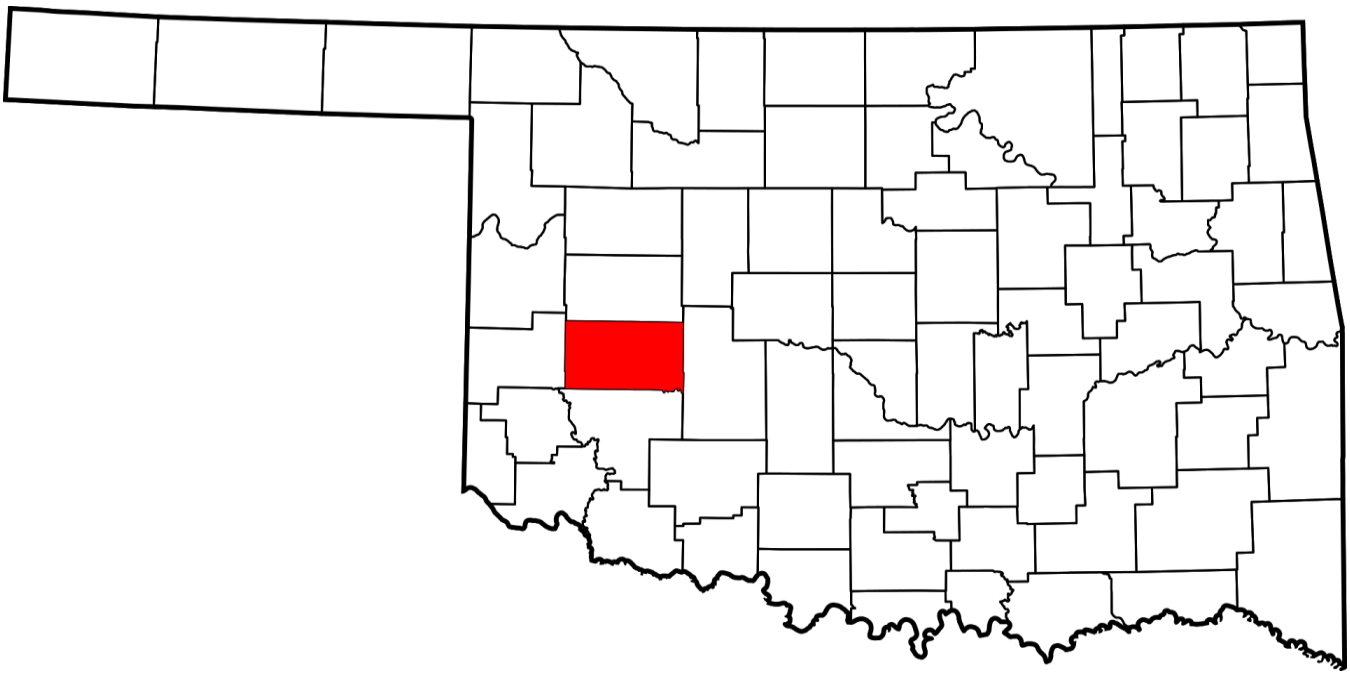


Washita County Multi-Jurisdictional Hazard Mitigation Plan Update

February 2019

Table of Contents

CHAPTER ONE: INTRODUCTION

1.1 Overview of Planning Area

Washita County is bordered by Custer County to the North, Beckham County to the West, Kiowa County to the South and Caddo County to the East. The County contains ten incorporated communities: The City of New Cordell (County Seat) and the Towns of Bessie, Burns Flat, Canute, Colony, Corn, Dill City, Foss, Rocky and Sentinel. The total land area within the County is approximately 1,009 square miles.

1.2 Participating Jurisdictions

This Plan is a hazard mitigation plan update for Washita County, City of New Cordell, Towns of Bessie, Burns Flat, Canute, Colony, Corn, Dill City, Foss, Rocky and Sentinel, the public schools of Burns Flat-Dill City, Canute, Cordell, Sentinel and private school Corn Bible Academy. When referring to the "Planning Area," the term is inclusive of all participating jurisdictions previously listed.

There are four (4) school districts and one (1) private school district in Washita County and all are participating in this plan:

- Burns Flat-Dill City Public Schools (EC-12): is located in Burns Flat, OK. District is in central area of Washita County. This district serves 633 students.
- Canute Public Schools (EC-12): Canute, OK. District is in western area of Washita County and serves 443 students.
- Cordell Public Schools (EC-12): Cordell, OK. District is in eastern area of Washita County and serves 749 students.
- Sentinel Public Schools (EC-12): Sentinel, OK. District is in southern area of Washita County and serves 351 students.
- Corn Bible Academy (7-12): Corn, Ok. District is in northeast area of Washita County and serves 84 students.

CHAPTER TWO: PLANNING PROCESS

2.1 Overview of Planning Process

The Washita County hazard mitigation plan was developed during a series of meetings and outreach methods from June 2018 to December 2018.

2.2 Washita County Planning Team Members

Name	Title	Jurisdiction Represented	Contribution to Planning Process
Sandy Settle	Emergency Manager (Planning Team Chairman)	Washita County	• Provided County/City/Town capability assessment
Robin Selman	Special Projects Coordinator	SWODA	• Provided County/City/Town hazard information • Provided County/City/Town Mitigation Actions • Lead Planning Team

			• Assembled public comments from County/City/Town • Provided estimated loss information for identified hazards • Provided local history • Reviewed NCDC Data • Provided school district hazard information • Provided school district mitigation actions • Assembled public comments from school district staff • Provided school district capability assessment
Leo Goeringer	County Commissioner	Washita County	• Provided County/City/Town capability assessment • Provided County/City/Town Mitigation Actions • Provided County/City/Town hazard information • Provided local history • Reviewed NCDC Data • Provided estimated loss information for identified hazards
Raydell Schneberger	County Commissioner	Washita County	
Bart Gossen	County Commissioner	Washita County	
Roger Reeve	County Sheriff	Washita County	
Kristen Dowell	County Clerk	Washita County	
Al Trowbridge	Mayor	Bessie	• Provided County/City/Town hazard information • Provided County/City/Town Mitigation Actions • Provided city/town capability assessment • Provided local history • Reviewed NCDC Data
Marilyn Bentley	Town Clerk	Bessie	
Becca Jones	Town Board Member	Bessie	
Charla Ingram	Town Board Member	Bessie	
Donelle Ratheal	Town Attorney	Bessie	
Toby Anders	Code Compliance Officer	Bessie	
Joel Newberry	Town Manager	Burns Flat	
Dan Price	Town Manager	Canute	
Lonnie Yearwood	Mayor	Colony	
Benjamin Snider	Town Board Member	Corn	
Penny Reeve	Town Clerk	Dill City	
Mandell Greteman	Mayor	Foss	
J.C. Moser	City Administrator	New Cordell	
Bob Plummer	Mayor	New Cordell	
Carol Pritchard	Grant Writer	New Cordell	

David Pritchard	Grant Writer	New Cordell	
Brandon Rogers	Police	New Cordell	
Seth Slaughterback	Fire Chief	New Cordell	
David Jones	Mayor	Rocky	
Sam Dlugonski	Mayor	Sentinel	
Larry Johnson	Superintendent	Burns Flat-Dill City Schools	• Provided school district hazard information
Jill Henderson	Superintendent	Canute Schools	• Provided school district mitigation actions
Brad Overton	Superintendent	Cordell Schools	• Assembled public comments from school district staff
Jason Goostree	Superintendent	Sentinel Schools	• Provided school district capability assessment
Dr. Greg Giles	Superintendent	Corn Bible Academy	

The Washita County Hazard Mitigation Planning Committee was formed to provide guidance during the preparation of this Plan. This Committee was comprised of representatives from local government, County Commissioners, state government, local businesses/industries and school superintendents. Thirty-two (32) Washita County representatives, the mayors, or appointed representatives, school superintendents from each community were approved as members of the Hazard Mitigation Planning Committee by the County Commissioners. The Committee held regular meetings throughout the planning process. The planning process continued approximately six (6) months until completion. The Committee worked toward limiting the loss of life and property and the associated costs from natural hazards through cost effective recommendations of publicly accepted, prioritized, and multi objective actions. The meetings were designed for public involvement to explain the basis of the State Hazard Mitigation Plan and requirements for Washita County and local communities. The meetings were designed to encourage and invite input from private citizens and local officials. Each of the meetings was posted and local newspapers were informed.

For each of the respective jurisdictions, Committee participants provided local history, reviewed NCDC data, addressed and analyzed issues of cost versus health/safety, and made recommendations to the plan. Then the Committee participants discussed these items in open meetings, approved the Plan and recommended to the Washita County Commissioners for Plan approval.

Effort was made to solicit public input during the planning process through the LEPC public meetings for which each agenda was posted according to the Oklahoma Open Meeting Law. Individual community public open meetings were held in Bessie, Burns Flat, Canute, Colony, Corn, Dill City, Foss, New Cordell, Rocky and Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.

Feedback received from the public proved valuable in the development of the Plan. Comments and open discussion led to addressing and prioritizing mitigation actions (i.e. warning devices, communication, education and training).

2.3 Other Stakeholders

There are many public agencies, private organizations, pipeline utilities and businesses that contend with natural hazards. These entities were contacted; either in person, via email, or phone to collect information on the hazards and to help determine how their programs could best support the County's mitigation program. Among the organizations and agencies contacted were:

Neighboring Communities, Businesses, and Non-Profit Agencies Contacted

- American Red Cross – Mary Ann White, Disaster Program Manager
- SWODA – Robin Selman – Special Projects Coordinator
- Emergency Managers:
  - Washita County – Sandy Settle
  - Beckham County – Lonnie Risenhoover
  - Custer County - Mike Galloway
  - Caddo County – Larry McDuffey
  - Kiowa County – Daniel Fantinel

State and Federal Agencies Contacted

- Federal Emergency Management Agency – (Hazard Mitigation Planner)
- National Weather Service (NWS) – Rick Smith, Meteorologist in Charge
- US Army Corps of Engineers-Emergency Manager, William Smiley
- Oklahoma Water Resources Board- State NFIP Coordinator, Yohanes Sugeng
- Oklahoma Department Emergency Management-State Hazard Mitigation Officer, Matt Rollins
- Oklahoma Forestry Services-Fire Wise Coordinator, Andy James

2.4 Plans, Documents and Literature Reviewed

During the mitigation plan development we reviewed various plans and studies for information regarding hazards, disaster history, and potential impacted areas. Below is a list of plans and an overview of the data utilized in plan development. Many plans are more appropriately referenced in the hazard profiles associated with the plan. The Washita County Hazard Mitigation Planning Committee has reviewed each aspect of the Capital Improvement Plans and Flood Damage Prevention Ordinances. Upon final approval of the Hazard Mitigation Plan, it will be reviewed and the appropriate parts will be incorporated into other respective planning processes. Each city/town/school board will be responsible for the incorporation of the Hazard Mitigation items as appropriate in to their plan and also providing revisions of their plans to the Mayors of the Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel and the Washita County Emergency Manager so they may be incorporated in to future revisions of the Hazard Mitigation Plan.

Plan Title	Information Used
Local Health Risk Assessment for Disaster Related Community Preparedness and Resiliency	Plan contains much of the same information required of a local HMP. Information was reviewed and integrated into the capability assessment, risk assessment, and mitigation strategy.
State Plan Hazard Mitigation Plan	Hazard definitions, previous occurrence data, disaster history and state goals
Washita County Emergency Operations Plan	Capability Assessment
School Emergency Action Plans	Wildfire extent, probability, fuel sources
Capital Improvements Plans	Information was reviewed and integrated into the capability assessment, risk assessment, and mitigation strategy.
Local Records	Evacuation Routes, High risk areas, vulnerable populations
Comprehensive Plans	Capability Assessment
Oklahoma Water Resources Board Watershed Emergency Action Plans	Information was reviewed and integrated into capability assessment, risk assessment and mitigation strategy.

To counter pertinent hazards, Washita County has several programs that range from informing people about protection measures, warning the public of impending threats, requiring protection measures to be incorporated in new buildings, acquiring and clearing properties in high hazard areas, and constructing flood control projects. All efforts to mitigate the impact of hazards have helped, but they have not eliminated all potential problems. The following plans and floodplain data were reviewed. This information is vital and was incorporated in this hazard mitigation plan.

Capital Improvements Plan

Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Dill City, Town of Foss, City of New Cordell, Town of Sentinel and Town of Rocky have Capital Improvement Plans (CIP). These plans have inventories of the capital assets of the communities and have placed a dollar amount and listed the condition of each asset. Information was used from the Capital Improvement Plans in the preparation of the Hazard Mitigation Plan, including assets and exposures in the jurisdictions. Objectives from the updated Hazard Mitigation Plan will be useful in the renewal of the Capital Improvement Plan. The Town of Dill City updated their CIP in 2016. The Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Dill City, Town of Foss, City of New Cordell, Town of Sentinel and Town of Rocky will continue to improve their infrastructure and implement improvement projects as funding becomes available.

Emergency Operations Plan (EOP)

The Washita County EOP was used as a reference in preparing this Hazard Mitigation Plan, along with EOP's from each of the participating jurisdictions - Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Dill City, Town of Foss, City of New Cordell, Town of Sentinel and Town of Rocky, Burns Flat-Dill City School District, Canute School District, Cordell School District, Sentinel School District and Corn Bible Academy. The EOP's provided information on disaster response after a natural occurring hazard and the information were incorporated into the Hazard Mitigation Plan. Hazards identified in the Hazard Mitigation Plan will be considered in future EOP updates. All participating jurisdictions - Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Dill City, Town of Foss, City of New Cordell, Town of Sentinel and Town of Rocky, Burns Flat-Dill City School District, Canute School District, Cordell School District, Sentinel School District and Corn Bible Academy have updated mitigation strategy goals and objectives since the 2013 Washita County Multi-Jurisdictional Hazard Mitigation Plan.

National Flood Insurance Program (NFIP)

National Flood Insurance Program data was reviewed and incorporated into the plan, including the Town of Bessie, Town of Canute, Town of Colony, City of New Cordell, Town of Sentinel and Washita County. FEMA records indicate that the Town of Canute is rated as NSFHA (No Special Flood Hazard Area) with the town being rated as 'Zone C'. The Town of Burns Flat, Town of Dill City, Town of Foss and Town of Rocky have no mapped flood zones within town limits and are not listed as participants in the NFIP, but are investigating what needs to be done for their jurisdictions to become NFIP compliant. The entities currently participating in the NFIP are as follows: Washita County, Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell and Town of Sentinel. To stay in compliance with the NFIP Washita County, Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell and Town of Sentinel continue to have a flood plain manager that regulates and monitors any special flood hazard areas.

2.4.1 Literature/Resources from the following agencies were used during the update of this plan

- National Climatological Data Center (NCDC) – Hazard occurrences from 2000-2016.
- US Geological Survey – Data on increased seismic activity across Oklahoma.

- US Census Bureau – Population for Washita County.
- Oklahoma State University Agricultural Extension Service – Data on agricultural and ranching revenue from 2000-2016.
- Oklahoma Department of Transportation – Data on county and US highway routes was used when evaluating mitigation action items.
- Oklahoma Climatological Survey – Hazard occurrences from 2000-2016.
- Oklahoma Geological Survey - Data on increased seismic activity across Oklahoma.
- Oklahoma Department of Mental Health – Information on how vulnerable populations are affected by disasters.
- Oklahoma Health Department – Data on health safety precautions was used when evaluating mitigation action items.
- Oklahoma Department of Environmental Quality – Water purity data on rivers in Oklahoma.

2.5 Continued Public Involvement

Washita County Emergency Manager will involve the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. The Washita County Emergency Manager with the assistance of the planning team will conduct an annual review of the Plan. The Plan will be updated every five years. The public will be able to directly comment on and provide feedback about the Plan by contacting Washita Emergency Manager directly either by cell phone or in person. Public meetings will be publicized and open to the public for comment. The following meetings provided the public a forum where Washita County residents expressed their concerns, opinions, and ideas about the Plan.

Meeting #1: Wednesday, May 1, 2018, 9:00 a.m., City of New Cordell.
Meeting #2: Tuesday, May 7, 2018, 6:30 p.m., Town of Bessie.
Meeting #3: Wednesday, May 8, 2018, 9:00 a.m., City of New Cordell.
Meeting #4: Wednesday, May 22, 2018, 9:00 a.m., City of New Cordell.
Meeting #5: Tuesday, June 12, 2018, 10:00 a.m., City of New Cordell.
Meeting #6: Monday, July 2, 2018, 9:00 a.m., City of New Cordell.

Meeting notices will be posted in accordance with the policies for the Oklahoma Open Meeting Law and meetings at the Washita County Courthouse, which is located in Cordell, OK. An ad in the local newspapers, official legal notice, will inform the public about the meetings. These meetings will provide the public a forum where residents can express their concerns, opinions, or ideas about the Plan. Citizen's comments and concerns will be discussed at the annual evaluation to determine if changes to the plan need to be made.

A copy of this plan will be available at the Washita County Court House and the plan will be available to any citizen upon request. Copies of the Plan will be distributed to every City/Town Hall, Emergency Management Director and School Superintendent.

Local newspapers and the city/town and county websites will also be utilized to notify the public and additional stakeholders of the opportunity to comment as well as serving as a tool they can utilize to submit comments for review. Upon completion of the update process, the plan will be resubmitted to the State and FEMA for approval.

2.6 Monitoring, Evaluating and Updating

Monitoring

The Washita County Emergency Management Director will perform any necessary monitoring site visits on as needed basis. He or she will also be the lead contact for phone calls and the scheduling of meetings.

- Monitor the hazard analysis for changes and additions.
- Monitor objectives and determine if they meet current and expected hazardous conditions.
- Determine if there were any implementation problems, such as technical, political, legal, or coordination issued with other agencies.

The mayors, superintendents, and emergency management director will be responsible for the monitoring of the plan. The emergency management director will give the city/town boards and school boards a monitoring update report every year. The plan will remain an active and relevant document with continued public participation such as: Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel using newspaper ads, utility bills, town/city board meetings and social media to keep the public engaged. Additionally the public schools in Burns Flat, Canute, Cordell, Sentinel and private school in Corn will be using school newsletters, social media, school websites and school board meetings during the plan maintenance process.

Evaluating

The plan will be reviewed/revised on yearly schedules or as needed based on disaster events. Washita County Emergency Manager and the appointed officials for each incorporated community, county elected official and school personnel in Washita County will ensure that regular review and update of the Hazard Mitigation Plan occurs. Through the Washita County Local Emergency Planning Committee (LEPC), the Emergency Management Director for Washita County is responsible for evaluating the progress of the mitigation strategies in the Plan.

The Washita County Planning Committee will evaluate the plan to review the goals and objectives to determine their relevance to changing situations in the County, as well as changes in State or Federal policy, and to ensure that they are addressing current and expected conditions. The planning committee will also review the risk assessment portion of the Plan to determine if this information should be updated or modified. The jurisdictions responsible for the various implementation actions will be requested on an annual basis to report to the planning committee on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

Annually the planning committee members will meet to evaluate the risk assessment to ensure the hazard information along with the vulnerabilities and impacts originally addressed are still valid for the participating communities. The planning committee will also evaluate the goals and the mitigation strategy to ensure they continue to address the priorities of the each participating jurisdiction. Each jurisdiction representatives on the planning committee will monitor the processes and requirements identified in the Washita County Hazard Mitigation Plan at the annual meeting summarizing the effectiveness of the ongoing maintenance processes, as well as the incorporation of the Hazard Mitigation Plan into each of the jurisdictions planning mechanisms. In addition to monitoring the plan, each representative on the planning committee will monitor the progress of the mitigation actions and seek out grant funding as programs announce availability.

Updating

Twenty-four (24) months before the plan expiration, the plan update process will begin with Washita County Emergency Manager and the planning committee. The emergency manager and the planning committee will reconvene the plan development meetings as described in this Updated Washita County Hazard Mitigation Plan, planning process to discuss the findings of the meetings, update the risk assessment, and revise the strategy and plan components as needed. A draft plan will be submitted to Oklahoma Emergency Management for review twelve months before the plan expiration. Any revisions

will be incorporated into the document as necessary, and the plan resubmitted to FEMA for approval. Once approved, participating jurisdictions will adopt the plan by resolution.

CHAPTER THREE: HAZARD IDENTIFICATION AND RISK ASSESSMENT

3.1 List of Identified Hazards

In this section an effort was made to identify and describe past and possible natural hazard occurrences that have affected or may affect the Planning Area.
A natural disaster is a Washita adverse event resulting from natural processes of the Earth and fall into five (5) Washita categories: atmospheric, geological, hydrological, extraterrestrial and biological. They have influenced, shaped and modified human behavior, changing the way people live with and respond to the environment. Moreover, natural disasters have resulted in enormous intangible losses, causing grief through the loss of life and personal possessions and had a profound effect on the population's resilience or ability to recover.

During development of the previous plan the Washita County Hazard Mitigation Planning Committee identified hazards that are historical, typical and possible within County boundaries. These hazards were identified through a process that utilized input from planning committee members and individuals, the Washita County Hazard Vulnerability Assessment, researching past disaster declarations in the County and a review of current FIRMs.

The following Table identifies the hazards that could possibly impact the County, followed by a listing of Presidential Disasters declared in Washita County since the previous plan update. Hazard profiles are included below.

Hazard	How Identified	Why Identified
Lightning, Hail, Tornados, High Winds,	• Review of Past Disasters • Risk Assessments • Public Input • Review of Emergency Management Storm Watch Records • NWS-NCDC Records	• History of many severe weather events, including thunderstorms and Tornados
Winter Storms, Floods	• Review of Past Disasters • Public Input • Review of FIRMS • NWS-NCDC Records	• History of Severe Winter Storms • History of Some Flooding
Extreme Heat, Wildfires, Drought	• Past History of Fire • Record Review • Public Input • Review of Extension and Ag Records • Data obtained from the Oklahoma Water Resources Board	• History of Extremely Hot and Dry Weather
Earthquake	• Record Review • Public Input	• Geographic Location Proximity to Fault
Dam Failure	• Review past disaster declarations • OWRB database • Local input • Risk Assessment	• To consider the vulnerability • Potential flooding if dam fails

3.2 Disaster History January 2001 through December 2017

Disaster Number	Year	County	Declaration Date	Disaster Type	Incident Type
1384	2001	Washita	6/29/01	DR	Severe Storms
1395	2001	Washita	10/25/01	DR	Severe Storms, Flooding
1401	2002	Washita	2/01/02	DR	Severe Ice Storms
1452	2003	Washita	2/04/03	DR	Severe Ice Storms
3219	2005	Washita	9/05/05	EM	Hurricane Katrina Evacuation
1623	2006	Washita	1/10/06	DR	Severe Wildfire Threat
3272	2007	Washita	1/14/07	EM	Severe Winter Storms and Flooding
1678	2007	Washita	2/01/07	DR	Severe Winter Storms
1712	2007	Washita	7/07/07	DR	Severe Storms, Tornadoes and Flooding
1718	2007	Washita	8/24/07	DR	Severe Storms, Tornadoes and Flooding
3280	2007	Washita	12/10/07	EM	Severe Winter Storms
1775	2008	Washita	7/9/08	DR	Severe Storms, Flooding
3308	2010	Washita	1/30/10	EM	Severe Winter Storms
1876	2010	Washita	2/25/10	DR	Severe Winter Storms
1883	2010	Washita	3/5/10	DR	Severe Winter Storms
3316	2011	Washita	2/02/11	EM	Severe Winter Storms
4109	2013	Washita	4/8/13	DR	Severe Winter Storm and Snowstorm
4222	2015	Washita	5/26/15	DR	Severe Storms, Tornadoes, Straight-Line Winds and Flooding
4247	2015	Washita	12/29/15	DR	Severe Winter Storms and Flooding
4256	2016	Washita	2/10/16	DR	Severe Winter Storms and Flooding
4315	2017	Washita	5/26/17	DR	Severe Storms, Tornadoes and Flooding
4324	2017	Washita	7/25/17	DR	Severe Storms, Tornadoes, Straight-Line Winds and Flooding

3.3 Hazard Probability Rating

The probability rating in the hazards below is based on the following criteria:

High = Event probable in next year
Medium = Event probable in next 3 years
Low = Event probable in next 5 years
Very Low = Event probable in next 10 years

Based on history and using the previously mentioned probability statements, probability was quantified as follows:

High = Event has 1 in 1 year chance of occurring; 1/1=1.00
Medium = Event has 1 in 3 years chance of occurring; 1/3=0.33
Low = Event has 1 in 5 years chance occurring; 1/5=0.20
Very Low = Event has 1 in 10 years chance occurring; 1/10=0.10

Which result in the following ranges of probability:

High = greater than .33

Medium = greater than .20, but less than or equal to .33
Low = greater than .10, but less than or equal to .20
Very Low = .10 or less

Example: Washita County has had 170 Hail events recorded in the last 16 years.
170/16 = 10.625 which would make it “High”.

3.4 Profiled Hazards

3.4.1 Lightning

Description
Lightning is a discharge of intense atmospheric electricity, accompanied by a vivid flash of light, from one cloud to another, or from a cloud to the ground. Lightning is formed by the separation of positive and negative charges that occur when ice crystals collide high up in a thunderstorm cloud. As lightning passes through the atmosphere the air immediately surrounding it is heated, causing the air to expand rapidly. The resulting sound wave produces thunder.

Location
Lightning affects the entire Planning Area.

Previous Occurrences
NWS-NCDC records show that was 1 damaging Lightning event reported in the Planning Area between 01/01/2001 and 12/31/2017.

August 21, 2006: Lightning caused some structural damage to a house in Sentinel. A small fire also caused some damage. Property damage estimated at $15,000.

None of the school districts participating in this plan reported damages from previous lightning events.

Extent
Lightning Activity Level (LAL) Grids

The lightning activity level is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

LAL	Cloud & Storm Development	Lightning Strikes/15 min
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area.	16-25

	Moderate rain is common and lightning is frequent.	
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

Minor severity: Any lightning strike that occurs on a Lightning Activity Level of 3 or less.
Major severity: Any lightning strike that occurs on a Lightning Activity Level of 4 or greater.

Washita County anticipates that in the future lightning strikes between 1-8 strikes in fifteen minutes to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events
The probability of damaging lightning events in the Planning Area is very low.

Vulnerability and Impacts
The greatest vulnerability to lightning in the participating jurisdictions is the potential loss of human life. Property damage can also occur to structures, electrical equipment, water wells, etc. Anyone outdoors during a thunderstorm is exposed and at risk of injury from lightning. Most people are injured or killed by lightning will participating in some form of recreation. Some of the area swimming pools and water parks are installing early warning devices for the danger of lightning strikes. Damage to trees and homes would generally be under $1,000 if a strike did occur. People, buildings, trees, electrical systems and components are all vulnerable to a lightning strike. The impacts of these would be injury or death, structural damages and fire to buildings, trees and or tree limbs falling and damaging structures, auto's, people, or electrical lines, electrical substations could be hit leaving homes and businesses without power, and electrical components damaged or destroyed. Washita County Emergency Management encourages residents in the participating jurisdictions to download particular weather applications on their mobile devices to detect lightning strikes.

Though none of the schools districts participating in this plan have reported damages from lightning events, all schools are vulnerable to future impacts. Lightning strike may impact breakers and has the potential to cause a structural fire. Additionally, lightning may cause damage to IT equipment. Perhaps the most concerning issue is for those participating in outdoor sporting events. None of the school districts in Washita County have lightning detection systems in place. In general school officials will call a game if lightning becomes a concern. A lightning strike would cause loss of life and injury if it occurred when patrons were outdoors at a sporting event. In the past, Washita County Emergency Management has worked with the National Weather Service to provide school officials storm timing information to prepare for scheduling for school outdoor activities.

All participating jurisdictions are vulnerable to lightning strikes due to the randomness of the hazard.

A large number of tank batteries are scattered throughout the county. These pose a threat of being struck by lightning causing a Haz Mat problem.

Events being held at the following locations need to be aware of approaching storms due to the threat of lightning that can strike within a 10 mile radius during outdoor events.

Town of Bessie - Park
Town of Burns Flat – Municipal swimming pool, baseball and softball fields, park, daycare
Town of Canute – Baseball and softball fields, park, daycare
Town of Colony – Park
Town of Corn – Baseball and softball fields, park
Town of Dill City – Park
Town of Foss - Park
City of New Cordell – Washita County Activity Center, Municipal Swimming Pool, rodeo grounds, daycare, baseball and softball fields, soccer fields
Town of Rocky – Park
Town of Sentinel – Municipal swimming pool, park, daycare, Sentinel Activity Center
All participating schools have concern with lightning during outdoor sporting events at the football stadiums, baseball fields, softball fields and parking lots at campus locations.

3.4.2 HAIL

Description
Hail is a form of solid precipitation that consists of balls or irregular lumps of ice, which are individually called hailstones. Hail formation requires an atmospheric environment of strong, upward moving air, called an updraft, within the subfreezing region of a thunderstorm cloud. Large hail stones greater than an inch in diameter (quarter size), can result from a severe thunderstorm and require a very powerful updraft to form. Most large hail is the product of supercell thunderstorms, which have a sustained rotating updraft that moves growing hailstones a long distance through the height of the cloud before falling to the ground.

Location
Hail affects the entire Planning Area.

Previous Occurrences
NWS-NCDC records show that 170 hail events were reported in Washita County between 01/01/2001 and 12/31/2017. The largest hail reported during this time was 3.50 inches. Schools in the county reported no impacts.

May 9, 2003: Large hail and strong straight-line winds associated with the rear-flank downdraft also occurred with this tornadic supercell. Other severe thunderstorms produced damaging large hail and strong winds across portions of Oklahoma.

March 30, 2008: The supercell thunderstorms produced hail larger than baseballs in some areas, with thunderstorm wind gusts to 60 mph also reported. These thunderstorms became more intense as the moved northeast through the evening into central and northern Oklahoma. These thunderstorms produced very large hail. The hail was mostly up to golfball size, but a few stones measured three to three and a half inches.

April 18, 2015: As the slow moving upper trough continued eastward, it moved into portions of western Kansas and Oklahoma. A Pacific front/dryline surged eastward during the day, igniting thunderstorms. Given impressive upper level winds, and moderate instability, reports of large hail and damaging winds were widespread and lasted into the night.

None of the school districts participating in this plan reported damages from previous hail events.

Extent
Washita County and all participating jurisdictions consider any hail of H4 or higher on the NOAA/TORRO hail scale to be a Washita severity and an H3 and below a minor severity.

Hail size and diameter in relation to TORRO Hailstorm Intensity Scale.		
Size code	**Maximum Diameter mm**	**Description**
H0	5-9	Pea
H1	10-15	Mothball
H2	16-20	grape
H3	21-30	Walnut
H4	31-40	Pigeon's egg > squash ball
H5	41-50	Golfball > Pullet's egg
H6	51-60	Hen's egg
H7	61-75	Tennis ball > cricket ball
H8	76-90	Large orange > Soft ball
H9	91-100	Grapefruit
H10	>100	Melon

Washita County anticipates that in the future hail size between H0-H2 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events
The probability of hail events in the Planning Area is high.

Vulnerability and Impacts
Vulnerability is difficult to evaluate since hail occurs in random locations and creates relatively narrow paths of destruction. Hail is capable of causing considerable damage to crops, buildings, and vehicles, and occasionally death to farm animals. A significant hail storm in Washita County would be detrimental to the economy due to the county being agriculture is a main source of income. Hail can also strip leaves and small limbs from non-evergreen trees. While large hail poses a threat to people caught outside in a storm, it seldom causes loss of human life.

Costs and losses to agricultural and livestock producers:
- Reduced yields and crop loss
- Injuries or loss of livestock
- Damage to barns and other farm buildings
- Damage to trees resulting in increased susceptibility to disease

Residential and commercial
- Damage to buildings, possibly critical facilities
- Roofs
- Windows
- Damage to automobiles, trucks, trains, airplanes, etc.
- Disruptions to local utilities and services
- Power

- Communications
- Transportation

Damage to vehicles can range from several hundred dollars to total loss of the vehicle. At times when large parking lots or dealerships get hit, losses can be in the millions of dollars. Loss from a Washita hailstorm damaging automobiles and structures in the participating jurisdictions could total in the millions of dollars.

The greatest concerns identified for participating school districts is roof damage, and damage to windows. These would be the most likely structural impacts as a result of large hailstones. Most of the school districts have bus barns which protect school buses from potential impacts.

All participating jurisdictions are vulnerable to hail due to the randomness of the hazard.
Hail can cause a negative economic impact to Washita County farmers and ranchers as hail is capable of causing considerable damage to crops and injury or possible death to animals.

Vulnerabilities to hail for the following jurisdictions are as follows:

County – Damage to equipment and expense for debris removal from hail.
City of New Cordell – Car dealership.
All participating jurisdictions – Roof / window damage to houses / churches – Damage to equipment and expense for debris removal.
All participating schools – Faculty parking and school equipment and buses.

3.4.3 TORNADO

Description
Tornadoes are traditionally defined as a violently rotating column of air that reaches from the bottom of a cumulonimbus cloud to the ground. Tornadoes are found in severe thunderstorms, but not all severe thunderstorms will contain tornadoes. While all tornadoes touch both the ground and the bottom of a cloud, it is possible for only part of the tornado to be visible. A tornado may be on the ground for only a few seconds, or last for over an hour. Tornadoes can appear in a variety of shapes and sizes ranging from thin ropelike circulations to large wedge shapes greater than one mile in width. However, a tornado's size is not necessarily related to its wind speed. The strongest tornadoes can have wind speeds in excess of 200 mph. Over 80% of Oklahoma tornadoes have struck between 3PM and 9PM, but can still occur anytime. Spring is the peak season for Oklahoma tornadoes, but they can form during any season when the necessary atmospheric conditions of wind shear, lift, instability, and moisture are present.

Location
Tornadoes affect the entire Planning Area.

Previous Occurrences
NWS-NCDC records show that 13 tornado events were reported in the Planning Area between 01/01/2001 and 12/31/2017.

October 9, 2001: A tornado developed on the southwest side of City of New Cordell, where a mobile home and metal warehouse were blown into a farmhouse. The tornado then moved through south, east and northeast portions of City of New Cordell, including a business district and a large residential area. Most damage south of Main Street was rated F0 or F1. North of Main Street, the damage path widened to approximately 500 yards, with the tornado then inflicting

widespread F1 to F2 damage up to 12th Street. Hundreds of homes were damaged in this area. As the tornado began to exit the northeast side of City of New Cordell, F3 damage was sustained to several homes on 9th Street, just west of Crider Road. An F4 rating was considered; however, the structural integrity of most structures was at or below average and was taken into consideration. Another interesting note is that several eye-witnesses reported that the tornado was widest and contained the most violent-looking winds at this time. The tornado eventually exited City of New Cordell and dissipated 3.5 miles northeast of town. The Oklahoma State Emergency Management Office estimated that 477 single-family homes were damaged, 132 considered uninhabitable. In addition, 40 businesses were damaged, 22 considered uninhabitable. Damage was estimated near 100 million dollars, and nine injuries were reported.

May 16, 2017: Storms formed along the dryline in the Texas panhandle on the afternoon of the 16th before moving eastward. As a cold front caught up to the storms, convection increased and storms began to form into a line. This tornado moved into Washita County and moved northeast about 3 miles before dissipating. Three outbuildings were damaged or destroyed and one house received minor damage. Otherwise, damage was primarily to trees and power lines in Washita County. Damage costs were roughly estimated at $20,000.

None of the school districts participating in this plan reported damages from previous tornado events.

Extent

Tornado intensity is rated using the Enhanced Fujita Scale. The scale is described below and is based on wind speed and type of damage done. The most severe impact by a tornado would be the result of an EF5 tornado moving through the county and several communities Washita County. The Planning Area has experienced Tornados that range from F0-F4. Washita County and all participating jurisdictions consider a tornado of F0-F1 to be a minor severity and a F2 to F5 to be a major severity.

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

(http://www.spc.noaa.gov/faq/tornado/ef-scale.html)

Washita County anticipates that in the future a tornado rate between EF0-EF2 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events

Due to annual tornado events in the Planning Area, the probability is high these events will continue every year.

Vulnerability and Impacts

Tornadoes have inflicted their share of damage in all participating jurisdictions in Washita County.

Every structure in the participating jurisdictions is vulnerable to tornadoes. Utility service outages can affect large segments of the population for long periods of time with no electric, gas or water service. Economic losses from homeowners and businesses alike can be devastating. Food spoilage with lack of refrigeration, gas pumps not operating, and daily life activities can all come to a halt. People displaced from homes that are damaged and destroyed also create a new set of challenges with the basics of food, shelter and clothing.

On the lower end, damage from an F0 tornado with winds from 40-72 mph can result in destruction of road signs, tall structures, trees, and possible damage to shingled roofs. Mid –range F2 and F3 tornadoes with winds from 113-206 mph will result in considerable damage. Roofs will be torn off structures, mobile homes completely demolished, most trees and plant life destroyed, objects as big as cars thrown small distances (as well as other light missiles being generated), and trains being blown over can result from these storms. The worst case is the F5 tornado with winds from 261-318 mph. Total destruction will occur in the path of the tornadoes, which have been up to ½ mile wide in the past. Homes, automobiles, appliances, outbuildings, and anything outdoors can be picked up and thrown long distances as large missiles.

Utility infrastructure such as power lines, substations, water towers, and water wells, are vulnerable and can be severely damaged or destroyed from a tornado. Emergency vehicles responding to the devastated areas can have trouble responding due to down power lines and debris in roadways. Livestock is vulnerable during tornado events and are often killed since there is little protection for the animals on the open range. Residents most vulnerable to tornadoes are those living in mobile homes.

Utilizing storm spotters and early warning systems, Washita County residents can take appropriate precautions during these events. The use of better building techniques, tie-down systems and the availability of storm shelters and safe rooms all help mitigate losses in the Planning Area. The most severe impact by a tornado would be the result of an EF5 tornado moving through the County and hitting several communities. Although tornadoes rarely stay on the ground for long periods of time, sometimes they can "hopscotch" across a large area. If a tornado or series of tornadoes within the same supercell were to track across the county from southwest to northeast (a fairly common path) a lot of farmland could also be damaged, including rural homes, livestock, and crops. This would cause an increase in losses, but generally not as much as if a community is struck.

If a school facility were to take a direct hit from a tornado, it would be unable to operate. The planning team identified this as a concern and noted there may also be issues relocating students to other school districts in the interim. Other structural impacts from might include window and roof damage. Most schools Washita County could withstand an EF0 event without it disrupting the school. Tornado events in the EF2 or greater range could cause complete loss of school facilities in Washita County. Additionally, loss of life and injury is always a primary concern.

All participating jurisdictions are vulnerable to tornadoes due to the randomness of the hazard. Disruption of utilities and communications is a possibility in all jurisdictions after a tornado event. All jurisdictions must plan for continuity of operations. Debris removal is a costly expense to consider after a tornado.

Tornadoes can cause a negative economic impact to Washita County farmers and ranchers due to the capability of causing considerable damage to crops and injury or possible death to animals.

Unique facilities per jurisdiction are listed below:

County – District Barns, Courthouse and Radio Communication Towers.
All participating jurisdictions – Town and City Halls, Fire Departments and Senior Citizen Centers.
Town of Corn – Corn Heritage Village
City of New Cordell – Cordell Memorial Hospital, Cordell Christian Home and Integris Village.
All participating schools – all school campuses.

3.4.4 HIGH WIND

Description
High winds can result from thunderstorms, strong cold front passages, or gradient winds between high and low pressure moving across Oklahoma. High winds, sometimes referred to as "straight-line" winds, are speeds reaching 58 mph or greater, either sustaining or gusting. Wind is defined as the movement of air relative to the earth's surface. Downdraft winds are a small-scale column of air that rapidly sinks toward the ground, usually accompanied by precipitation as in a shower or thunderstorm. A downburst is the result of a strong downdraft associated with a thunderstorm that causes damaging winds near the ground. These winds can range from light breezes to sustained speeds of 80 to 100 mph.

Location
High Winds affect the entire Planning Area.

Previous Occurrences
NWS-NCDC records show that 135 High Wind events were reported in Washita County between 01/01/2001 and 12/31/2017.

April 6, 2001: In addition to hail and wind damage from severe thunderstorms, the intensity of the low pressure system which helped produce the severe weather also resulted in very strong winds outside of thunderstorms. Before and after the severe weather there was sustained winds of 35 to 45 mph from the southeast and southwest with gusts to near 60 mph affected most of western Oklahoma. Trees were snapped; power lines were downed, and scattered roof damage was reported.

November 11, 2006: A strong surface low pressure moved across the region causing strong to high wind gusts across approximately the western two-thirds of Oklahoma from the early morning hours through part of the day. Numerous wind gusts of 35 knots to 49 knots (40-57 mph) were measured across Oklahoma by Oklahoma Mesonet and ASOS stations, along with many high wind gusts of 50 to 59 knots (58-68 mph). The strongest wind gusts of 59 knots (68 mph) were measured at the Oklahoma Mesonet Stations. A tractor trailer overturned near the Town of Canute in Washita County near mile marker 45 on Interstate 40. This accident closed parts of Interstate 40 for about two hours. No injuries were reported in this accident. Numerous power outages were reported and power lines downed across the area due to the high winds.

April 23, 2014: A sharpening dryline served as the focus for thunderstorm development during the late afternoon and evening hours. Storms slowly moved eastward from the Texas Panhandle into western Oklahoma. Several reports of damaging winds estimated 80 mph wind gusts were received with this activity. Some minor tree damage was reported.

Extent

The extent of winds is generally measured by the Beaufort Wind Chart shown below. The Beaufort Wind Scale is used to measure wind classifications between 1 and 12. Washita County and its participating jurisdictions experience wind speeds in each area of this scale. Washita County and all participating jurisdictions consider high wind damage 0 to 10 on the Beaufort Wind Chart to be a minor severity and anything above 10 on the Beaufort Wind Chart and to be a major severity.

Beaufort Wind Chart – Estimating Winds Speeds

Beaufort Number	MPH Range	MPH Average	Terminology	Description
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	**Light structure damage.**
10	55-63	60	Storm	**Trees uprooted. Considerable structural damage.**
11	64-73	70	Violent storm	**Widespread structural damage.**
12	74-95	90	Hurricane	**Considerable and widespread damage to structures.**

Webpage: http://www.weather.gov/iwx
Twitter: @nwsiwx
Facebook: NWSNorthernIndiana

(http://www.crh.noaa.gov/images/iwx/publications/Beaufort Wind Chart.pdf)

Washita County anticipates that in the future wind speeds between 0-6 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events
Considering the previous occurrences and the high number of recorded thunderstorms, the probability that high wind events will occur in the Planning Area is high.

Vulnerability and Impacts
In Washita County and the participating jurisdictions buildings that could fail under the effects of extreme winds often appear to have exploded, giving rise to the misconception that the damage is caused by unequal wind pressures inside and outside the building. This misconception has led to the myth that during an extreme wind event, the windows and doors in a building should be opened to equalize the pressure. In fact, opening a window or door allows wind to enter a building and increases the risk of building failure.

Damage can also be caused by flying debris (referred to as windborne missiles). If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, walls, or the roof. For example, an object such as a 2" x 4" wood stud weighing 15 pounds, when carried by a 250-mph wind, can have a horizontal speed of 100 mph and enough force to penetrate most common building materials used in houses today. Even a reinforced masonry wall will be penetrated unless it has been designed and constructed to resist debris impact during extreme winds. Because missiles can severely damage and even penetrate walls and roofs, they threaten not only buildings but the occupants as well.

In addition to structural issues, high winds can affect electrical and other utilities with service outages. Power lines can ground out or knocked down causing loss of electrical service. Travel can be disrupted with the loss of stop lights, street lights and dangerous cross winds making travel difficult. There could also be loss of water, sewer, and communications abilities.

High Wind impacts cause similar damages as tornado events. If a school facility were damaged by a high wind event, and unable to operate, the planning team identified issues relocating students to other school districts as a potential for concern. Other structural impacts from might include window and roof damage, and inundation of facilities by heavy rain. Additionally, loss of life and injury is always a primary concern.

According to the National Weather Service statistics in Oklahoma from 1999 through 2016, EF0 and EF1 tornadoes have caused zero fatalities. In that same period, thunderstorms straight line winds have resulted in 11 deaths. As a result Washita County and participating jurisdictions are either considering or have incorporated sounding sirens for dangerous damaging winds at or above 75 mph or higher.

All participating jurisdictions are vulnerable to high winds due to the randomness of the hazard. Disruption of utilities and communications is a possibility in all jurisdictions after a high wind event. All jurisdictions must plan for continuity of operations. Debris removal is a costly expense to consider after high winds.

High winds can cause a negative economic impact to Washita County farmers and ranchers due to the capability of causing considerable damage to crops and injury or possible death to animals.

Unique facilities per jurisdiction are listed below:

County – District Barns, Courthouse and Radio Communication Towers.
All participating jurisdictions – Town and City Halls, Fire Departments and Senior Citizen Centers.
Town of Corn – Corn Heritage Village

City of New Cordell – Cordell Memorial Hospital, Cordell Christian Home and Integris Village.
All participating schools – all school campuses.

3.4.5 WINTER STORM

Description
Winter Storm can refer to a combination of winter precipitation, including snow, sleet and freezing rain. A severe winter storm can range from freezing rain or sleet to moderate snow over a few hours to blizzard conditions and extremely cold temperatures that lasts several days.

Severe winter storm is one that drops 4 or more inches of snow during a 12–hour period, or 6 or more inches during a 24- hour span.

Blowing snow is wind-driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground and picked up by the wind. Blizzards occur when falling and blowing snow combine with high winds of 35 mph or greater reducing visibility to near zero.

Freezing rain is rain that falls as liquid onto a surface with a temperature below freezing. This causes the drops to freeze on contact onto surfaces like trees, utility lines, cars, and roads, forming a coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.

Sleet is frozen precipitation that has melted by falling through a warm layer of the atmosphere and then refreezes into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not immediately stick to objects. However, it can accumulate like snow and cause a hazard to motorists.

Ice storms are extended freezing rain events, lasting several hours to sometimes days, when the freezing rain accumulates a thick enough glaze on surfaces to damage trees, utility lines, and cause Washita travel hazards. Ice storms can result in a heavy glaze an inch thick or more, but even a quarter inch ice accumulation can cause problems under windy conditions.

Wind chill is used to describe the relative discomfort and danger to people from the combination of cold temperatures and wind. The wind chill chart below from the National Weather Service shows the apparent temperature derived from both wind speed and temperature.

Location
Winter Storms affect the entire Planning Area.

Previous Occurrences
NWS-NCDC records show that 19 winter storm events were reported in Washita County between 01/01/2001 and 12/31/2017.

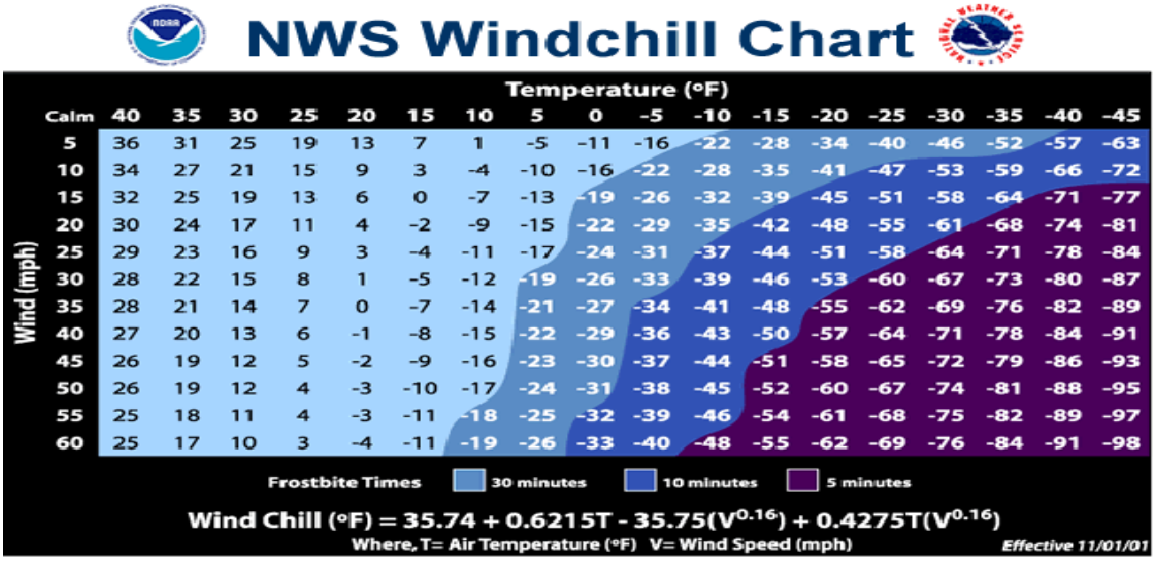
December 3, 2002: A winter storm affected the western half of Oklahoma during the afternoon and evening of the 3rd. The precipitation started as freezing rain and sleet across portions of western Oklahoma and then quickly changed to snow. Total accumulations were between four and eight inches. A mixture of freezing rain, sleet, and snow fell, with ice accumulations ranging from a trace to one half inch, and snow accumulations between two and three inches. Nearly 50,000 residences were without power during the peak of the winter storm.

January 28, 2010: A major winter storm impacted much of Oklahoma beginning on the morning of January 28th and continued through much of the day. While the storm produced a variety of wintry precipitation, it's most significant impacts came with an extended period of heavy freezing rain across western parts of Oklahoma. Almost 180,000 homes and business' were without power at the peak of the storm, several of which were without power for almost a week. Up to a half of an inch of glaze accumulated on most elevated surfaces before changing to sleet and snow during the early afternoon hours. Slightly higher amounts near 3/4 were realized near the Washita/Kiowa county border. Some tree and power pole/line damage was reported as a result of the glaze accumulation, especially over the southern portion of the county. Sleet totals averaged two to three inches by sunrise.

March 4, 2015: A strong cold front surged through Oklahoma early on the 4th, bringing an Arctic air mass into much of the Southern Plains. Several inches of snow and sleet fell, with significant impacts to travel. Light freezing rain/drizzle and sleet transitioned over to all snow by early afternoon. The snow lasted into the evening hours. By the time snow had ended, up to 5 inches of snow had fallen in Cordell, with 4 inches in Foss.

Extent

Wind Chills in Washita County can reach -19 as shown on the wind chill chart below. A minor event is considered a typical winter storm in Washita County with deposits up to 1 inch of snow. A Washita winter storm is one that drops more than 1 inch or more of snow during a 12-hour period accompanied with sleet and ice. As little as 2 inches of snow combined with strong winds can cause blizzard conditions.



http://www.nws.noaa.gov/om/winter/windchill.shtml

An index scale used by the utility industry to anticipate impact and damage of an icing event to transmission lines is the Sperry-Piltz Ice Accumulation Index (image included below). As a tool for risk management and winter weather preparedness, the index uses National Weather Service forecast parameters to predict the spatial coverage, total ice accumulation, and potential damage from ice storms. The Planning Area considers a reading of 1 or below on the SPIA a minor severity event and a reading of 1 or above to be a Washita severity event.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

http://www.spia-index.com

Washita County anticipates that in the future wind chills between Calm-10 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Washita County anticipates that in the future ice accumulation between 0-2 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events

The probability of Winter Storm events in the planning area is high.

Vulnerability and Impacts

Washita County and all participating jurisdictions are affected periodically by heavy snow and ice that causes damage. The most recent occurrence was in December 2015 that resulted in DR 4247 that affected the Washita County. Trees and power lines fall due to the weight of ice and snow causing damage to their surroundings as well as blocking streets and roads. Icy roads cause accident rates to increase and impair the ability for emergency vehicles to respond which can result in more injuries and a higher loss of life.

Winter storms can range from accumulating snow and/or ice over just a few hours to blizzard conditions with blinding wind-driven snow that can last several days. The aftermath from a damaging winter storm can continue to impact a region for weeks and even months. Economic losses can occur to livestock producers and any business in the affected areas. Water systems being shut down or frozen can disrupt social services, schools, homes, and businesses. Carbon monoxide poisoning is always a possibility as homeowners and businesses use alternative heat sources to keep warm. Personal health can be affected in a variety of ways including mental and physical stress, frostbite or related injuries and inability to travel for care.

In the event of a severe ice storm, those Washita County residents living in remote parts of the county could possibly wait days before power company crews are able to repair power lines servicing their homes. Utility companies have developed extensive right-of-way maintenance programs to remove trees that pose a threat to nearby power lines. Ice storm contingency plans

have also been developed by utility companies. These plans identify priority facilities such as hospitals that need power service restored as quickly as possible. The plan also lists neighboring utility companies that, if unaffected by the ice storm, can send service crews to the area to help restore power. Because of the costs associated with the placement and maintenance of underground lines and the immediate need to restore power to a disaster area, efforts to bury lines during a disaster are usually not appropriate. However, as new lines are considered and/or replacement lines are needed, the providers should thoroughly investigate replacing these lines with underground lines. This concept may be more appropriate with more urban or defined incorporated areas. As a result of the aforementioned ice storms, utility service providers in Washita County are encouraged to use underground cables. Establishment of Citizen Emergency Response Teams is encouraged in the County to help with a debris removal plan to be used in mitigation.

The primary impact of winter storms on school districts in Washita County is school closure, sometimes for extended periods of time. Structural impacts include roof collapse and damage to outbuildings from heavy snow loads.

Winter storms can cause a negative economic impact to Washita County farmers and ranchers due to the inability to access livestock with feed and water supply and the exposure to the elements.

County and all participating jurisdictions vulnerability lies with access to public facility during winter weather. Snow and ice removal from roads and bridges can be costly. Disruption of utilities and communications is a possibility in all participating jurisdictions during and after a winter storm. All participating jurisdictions must plan for possible closures during winter weather. Special needs residents cause a particular concern and need for awareness during power outages caused by winter storms.

Unique facilities per jurisdiction are listed below:

County – District Barns, Courthouse and Radio Communication Towers.
All participating jurisdictions – Town and City Halls, Fire Departments and Senior Citizen Centers.
Town of Corn – Corn Heritage Village.
City of New Cordell – Cordell Memorial Hospital, Cordell Christian Home and Integris Village.
All participating schools – all school campuses.

3.4.6 FLOOD

Description

Flooding is a natural event for rivers and streams. River flooding is when a river rises to its flood stage and spills over the banks. The amount of flooding is usually a function of the amount of precipitation in an area, the amount of time it takes for rainfall to accumulate, previous saturation of local soils, and the terrain around the river system. For instance, a river located in a broad, flat floodplain will often overflow to create shallow and persistent flood waters in an area that do not recede for extended periods of time. The excess water can be from snowmelt or rainfall far upstream. Flood effects can be local, impacting a neighborhood or community; or very large, affecting entire river basins and multiple states. The average annual precipitation ranges is 29.60 inches in Washita County.

There are two types of floods, both which can occur in Washita County and participating jurisdictions. First, flash floods, which result from localized heavy rain falls. Flash floods occur rapidly with little warning. Dam failures are a unique form of flash flood. Flash flooding is the most

common cause of death by natural disaster in the United States. Second, riverine floods, occur after extended periods of rain over several days of weeks. Riverine floods generally can be forecast in advance and proper precautions taken to save lives and mitigate some, though certainly not all, property losses.

Location

The location of the hazard area consists of all of Washita County including the jurisdictions of Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City School District, Canute School District, Cordell School District, Corn Bible Academy, Sentinel School District and Washita County unincorporated areas. The floodplain and flood-prone areas of the county would experience the effects first. There are no repetitive loss structures in Washita County.

There are flood damages on county roads in all three county commissioner districts in Washita County annually. Floods in Washita County usually come in two forms: riverine and sheet flooding. Riverine flooding occurs when a stream becomes so full as to overflow onto adjacent lands. Sheet flooding occurs when excessive rainfall exceeds the design capabilities of drainage facilities and ponding occurs. Washita County flooding is 65% riverine since most of the County is rolling hills and pastureland. For the other 35% scattered throughout the County, the terrain lends itself to sheet flooding. Washita County has had 6 floods since 2001 resulting in over $20,000 in damages.

Flash flooding affects all participating jurisdictions in Washita County. Flooding within the municipalities and school districts would primarily be street-type flooding in areas where poor drainage exists. Maps from FEMA Flood Insurance Rate Map for participating jurisdictions and city and town flood zone area maps are included in Appendix A.

Participants in the National Flood Insurance Program include, Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell, Town of Sentinel and Washita County. The Towns of Burns Flat, Dill City, Foss and Rocky are not participants in the NFIP.

Because FEMA has not conducted a study of special flood hazard areas in Burns Flat, Dill City, Foss and Rocky, nor developed floodplains for these entities, Geographic Information Software (GIS) was used by SWODA staff to map areas identified by fire chiefs and other emergency response personnel that are known to repeatedly flood. This is just an approximation, not a detailed study as that is not within SWODA's scope of work.

Previous Occurrences

NWS-NCDC records show that 6 flood events were reported in Washita County between 01/01/2001 and 12/31/2017.

August 1, 2007 - Isolated thunderstorms with very heavy rainfall developed over parts of Oklahoma, including Washita County, during the afternoon hours. The slow movement of the thunderstorms and an already saturated ground allowed for small-scale areas of flash flooding. Monetary damages were estimated. Several roads in Cordell were barricaded off due to the rising water.

May 23, 2015 - Storms developed in the panhandles on the 23rd under the influence of an upper level trough. These storms merged into a line and moved eastward over Oklahoma producing widespread flooding. State Highway 152 shut down west of Cordell due to water over the road.

June 14, 2015 - With several boundaries floating around the area, storms erupted on the 14th and 15th as an upper level low moved by, producing some flash flooding. A bridge in Washita County on Rural Road E 1150 was overtopped by floodwaters. Surrounding roads were also covered in several inches of water.

Extent

Washita County is more susceptible to flash flooding with a 24-48 hour turnaround. Severity of flooding is determined by several factors including rainfall intensity, duration and location. Topography and ground cover are contributing factors for floods. Flash floods are most dangerous since they can occur suddenly and begin before the rain stops. A maximum flood threat could result if soils are saturated and wide spread heavy rains begin to fall. The extent of flooding in Washita County will be determined by the Zone A, 100 year flood hazard areas, on the FIRM maps. The maximum observed in Washita County is four feet in Washita drainage systems. Washita County FIRM maps are included below. Schools in the county are not at risk to the flood hazard and have not been impacted in the past. Washita County and all participating jurisdictions describe minor flooding as one foot or less and major flooding is described as one foot or more.

Washita County anticipates that in the future 1-4 inches of rain that cause flash flooding to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events

The probability of flood events occurring in the Planning Area is high.

Vulnerability and Impacts

Damages could include homes and buildings interiors and furnishings, electrical shorts, mold growth, foundation issues, and economic loss due to loss of sales and/or merchandise. If water and wastewater systems are damaged contaminated drinking water and raw sewage in floodwaters could also occur. Water well flooding may cause damage to water pumps and electrical operations, causing an entire town to be without water services. Lift station flooding would result in power loss and lack of water services to town. Disruptions of traffic flow could happen for not only the citizens' daily traffic but also critical services such as emergency police, fire, and ambulance. School bus and mail routes are also disrupted because flood waters damaged or destroyed roads and bridges. Employment is often affected because of businesses that close due to flood damage and loss of business. Farmers could encounter crop losses if the flood waters remain for several days at a time or comes just after planting or at harvest time. Livestock and farm animals can also be vulnerable if caught in rapidly-rising floodwaters with no route of escape.

Flooding within all participating jurisdictions in Washita County would primarily be street-type flooding in areas where poor drainage exists. Critical facilities and infrastructures within all participating jurisdictions in Washita County would be as susceptible to flooding as any other structure in the county that is not in a floodplain. Roadways, bridges, and some farmland remain vulnerable.

Aside from infrastructure, ranchers also suffer during flood events. Flood events have also in the past caused contamination of soils and water sources. Local ranchers should be made aware of potential flood prone areas and continue to maintain relationships with USDA and OSU Extension offices, and DEQ. Flooding in the past has impacted none of the participating school districts. If a future flood event caused the schools to flood, school would likely have to be evacuated and loss of school days would occur. This is a major impact early in the year because days off would eat up the snow days.

Another issue all jurisdictions face is the general public going around barricades to drive through flooded roadways. The county has put up signs for Turn Around, Don't Drown. There would be no direct impact to school facilities as a result of flooding in the planning area. All participating schools are built high and will not be inundated by floodwaters. As with all hazards, this will be readdressed at the five year update to consider any changes in development and exposure. The County has been able to rip-wrap several washout and erosion areas, thus addressing erosion and road washouts.

Maximum flood threat would most likely result from wide spread heavy rains, which can cause all streams and rivers within the county to rise.

3.4.7 Extreme Heat

Description

The onset of a heat wave can be subtle and does not result in structural damage like other meteorological events. In rural areas extreme temperatures can significantly damage crops, especially if too hot of temperatures occur during critical growth periods. Certainly hot temperatures dramatically increase the rate of evaporation off crop fields and farmers must irrigate at much higher rates to maintain growth. Meteorologists use different ways to describe heat waves, including daytime high and overnight low temperatures, duration, moisture and relation to the climate variability observed at a given location.

Location

Extreme Heat affects the entire Planning Area.

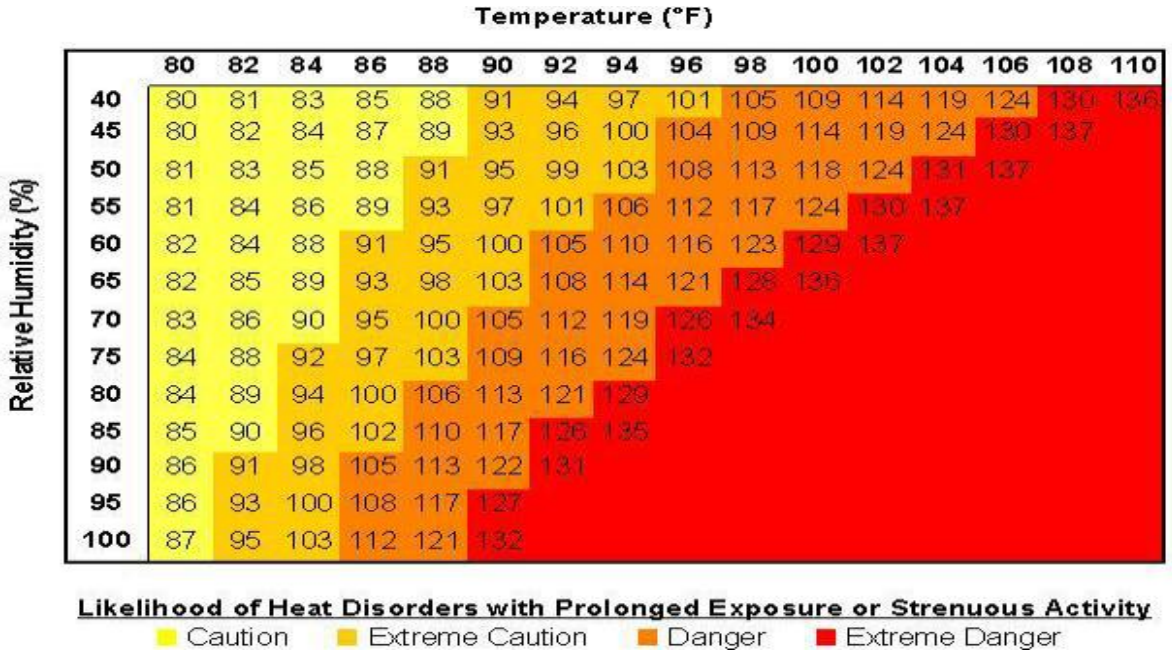
Previous Occurrences

NWS-NCDC records show that 3 extreme heat events were reported in Washita County between 01/01/2001 and 12/31/2017. No damages were reported during any of the events. None of the school districts participating in this plan reported damages from previous extreme heat events.

July 4, 2001 through July 31, 2001, an extended period of excessive heat affected all of western and central Oklahoma in July. Daily mean temperatures ranged from the mid 80s to near 90 degrees, which is four to five degrees above normal. Most areas regularly experienced high temperatures at or above 100 degrees, particularly western and north central Oklahoma.

Extent

The Planning Area may experience a high temperature near 104 degrees with a relative humidity of 50 percent for a heat index of 131 which puts residents in extreme danger. Washita County and all participating jurisdictions consider a minor heat incident as anything in the caution areas on the Heat Index Scales and a Washita heat incident is anything in the danger area on the Heat Index Scales. See the Heat Index Scales below.



Washita County anticipates that in the future extreme heat temperatures of 80 with high humidity of 90 to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events
The probability of extreme heat events occurring in Washita County is low.

Vulnerability and Impacts
Washita County and participating jurisdictions is vulnerable to extreme heat. Heat kills by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.

Young children, elderly people, and those who are sick or overweight are more likely to become victims to extreme heat. Other conditions that can limit the ability to regulate temperature include fever, dehydration, heart disease, mental illness, poor circulation, sunburn, prescription drug use, and alcohol use. Another segment of the population at risk is those whose jobs consist of strenuous labor outside. When temperatures reach 90 degrees and above, people and animals are more likely to suffer sunstroke, heat cramps, and heat exhaustion.

Another extreme heat hazard is air pollution. During summer months, consistent high temperatures and stagnant airflow patterns cause a build-up of hydrocarbons to form a dome-like ceiling over large cities. The abundance of factories, automobiles, lawn equipment, and other internal combustion machines emit high particulate matter that builds and worsens with the increase in temperature. The resulting stagnant, dirty, and toxic air does not move away until a weather front arrives to disperse it.

The local Red Cross, public utilities, fire agencies, County health department, and other volunteer organizations implement short term programs such as fan and air conditioner distribution, senior checkups, and voluntary or mandatory water conservation. Communities and rural residents have historically managed to address short-lived Drought or Extremely Hot/Dry Seasonal Weather with volunteer activities such as those mentioned above. Additionally extreme heat can cause brownouts and loss of power. Generators are needed at all critical facilities, included schools, to maintain operability during power outages as a result of heat.

At times in extreme heat situations local ambulance service has accompanied the participating jurisdictions fire departments on calls to rehabilitate the emergency responders.

Livestock and crops can also become stressed, decreasing in quality or in production, during times of extreme temperatures. This has the potential to affect the economic stability of the county.

Extreme heat poses the risk of heat exhaustion or heat strokes to people who over exert themselves and fail to be sufficiently hydrated. Municipal water systems often have an increased burden keeping sufficient water supply to their citizens during periods of extreme heat, especially when low or no rainfall is occurring.

County and all participating jurisdictions vulnerability lies with access to public facility during extreme heat weather. Special needs residents cause a particular concern and need for awareness during power outages caused by extreme heat.

Unique facilities per jurisdiction are listed below:

County – District Barns, Courthouse and Radio Communication Towers.
All participating jurisdictions – Town and City Halls, Fire Departments and Senior Citizen Centers.
Town of Corn – Corn Heritage Village.
City of New Cordell – Cordell Memorial Hospital, Cordell Christian Home and Integris Village.
All participating schools – all school campuses.

3.4.8 Wildfire

Description

A wildfire is an uncontrolled fire in a rural or wilderness area. The majority of wildfires in Oklahoma occur in the late fall through winter and into early spring, which coincides with dormant vegetation and the time of the year the state receives the least amount of precipitation. A wildfire often begins unnoticed and can spread quickly, lighting brush, trees and even homes. It may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, lightning or arson. There are three different classes of wildfires. A surface fire is common in grasslands or areas with open vegetation and can spread quickly. A ground fire is a dense, very hot fire that has a thick fuel source and significantly damages the soil health where it occurs. Crown fires are those that move by jumping along the tops of trees. Wildfires often begin unnoticed, but are usually signaled by dense smoke that fills the area for miles around.

Location

The rural areas of Washita County has abundant fuel sources of native grass, crops and CRP grass, that are a prime location for wildfires to start and thrive. Warm spring weather with ample rainfall makes for a perfect growing season for prairie grasses, brush and cedar trees. Long, hot and dry periods turn this growth into a tinderbox waiting for ignition. An out of control wildfire can move into populated communities placing both people and structures at risk. The makeup of the unincorporated areas in Washita County is mostly that of farming and ranching. Within its boundaries are large areas of grassland pastures and no till croplands. Most all areas have several red shale canyons which make access to many fires extremely difficult.

All participating jurisdictions have pastureland and/or wooded areas on several sides, especially the west and southwest (pre-dominate wind directions), have increased vulnerability. Crop fields just prior to, during and just after harvest also increase the risk due to the dry nature of the plants.

There are also many creeks as well as the Washita River which pose access problems and delayed firefighting activities to begin. With most farming now being done with no till activities the natural fire breaks these fields once provide are being diminished greatly, allowing for fires to consume large number of acres before being brought under control.

The Town of Bessie has a high fuel load to the east and south, Town Burns Flat to the north and east, Town of Canute to the north, south and west, Town of Colony to the north, south, east and west, Town of Corn to the north, west, south and east, Town of Dill City to the north, south, east and west, Town of Foss to the north, west and south, City of New Cordell to the north, west and south, Town of Rocky to the north, east and south and the Town of Sentinel to the north, west and south. Burns Flat-Dill City Schools, Canute Schools, Cordell Schools Corn Bible Academy and Sentinel Schools are not in the wildland interface. An out of control wildfire driven by high winds could easily jump into one of the towns causing a chain reaction of both brush and structure fires. See high wildfire fuel areas and wildland and urban interface maps in Appendix A.

Previous Occurrences

Wildfire data reported by NCDC is not always current or reflective of the number of events that have occurred. Additionally, State Fire Marshall Data is often incomplete. Washita County Emergency Management provided previous occurrence data below from the years of 1/1/2001 – 12/31/2017 for the wildfire hazard.

Fire Department	Number of Grass, Crop and Wildland Fires Reported	Number of Acres Burned	Cost of Loss Reported
Bessie	119	4,600	$72,450
Burns Flat	171	7,193	$113,289
Canute	269	12,200	$192,150
Colony	105	12,000	$191,750
Corn	149	7,350	$115,760
Dill City	107	7,150	$112,615
Foss	79	5,940	$93,555
New Cordell	133	6,330	$99,697
Rocky	81	2,975	$46,856
Sentinel	110	4,450	$70,100
TOTAL	1,323	70,388	$1,108,222

None of the school districts participating in this plan reported damages from previous wildfire events.

Extent

According to the Southern Wildfire Risk Assessment Portal, flames up to 8 feet in length may impact Washita County; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increased preparedness measures may be needed to better protect homes and property. Washita County and all participating jurisdictions consider a minor wildfire as 2.5 or less on the Southern Wildfire Risk Assessment Portal and a Washita wildfire is considered 3 and above on the Southern Wildfire Risk Assessment Portal.

	1	Lowest Intensity	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
	1.5		
	2	Lowest Intensity	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
	2.5		
	3	Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
	3.5		
	4	High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
	4.5		
	5	Highest	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

(http://www.southernwildfirerisk.com/map/index/public)

Washita County anticipates that in the future fires of 1-2 on the Southern Wildfire Risk Assessment Portal to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events

Although the number of incidences indicate that wildfires are likely to occur, most wildfires are small in size and contained by local resources. A small wildfire is considered to be 160 acres or less. Because growth within the wildland/urban interface has been limited this helps keep the wildfire threat lower. However, due to recent large fires in neighboring counties that Washita County firefighters have assisted with, wildfire is considered to be a major threat to the county overall. The probability of wildfire events occurring in Washita County is high.

Vulnerability and Impacts

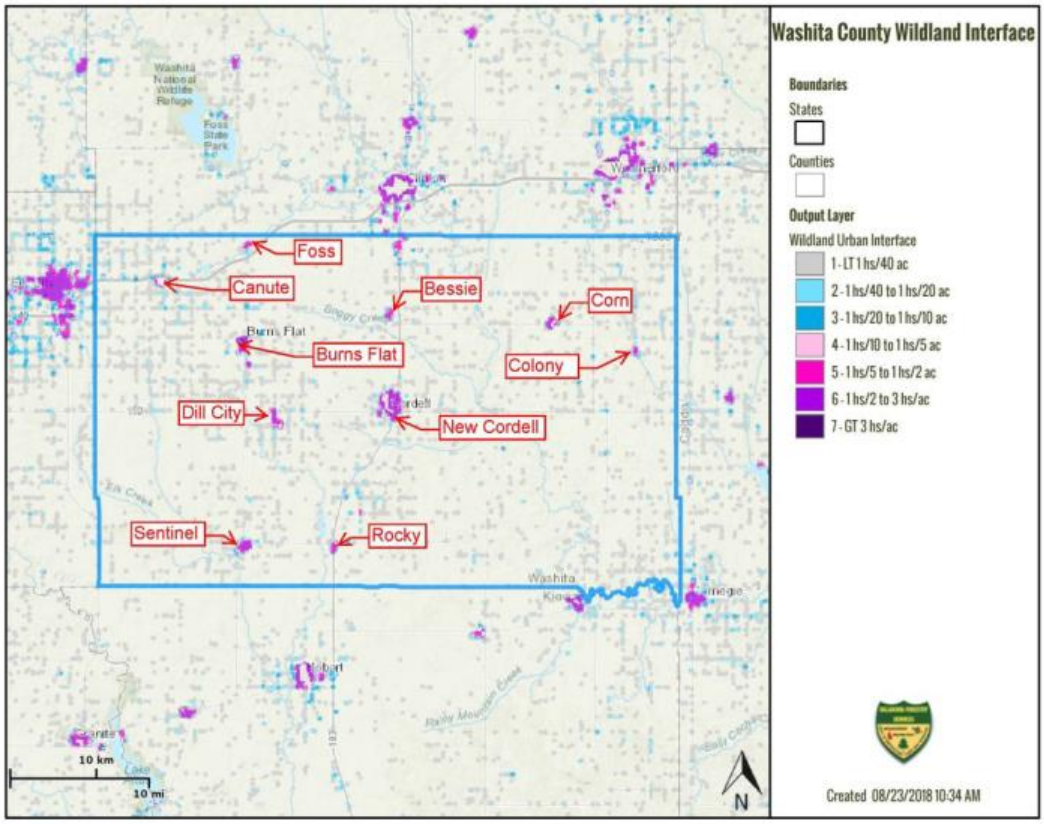
Periods of drought, dry conditions, high temperatures, and low humidity set the stage for wildfires. The sparsely populated tall grassed range lands are capable of experiencing large sweeping fires. Ironically, fire suppression is capable of creating larger fire hazards, because live and dead vegetation is allowed to accumulate in areas where fire has been excluded. The especially large accumulations of deadfall throughout the county resulting from the severe ice storms of 2012 and 2016, is becoming a concern to firefighters. Cedar trees in the county are increasing 5-10% per year and that is also a concern for wildfires.

Four out of five wildfires are human caused, usually as debris burns, arson, or carelessness. Lightning strikes are another leading cause of wildfires. Other sources of ignition include railroads, catalytic converters on automobiles, and spontaneous ignition of hay bales. Wildfires that do not encounter a human population are difficult to calculate damages. Homes and businesses that are burned in naturally occurring fires are usually privately owned. When wild lands are destroyed by fire, the resulting erosion can cause heavy silting of streams, rivers, and reservoirs. Serious damage to aquatic life, irrigation, and power production then occurs.

Mitigation and rapid emergency response are the most effective activities for reducing the short-term impact of wildfires. There are active volunteer fire departments located throughout the county, all of which operate under a collaborative mutual aid agreement. Washita County fire departments have long advocated use of fire retardant building materials and sprinkler systems on new construction.

All participating jurisdictions have pastureland and/or wooded areas on several sides, especially the west and southwest (pre-dominate wind directions), have increased vulnerability. Crop fields just prior to, during and just after harvest also increase the risk due to the dry nature of the plants. The outer one block perimeter of the municipalities within the county, are somewhat more vulnerable than the center of the towns, since vegetation density is lower in the middle of town. However, the Town of Bessie has a high fuel load to the east and south, Town Burns Flat to the north and east, Town of Canute to the north, south and west, Town of Colony to the north, south, east and west, Town of Corn to the north, west, south and east, Town of Dill City to the north, south, east and west, Town of Foss to the north, west and south, City of New Cordell to the north, west and south, Town of Rocky to the north, east and south and the Town of Sentinel to the north, west and south. Burns Flat-Dill City Schools, Canute Schools, Cordell Schools and Sentinel Schools are not in the wildland interface. They could be at risk with the combination of high temperatures, low dew points, and high winds.

The Wildland Urban Interface map below shows the communities most vulnerable locations.



Wildland Urban Interface-Population and Acres

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	2,253	23.0%	99,076	87.1%
1hs/40ac to 1hs/20ac	658	6.7%	7,579	6.7%
1hs/20ac to 1hs/10ac	256	2.6%	2,091	1.8%
1hs/10ac to 1hs/5ac	188	1.9%	1,224	1.1%
1hs/5ac to 1hs/2ac	872	8.9%	1,758	1.5%
1hs/2ac to 3hs/1ac	4,744	48.4%	1,957	1.7%
GT 3hs/1ac	834	8.5%	94	0.1%

3.4.9 Drought

Description

A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country. When no rain or only a small amount of rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months or years the flow of streams and rivers declines causing water levels in lakes and reservoirs to fall, and the depth of water in wells decreases. If dry weather persists and water supply problems develop, the dry period can become a drought.

Location

All areas of the planning area are equally susceptible to drought.

Previous Occurrences

NWS-NCDC records show that 67 periods of drought were reported in Washita County between 01/01/2001 and 12/31/2017. None of the school districts participating in this plan reported damages from previous drought events.

August 1, 2000-October 31, 2000, an extended period of unusually dry weather began in early August and lasted for 2 months. Many parts of the state did not receive rain in August, with portions of southwest and south central Oklahoma remaining dry for almost 90 days, starting in June. Due largely to Oklahoma's Washita crops of wheat, cotton, and peanuts, which greatly suffered, total agricultural losses were estimated between 600 million and 1 billion dollars statewide. Reservoir levels were also low across southwest and south central Oklahoma, averaging 50 percent of normal.

November 1, 2006, severe to extreme (D2-D3) drought conditions were seen across much of Oklahoma during the month of November despite some precipitation. However, in northern Oklahoma the drought deteriorated to exceptional (D4) drought conditions by the end of the month. The drought that has lasted for more than a year continued to cause water concerns for many communities. Many communities had limited watering activities along with a concern over the availability of adequate drinking water. The low water levels also continued to affect outdoor recreation. Many boat docks and ramps remained on dry ground. Boaters who were able to get in the water also had to be careful due to the lakebed being closer to the surface. This led to the closure of several lakes due to safety concerns. Outdoor recreation activities such as hunting were also affected due to the wildlife dealing with the lack of water and proper vegetation for food. The agriculture industry continued to be hit hard by the drought. Hay crop was small which led to

many ranchers and farmers selling all or part of livestock herds due to the lack of food. The cotton crop was affected by the heat and drought of the summer months. There was also concern that the lack of adequate moisture will affect other future crops that were planted during the fall such as winter wheat. The dry conditions combined with wind caused the spread of several wildfires.

May 1, 2014 - Despite several rounds of shower and thunderstorm activity, rain was fairly sparse through the month. A bout of very warm temperatures through the first half of the month allowed for substantial surface drying and drought conditions worsened across all of Oklahoma. With very few rainfall events over western Oklahoma, D3 (extreme) to D4 (exceptional) drought prevailed through the month.

Extent

Utilizing the Palmer Drought Severity Index (PDSI), the affected jurisdictions of Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel, Burns Flat-Dill City School District, Canute School District, Corn Bible Academy and Sentinel School District consider a drought lasting 6 months or less at -2.99 or lower to be a minor severity. Droughts lasting more than 6 months and at -3.00 and higher, especially summer months, are considered a Washita severity.

Palmer Drought Severity Index

	< -4.0	Extreme Drought
	-3.99 to -3.0	Severe Drought
	-2.99 to -2.0	Moderate Drought
	-1.99 to -1.0	Mild Drought
	-0.99 to -0.5	Incipient Drought
	-0.49 to 0.49	Near Normal
	0.5 to 0.99	Incipient Moist Spell
	1.0 to 1.99	Moist Spell
	2.0 to 2.99	Unusual Moist Spell
	3.0 to 3.99	Very Moist Spell
	> 4.0	Extreme Moist Spell

Washita County anticipates that in the future ›4.0 extreme moist spell to -2.99 to -2.0 moderate drought to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events

The probability a drought occurring in the Planning Area is high.

Vulnerability and Impacts

Washita County and the participating jurisdictions are located in north central Oklahoma which is located in the south central United States. The primary air masses that bring moisture to the county originate in the Gulf of Mexico. Air masses that come from the west are usually stripped of moisture by the Rocky Mountains, and as a result the mean annual precipitation increases from west to east in Washita County by as much as six inches. Average annual precipitation ranges from about 24 inches in western Washita County to 30 inches in the east. On average, the county receives nearly 29 inches of precipitation each year. Given that some of the most historically devastating droughts have occurred in the southwestern and south central portions of the United States, all of Washita County remains vulnerable to future drought events, should they occur.

Drought impacts in a number of ways, spanning all regions and is capable of affecting the economy as well as the environment. Specific impacts on Washita County and the participating jurisdictions can include:

- reduced crop, rangeland;
- increased livestock and wildlife mortality rates;
- reduced income for farmers and agribusiness;
- increased fire hazard;
- reduced water supplies for municipal/industrial, agricultural and power uses;
- damage to fish and wildlife habitat;
- increased consumer prices for food;
- reduced tourism and recreational activities;
- unemployment;
- reduced tax revenues because of reduced expenditures; and
- foreclosures on bank loans to farmers and businesses.

The most direct impact of drought in Washita County and the participating jurisdictions is economic rather than loss of life or immediate destruction of property. While drought impacts in Washita County and participating jurisdictions are numerous and often dependent upon the timing and length of individual drought episodes, the greatest impacts of drought are usually experienced in the agricultural community because Washita County and participating jurisdictions is largely an agricultural county. In addition to the obvious direct losses of both crop and livestock production due to a lack of surface and subsurface water, drought is frequently associated with increases in insect infestations, plant disease, and wind erosion. For example, a reduction in crop and rangeland productivity would result in reduced income for farmers and agribusiness, and increased prices for food, higher unemployment, reduced tax revenues because of reduced expenditures, possibly increased crime and foreclosures on bank loans to farmers and businesses, and disaster relief programs.

Another aspect of agriculture and drought is the lack of vegetation for grazing and/or hay production. The residents of Washita County and participating jurisdictions have qualified for drought relief assistance through the USDA. The brittle grass, brush and undergrowth become ready fuel for wildfires. These conditions result in the farmer being forced to prematurely sell livestock or face losses through death of animals. Drought also increases the risk of wildfires.

The ripple effect of reduced farming income as the result of drought also extends to retailers and others who provide goods and services to others, leading to unemployment, increased credit risk for financial institutions, capital shortfalls and loss of tax revenue for local, state, and federal government.

Of course, one of the most significant potential impacts of drought relates to public and rural water supply. In areas there may be a need to stop washing cars, cease watering the grass and take other water conservation steps. In smaller communities, reduced flow in rivers and streams can have a significant effect on the water amount allowed for municipal use. Hot weather during the summer increases demand and subsequent use of supplies, as well as evaporation. In turn, increased water demand can stress many smaller and/or antiquated delivery and treatment facilities to the point of collapse. Prolonged drought has a much greater impact on rural communities, which usually rely on relatively small watersheds and are especially vulnerable during such periods. A good portion of Washita County and participating jurisdictions rely on water wells for residential use and irrigation for agriculture use.

Water shortages can also affect fire fighting capabilities through reduced water flows and pressures. Most droughts dramatically increase the danger of fires on wild land. When wild lands are destroyed by fire, the resulting erosion can cause heavy silting of streams, rivers, and reservoirs. Serious damage to aquatic life, irrigation, and power production can then occur. There are limited fresh water supply sources throughout Washita County and participating jurisdictions.

Although drought can have a serious impact during winter months, it is most often associated with extreme heat. Wildlife, pets, livestock, crops, and humans are vulnerable to the high heat that can accompany drought. When temperatures reach 90 degrees and above, people and animals are more likely to suffer sunstroke, heat cramps, and heat exhaustion.

Environmental impacts of drought, in addition to those related to impacts discussed previously, include direct damage to plant and animal species, loss of wildlife habitat (wetlands, lakes, and vegetation) and biodiversity, and reduced air and water quality (i.e., through reduced flows). Social impacts typically involve public safety, health, conflicts between water users, reduced quality of life, and inequities in the distribution of impacts and disaster relief.

The greatest concern for school districts is water supply during periods of extreme drought. Schools in Washita County have adequate water supply through the city or town they are located in, so it is unlikely any school districts in this plan would be entirely without water unless a waterline was to break.

3.4.10 Earthquake

Description

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth surface. This sudden motion or trembling is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.

The Richter magnitude is a measure of the amount of energy released by an earthquake. The following table describes the typical effects of earthquakes of various magnitudes. This table should be taken with caution, since intensity and thus ground effects depend not only on the magnitude, but also on the distance to the epicenter, ground conditions, construction standards, and other factors.

Location

There have not been any felt earthquakes in Washita County and participating jurisdictions in recent years. The location of the hazard area consists of all of Washita County including the jurisdictions of Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel, Burns Flat-Dill City School District, Canute School District and Sentinel School District and Washita County unincorporated areas. No one area is more prone to earthquake than another in the county.

Previous Occurrences

Oklahoma Geological Survey located at the University of Oklahoma shows there has been 1 earthquake in Washita County from 1/1/2001 – 12/31/2017.

Extent

The size of an earthquake can be expressed quantitatively as a magnitude and the local strength of shaking as intensity. The inherent size of an earthquake is expressed using a magnitude. The

following Richter Scale is the most commonly used scale. A minor earthquake in Washita County and all participating jurisdictions is a 4 and below on the Mercalli Scale and a major earthquake in Washita County and all participating jurisdictions is a 5 and above on the Mercalli Scale.

Magnitude	Mercalli	Description	Earthquake Effects
2	I	Instrumental	Not felt except by a very few under especially favorable conditions.
	II	Feeble	Felt only by a few persons at rest, especially on upper floors of buildings.
3	III	Slight	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
	IV	Moderate	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
4	V	Rather Strong	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5	VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
	VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6	VIII	Destructive	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
7	IX	Ruinous	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
	X	Disastrous	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
8	XI	Very Disastrous	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
	XII	Catastrophic	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

(http://earthquake.usgs.gov/learn/topics/mercalli.php)

Washita County anticipates that in the future 2-3 on Richter Scale to occur in any part of Washita County and/or in any part of the participating jurisdictions.

Probability of Future Events
The probability an earthquake occurring in Washita County is very low.

Vulnerability and Impacts
Vulnerabilities include all structures, homes, businesses and transportation infrastructure, roads and bridges, water, sewer, oil and gas pipe lines, electrical supply systems, etc. The impacts caused by an earthquake would be people misplaced, left unemployed, power outages, lack of potable water or water to fight fires, transportation routes shut down causing people and emergency responders to find alternate routes, possible ground water contamination from broken pipelines and cell towers damaged resulting in loss of cell phone service.

None of the schools in Washita County are constructed to withstand earthquake events. Schools may be impacted from a Washita to minor structural damage. The main concern is items falling off shelves or unsecured furniture falling. The situations could cause injury if a student or faculty member were in the way of falling objects.

3.4.11 Dam Failure

Description
Dams can fail by several different means. Three general failure models include:

a. Natural disaster related failure: such as when the dam is overtopped by flood waters, which creates a breach through the embankment.
b. Intrinsic structural failure, (including foundation problems) either under sunny-day circumstances or during high reservoir levels.
c. Failure resulting from an act of terrorism or sabotage.

Location
There are numerous soil conservation dams and small farm pond dams in Washita County. The National Inventory of Dams (NID) database was a resource used in the Washita County dam failure assessment. Through Congressional authorization, (National Dam Inspection Act - Public Law 92-367) the US Army Corps of Engineers inventoried dams in the United States. The Corps maintains and updates the NID authorized by the Water Resources Development Act of 1986 (Public Law 99-992). The Corps also collaborates close with FEMA and state regulatory offices to obtain more accurate and complete information.

Dams in the NID meet at least one of the following criteria:
- High hazard classification – loss of human life is likely if the dam fails
- Equal or exceed 25 feet in height and exceed 15 acre-feet in storage
- Equal or exceed 50 acre-feet storage and exceed 6 feet in height

Cobb Creek Dam No. 1 is located six miles northwest of Colony. Travel north from the north side of Colony on Watan Road (turns into N2420 Rd.) for four miles, turn left (west) onto E 1110 Rd. and travel one mile where road turns into CR E1100, continue on for one mile to dam. Oak Creek Dam No. 5 is located from the four way stop in Mt. View, go approximately one mile west on Highway 9, then north on N2370 approximately 1.5 miles, turn left (west) on E1290 and go three miles and turn right (north) onto N2330 Road, go one mile. The dam is 0.2 miles to the right. Oak Creek Dam No. 8 is located from the intersection of Hwy. 9 and 115 in Mt. View, go north on Hwy. 115 for 2.5 miles and turn left (west) onto E1300 Rd., go 2.25 miles and the dam in .25 miles north of road. Oak Creek Dam No. 2 is located 7 miles north of the Town of Gotebo. Oak Creek Dam No. 3 is located six miles east and 9 miles south of Cordell. Oak Creek Dam No. 4 is located from the

intersection of Highways 9 and 54 in Gotebo, go north on Hwy. 54 for six miles and turn left (west) onto a dirt road and go .4 miles to the dam. Oak Creek Dam No. 5 is located from the four way stop in Mt. View, go approximately one mile west on Highway 9, then north on N2370 Rd. approximately 1.5 miles, turn left (west) onto E1310 Rd. and travel one-half mile and turn right (north) onto N2380 Rd., go two miles, turn left (west) on E1290 and go three miles and turn right (north) onto N2330 Rd., go one mile. The dam is .2 miles to the right. Cavalry Creek Dam No. 20 is located from Hwy. 183 and 14th St. in Cordell, go 1 ½ miles west, dam is on the south side of the road. Cavalry Creek Dam No. 24 is located from Hwy. 183 and 14th St. in Cordell, go west one mile, then ½ mile north, then east to dam. Boggy Creek Dam No. 18 is located from I-40, exit 53, to Hwy. 44, go 3.25 miles south, then 4 miles east. Boggy Creek Dam No. 27 is located from junction of Hwy. 183 and Hwy. 183A, go west 1/8 mile to dam. Turkey Creek Dam No. 7 is located from Interstate 40 at Foss, go three miles west, exit to old Highway 66 and go west into dam. Turkey Creek Dam No. 8 is located from the intersection of Interstate 40 and Hwy. 44 (0.5 mile south of Foss), go south on Hwy. 44 for one mile, then .5 miles west. The dam is .5 miles west into pasture. Turkey Creek Dam No. 12 is located five miles east of Clinton on I-40, exit Stafford Rd., three miles west, left into dam. Turkey Creek Dam No. 9 is located thirteen miles west of Clinton on Highway 66 and 1.5 miles south. Cobb Creek Dam No. 2 is located one mile west of the center of Colony on OK Hwy. 54B and then go one mile north on a dirt, unnamed road to the dam. Cobb Creek Dam No. 3 is located at the intersection of N. 2420 Rd. and E. 1150 Rd. in Colony, travel north on N. 2420 Rd. for 2.75 miles. The dam is east of the road .25 miles. Turkey Creek Dam No. 10 is located 3½ miles north of Burns Flat on the east side of the road. Hobart Lake is located ½ mile west and 1 mile north of Rocky. Clinton Lake is located on I-40 Exit 50, go ½ mile north on Clinton Lake Rd.

Washita County Dams

Dam Name	Owner	River	Nearest City	Hazard Level
Calvalry Creek Site-20	Wa. Co. Cons. Dist.	Cavalry Creek	Cordell	H
Calvalry Creek Site-24	Wa. Co. Cons. Dist.	Cavalry Creek	Cordell	H
Oak Creek Site-008	Wa. Co. Cons. Dist.	Washita River	Mt. View	H
Oak Creek Site-004	Wa. Co. Cons. Dist.	Oak Creek	Mt. View	H
Oak Creek Site-002	Wa. Co. Cons. Dist.	Oak Creek	Mt. View	H
Oak Creek Site-005	Wa. Co. Cons. Dist.	Gyp Creek	Mt. View	H
Oak Creek Site-003	Wa. Co. Cons. Dist.	Oak Creek	Mt. View	H
Cobb Creek Site-002	Deer Creek Cons. Dist.	Bull Creek	Colony	H
Cobb Creek Site-003	Deer Creek Cons. Dist.	Spring Creek	Colony	H
Boggy Creek Site-27	Wa. Co. Cons. Dist.	Boggy Creek	Bessie	H
Cobb Creek Site-001	Deer Creek Cons. Dist.	Cobb Creek	Colony	H
Boggy Creek Site-18	Wa. Co. Cons. Dist.	Boggy Creek	Cloud Chief	H
Turkey Creek Site-07	Wa. Co. Cons. Dist.	Monument Creek	Foss	H
Turkey Creek Site-09	Wa. Co. Cons. Dist.	Sand Creek	Foss	H
Turkey Creek Site-08	Wa. Co. Cons. Dist.	Turkey Creek	Foss	H
Turkey Creek Site-12	Wa. Co. Cons. Dist.	Turkey Creek	Parkersburg	H
Turkey Creek Site-10	Wa. Co. Cons. Dist.	Turkey Creek	Foss	H
Hobart Lake	City of Hobart		Rocky	H
Clinton Lake	City of Clinton	Turkey Creek	Canute	H

Extent

Dam failures have not occurred in any years between 2001 and 2017. Damages to personal property are estimated at $0.00.

Hazard classifications used by the Oklahoma Water Resources Board (OWRB) to identify dams are based upon their location and the population density located downstream from the structures. (The table below has been added to this plan.)

Hazard	Loss of Life	Economic Loss (Property)
Low	None (no probable future development exists)	Minimal (undeveloped, occasional structure or agr.)
Significant	None (potential for future development exists)	Appreciable (notable agriculture, industrial or structural)
High	Yes (dam failure would likely result in loss of life)	Excessive (extensive community, industrial or agriculture)

Significant hazard structures are so designated because of potential loss of life on roadways and/or loss of bridges.

The program requires inspections every five and three years for low and significant hazard structures, respectively.

Should the dam experience a partial failure or a major seepage releasing one foot of water or less into the swash zone this would be considered a minor event. This release would flow through the agriculture area only and crops would survive. The water would flow on to the nearby creek. The jurisdictions consider a major severity dam failure classified as a severe event releasing one or more feet of water into the swash zone which will ruin crops, multiple roads and bridges, homes and businesses, and railroads.

If a dam breach should occur, Washita County and participating jurisdictions would consider a minor dam breach that would release 1 ft. of water that would remain in the river channel. A major breach would be where more than 1 ft. of water would be released and flood outside the river banks flooding homes and covering highways.

Because many of these dams are old structures and, as a result, require periodic repair. The OWRB requires submittal and subsequent approval of plans and specifications prior to dam modifications. Staff also coordinates periodic training sessions and workshops on dam safety issues and regulations for dam owners and engineers. The NRCS offers technical assistance in the construction of small farm ponds and related structures.

Inundation Maps for all high hazard dams are located in Appendix A.

Previous Occurrences

There are no previous occurrences of dam failure within the participating jurisdictions.

Probability of Future Events

Since no dam breaks have occurred within the participating jurisdictions, probability of a dam failure is rated as very low.

Vulnerability and Impacts

The vulnerability of a dam failure in participating jurisdictions would be to the roads, bridges and utilities that are downstream of the dam and potential loss of life if vehicles were involved. Damage to or loss of these roads, bridges and utilities would impact the citizens and county through the loss of communication infrastructure, mail, school buses, access for emergency vehicles and utilities such as electrical power. There would be the added expense of taking alternate routes and the cost of repairing the roads and bridges.

Based on the fact that there is no history of dam failure in Washita County or participating jurisdictions, that listed dams are regularly inspected and well maintained, and that there is a small likelihood of a dam breach occurring, Washita County and participating jurisdictions are rated negligible vulnerable to dam failure. Losses of residences, livestock, crops, roads, bridges, utilities and other infrastructure would be possible should a dam breach occur. The uncontrolled release of water resulting from a dam breach would likely cause losses of structures, utilities, vehicles, homes, livestock, and transportation infrastructure where roadway and bridges could be washed out. A loss of the transportation infrastructure from a breach has the potential to isolate residents in the area and slow emergency response.

As long as dams exist so does the chance for failure. Resources in the flood zones included agricultural, roads, bridges and public utility infrastructure. The county floodplain program restricts building of habitable structures below dams. No future buildings or critical facilities are planned and infrastructure is limited to bridges and roads.

There is no record of dam failure in the history of Washita County and participating jurisdictions. There are sixteen dams in the participating jurisdictions that are designated as high hazard.

This designation simply reflects a dam's potential for doing damage downstream if it were to fail and does not mean that a dam is in need of repair. The areas impacted (swash zones) are delineated using dam breach analysis. However, due to the low population downstream of the dams, the Corps of Engineers has not conducted such analysis.

Cobb Creek Dam No. 1 will impact six houses, Oklahoma Highway 54B and County Rd. 2420 may be inundated by a dam breach. Other homes in the area may be affected by flooded road. Oak Creek Dam No. 5 will impact two houses, one seasonal cabin and six county roads may be inundated by a dam breach. Oak Creek Dam No. 8 will impact one seasonal cabin and two county roads and bridges may be inundated by a dam breach. Oak Creek Dam No. 2 will impact 3 houses and a bridge on Hwy. 54. Hwy. 54 may be inundated by a dam breach. Oak Creek Dam No. 3 will impact 3 houses and a bridge on Hwy. 54. Hwy. 54 may be inundated by a dam breach. Oak Creek Dam No. 4 will impact 1 house, Hwy. 54 and four county roads and bridges may be inundated by a dam breach. Oak Creek Dam No. 5 will impact two houses, one seasonal cabin and six county roads and bridges may be inundated by a dam breach. Calvary Creek Dam No. 20 will impact one home by a dam breach. Calvary Creek Dam No. 24 will impact several homes along the creek within Cordell City limits by a dam breach. Boggy Creek Dam No. 18 will impact two railroads and Hwy. 283 by a dam breach. Boggy Creek Dam No. 27 will impact one home and Hwy. 183A and Hwy. 183 by a dam breach. Turkey Creek Dam No. 7 will impact Interstate 40 and Highway 66 by a dam breach. Turkey Creek Dam No. 8 will impact two houses, the south access road for Interstate 40, the north frontage road for I-40 and both the east and west bound lanes of Interstate 40 may be inundated by a dam breach. Turkey Creek Dam No. 12 will impact Highway 66 by a dam breach. Turkey Creek Dam No. 9 will impact two homes by a dam breach.

CHAPTER FOUR: MITIGATION STRATEGY

4.1 Capability Assessment

Each community has a unique set of capabilities, including authorities, policies, programs, staff, funding and other resources available to accomplish mitigation and reduce long- term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning team identified capabilities that currently reduce disaster losses or could be used to reduce losses in the future, as well as capabilities that inadvertently increase risks in the planning area. The following is a capability assessment for Washita County and participating municipalities and school districts.

4.1.1. Existing Institutions, Plans and Ordinances

This table provides a summary of the plans, codes, policies, and ordinances currently in place in each participating jurisdiction. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the hazard mitigation objectives outlined in this document. This list does not necessarily reflect every plan, ordinance, or other guidance document within each jurisdiction; however, this is a summary of the guidance documents known to and recommended for review by the members of the planning committee. The checkmark (√) indicates that the jurisdiction reported having the authority to implement the specified regulatory tool and that the tool is currently in place.

Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance	Special Purpose Ordinance	Growth Management Ordinance	Site Plan Review Requirements	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Emergency Response Plan\Emergency Action Plan	Post-Disaster Recovery Plan	Plan Manager
Washita Co.				√		√				√	√	√
Bessie								√				√
Burns Flat	√	√		√		√	√	√	√	√	√	√
Canute	√	√	√	√		√		√		√	√	√
Colony												√
Corn		√						√		√		√
Dill City								√		√		√
Foss							√	√		√		√
New Cordell	√	√	√	√	√	√	√	√	√	√	√	√
Rocky								√				√
Sentinel	√	√	√			√		√	√	√	√	√
Burns Flat-Dill City Sch.										√		√
Canute Sch.										√		√
Cordell Sch.										√		√
Corn Bible Academy Sch.										√		√
Sentinel Sch.										√		√

Legal and Regulatory Capabilities

As indicated in the previous table, Washita County and its incorporated jurisdictions have several policies, programs, and capabilities, which help to prevent and minimize future damages resulting from hazards. These tools are valuable instruments in pre and post disaster mitigation as they facilitate the implementation of mitigation activities through the current legal and regulatory framework. These policies, programs, and capabilities are described in greater detail for Washita County and the participating jurisdictions, as well as the State and Federal levels.

Building Code

Building codes regulate construction standards and are developed for specific geographic areas of the county. They consider the type, frequency, and intensity of hazards present in the region.

Structures built to applicable building codes are inherently resistant to many hazards such as strong winds, floods, and earthquakes, up to cel1ain levels of severity. Due to the location specific nature of the building codes, these are very valuable tools for mitigation.

Zoning Ordinance

Zoning ordinances from each participating jurisdiction were also reviewed for input in the Hazard Mitigation Plan. Zoning ordinances help communities direct the growth of housing, commercial, industrial, agricultural, and public lands in a methodical and logical order.

With different jurisdictions participating in this hazard mitigation plan, funding capabilities can vary widely. All of the jurisdictions have budgets to utilize, and Community Development Block Grants (CDBG) AND Rural Economic Action Plan (REAP) can be utilized by the cities, towns, and sometimes counties (depends on the project and income level of the affected residents). All of the jurisdiction can utilize special bonds to finance projects but they have to be approved by the citizens if they are tax-based bonds (the schools often utilize these but the cities, towns and county are also eligible). All participating jurisdictions can utilize capital improvements projects funding if they have set up their budgets to do so. Fees from water, sewer, gas and/or electric usage are options for communities that supply these utilities - Bessie, Burns Flat, Canute, Colony, New Cordell, Corn, Dill City, Foss, Rocky and Sentinel.

Subdivision Ordinance

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

Special Purpose Ordinance

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

Growth Management Ordinance

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

Site Plan Review Requirements

Site plan review requirements are used to evaluate proposed development prior to construction. An illustration of the proposed work, including its location, site elevations, exact dimensions, existing and proposed buildings, and many other elements are often included in the site plan review requirements. The site plan reviews offer an opportunity to incorporate mitigation

principles, such as ensuring that the proposed development is not in an identified hazard area and that appropriate setbacks are included.

Comprehensive Plan

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

Capital Improvement Plan

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

Economic Development Plan

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

Emergency Operations Plan/Emergency Action Plan

Emergency Operations Plan (EOP)/Emergency Action Plan provide an opportunity for local governments and schools to anticipate an emergency and plan the response accordingly. In the event of an emergency, a previously established emergency response plan can reduce negative effects of an event by pre-determining the responsibilities and means by which resources are deployed has been previously determined.

Post-Disaster Recovery Plan

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

Plan Manager

The Plan Manager (department or functional manager) of the existing jurisdictional Plan, Institutions and Ordinances (PIO) is responsible for integrating the hazard mitigation plan and action items into the respective PIO (i.e. Capital Improvement Plan, Emergency Operations Plan/Emergency Action Plan, etc.).

At the time when a jurisdiction undertakes a review or update of its PIO in accordance with their respective review and renewal requirements, those jurisdictions will have the opportunity to include elements of the Hazard Mitigation Plan. The Washita County Emergency Manager

annually will request those jurisdictions provide any updates of any revisions or changes to their existing PIO. The Washita County Emergency Manager would then update the Hazard Mitigation Plan with the revised jurisdiction capabilities, where appropriate.

4.1.2 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is contingent upon its staff and resources. Administrative capability is determined by evaluating whether there are an adequate number of personnel skilled in surveying and Geographic Information Systems.

The table below provides a summary of the administrative and technical capabilities currently in place in each participating jurisdiction. The checkmark (√) indicates that the local government reported maintaining a staff member for the given function.

Administrative and Technical Capability										
Jurisdiction	Planner(s) or Engineer(s) with knowledge of land development and management practices	Engineer(s) or professional(s) trained in construction practices related to buildings and ire	Planner(s) or Engineer(s) with an understanding of natural and/or human caused hazards	Floodplain Manager	Surveyors	Staff with education or expertise to assess the communities vulnerability to hazards	Personnel skilled in GIS and/or HAZUS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers
Washita Co.	Contract Only	Contract Only	Contract Only	√	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Bessie	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Burns Flat	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Canute	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Colony	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Corn	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Dill City	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Foss	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
New Cordell	Contract Only	Contract Only	Contract Only	√	Contract Only	Contract Only	Contract Only	Contract Only	√	√
Rocky	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only
Sentinel	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	Contract Only	√	Contract Only

Staffing Resources

Having a planner or engineer trained in land development, construction practices, or one who has an understanding of natural or man-made hazards are great resources to a community. Having their level of knowledge and expertise will help in the process of assessing and mitigating risks while limiting risk to new development or redevelopment.

Floodplain Management

By employing floodplain management, the jurisdiction can protect its citizens against much of the

devastating financial loss resulting from flood disasters. Careful local management of development in the floodplains results in construction practices that can reduce flood losses and the high costs associated with flood disasters to all levels of government. Participating jurisdictions in NFIP will continue NFIP compliance through floodplain training.

Washita County and the Towns of Bessie, Canute, Colony, Corn, Sentinel and City of New Cordell participate in the NFIP. The Towns of Burns Flat, Dill City, Foss and Rocky (no mapped flood zones within town limits) are not listed as participants in the NFIP, but are investigating what needs to be done for their jurisdictions to become NFIP compliant. These jurisdictions are also in the process of identifying a floodplain manager.

Washita County has been a participant in the NFIP since April 3, 2012, CID # 400223. The Town of Bessie has been a participant in the NFIP since April 3, 2012, CID # 400261. The Town of Canute has been a participant in the NFIP since April 3, 2012, CID # 400274. The Town of Colony has been a participant in the NFIP since April 3, 2012, CID # 400253. The Town of Corn has been a participant in the NFIP since April 3, 2012, CID # 400225A. The City of New Cordell is the Washita County Seat and has been a participant in the NFIP since April 3, 2012, CID # 400224. The Town of Sentinel has been a participant in the NFIP since April 3, 2012, CID # 400442. Each jurisdiction has in place a Flood Damage Prevention Ordinances that restricts development in floodplain areas, through a building development permit system. A copy of these ordinances may be found at the Washita County Emergency Management Office.

There are 0 Repetitive Loss and 0 Severe Repetitive Loss Properties in the Washita County and the Towns of Bessie, Canute, Colony, Corn, Sentinel and City of New Cordell.

Surveyors

Surveyors gather information that is needed by the city engineers or city projects that involve development or redevelopment. A surveyor records geographic conditions and man-made features as they currently exist. Other noted information might include: terrain, drainage, property boundaries and ownership, soil condition, and other physical features.

GIS/HAZUS

GIS (Geographical Information Systems) and HAZUS are powerful resources that the jurisdictions can be used to identify important facts about the community. HAZUS is methodology for estimating potential losses from earthquakes, and floods. HAZUS uses GIS technology to estimate physical, economic, and social impacts of disasters.

Emergency Manager

An emergency manager performs administrative and technical work in the development, implementation, and coordination of the community's emergency management program. This position also acts as the authority in disaster recovery efforts, oversees the disaster training, exercises and public awareness programs, and performs related duties as assigned.

4.1.3 Financial Capabilities

Financial Capability								
Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes	Water, Sewer, Gas, or Electric service Fees	Incur fees for new development	Incur debt through general obligation funds and/or special tax bonds	Community Development Block Grant	Federal funding programs	State funding programs
Washita County	√	√		√	√	√	√	
Bessie	√	√	√	√	√	√	√	√
Burns Flat	√	√	√	√	√	√	√	√
Canute	√	√	√	√	√	√	√	√
Colony	√		√		√	√	√	√
Corn	√	√	√	√	√	√	√	√
Dill City	√	√	√	√	√	√	√	√
Foss		√	√		√	√	√	√
New Cordell	√	√	√	√	√	√	√	√
Rocky	√	√	√		√	√	√	√
Sentinel	√	√	√	√	√	√	√	√

4.1.4 Education and Outreach Capability

Education & Outreach Capability						
Jurisdiction	Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Ongoing public education or information programs	Natural disaster or safety related programs	StormReady Certification	Plan Manager	Public-Private partnership initiatives addressing disaster-related issues
Washita County		√	√		√	
Bessie					√	
Burns Flat	√	√	√	√	√	√
Canute	√	√	√		√	√
Colony					√	
Corn					√	
Dill City					√	√
Foss	√	√		√	√	√
New Cordell	√	√	√		√	
Rocky					√	√
Sentinel	√	√			√	√
Burns Flat-Dill City Schools	√	√	√		√	√
Canute Schools	√	√	√		√	√
Cordell Schools	√	√	√		√	√
Corn Bible Academy Schools	√	√	√		√	√
Sentinel Schools	√	√	√		√	√

Arguably, elementary school is the best place to start for educating the public about emergency preparedness issues. However, countless other education opportunities exist for disseminating emergency preparedness information to diverse populations.

Most, if not all of the following entities / capabilities were identified in Washita County:

- Agribusiness organizations (OSU Extension, Future Farmers of America, CO-Ops, Washita County Cattlemen's)
- Amateur radio organizations (Washita County Amateur Radio Club)
- Annual calendar promotions – National Preparedness month, Fire Prevention Week
- Business/fraternal groups (Lions, Rotary, Optimists, American Business Women's Association, Odd Fellows, Masons, Veterans of Foreign Wars, American Legion)
- Chambers of Commerce (Fairview and Seiling)
- Coalition meetings (Northwest Oklahoma Regional Transportation Planning)
- Direct mailing pieces
- FEMA and other free online training venues
- Insurance groups
- Local Emergency Planning Committees (LEPCs) (Washita County)
- National Weather Service storm spotter training
- Neighborhood watch programs
- Point of Sale (POS) sites
- Parent-Teacher Organizations
- Public education campaigns
- Public lecture series, seminars. Webinars, demonstrations
- Public Service Announcement (PSAs) and other media campaigns
- Schools/student organizations
- Special events (rodeo, county fair, health fairs, street shows)
- Town Hall meetings or topic specific public forums
- Tribal gatherings (Cheyenne-Arapaho, EMS, Flood Plain meetings)
- Utility companies
- Volunteer Organizations Active in Disaster (Red Cross, Southern Baptist Relief)
- Websites, public white boards, Facebook® pages
- Wednesday newspaper inserts or display advertising (Fairview Republican and Dewey County Record)
- Youth groups (YMCA, Boys & Girls Club, Scouting, and entrepreneurial groups).

StormReady

StormReady is a national voluntary program, administered through the National Weather Service, which gives communities the skills and education needed to cope with and manage potential weather-related disasters, before, and during the event. The program encourages communities to take a new pro-active approach.

Plan Manager

The Plan Manager (department or functional manager) of the existing jurisdictional Plan, Institutions and Ordinances (PIO) is responsible for integrating the hazard mitigation plan and action items into the respective PIO (i.e. Capital Improvement Plan, Emergency Operations Plan/Emergency Action Plan, etc.).

At the time when a jurisdiction undertakes a review or update of its PIO in accordance with their respective review and renewal requirements, those jurisdictions will have the opportunity to include elements of the Hazard Mitigation Plan. The Washita County Emergency Manager annually will request those jurisdictions provide any updates of any revisions or changes to their existing PIO. The Washita County Emergency Manager would then update the Hazard Mitigation Plan with the revised jurisdiction capabilities, where appropriate.

4.1.5 School District Capability Assessment

School Districts were asked to provide information on their capabilities as they relate to those outlined for each participating jurisdiction. Each School Superintendent answered the following questions:

1. Has your school district had positive responses to bond issues?
2. Based on population, is the school district population growing or declining?
3. Has the school district taken any measures to protect students during hazard events?
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster.

Burns Flat-Dill City Public Schools

1. Has your school district had positive responses to bond issues? Yes
2. Based on population, is the school district population growing or declining? Held steady the previous two years but had a small decline this year.
3. Has the school district taken any measures to protect students during hazard events? Elementary school has two basements and high school has one.
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster: None.

Other capabilities identified include: Burns Flat-Dill City Public Schools has a three year facilities plan that is used and updated regularly. The district has an Emergency Action Plan in place and an ongoing CO-OP plan. Burns Flat-Dill City Schools conduct drills multiple times each year and hazard weather awareness programs. The District also identified the following: Local citizen groups willing to assist with mitigation activities; ongoing public education or information programs; natural disaster or safety related programs; Public-private partnership addressing disaster related issues. The district can continue to expand on capabilities through continued education, and coordination with Washita County Emergency Management.

Canute Public Schools

1. Has your school district had positive responses to bond issues? Yes
2. Based on population, is the school district population growing or declining? The school district is growing.
3. Has the school district taken any measures to protect students during hazard events? Yes, new safe room has been built.
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster: None.

Other capabilities identified include: Local citizen groups willing to assist with mitigation activities; ongoing public education or information programs; natural disaster or safety related programs; Public-private partnership addressing disaster related issues. The district has an Emergency Action Plan in place. The district can continue to expand on capabilities through continued education, and coordination with Washita County Emergency Management.

Cordell Public Schools

1. Has your school district had positive responses to bond issues? Yes, the last bond was passed in 2014.
2. Based on population, is the school district population growing or declining? The school district is experiencing a slight decline. We have lost 70 students in the last 2 years.
3. Has the school district taken any measures to protect students during hazard events? Yes, through the bond issues the district has built safe rooms that can accommodate all students and staff. We have also been able to install door access controls on all of our main entrances as well as upgrades to video security systems. We have also installed solid wood doors in some of our buildings. We are currently looking into security film for glass doorways, this film would slow down any intruder as it would make it more difficult to enter the building.
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster: None.

   Other capabilities identified include: Cordell Public Schools has capital improvements plan. The district has an Emergency Action Plan and an ongoing CO-OP plan. Cordell Public Schools conduct drills multiple times each year to meet the state requirements for safety drills. The District also identified the following: Local citizen groups willing to assist with mitigation activities; ongoing public education or information programs; natural disaster or safety related programs; Public-private partnership addressing disaster related issues. The district can continue to expand on capabilities through continued education, and coordination with Washita County Emergency Management.

Corn Bible Academy Private School

1. Has your school district had positive responses to bond issues? As a private school we cannot do bonds.
2. Based on population, is the school population growing or declining? We draw students from all over western Oklahoma so the population is from a large area and holds steady from year to year.
3. Has the school district taken any measures to protect students during hazard events? We have practice drills in the event of a fire, tornado or intruders. We also have a storm shelter if needed.
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster: In the past ten years we haven't filed any insurance claims for our building for any disasters. We have experienced strong winds and ice storms but no building damage.

Other capabilities identified include: Corn Bible Academy has capital improvement plan. The district has an Emergency Action Plan and an ongoing CO-OP plan. Corn Bible Academy conduct drills multiple times each year to meet the state requirements for safety drills. The Academy also identified the following: Local citizen groups willing to assist with mitigation activities; ongoing public education or information programs; natural disaster or safety related programs; Public-private partnership addressing disaster related issues. The district can continue to expand on capabilities through continued education, and coordination with Washita County Emergency Management.

Sentinel Public Schools

1. Has your school district had positive responses to bond issues? The district has not had a bond for twenty years.

2. Based on population, is the school district population growing or declining? The district population has grown slightly this year.
3. Has the school district taken any measures to protect students during hazard events? The district performs all the necessary safety drills each year.
4. List any damages your school has experienced during the last 10 years due to weather events or natural disaster: Damages to the Sentinel Activity Center was damaged by a tornado a few years ago.

   Other capabilities identified include: Local citizen groups willing to assist with mitigation activities; ongoing public education or information programs. The district can continue to expand on capabilities through continued education, and coordination with Washita County Emergency Management.

Capability Assessment Conclusion

Mitigation requires capabilities necessary to reduce loss of life and property by lessening the impacts of disasters. Each jurisdiction has demonstrated a set of capabilities unique to their community. The capability assessment finds that Washita County and the participating jurisdictions collectively have a significant level of legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies. All of the jurisdictions have the legal capabilities or ordinances and codes in place that might help reduce loss due to a disaster. The jurisdictions including school districts have a range of staff trained or have knowledge about hazards and their impacts. While some jurisdictions lack an emergency manager in their community, there is the Washita County Emergency Management Department that can provide assistance.

All participating jurisdictions have financial resources that can be used towards mitigation. Most of those resources are capital improvement funds or tax bonds. All communities in Washita County have local citizen groups that are willing to assist in emergency management efforts. Most jurisdictions participate in the safety related school programs. All participating jurisdictions can utilize burn bans. These jurisdictions can expand their capabilities by implementing wildfire plans. The majority of the participating jurisdictions have an Emergency Operations Plan in place.

The Washita County Planning Team put a significant amount of effort into making this plan a useful document. Because the information in this plan is relevant, and was developed by the planning team members directly, the plan will be more easily integrated into the plans and ordinances listed in this section. The Emergency Manager for the county and each jurisdiction, through maintenance of this document, will provide a copy of this plan to parties responsible for other planning processes in the planning area. This document can be integrated into other plans when determining future growth areas, capital improvement projects, building code and ordinance proposals, and prioritizing local funds.

4.2 Mitigation Goals

During the update of the Washita County Hazard Mitigation Plan the goals were reviewed and were found to be adequate for the update of the plan***.***

Goal 1: To increase countywide ability to communicate and respond quickly and efficiently to disasters.
Goal 2: To enhance public awareness and understanding of hazard mitigation.
Goal 3: To reduce repetitive flooding in flood-prone areas of Washita County.
Goal 4: To develop and educate responders and health care providers regarding mitigated measures for specific hazards.
Goal 5: To enhance pre-disaster and prevention activities.

4.3 Action Item Prioritization

The Washita County Hazard Mitigation Planning Committee reviewed, analyzed and prioritized the risk assessment studies. The STAPLEE guide was used to prioritize the action items and insure that an appropriate Cost Benefit performance is maintained. The goals and objectives listed below were determined to be those that would have the greatest benefit in hazard reduction to the County. This priority has been revised to reflect the current hazards, and will be readdressed in the five-year update to account for any growth and development in the planning area:

Evaluation Category	
Social	Members of Local, County and State Government were members of the Hazard Mitigation Planning Committee and had input throughout the planning process. It must be noted that many small town political leaders are also business or professional persons. Existing community plans were used wherever possible. Members of the Media were contacted and invited to attend all HMPC meetings.
Technical	The following Persons/Agencies were consulted as to the technical feasibility of the various projects: Washita County Commissioners, Oklahoma State University Extension Service and Washita County Health Departments. All of these had their comments and suggestions incorporated.
Administrative	Staffing for proper implementation of the plan currently will rely on existing members of the various agencies involved. It is the opinion of the HMPC that insufficient staff is available currently due to budget constrains as staff has been cut to a minimum and many agencies have staff members who are overloaded now. Technical assistance is available from South Western Oklahoma Development Authority and various State Agencies. Some local jurisdictions have incorporated Hazard Mitigation efforts into their Capital Improvement Plans. The Local Emergency Planning Committee in Washita County, led by the Washita County Emergency Management Director, has agreed to an annual review and assessment of the Plan and its progress. Operations Costs are under discussion by the relevant department heads.
Political	A representative of the Washita County Commissioners and each local government Mayor or his representative attended the HMPC meetings and were consulted on all aspects of the Plan.
Legal	Members of the HMPC discussed legal issues with the County Commissioners, and it was their opinion that no significant legal issues were involved in the projects that were selected by the HMPC.
Economic	Economic issues were the predominant issues discussed by all concerned. Each entity felt that the projects selected would have a positive effect in that the projects would attract business and recreation to the area as well as help the community be better prepared for a disaster. Funding for the various projects was the Washita concern as local budgets were not capable of fulfilling the needs due to the economic down turn. Reliance on outside grants will be relied on heavily for completion of projects. Some communities felt that it would require a bond issue to fulfill the project, while others felt that the funds could be raised by cutting funding to other projects or relying on grant assistance.
Environmental	Oklahoma Department of Environmental Quality, Oklahoma Forestry Service, and the Oklahoma Water Resources Board were all consulted as to the environmental impact of the various projects and it was felt that there would be no negative impact. Local governments are currently considering zoning of environmentally sensitive areas.

Much progress has been made in Washita County since the previous update of the hazard mitigation plan. The following action items have been reviewed, and updated as necessary for the Hazard Mitigation Plan Update.

4.4 Action Items

All other action items from the previous plan are still relevant and are included in the current projects below.

4.4.1	Mitigation Project A- Outdoor Warning Devices
Hazard(s) Addressed	Tornado, High Winds, Lighting, Hail, Dam Failure
Jurisdictions	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Purchase and install additional outdoor warning devices for the incorporated communities and schools of Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools in Washita County in order to supplement current devices. The Emergency Management Directors should review the effectiveness of the current warning devices and upgrade as needed. Some current devices are not reaching all areas of the communities as growth has caused expansion beyond the capabilities of the original devices. Current systems need additional capability to warn communities of more than one hazard.
Responsible Party	Mayors and Emergency Managers of each community, Superintendents of each school and Washita County Emergency Management
Potential Implementation Timeline	Ongoing as funding becomes available
Cost	$30,000 per unit
Potential Funding Sources	HMGP, Community budget, REAP funds, Dept. of Agriculture, Public Safety and school budgets.

4.4.2	Mitigation Project B- Early Warning Communications System intercom or phone capability.
Hazard(s) Addressed	Tornado, High Winds, Lightning, Hail, Wildfire, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Communication is important in any situation, especially a disaster. The city/towns, county and schools work hand-in-hand with the weather experts to distribute accurate warning information that would reduce injury and death.
Responsible	Mayors or Emergency Managers of each community; Washita County Emergency

Party	Management, Superintendents of each school.
Potential Implementation Timeline	Ongoing as funding becomes available
Cost	$20,000-equipment
Potential Funding Sources	County/City/Town/School Budgets, grants

4.4.3	Mitigation Project C-Public Education and Awareness Campaign
Hazard(s) Addressed	Lightning, Hail, Tornado, High Winds, Winter Storms, Flooding, Extreme Heat, Wildfire, Drought, Earthquake, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Prepare a public education and awareness campaign for Washita County and the communities of Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools in Washita County. This should include distributions of awareness and safety literature through utility inserts and to school children to take to the parents. Much of this literature is available at no cost. This should include information on all hazards identified in this plan.
Responsible Party	Mayors, Emergency Management Director, Superintendents and Red Cross
Potential Implementation Timeline	Ongoing as funding becomes available.
Cost	$10,000
Potential Funding Sources	County/Community Budgets/School Budgets, HMGP

4.4.4	Mitigation Project E-Educate Public on Flood Insurance and the NFIP
Hazard(s) Addressed	Flooding, Dam Failure
Jurisdiction	Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell, Town of Sentinel and Washita County.
Action	Host educational workshops regarding flood insurance and the NFIP for the citizens of Washita County

Responsible Party	Floodplain Coordinator & Emergency Management Director
Potential Implementation Timeline	Conduct workshop on an annual basis as funding is available.
Cost	$10,000
Potential Funding Sources	City/Town Budget, OFMA grant

4.4.5	Mitigation Project F-Develop and Distribute Digital Mapping of appropriate areas which impact Disaster Mitigation and Disaster Recovery.
Hazard(s) Addressed	Lightning, Hail, Tornado, High Wind, Winter Storm, Flooding, Extreme Heat, Wildfire, Drought, Earthquake, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	GPS Identification and Mapping to provide information on high hazard impact areas and used in recovery response.
Responsible Party	Mayors, Emergency Management Director and County Commissioners
Potential Implementation Timeline	Ongoing as funding becomes available.
Cost	$25,000
Potential Funding Sources	City/County Budget, REAP, HMGP

4.4.6	Mitigation Project G-Update Mutual Aid Agreements
Hazard(s) Addressed	Flooding, Tornado, Wildfires, Winter Storms, Earthquakes, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	The mutual aid agreements already in place among County agencies, such as fire departments, should be continued by updating or renewal. It is suggested that other agreements be consummated where possible, such as County Emergency responders enter into agreement with other surrounding Emergency Management Agencies for HAZMAT incidents. Apply for long-rang grant assistance, for continual training and update of equipment.

Responsible Party	Washita County Emergency Management Director
Potential Implementation Timeline	Ongoing as funding becomes available.
Cost	None
Potential Funding Sources	Homeland Security Grants

4.4.7	Mitigation Project H-Construct Safe rooms in County Schools
Hazard(s) Addressed	High Winds, Tornado
Jurisdiction	Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	This project would build safe rooms in all existing and any future construction of school buildings.
Responsible Party	School District Superintendents
Potential Implementation Timeline	Ongoing as funding allows
Cost	$200,000 per school
Potential Funding Sources	School Bond Issues, HMGP, school budgets

4.4.8	Mitigation Project I- Public Education and Awareness Campaign
Hazard(s) Addressed	Lightning, Hail, Tornado, High Wind, Winter Storm, Flooding, Extreme Heat, Wildfire, Drought, Earthquake, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Public awareness of hazards for local citizens. The program will provide detailed information on each hazard, past occurrences and how to prepare and react if an event occurs. This will prepare citizens and help to minimize the risk of any natural hazard event. Such programs include Fire Wise and Storm Ready. Educating public about techniques and regulations pertaining to controlled burns.
Responsible Party	Emergency Managers, Mayors, Fire Chiefs, Oklahoma Forestry Service

Potential Implementation Timeline	1 year
Cost	Less than $10,000
Potential Funding Sources	OK Forestry Service, HMGP, City/Town/County Budget, Grants

4.4.9	Mitigation Project J- Implement red cedar eradication to reduce wildfire potential
Hazard(s) Addressed	Wildfires
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	Implementing red cedar eradication program to reduce wildfire potential.
Responsible Party	Washita County, Emergency Managers, Oklahoma Forestry Services
Timeline	2 years
Cost	Depends on size of project.
Potential Funding Sources	OK Forestry Service, HMGP, NRCS

4.4.10	Mitigation Project K- Install hail resistant roofs on all town/city/county/school buildings
Hazard(s) Addressed	Hail
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	The use of hail resistant roofs will reduce potential structural damages in the future.
Responsible Party	Mayors, Emergency Managers, School Superintendents
Timeline	Ongoing as funding allows.
Cost	$70,000
Potential Funding Sources	HMGP, School Bonds, City/Town/County Budgets

4.4.11	Mitigation Project L-National Flood Insurance Program for four jurisdictions
Hazard(s) Addressed	Flooding and Dam Failure
Jurisdiction	Town of Burns Flat, Town of Dill City, Town of Foss and Town of Rocky
Action	Encourage Town of Burns Flat, Town of Dill City, Town of Foss and Town of Rocky to enroll into the National Flood Insurance Program and meet mitigation criteria for enrollment.
Responsible Party	Mayors
Potential Implementation Timeline	1 Year
Cost	$50,000
Potential Funding Sources	Town Budget, REAP, OWRB

4.4.12	Mitigation Project M-Community Safe Structure for City/Towns and County
Hazard(s) Addressed	Tornado, High Winds
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	Construct a community storm safe shelter to house citizens.
Responsible Party	HMGP and City/Town/County Budgets
Potential Implementation Timeline	Ongoing as funding is available
Cost	$400,000
Potential Funding Sources	Homeland Security Grants, County/City/Town Budget, HMGP

4.4.13	Mitigation Project N-Drill Additional Water Wells
Hazard(s) Addressed	Drought
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.

Action	Drill additional water wells ensuring than an adequate water supply is available for residents of Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Responsible Party	Washita County, Conservation district USDA/NRCS
Potential Implementation Timeline	1 Year
Cost	$210,000
Potential Funding Sources	County Budget, City and Town Budgets, Water Resources Board, HMGP

4.4.14	Mitigation Project O- Install window safety film on city/town and county owned buildings and schools.
Hazard(s) Addressed	Hail, Tornado, Earthquake, Extreme Heat and High Winds
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Installing window safety film on all public city/town and county owned buildings and schools to protect life and property from outside debris that may become missiles of injury. Also to keep buildings cool from the extreme heat.
Responsible Party	Mayors, Emergency Managers, Superintendents
Potential Implementation Timeline	Depends on size of project.
Cost	$1,000 each
Potential Funding Sources	HMGP and City/Town/County/School Budgets

4.4.15	Mitigation Project P- Promote awareness of the importance of mindful water use and involve the public in finding and implementing new ways to conserve water.
Hazard(s) Addressed	Drought, Wildfire
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.

Action	Prepare and/or distribute information to educate the public on how to conserve water usage. Promote the use of xeriscape, or water wise, plants to minimize the need of frequent watering.
Responsible Party	Mayors, Emergency Managers, Superintendents
Potential Implementation Timeline	Ongoing
Cost	$1,000
Potential Funding Sources	Grants, City/Town/County/School Budget

4.4.16	Mitigation Project Q-Implement programs to locate/contact/assist elderly, disabled and/or other at-risk citizens during and after a natural hazard and educate residents on how to protect themselves and/or where to go to seek help before, during and/or after a natural hazard.
Hazard(s) Addressed	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storm, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Prepare and/or distribute information to educate the public on how to protect themselves against natural hazards, including the dangers and signs of heat-related and cold-related stresses and inform the public of preventive measures in each case. This will provide “just-in-time” education materials. Develop a database of vulnerable populations to identify those who need assistance during hazards.
Responsible Party	Mayors, Emergency Manager, Superintendents
Potential Implementation Timeline	24 months
Cost	$100,000
Potential Funding Sources	Budget

4.4.17	Mitigation Project R: Upgrade construction technique for future buildings
Hazard(s) Addressed	Drought, Earthquake, Extreme Heat, Flood, Hail, High Winds, Lightning, Tornado, Wildfire, Winter Storm

Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Change building codes to require construction techniques for new critical facilities to reduce loss of life and property, and improve operability of facilities during weather events.
Responsible Party	Emergency Managers, Community Officials, Superintendents
Potential Implementation Timeline	24 months
Cost	$8,000
Potential Funding Sources	County/City/Town Budgets

4.4.18	Mitigation Project S-Purchase and Installation of Generators to Power Critical Facilities
Hazard(s) Addressed	Lightning, Hail, Tornado, High Winds, Winter Storms, Flooding, Extreme Heat, Wildfire and Earthquake, Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Install generators at critical facilities in City/Town/County/Schools/Technology Center such as the Courthouse, County Barns, rural water districts, shelters, schools, safe rooms, health departments, water wells, lift stations, etc.
Responsible Party	Mayors, Emergency Manager, Superintendents
Potential Implementation Timeline	36 months
Cost	$40,000
Potential Funding Sources	HMGP, Grants, County/City/Town/School Budget

4.4.19	Mitigation Project T- Provide cooling stations and warming stations to allow citizens and students to come out of the heat to cool down during extreme heat days and warm up during extreme cold days.
Hazard(s) Addressed	Extreme Heat, Winter Storms

Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Provide and/or promote locations for "cooling stations" during extreme heat days and "warming stations" during extreme cold days. These stations can be in public libraries, senior citizen centers, school gyms or auditoriums.
Responsible Party	Mayors, Emergency Manager, Superintendents
Potential Implementation Timeline	Ongoing
Cost	$2,000
Potential Funding Sources	HMGP, Grants, County/City/Town/School Budget

4.4.20	Mitigation Project U- Lightning Detection Systems and Warning System
Hazard(s) Addressed	Lightning
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Purchase and install lightning detection and warning system, allowing city/town/school officials to move spectators indoors when lightning threatens.
Responsible Party	Mayors , Emergency Managers and Superintendents
Potential Implementation Timeline	As funding becomes available
Cost	$25,000
Potential Funding Sources	HMGP, County/City/Town/School Budget

4.4.21	Mitigation Project V-Lightning Suppression Systems at Critical Facilities and Schools
Hazard(s) Addressed	Lightning
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell

	Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Install Lightning protection and suppression systems protecting radios and other essential equipment at critical facilities and schools throughout the County.
Responsible Party	Mayors , Emergency Managers and Superintendents
Potential Implementation Timeline	24 Months
Cost	$30,000
Potential Funding Sources	HMGP, County/City/Town/School Budget

4.4.22	Mitigation Project W- Continue participation in the NFIP
Hazard(s) Addressed	Flooding and Dam Failure
Jurisdiction	Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell, Town of Sentinel and Washita County.
Action	Continued participation in the NFIP will insure that individuals are not building in the flood hazard areas and become eligible for the NFIP flood insurance.
Responsible Party	Town flood plain managers, Emergency Managers
Potential Implementation Timeline	As funding becomes available.
Cost	$0
Potential Funding Sources	Town/City/County Budget

4.4.23	Mitigation Project X- Develop and/or update floodplain ordinances to comply with NFIP standards.
Hazard(s) Addressed	Flooding and Dam Failure
Jurisdiction	Washita County, Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell and Town of Sentinel.
Action	Develop and/or update floodplain ordinances to comply with NFIP standards.
Responsible Party	Mayor

Potential Implementation Timeline	As funding becomes available
Cost	Minimal
Potential Funding Sources	Town/City Budgets, Grants

4.4.24	Mitigation Project Y-Reduction of Earthquake Property Damage
Hazard(s) Addressed	Earthquakes
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Coordinate with participating jurisdictions to adopt and utilize international building code standards for seismic design in order to reduce potential damages from earthquake activity.
Responsible Party	Washita County and Municipal Resources
Potential Implementation Timeline	1 year
Cost	$15,000
Potential Funding Sources	Operating Budget, STCI, Grants

4.4.25	Mitigation Project Z- Reduce flooding and flash flooding and the resulting damages to roads, bridges and other structures/facilities within, and/or critical to, the communities and county and identify homes and businesses vulnerable to flooding.
Hazard(s) Addressed	Flooding and dam failure
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	Remove silt and debris from drainage channels, ditches, tinhorns, culverts, etc., which have filled in over the years and have gotten shallow and widened the drainage channel creating a larger drainage/flood area. Replace tinhorns and culverts that are too small, damaged and/or have soil eroding out from around it with appropriate sizes and installed properly to maintain the integrity of the drainage/flood area.
Responsible Party	County Commissioners, Mayors
Potential Implementation Timeline	As funding becomes available.
Cost	Less than $250,000
Potential Funding Sources	County/City Budget

4.4.26	Mitigation Project AA: Implement Fuel Reduction Program for Jurisdictions
Hazard(s) Addressed	Wildfire
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Performing maintenance including fuel management techniques such as pruning and clearing dead vegetation, selective logging, cutting high grass, planting fire-resistant vegetation, and creating fuel/fire breaks (i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels)
Responsible Party	County Commissioners, Mayors, Superintendents
Potential Implementation Timeline	Annual (on-going)
Cost	Annual budget
Potential Funding Sources	County, City, Town and School Budget

4.4.27	Mitigation Project AB: Increase availability of covered shelters so as to reduce damages to vehicles during hazard events.
Hazard(s) Addressed	Hail, Earthquake, High Wind, Lightning and Winter Storm
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Provide covered shelters for county/city/town/school owned vehicles to protect from damages.
Responsible Party	County Commissioners, Mayor, Superintendent
Potential Implementation Timeline	As funding becomes available
Cost	$50,000
Potential Funding Sources	County/City/Town/School Budget, HMGP Grants

4.4.28	Mitigation Project AC: Install surge protectors on all county/city/town owned computer equipment in critical facilities.
Hazard(s) Addressed	High Wind, Lightning, Tornado, Winter Storms
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Purchasing surge protectors will save thousands in potentially damaged computer equipment at critical facilities.
Responsible Party	County Commissioner, Mayor, Superintendent
Potential Implementation Timeline	As funding becomes available
Cost	$50,000
Potential Funding Sources	HMGP, Grants, City/County/School Budget

4.4.29	Mitigation Project AD: Conduct an Individual Safe Project for each community.
Hazard(s)	High Wind, Tornado

Addressed	
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky and Town of Sentinel.
Action	Encourage homeowners to construct safe rooms at their homes to reduce the risk of injury, and/or loss of life.
Responsible Party	Mayor, Emergency Manager
Potential Implementation Timeline	As funding becomes available
Cost	$100,000
Potential Funding Sources	HMGP, City/County/Town Budget

4.4.30	Mitigation Project AE: Purchase NOAA Weather Radios for public use.
Hazard(s) Addressed	Lightning, Hail, Tornado, High Winds, Winter Storms, Flooding Extreme Heat, Wildfire, Dam Failure and Earthquake
Jurisdiction	Washita County, Town of Bessie, Town of Burns Flat, Town of Canute, Town of Colony, Town of Corn, Town of Dill City, Town of Foss, City of New Cordell, Town of Rocky, Town of Sentinel, Burns Flat-Dill City Public Schools, Canute Public Schools, Cordell Public Schools, Corn Bible Academy and Sentinel Public Schools.
Action	Warning the public is the key to protecting health and life. By purchasing these radios personal damage would be much less.
Responsible Party	Mayor, Emergency Manager, Superintendents
Potential Implementation Timeline	As funding becomes available
Cost	$30,000
Potential Funding Sources	HMGP, County/City/Town and School Budget

4.4.31	Mitigation Project AF: Construction of upstream flood water retention reservoir.
Hazard(s) Addressed	Flooding
Jurisdiction	City of New Cordell
Action	Construction of upstream flood water retention reservoir would keep the East Fork of the North Calvary Creek from flooding residences, businesses, public roadways and

	public areas by the creek.
Responsible Party	Mayor, Emergency Manager, NRCS, City Manager
Potential Implementation Timeline	As funding becomes available.
Cost	To be determined based on future feasibility studies.
Potential Funding Sources	City Budget, REAP, HMGP, U.S. Department of Agriculture, Oklahoma Conservation Commission

4.4.32	Mitigation Project AG: Channel realignment to increase instream flow during flood events.
Hazard(s) Addressed	Flooding
Jurisdiction	City of New Cordell
Action	East Fork of the North Calvary Creek channel realignment at 14th Street north and to maintain waterways throughout the city to increase instream flow during flood events.
Responsible Party	Mayor, Emergency Manager, NRCS, City Manager
Potential Implementation Timeline	As funding becomes available.
Cost	To be determined based on future feasibility studies.
Potential Funding Sources	City Budget, REAP, HMGP, U.S. Department of Agriculture, Oklahoma Conservation Commission

CHAPTER FIVE: PLAN UPDATE PRIORIZATION AND REVIEW

5.1 Changes in Jurisdictional Development

Washita County and participating jurisdictions did not experience significant growth or development since the previous plan. Development, including school district growth, was discussed in the planning process. It was determined any growth was minimal and had no impact on the exposure of the planning area to hazards addressed in this plan. Future buildings, infrastructure, and critical facilities are not expected to have any different vulnerability than existing structures. Continued enforcement of building codes, the Flood Damage Prevention Ordinance and encouragement to build safe rooms in both public and private future structures will have a positive impact in reducing vulnerability. The Committee is unable to approximate associated costs, numbers and types for future structures.

Commercial construction including buildings, infrastructure and critical facilities built in unincorporated areas of Washita County may enjoy a reduced vulnerability over residential construction because many of

these facilities will be designed by a professional architect using nationally accepted building codes. The size, value and employment implications of the commercial buildings will bring attention of community leaders who may provide guidance to local conditions affecting the construction.

Residential construction in unincorporated areas of Washita County may go unnoticed because of the rural nature of the county. Builders are not required to purchase permits, have in-progress inspections or follow any building or zoning codes. This can create a structure that is highly vulnerable to many types of natural hazards.

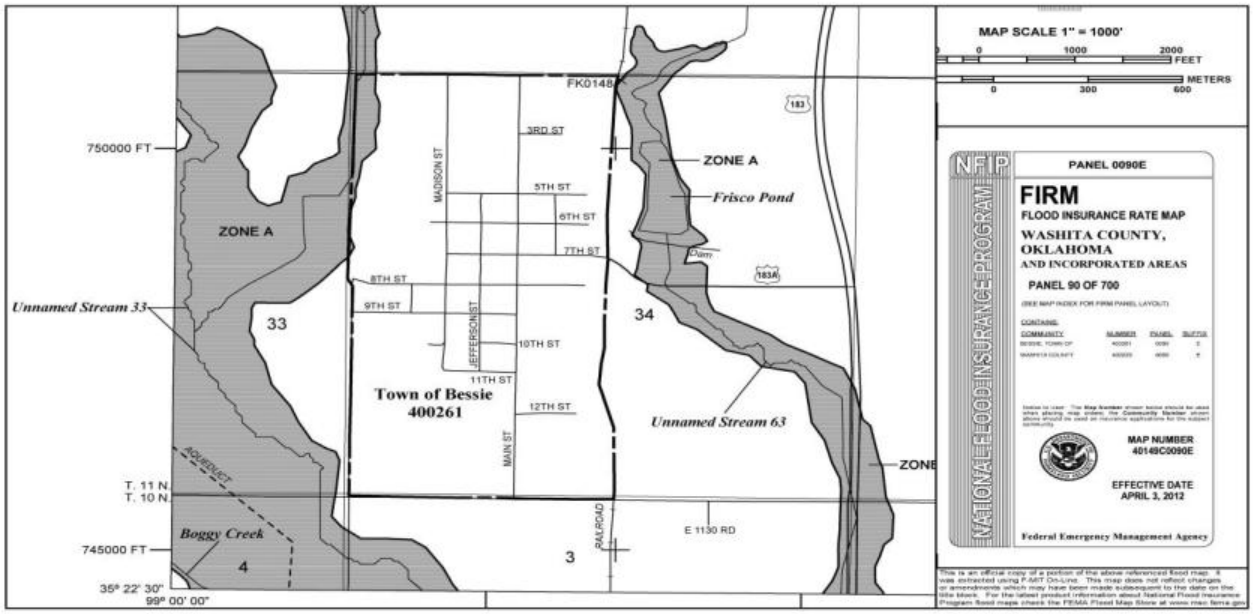
Washita County intends to stay NFIP compliant and develop a floodplain ordinance to ensure that any growth and improvements would be directed away from flood plain areas. Since floodplain ordinances for the jurisdictions of Town of Bessie, Town of Canute, Town of Colony, Town of Corn, City of New Cordell and Town of Sentinel regulate the issuing of building permits within flood zones, growth and improvements are being directed away from floodplain areas.

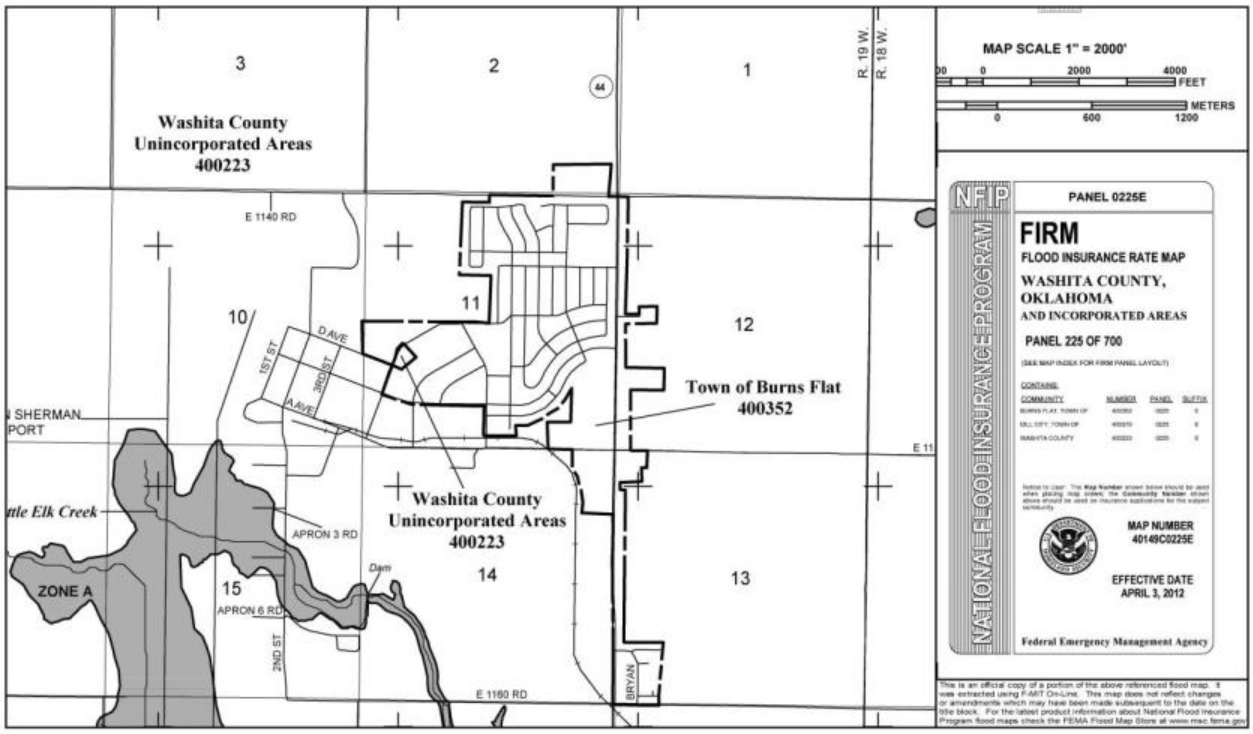
5.2 Status of Previous Mitigation Action Items

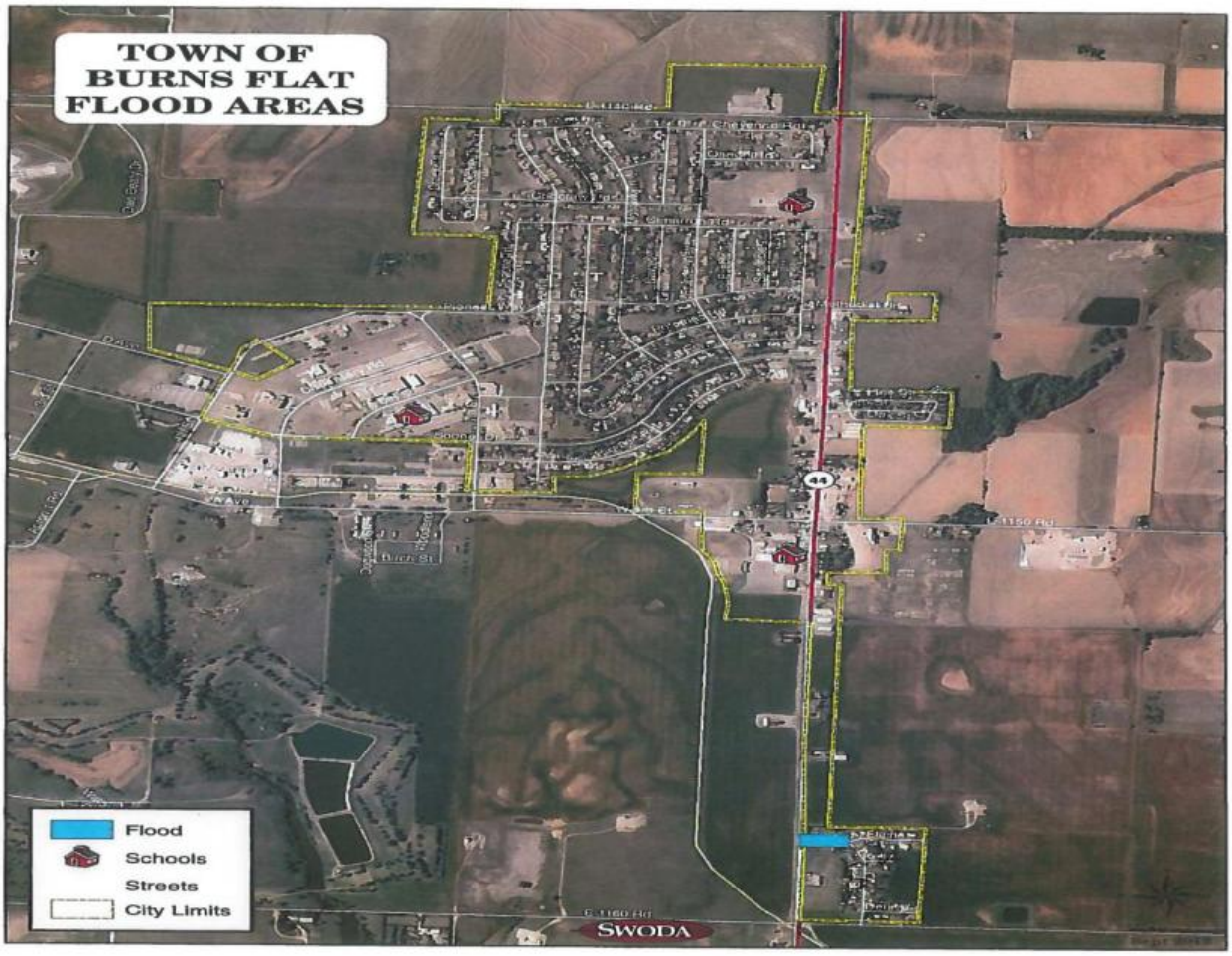
- Washita County (Action #12), Town of Bessie (Action #6), Town of Colony (Action #6), Town of Corn (Action #6), City of New Cordell (Action #5) and Town of Sentinel (Action #5) Floodplain Managers attend yearly training at OFMA to expand on floodplain management capability.
- Cordell Schools (Action #1) installed a safe room that accommodates their schools.
- Washita County (Action #2), Town of Burns Flat (Action #1), Town of Canute (Action #1), Town of Foss (Action #2), City of New Cordell (Action #2), Town of Sentinel (Action #2) installed generators to critical facilities such as; the fire department, police department, EOC and water wells, located in their jurisdictions.
- City of New Cordell (Action #4) replaced inadequate water lines.
- City of New Cordell (Action #1), Cordell Schools (Action #4), Town of Foss (Action #1) upgrade warning system.
- Cordell Schools (Action #9) updated NOAA weather radios throughout schools.
- Town of Burns Flat (Action #3) drilled additional water wells.
- Town of Burns Flat (Action #4) located existing storm shelters in community.
- Town of Foss (Action #4) construct community shelter.
- Town of Foss (Action #6) rectify data limitation and data deficiencies.
- Town of Foss (Action #8) purchase NOAA radios.
- Washita County (Action #8) install surge protectors for all computer equipment.

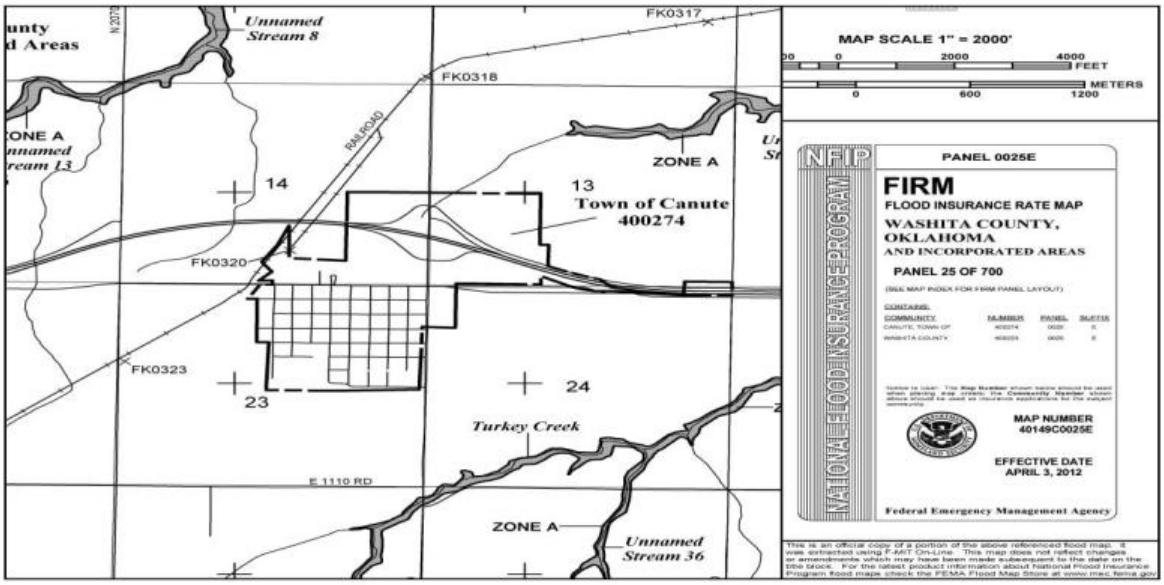
APPENDIX A

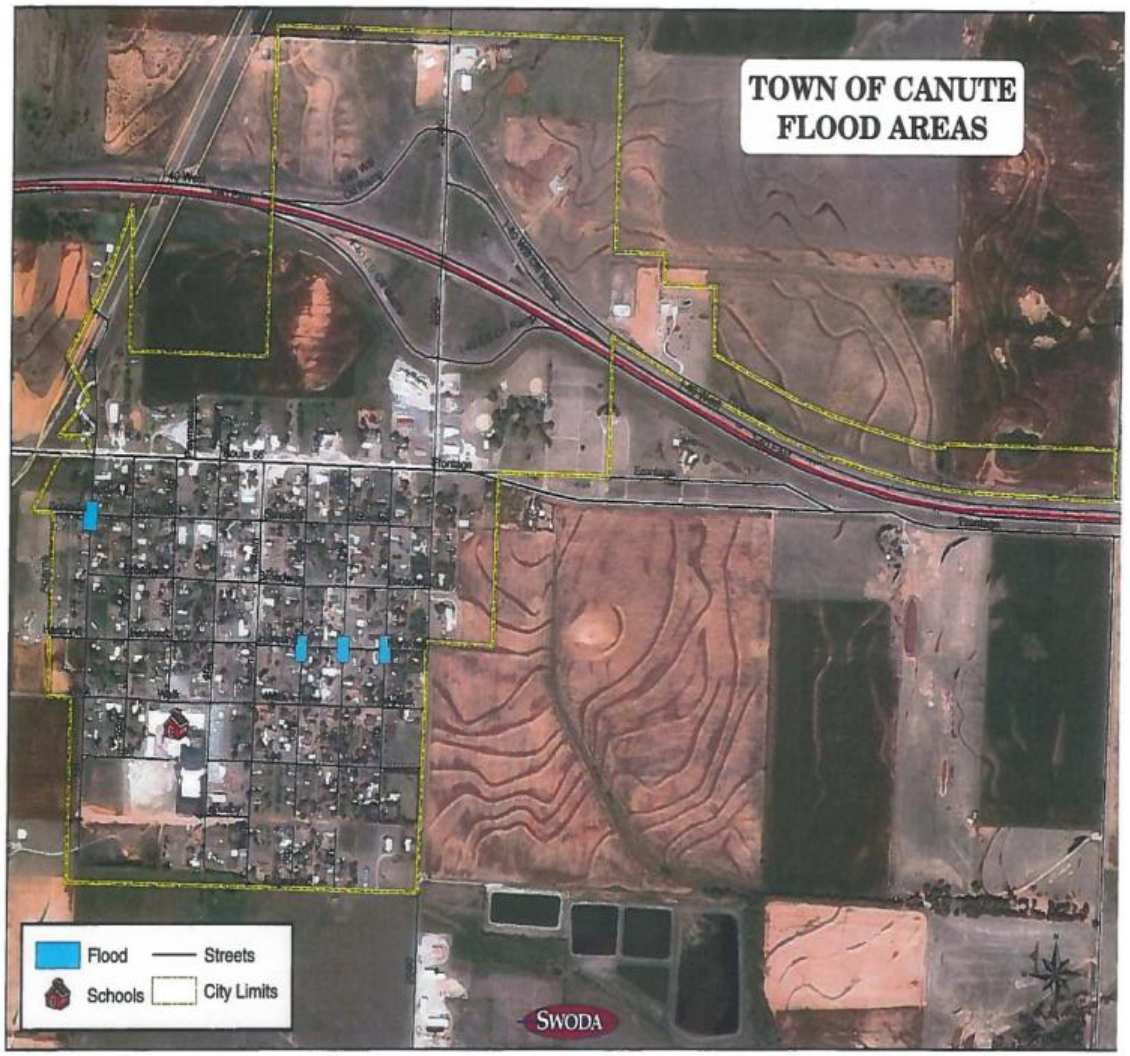
FIRM MAPS, CITY AND TOWN FLOOD ZONE AREA MAPS AND DAM BREACH INUNDATION MAPS

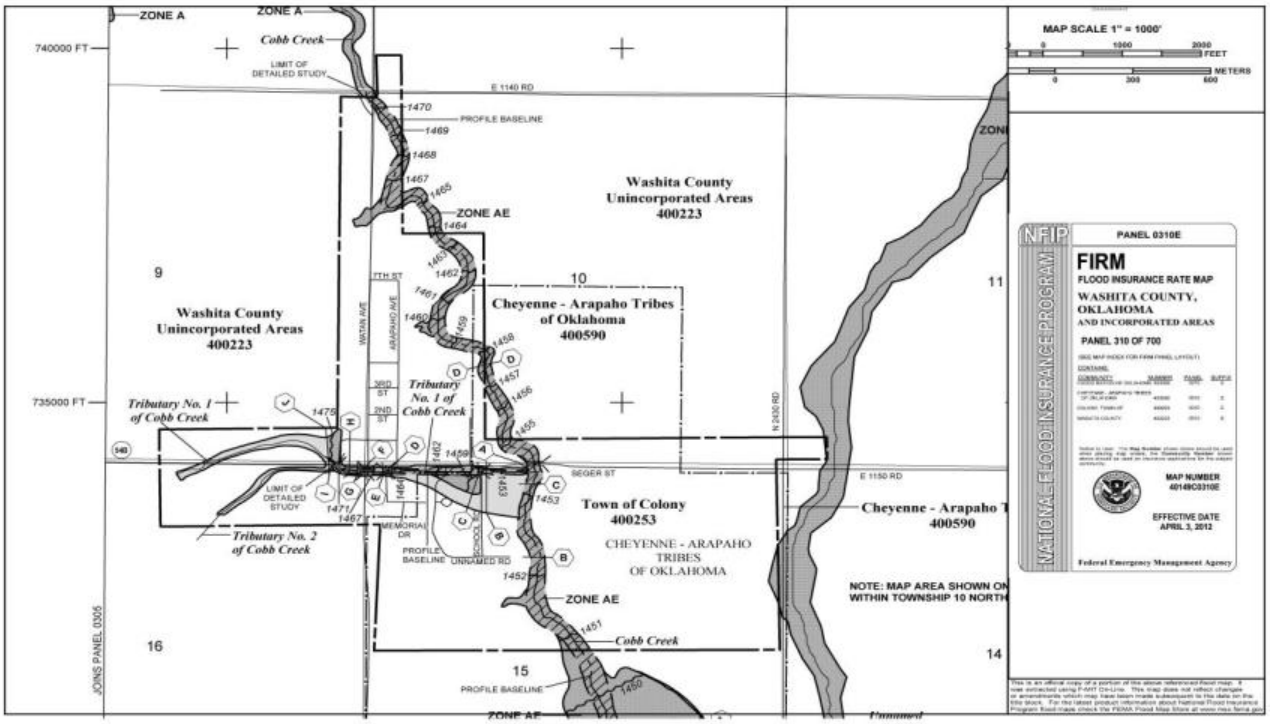


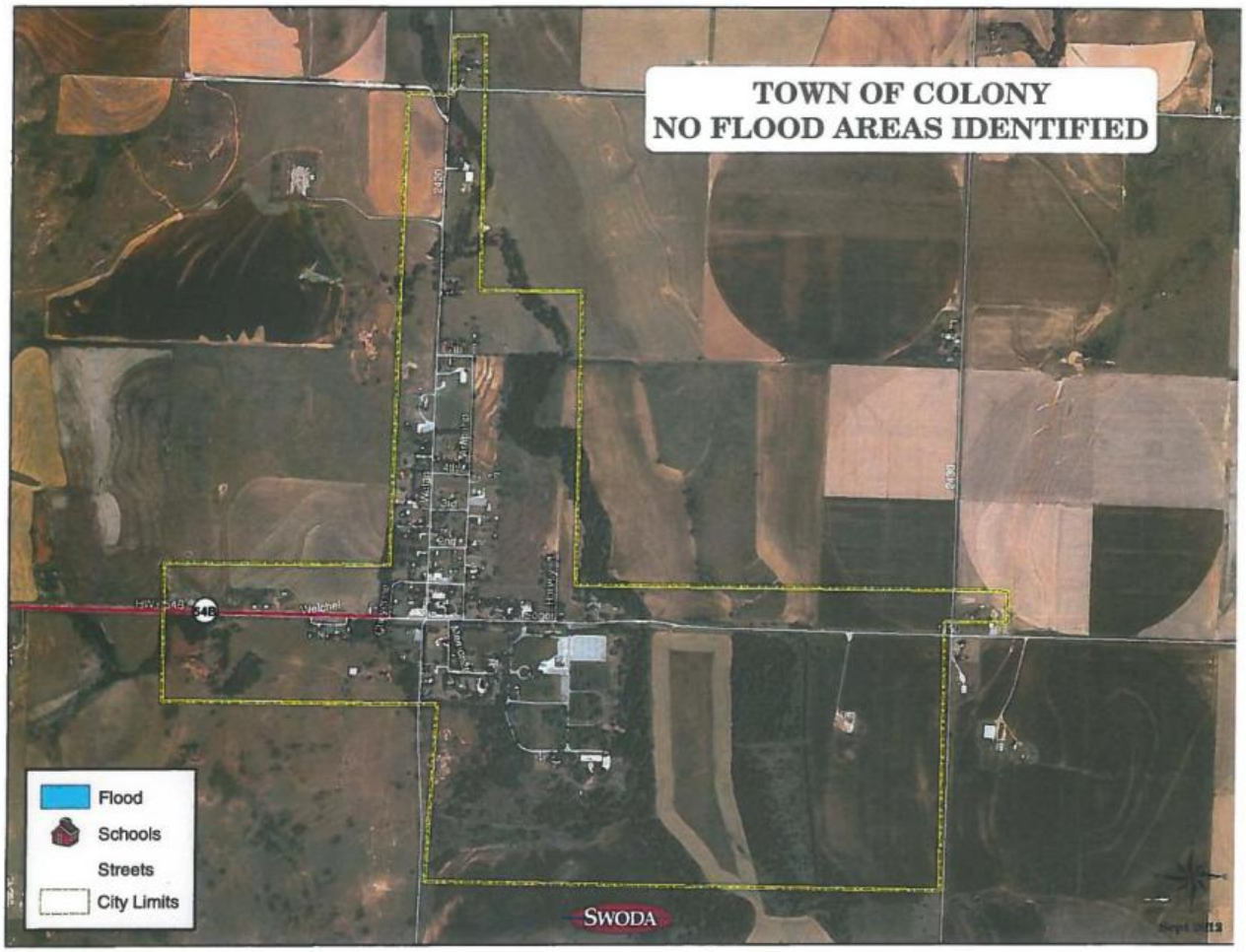

MAP SCALE 1" = 2000'
0 2000 4000 FEET
0 600 1200 METERS
NFIP
PANEL 0225E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 225 OF 700
MAP NUMBER
40149C0225E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
Washita County Unincorporated Areas 400223
Town of Burns Flat 400352
Washita County Unincorporated Areas 400223
E 1140 RD
E 1160 RD
D AVE
A AVE
1ST ST
3RD ST
2ND ST
APRON 3 RD
APRON 6 RD
Dam
ZONE A
BRYAN
R. 19 W.
R. 18 W.
SHERMAN PORT
ttle Elk Creek

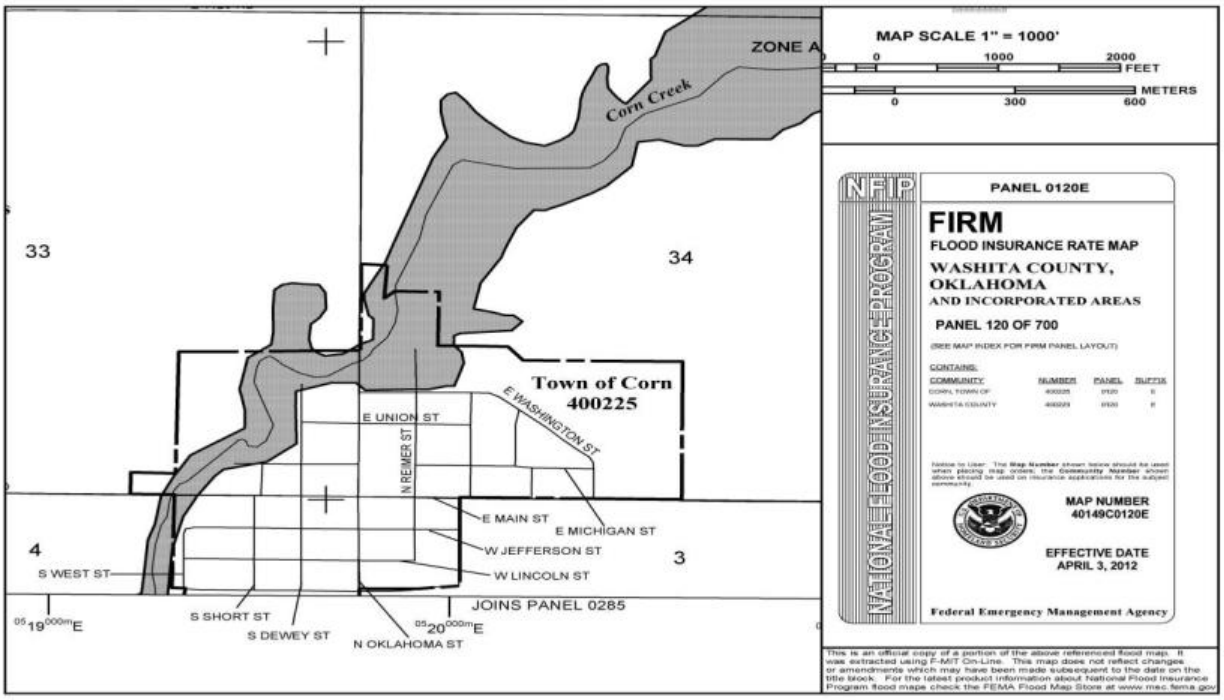

TOWN OF BURNS FLAT FLOOD AREAS
Flood
Schools
Streets
City Limits
SWODA
E 1160 Rd
1150 Rd
44

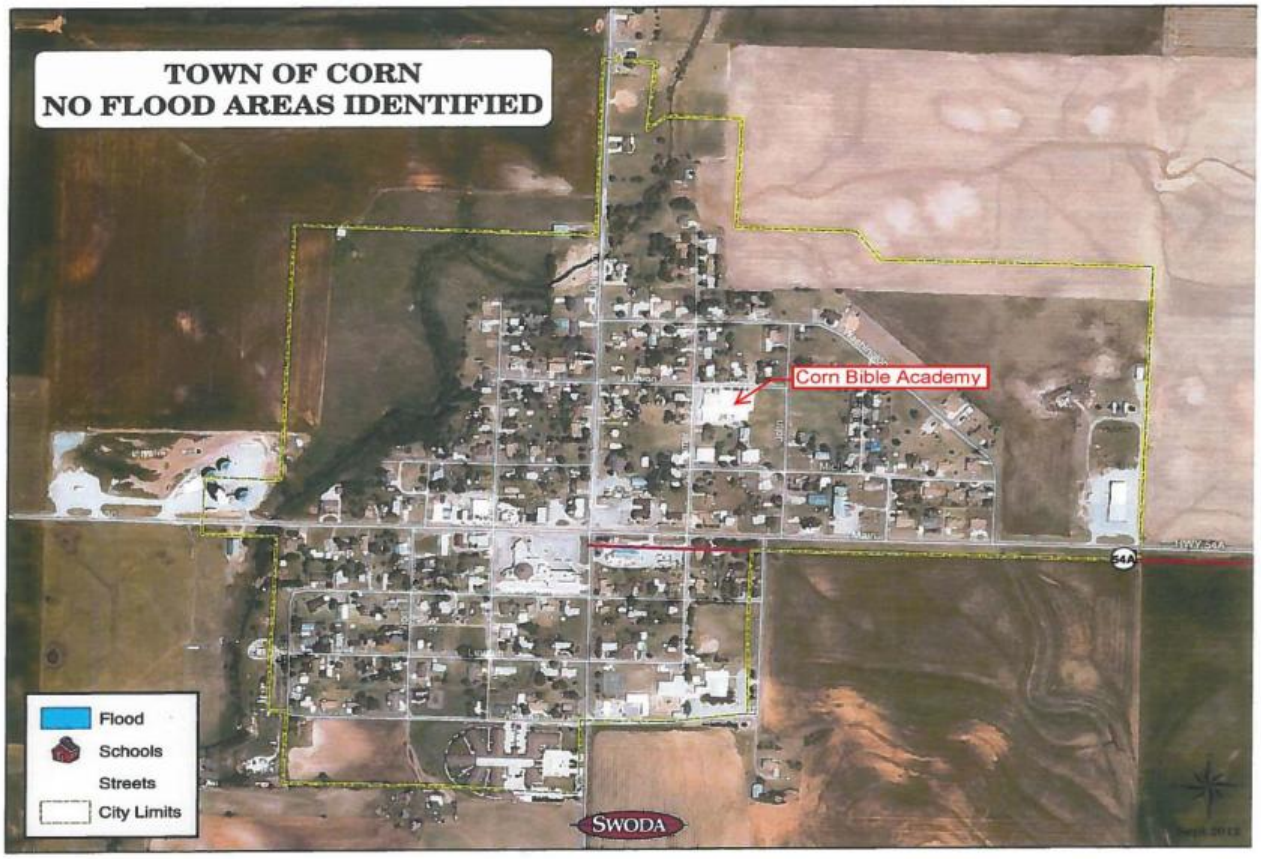

Unnamed Stream 8
FK0317
FK0318
RAILROAD
ZONE A
14
13
Town of Canute
400274
FK0320
FK0323
23
24
Turkey Creek
E 1110 RD
ZONE A
Unnamed Stream 36
MAP SCALE 1" = 2000'
2000
4000
FEET
600
1200
METERS
NFIP
PANEL 0025E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 25 OF 700
MAP NUMBER
40149C0025E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency

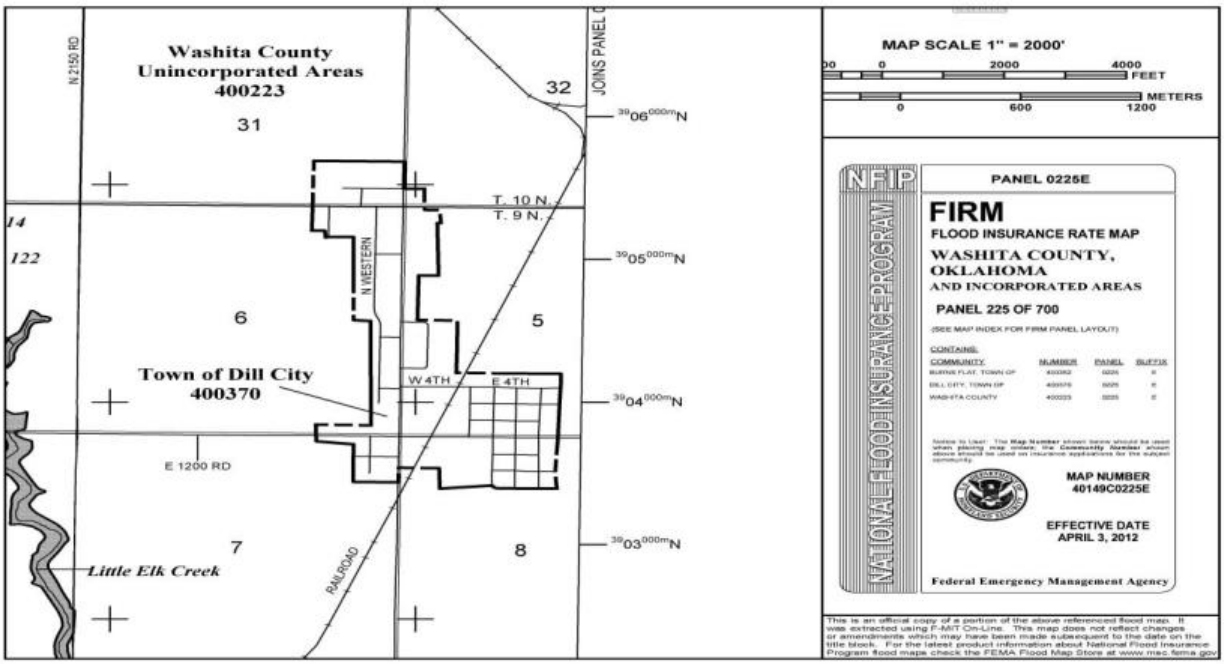

TOWN OF CANUTE
FLOOD AREAS
Flood
Streets
Schools
City Limits
SWODA

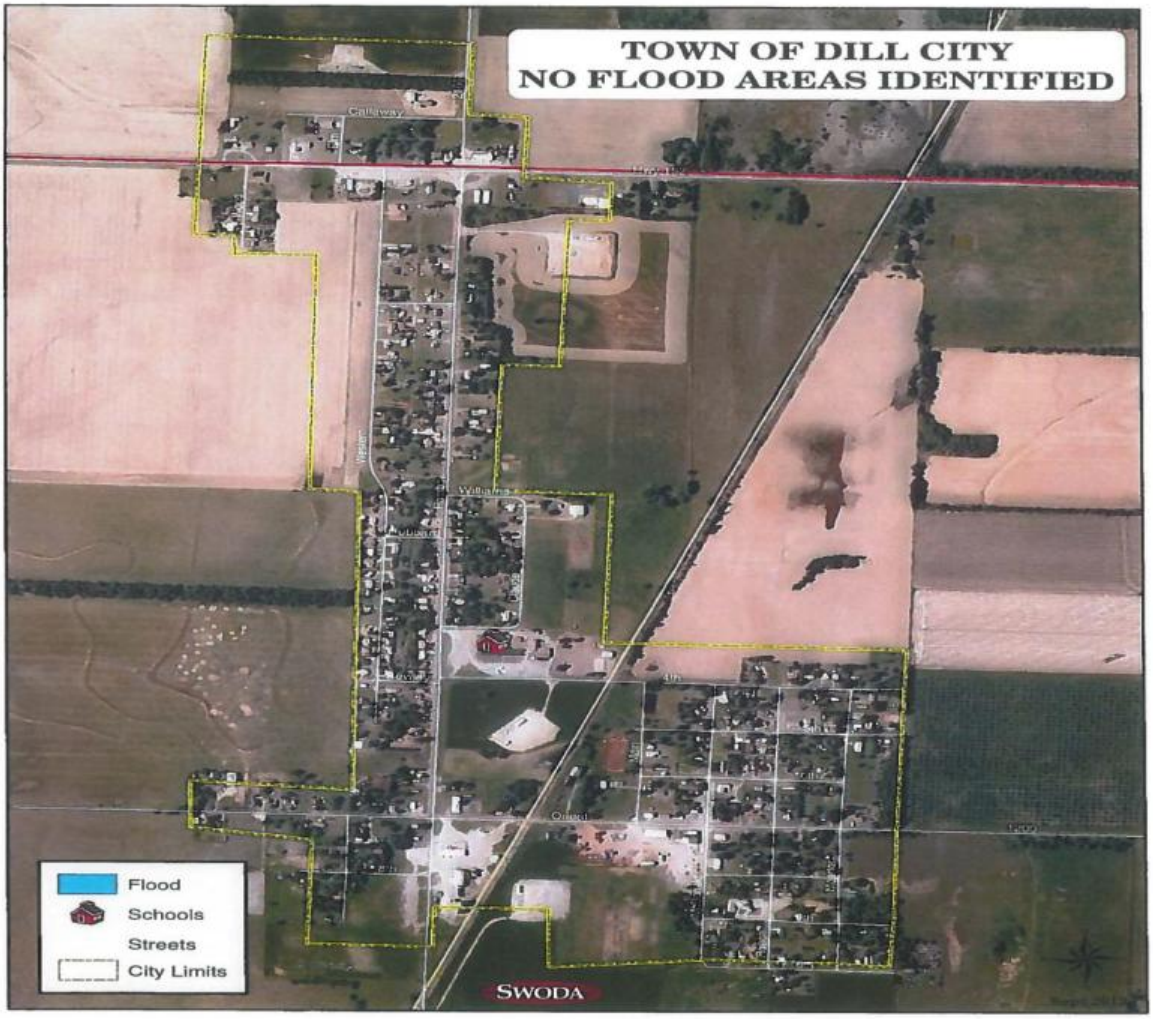

ZONE A
Cobb Creek
LIMIT OF DETAILED STUDY
E 1140 RD
PROFILE BASELINE
ZONE AE
Washita County Unincorporated Areas 400223
Cheyenne - Arapaho Tribes of Oklahoma 400590
Tributary No. 1 of Cobb Creek
Tributary No. 2 of Cobb Creek
Town of Colony 400253
CHEYENNE - ARAPAHO TRIBES OF OKLAHOMA
SEGER ST
MEMORIAL DR
UNNAMED RD
N 2400 RD
E 1150 RD
740000 FT
735000 FT
JOINS PANEL 0305
MAP SCALE 1" = 1000'
NFIP
PANEL 0310E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 310 OF 700
MAP NUMBER
40149C0310E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency
NOTE: MAP AREA SHOWN ON
WITHIN TOWNSHIP 10 NORTH

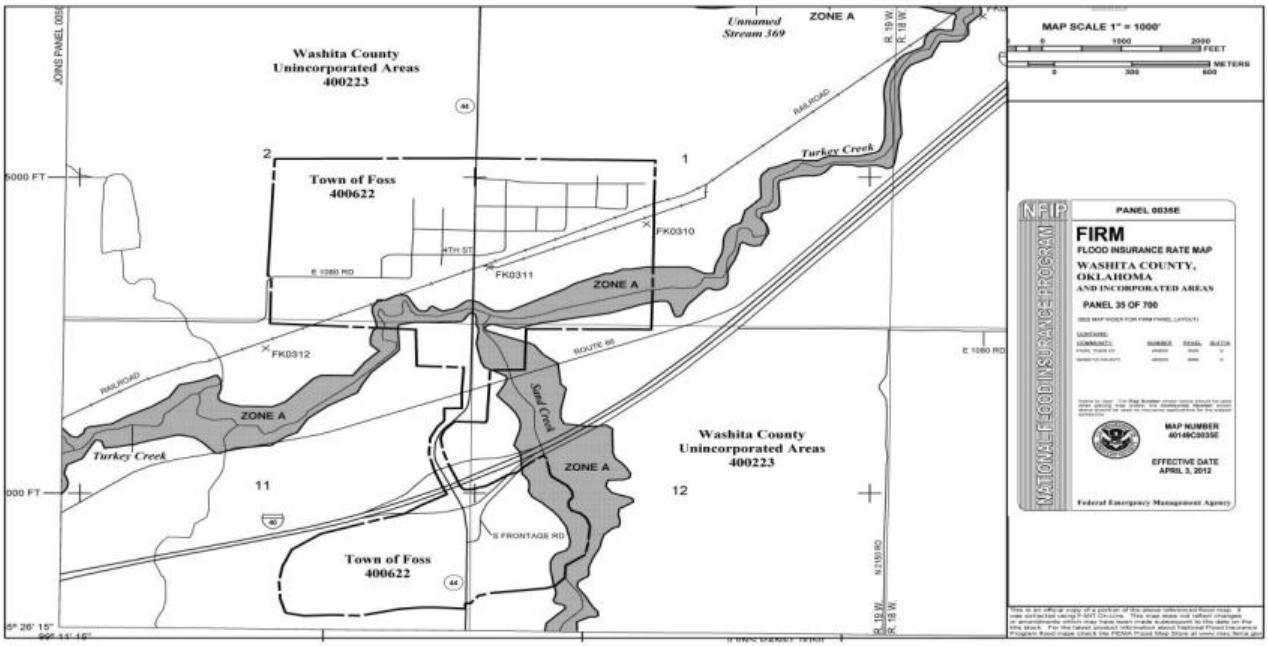

TOWN OF COLONY
NO FLOOD AREAS IDENTIFIED
Flood
Schools
Streets
City Limits
SWODA

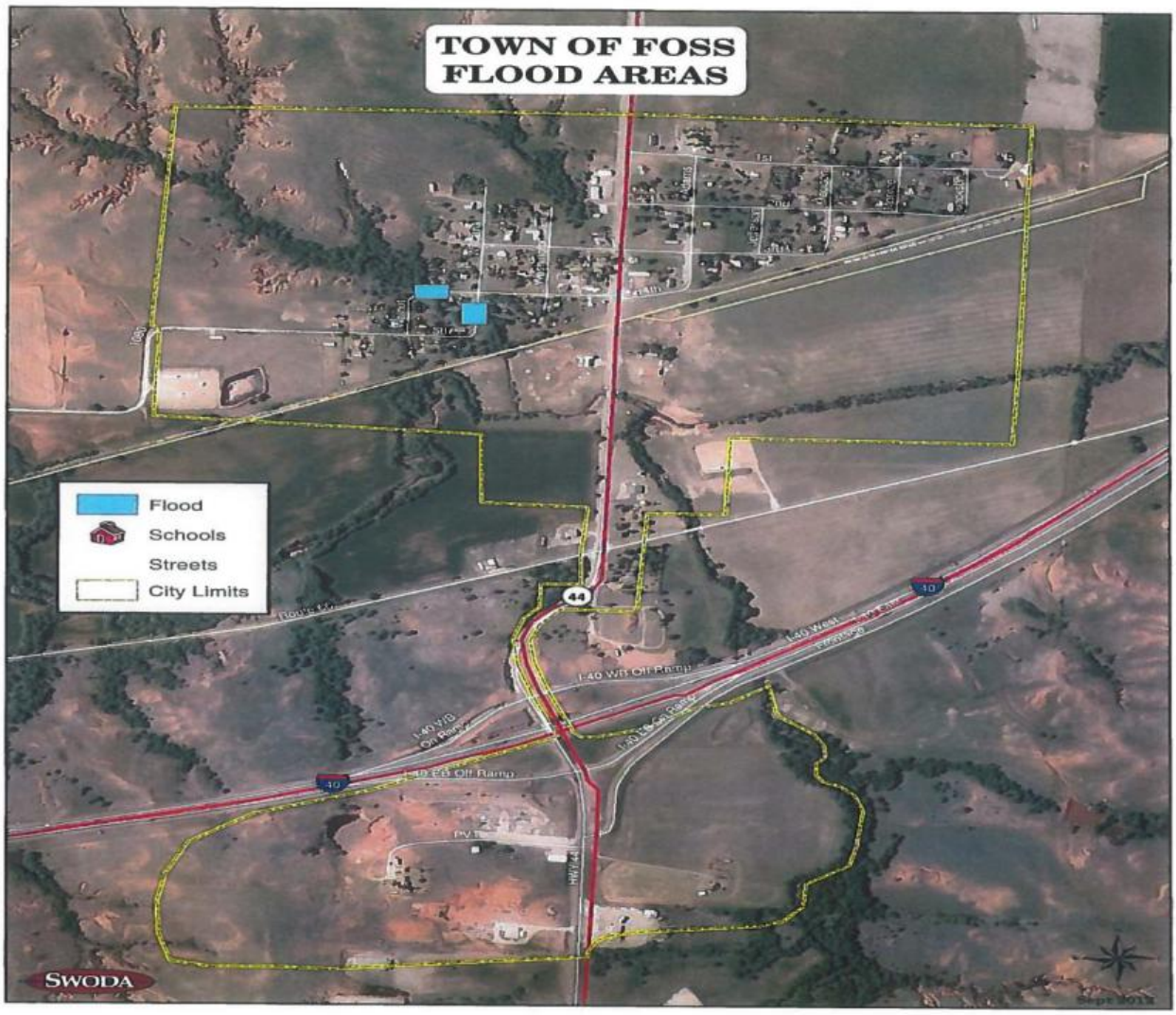

ZONE A
Corn Creek
33
34
Town of Corn
400225
E UNION ST
E WASHINGTON ST
N REIMER ST
E MAIN ST
E MICHIGAN ST
W JEFFERSON ST
W LINCOLN ST
4
3
S WEST ST
JOINS PANEL 0285
S SHORT ST
S DEWEY ST
N OKLAHOMA ST
MAP SCALE 1" = 1000'
0 1000 2000 FEET
0 300 600 METERS
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0120E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 120 OF 700
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
CORN, TOWN OF 400225 0120 E
WASHITA COUNTY 400023 0120 E
MAP NUMBER
40149C0120E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

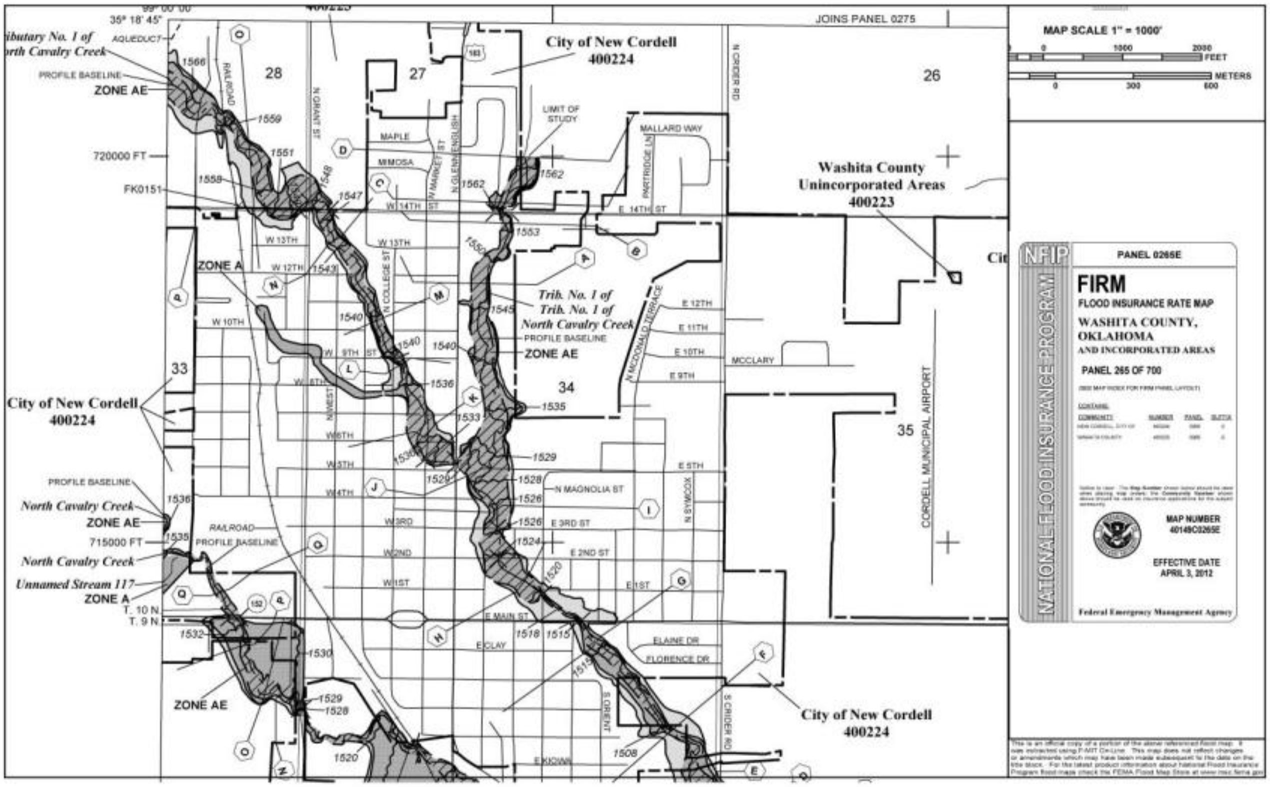

TOWN OF CORN
NO FLOOD AREAS IDENTIFIED
Corn Bible Academy
54A
Flood
Schools
Streets
City Limits
SWODA

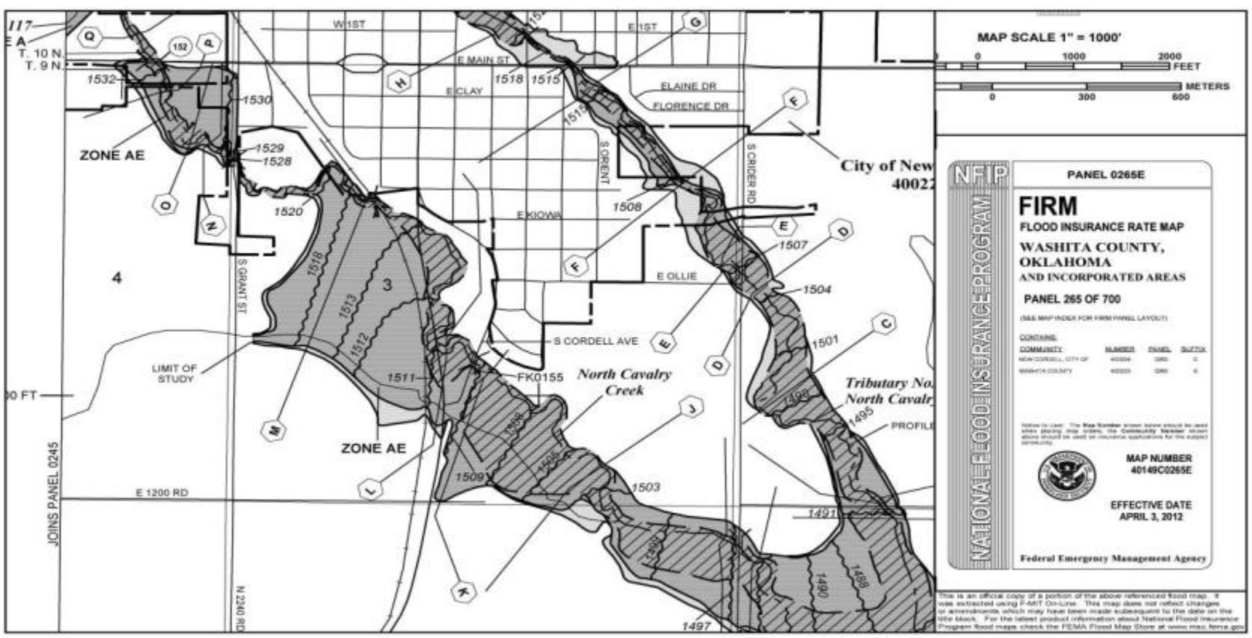

Washita County
Unincorporated Areas
400223
Town of Dill City
400370
Little Elk Creek
RAILROAD
N 2150 RD
E 1200 RD
N WESTERN
W 4TH
E 4TH
T. 10 N.
T. 9 N.
JOINS PANEL
32
31
6
5
7
8
14
122
3906000mN
3905000mN
3904000mN
3903000mN
MAP SCALE 1" = 2000'
0
2000
4000
FEET
METERS
0
600
1200
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0225E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 225 OF 700
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
MAP NUMBER
40149C0225E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

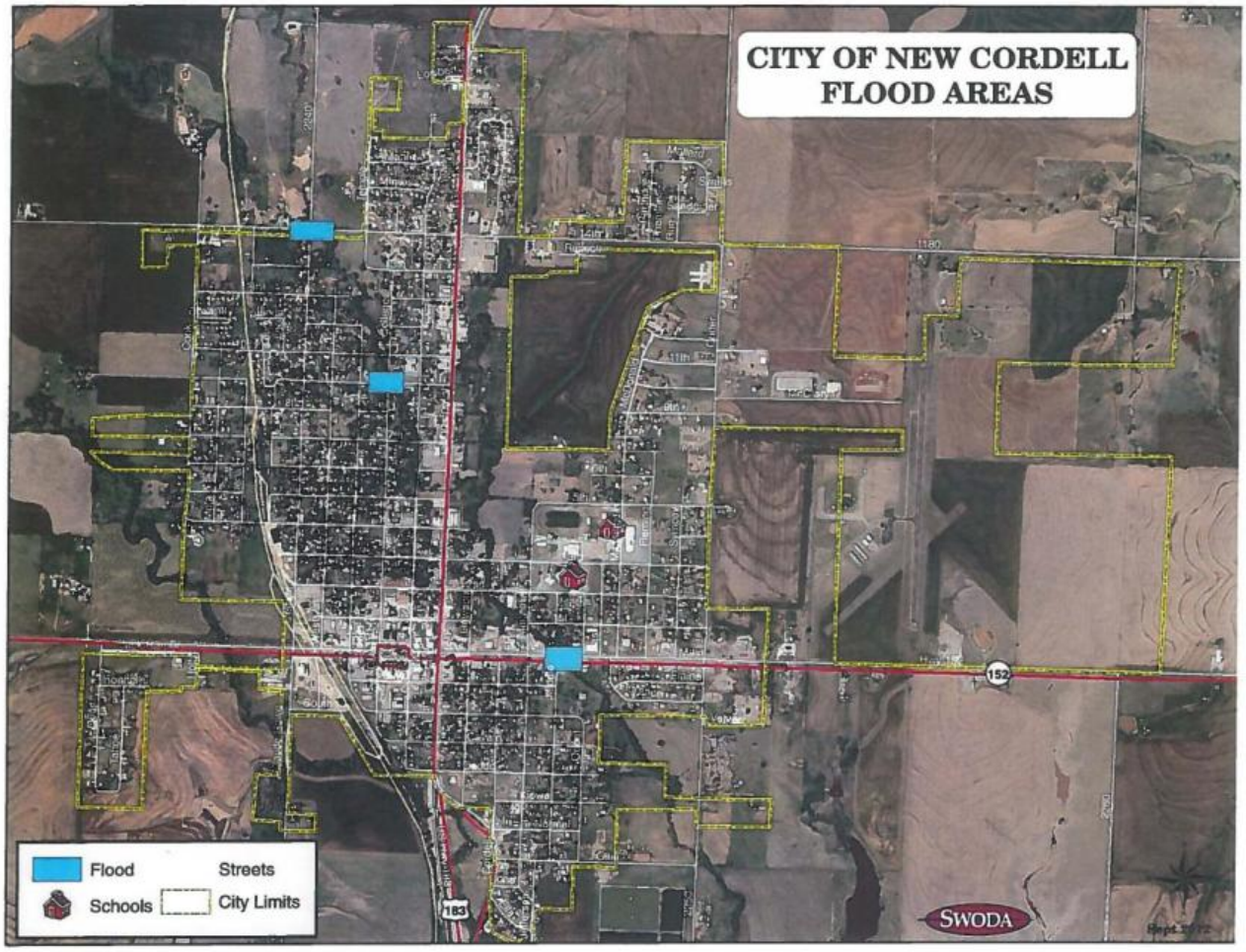

TOWN OF DILL CITY
NO FLOOD AREAS IDENTIFIED
Flood
Schools
Streets
City Limits
SWODA

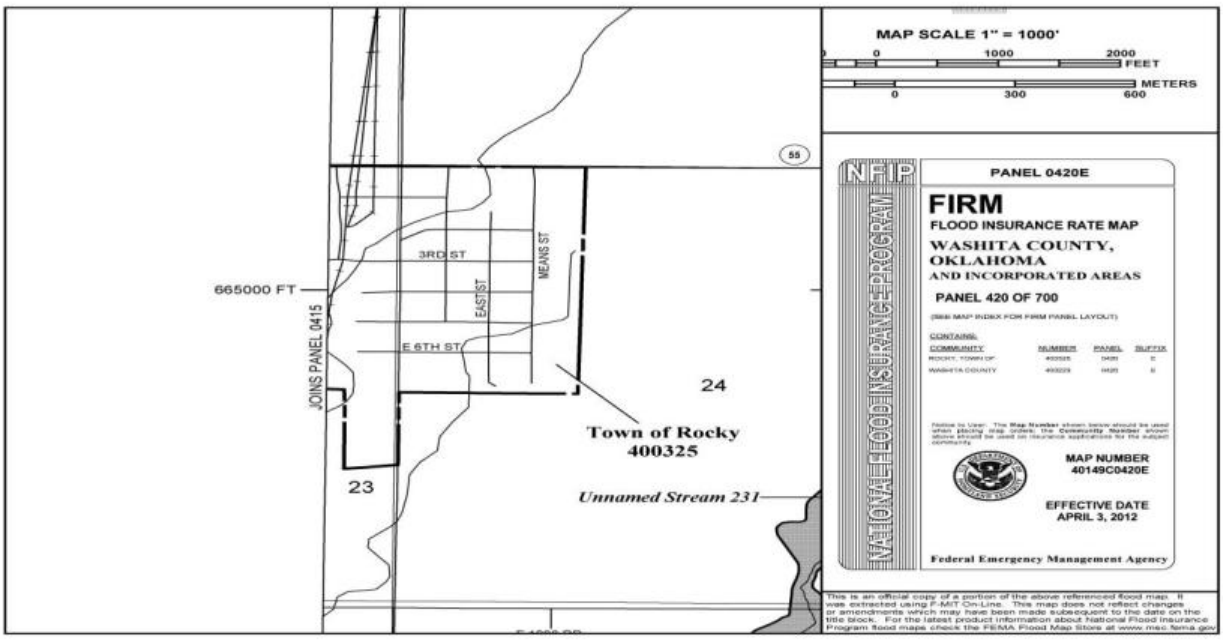

Washita County
Unincorporated Areas
400223
Town of Foss
400622
Unnamed
Stream 369
ZONE A
Turkey Creek
Sand Creek
RAILROAD
ROUTE 66
FK0310
FK0311
FK0312
4TH ST
E 1080 RD
S FRONTAGE RD
N 2160 RD
R. 19 W.
R. 18 W.
MAP SCALE 1" = 1000'
PANEL 0035E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 35 OF 700
MAP NUMBER
40149C0035E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM

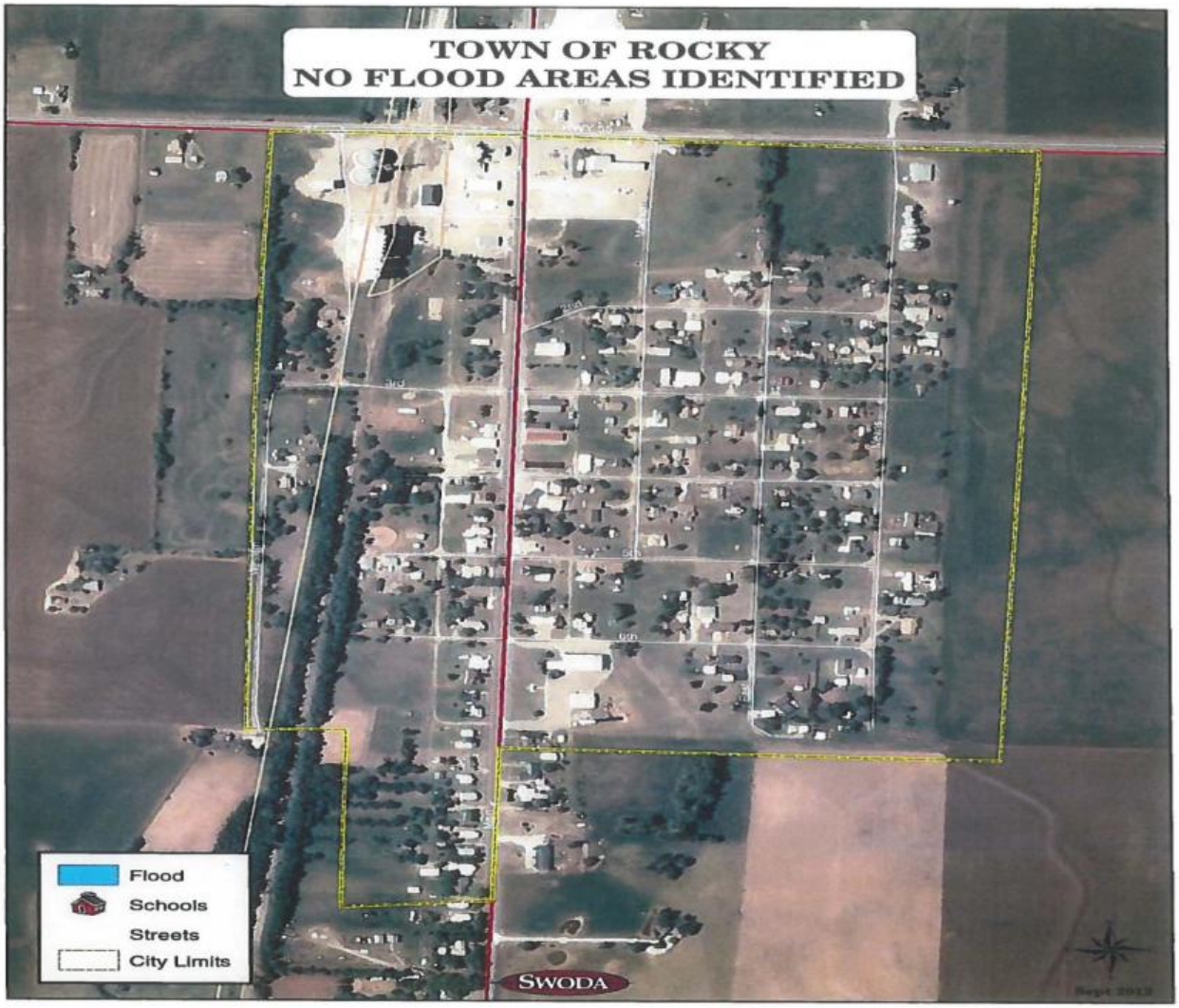

TOWN OF FOSS
FLOOD AREAS
Flood
Schools
Streets
City Limits
I-40 West Off Ramp
I-40 East Off Ramp
SWODA

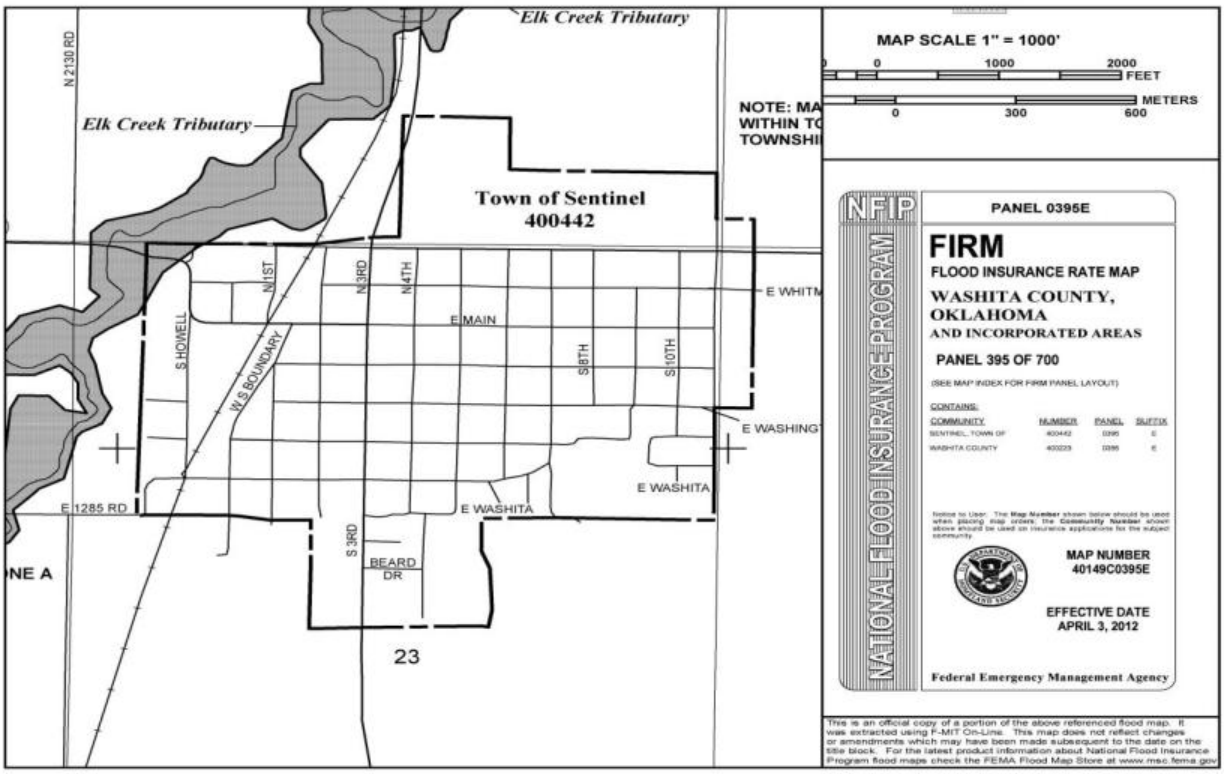

JOINS PANEL 0275
City of New Cordell
400224
Washita County
Unincorporated Areas
400223
MAP SCALE 1" = 1000'
FEET
METERS
ZONE AE
ZONE A
PROFILE BASELINE
720000 FT
FK0151
715000 FT
Trib. No. 1 of
North Cavalry Creek
North Cavalry Creek
Unnamed Stream 117
T. 10 N.
T. 9 N.
CORDELL MUNICIPAL AIRPORT
LIMIT OF STUDY
MALLARD WAY
MAPLE
MIMOSA
E MAIN ST
E CLAY
ELAINE DR
FLORENCE DR
E KIOWA
N GRANT ST
N CRIDER RD
S CRIDER RD
S ORIENT
NFIP
PANEL 0265E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY,
OKLAHOMA
AND INCORPORATED AREAS
PANEL 265 OF 700
MAP NUMBER
40149C0265E
EFFECTIVE DATE
APRIL 3, 2012
NATIONAL FLOOD INSURANCE PROGRAM
Federal Emergency Management Agency


MAP SCALE 1" = 1000'
FEET
METERS
ZONE AE
City of New
LIMIT OF STUDY
FK0155
North Cavalry
Creek
Tributary No.
North Cavalr
JOINS PANEL 0245
E 1200 RD
N 2240 RD
S GRANT ST
S CORDELL AVE
E OLLIE
E KIOWA
E MAIN ST
E CLAY
ELAINE DR
FLORENCE DR
S CRIDER RD
NFIP
PANEL 0265E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY,
OKLAHOMA
AND INCORPORATED AREAS
PANEL 265 OF 700
MAP NUMBER
40149C0265E
EFFECTIVE DATE
APRIL 3, 2012
NATIONAL FLOOD INSURANCE PROGRAM
Federal Emergency Management Agency

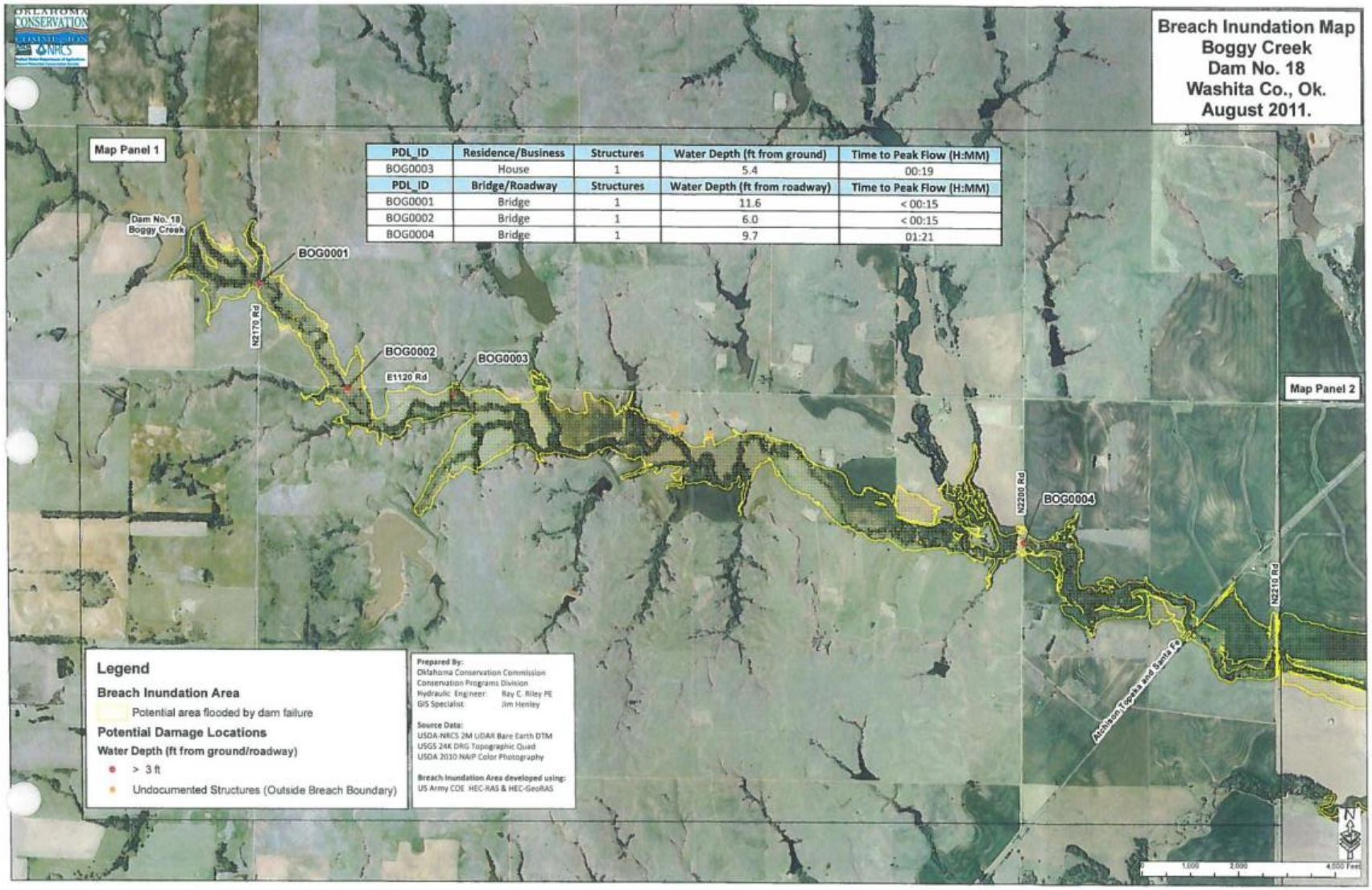

CITY OF NEW CORDELL
FLOOD AREAS
Flood
Streets
Schools
City Limits
SWODA

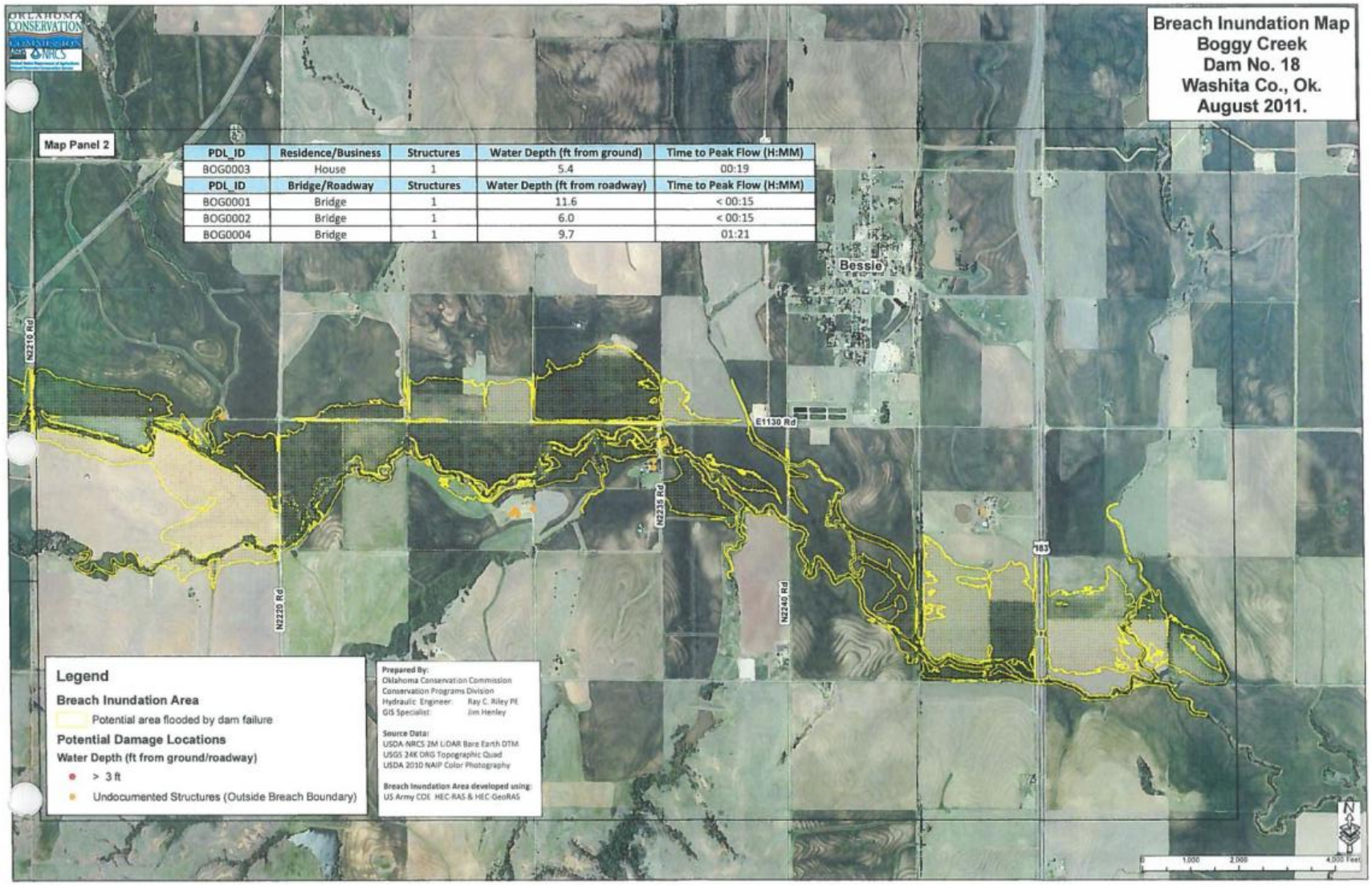

MAP SCALE 1" = 1000'
0
1000
2000
FEET
METERS
0
300
600
665000 FT
JOINS PANEL 0415
3RD ST
EAST ST
MEANS ST
E 6TH ST
24
23
Town of Rocky
400325
Unnamed Stream 231
55
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0420E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 420 OF 700
MAP NUMBER
40149C0420E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency


TOWN OF ROCKY
NO FLOOD AREAS IDENTIFIED
Flood
Schools
Streets
City Limits
SWODA

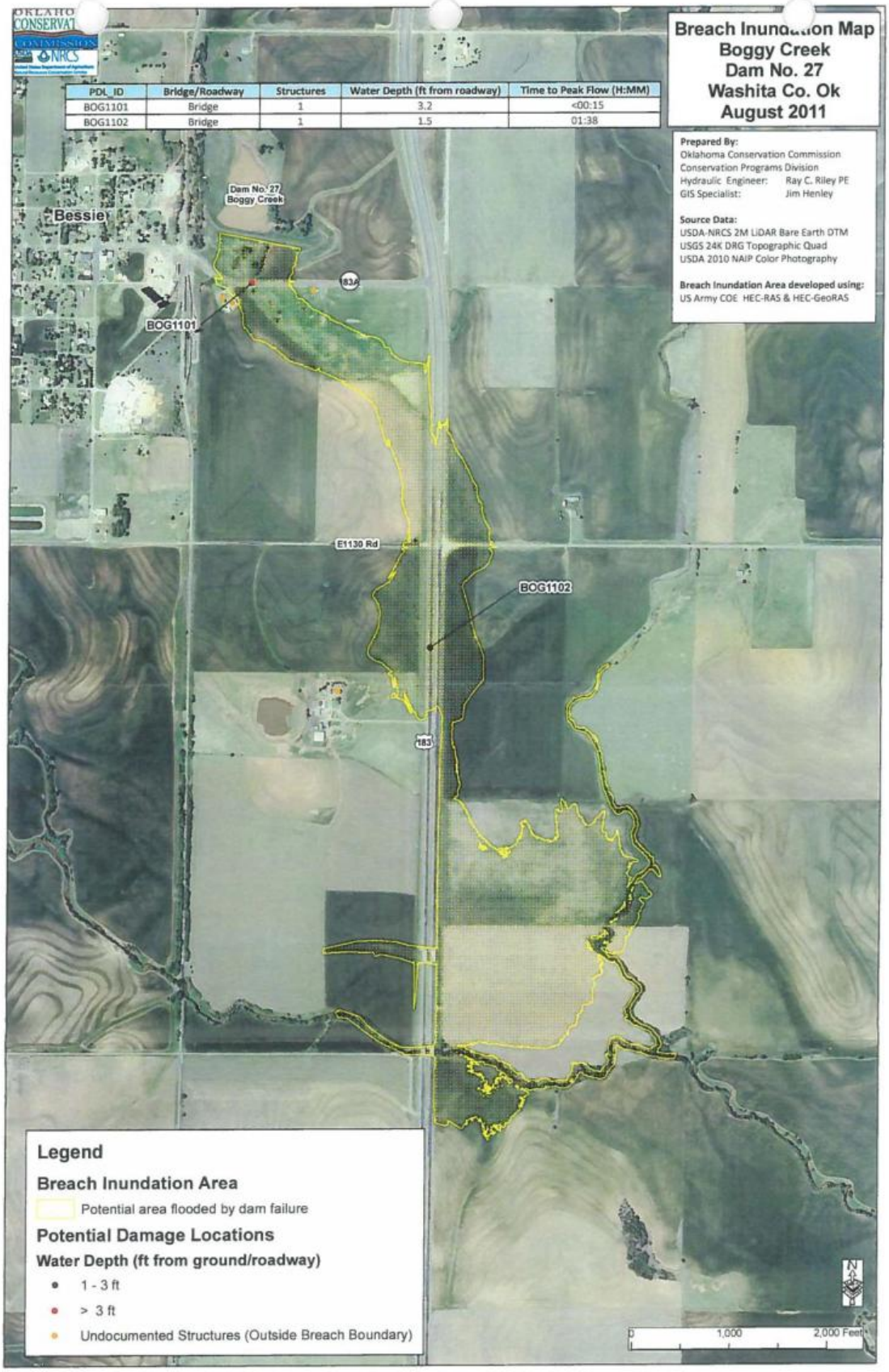

Elk Creek Tributary
N 2130 RD
Elk Creek Tributary
Town of Sentinel
400442
N 1ST
N 3RD
N 4TH
E MAIN
S 8TH
S 10TH
S HOWELL
W S BOUNDARY
E WASHITA
E 1285 RD
S 3RD
BEARD DR
23
MAP SCALE 1" = 1000'
0 1000 2000 FEET
0 300 600 METERS
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0395E
FIRM
FLOOD INSURANCE RATE MAP
WASHITA COUNTY, OKLAHOMA
AND INCORPORATED AREAS
PANEL 395 OF 700
MAP NUMBER
40149C0395E
EFFECTIVE DATE
APRIL 3, 2012
Federal Emergency Management Agency

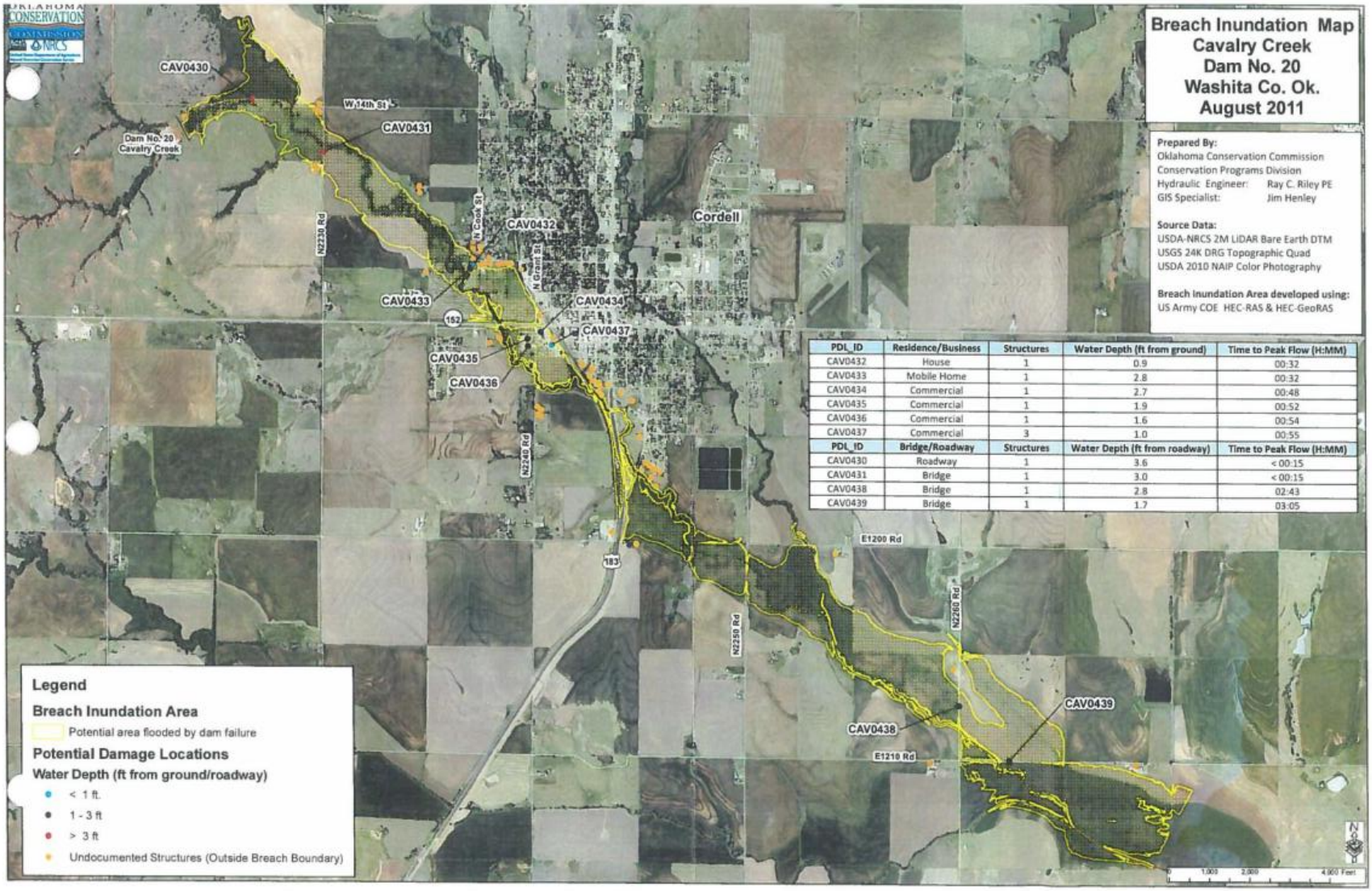

TOWN OF SENTINEL
NO FLOOD AREAS IDENTIFIED
Flood
Schools
Streets
City Limits
SWODA


Breach Inundation Map
Boggy Creek
Dam No. 18
Washita Co., Ok.
August 2011.
Map Panel 1
Map Panel 2
Dam No. 18 Boggy Creek
BOG0001
BOG0002
BOG0003
BOG0004
N2170 Rd
E1120 Rd
N2200 Rd
N2210 Rd
Atchison Topeka and Santa Fe
PDL_ID | Residence/Business | Structures | Water Depth (ft from ground) | Time to Peak Flow (H:MM)
BOG0003 | House | 1 | 5.4 | 00:19
PDL_ID | Bridge/Roadway | Structures | Water Depth (ft from roadway) | Time to Peak Flow (H:MM)
BOG0001 | Bridge | 1 | 11.6 | < 00:15
BOG0002 | Bridge | 1 | 6.0 | < 00:15
BOG0004 | Bridge | 1 | 9.7 | 01:21
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft from ground/roadway)
> 3 ft
Undocumented Structures (Outside Breach Boundary)
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
0 1,000 2,000 4,000 Feet

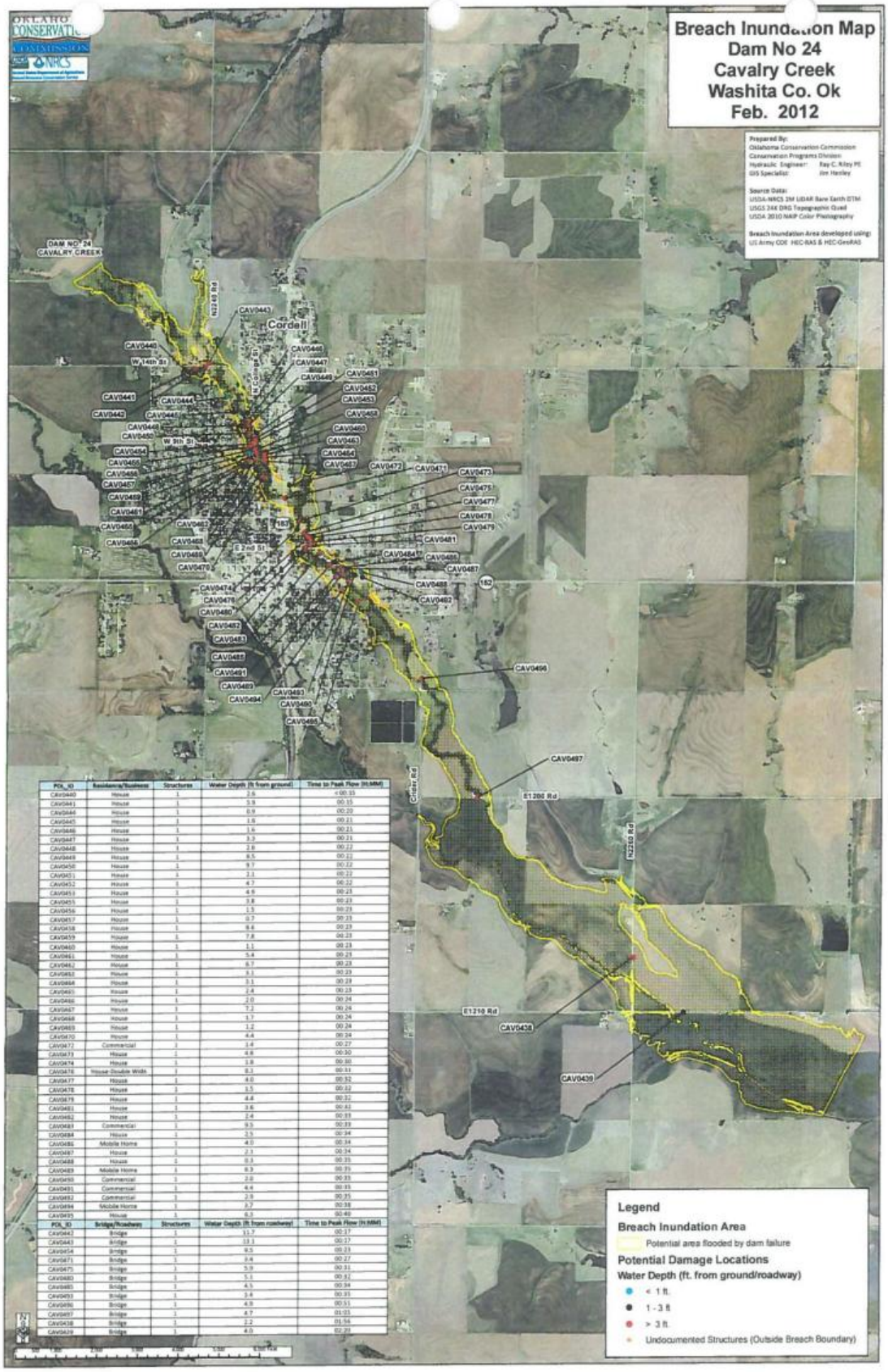


PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
BOG0003	House	1	5.4	00:19
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
BOG0001	Bridge	1	11.6	< 00:15
BOG0002	Bridge	1	6.0	< 00:15
BOG0004	Bridge	1	9.7	01:21


Breach Inundation Map
Boggy Creek
Dam No. 27
Washita Co. Ok
August 2011
PDL_ID | Bridge/Roadway | Structures | Water Depth (ft from roadway) | Time to Peak Flow (H:MM)
BOG1101 | Bridge | 1 | 3.2 | <00:15
BOG1102 | Bridge | 1 | 1.5 | 01:38
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
Dam No. 27
Boggy Creek
Bessie
BOG1101
BOG1102
E1130 Rd
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft from ground/roadway)
1 - 3 ft
> 3 ft
Undocumented Structures (Outside Breach Boundary)
1,000
2,000 Feet



PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
CAV0432	House	1	0.9	00:32
CAV0433	Mobile Home	1	2.8	00:32
CAV0434	Commercial	1	2.7	00:48
CAV0435	Commercial	1	1.9	00:52
CAV0436	Commercial	1	1.6	00:54
CAV0437	Commercial	3	1.0	00:55
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
CAV0430	Roadway	1	3.6	< 00:15
CAV0431	Bridge	1	3.0	< 00:15
CAV0438	Bridge	1	2.8	02:43
CAV0439	Bridge	1	1.7	03:05



POI_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
CAV0440	House	1	2.6	<00:15
CAV0441	House	1	3.9	00:15
CAV0446	House	1	0.9	00:20
CAV0445	House	1	1.8	00:21
CAV0446	House	1	1.6	00:21
CAV0447	House	1	3.3	00:21
CAV0448	House	1	2.8	00:22
CAV0449	House	1	8.5	00:22
CAV0450	House	1	9.7	00:22
CAV0451	House	1	2.1	00:22
CAV0452	House	1	4.7	00:22
CAV0453	House	1	4.9	00:23
CAV0454	House	1	3.8	00:23
CAV0456	House	1	1.5	00:23
CAV0457	House	1	0.7	00:23
CAV0458	House	1	0.6	00:23
CAV0459	House	1	7.8	00:23
CAV0460	House	1	1.1	00:23
CAV0461	House	1	5.4	00:23
CAV0462	House	1	6.7	00:23
CAV0463	House	1	3.1	00:23
CAV0464	House	1	3.1	00:23
CAV0465	House	1	2.4	00:23
CAV0466	House	1	2.0	00:24
CAV0467	House	1	7.2	00:24
CAV0468	House	1	1.7	00:24
CAV0469	House	1	1.2	00:24
CAV0470	House	1	4.4	00:24
CAV0472	Commercial	1	1.4	00:27
CAV0473	House	1	4.8	00:30
CAV0474	House	1	1.8	00:30
CAV0476	House-Double Wide	1	0.1	00:31
CAV0477	House	1	4.0	00:32
CAV0478	House	1	1.5	00:32
CAV0479	House	1	4.4	00:32
CAV0481	House	1	0.6	00:33
CAV0482	House	1	2.4	00:33
CAV0483	Commercial	1	0.5	00:33
CAV0484	House	1	1.5	00:34
CAV0485	Mobile Home	1	4.0	00:34
CAV0487	House	1	2.1	00:34
CAV0488	House	1	0.3	00:35
CAV0489	Mobile Home	1	0.3	00:35
CAV0490	Commercial	1	2.0	00:35
CAV0491	Commercial	1	4.4	00:35
CAV0492	Commercial	1	2.9	00:35
CAV0494	Mobile Home	1	0.7	00:38
CAV0495	House	1	6.3	00:40
POI_ID	Bridge/Roadway	Structures	Water Depth (ft from roadway)	Time to Peak Flow (H:MM)
CAV0442	Bridge	1	11.7	00:17
CAV0443	Bridge	1	13.1	00:17
CAV0454	Bridge	1	9.5	00:23
CAV0471	Bridge	1	9.4	00:27
CAV0475	Bridge	1	5.9	00:31
CAV0480	Bridge	1	5.1	00:32
CAV0480	Bridge	1	4.5	00:34
CAV0493	Bridge	1	3.4	00:35
CAV0496	Bridge	1	4.9	00:51
CAV0497	Bridge	1	4.7	01:03
CAV0438	Bridge	1	2.2	01:56
CAV0439	Bridge	1	4.0	02:28

Figure 4-1 Sunny Day Piping Breach, Maximum Inundation Depths, Upstream Affected Area

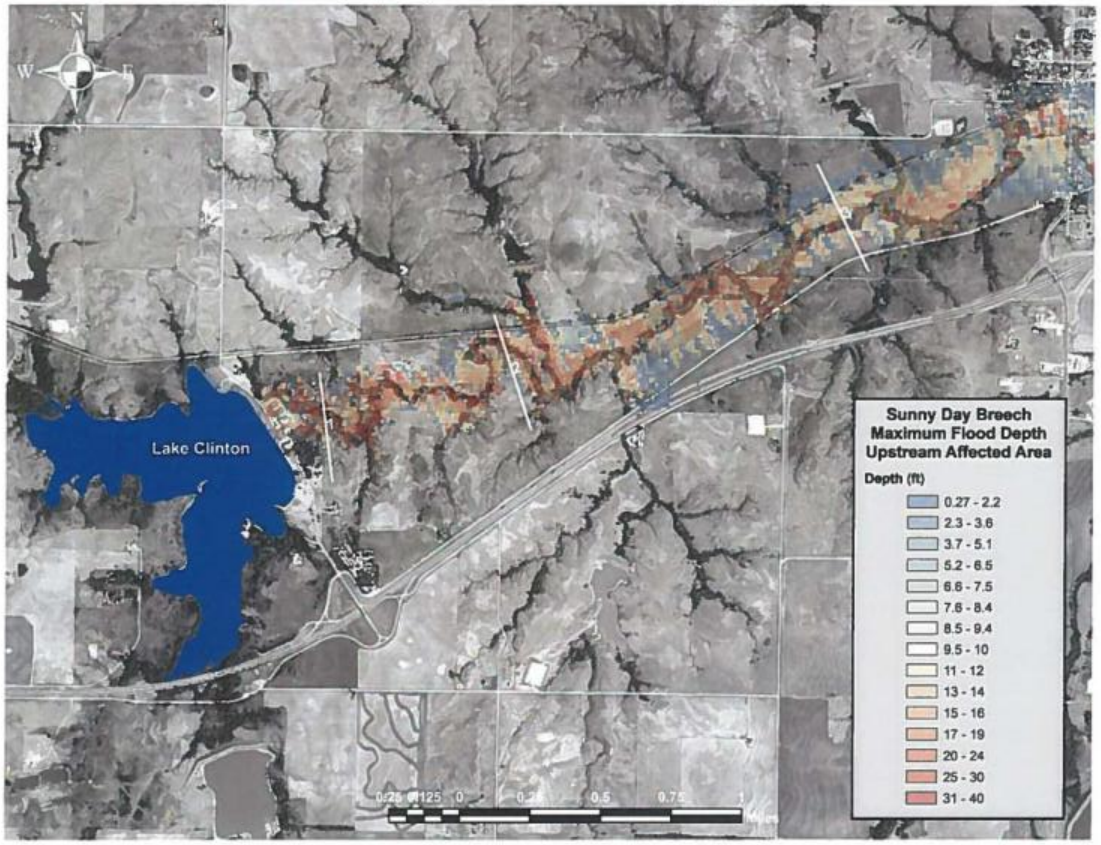
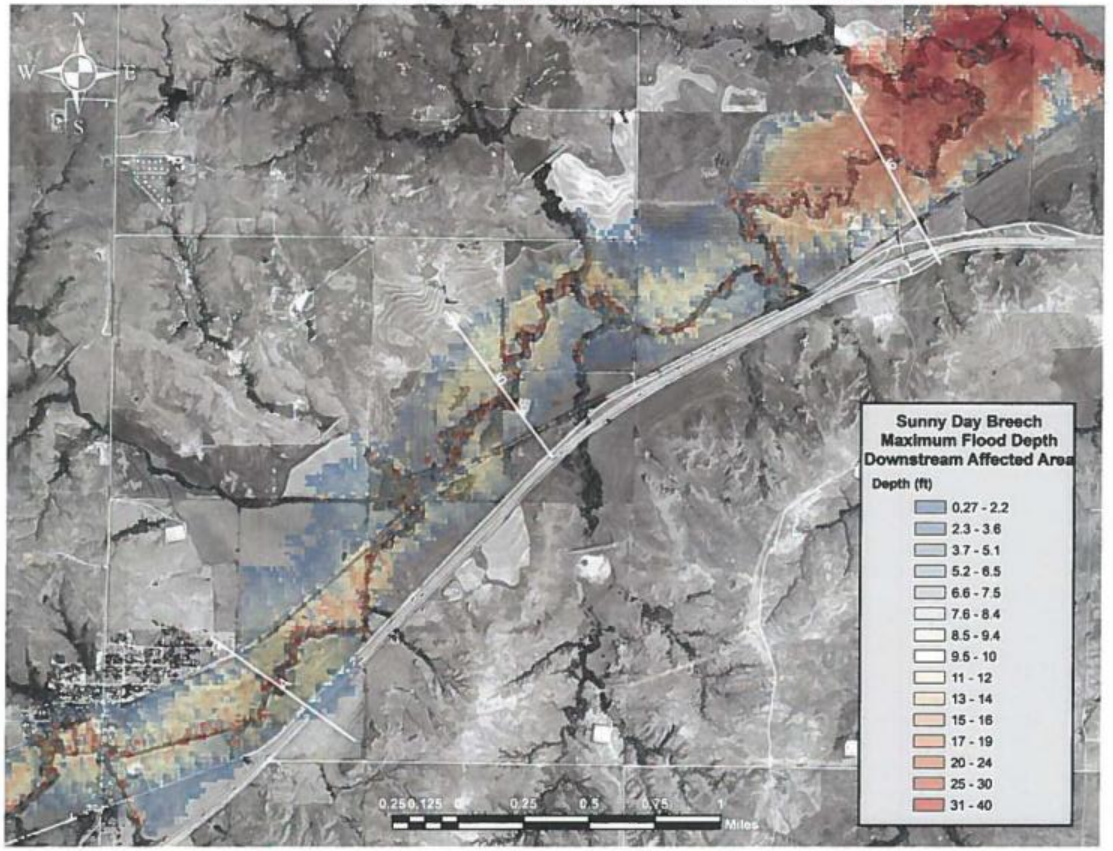


Figure 4-2 Sunny Day Piping Breach, Maximum Inundation Depths, Downstream Affected Area



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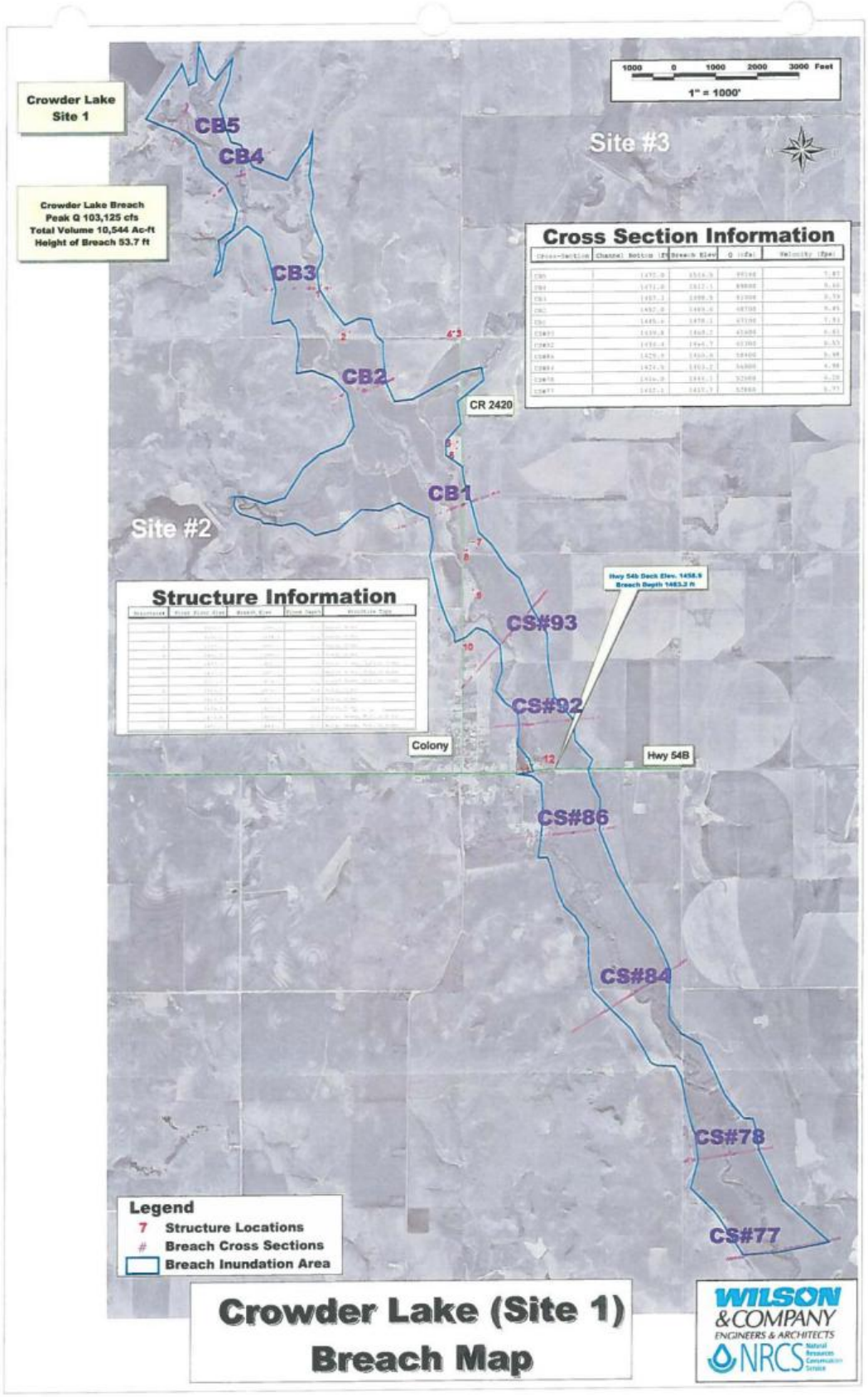
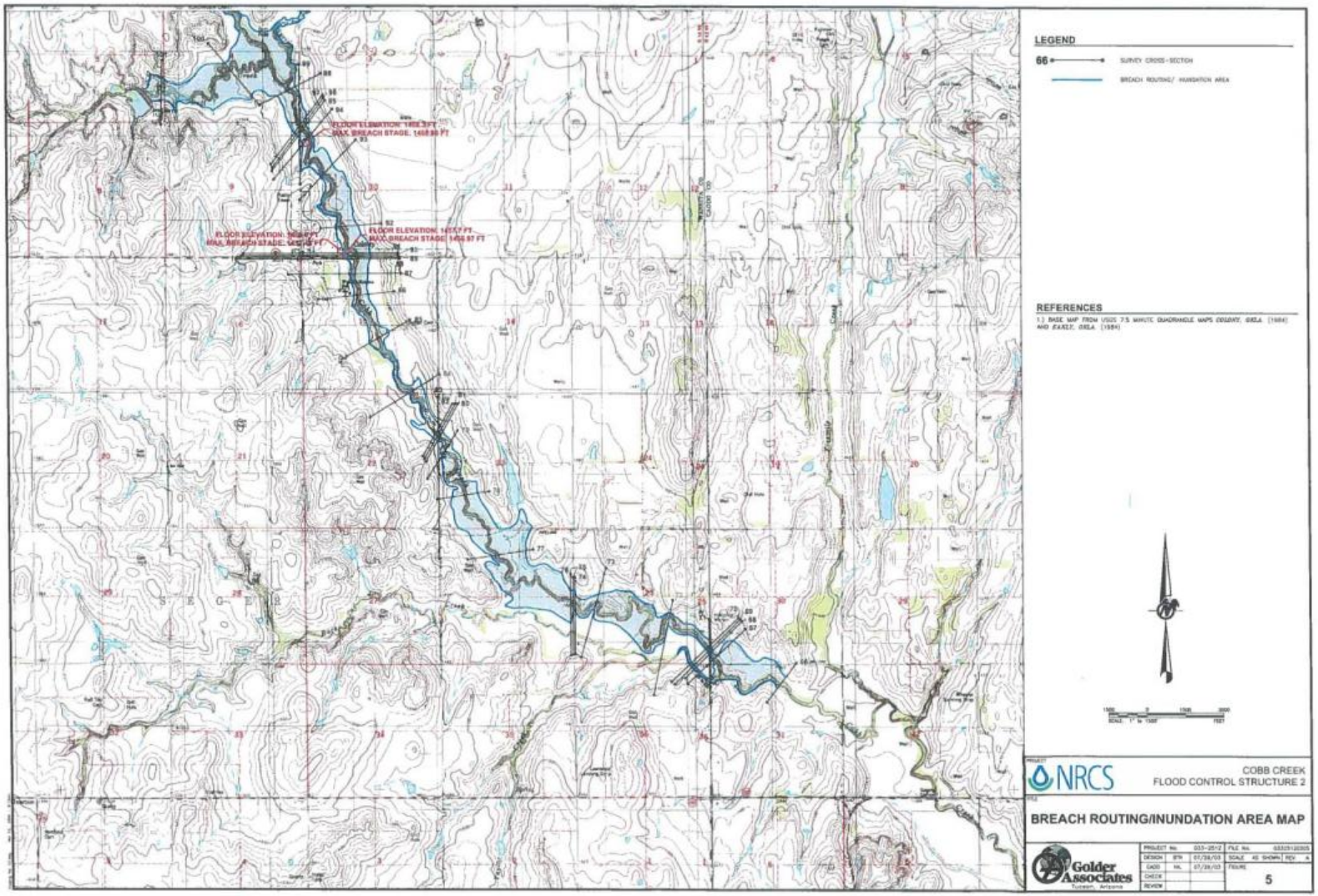
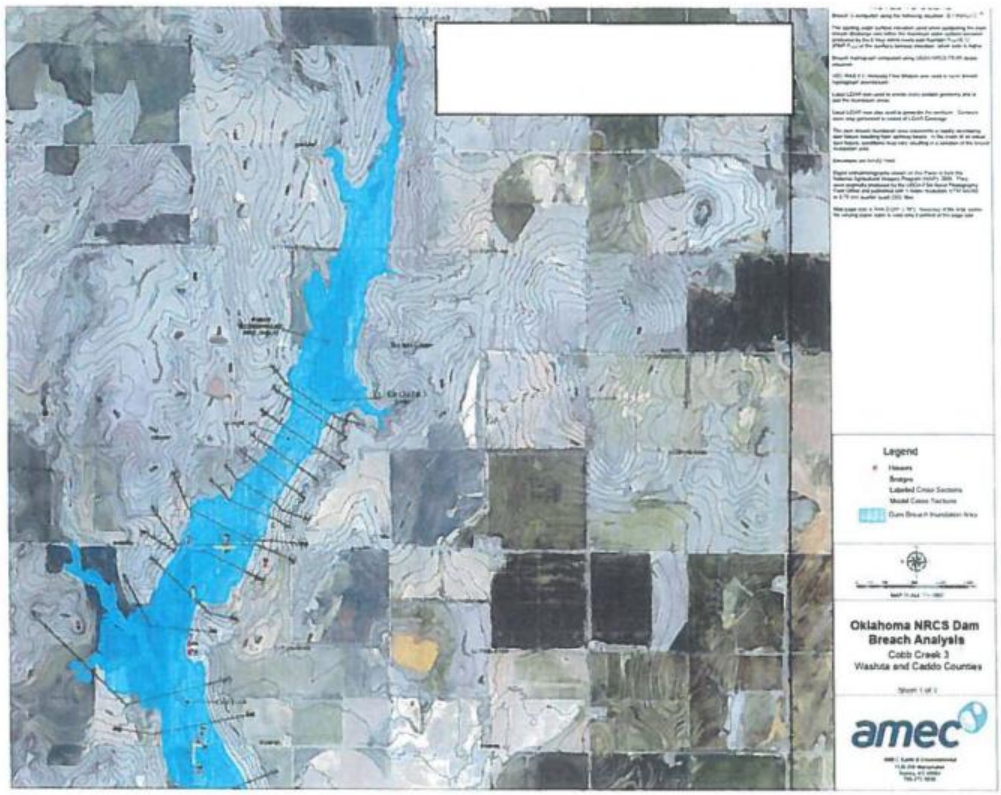
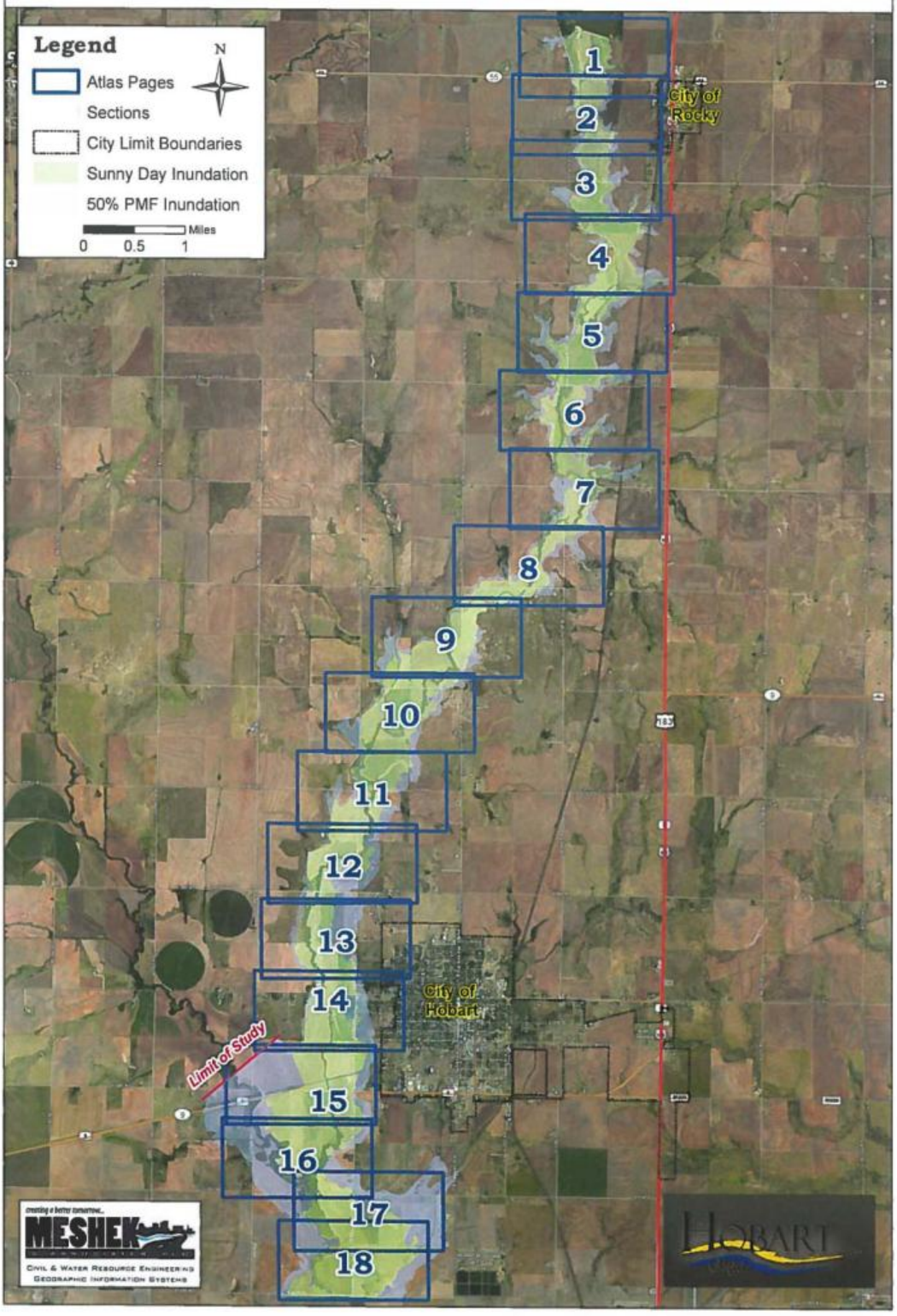

Crowder Lake Site 1
Crowder Lake Breach
Peak Q 103,125 cfs
Total Volume 10,544 Ac-ft
Height of Breach 53.7 ft
1000 0 1000 2000 3000 Feet
1" = 1000'
Site #3
Cross Section Information
CB5
CB4
CB3
CB2
CB1
CR 2420
Site #2
Structure Information
Hwy 54b Deck Elev. 1458.9
Breach Depth 1483.2 ft
CS#93
CS#92
Colony
Hwy 54B
CS#86
CS#84
CS#78
CS#77
Legend
7 Structure Locations
Breach Cross Sections
Breach Inundation Area
Crowder Lake (Site 1)
Breach Map
WILSON & COMPANY
ENGINEERS & ARCHITECTS
NRCS

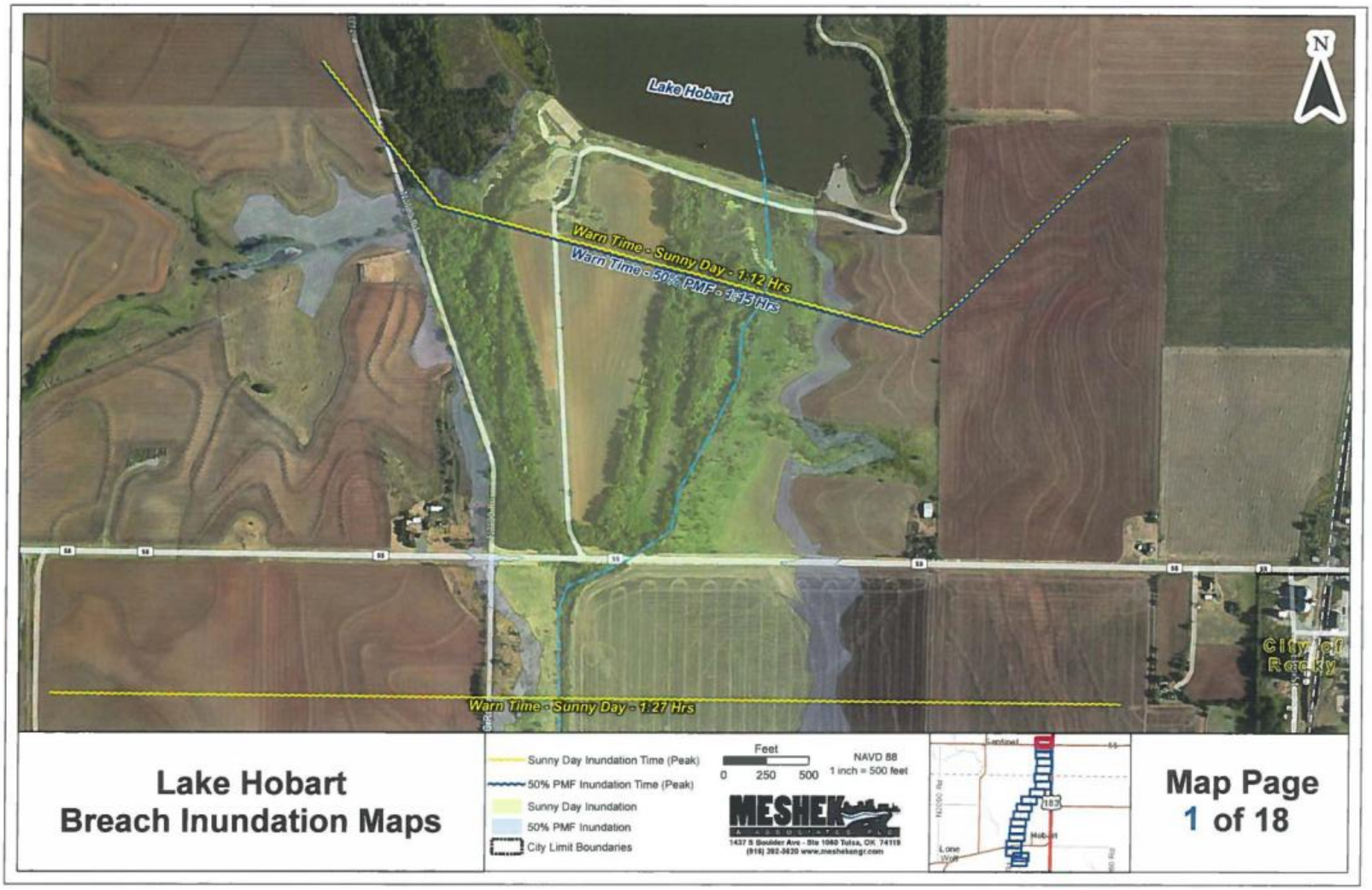

LEGEND
66
SURVEY CROSS-SECTION
BREACH ROUTING/ INUNDATION AREA
REFERENCES
1.) BASE MAP FROM USGS 7.5 MINUTE QUADRANGLE MAPS (DOUGHT, OKLA. (1984) AND (EARLY, OKLA. (1984)
NRCS
COBB CREEK
FLOOD CONTROL STRUCTURE 2
BREACH ROUTING/INUNDATION AREA MAP
Golder Associates
Tucson, Arizona
5

Appendix D- 4
Breach Inundation Map
Cobb Creek Dam No. 3



Lake Hobart Dam Breach Inundation Index Map




Lake Hobart
Warn Time - Sunny Day - 1.12 Hrs
Warn Time - 50% PMF - 1.13 Hrs
Warn Time - Sunny Day - 1.27 Hrs
N
City of Rocky
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
1437 S Boulder Ave - Ste 1060 Tulsa, OK 74119
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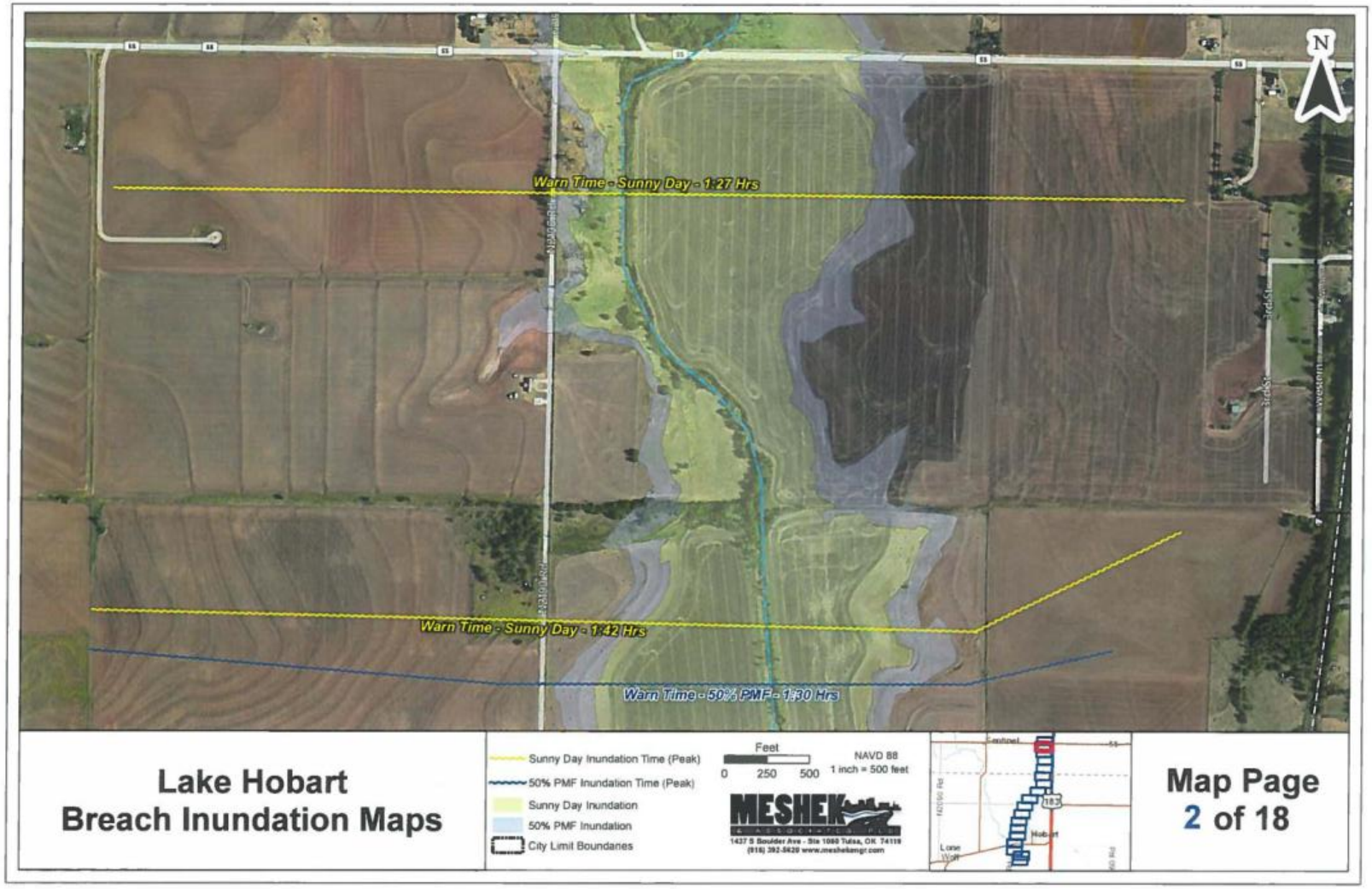
Map Page
1 of 18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Warn Time - Sunny Day - 1:27 Hrs
Warn Time - Sunny Day - 1:42 Hrs
Warn Time - 50% PMF - 1:30 Hrs
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
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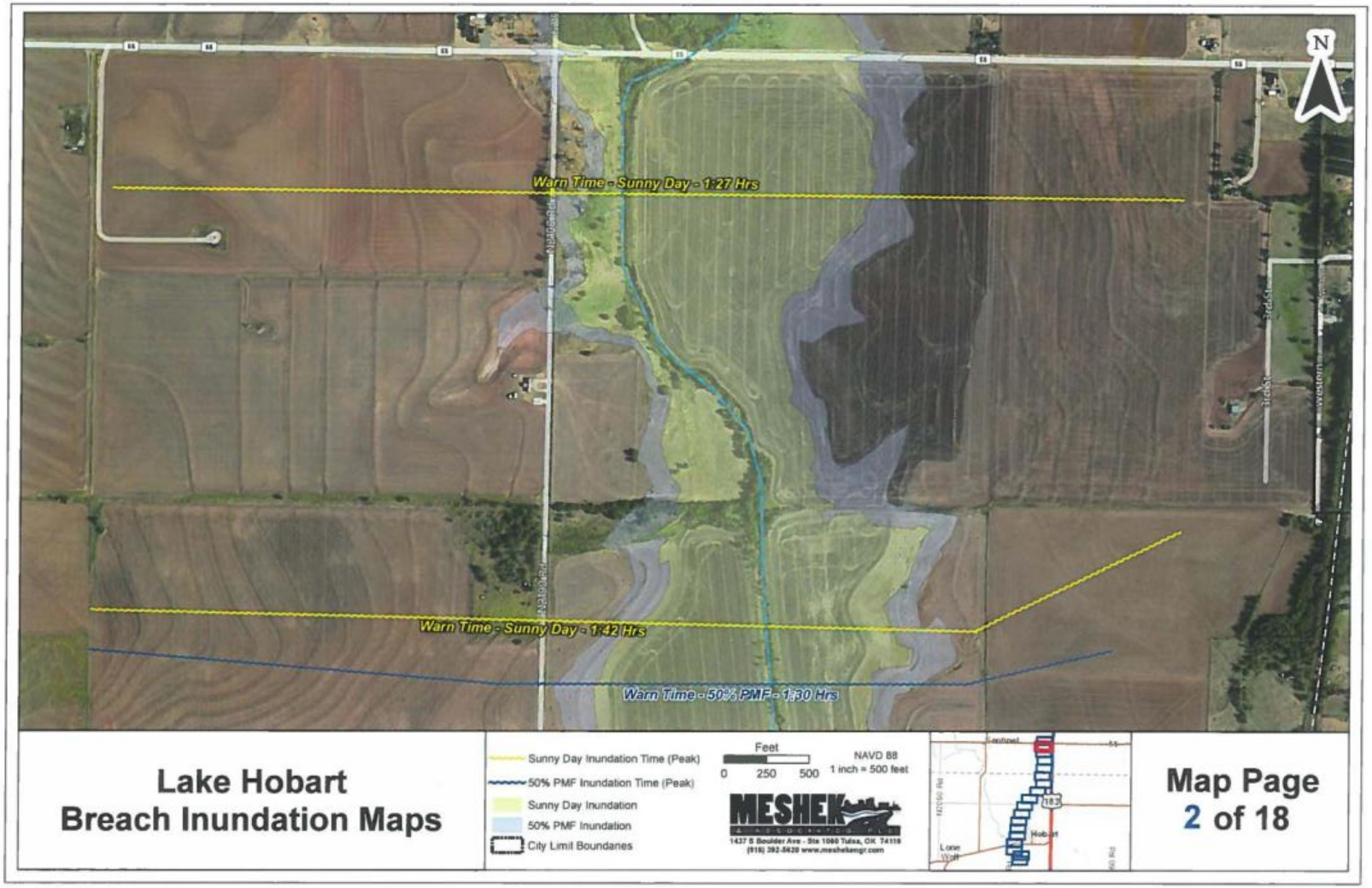
Hobart
Lone Wolf
Map Page
2 of 18


N
Warn Time - Sunny Day - 1:27 Hrs
Warn Time - Sunny Day - 1:42 Hrs
Warn Time - 50% PMF - 1:30 Hrs
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
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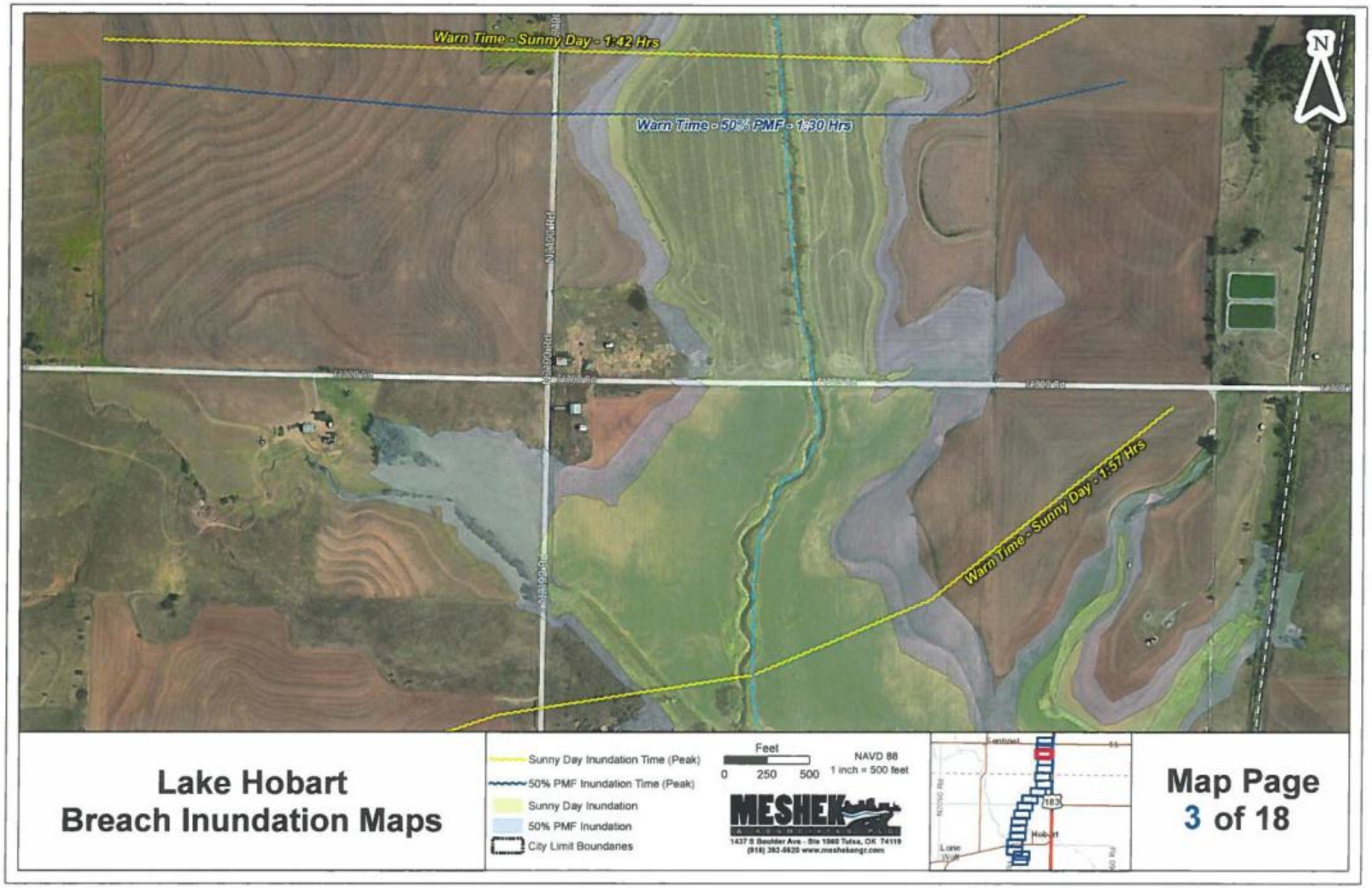
Map Page
2 of 18


Warn Time - Sunny Day - 1:42 Hrs
Warn Time - 50% PMF - 1:30 Hrs
Warn Time - Sunny Day - 1:57 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
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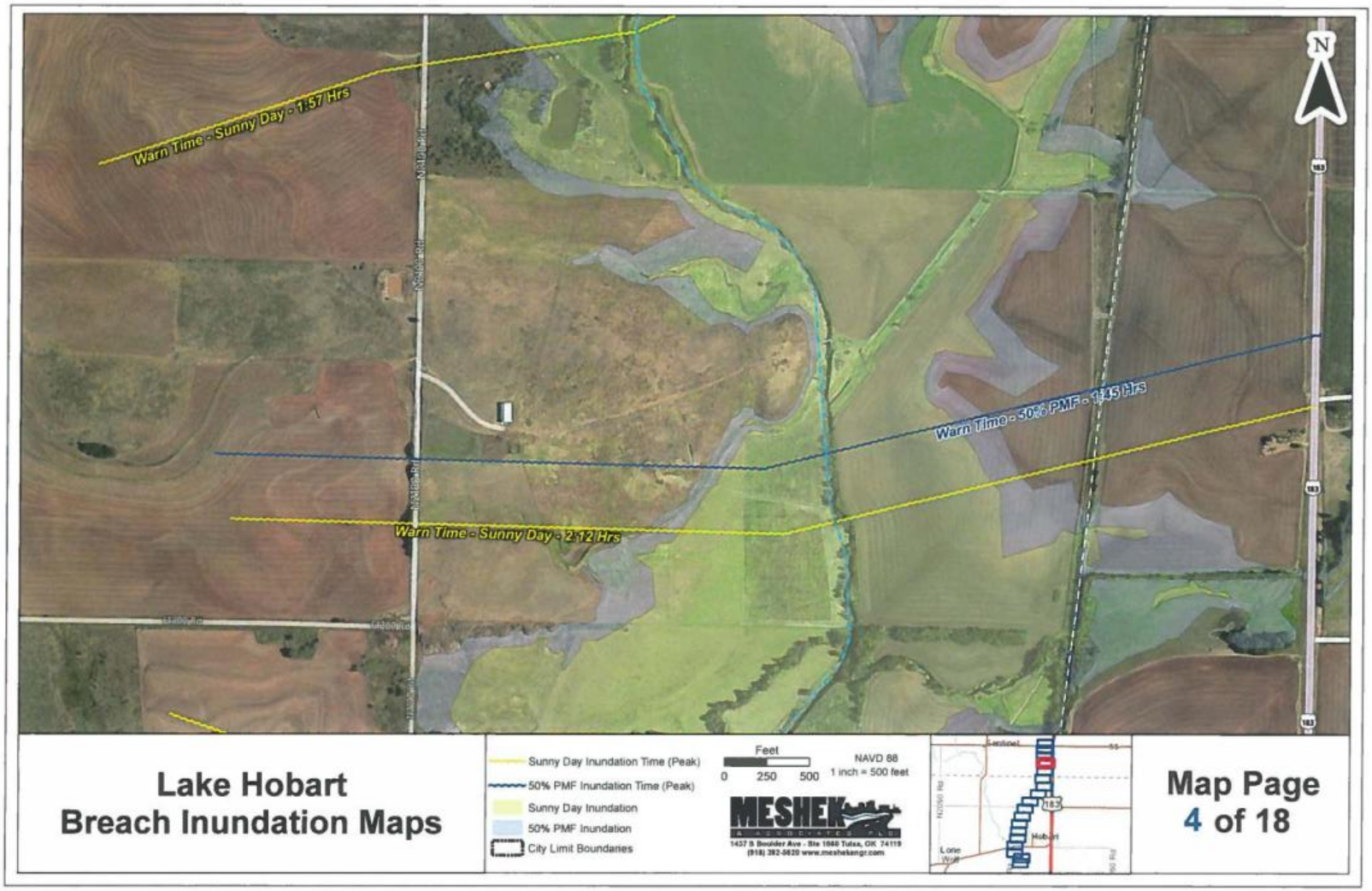
3 of 18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Warn Time - Sunny Day - 2:12 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
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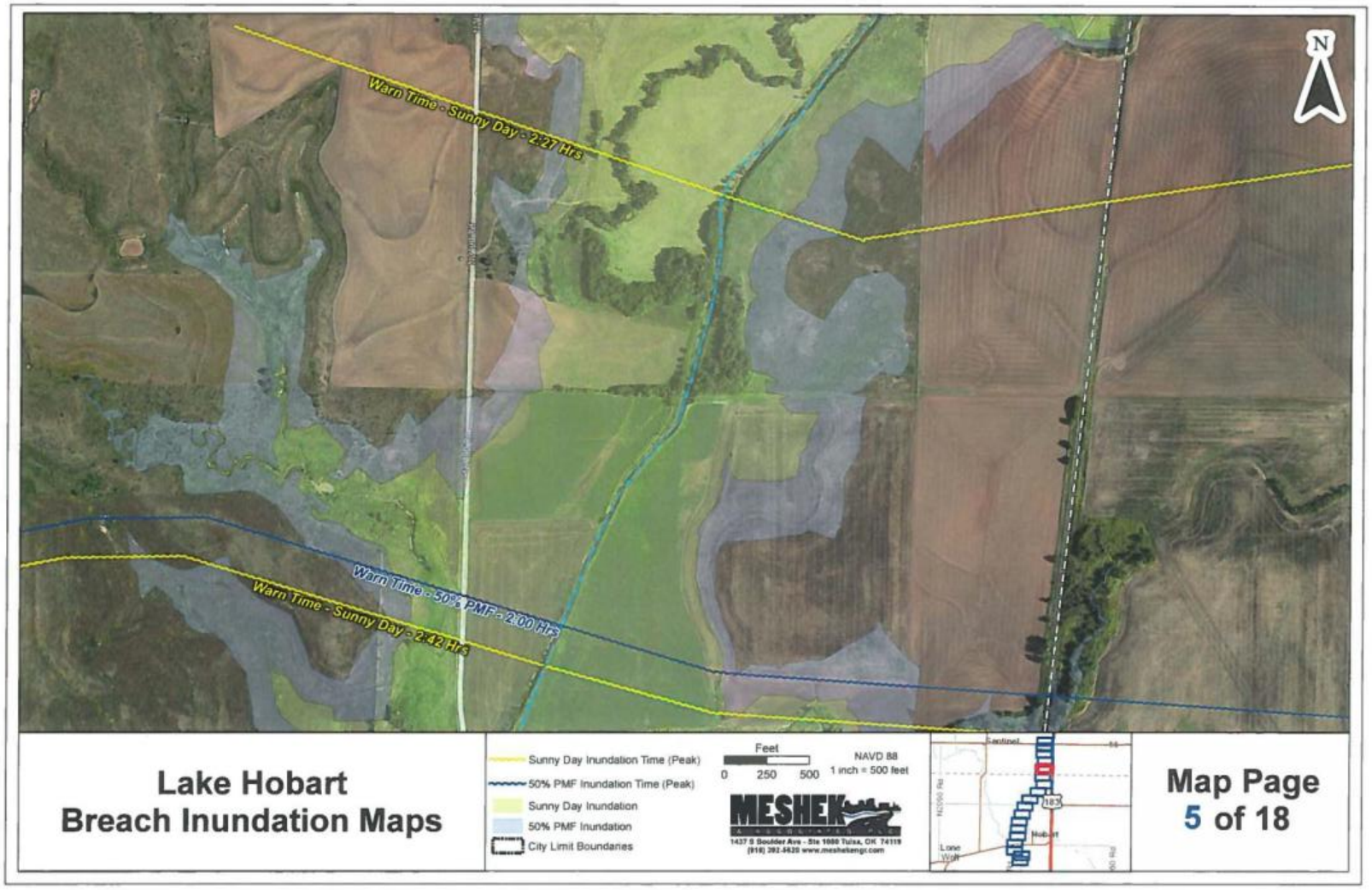
Hobart
Lone Wolf
Map Page
4 of 18


Warn Time - Sunny Day - 2:27 Hrs
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Warn Time - Sunny Day - 2:42 Hrs
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Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
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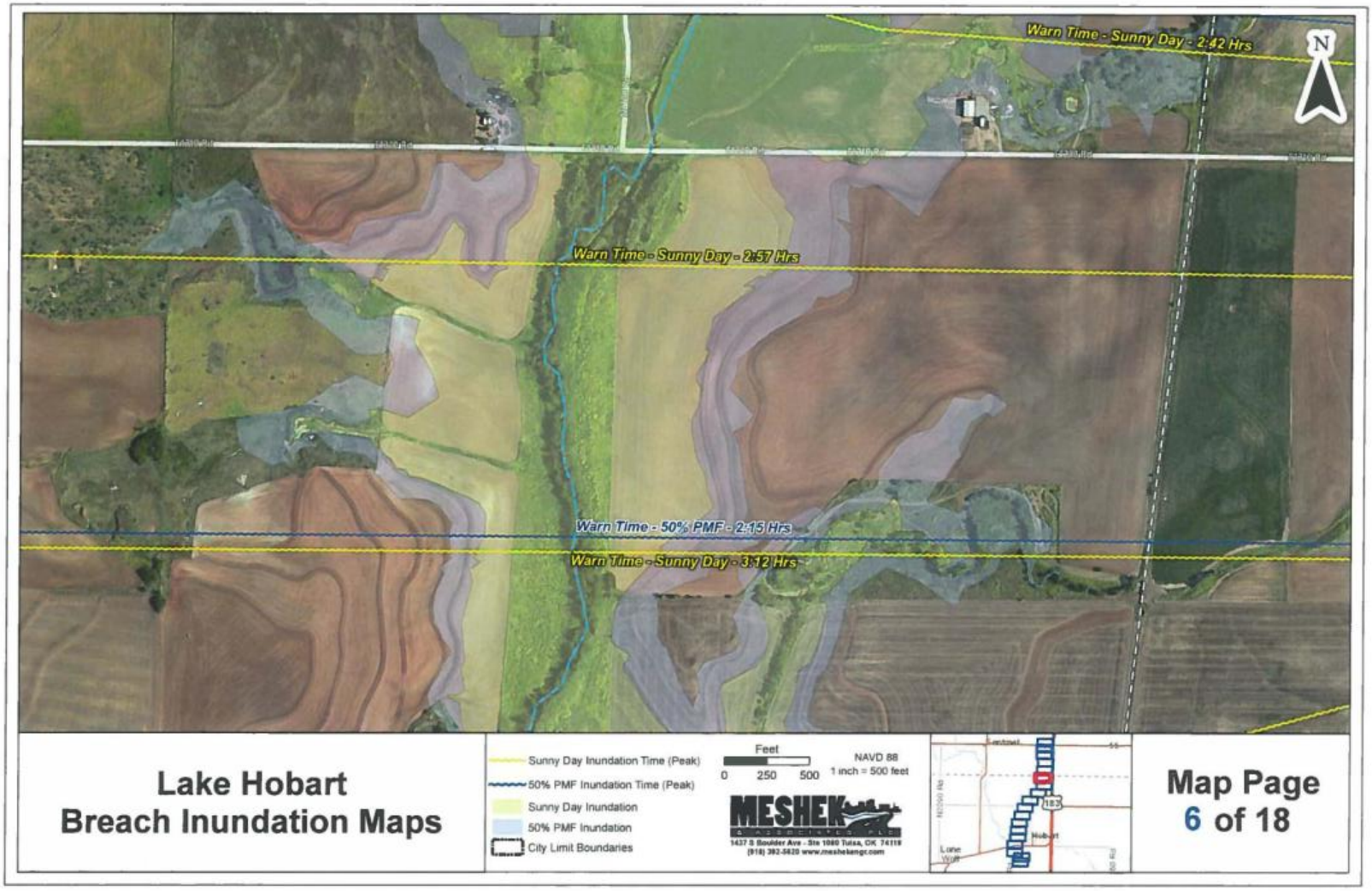
Hobart
Lone Wolf
Map Page
5 of 18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Warn Time - Sunny Day - 2:57 Hrs
Warn Time - 50% PMF - 2:15 Hrs
Warn Time - Sunny Day - 3:12 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
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NAVD 88
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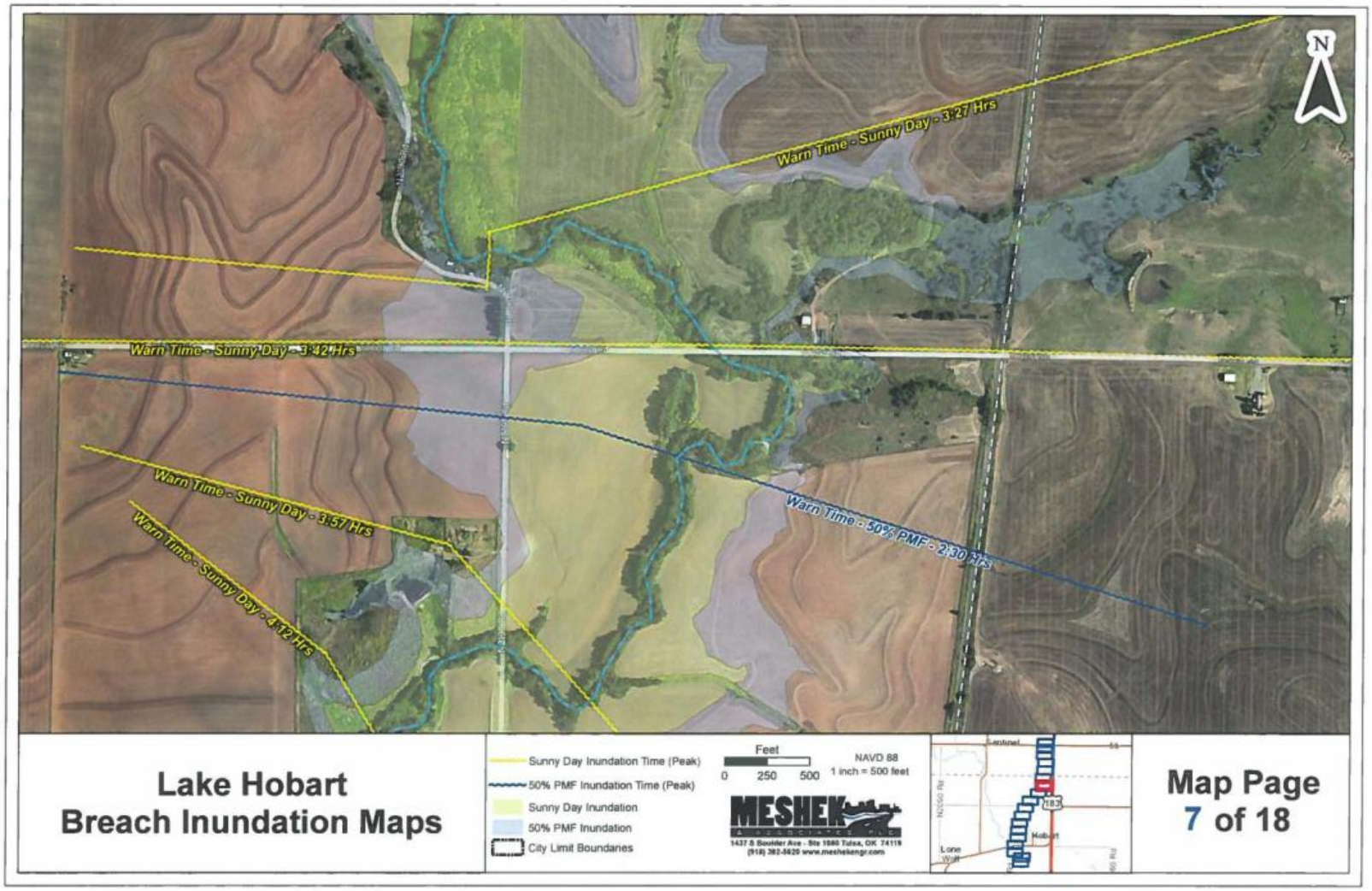
Hobart
Lone Wolf
Map Page
6 of 18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Warn Time - Sunny Day - 3:57 Hrs
Warn Time - Sunny Day - 4:12 Hrs
Warn Time - 50% PMF - 2:30 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
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NAVD 88
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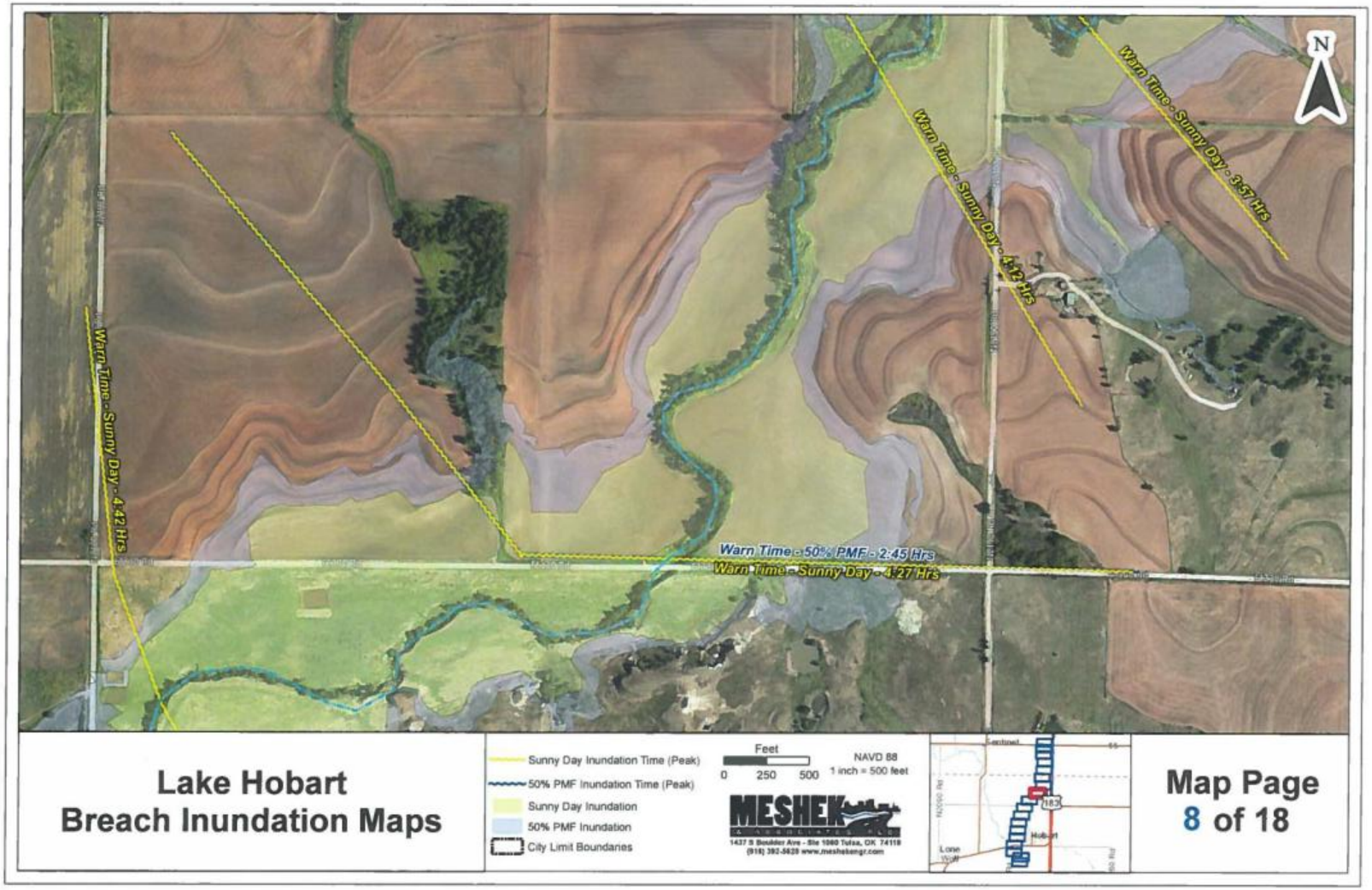
7 of 18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Warn Time - Sunny Day - 4:42 Hrs
Warn Time - 50% PMF - 2:45 Hrs
Warn Time - Sunny Day - 4:27 Hrs
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
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Feet
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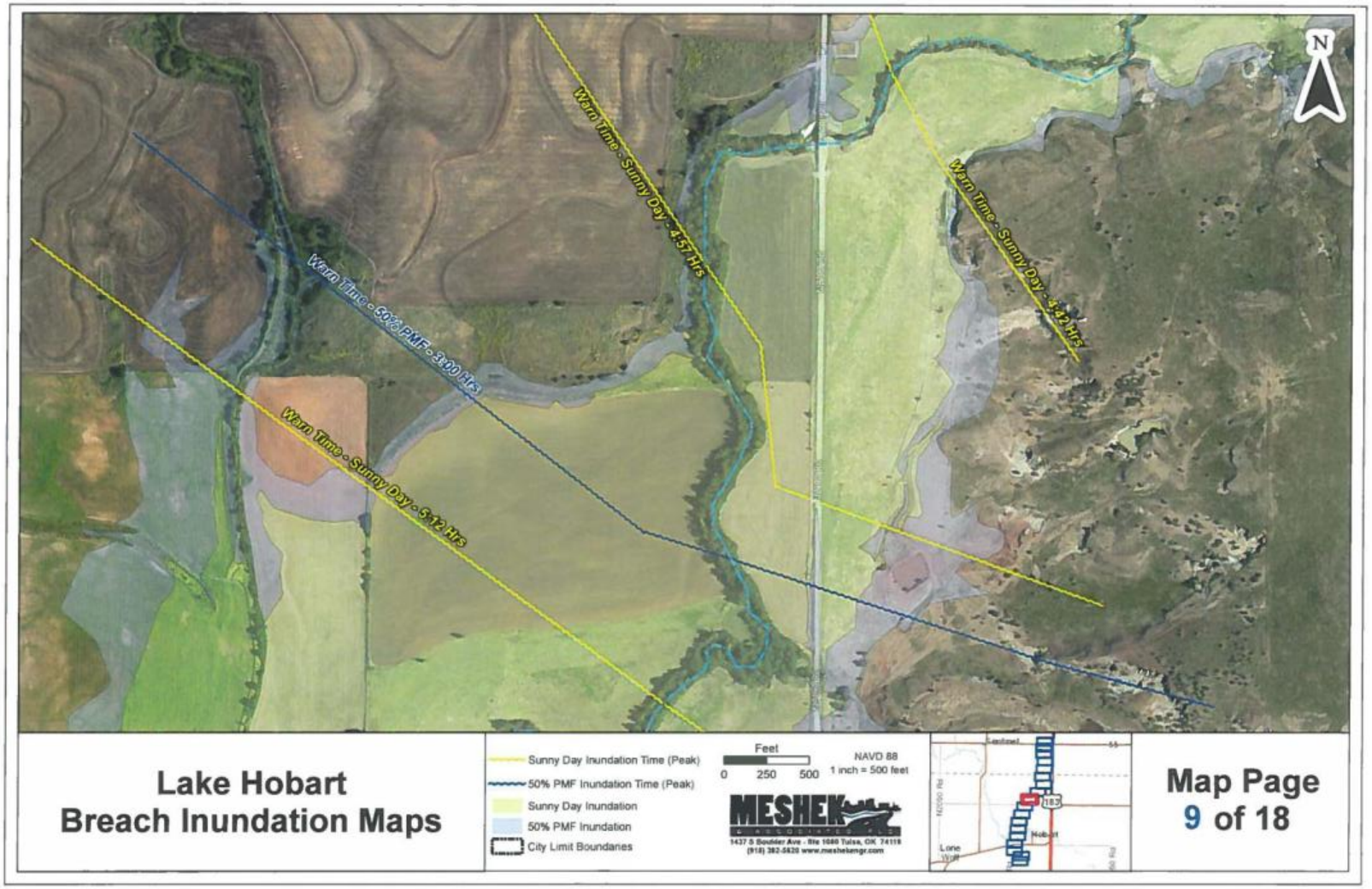
Map Page
8 of 18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Warm Time - Sunny Day - 5:12 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
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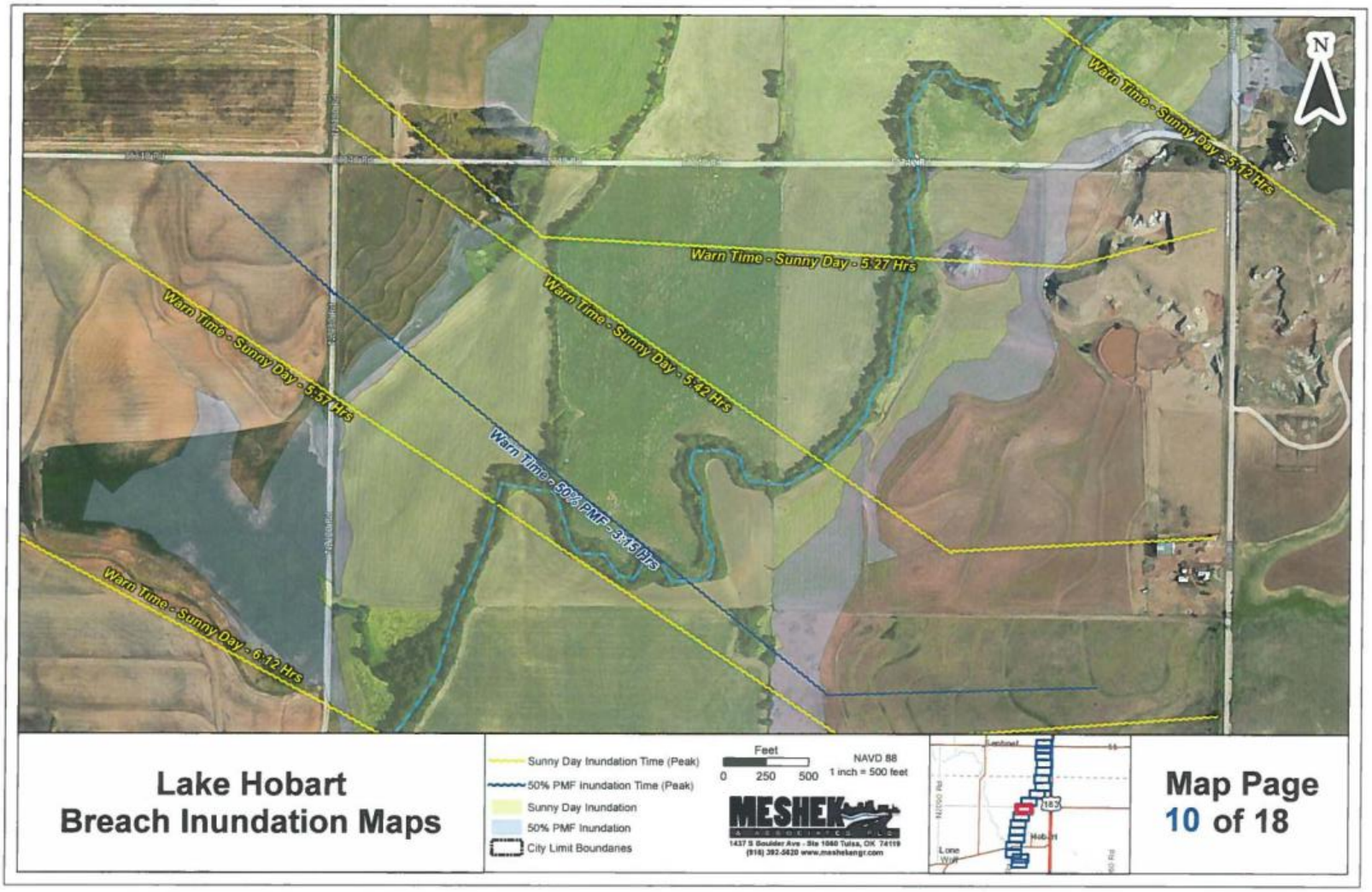
Lone Wolf
Nobart
183
Map Page
9 of 18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Warn Time - Sunny Day - 5.57 Hrs
Warn Time - 50% PMF - 3.15 Hrs
Warn Time - Sunny Day - 6.12 Hrs
Lake Hobart
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50% PMF Inundation
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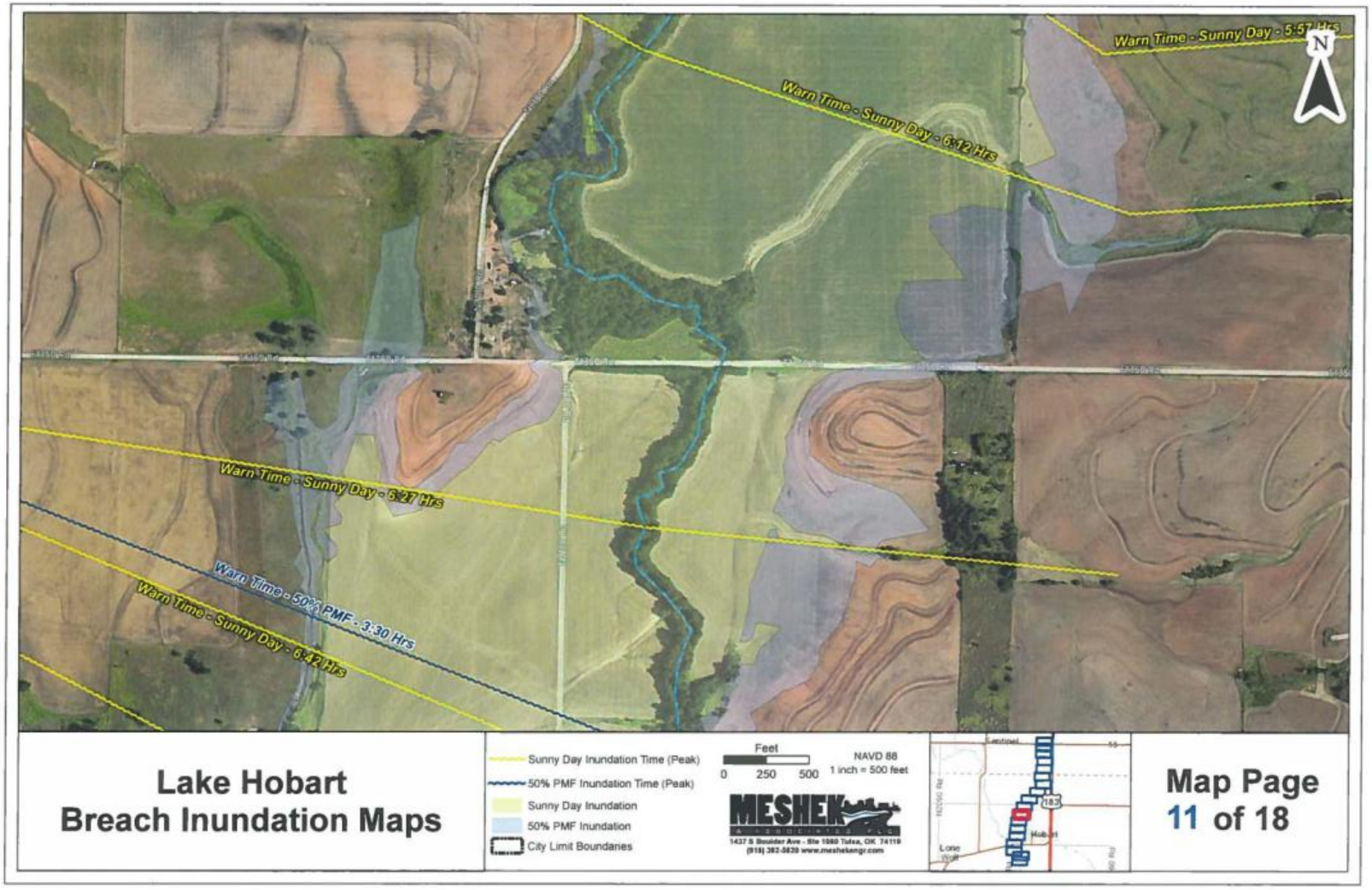
Map Page
10 of 18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Warn Time - Sunny Day - 6:12 Hrs
Warn Time - Sunny Day - 6:27 Hrs
Warn Time - 50% PMF - 3:30 Hrs
Warn Time - Sunny Day - 6:42 Hrs
N
Lake Hobart
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50% PMF Inundation Time (Peak)
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NAVD 88
1 inch = 500 feet
MESHEK
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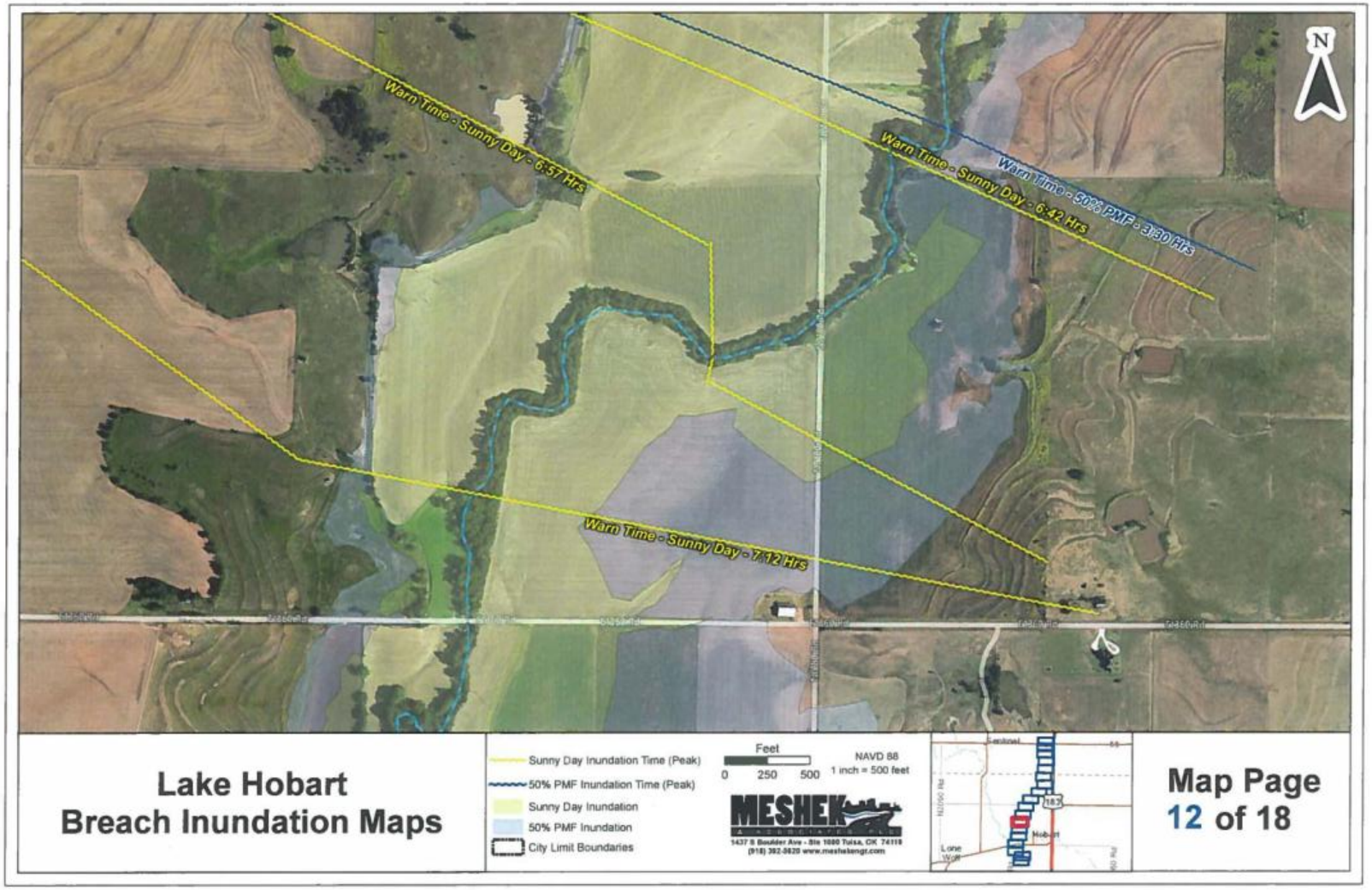
Map Page
11 of 18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Warn Time - Sunny Day - 6:42 Hrs
Warn Time - 50% PMF - 3:30 Hrs
Warn Time - Sunny Day - 7:12 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
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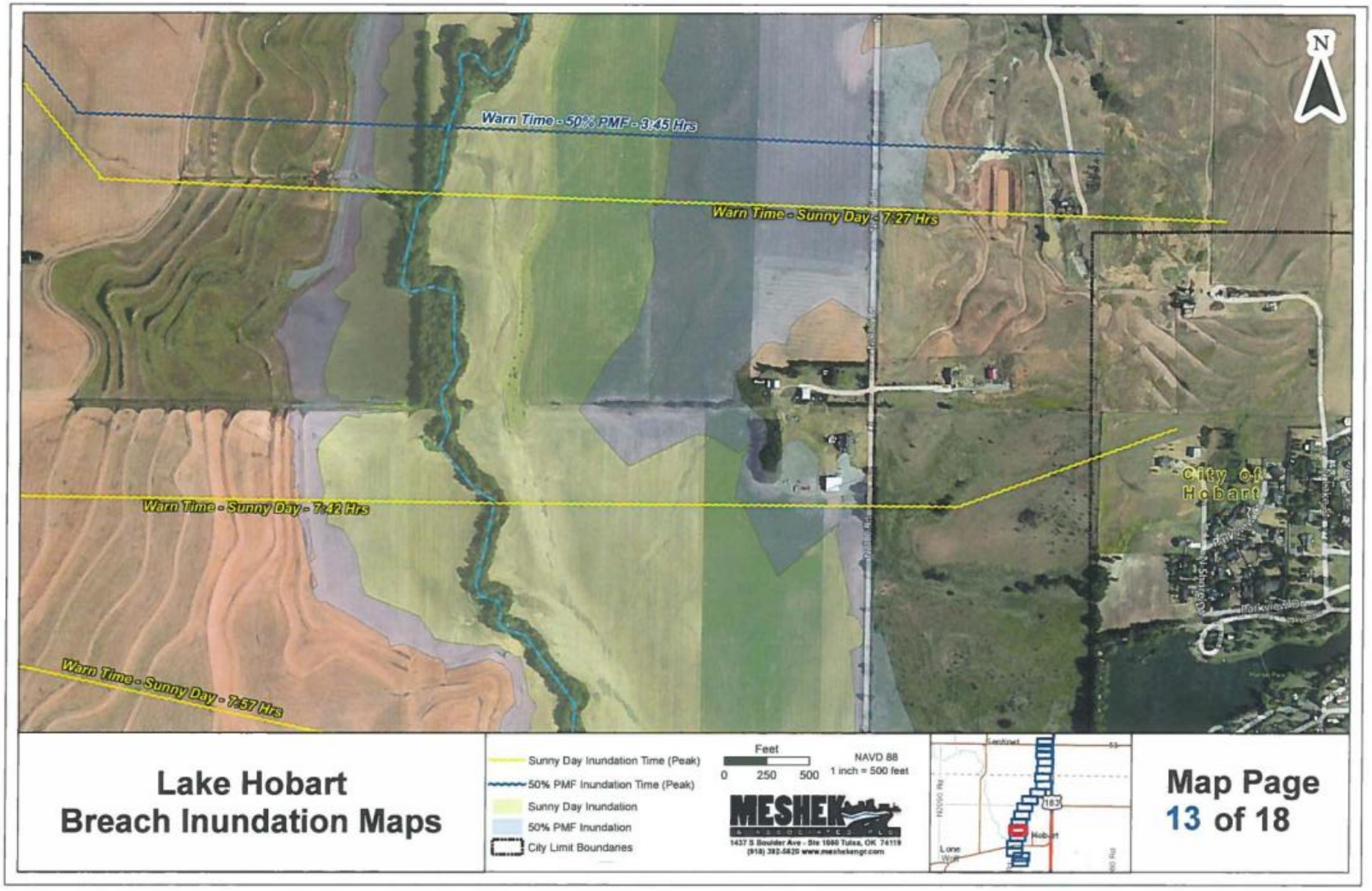
Map Page
12 of 18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Warn Time - Sunny Day - 7:27 Hrs
Warn Time - Sunny Day - 7:42 Hrs
Warn Time - Sunny Day - 7:57 Hrs
city of Hobart
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
1437 S Boulder Ave - Ste 1040 Tulsa, OK 74119
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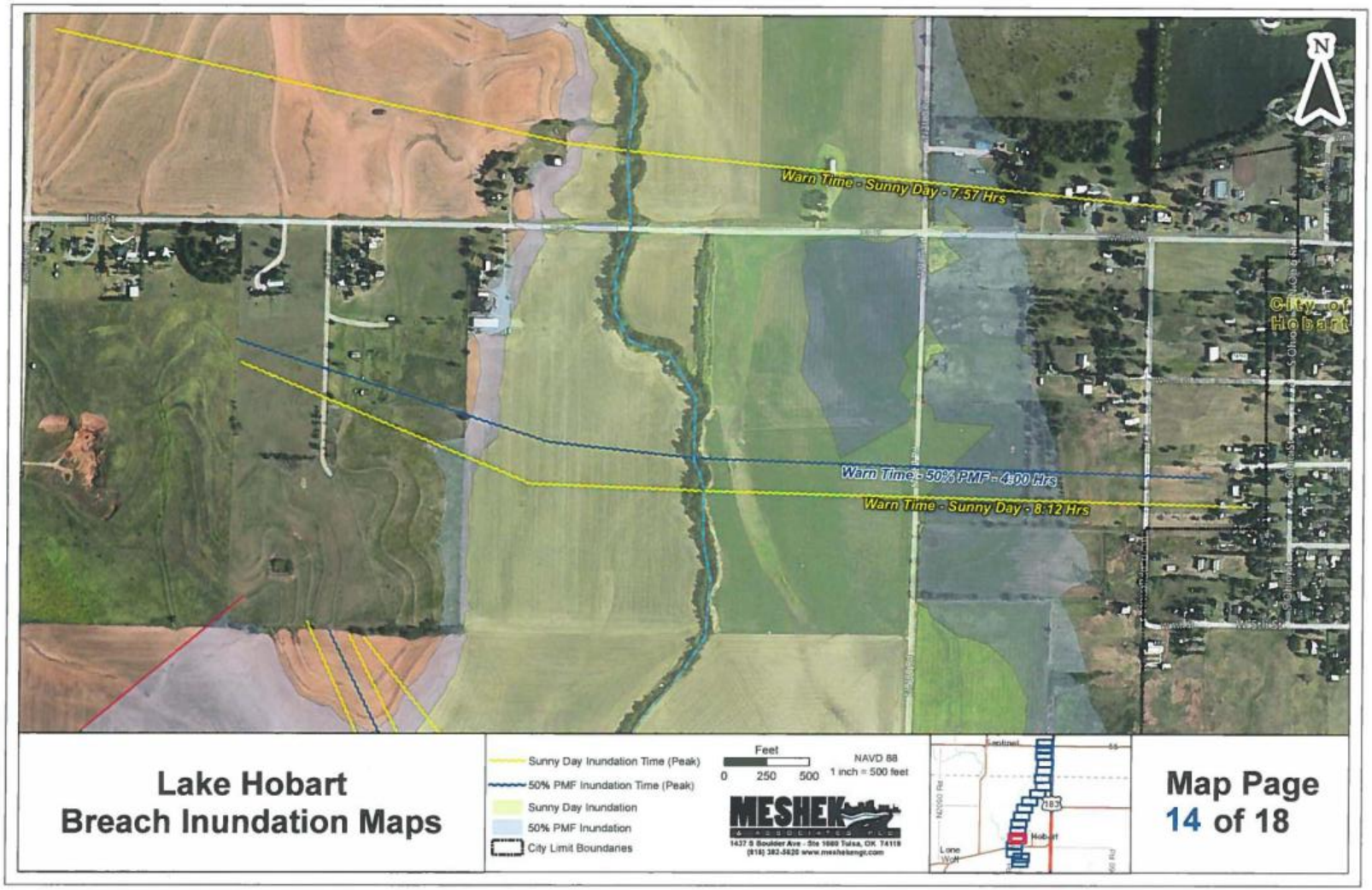
Map Page
13 of 18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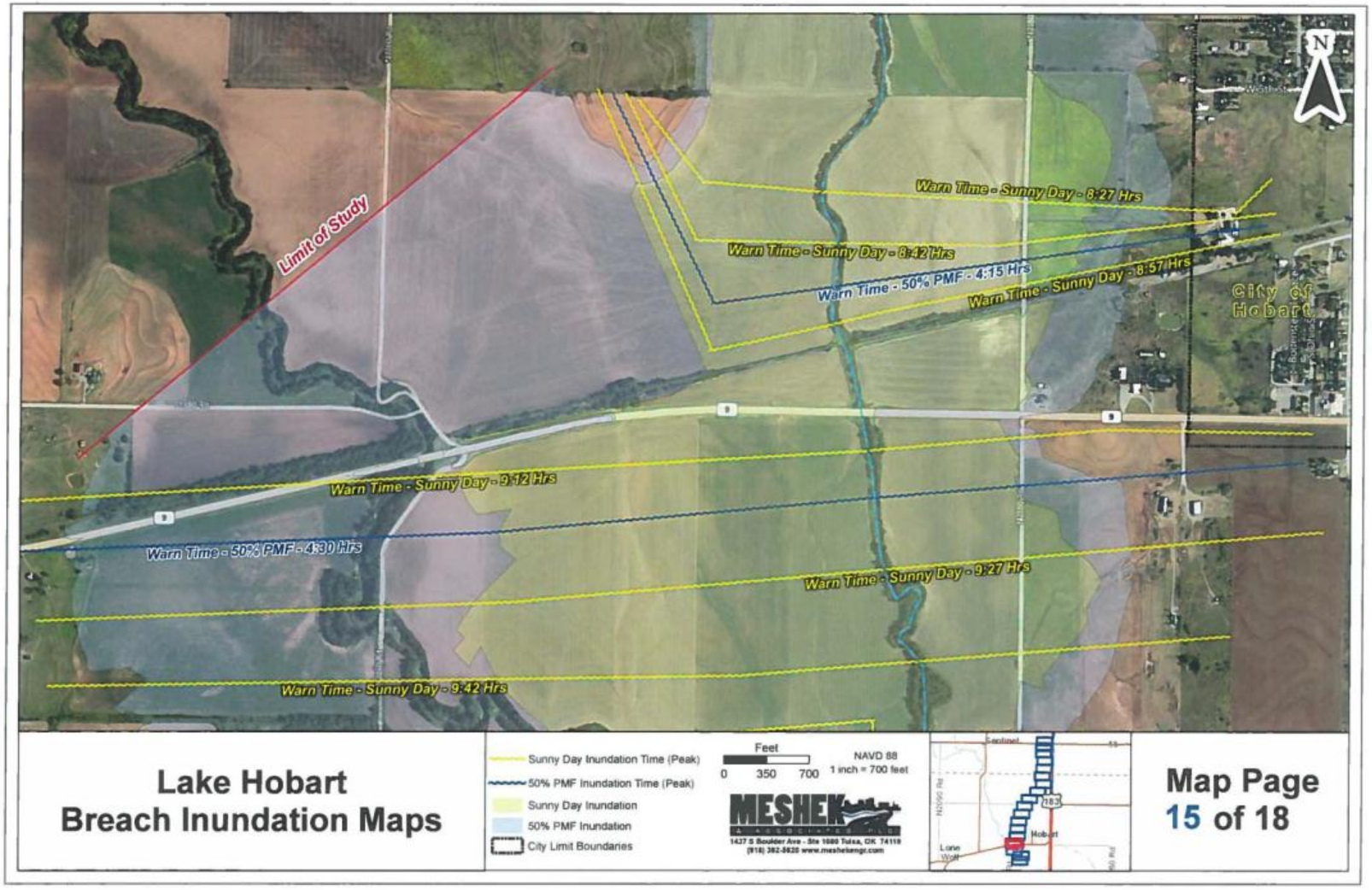
Warn Time - Sunny Day - 7.57 Hrs
Warn Time - 50% PMF - 4.90 Hrs
Warn Time - Sunny Day - 8.12 Hrs
City of Hobart
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 250 500
NAVD 88
1 inch = 500 feet
MESHEK
1437 S Boulder Ave - Ste 1000 Tulsa, OK 74119
(918) 382-5820 www.meshekengr.com
Map Page
14 of 18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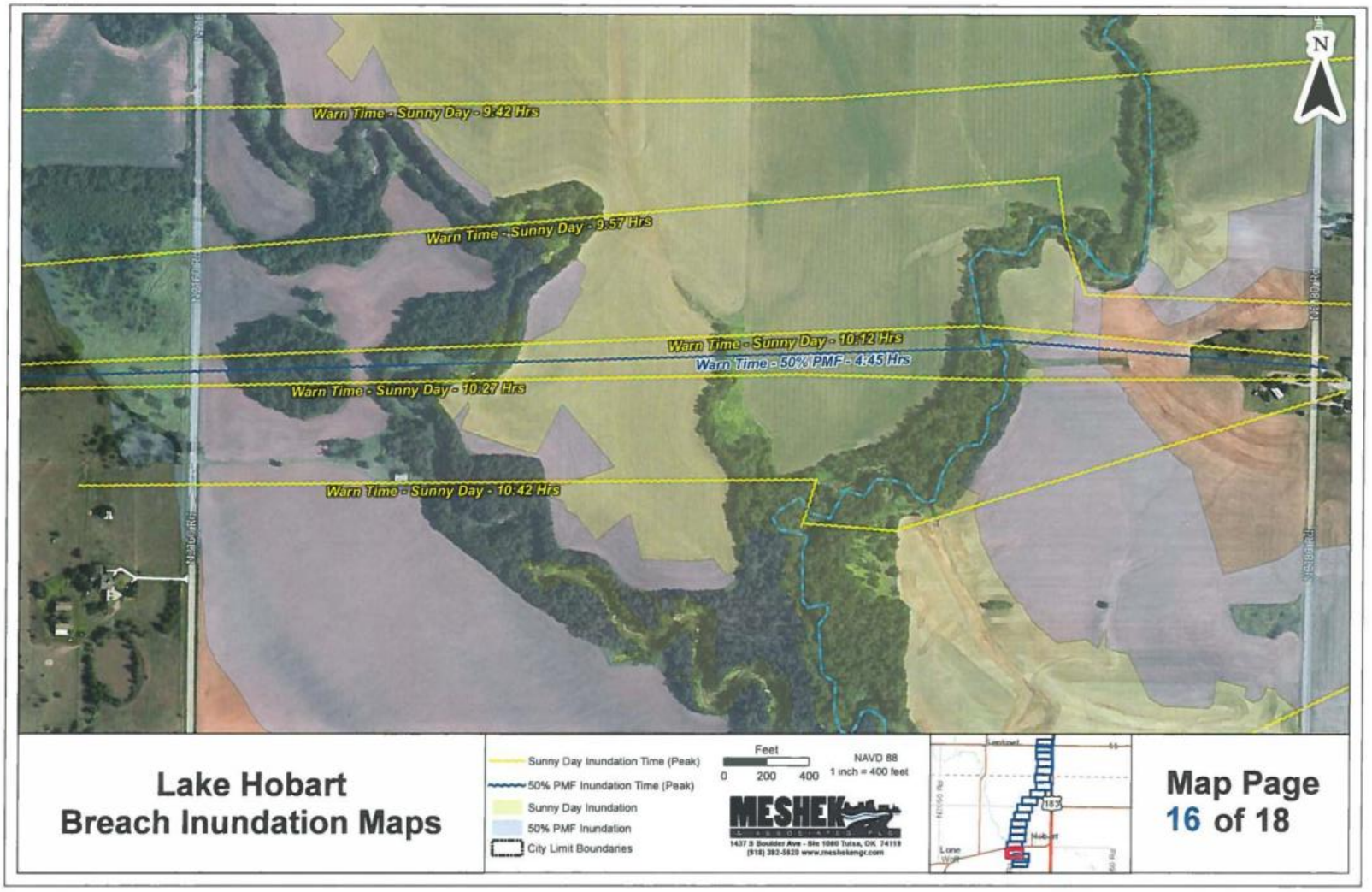
Warn Time - Sunny Day - 8:42 Hrs
Warn Time - 50% PMF - 4:15 Hrs
Warn Time - Sunny Day - 8:57 Hrs
City of Hobart
Warn Time - Sunny Day - 9:12 Hrs
Warn Time - 50% PMF - 4:30 Hrs
Warn Time - Sunny Day - 9:27 Hrs
Warn Time - Sunny Day - 9:42 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 350 700
NAVD 88
1 inch = 700 feet
MESHEK
& ASSOCIATES PLLC
1437 S Boulder Ave - Ste 1000 Tulsa, OK 74119
(918) 382-5620 www.meshekengr.com
Map Page
15 of 18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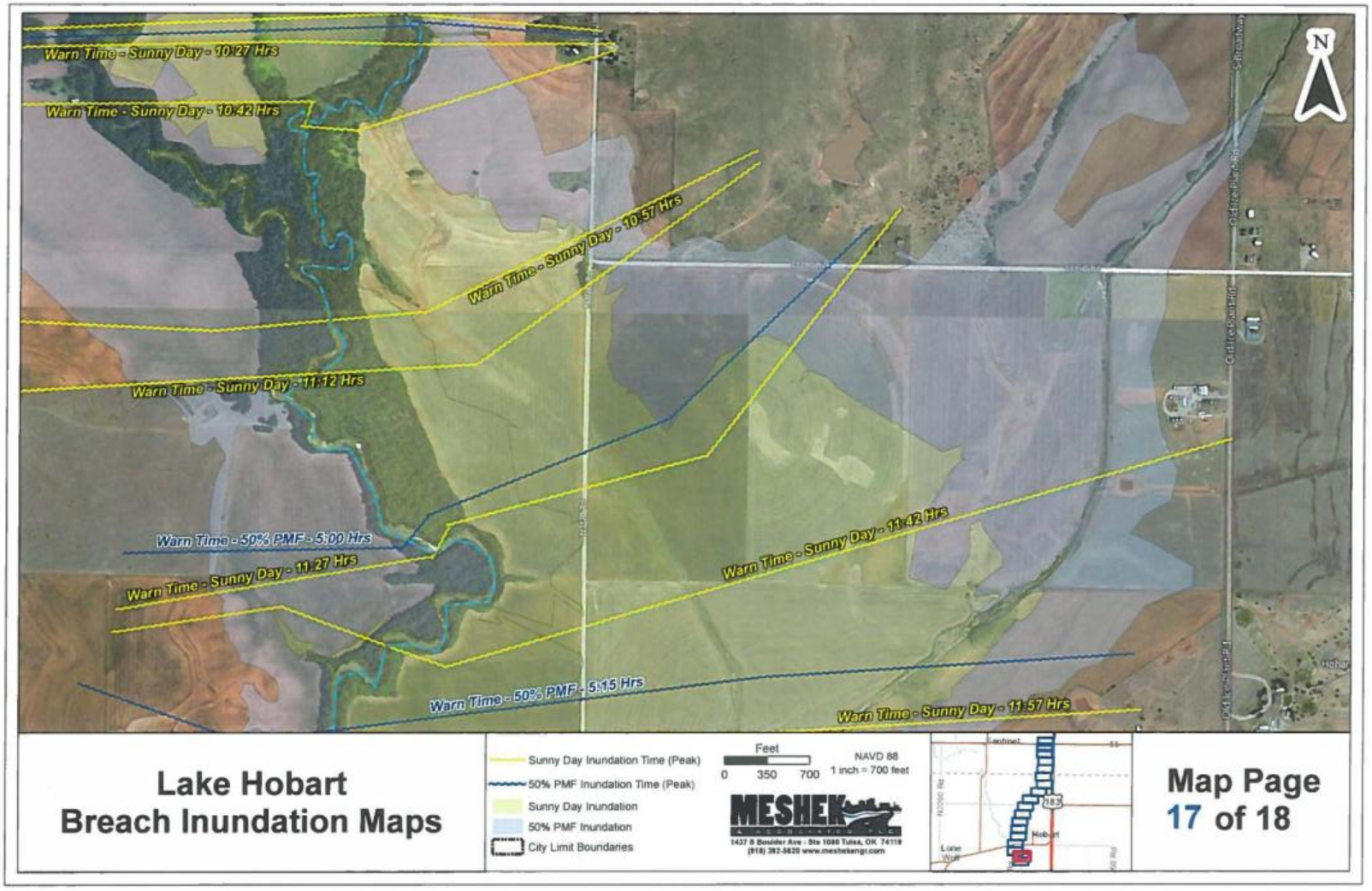
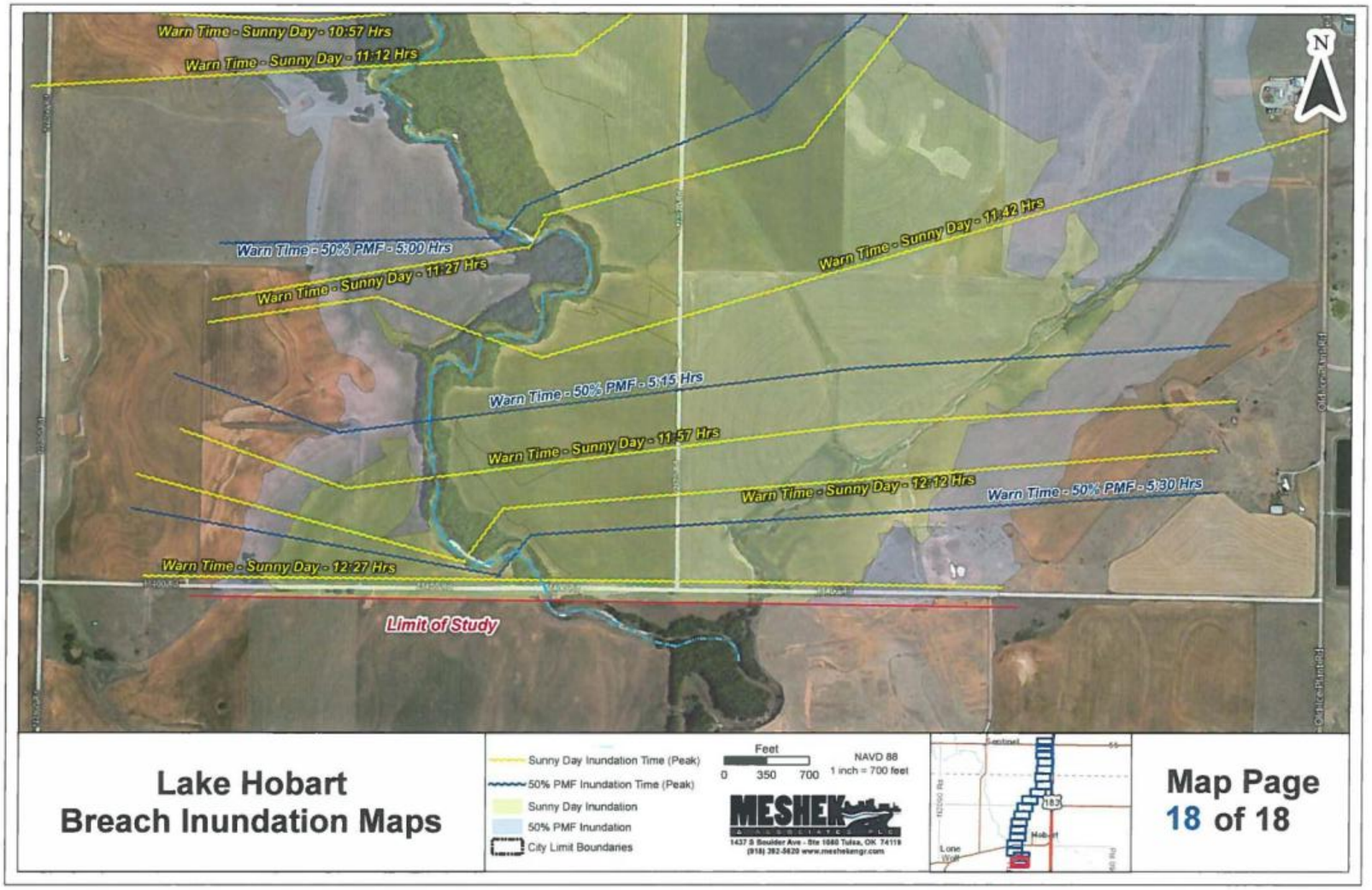
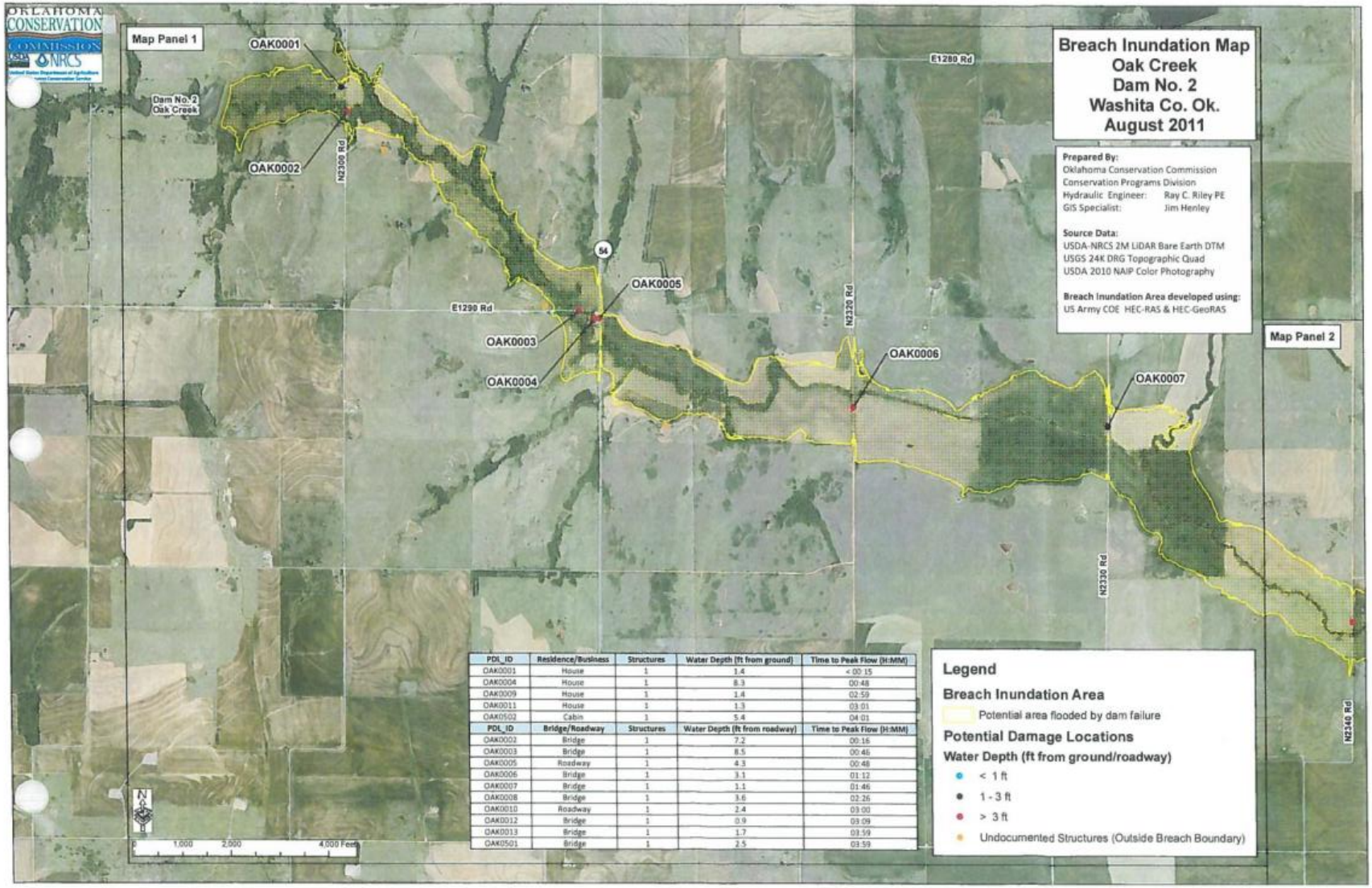
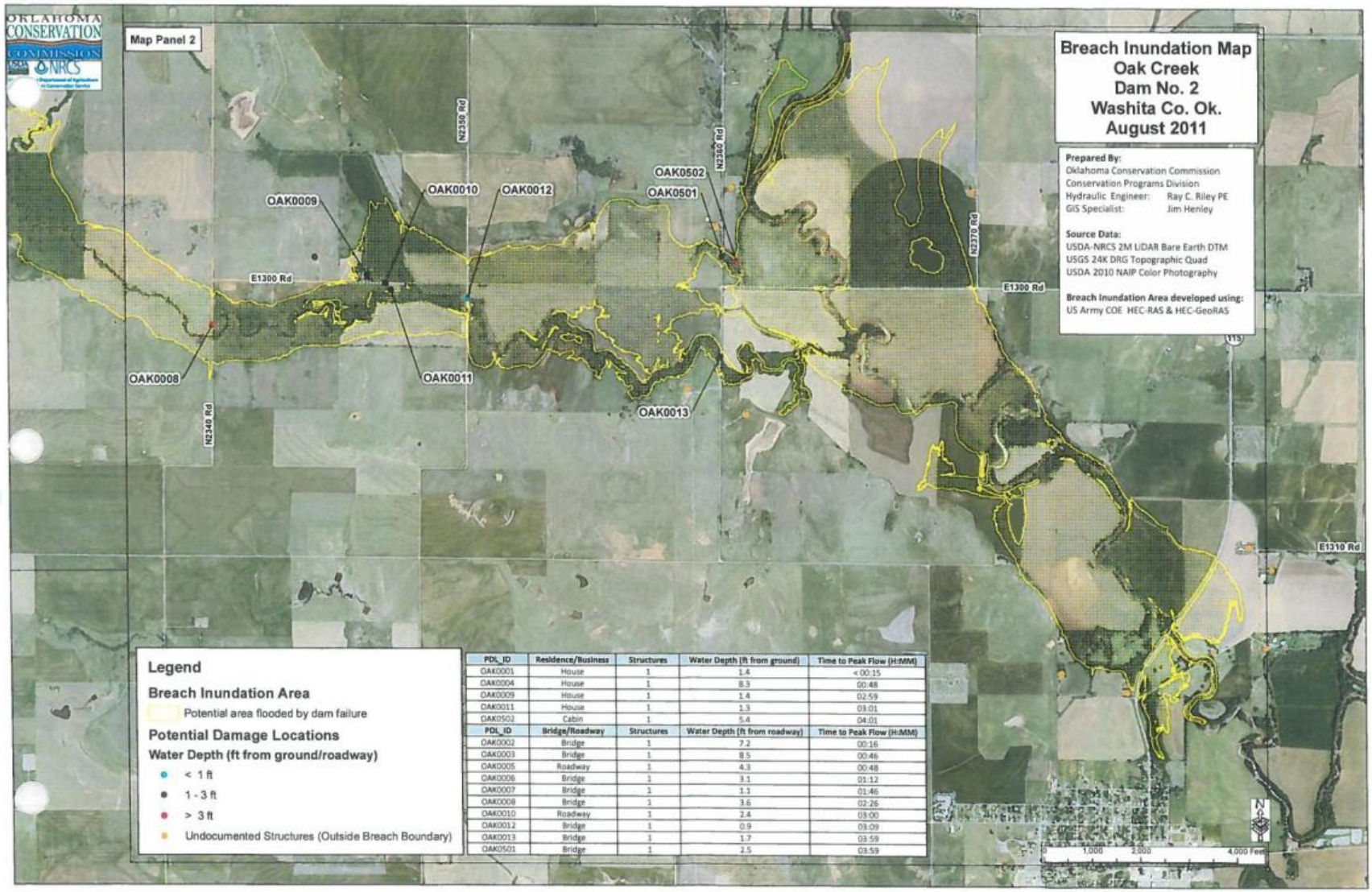
Warn Time - Sunny Day - 10:12 Hrs
Warn Time - 50% PMF - 4:45 Hrs
Warn Time - Sunny Day - 10:27 Hrs
Warn Time - Sunny Day - 10:42 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 200 400
NAVD 88
1 inch = 400 feet
MESHEK
1437 S Boulder Ave - Ste 1060 Tulsa, OK 74119
(918) 392-5820 www.meshekengr.com
Map Page
16 of 18

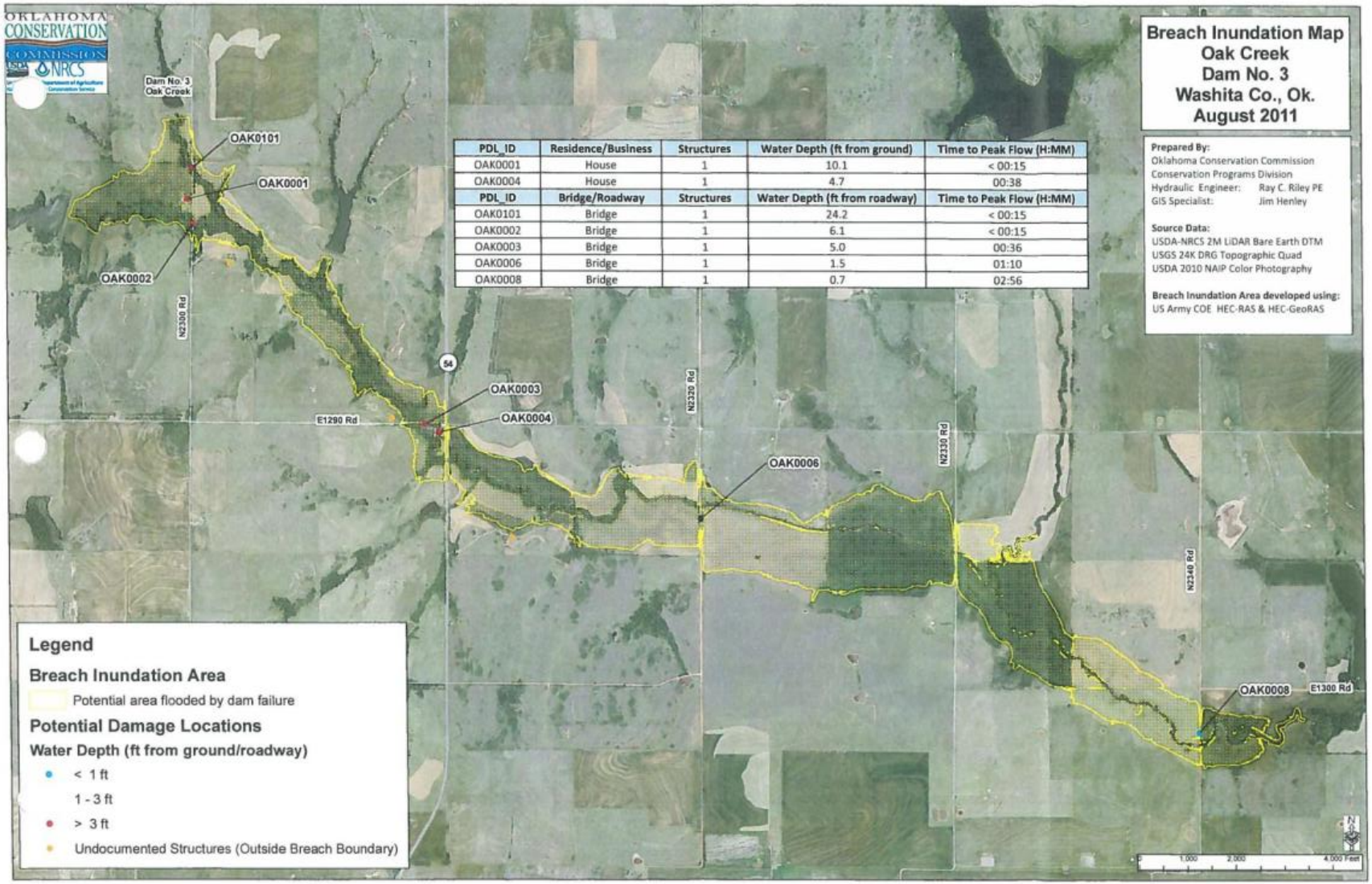

Warn Time - Sunny Day - 10:27 Hrs
Warn Time - Sunny Day - 10:42 Hrs
Warn Time - Sunny Day - 10:57 Hrs
Warn Time - Sunny Day - 11:12 Hrs
Warn Time - 50% PMF - 5:00 Hrs
Warn Time - Sunny Day - 11:27 Hrs
Warn Time - Sunny Day - 11:42 Hrs
Warn Time - 50% PMF - 5:15 Hrs
Warn Time - Sunny Day - 11:57 Hrs
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 350 700
NAVD 88
1 inch = 700 feet
MESHEK
1437 S Boulder Ave - Ste 1080 Tulsa, OK 74119
(918) 382-5620 www.meshekengr.com
Map Page
17 of 18


Warn Time - Sunny Day - 10:57 Hrs
Warn Time - Sunny Day - 11:12 Hrs
Warn Time - 50% PMF - 5:00 Hrs
Warn Time - Sunny Day - 11:27 Hrs
Warn Time - Sunny Day - 11:42 Hrs
Warn Time - 50% PMF - 5:15 Hrs
Warn Time - Sunny Day - 11:57 Hrs
Warn Time - Sunny Day - 12:12 Hrs
Warn Time - 50% PMF - 5:30 Hrs
Warn Time - Sunny Day - 12:27 Hrs
Limit of Study
N
Lake Hobart
Breach Inundation Maps
Sunny Day Inundation Time (Peak)
50% PMF Inundation Time (Peak)
Sunny Day Inundation
50% PMF Inundation
City Limit Boundaries
Feet
0 350 700
NAVD 88
1 inch = 700 feet
MESHEK
1437 S Boulder Ave - Ste 1060 Tulsa, OK 74119
(918) 392-5620 www.meshekengr.com
Map Page
18 of 18


OKLAHOMA CONSERVATION COMMISSION
USDA NRCS
Map Panel 1
OAK0001
Dam No. 2 Oak Creek
OAK0002
N2360 Rd
E1290 Rd
54
OAK0005
OAK0003
OAK0004
N2320 Rd
OAK0006
OAK0007
Map Panel 2
N2330 Rd
N2340 Rd
Breach Inundation Map
Oak Creek
Dam No. 2
Washita Co. Ok.
August 2011
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
PDL_ID | Residence/Business | Structures | Water Depth (ft from ground) | Time to Peak Flow (H:MM)
OAK0001 | House | 1 | 1.4 | < 00:15
OAK0004 | House | 1 | 8.3 | 00:48
OAK0009 | House | 1 | 1.4 | 02:59
OAK0011 | House | 1 | 1.3 | 03:01
OAK0502 | Cabin | 1 | 5.4 | 04:01
PDL_ID | Bridge/Roadway | Structures | Water Depth (ft from roadway) | Time to Peak Flow (H:MM)
OAK0002 | Bridge | 1 | 7.2 | 00:16
OAK0003 | Bridge | 1 | 8.5 | 00:46
OAK0005 | Roadway | 1 | 4.3 | 00:48
OAK0006 | Bridge | 1 | 3.1 | 01:12
OAK0007 | Bridge | 1 | 1.1 | 01:46
OAK0008 | Bridge | 1 | 3.6 | 02:26
OAK0010 | Roadway | 1 | 2.4 | 03:00
OAK0012 | Bridge | 1 | 0.9 | 03:09
OAK0013 | Bridge | 1 | 1.7 | 03:59
OAK0501 | Bridge | 1 | 2.5 | 03:59
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft from ground/roadway)
< 1 ft
1 - 3 ft
> 3 ft
Undocumented Structures (Outside Breach Boundary)
N
0 1,000 2,000 4,000 Feet



PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
OAK0001	House	1	1.4	< 00:15
OAK0004	House	1	8.3	00:48
OAK0009	House	1	1.4	02:59
OAK0011	House	1	1.3	03:01
OAK0502	Cabin	1	5.4	04:01
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
OAK0002	Bridge	1	7.2	00:16
OAK0003	Bridge	1	8.5	00:46
OAK0005	Roadway	1	4.3	00:48
OAK0006	Bridge	1	3.1	01:12
OAK0007	Bridge	1	1.1	01:46
OAK0008	Bridge	1	3.6	02:26
OAK0010	Roadway	1	2.4	03:00
OAK0012	Bridge	1	0.9	03:09
OAK0013	Bridge	1	1.7	03:59
OAK0501	Bridge	1	2.5	03:59



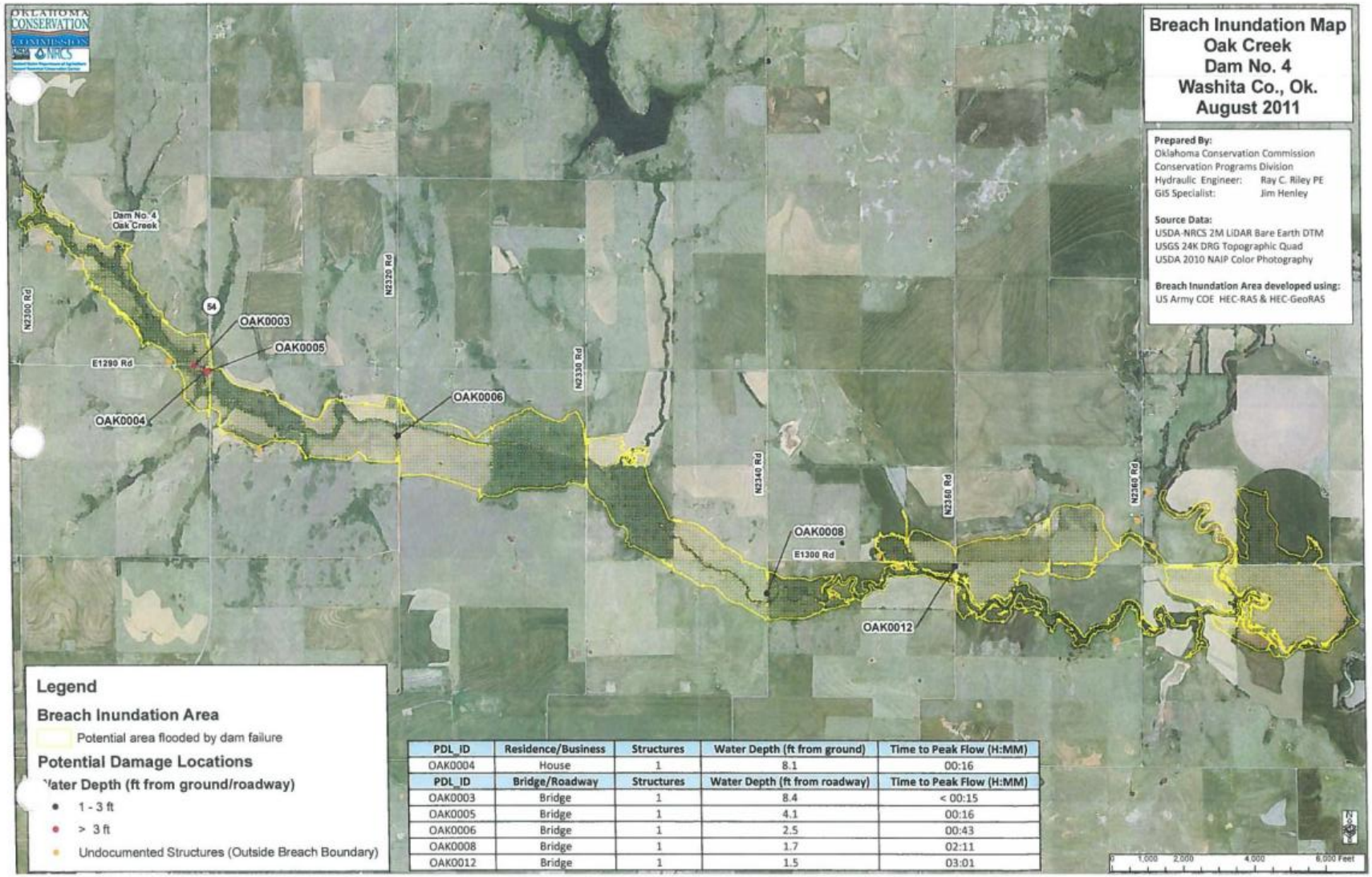
PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
OAK0001	House	1	10.1	< 00:15
OAK0004	House	1	4.7	00:38
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
OAK0101	Bridge	1	24.2	< 00:15
OAK0002	Bridge	1	6.1	< 00:15
OAK0003	Bridge	1	5.0	00:36
OAK0006	Bridge	1	1.5	01:10
OAK0008	Bridge	1	0.7	02:56

Breach Inundation Map
Oak Creek
Dam No. 3
Washita Co., Ok.
August 2011

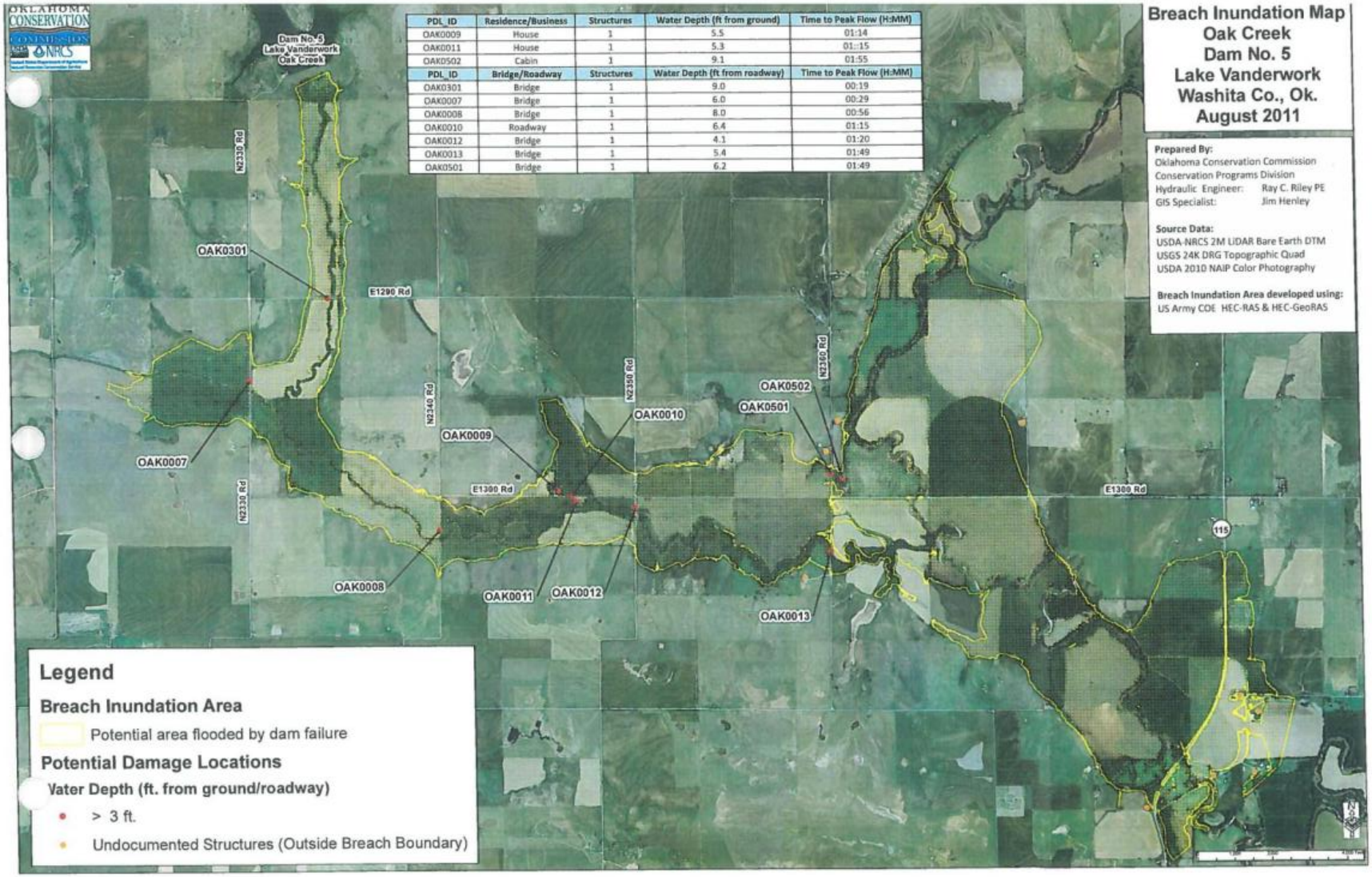
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley

Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography

Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS



PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
OAK0004	House	1	8.1	00:16
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
OAK0003	Bridge	1	8.4	< 00:15
OAK0005	Bridge	1	4.1	00:16
OAK0006	Bridge	1	2.5	00:43
OAK0008	Bridge	1	1.7	02:11
OAK0012	Bridge	1	1.5	03:01



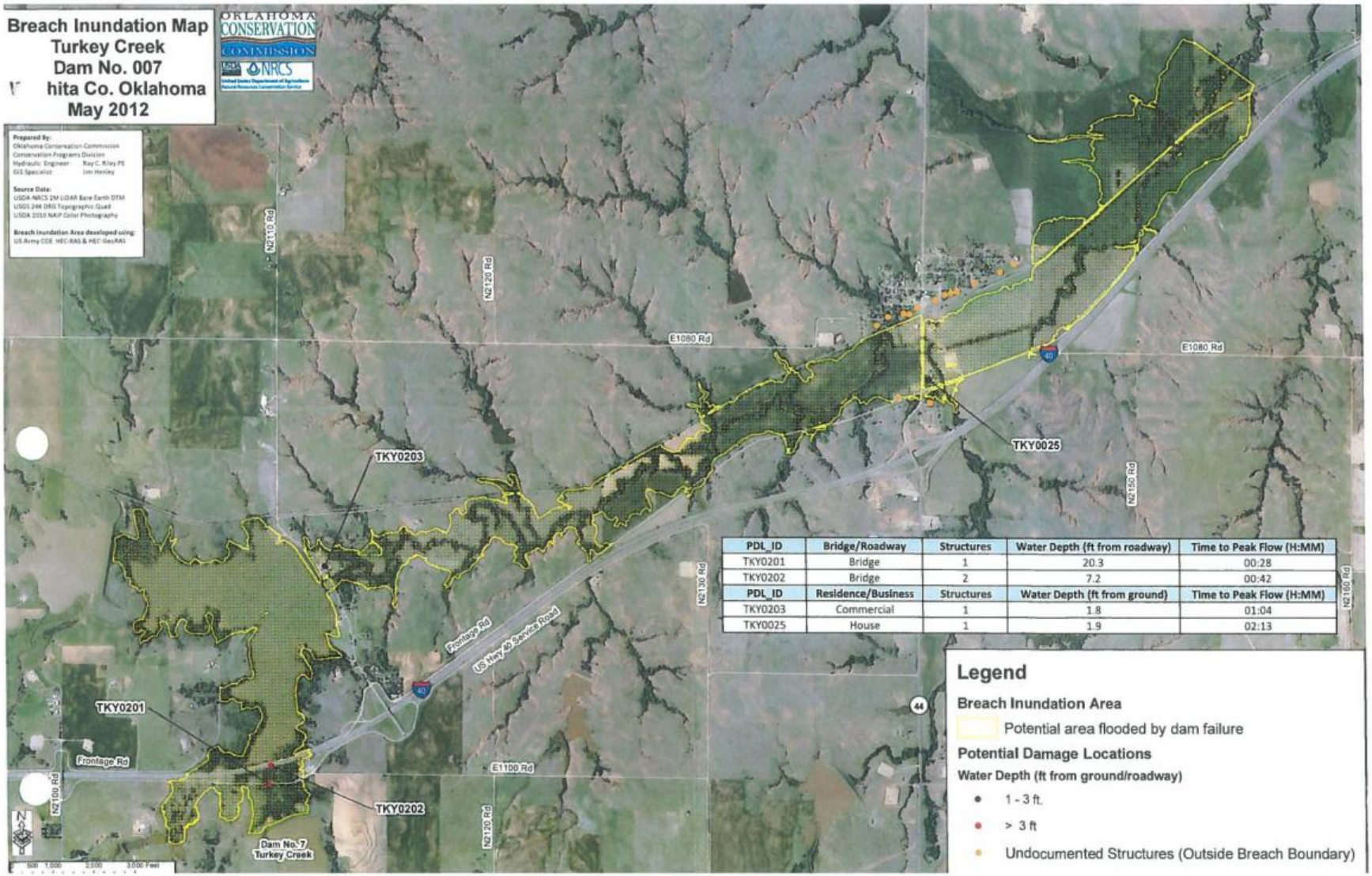
PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
OAK0009	House	1	5.5	01:14
OAK0011	House	1	5.3	01::15
OAK0502	Cabin	1	9.1	01:55
PDL_ID	**Bridge/Roadway**	**Structures**	**Water Depth (ft from roadway)**	**Time to Peak Flow (H:MM)**
OAK0301	Bridge	1	9.0	00:19
OAK0007	Bridge	1	6.0	00:29
OAK0008	Bridge	1	8.0	00:56
OAK0010	Roadway	1	6.4	01:15
OAK0012	Bridge	1	4.1	01:20
OAK0013	Bridge	1	5.4	01:49
OAK0501	Bridge	1	6.2	01:49

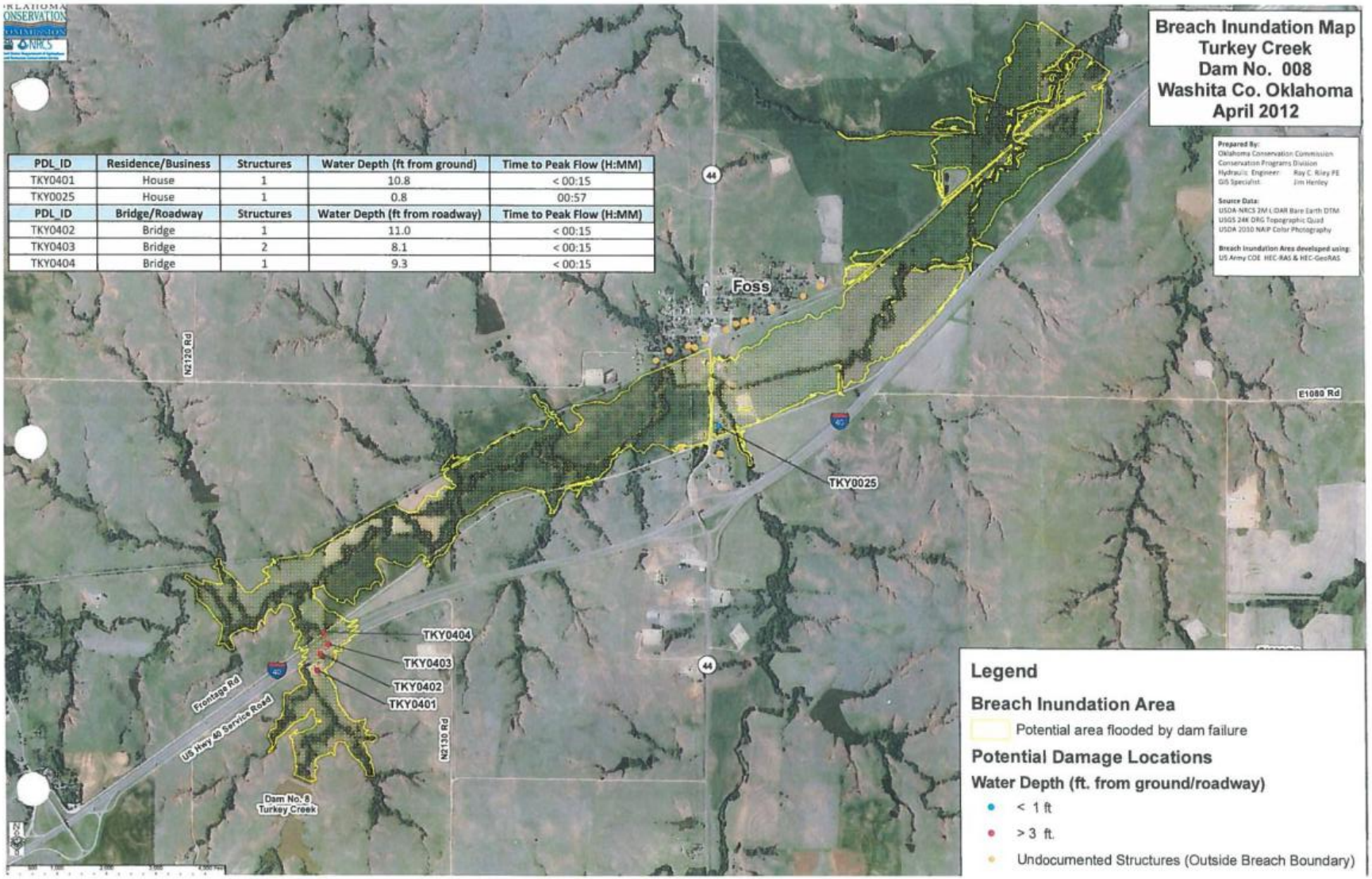
Breach Inundation Map
Oak Creek
Dam No. 5
Lake Vanderwork
Washita Co., Ok.
August 2011

Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley

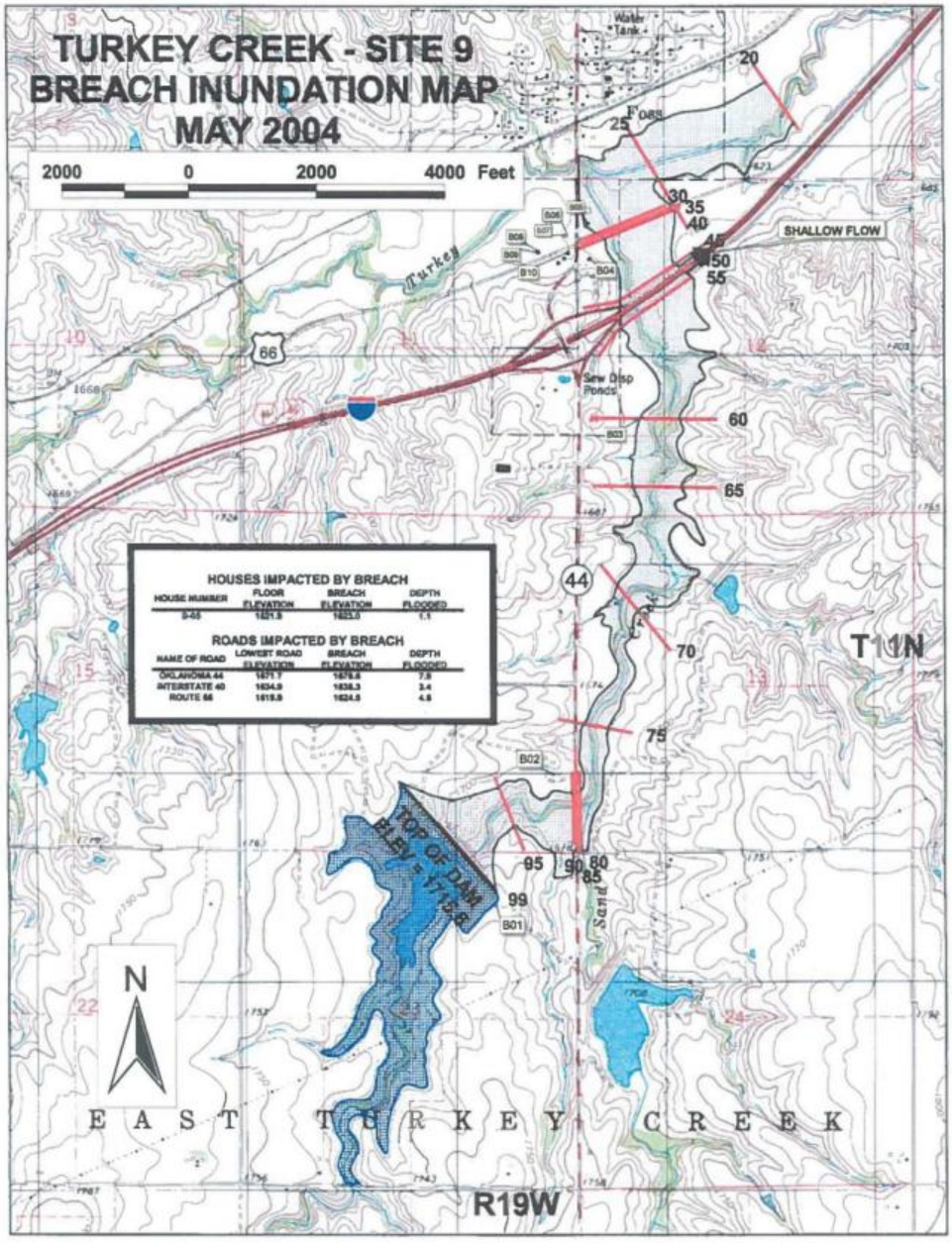
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography

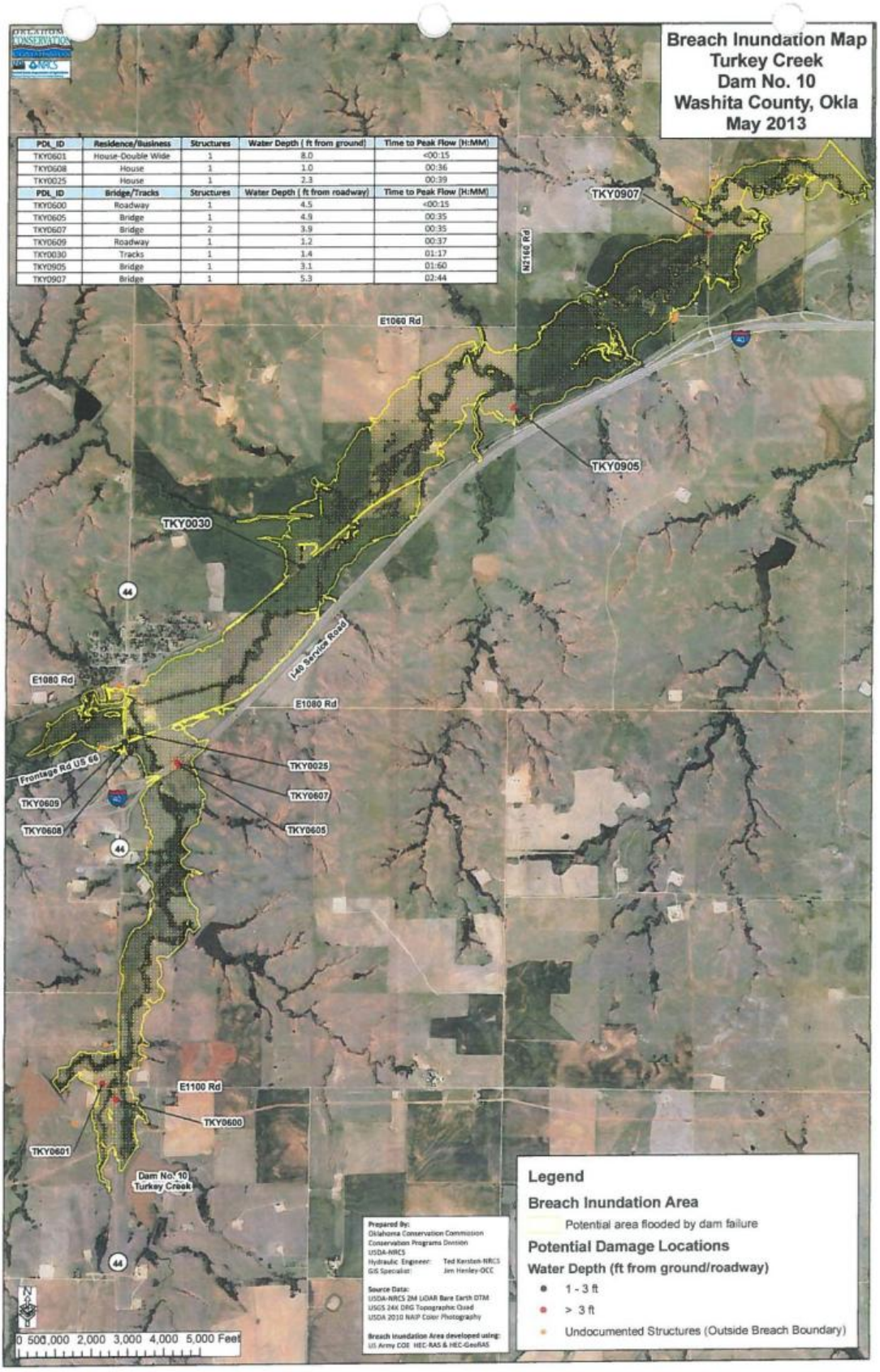
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS

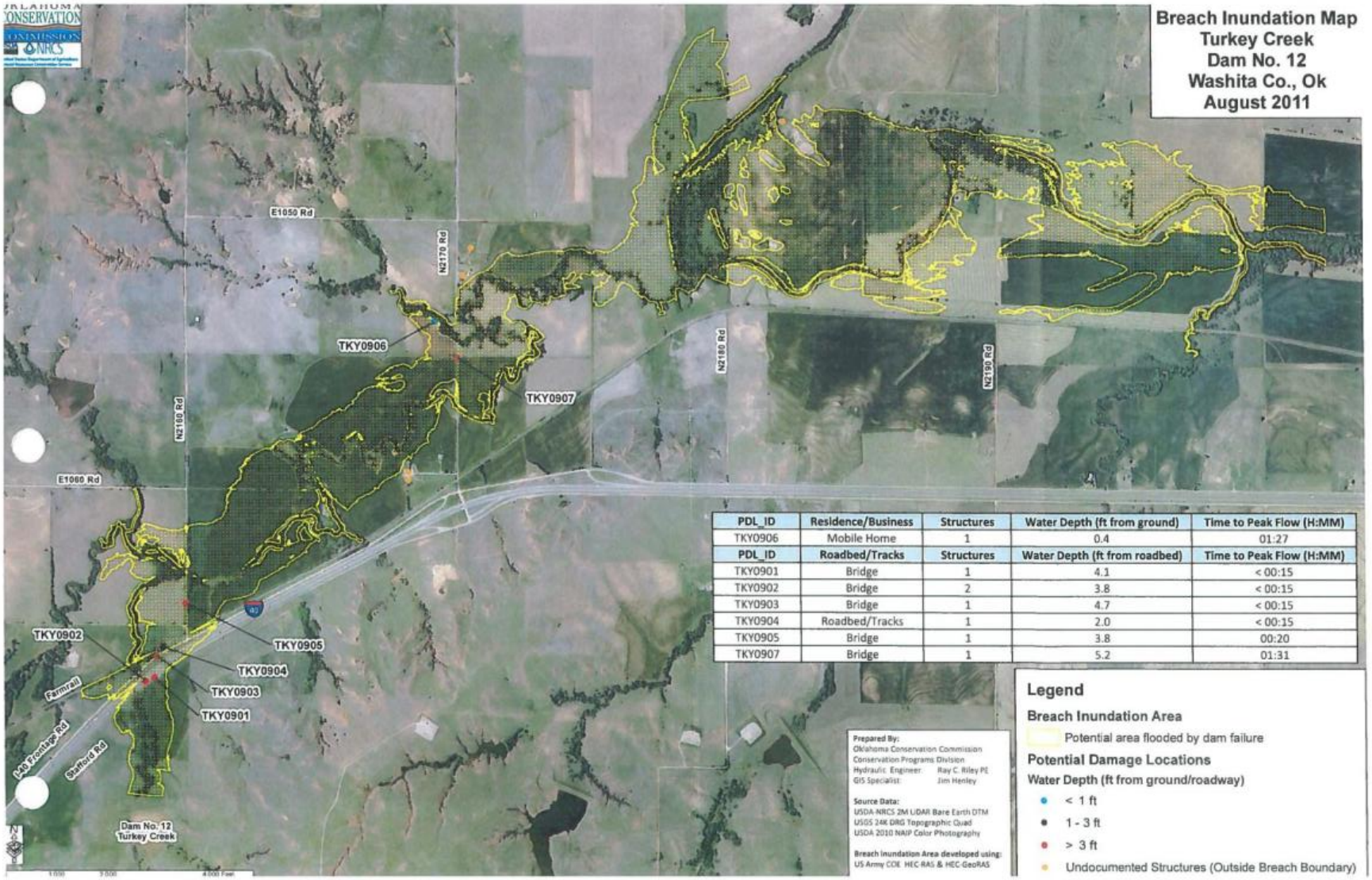

Breach Inundation Map
Turkey Creek
Dam No. 007
hita Co. Oklahoma
May 2012
OKLAHOMA CONSERVATION COMMISSION
NRCS
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
N2110 Rd
N2120 Rd
E1080 Rd
E1080 Rd
N2150 Rd
N2160 Rd
N2130 Rd
TKY0203
TKY0025
TKY0201
TKY0202
Frontage Rd
US Hwy 40 Service Road
Frontage Rd
E1100 Rd
N2100 Rd
N2120 Rd
Dam No. 7
Turkey Creek
40
44
PDL_ID | Bridge/Roadway | Structures | Water Depth (ft from roadway) | Time to Peak Flow (H:MM)
TKY0201 | Bridge | 1 | 20.3 | 00:28
TKY0202 | Bridge | 2 | 7.2 | 00:42
PDL_ID | Residence/Business | Structures | Water Depth (ft from ground) | Time to Peak Flow (H:MM)
TKY0203 | Commercial | 1 | 1.8 | 01:04
TKY0025 | House | 1 | 1.9 | 02:13
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft from ground/roadway)
1 - 3 ft.
> 3 ft
Undocumented Structures (Outside Breach Boundary)


Breach Inundation Map
Turkey Creek
Dam No. 008
Washita Co. Oklahoma
April 2012
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
Hydraulic Engineer: Ray C. Riley PE
GIS Specialist: Jim Henley
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
PDL_ID | Residence/Business | Structures | Water Depth (ft from ground) | Time to Peak Flow (H:MM)
TKY0401 | House | 1 | 10.8 | < 00:15
TKY0025 | House | 1 | 0.8 | 00:57
PDL_ID | Bridge/Roadway | Structures | Water Depth (ft from roadway) | Time to Peak Flow (H:MM)
TKY0402 | Bridge | 1 | 11.0 | < 00:15
TKY0403 | Bridge | 2 | 8.1 | < 00:15
TKY0404 | Bridge | 1 | 9.3 | < 00:15
Foss
N2120 Rd
E1080 Rd
N2130 Rd
TKY0025
TKY0404
TKY0403
TKY0402
TKY0401
Frontage Rd
US Hwy 40 Service Road
Dam No. 8
Turkey Creek
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft. from ground/roadway)
< 1 ft
> 3 ft.
Undocumented Structures (Outside Breach Boundary)

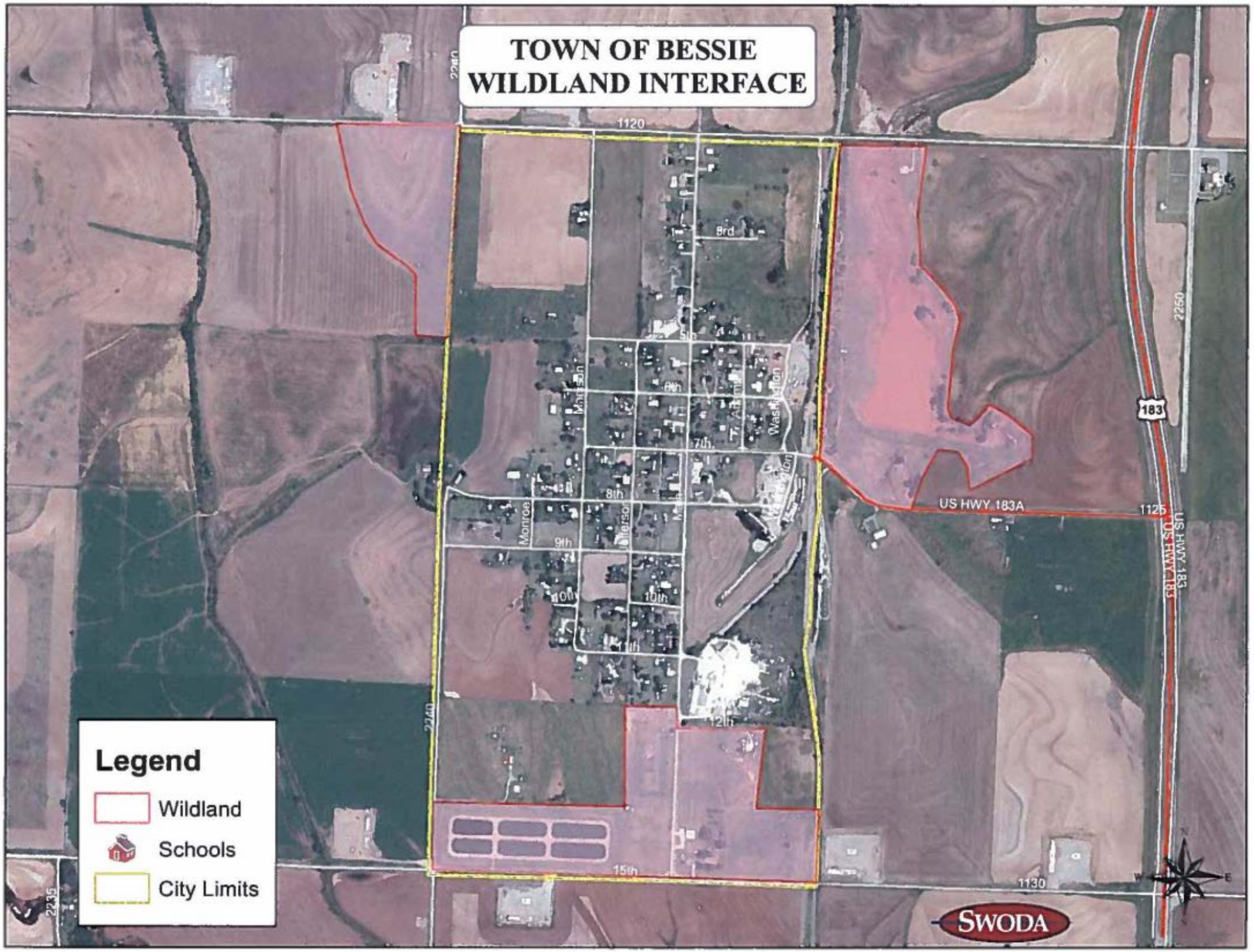
Appendix E- 4
Breach Inundation Map
Turkey Creek Watershed Dam No. 9

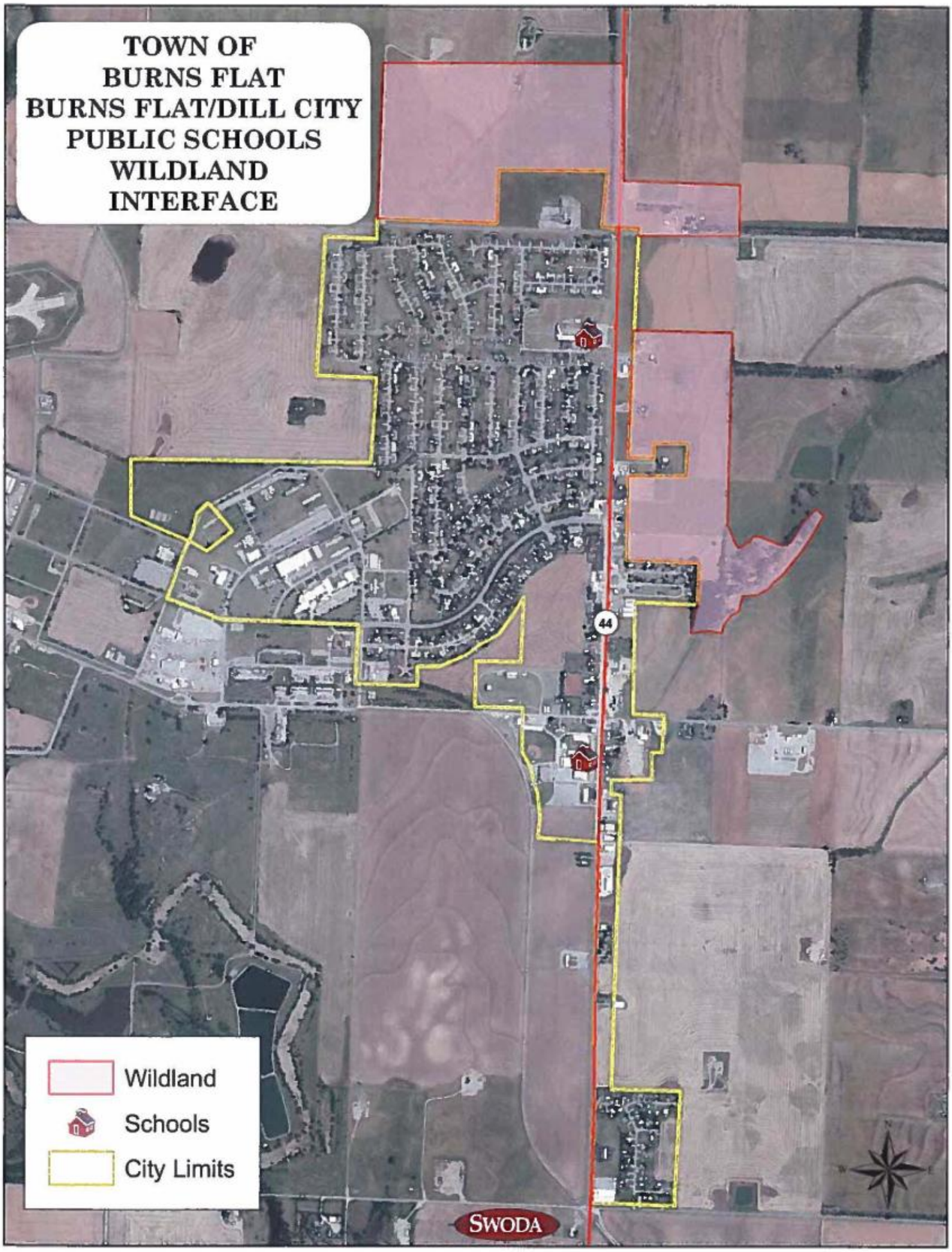


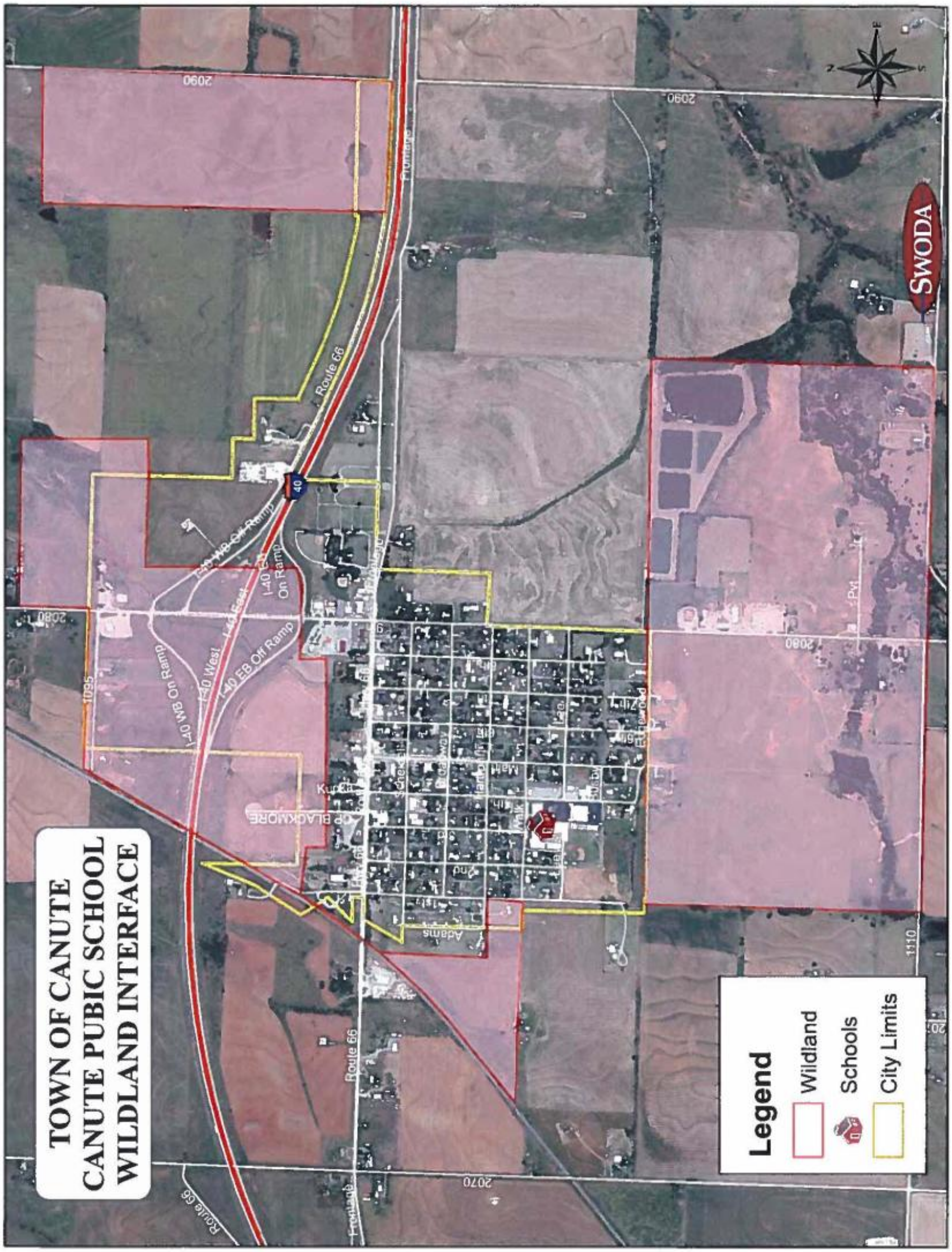

Breach Inundation Map
Turkey Creek
Dam No. 10
Washita County, Okla
May 2013
PDL_ID | Residence/Business | Structures | Water Depth (ft from ground) | Time to Peak Flow (h:MM)
TKY0601 | House-Double Wide | 1 | 8.0 | <00:15
TKY0608 | House | 1 | 1.0 | 00:36
TKY0025 | House | 1 | 2.3 | 00:39
PDL_ID | Bridge/Tracks | Structures | Water Depth (ft from roadway) | Time to Peak Flow (h:MM)
TKY0600 | Roadway | 1 | 4.5 | <00:15
TKY0605 | Bridge | 1 | 4.9 | 00:35
TKY0607 | Bridge | 2 | 3.9 | 00:35
TKY0609 | Roadway | 1 | 1.2 | 00:37
TKY0030 | Tracks | 1 | 1.4 | 01:17
TKY0905 | Bridge | 1 | 3.1 | 01:60
TKY0907 | Bridge | 1 | 5.3 | 02:44
TKY0907
NS15N Rd
E1060 Rd
TKY0905
TKY0030
I-40 Service Road
E1080 Rd
E1080 Rd
Frontage Rd US 44
TKY0025
TKY0607
TKY0609
TKY0605
TKY0608
E1100 Rd
TKY0600
TKY0601
Dam No. 10
Turkey Creek
Prepared By:
Oklahoma Conservation Commission
Conservation Programs Division
USDA-NRCS
Hydraulic Engineer: Ted Kerstetter-NRCS
GIS Specialist: Jim Henley-OCC
Source Data:
USDA-NRCS 2M LiDAR Bare Earth DTM
USGS 24K DRG Topographic Quad
USDA 2010 NAIP Color Photography
Breach Inundation Area developed using:
US Army COE HEC-RAS & HEC-GeoRAS
0 500 1,000 2,000 3,000 4,000 5,000 Feet
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft from ground/roadway)
1 - 3 ft
> 3 ft
Undocumented Structures (Outside Breach Boundary)

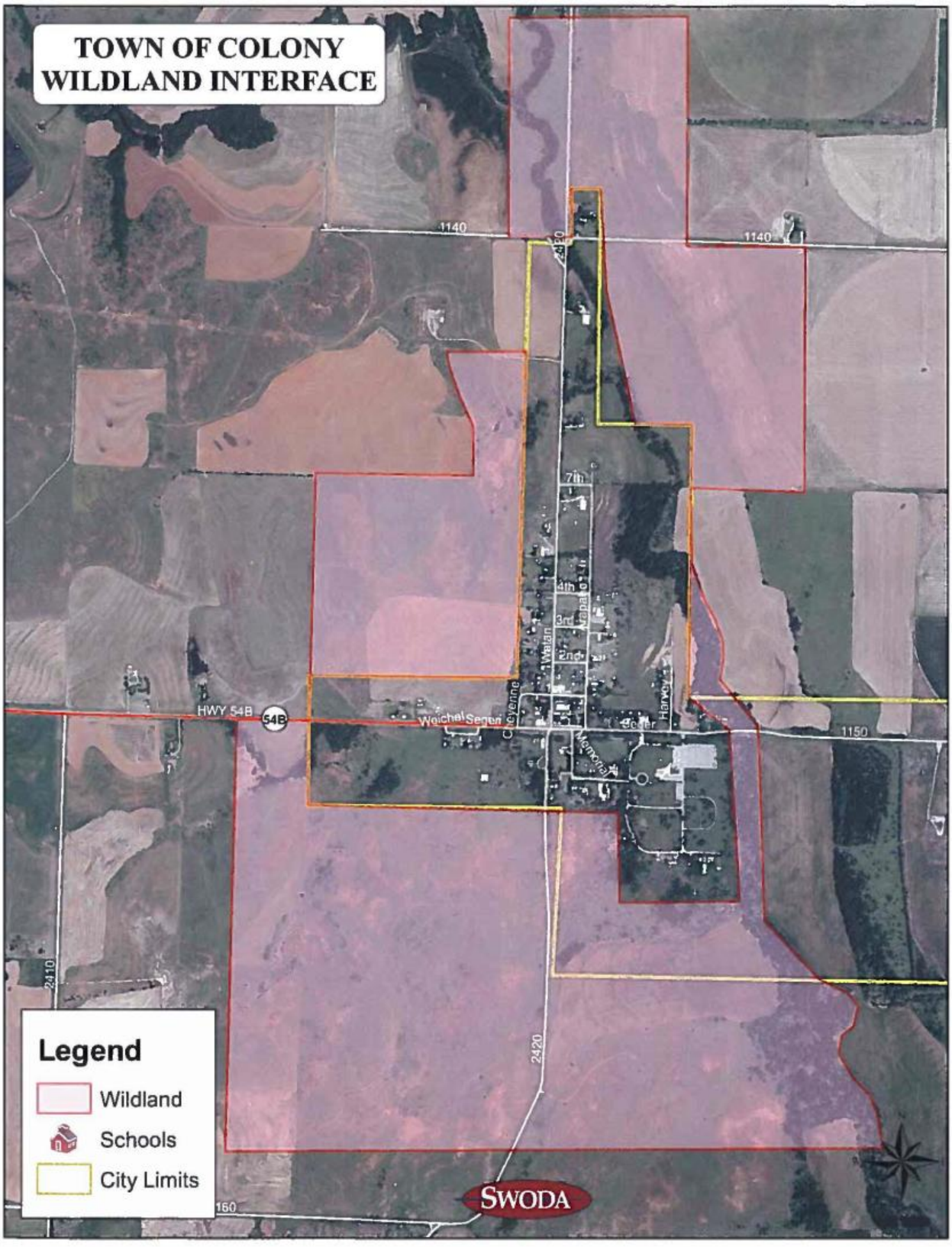


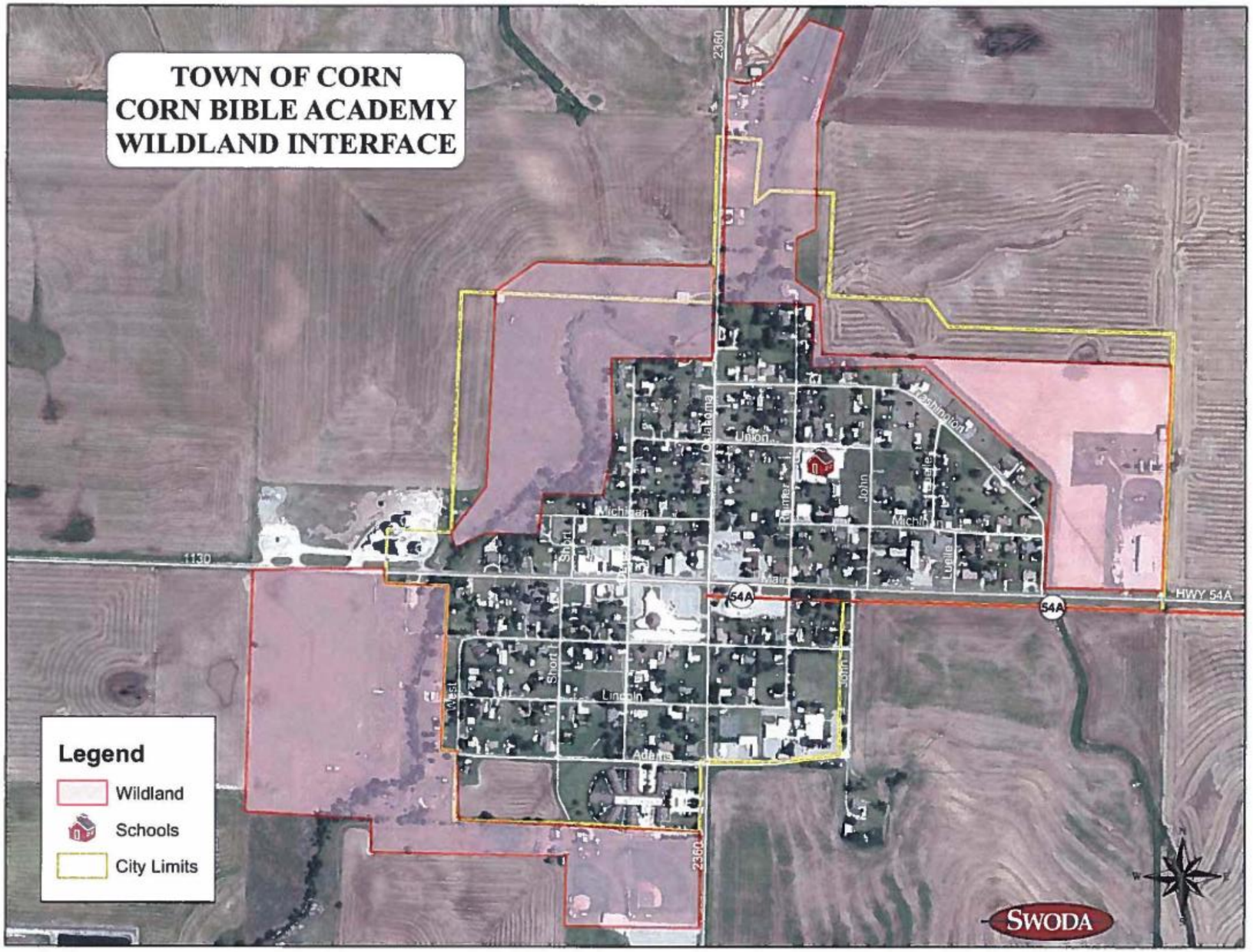
PDL_ID	Residence/Business	Structures	Water Depth (ft from ground)	Time to Peak Flow (H:MM)
TKY0906	Mobile Home	1	0.4	01:27
PDL_ID	**Roadbed/Tracks**	**Structures**	**Water Depth (ft from roadbed)**	**Time to Peak Flow (H:MM)**
TKY0901	Bridge	1	4.1	< 00:15
TKY0902	Bridge	2	3.8	< 00:15
TKY0903	Bridge	1	4.7	< 00:15
TKY0904	Roadbed/Tracks	1	2.0	< 00:15
TKY0905	Bridge	1	3.8	00:20
TKY0907	Bridge	1	5.2	01:31

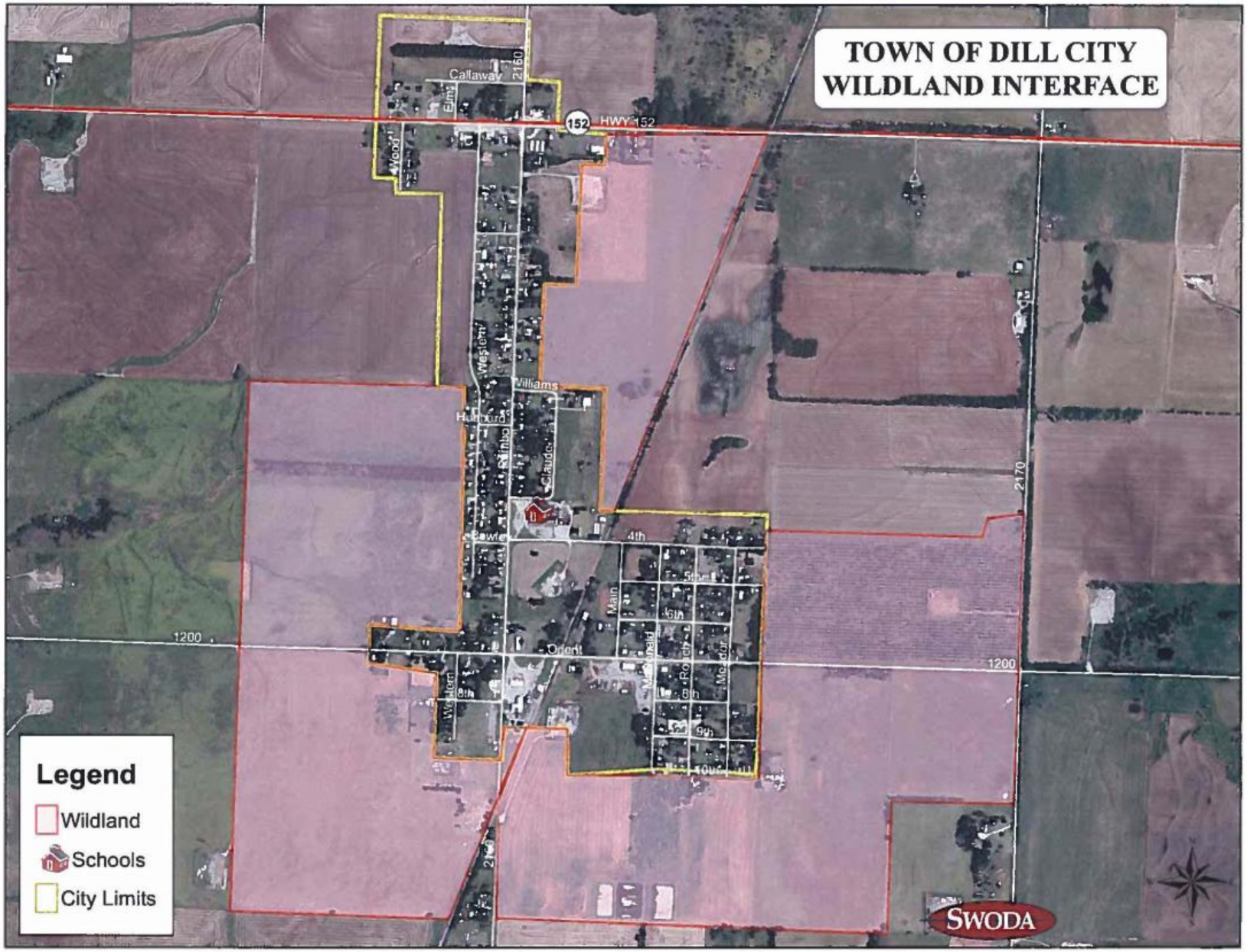

TOWN OF BESSIE
WILDLAND INTERFACE
1120
8rd
7th
8th
9th
10th
12th
15th
Monroe
Madison
Washington
US HWY 183A
1125
US HWY 183
183
2220
2240
2235
1130
Legend
Wildland
Schools
City Limits
SWODA

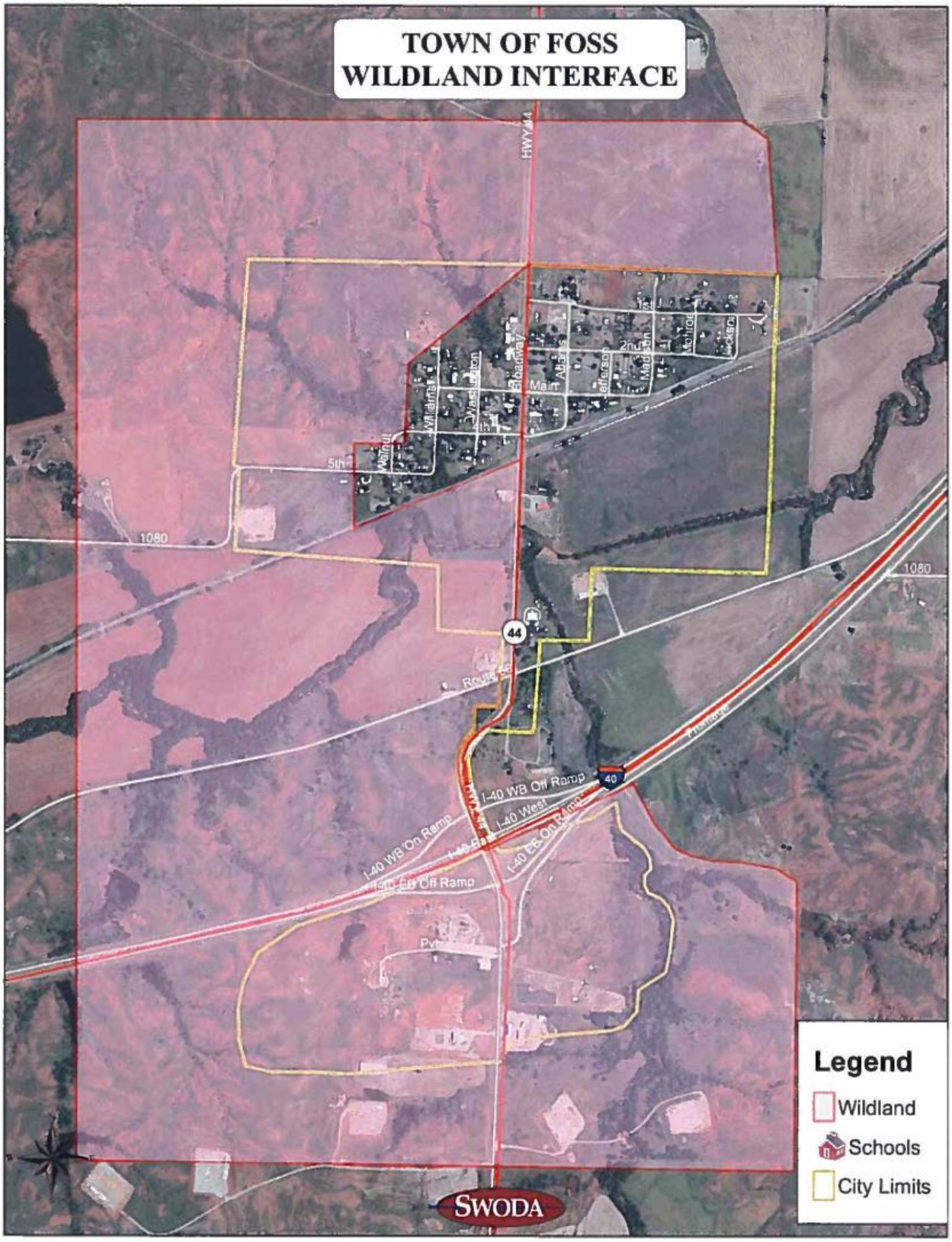

TOWN OF
BURNS FLAT
BURNS FLAT/DILL CITY
PUBLIC SCHOOLS
WILDLAND
INTERFACE
Wildland
Schools
City Limits
44
SWODA

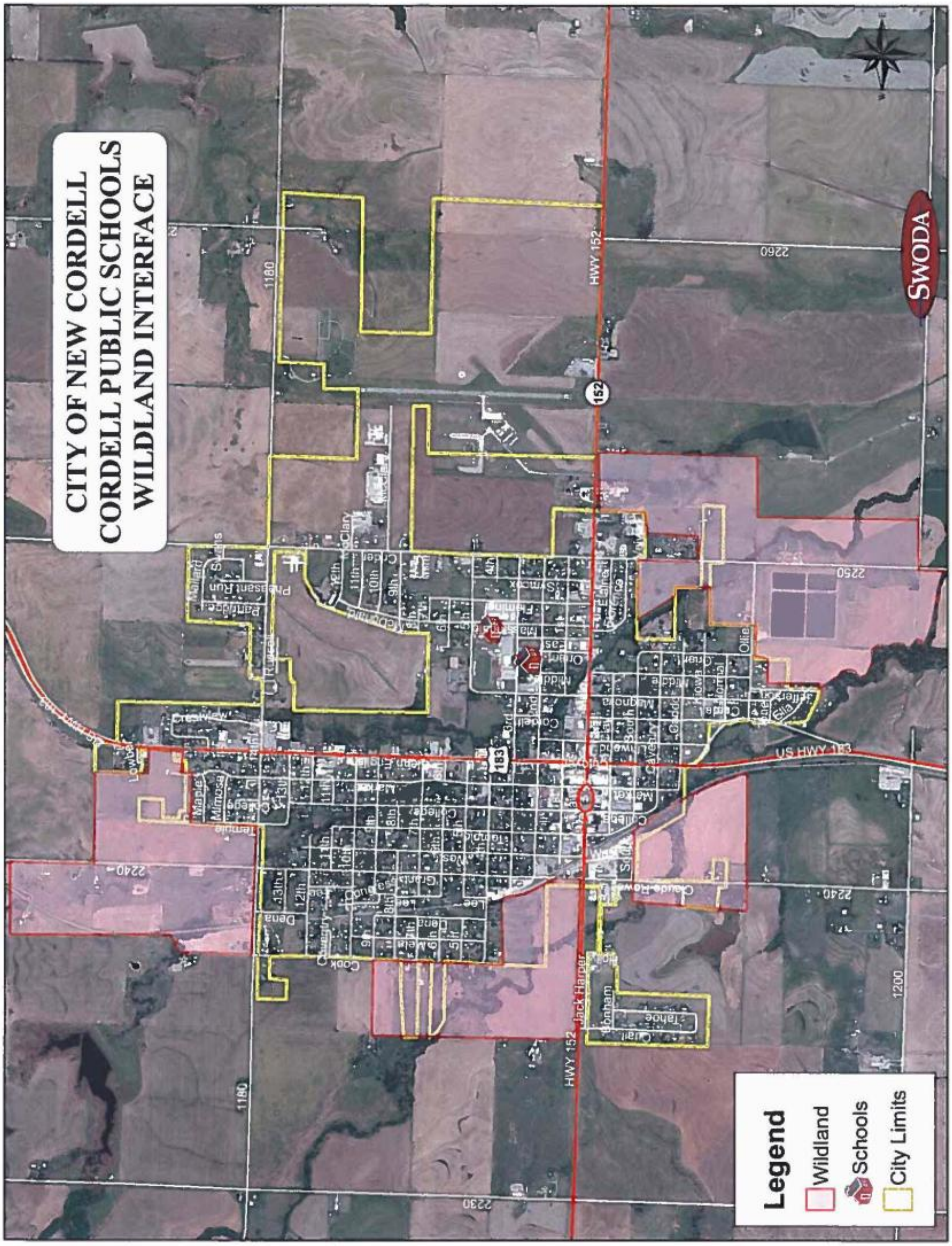

TOWN OF CANUTE
CANUTE PUBIC SCHOOL
WILDLAND INTERFACE
Legend
Wildland
Schools
City Limits
SWODA

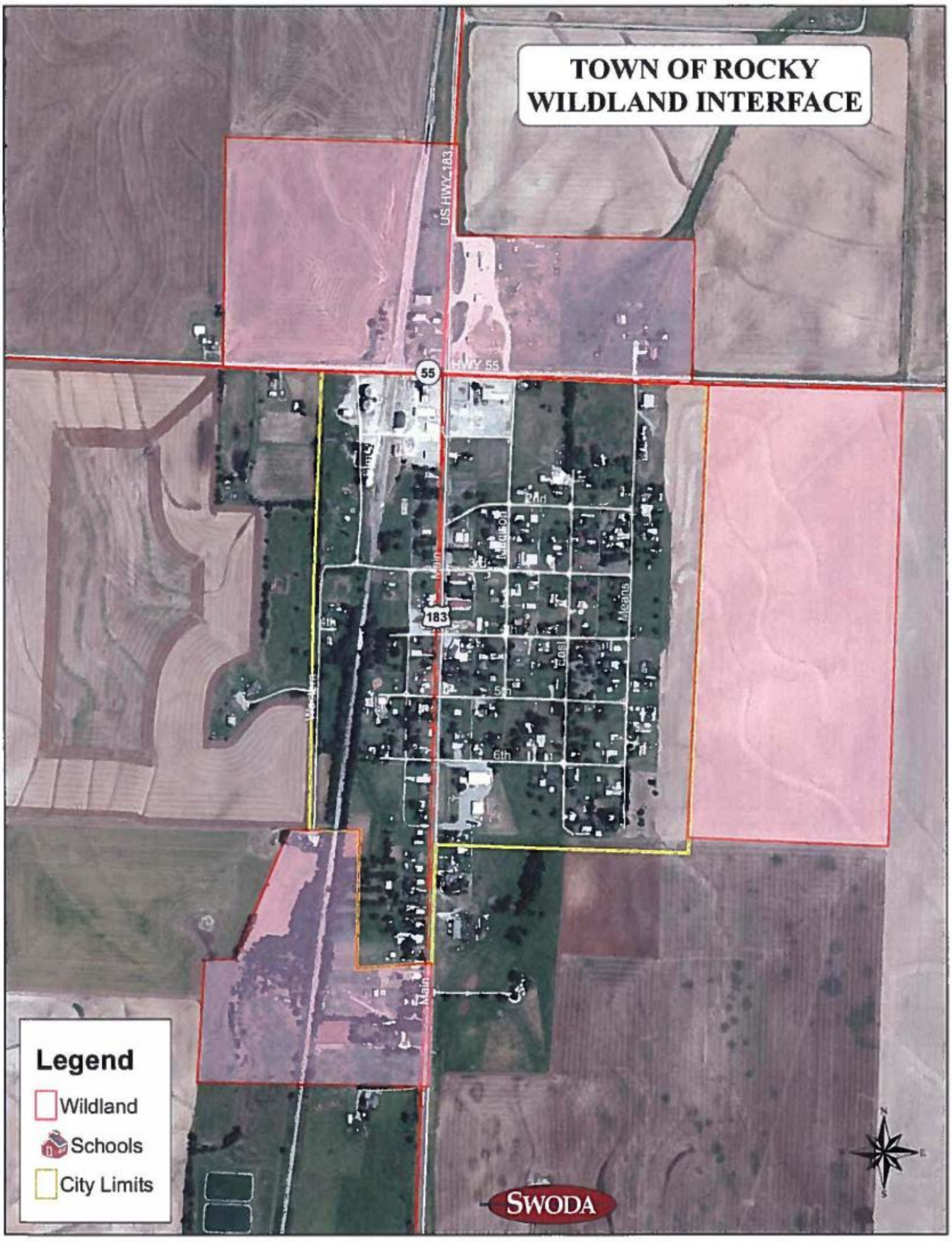

TOWN OF COLONY
WILDLAND INTERFACE
1140
1140
2430
7th
4th
3rd
2nd
Walan
Arapaho
Cheyenne
Harvey
Center
Menoma
HWY 54B
54B
Weichel-Segen
1150
2410
2420
150
SWODA
Legend
Wildland
Schools
City Limits

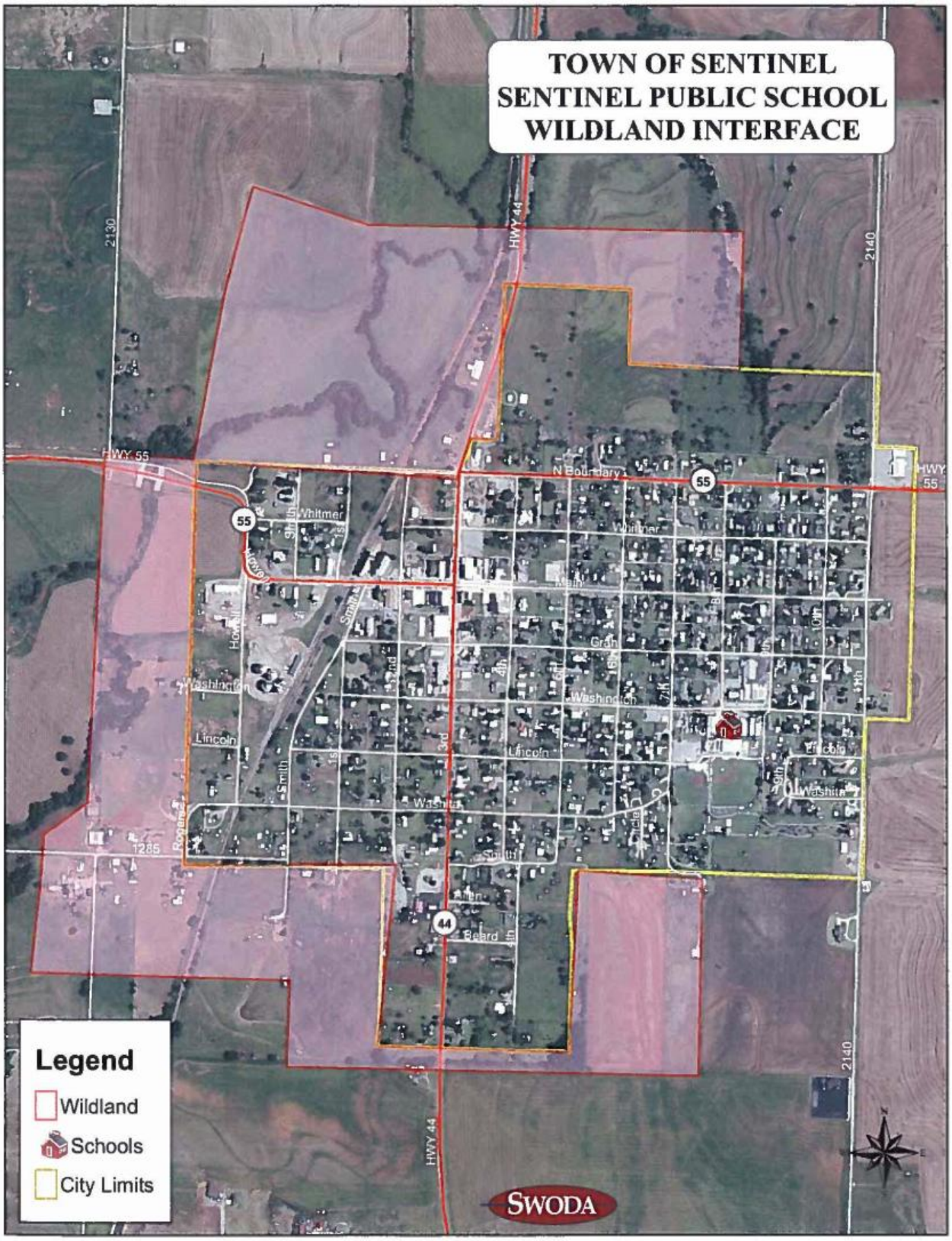

TOWN OF CORN
CORN BIBLE ACADEMY
WILDLAND INTERFACE
Legend
Wildland
Schools
City Limits
HWY 54A
54A
2360
1130
Union
Main
Lincoln
Adams
Michigan
Short
West
John
SWODA


TOWN OF DILL CITY
WILDLAND INTERFACE
Callaway
2160
Elm
152
HWY 152
Wood
Western
Williams
Hubbard
Claude
Lewis
4th
5th
Main
Orbert
1200
2170
Weldon
8th
Meador
9th
Legend
Wildland
Schools
City Limits
SWODA


TOWN OF FOSS
WILDLAND INTERFACE
HWY 44
Washington
Broadway
Main
Jefferson
Madison
2nd
Monroe
Jackson
Wildrose
Walnut
5th
1080
1080
44
Route 66
I-40 WB Off Ramp
I-40 West
I-40 WB On Ramp
I-40 EB On Ramp
I-40 EB Off Ramp
40
SWODA
Legend
Wildland
Schools
City Limits


CITY OF NEW CORDELL
CORDELL PUBLIC SCHOOLS
WILDLAND INTERFACE
Legend
Wildland
Schools
City Limits
SWODA
HWY 152
US HWY 183
Jack Harper
1180
1200
2230
2240
2250
2260


TOWN OF ROCKY
WILDLAND INTERFACE
US HWY 183
HWY 55
55
183
Main
Madison
Means
Western
3rd
4th
5th
6th
Legend
Wildland
Schools
City Limits
SWODA


TOWN OF SENTINEL
SENTINEL PUBLIC SCHOOL
WILDLAND INTERFACE
HWY 44
2130
2140
HWY 55
N Boundary
55
Whitmer
Main
Grant
Washington
Lincoln
Smith
Howard
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
Roger
1285
Beard
44
Legend
Wildland
Schools
City Limits
SWODA