 4:49 PM

N W E S



Mulberry Public Schools & **Site #1 Dam**
Location Map
Crawford County, Arkansas

Western Arkansas Planning & Development District Inc
1109 S 16th ST ~ Fort Smith, AR 72902
479-785-2651 ~ Fax 479-785-1964

1 inch equals 3,000 feet
0 500 1,000 2,000 3,000
US Feet
Date Exported: 2/22/2024 11:24 AM

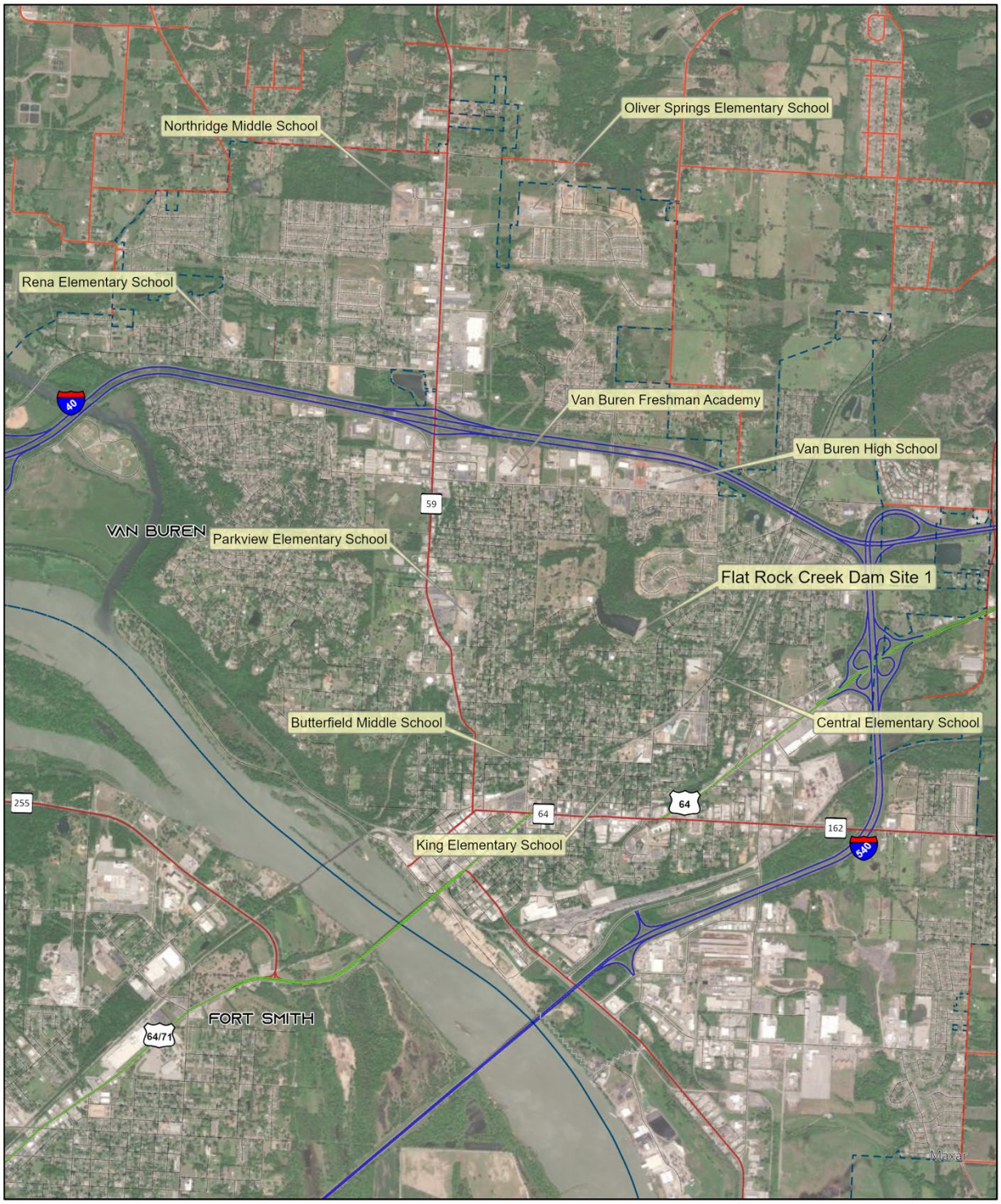
N
W E
S

Van Buren Public Schools & Lee Creek Dam
Location Map
Crawford County, Arkansas

Western Arkansas Planning & Development District Inc
1109 S 16th ST ~ Fort Smith, AR 72902
479-785-2651 ~ Fax 479-785-1964

1 inch equals 3,000 feet
0 500 1,000 2,000 3,000
US Feet
Date Exported: 2/22/2024 12:40 PM

N W E S



Van Buren Public Schools & Flat Rock Creek Dam Site 1
Location Map
Crawford County, Arkansas

Western Arkansas Planning & Development District Inc
1109 S 16th ST ~ Fort Smith, AR 72902
479-785-2651 ~ Fax 479-785-1964

1 inch equals 3,000 feet
0 500 1,000 2,000 3,000
US Feet
Date Exported: 2/22/2024 12:50 PM

N W E S

Appendix C: Effective FIRM Panels

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

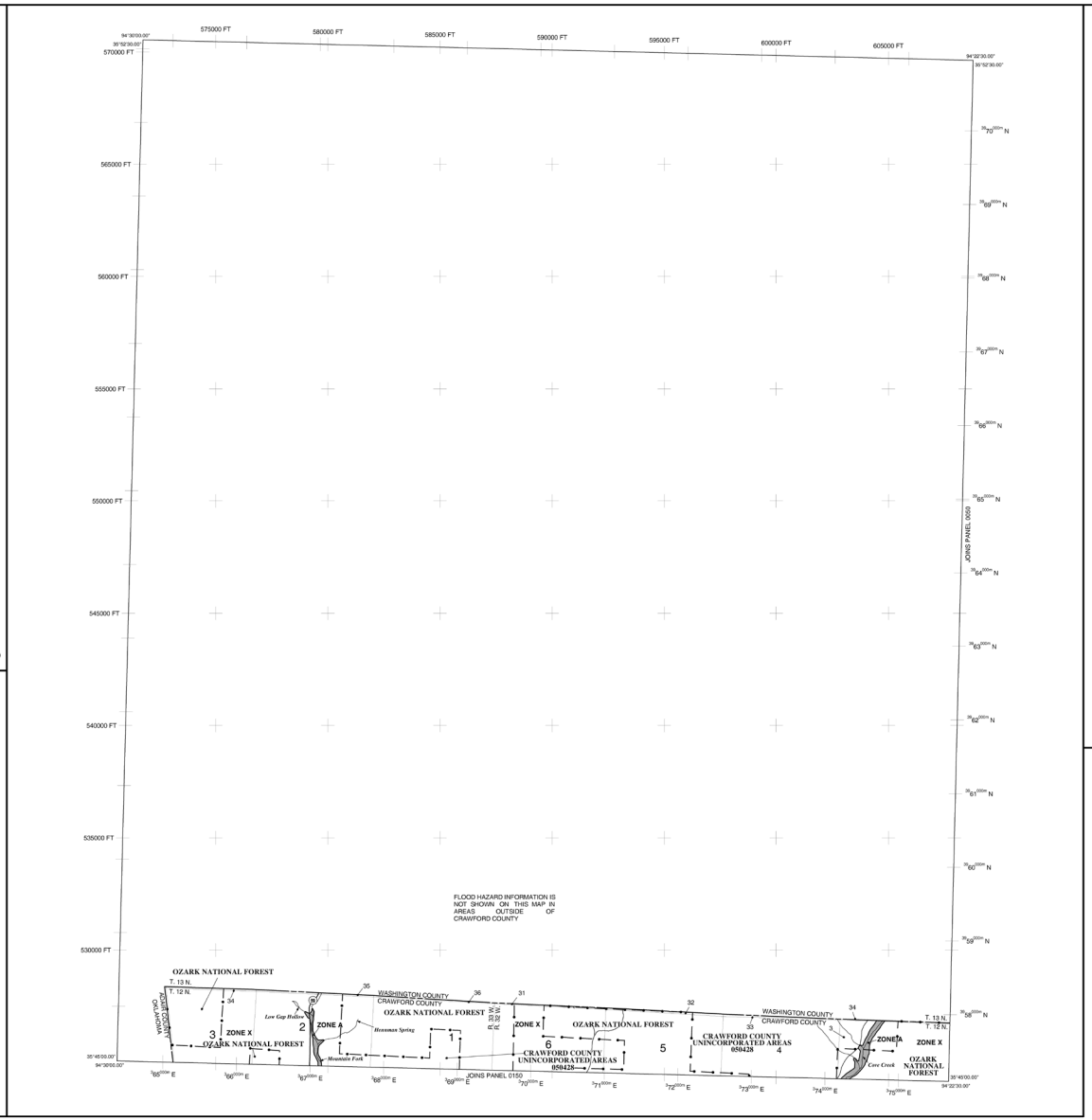
This map reflects more detailed and up-to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0025H

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

PANEL 25 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050419	0025	H

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

MAP NUMBER
05033C0025H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

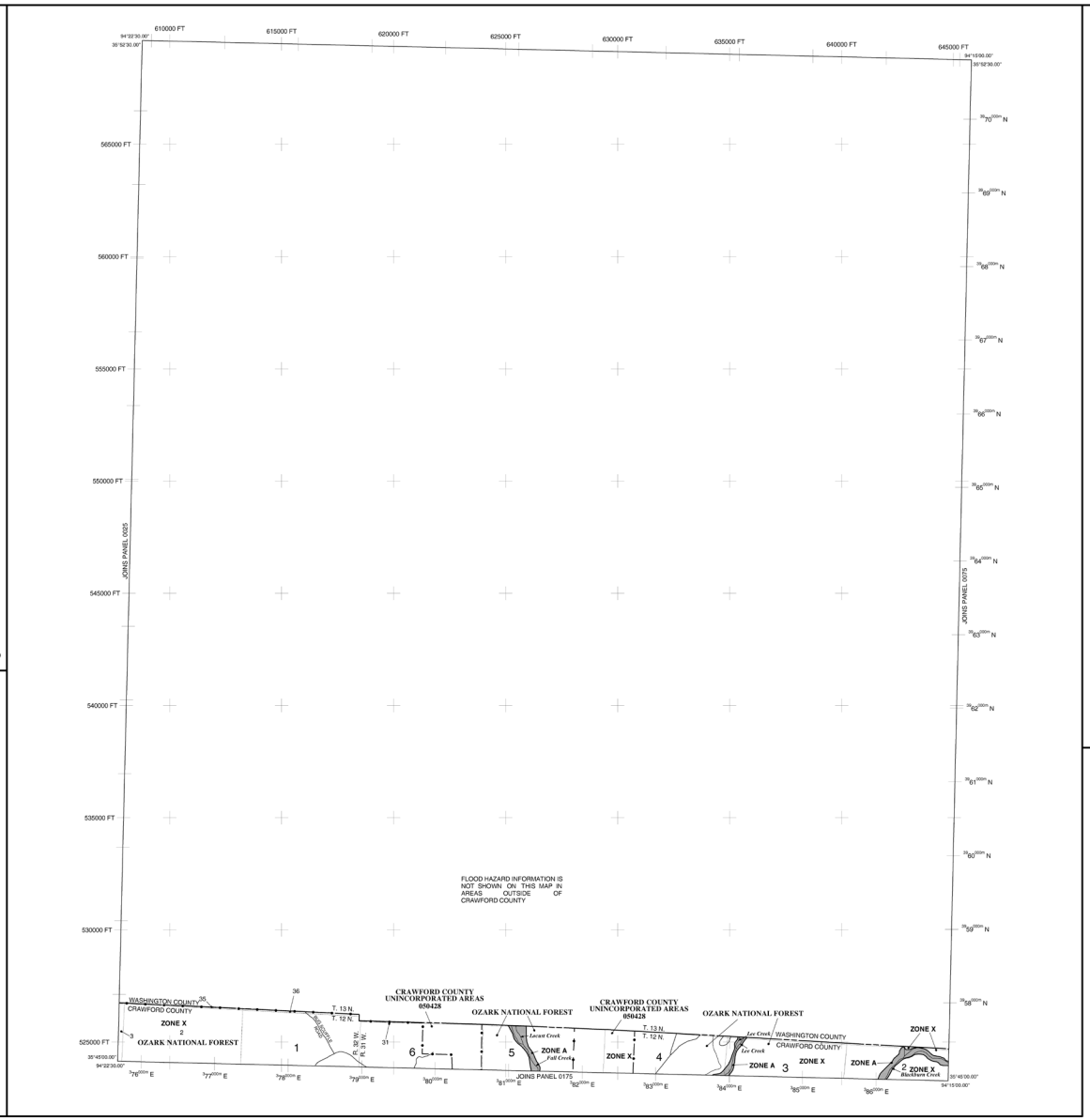
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4279000m N 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
March 16, 2009

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0050H

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

PANEL 50 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0050	H

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

MAP NUMBER
05033C0050H

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact this Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

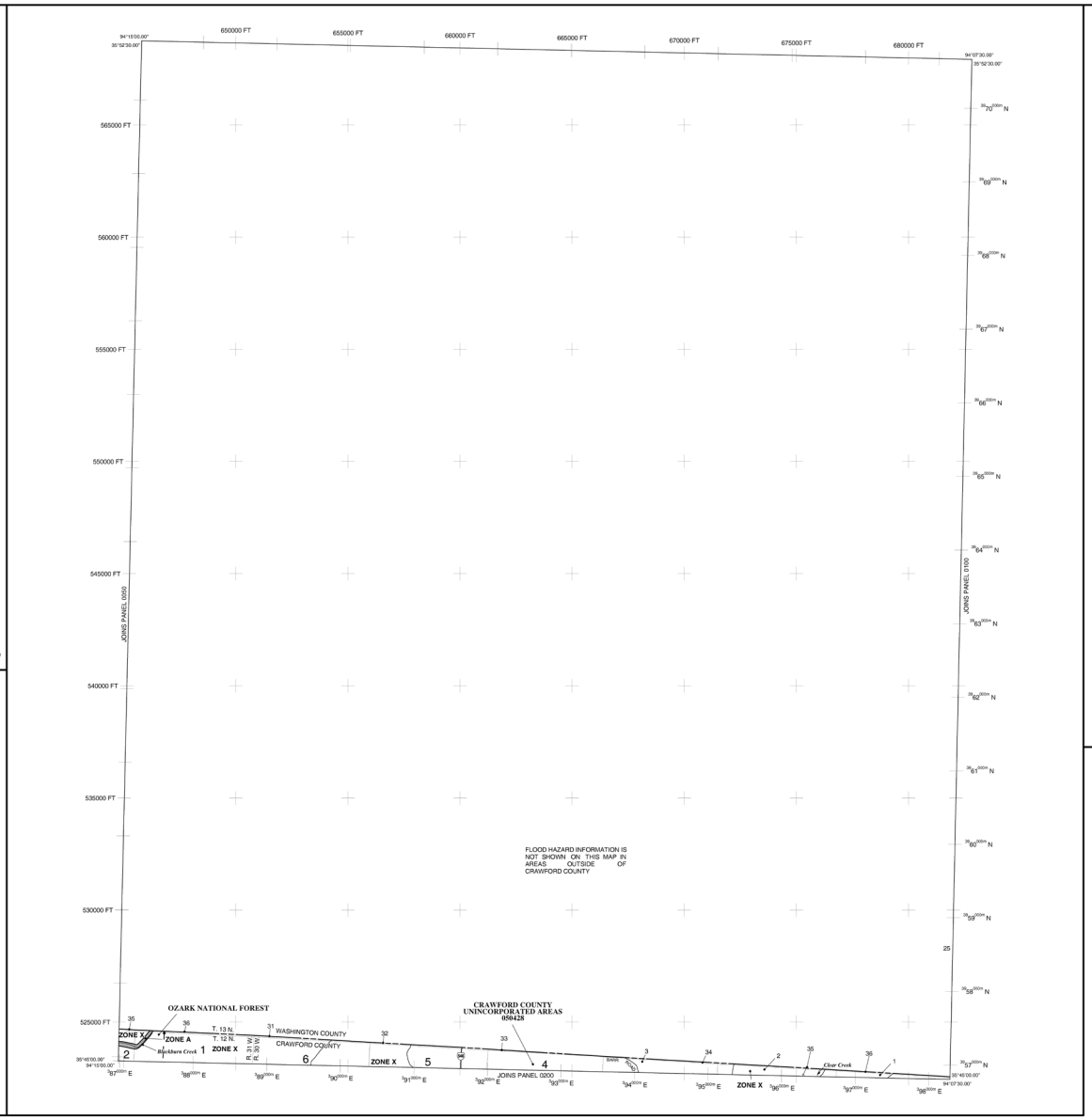
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- (A) Cross section line
- (23) Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991; September 30, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0075H

FIRM
FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 75 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0075	H

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

MAP NUMBER
05033C0075H

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

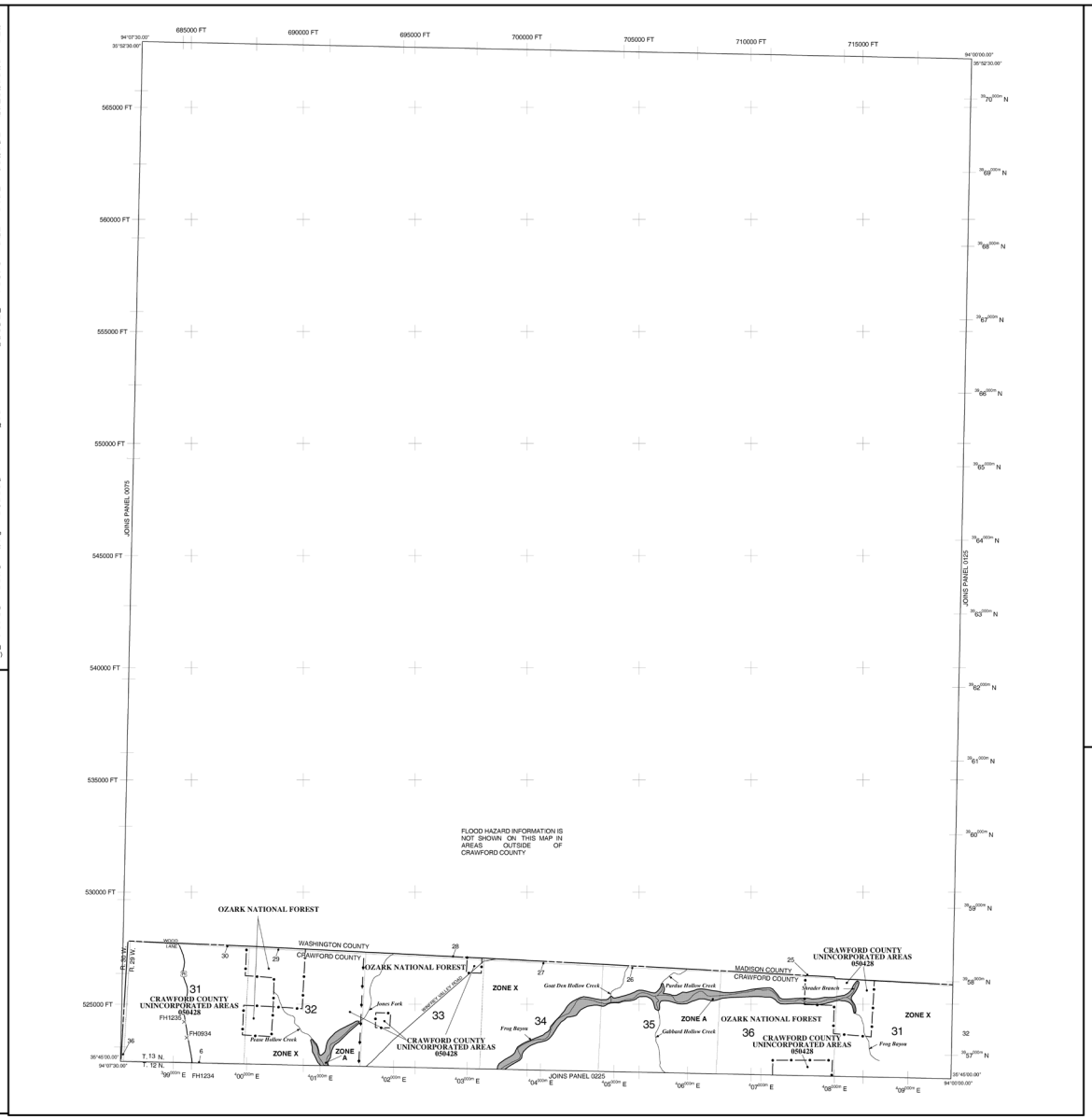
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A Cross section line

23 — 23 Transect line

97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4275000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15

6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic

DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0100H

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

PANEL 100 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0100	H

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

MAP NUMBER
05033C0100H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

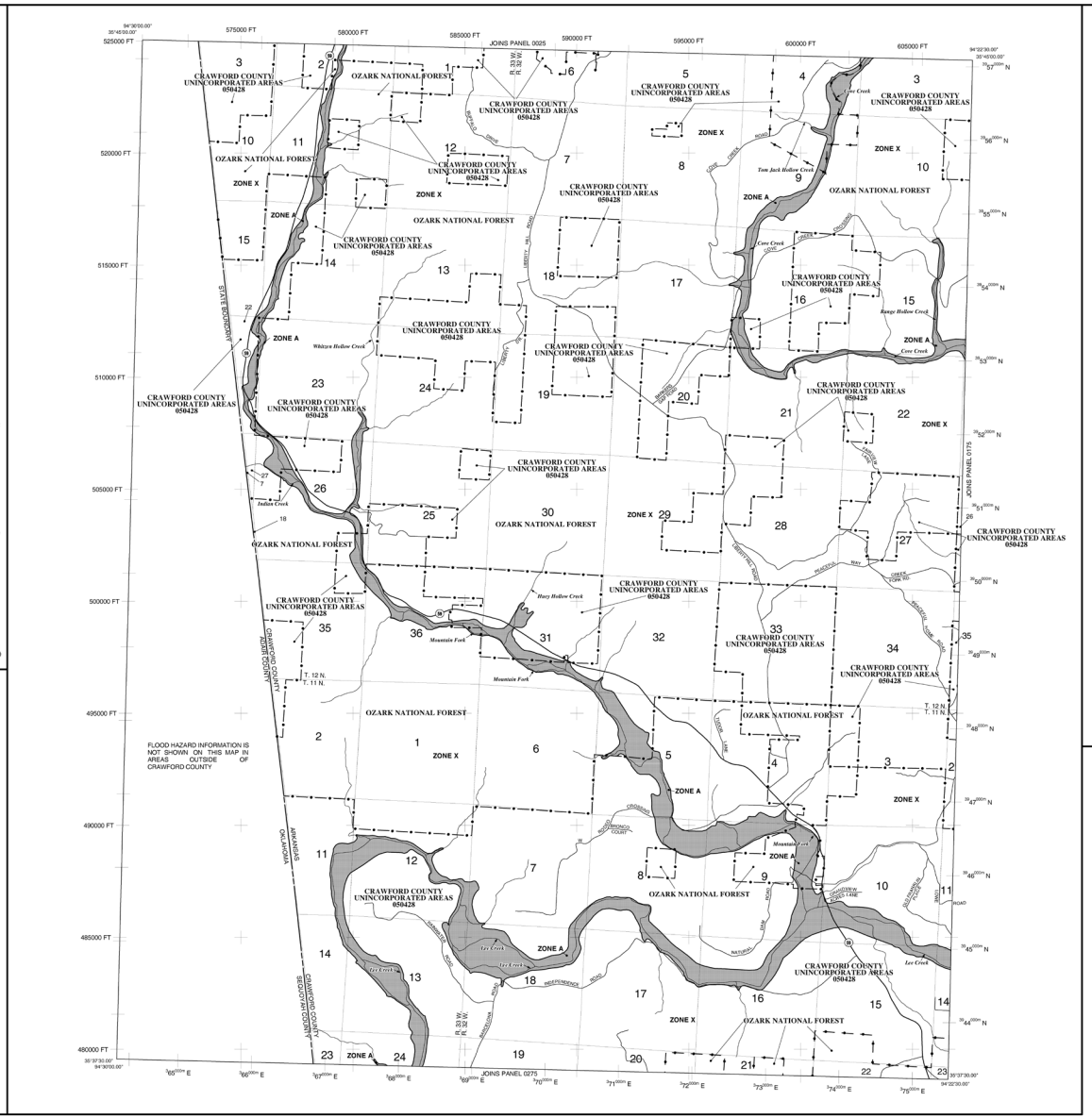
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas , and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0150H

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

PANEL 150 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0150	H

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

MAP NUMBER
05033C0150H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

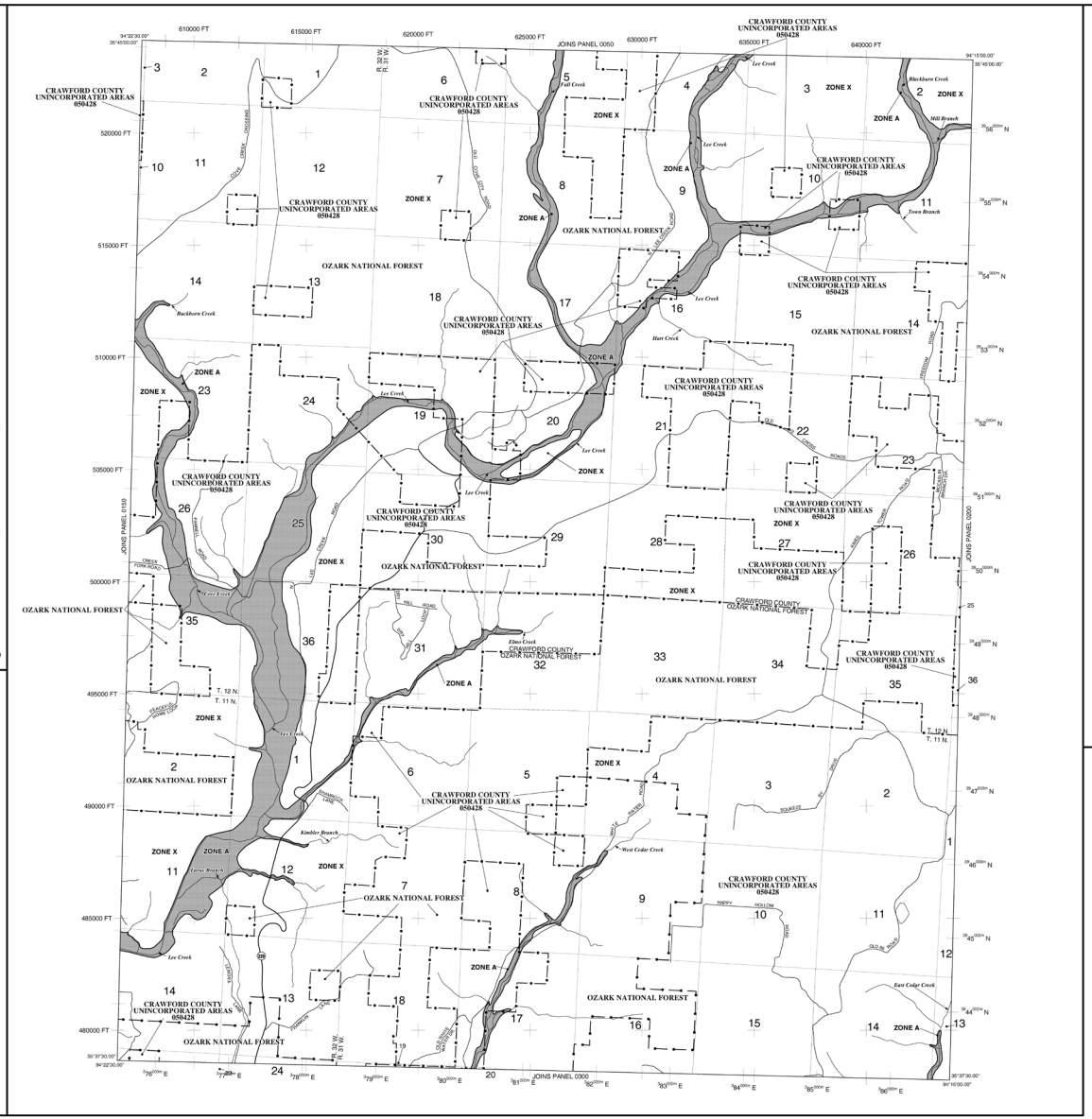
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0175H

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

PANEL 175 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0175	H

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

MAP NUMBER
05033C0175H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

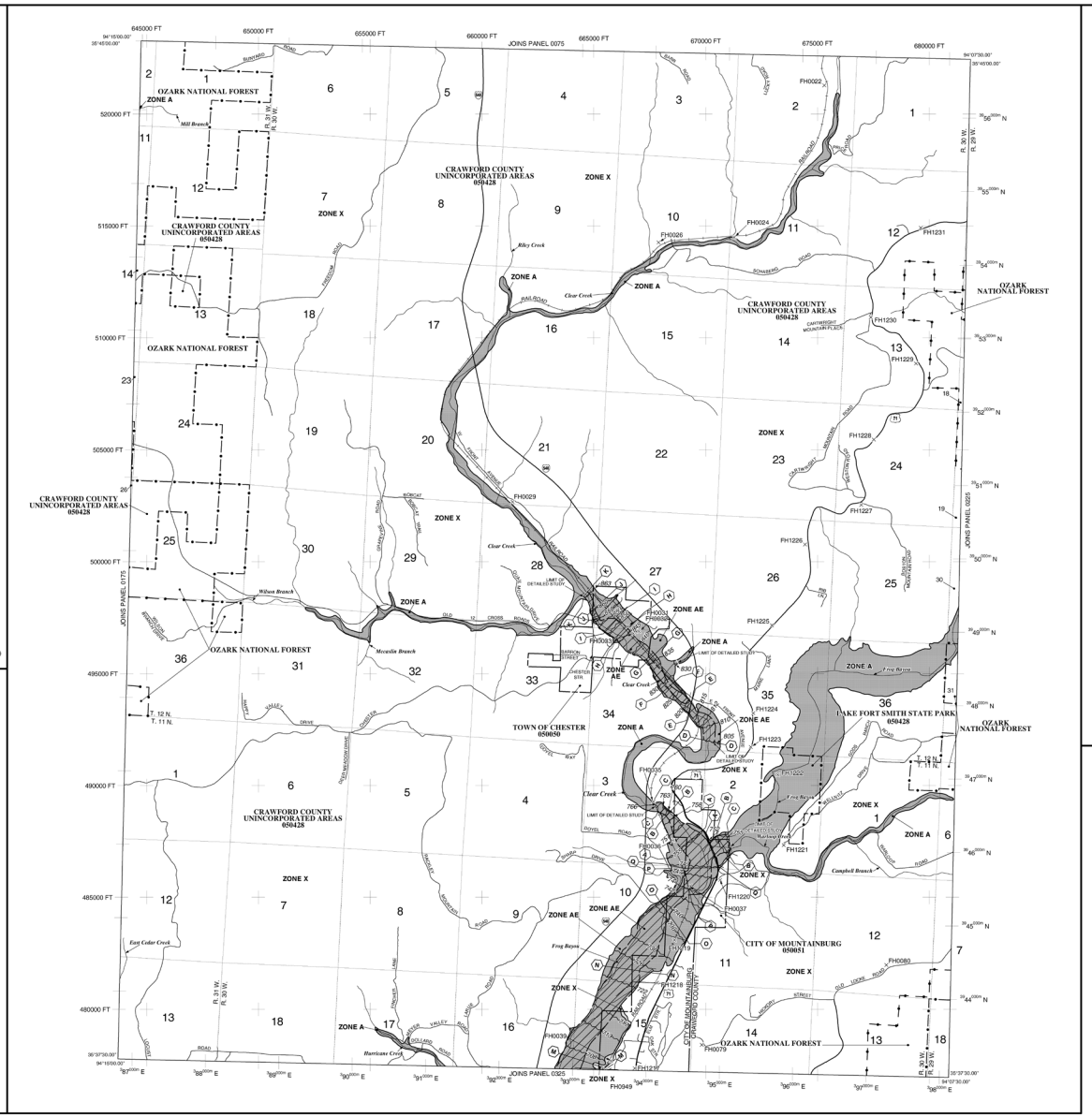
This map reflects more detailed and up-to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A—A Cross section line
- 23—23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1993 December 20, 2000
March 16, 2009 - to update Corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0200H

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

PANEL 200 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0200	H
CHESTER, TOWN OF	050050	0200	H
MOUNTAINBURG, CITY OF	050051	0200	H

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

MAP NUMBER
05033C0200H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

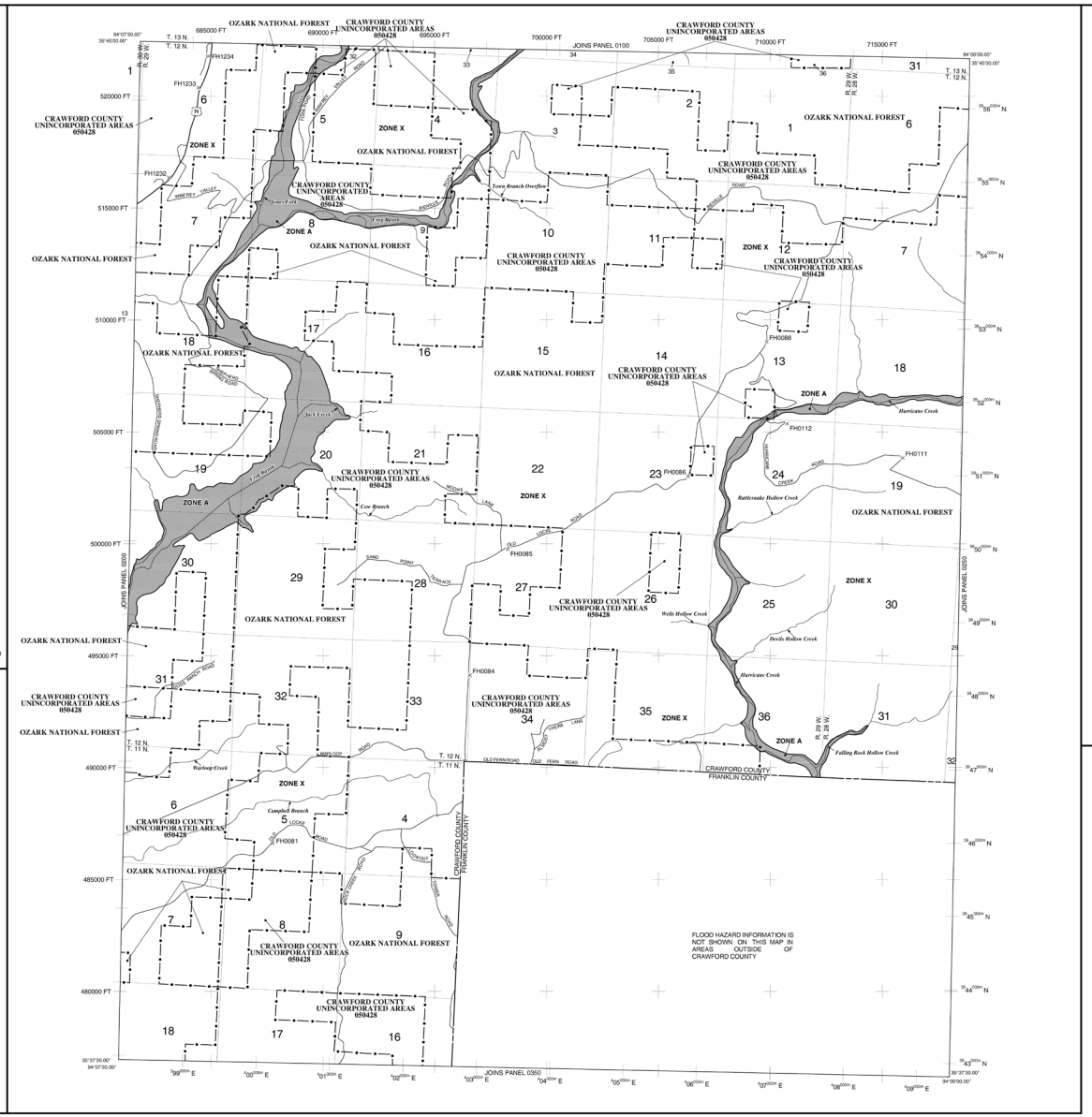
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study report (which contains authoritative hydraulic data* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A—A Cross section line
- 23—23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4429000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1993 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0225H

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

PANEL 225 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0225	H

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

MAP NUMBER
05033C0225H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact this Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

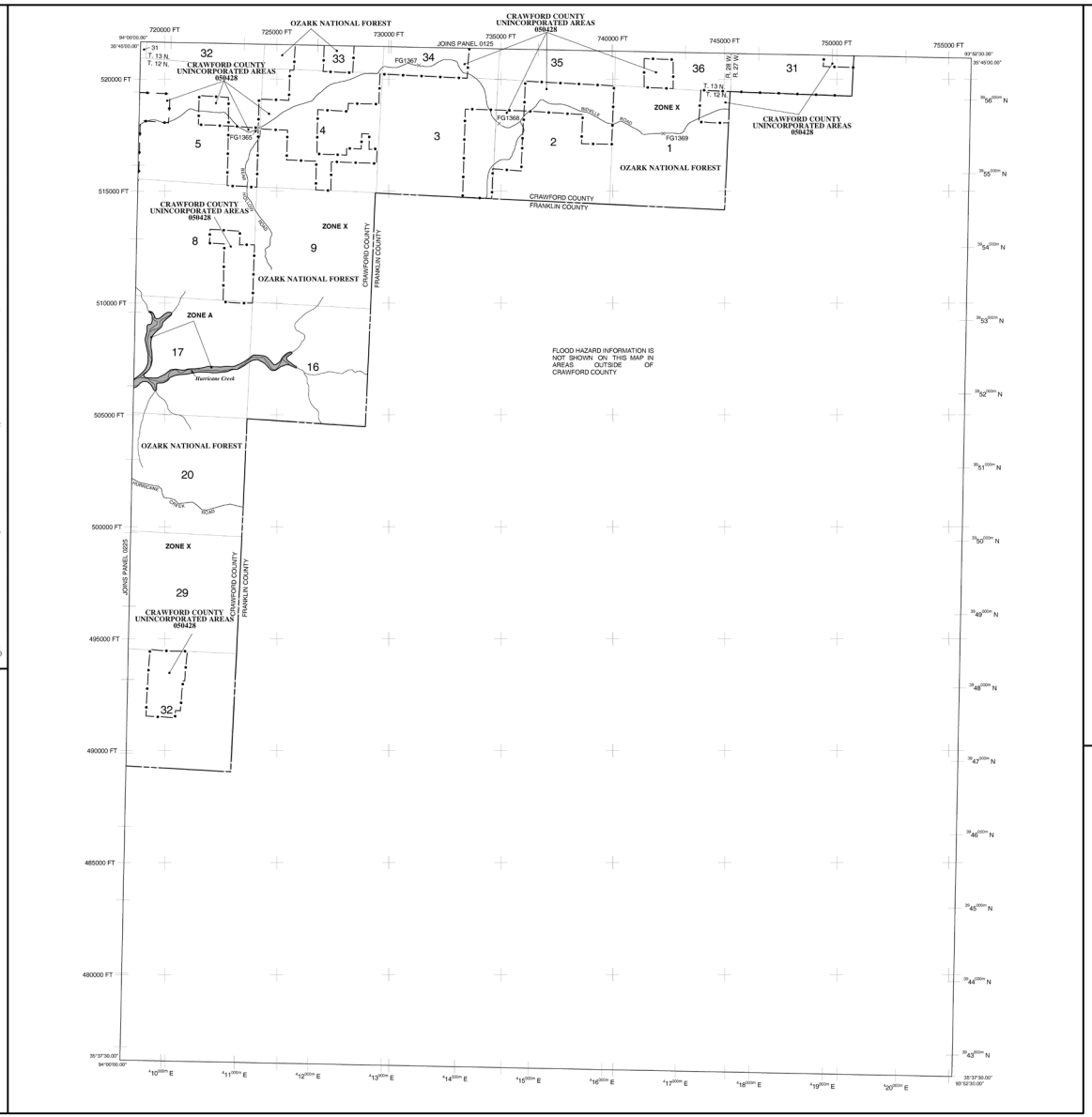
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4279000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991 - to update corporate limits
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0250H

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

PANEL 250 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0250	H

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

MAP NUMBER
05033C0250H

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

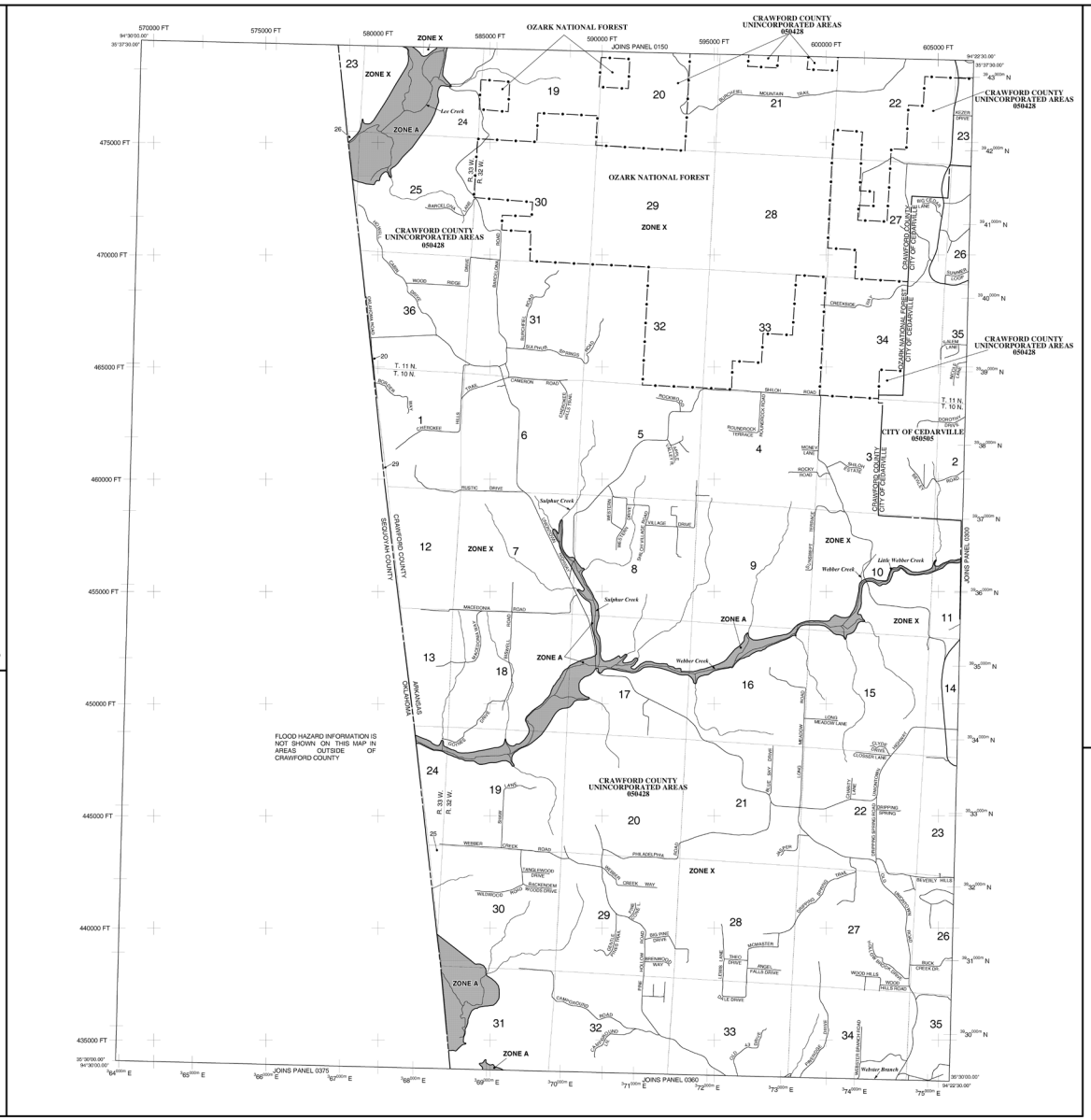
This map reflects more detailed and up to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance *Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% Floodplain boundary
- 0.2% Floodplain boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and/or zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0275H

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

PANEL 275 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0275	H
CEDARVILLE, CITY OF	050585	0275	H

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

MAP NUMBER
05033C0275H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

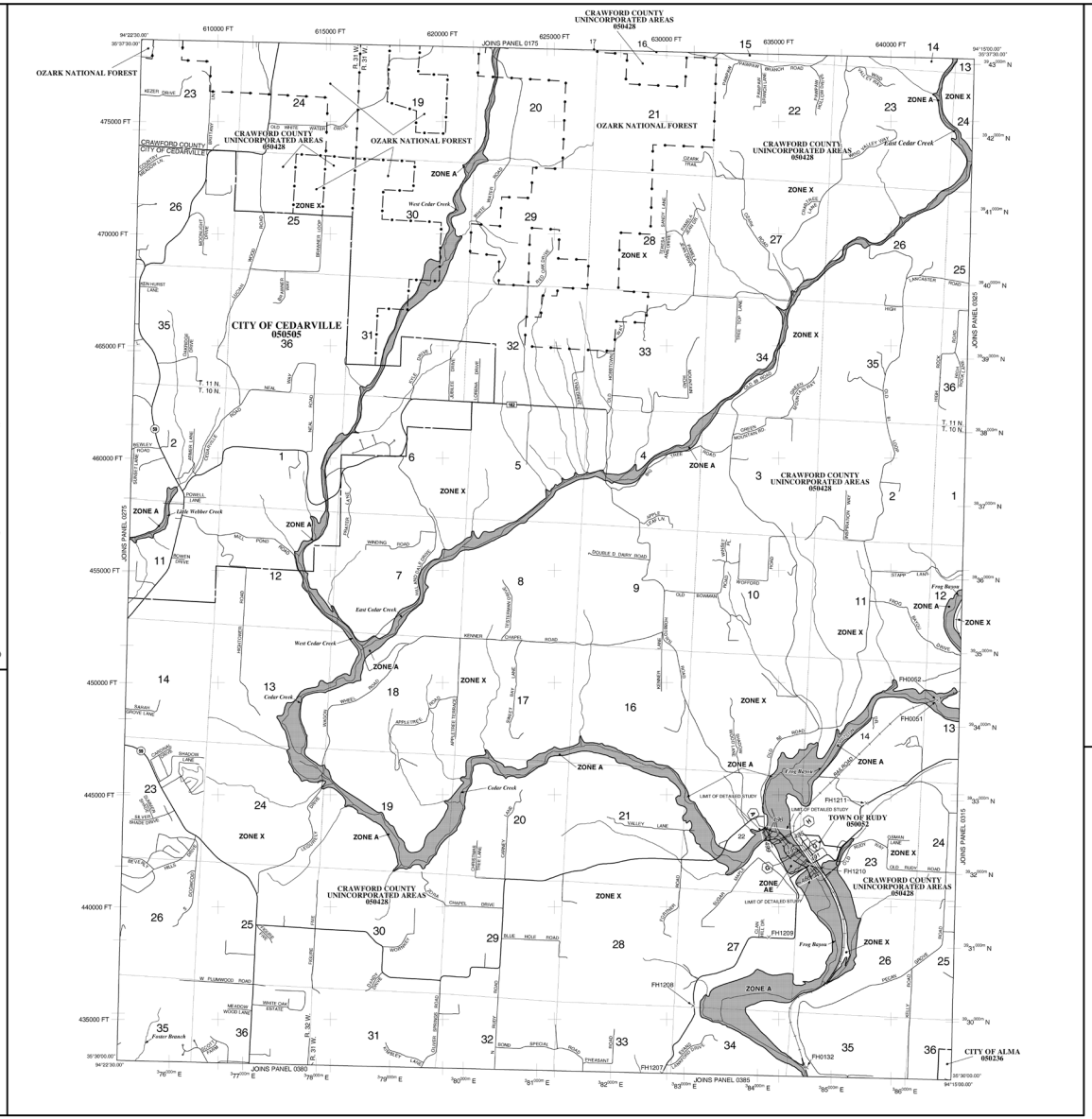
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A–A Cross section line
- 23–23 Transect line
- 87°07'30", 32°22'30" / 32°75'00"N Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 6000000 FT 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas , and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0300H

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

PANEL 300 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0300	H
CEDARVILLE, CITY OF	050505	0300	H
ALMA, CITY OF	050236	0300	H
RUDY, TOWN OF	050052	0300	H

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

MAP NUMBER
05033C0300H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

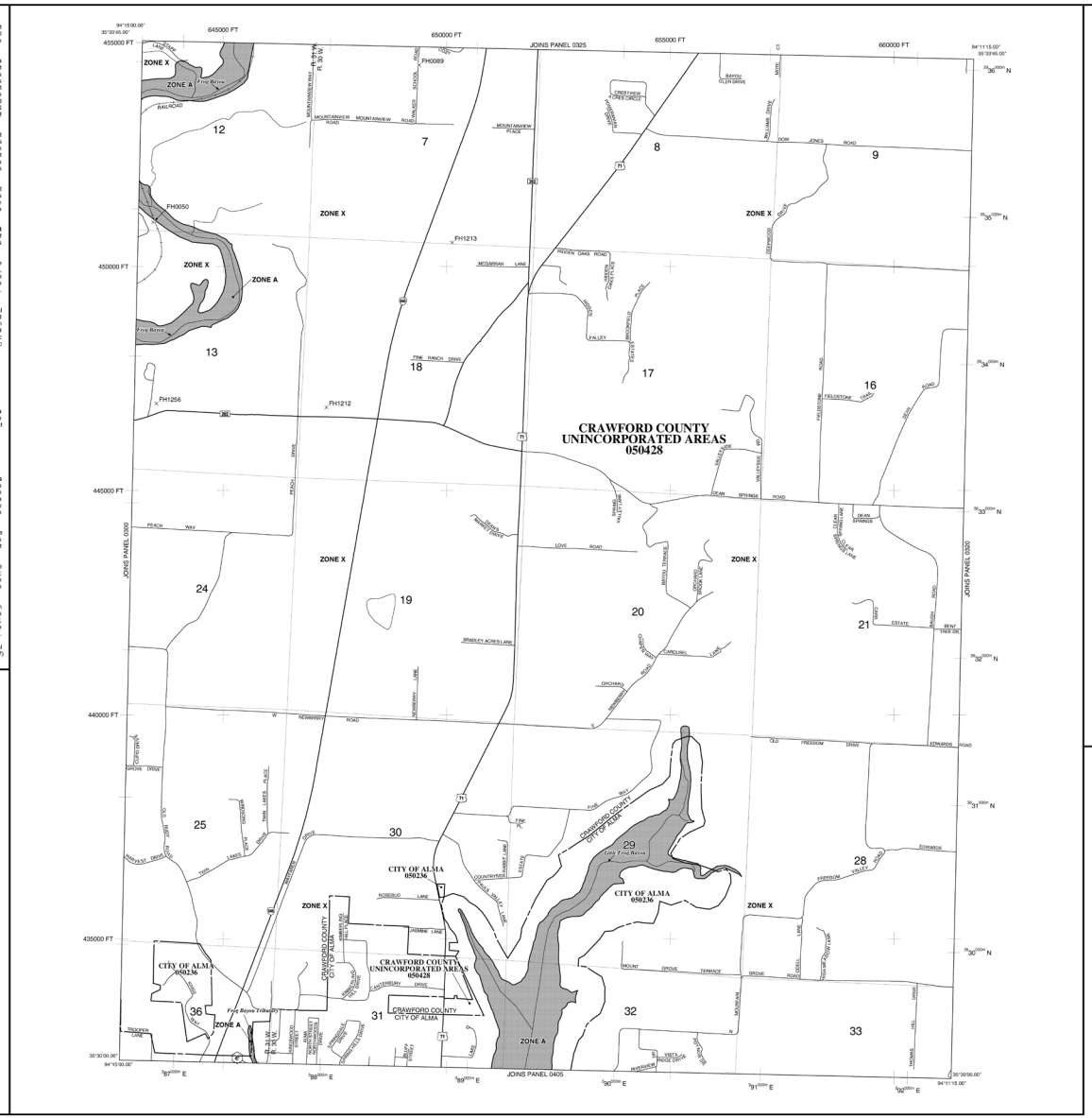
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water- surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A—A Cross section line
- 23—23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0315H

FIRM
FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 315 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0315	H
ALMA, CITY OF	050236	0315	H

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

MAP NUMBER
05033C0315H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

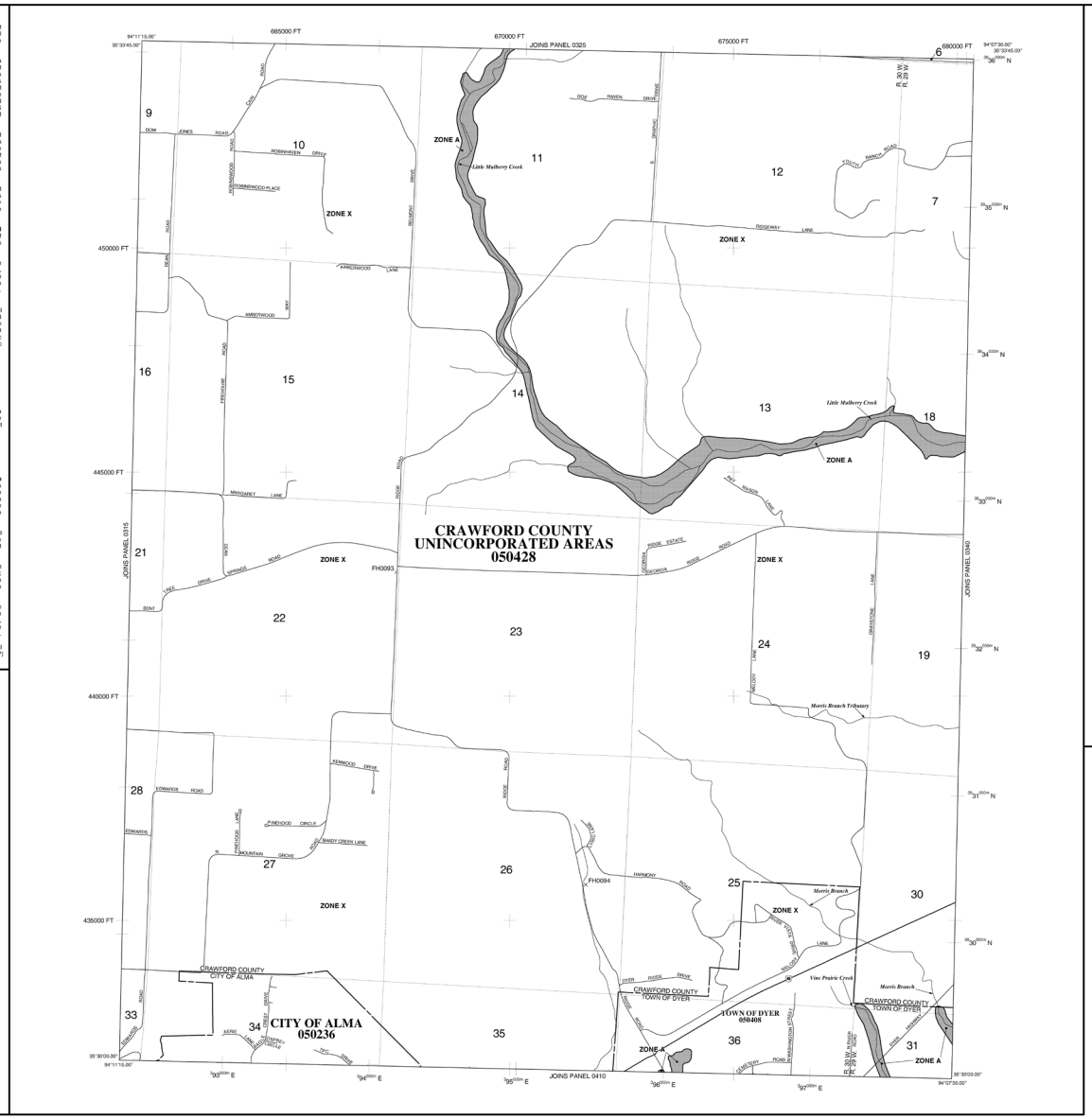
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991 - December 20, 2000

March 16, 2009 - to update corporate limits, to incorporate New Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
150 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0320H

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

PANEL 320 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0320	H
ALMA, CITY OF	060236	0320	H
DYER, TOWN OF	050408	0320	H

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

MAP NUMBER
05033C0320H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NVNGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

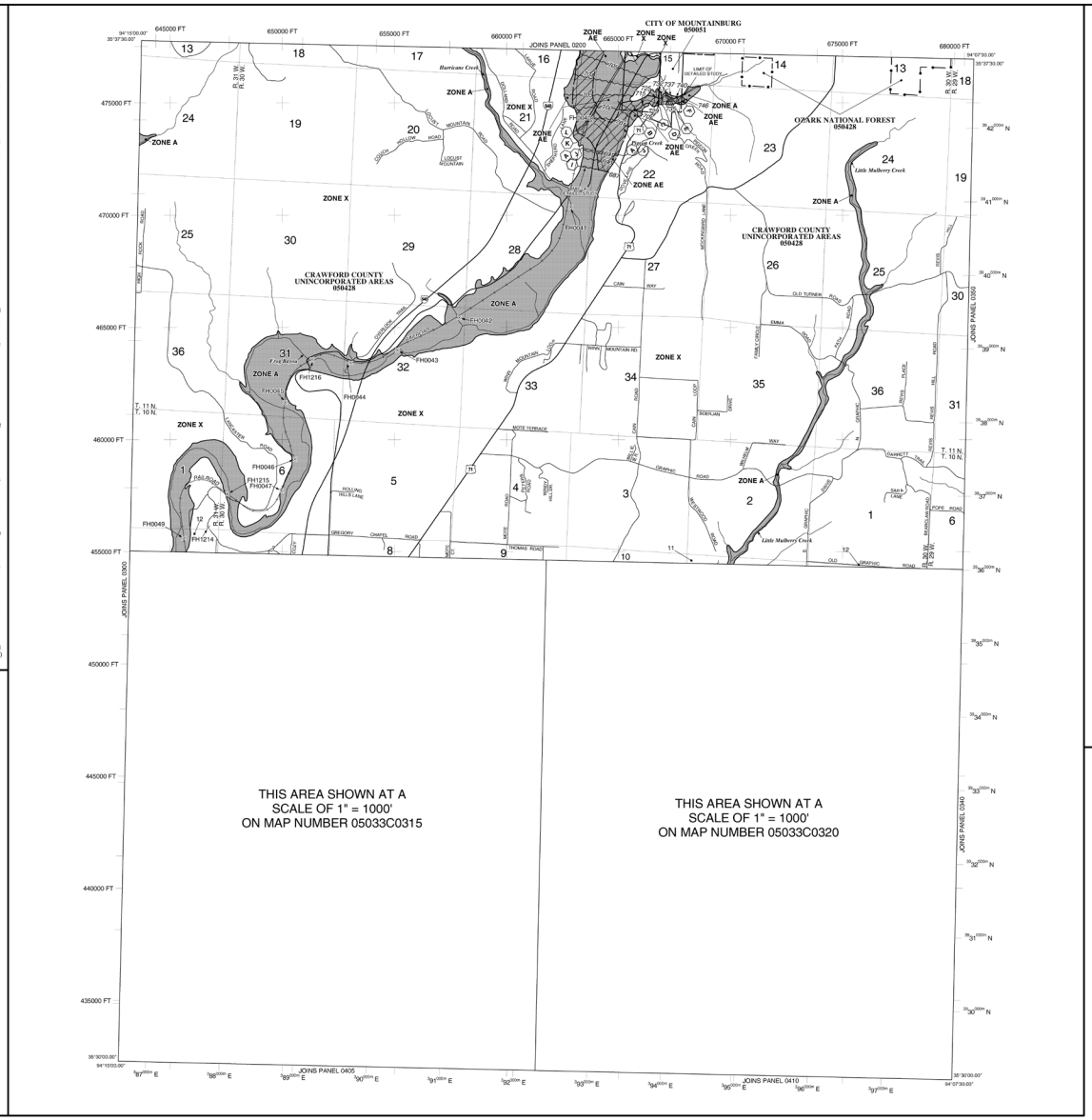
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report* (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 N 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
December 20, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2006

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0325H

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

PANEL 325 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0325	H
MOUNTAINBURG, CITY OF	050051	0325	H

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

MAP NUMBER
05033C0325H

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

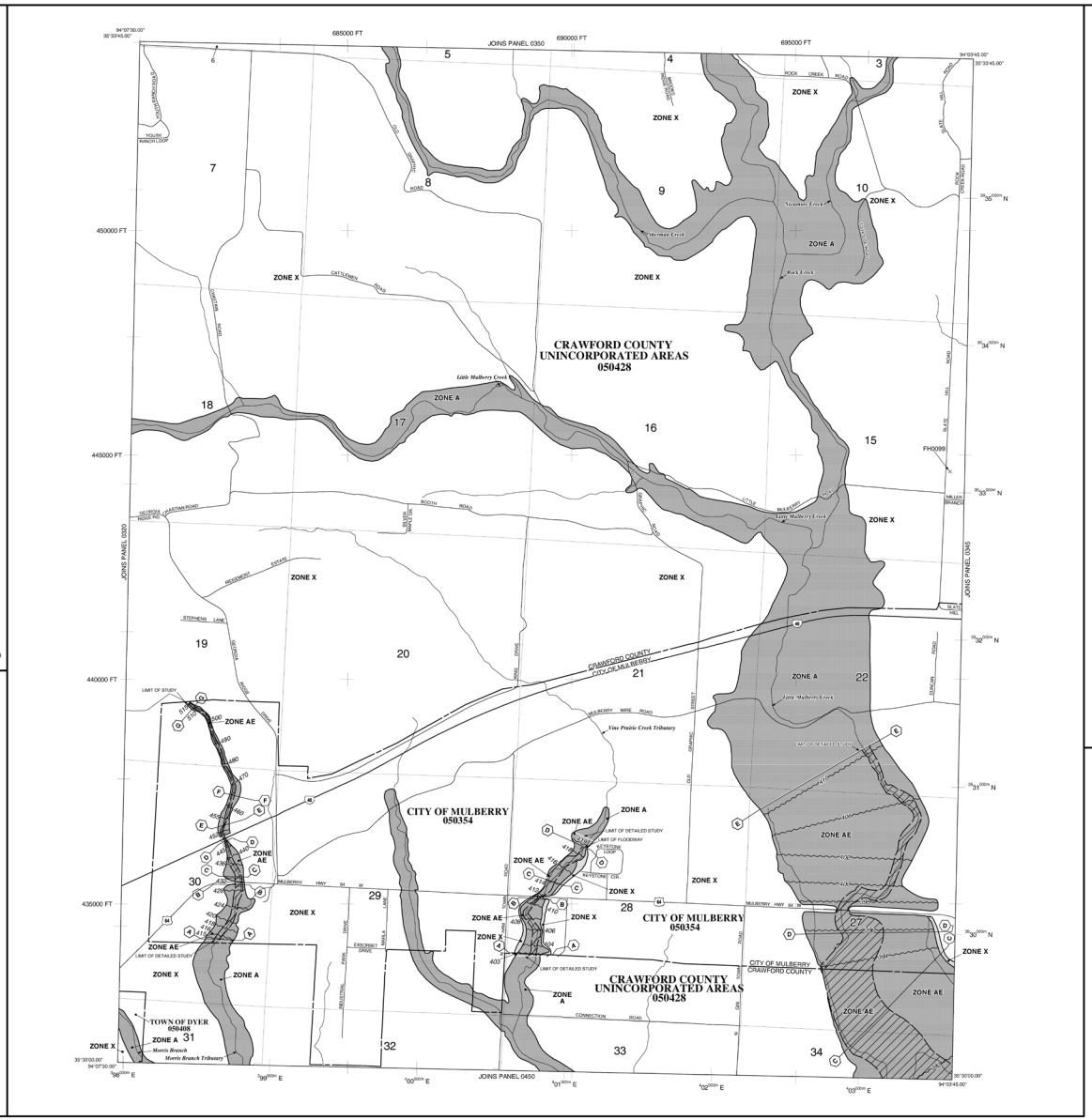
This map reflects more detailed and up-to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1993 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0340H

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

PANEL 340 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0340	H
DYER, TOWN OF	050408	0340	H
MULBERRY, CITY OF	050354	0340	H

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

MAP NUMBER
05033C0340H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

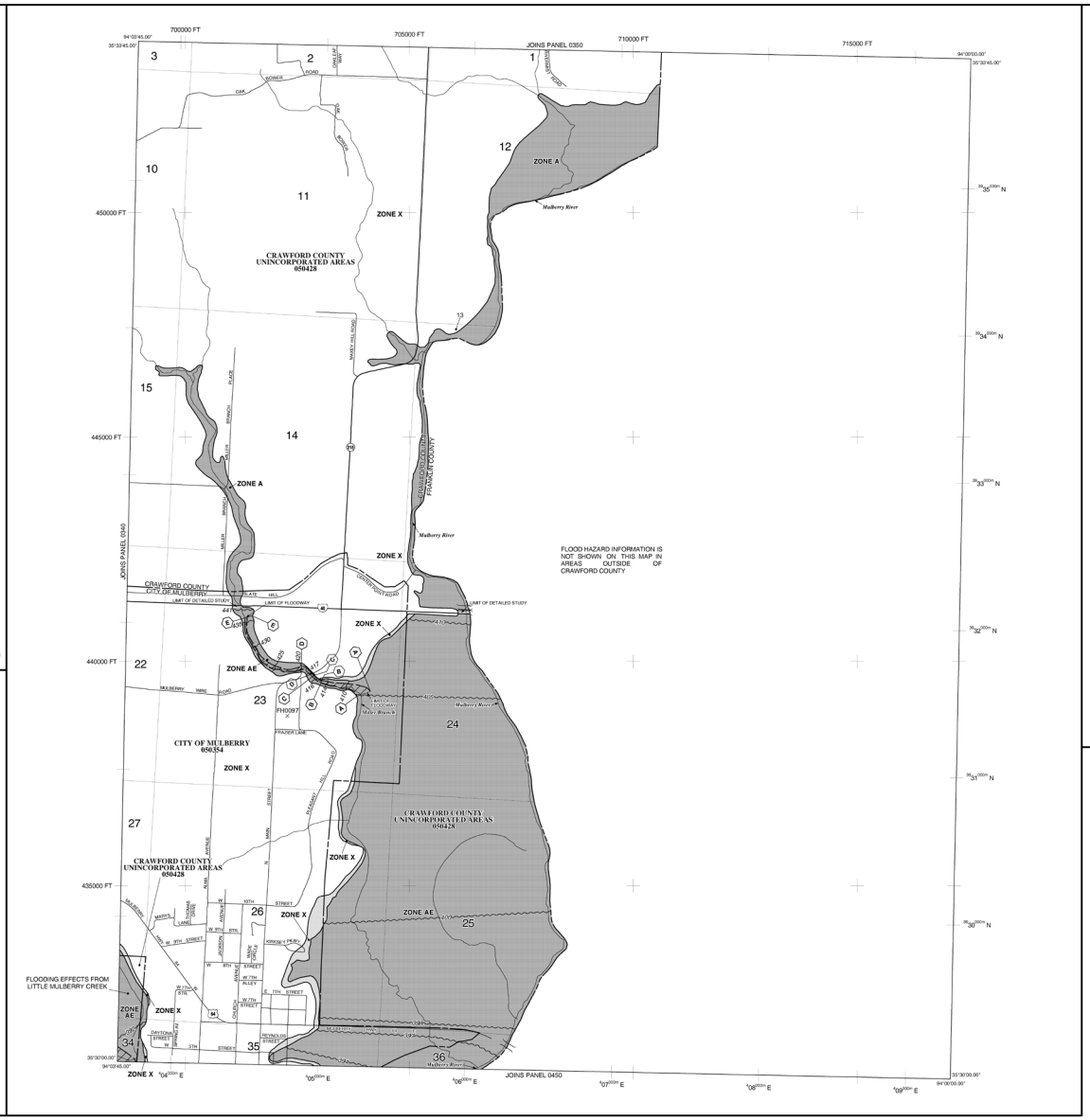
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a *Flood Insurance Study* report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991 - December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
150 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0345H

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

PANEL 345 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0345	H
MULBERRY, CITY OF	050354	0345	H

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

MAP NUMBER
05033C0345H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

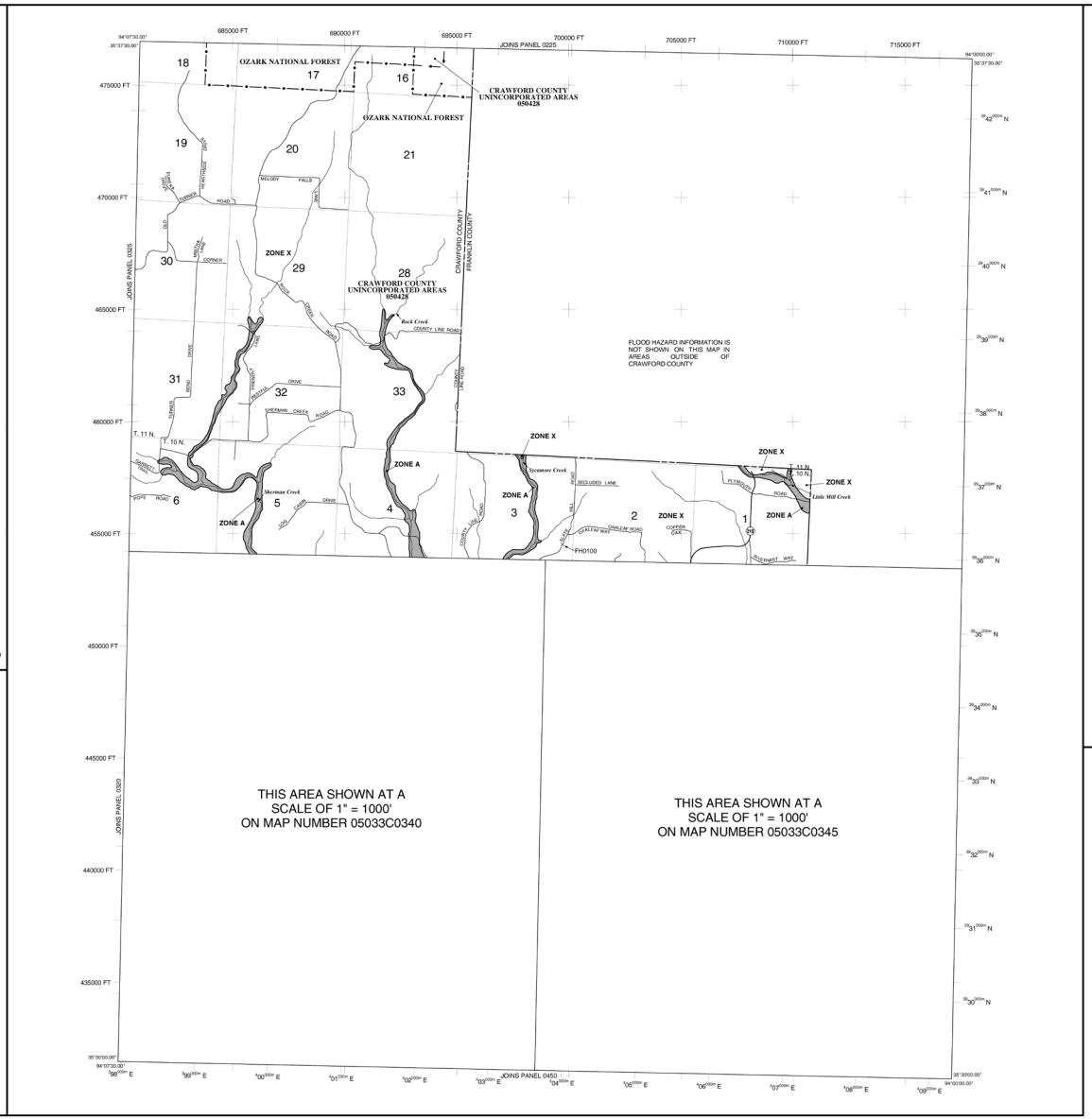
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0350H

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

PANEL 350 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0350	H

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

MAP NUMBER
05033C0350H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

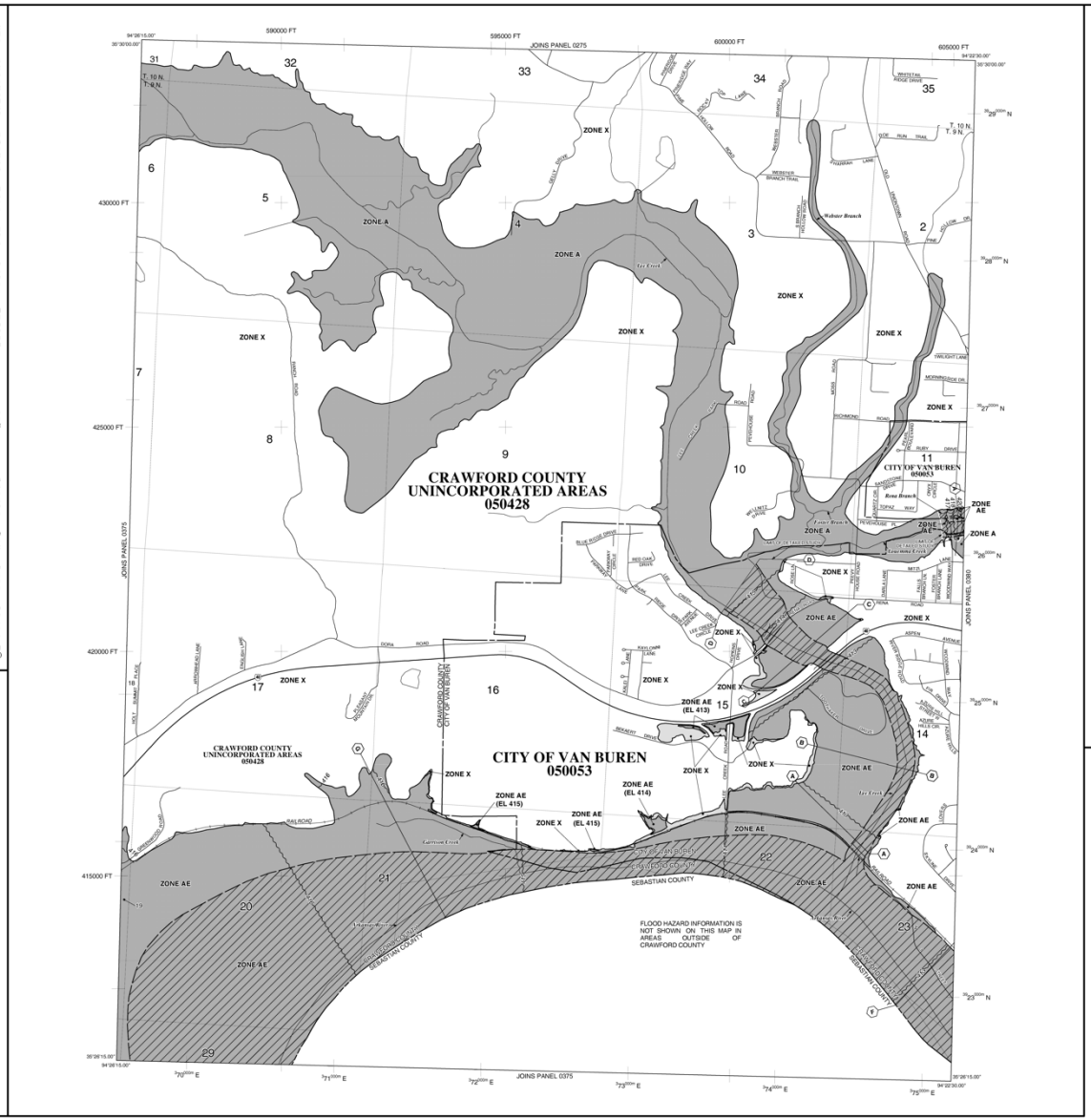
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 87°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 20, 1999 December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, floodway boundaries and zone designations, and to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 9620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0360H

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

PANEL 360 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0360	H
VAN BUREN, CITY OF	050053	0360	H

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

MAP NUMBER
05033C0360H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

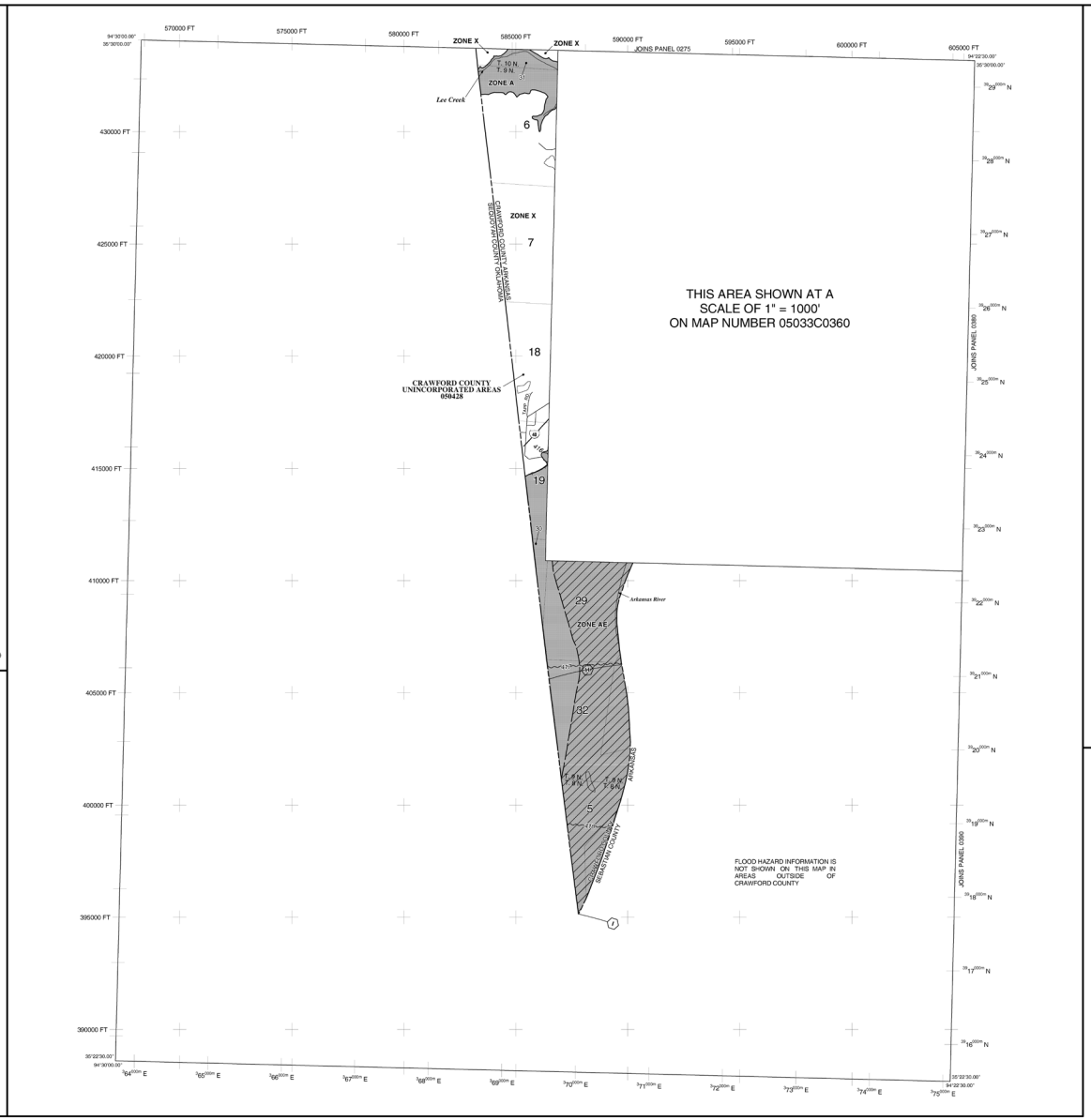
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A1- A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991 - to update corporate limits
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0375H

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

PANEL 375 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0375	H

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

MAP NUMBER
05033C0375H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

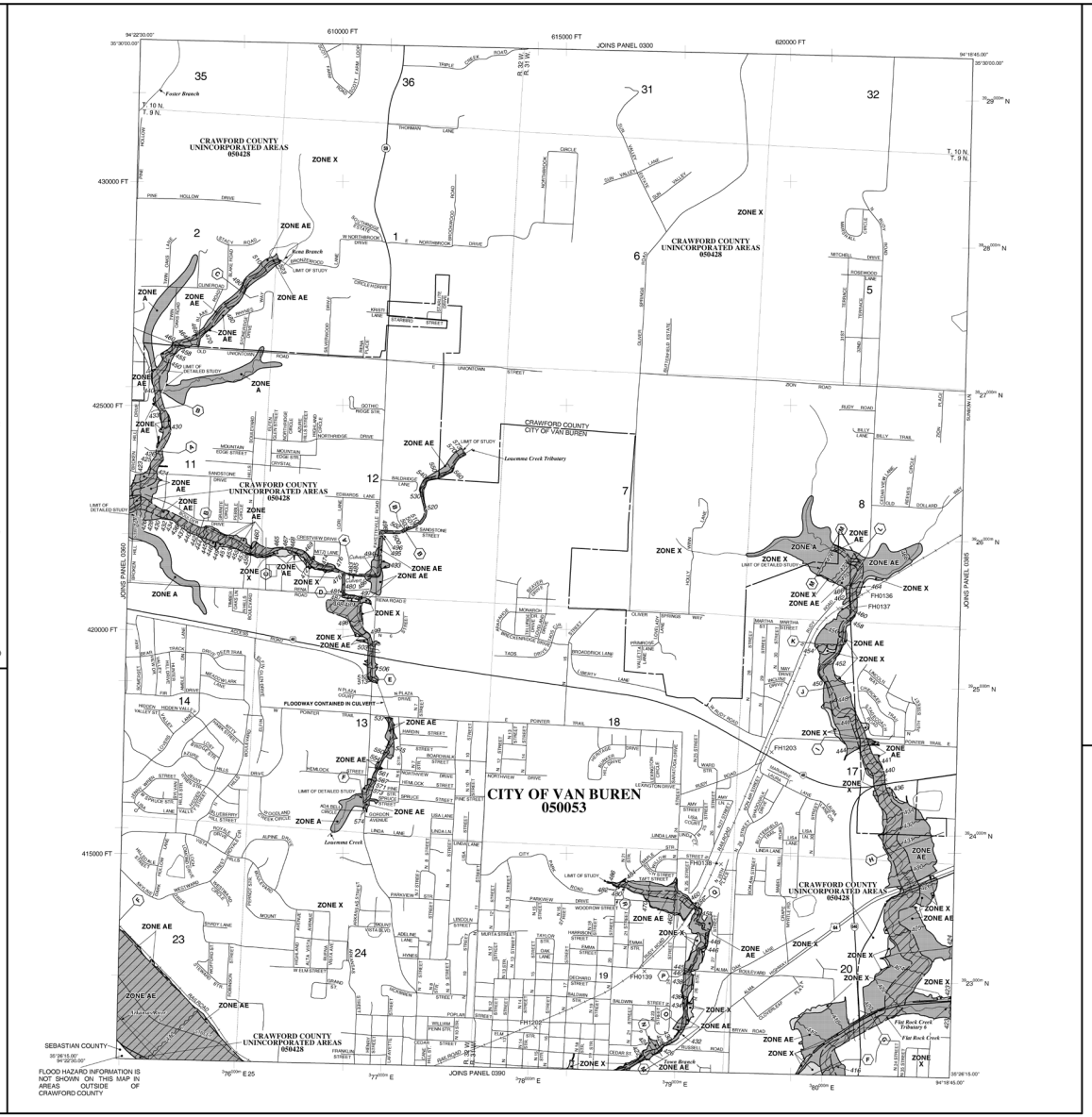
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A ——— A Cross section line
- 23 - - - - - - 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4475000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0380H

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

PANEL 380 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0380	H
VAN BUREN, CITY OF	050053	0380	H

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

MAP NUMBER
05033C0380H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

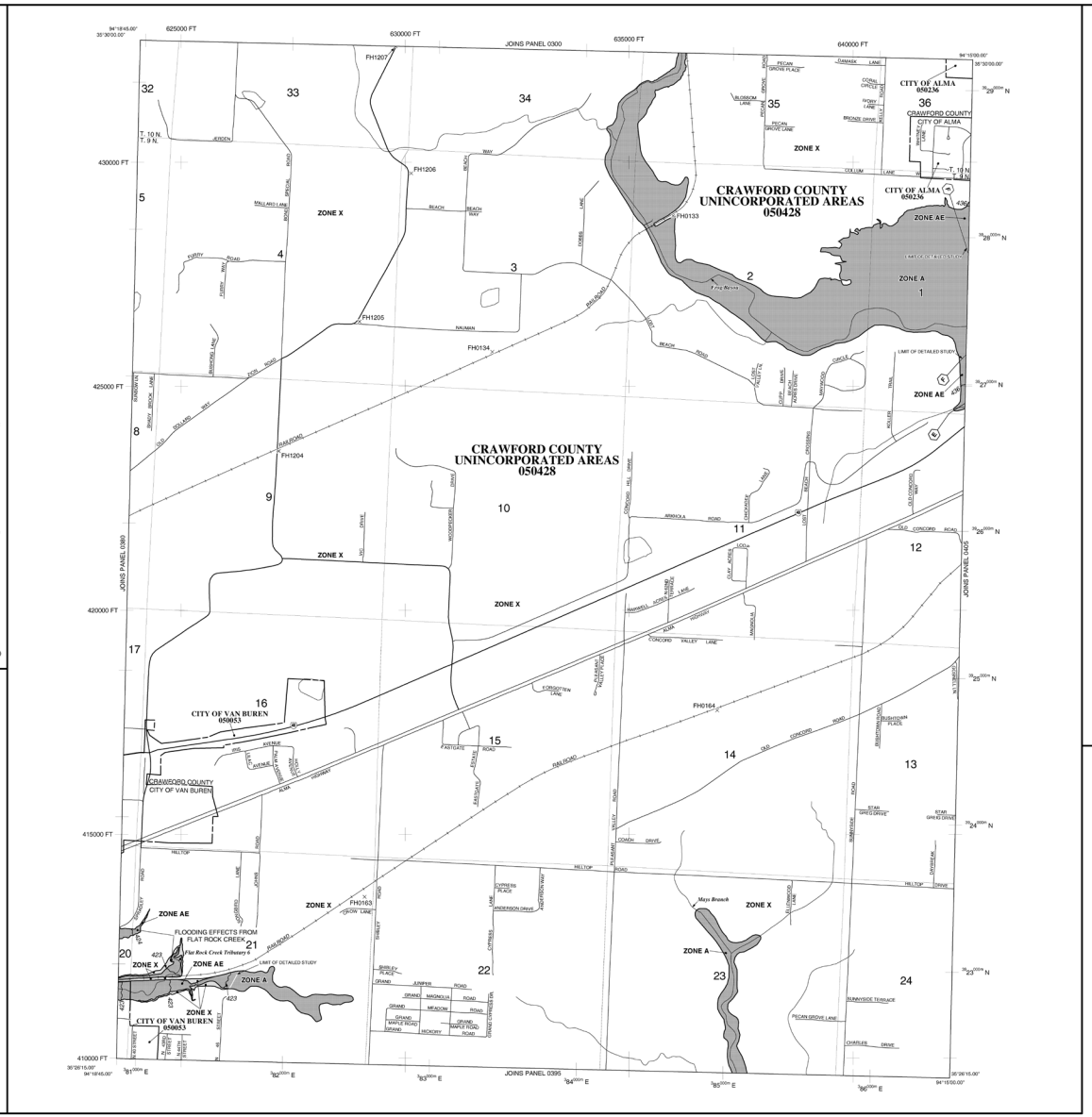
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1- **877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0385H

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

PANEL 385 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0385	H
ALMA, CITY OF	050236	0385	H
VAN BUREN, CITY OF	050053	0385	H

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

MAP NUMBER
05033C0385H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information office.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

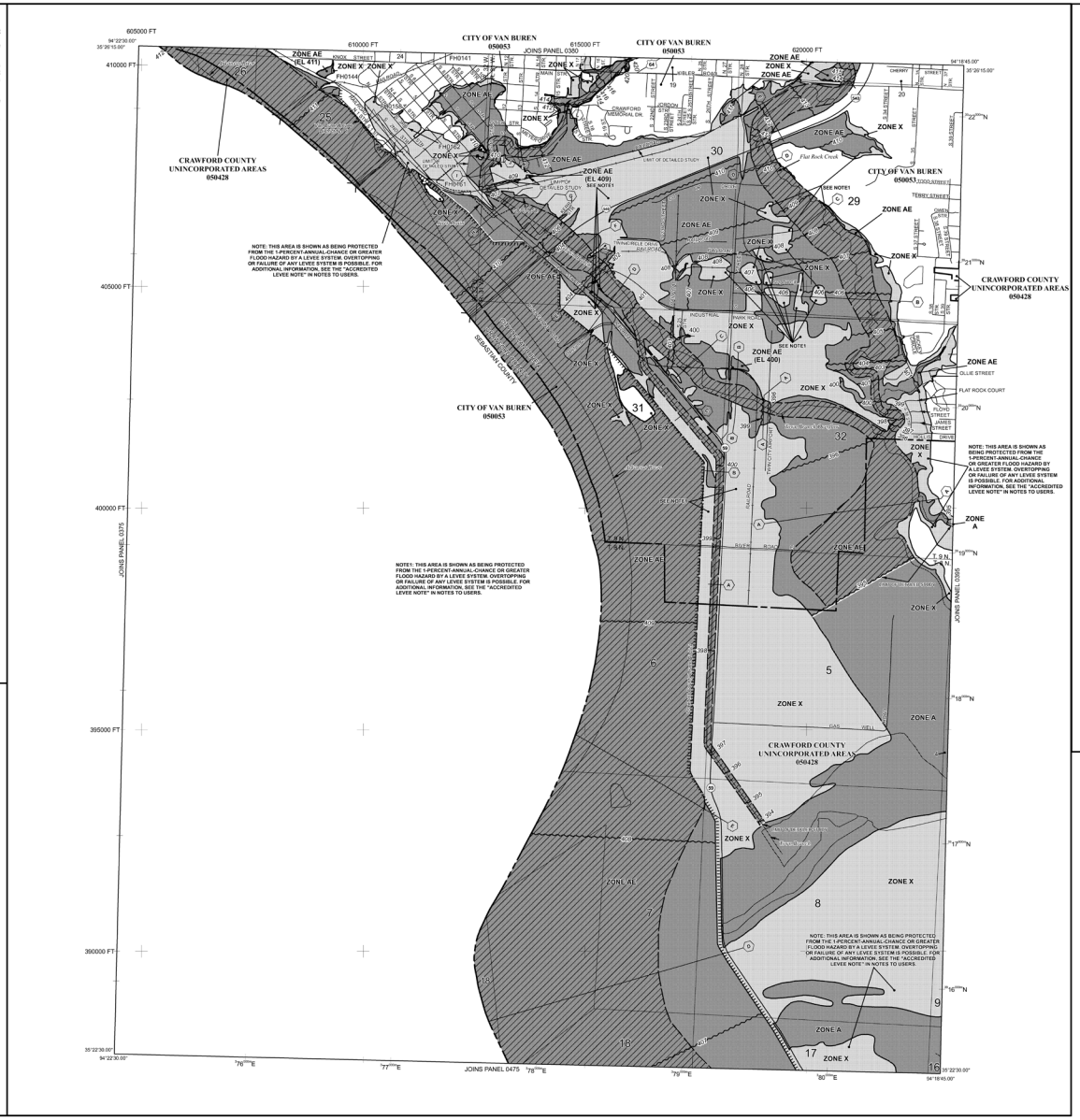
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or deannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A — No Base Flood Elevations determined.
- ZONE AE — Base Flood Elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referred to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 3776000 mN — 1000-meter Universal Transverse Mercator grid values, zone 15
- 600000 FT — 5000-foot grid values: Arkansas State Plane coordinate system, North zone (FIPSZONE 0301), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 - December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.
December 3, 2010 - to change map notes to reflect the accreditation of formerly provisionally accredited levees.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0390J

FIRM
FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 390 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0390	J
VAN BUREN, CITY OF	050053	0390	J

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

MAP NUMBER
05033C0390J

MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information office.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

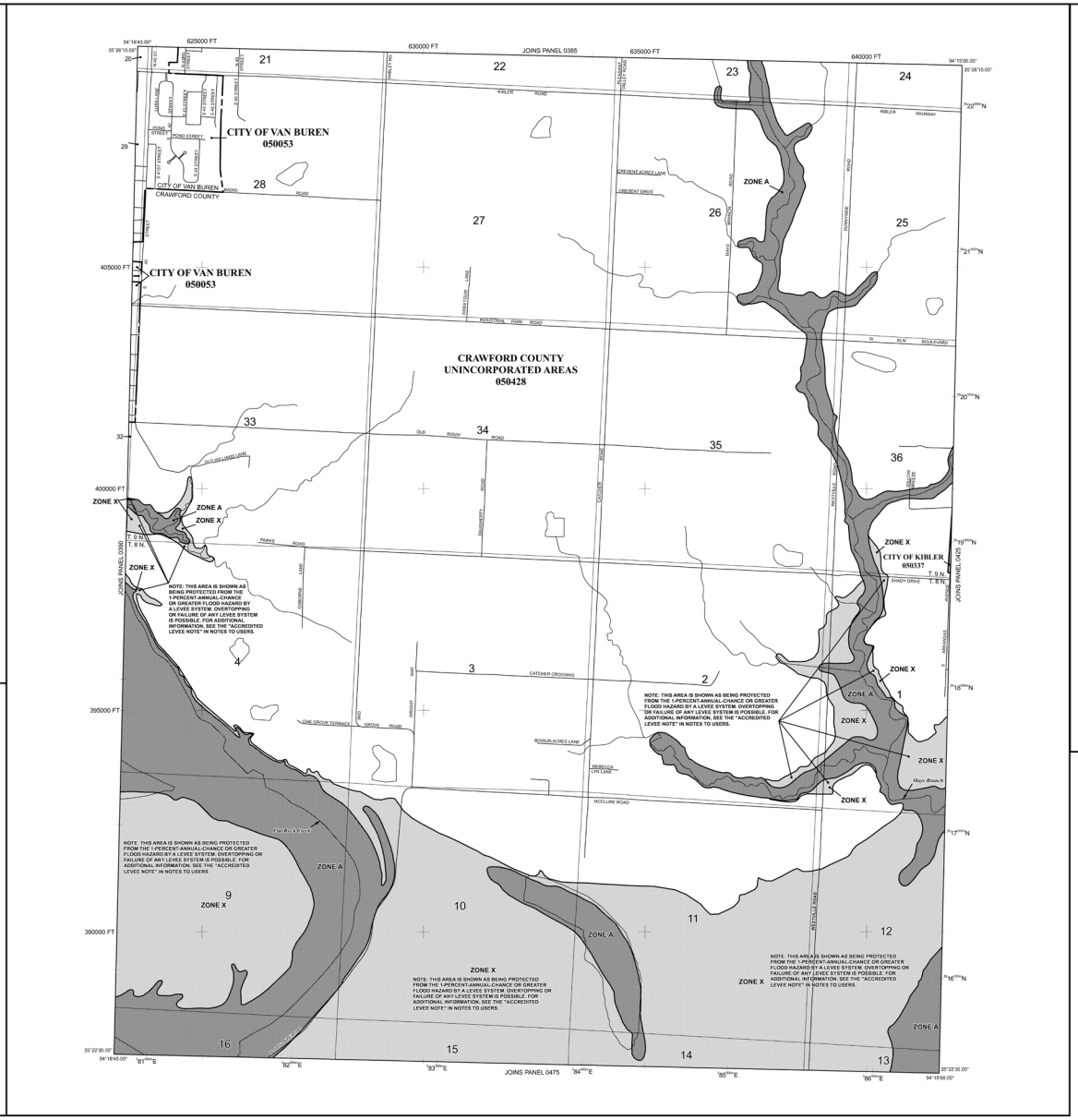
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or deannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index_shtm



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
- Limit of Moderate Wave Action
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section Line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 15
- 600000 FT — 5000-foot grid values: Arkansas State Plane coordinate system, North zone (FIPSZONE 0301), Lambert Conformal Conic projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.
December 3, 2010 - to change map notes to reflect the accreditation of formerly provisionally accredited levees.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0395J

FIRM
FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 395 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0395	J
KIBLER, CITY OF	050337	0395	J
VAN BUREN, CITY OF	050053	0395	J

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

MAP NUMBER
05033C0395J

MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

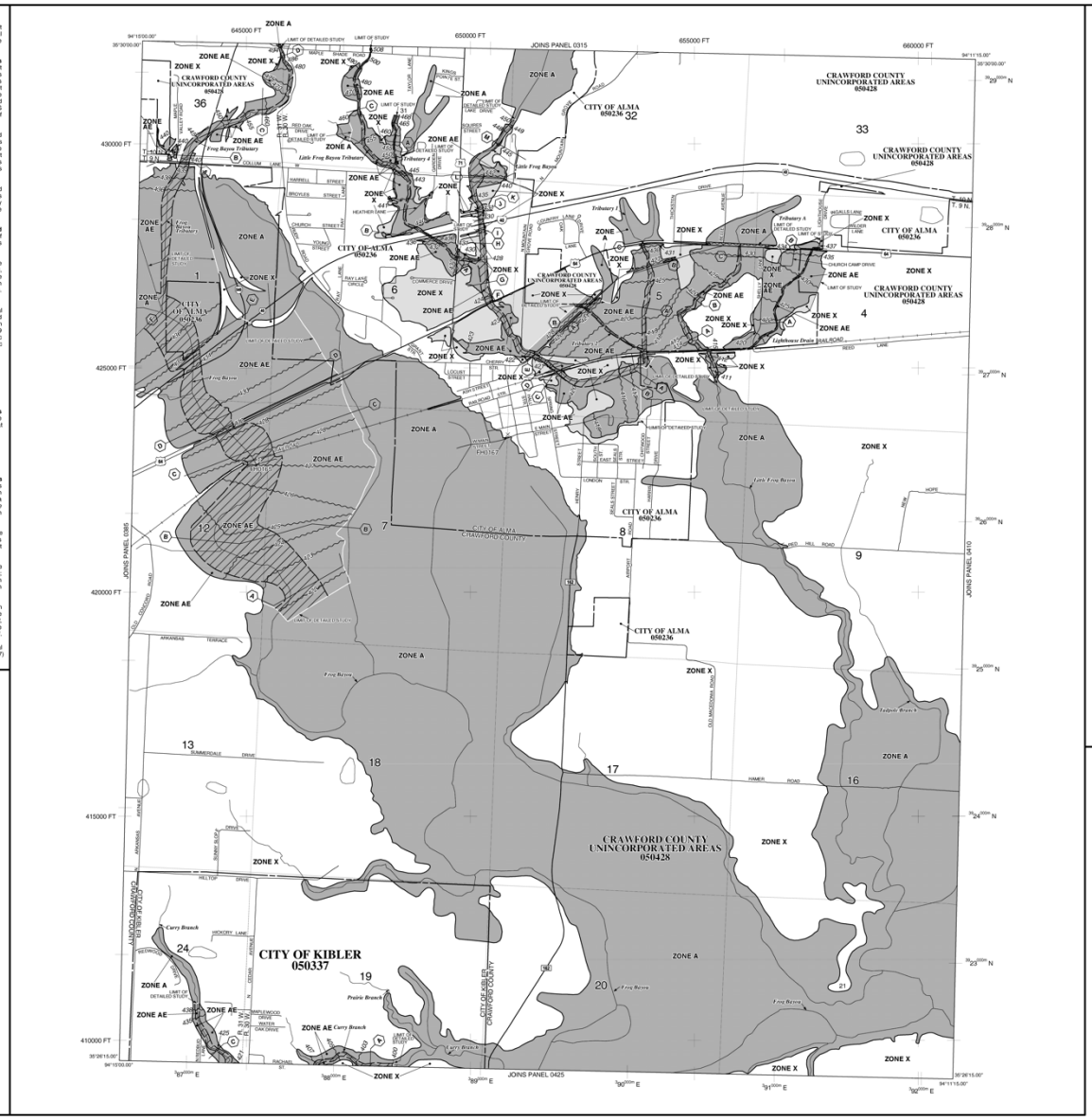
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referred to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 mN 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 1, 2000
March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0405H

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

PANEL 405 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0405	H
ALMA, CITY OF	050236	0405	H
KIBLER, CITY OF	050337	0405	H

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

MAP NUMBER
05033C0405H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC- 3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

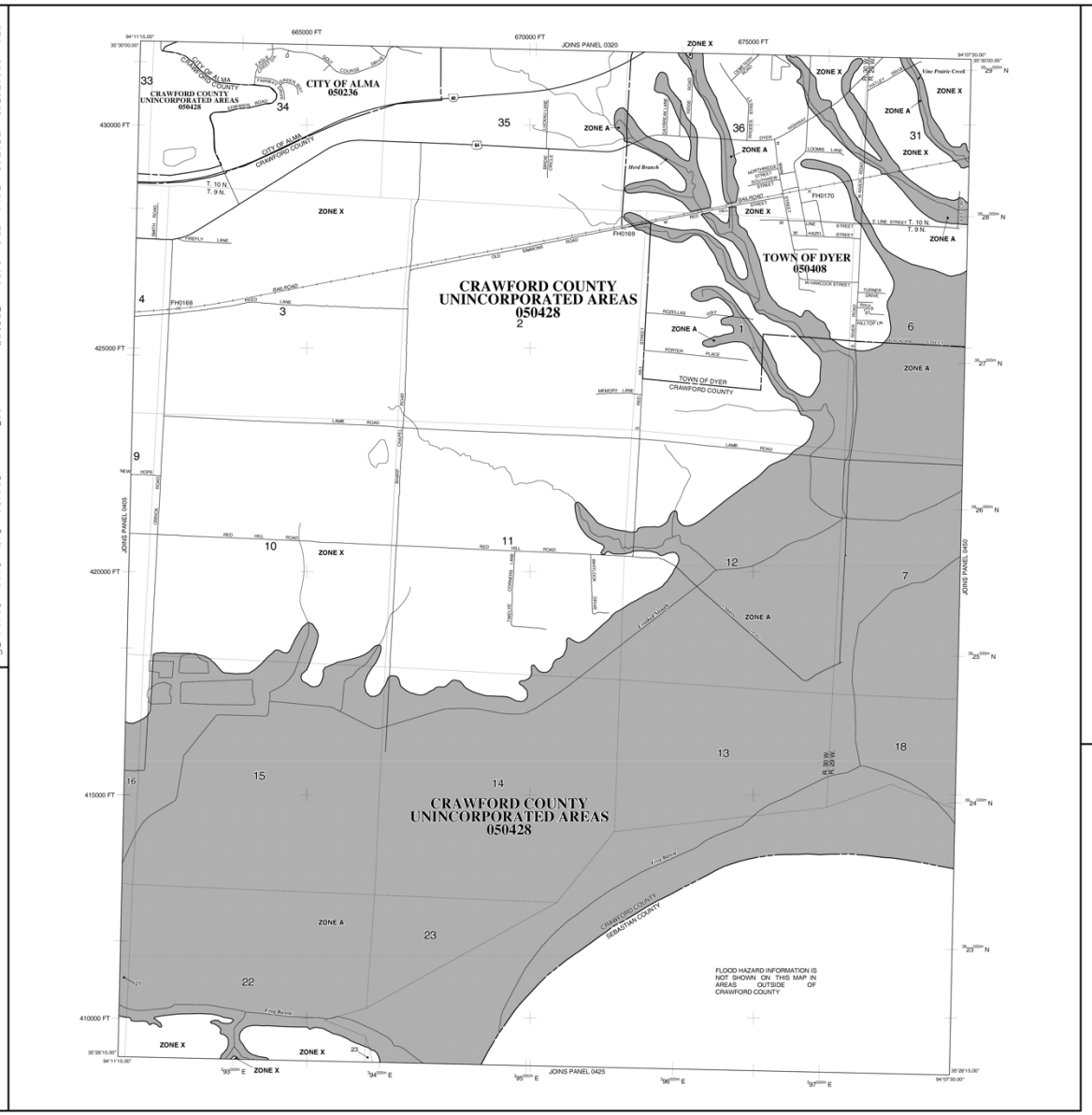
This map reflects more detailed and up- to- date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in *the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A6, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 Base Flood Elevation line and value; elevation in feet*
- (EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A Cross section line
- 23 — 23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000 FT 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 5, 1991 - December 31, 2007
March 16, 2009 - to update corporate limits, to change Special Flood Hazard Areas, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1- 800- 638- 6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0410H

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

PANEL 410 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0410	H
ALMA, CITY OF	050236	0410	H
DYER, TOWN OF	050408	0410	H

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

MAP NUMBER
05033C0410H

MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information office.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

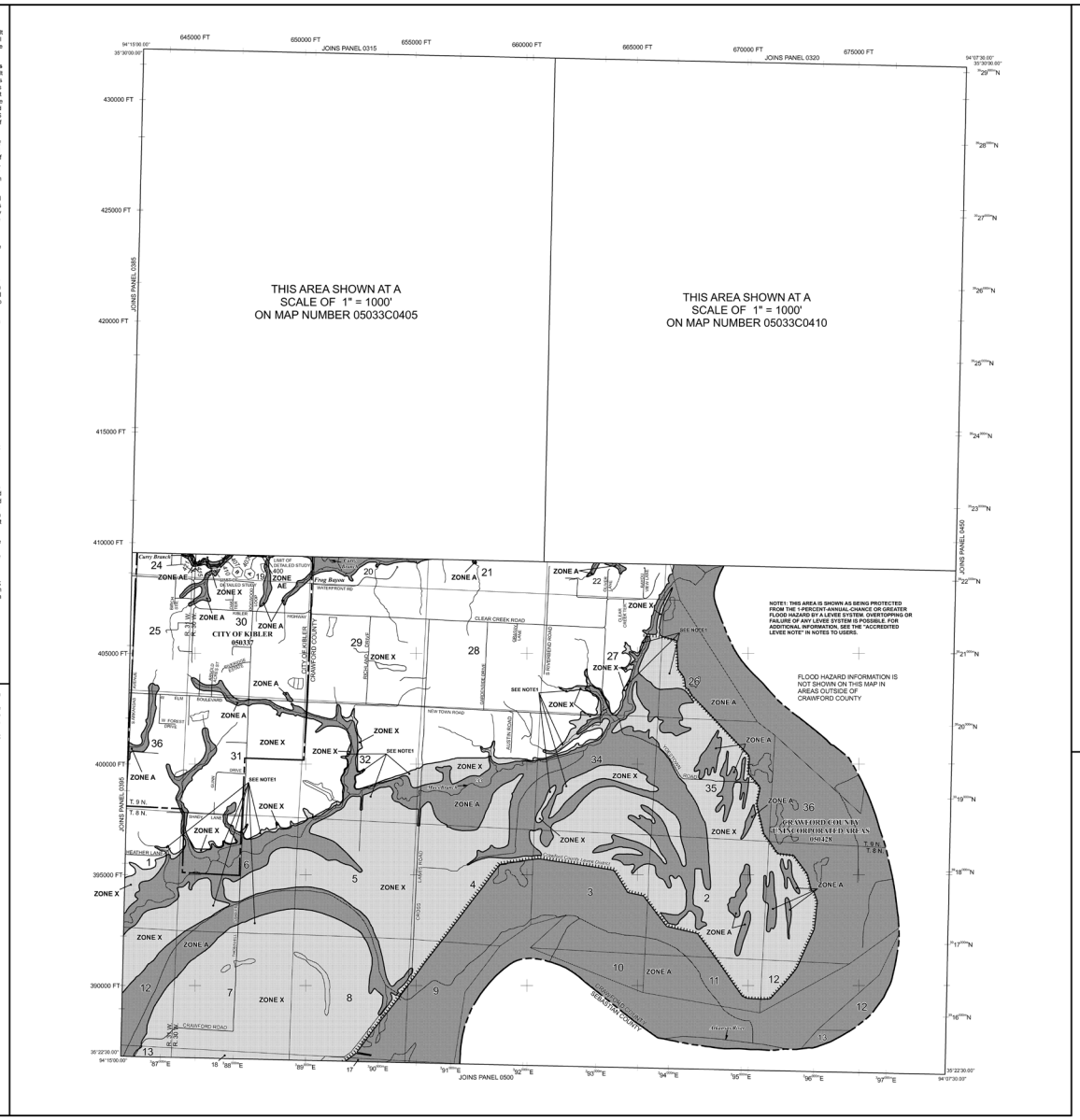
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or deannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/businessnfip.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equalled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section Line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mN — 1000-meter Universal Transverse Mercator grid values, zone 15
- 600000 FT — 5000-foot grid values: Arkansas State Plane coordinate system, North zone (FIPSZONE 0301), Lambert Conformal Conic projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999; December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, floodway boundaries, and zone designations, and to incorporate previously issued Letters of Map Revision; and to reflect updated topographic information.
December 3, 2010 - to change map notes to reflect the accreditation of formerly provisionally accredited levees.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0425J

FIRM

FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS
AND INCORPORATED AREAS

PANEL 425 OF 500

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050426	0425	J
KIBLER, CITY OF	050037	0425	J

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

MAP NUMBER
05033C0425J

MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East- West Highway
Silver Spring, MD 20910- 3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information Office.

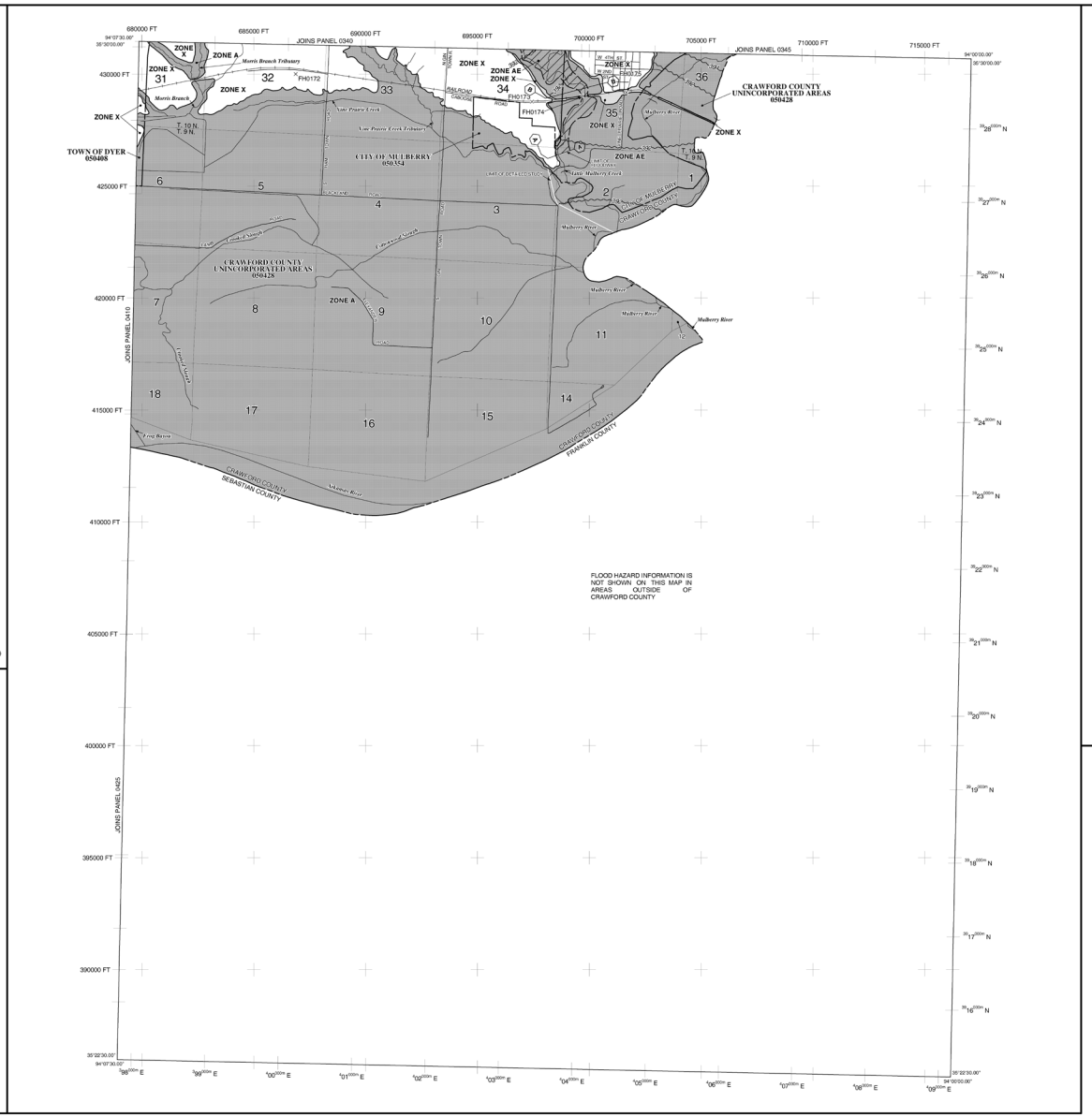
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the *Flood Insurance Study report (which contains authoritative hydraulic data* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de- annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1- 800- 358- 9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1- 800- 358- 9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1- 877- 336- 2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000mN — 1000-meter Universal Transverse Mercator grid ticks, zone 15
- 6000000 FT — 5000-foot grid ticks: Arkansas State Plane coordinate system, north zone (FIPSZONE 0301), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1993 December 20, 2000

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
600 0 600 1200 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0450H

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

PANEL 450 OF 500
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0450	H
DYER, TOWN OF	050408	0450	H
MULBERRY, CITY OF	050354	0450	H

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

MAP NUMBER
05033C0450H
MAP REVISED
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program . It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information office.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

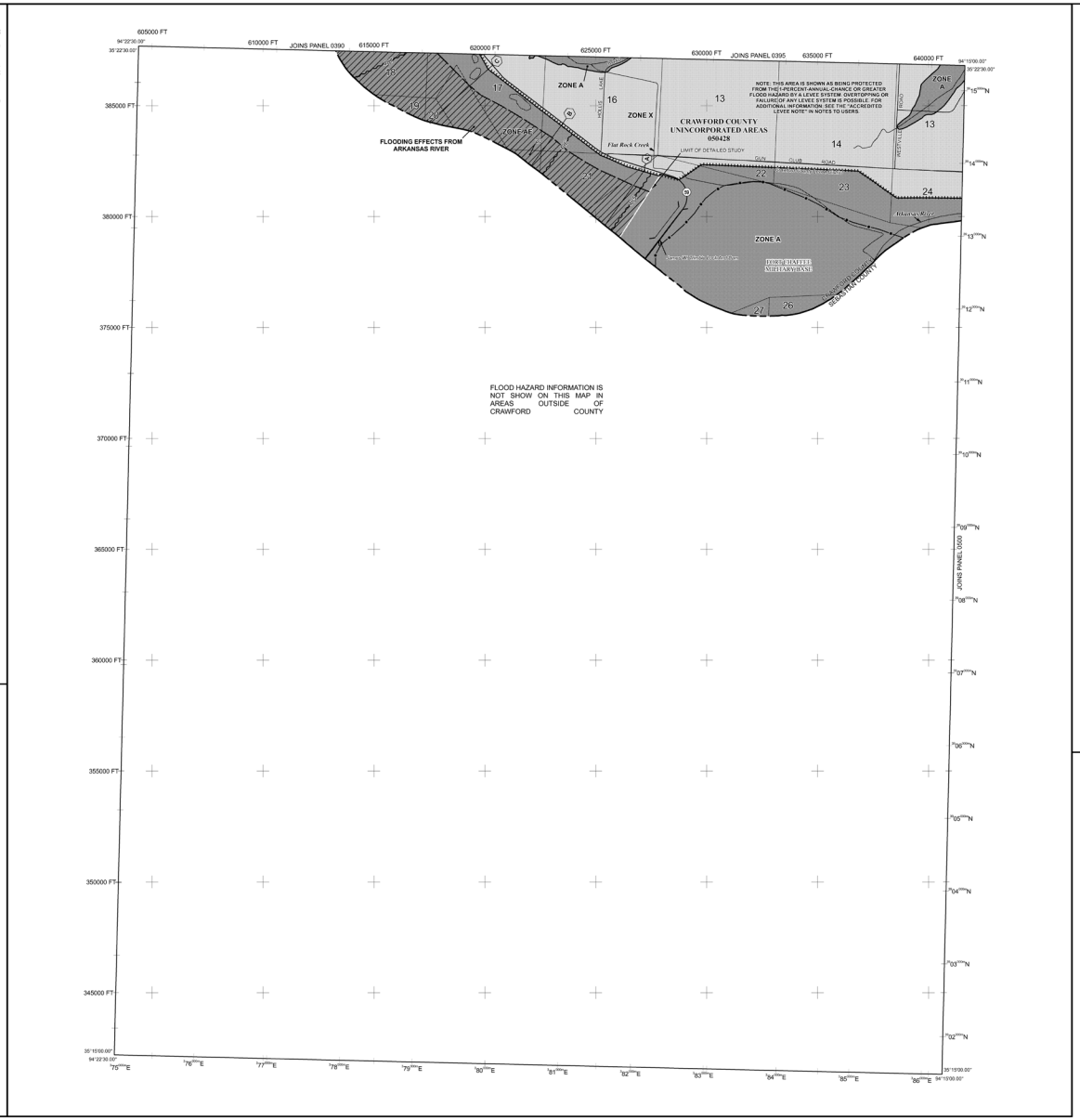
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or deannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section Line
- Transect line
- 87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4376000 mN 1000-meter Universal Transverse Mercator grid values, zone 15
- 600000 FT 5000-foot grid values: Arkansas State Plane coordinate system, North zone (FIPSZONE 0301), Lambert Conformal Conic projection
- DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2000

March 16, 2006 - to update corporate limits, to add roads and road designations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.
December 3, 2010 - to change map notes to reflect the accreditation of formerly provisionally accredited levees.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0475J

FIRM

FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 475 OF 500

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0475	J

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

MAP NUMBER
05033C0475J

MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Arkansas State Plane north zone (FIPSZONE 0301). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NNGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Arkansas Geographic Information office.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

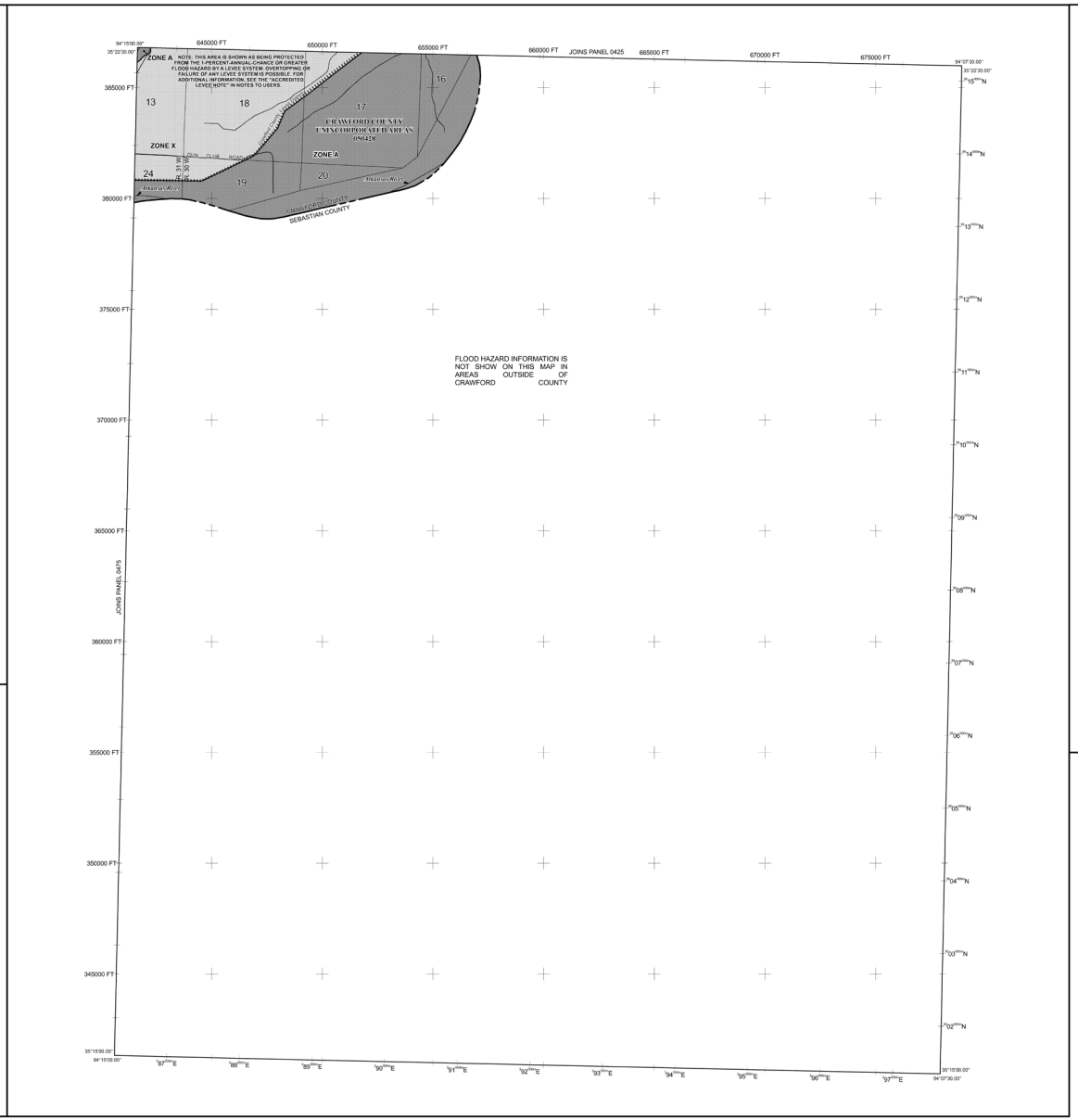
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or deannexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Information eXchange** at 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
	Limit of Moderate Wave Action
513 (EL 987)	Base Flood Elevation line and value; elevation in feet*
	Base Flood Elevation value where uniform within zone; elevation in feet*
A — A	Cross section Line
B — B	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4376000 mN	1000-meter Universal Transverse Mercator grid values, zone 15
600000 FT	5000-foot grid values: Arkansas State Plane coordinate system, North zone (FIPSZONE 0301), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

* Referenced to the North American Vertical Datum of 1988

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 5, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 23, 1999 December 20, 2006

March 16, 2009 - to update corporate limits, to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations, to update roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.
December 3, 2010 - to change map notes to reflect the accreditation of formerly provisionally accredited levees.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0500J

FIRM

FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

PANEL 500 OF 500

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

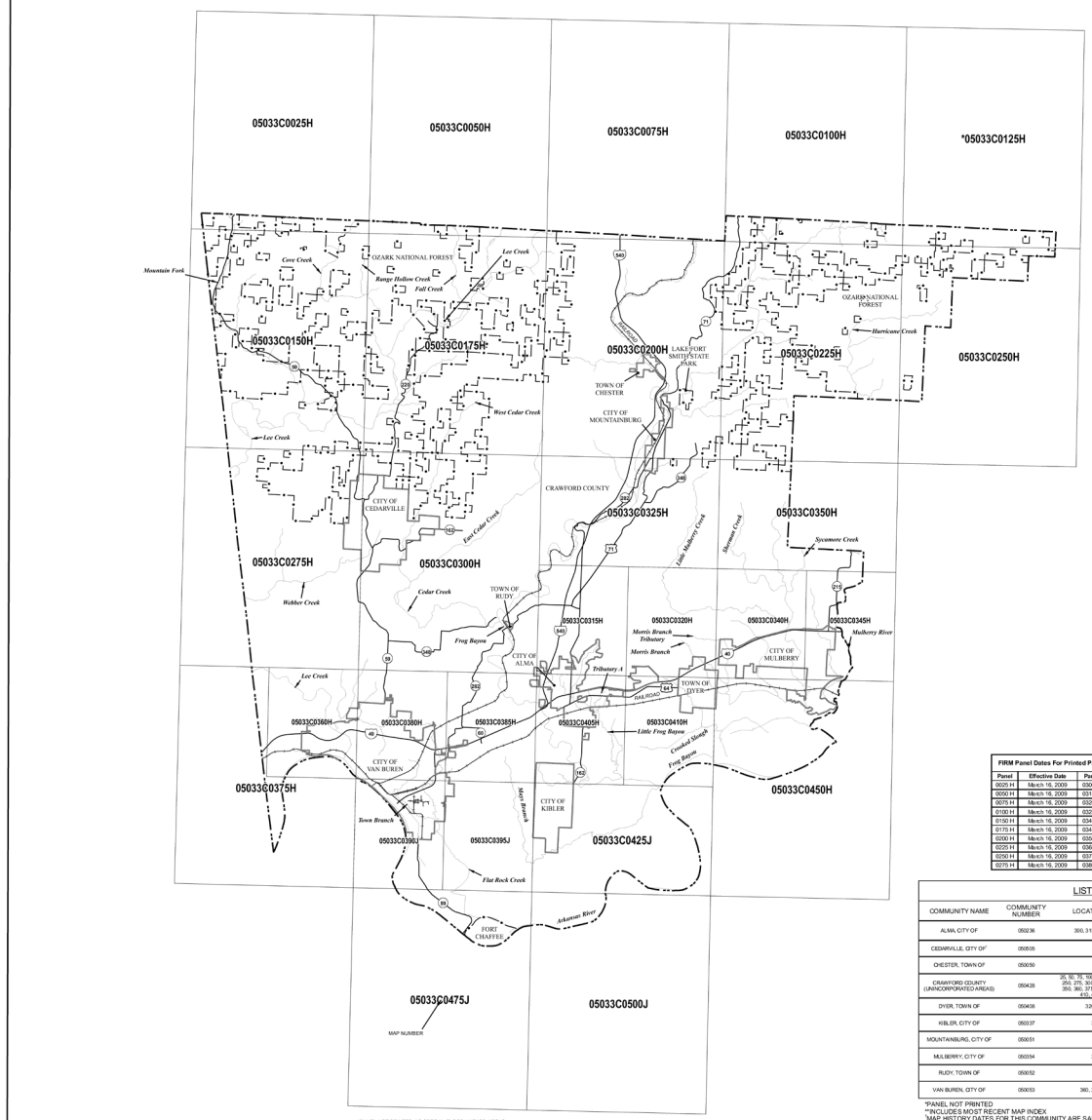
COMMUNITY	NUMBER	PANEL	SUFFIX
CRAWFORD COUNTY	050428	0500	J

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

MAP NUMBER
05033C0500J

MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency



*PANEL NOT PRINTED-NO SPECIAL FLOOD HAZARD AREAS

MAP DATES

This FIRM Index displays the map date for each FIRM panel at the time that this Index was printed. Because this Index may not be distributed to unaffected communities in subsequent revisions, users may determine the current map date for each FIRM panel by visiting the FEMA Map Information eXchange website at http://msc.fema.gov or by calling the FEMA Map Information eXchange at 1-877-336-2627.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

NOTE TO USERS

Future revisions to this FIRM Index will only be issued to communities that are located on FIRM panels being revised. This FIRM Index therefore remains valid for FIRM panels dated December 3, 2010 or earlier. Please refer to the "MOST RECENT FIRM PANEL DATE" column in the Listing of Communities table to determine the most recent FIRM Index date for each community.

MAP REPOSITORIES
(Maps available for reference only, not for distribution.)

ALMA, CITY OF:
804 Fayetteville Avenue
Suite B
Alma, Arkansas 72921

CEDARVILLE, CITY OF:
300 Main Street
Room 4
Van Buren, Arkansas 72956

CHESTER, TOWN OF:
Town Hall
Chester, Arkansas 72934

CRAWFORD COUNTY
(UNINCORPORATED AREAS):
300 Main Street
Room 4
Van Buren, Arkansas 72956

DYER, TOWN OF:
Town Hall
Dyer, Arkansas 72936

KIBLER, CITY OF:
City Hall
50 Oak Terrace
Kibler, Arkansas 72956

MOUNTAINBURG, CITY OF:
City Hall
Highway 71 North
Mountainburg, Arkansas 72946

MULBERRY, CITY OF:
City Hall
Second & Main
Mulberry, Arkansas 72947

RUDY, TOWN OF:
Town Hall
Rudy, Arkansas 72952

VAN BUREN, CITY OF:
1003 Broadway
Van Buren, Arkansas 72956

FIRM Panel Dates For Printed Panels of Crawford County, AR And Incorporated Areas

Panel	Effective Date	Panel	Effective Date	Panel	Effective Date
0025 H	March 16, 2009	0300 H	March 16, 2009	0385 H	March 16, 2009
0050 H	March 16, 2009	0315 H	March 16, 2009	0390 J	December 3, 2010
0075 H	March 16, 2009	0320 H	March 16, 2009	0395 J	December 3, 2010
0100 H	March 16, 2009	0325 H	March 16, 2009	0405 H	March 16, 2009
0150 H	March 16, 2009	0340 H	March 16, 2009	0410 H	March 16, 2009
0175 H	March 16, 2009	0345 H	March 16, 2009	0425 J	December 3, 2010
0200 H	March 16, 2009	0350 H	March 16, 2009	0450 H	March 16, 2009
0225 H	March 16, 2009	0360 H	March 16, 2009	0475 J	December 3, 2010
0250 H	March 16, 2009	0375 H	March 16, 2009	0500 J	December 3, 2010
0275 H	March 16, 2009	0380 H	March 16, 2009		

LISTING OF COMMUNITIES

COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANELS	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE**
ALMA, CITY OF	050236	300, 315, 320, 365, 405, 410	August 8, 1975	April 1, 1981	March 16, 2009
CEDARVILLE, CITY OF	050505	275, 300	June 17, 1977	August 5, 1991	March 16, 2009
CHESTER, TOWN OF	050050	200	August 5, 1991	August 5, 1991	March 16, 2009
CRAWFORD COUNTY (UNINCORPORATED AREAS)	050428	25, 50, 75, 100, 125*, 150, 175, 200, 225, 250, 275, 300, 315, 320, 325, 340, 345, 350, 360, 375, 380, 385, 390, 395, 405, 410, 425, 450, 475, 500	June 17, 1977	August 5, 1991	December 3, 2010
DYER, TOWN OF	050408	320, 340, 410, 450	July 11, 1975	August 5, 1991	March 16, 2009
KIBLER, CITY OF	050337	395, 405, 425	June 25, 1976	August 5, 1991	December 3, 2010
MOUNTAINBURG, CITY OF	050051	200, 325	May 3, 1974	April 15, 1981	March 16, 2009
MULBERRY, CITY OF	050354	340, 345, 450	November 26, 1976	April 1, 1981	March 16, 2009
RUDY, TOWN OF	050052	300	December 20, 1974	June 25, 1976	March 16, 2009
VAN BUREN, CITY OF	050053	360, 380, 385, 390, 395	November 16, 1973	November 16, 1977	December 3, 2010

*PANEL NOT PRINTED
**INCLUDES MOST RECENT MAP INDEX
†MAP HISTORY DATES FOR THIS COMMUNITY ARE SAME AS DATES FOR UNINCORPORATED AREAS OF CRAWFORD COUNTY; SEE COMMUNITY MAP HISTORY TABLE IN FIS REPORT

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

MAP INDEX

FIRM
FLOOD INSURANCE RATE MAP

CRAWFORD COUNTY, ARKANSAS AND INCORPORATED AREAS

(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX

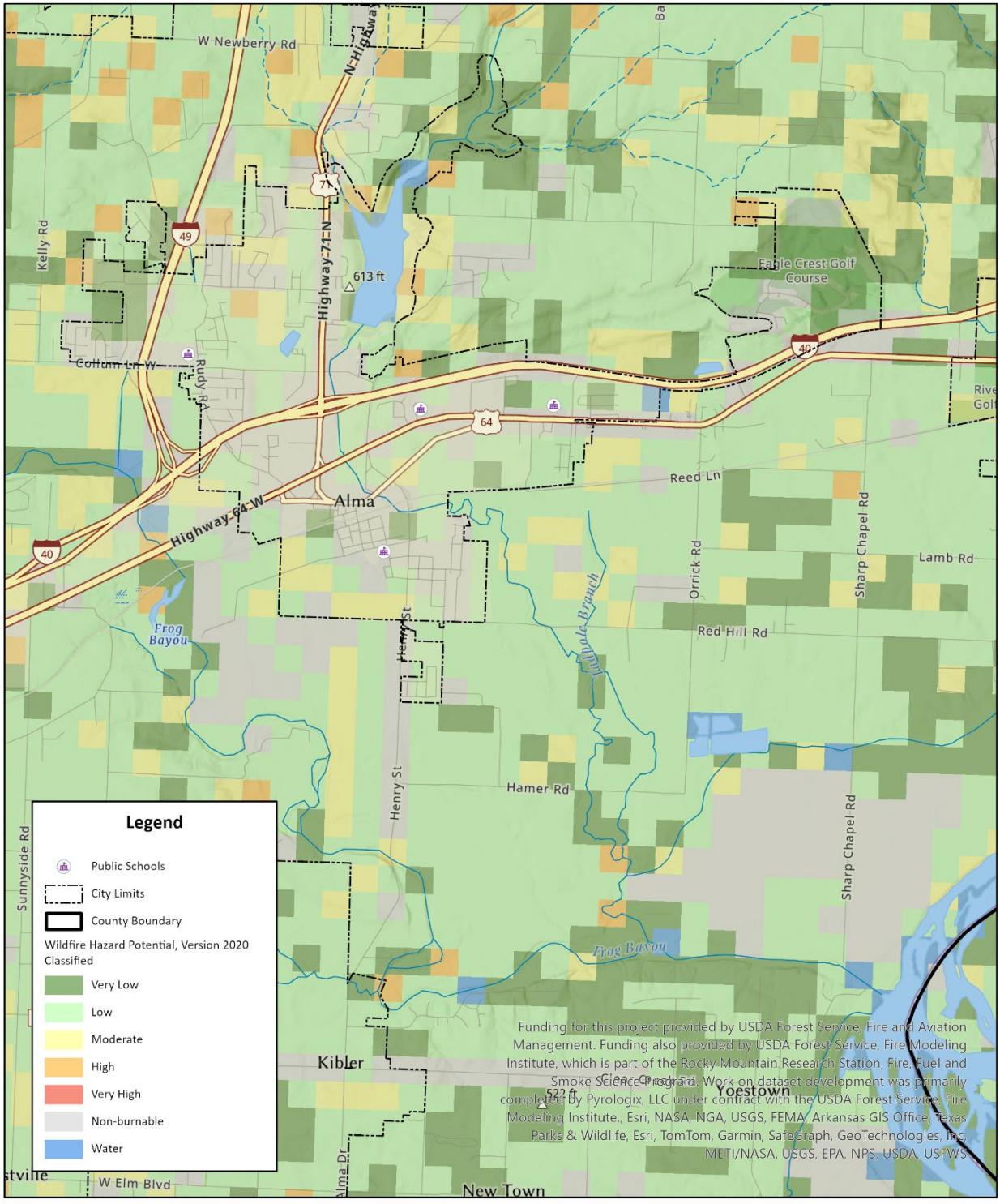
PANELS PRINTED: 25, 50, 75, 100, 150, 175, 200, 225, 250, 275, 300, 315, 320, 325, 340, 345, 350, 360, 375, 380, 385, 390, 395, 405, 410, 425, 450, 475, 500

MAP NUMBER
05033CIND0B

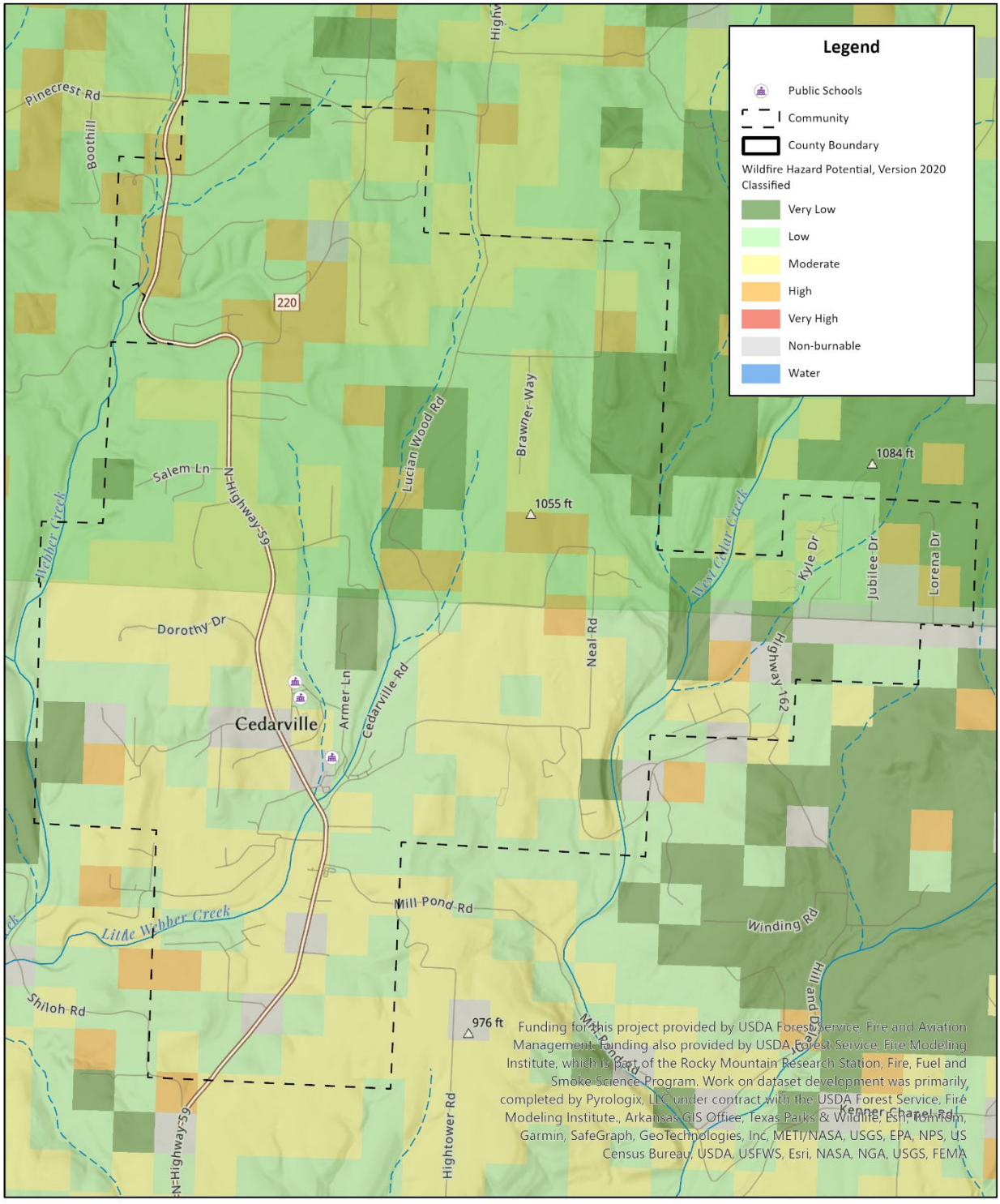
MAP REVISED
DECEMBER 3, 2010

Federal Emergency Management Agency

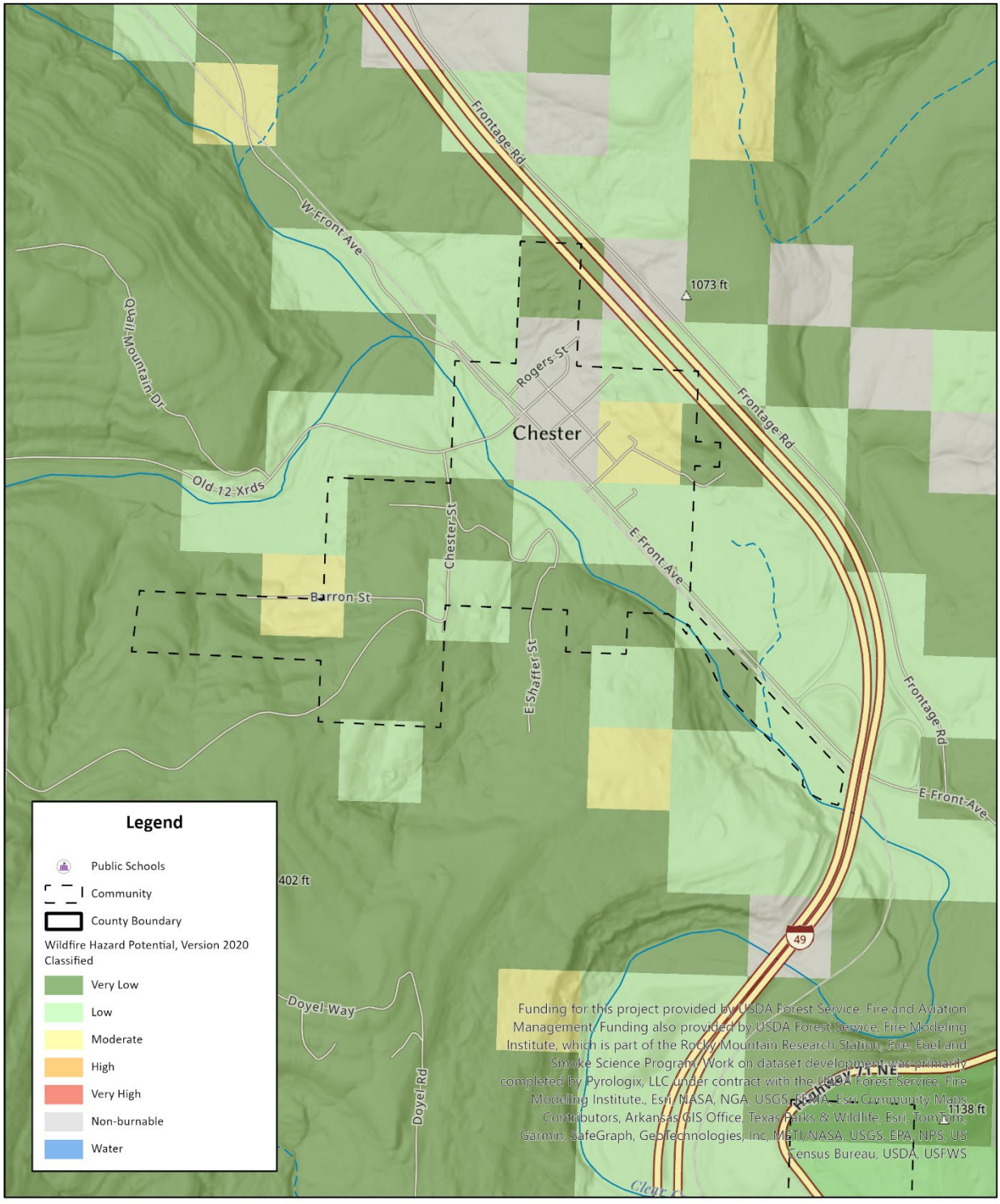
Appendix D: Wildfire Location Maps



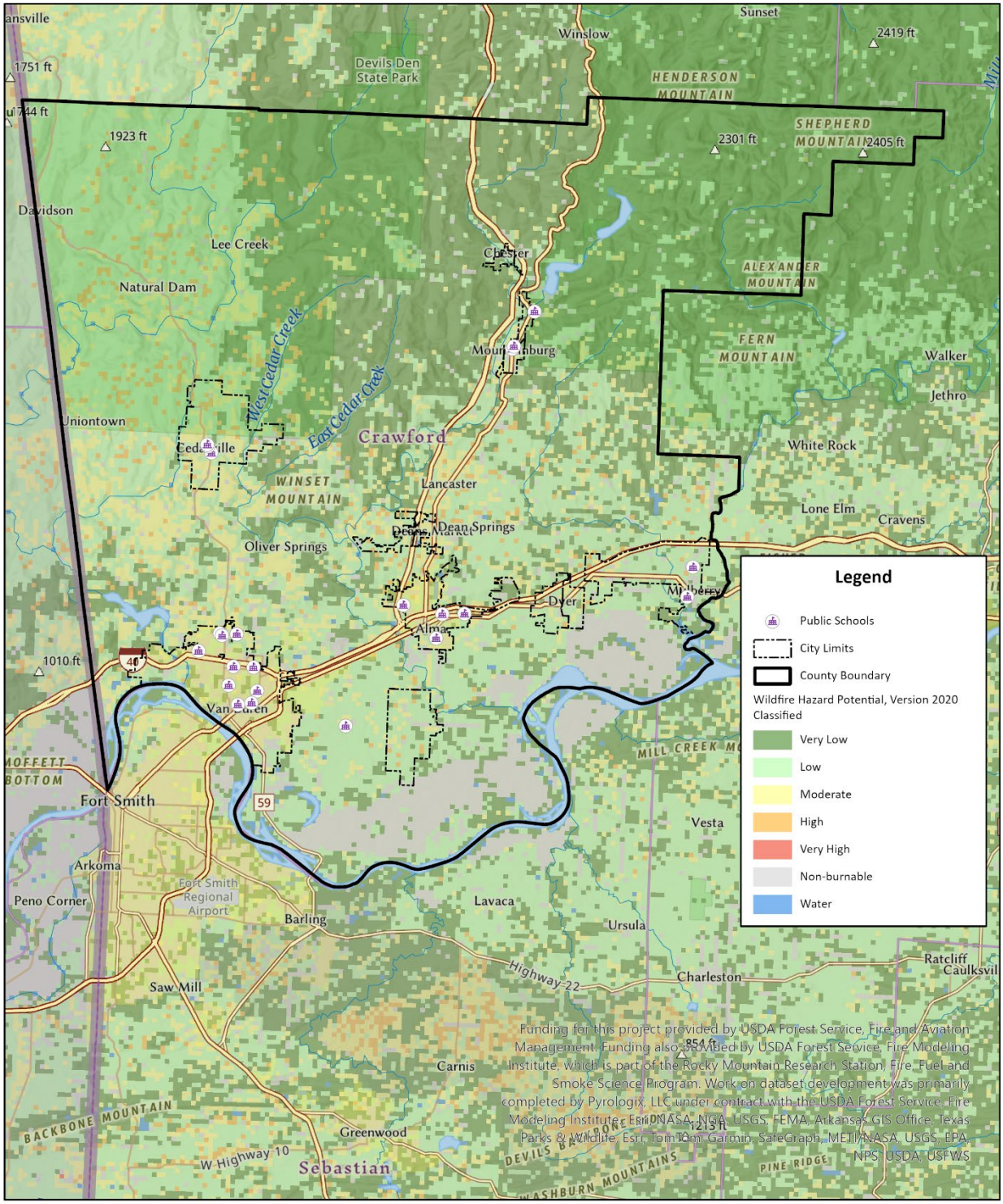
Alma Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	**Western Arkansas Planning & Development District, Inc.** 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.75 miles 0 0.38 0.75 Miles



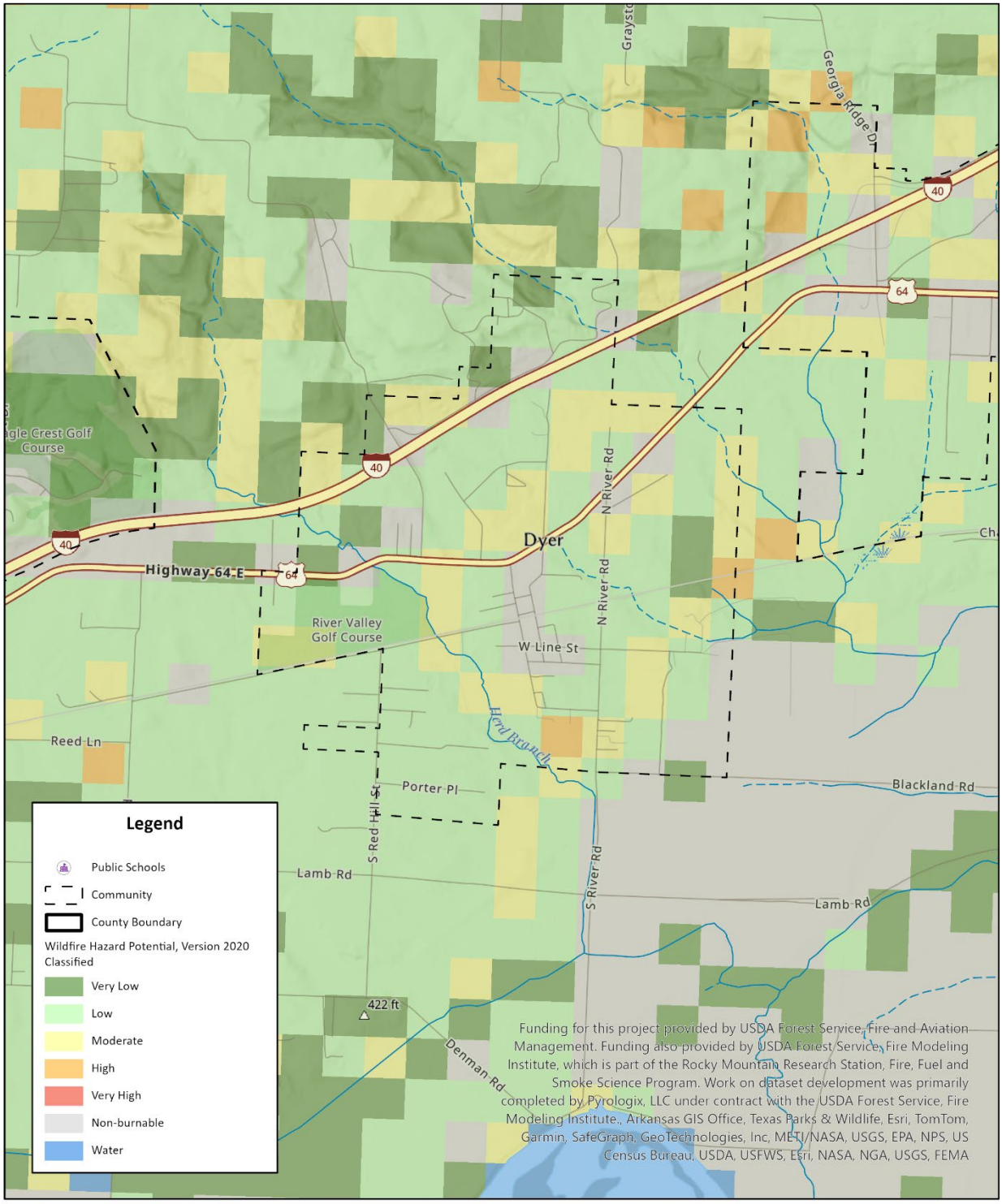
Cedarville Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.5 miles 0 0.25 0.5 Miles	N W E S



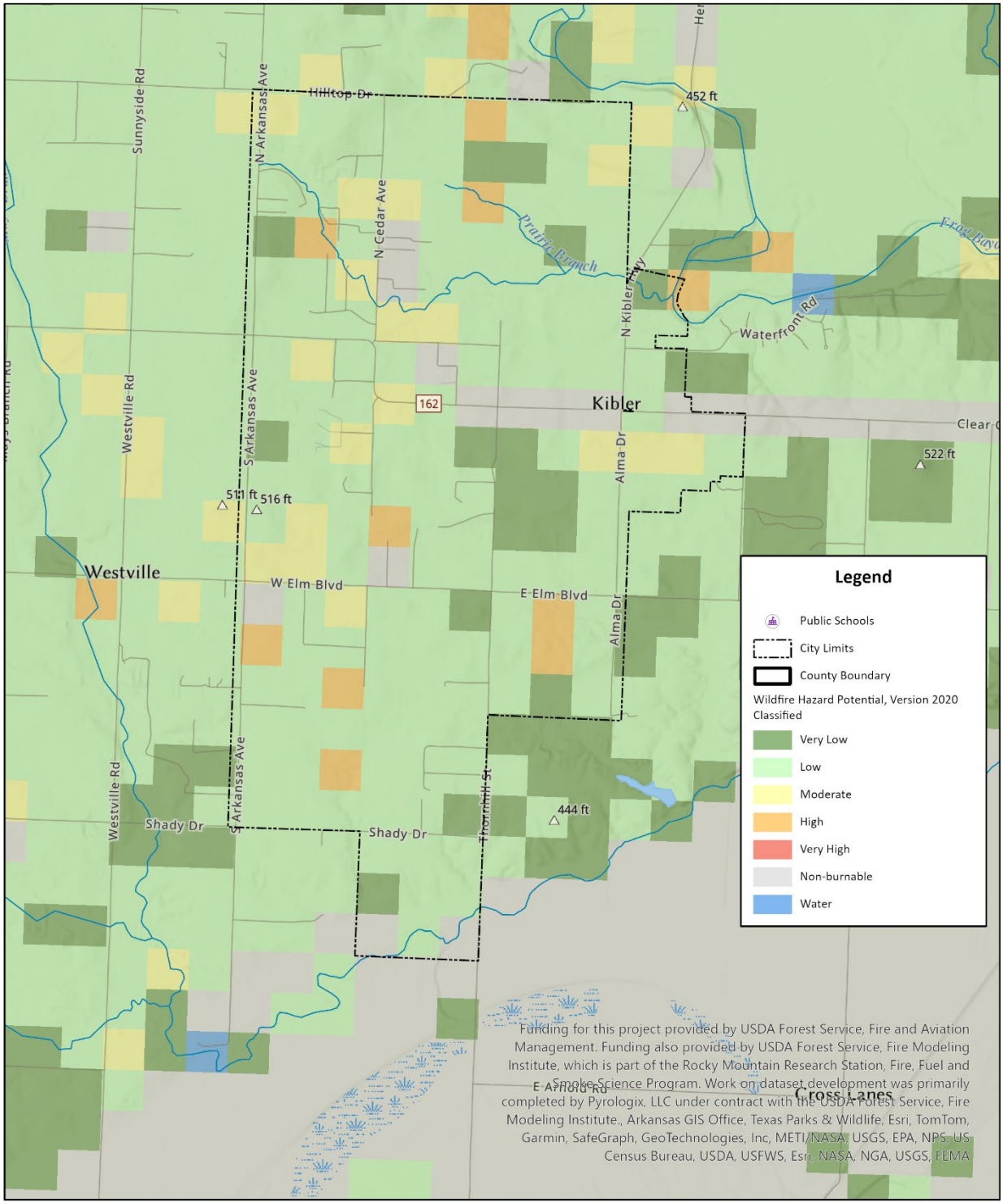
Chester Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.25 miles 0 0.13 0.25 Miles	N W E S



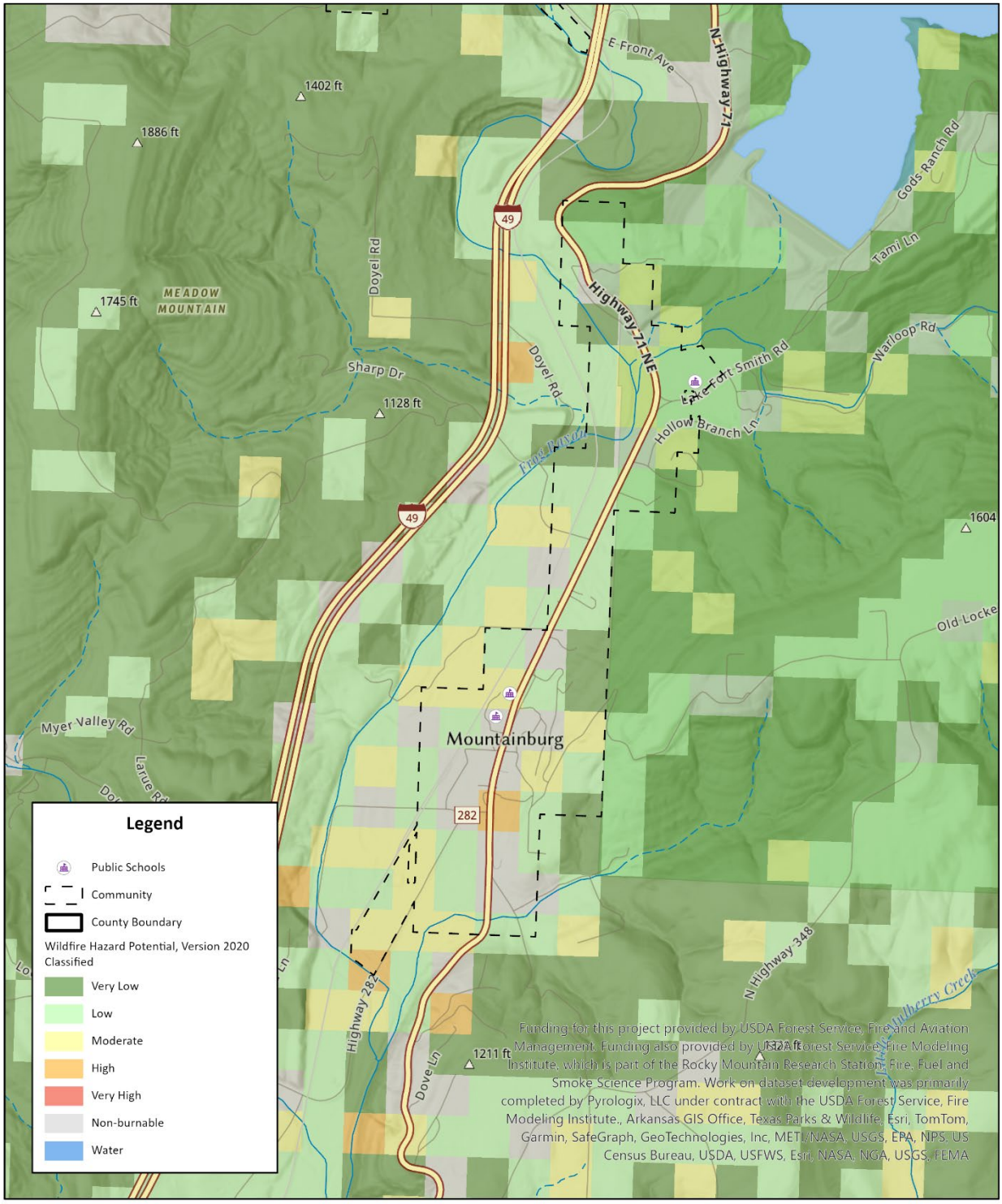
Crawford County Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 4.5 miles 0 2.25 4.5 Miles	N W E S



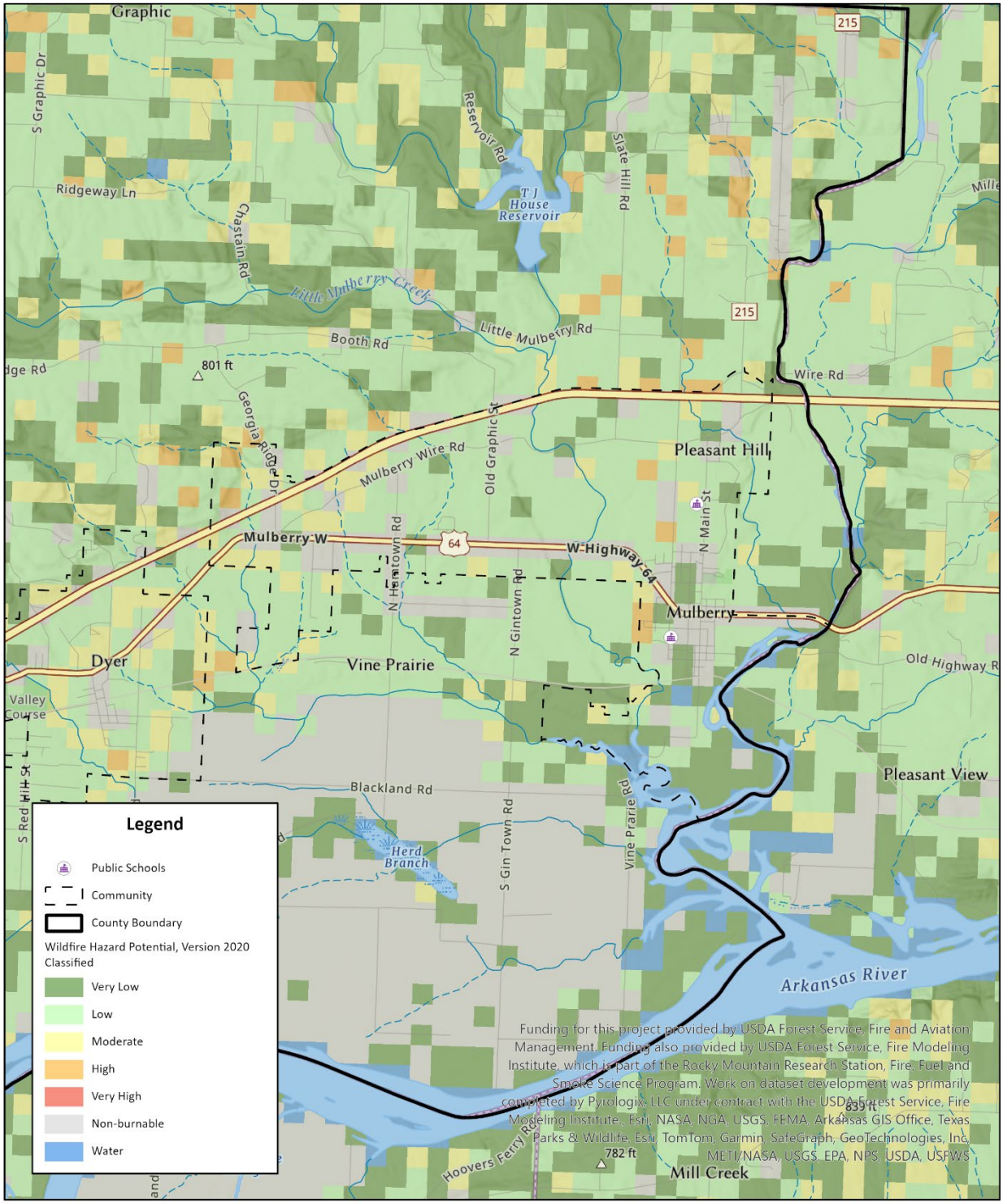
Dyer Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.5 miles 0 0.25 0.5 Miles	N W E S



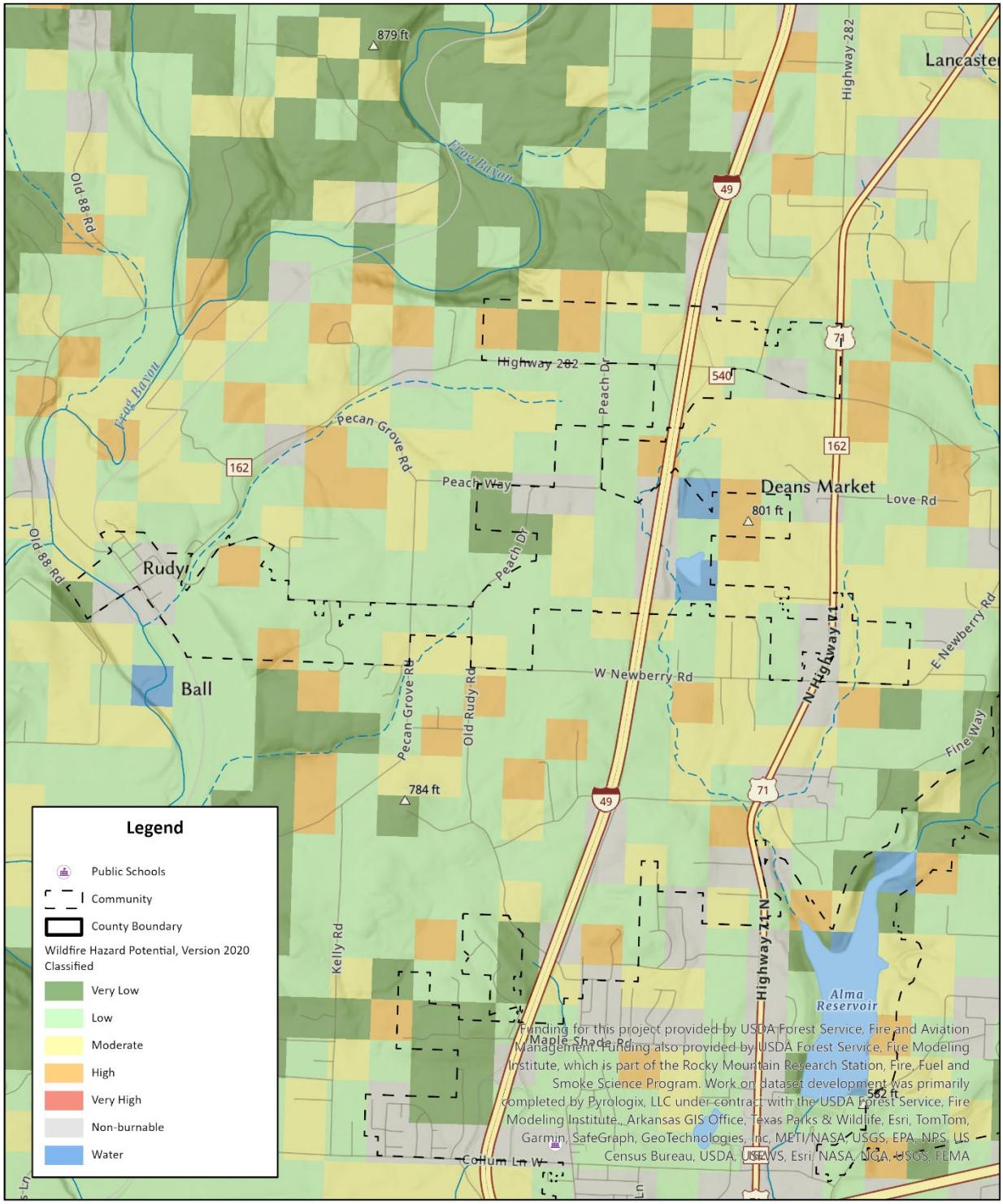
Kibler Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.5 miles 0 0.25 0.5 Miles	N W E S



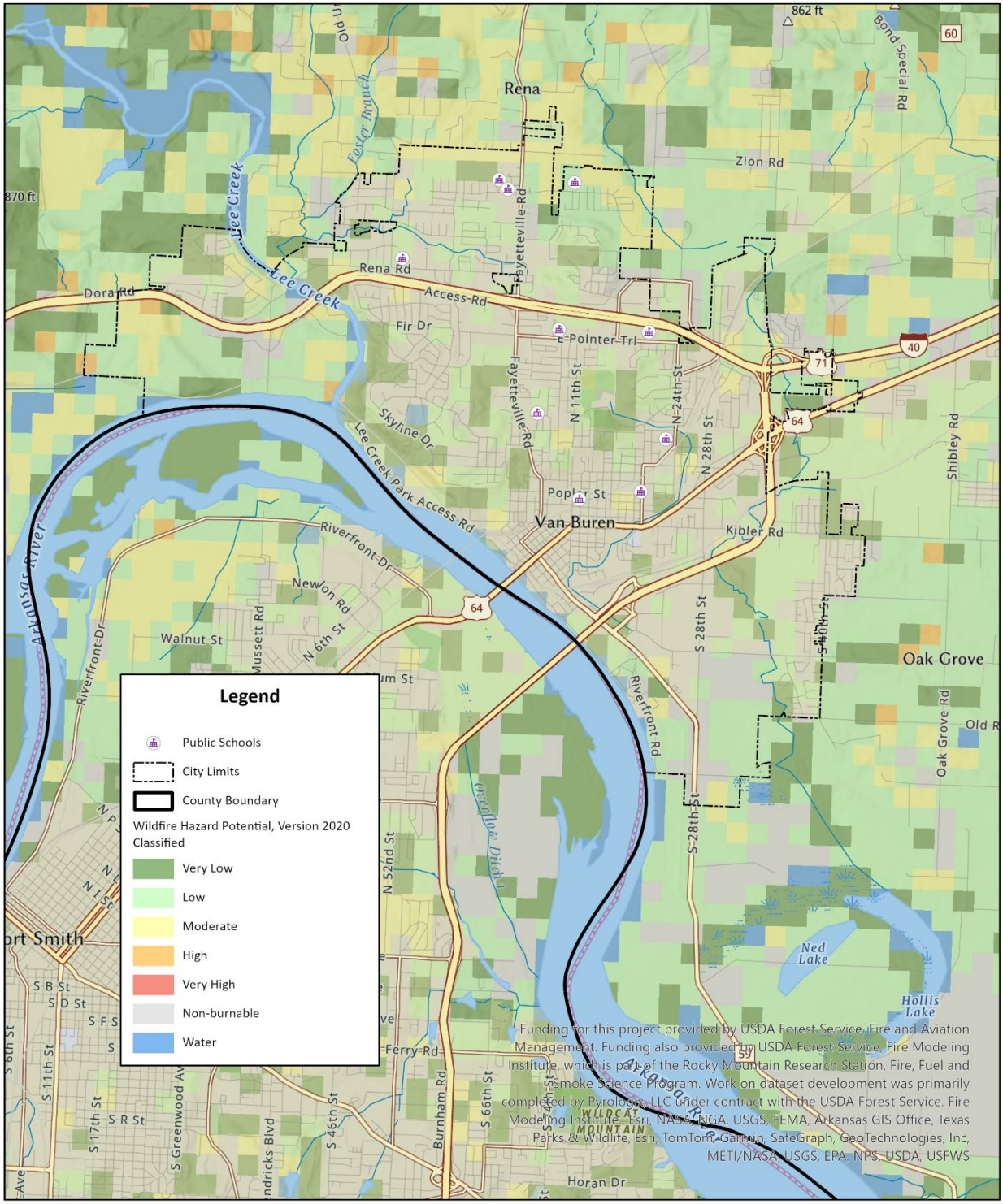
Mountainburg Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.5 miles 0 0.25 0.5 Miles	N W E S



Mulberry Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 1 miles 0 0.5 1 Miles



Rudy Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 0.5 miles 0 0.25 0.5 Miles	N W E S



Van Buren Wildfire Hazard Potential Map CRAWFORD COUNTY ARKANSAS	Western Arkansas Planning & Development District, Inc. 1109 S 16th ST ~ Fort Smith, AR 72901 479-785-2651 ~ Fax 479-785-1964	1 inch equals 1 miles 0 0.5 1 Miles	N W E S