City of Lawton

Hazard Mitigation Plan Update
July 2019

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CHAPTER ONE: INTRODUCTION

1.1 Overview of Planning Area

This is a hazard mitigation plan update for the City of Lawton, Oklahoma. The planning area includes all land within Lawton's jurisdictional boundaries and municipally owned properties outside Lawton City Limits. This area is illustrated in Appendix F

The City of Lawton is located in southwest Oklahoma in Comanche County, Approximately 80 miles southwest of Oklahoma City. The Wichita Mountains are located to the north and west of the City, which is located within central lowlands with flat topography and gently rolling hills that are also called the Osage Plains. The Osage Plains are divided into sub-regions; the City of Lawton is part of the Red Bed Plains. The City of Lawton is considered a dry subtropical climate, with temperature highs and lows that vary dramatically throughout the year. The summers are extremely hot and winters fairly mild. The average mean temperature in the City is 61.9°F, with around 21 days with temperatures at or above 100°F and 8 days below freezing. Annually, the City receives 31.64 inches of rain, with the most rain on average (5.08 inches) falling in May. The City experiences less than 3 inches of snowfall each year. The City is located within Tornado Alley and is prone to severe weather in late April through early June. Lawton is the county seat of Comanche County, Oklahoma.

The U.S. 2010 Census estimates the City's population to be 96,867 with 1,195.4 people per square mile. Approximately 68.7% of the City's population is over 21 years of age and 11.4% is over 62 years of age. The racial distribution in the City is made up of 60.3% white, 21.4% Black or African American, 4.7% American Indian or Alaska Native, 2.6% Asian, 0.6% Native Hawaiian or other Pacific Islander, 3.4% other race, and 7% two or more races.

This *2018 City of Lawton Hazard Mitigation Plan Update* serves as the City's roadmap to mitigation and preparedness over the next five year planning cycle. This update defines the revised comprehensive city-wide mitigation strategy and provides a detailed action plan for its accomplishment. Completion of these strategies will help to protect life and property in the City of Lawton. The City of Lawton originally adopted a Hazard Mitigation Plan in February, 2004 and updated in September, 2012. This Plan Update serves to provide additional information on the occurrences of disasters since the original adoption of the plan, as well as to review changes in the current capabilities of the City to mitigate the effects of a disaster. This plan symbolizes the continued commitment and dedication of the City to enhancing the safety of its residents and businesses by taking action before a disaster strikes. While nothing can be done to prevent natural hazards from occurring, the City is poised to minimize the disruption and devastation that so often accompanies these disasters.

The governing members of the City of Lawton are responsible for the protection of life and property within their jurisdictions. They take pride in the continued effort to prevent and mitigate known hazards. They are authorized to coordinate, finance, and oversee mitigation programs, and they have chosen to pursue Federal, State, and local grant monies for the reduction of risk and vulnerabilities to natural hazards. Implementation of the hazard mitigation program has been assigned to the City of Lawton Public Works Department.

CHAPTER TWO: PLANNING PROCESS

2.1 Overview of Planning Process

The City of Lawton Hazard Mitigation Planning Committee was formed to provide guidance during the preparation of this plan. The committee worked toward limiting the loss of life and property and the associated costs from natural through cost effective recommendations of publicly accepted, prioritized, and multi objective actions. Committee participants provided local history, reviewed National Climatic Data Center (NCDC) data, addressed and analyzed issues of cost versus health/safety, and made recommendations to the plan. The committee discussed these items in open meetings, approved the plan, and provided their recommendations to the City of Lawton for plan approval. The City of Lawton Hazard Mitigation Plan was developed during a series of meetings and outreach methods from January 2018 to July 2018.

2.2 Planning Committee Members

Name	Title	Jurisdiction	Contribution to Planning Process
Jerry Ihler	City Manager	City of Lawton	Provided hazard information, mitigation actions, and capabilities assessment.
Bart Hadley	Assistant City Manager	City of Lawton	Provided estimated loss information for identified hazards.
Dewayne Burk	Fire Chief	City of Lawton	Provided hazard information, mitigation actions, and capabilities assessment.
James Smith	Police Chief	City of Lawton	Provided hazard information, mitigation actions, and capabilities assessment.
Larry Wolcott	PW Dir. /Floodplain Administrator	City of Lawton	Lead Planning Committee POC
Cynthia Williams	Environmental Specialist	City of Lawton	Provided flood hazard data, mitigation actions, repetitive loss data, and NFIP participation information.
Richard Rogalski	Planning Director	City of Lawton	Provided building infrastructure and vulnerability information.
Afsaneh Jabbar	Director of Water and Wastewater	City of Lawton	Provided hazard information, mitigation actions, and capabilities assessment.
Rusty Whisenhunt	Director of Field Utilities	City of Lawton	Provided hazard information, mitigation actions, and capabilities assessment.
Michael Merritt	Lawton/Comanche Co. EM	City of Lawton	Provided hazard information, mitigation actions, capabilities assessment and county capabilities.
Fred Fitch	Mayor	City of Lawton	Provided hazard information, mitigation actions, capabilities assessment.

2.3 Other Stakeholders

Name	Title	Invited By	Jurisdiction	Contribution to Planning Process
Brandie O'Conner	Comanche Health Dept. Administrator	Email: BRANDIEO@ HEALTH.OK.G OV	Comanche Co. Health Dept.	Provided information on capabilities and aid agreements
Kyle Smith	Exec. Dir. Of Operations	Email: KSMITH@LA WTONPS.ORG	Lawton Pub. School	Provided information on capabilities and aid agreements
Mike Cornwell	Safety & Energy Coordinator	Email: MCORNWELL @LAWTONPS. ORG	Lawton Pub. School	Provided information on capabilities and aid agreements
Lynn Cordes	PIO	Email:Lcordes @lawtonps.org	Lawton Pub. School	Provided information on capabilities and aid agreements
Steve Gluck	Emergency	Phone	Fort Sill	Provided information on capabilities and aid

	Manager	442-2533		agreements
Heather Love	CCMH Customer Service Manager	Email: HEATHER.LOVE@CCMHHEALTH.COM	Comanche Co. Memorial Hospital	Provided information on capabilities and protocols
Scott Tanner	Emergency Dept. Director	Email: SCOTT.TANNER@CAPELLAHEALTH.COM	Southwestern Medical Center	Provided information on capabilities and protocols
Collin Betchan	Environmental Coordinator	Email: COLLIN_BETCHAN@GOODYEAR.COM	Goodyear	Provided information on capabilities and protocols
Tim Hushbeck	AEP PSO	Phone:800-216-3523	AEP/PSO	Provided information on capabilities and protocols
Gerald Kolb	District Operations Manager	Email: GERALD.KOLB@CENTERPOINTENERGY.COM	Centerpoint Energy	Provided information on capabilities and protocols
Bob Hanifield	Director of Physical Facilities	Email: RHANEFIELD@CAMERON.EDU	Cameron University	Provided information on capabilities and protocols
Kirk Mullenix	Campus Director	Email: KMULLENIX@GREATPLAINS.EDU	Great Plains Technology Center	Provided information on capabilities and protocols
Lyle Cable	Emergency Manager	Email: LYLEC@COMANCHENATION.COM	Comanche	Provided capability assessment of Tribal Nations
Carol Irwin	Disaster Response Specialist	Email: CAROL.IRWIN2@REDCROSS.ORG	American Red Cross	Provided vulnerable population information
David Robinson	Commanding Officer	Email: DAVID_ROBINSON@USS.SLAVATIONARMY.ORG	Salvation Army	Provided vulnerable population information
Dorla Tartsah	Director of Environmental	Email: D.TARTSAH@YAHOO.COM	Kiowa	Provided capability assessment of Tribal Nations
Jennifer Heninokeky	Emergency Manager	Email: JENNIFER.HEMINOKEKY@FORTSILLAPACHE-NSN.GOV	Fort Sill Apache	Provided capability assessment of Tribal Nations
Steve Taylor	President	Mail: 1401SW PARK RIDGE BLVD STE B1 73505	SW Oklahoma Home Builders Association	Provided information on capabilities and protocols

State and Federal Agencies Contacted

Name	Title	Invited By	Jurisdiction	Contribution to Planning Process
Matthew Rollins	Hazard Mitigation Officer	Email: MATTHEW.ROLLINS@OEM.OK.GOV	Oklahoma Department of Emergency Management	Provide guidance on plan requirements
Austin Bowling	Chief Meteorologist	Email: ABOWLING@KSWO.COM	National Weather Service/KSWO	Provide climatological data
Yohanes Sugeng	Engineering Manager; Stake NFIP Coordinator	Mail: 3800 N CLASSEN BLVD. OKC 73118	Dam Authority/ Water Resource Board	Provide data on dam safety; Provide NFIP data
George Geissler	FireWise Director	Email: GEORGE.GEISSLER@AG.OK.GOV	Forestry Service	Advise on mitigation actions

2.4 Public Involvement

All public meetings were designed to encourage and invite input from private citizens and local officials. The public was invited to attend all Planning Committee Meetings held at the City of Lawton City Hall. Individual public meetings were also held on March 13, 2018 and July 24, 2018. The agenda for each meeting was posted according to the Oklahoma Open Meeting Law. Each meeting was advertised in the local newspaper, posted at local libraries, and posted on Lawton's website. In addition, a draft copy of the Hazard Mitigation Plan was posted on the City of Lawton website.

Feedback received from the public proved valuable in the development of the plan. Based on feedback, the top three public priorities are: 1) additional flood protection measure, 2) improved warning communication methods, and 3) increased education and training on hazards. This information was used in developing mitigation action items.

The City will maintain public access to the plan by including it on the City website and keeping a copy of it in the Public Library. At times when the plan undergoes a significant revision, the City will continue to involve the public in the review process. Meeting information will be advertised in the local newspaper, posted at local libraries, and posted on Lawton's website.

2.5 Plans, Documents, and Literature Reviewed

During plan development, the City of Lawton Hazard Mitigation Planning Committee reviewed various plans and studies for information regarding hazards, disaster history, and potential impacted areas.

2.5.1 Literature and Resources Reviewed

Agency/Document	Relevant Information Used
National Climatological Data Center (NCDC)	Hazard occurrences from 2012 – 2017
US Geological Survey on Earthquakes	Data on increased seismic activity across Oklahoma
US Census Bureau Population Data	Population data for Lawton, Comanche County
State Department of Transportation	Data on County and US Highway routes was used when evaluating mitigation action items
State Department of Mental Health, "Population Stresses During Disaster,"	Information on how vulnerable populations are affected by disasters.

2.5.2 Plans Reviewed

Plan Title	Relevant Information Used
State Hazard Mitigation Plan	Hazard definitions, previous occurrence data, disaster history, state goals
City of Lawton All Hazard Mitigation Plan 2012	Hazard definitions, previous occurrence data, disaster history, previous local goals
Comanche County Hazard Mitigation Plan	Hazard definitions, previous occurrence data, disaster history, previous local goals
City of Lawton Capital Improvement Plan	Information was reviewed and integrated into the capability assessment, risk assessment and mitigation action items
City of Lawton Emergency Operations Plan	Information was reviewed and integrated into the capability assessment, risk assessment and mitigation action items

2.6 Continued Public Involvement

The City of Lawton will involve the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. This plan will be posted on the City of Lawton website. Hardcopies for public viewing will be available at the City of Lawton Public Library and City of Lawton Stormwater Management Office.

Annual planning committee meetings will be open to the public. Meeting notices will be posted in accordance with the policies for the Oklahoma Open Meeting Law and will include advertisement in the local newspaper and posting the agenda and meeting time on the City of Lawton website. An opportunity for public feedback will be scheduled into each meeting's agenda.

At times when the plan undergoes a significant revision, the City will continue to involve the public in review process. Such efforts will include:

- Conducting public outreach events in order to attract comments on the draft revision to the mitigation plan;
- Designating members of academia as well as private sector and non-profit representatives as official members of the City of Lawton Hazard Mitigation Planning Committee;
- Utilizing local media to update the public of any maintenance and/or periodic review activities taking place;
- Using the City of Lawton website to advertise any maintenance and/or periodic review activities taking place; and
- Keeping copies of the current Plan in public libraries and making it accessible via public websites.

2.7 Plan Update Monitoring, Evaluation, and Implementation

Upon final approval, the City of Lawton Hazard Mitigation Plan will be monitored, evaluated, and actions implemented by the City of Lawton Emergency Manager. He/she will accomplish this by working with the City of Lawton Department Directors and Local Emergency Planning Committee (LEPC) and the City of Lawton Hazard Mitigation Planning Committee. The City of Lawton Emergency Manager will serve as the primary point of contact, and will be responsible for coordinating all meetings related to this plan.

Once a year, or as needed following local disaster events, the City of Lawton Hazard Mitigation Committee will meet to discuss the effectiveness of the plan. Participants will provide a brief summary of how the plan met, or did not meet, its specific mitigation needs. These revelations can then be incorporated into the City of Lawton plan. In addition, each representative will be responsible for seeking out grant funding opportunities.

The plan update process will begin eighteen months prior to plan expiration, and the plan will be updated every five years. The update will include an in-depth review of the plan will conducted by the City of Lawton Hazard Mitigation Planning Committee as is required by FEMA in order to remain eligible for mitigation grant monies. This review includes a significant update of the Hazard Identification and Risk Analysis, the City Profile, and the Capabilities Assessment. This will then be used to inform a review of the mitigation strategy. Factors that may affect the necessary content of the plan include:

- New developments in identified hazard areas;
- An increased exposure to hazards; and
- The increase or decrease in the City's ability to address hazards.

The plan review process provides community officials with an opportunity to evaluate plans that have been successful and to explore the possibility of documenting potential losses avoided as a result of implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions, strategies, and projects that may not have been successfully implemented as assigned. The committee will endeavor to submit the plan to OEM six months prior to the expiration of the existing plan. The five year in-depth review of the 2012 City of Lawton All Hazard Mitigation Plan determined that the priorities have not changed and that all previous information remains valid. A copy of the review is included in appendix A.

CHAPTER THREE: HAZARD IDENTIFICATION AND RISK ASSESSMENT

3.1 Introduction

Natural disasters fall into five (5) major categories: atmospheric, geological, hydrological, extraterrestrial, and biological. Natural disasters have resulted in enormous intangible losses and have had a profound effect on the population's resilience.

During development of this plan, the City of Lawton Hazard Mitigation Planning Committee identified hazards that are historical, typical, and possible within the planning area. These hazards were identified by incorporating the City of Lawton Hazard Vulnerability Assessment data, planning committee input, public feedback, review of current Flood Insurance Rate Map (FIRM) data, and through research of past disaster declarations.

3.2 List of Identified Hazards

City of Lawton	Comanche County (Mitigation Plan)	Oklahoma (Mitigation Plan)
High Winds	Thunder Storms and Lightning	High Winds / Thunderstorm Wind
Tornadoes	Tornadoes & Wind	Tornadoes
Winter Storms / Freezing Rain / Extreme Cold	Severe Winter Storms	Winter Storms / Freezing Rain
Wildfires	Wild Fire	Wildfires
Hail	Hail	Hail
Flooding	Flooding	Flooding
Extreme Heat	Extreme Heat	Extreme Heat
Expansive Soils	Expansive Soils	Expansive Soils
Drought	Drought	Drought
Lightning/Thunderstorms	*Combined with Thunder Storms	Lightning
Earthquakes	Earthquakes	Earthquakes
Dam Failure	Dam Failure	Dam Failure
		Landslides
		Subsidences
		Special Events (Tar Creek Project)

The Oklahoma Hazard Mitigation Plan includes subsidence, and landslides as potential hazards. These two hazards were **not** included in the City of Lawton Hazard Mitigation plan for the following reasons:

- The soil found in the City of Lawton consists of a low percentage of clay, which eliminates the potential for expansive soils.
- Lack of clay in the soil also reduces the exposure to subsidence, along with a stable water table and no mining activities within the planning area.
- The City of Lawton consists of flat terrain and is not at risk for landslides.

3.3 Disaster History

The City of Lawton / Oklahoma Federally-Declared Disaster History from 2012 to 2016

Date	Declaration	Hazard
7/15/2016	DR-4274	Severe Storms and Flooding
2/10/2016	DR-4256	Severe Winter Storms and Flooding
12/29/2015	DR-4247	Severe Winter Storms and Flooding
5/26/2015	DR-4222	Severe Storms, Tornadoes, Straight-line Winds and Flooding
1/30/2014	DR-4164	Severe Winter Storm
5/20/2013	DR-4117	Severe Storms and Tornadoes
4/8/2013	DR-4109	Severe Winter Storm and Snowstorm
8/22/2012	DR-4078	Freedom and Noble Wildfires
6/14/2012	DR-4064	Severe Storms, Tornadoes, Straight-line Winds and Flooding

3.4 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 100%
Medium = Event has 1 in 3 years chance 33%
Low = Event has 1 in 5 years chance 20%
Very Low = Event has 1 in 10 years chance 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: The City of Lawton has had 500 Hail events recorded in the last 61 years.
500 / 61 =8.197 x 100% = 819%, which would make it "High."

3.5 Profiled Hazards

3.5.1 Lightning/Thunderstorms

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. There are four types of thunderstorms: single-cell , multi-cell cluster , multi-cell lines, and supercells. Damage that results from thunderstorms is mainly inflicted by downburst winds, hailstones, and flooding.

Location
The entire planning area is vulnerable to lightning and thunderstorms

Extent
According to information provided the Tulsa, OK National Weather Service (NWS) office, cloud-to-ground (CG) lightning is classified as either negative or positive. Positive CG flashes make up approximately 5-10% of the total CG lightning. Positive CG flashes typically originate in the upper portion of thunderstorms. This increases the distance between the charge region within the cloud and the earth. Stronger charge is needed to overcome the electric potential of this distance compared to negative CG flashes, which originate lower in the cloud. The result is that positive CG flashes have a higher peak current compared to negative CG flashes. Positive CG flashes may have a peak current 10x that of a negative CG flash. The National Weather Service explained that positive CG flashes are often observed as far away as 10 miles or more from the main precipitation area of a thunderstorm due to the location of the upper charge region. This poses an extra fire danger, and can catch people who are outdoors off guard. Once in contact with an object on the ground, a CG flash can have multiple return strokes, (this looks like a flickering flash), a continuous current, (this looks like a steady flash), or a combination of these two. Continuous current is more destructive and leads to a greater chance of fire. This is because the electricity remains in contact with an object for a longer period of time, allowing for greater heat to build up. (Lightning can be as hot as 50,000 degrees Fahrenheit). Positive CG flashes predominantly have continuous currents and are more likely to cause damage than negative CG flashes, due to the likelihood of continuous and high peak currents. It is important to remember that all lightning can cause damage.

The following scale provides a scale for lightning activity level

LAL	Cloud & Storm Development	Lightning Strikes per 15 minutes
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 product 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. Moderate rain is common and lightning is frequent.	16-25
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 thunderstorm are dry.	

Source: http://www.prh.noaa.gov/hnl/pages/LAL.php

Based on the information provided by the NWS, the City of Lawton considers:

- A **minor severity** lightning event: a negative cloud-to-ground flash with multiple return strokes on LAL of 1, 2, 3.
- A **major severity** lightning event: a positive cloud-to-ground flash on a LAL of 4, 5, 6 with a continuous or high peak current.

Previous Occurrences

Lightning & Thunderstorm Events from 2012 to 2016

(see Hail, Flooding and Wind for additional Thunderstorm information)

Date of Event	Disaster #	Location	Information/Damages
9/12/1995	NA	Lawton	Damage to apartment roof
6/6/1996	NA	Lawton	Damage to apartment wall
10/22/2000	NA	Lawton	Power outage to 1,100 homes and businesses

None of the members participating in this plan reported damages from previous lightning events during this review period.

Probability of Future Events

The probability of damaging lightning events in the planning area is **High**.
The City of Lawton has had 29 lightning events recorded in the last 61 years, 29 / 61 = 0.4754 x 100% = 48%.

Impact and Vulnerability

People, buildings, schools, trees, electrical systems and equipment, and electrical components are all vulnerable to a lightning strike. A few of the impacts of a lightning strike could include injury or death, structural damages, fire, downed electrical lines, and power loss to electrical substations. The greatest vulnerability to lightning in the planning area 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 to, and at risk of, injury from lightning. Most people are injured or killed by lightning when participating in some form of outdoor recreation during a lightning event. Some of the area swimming pools and water parks are installing early warning devices to further protect citizens. The City of Lawton does not have lightning detection systems in place. However, KSWO and the National Weather Service does have a detection and notice system that can alert mobile devices of their vicinity in reference to lightning strikes. In general, officials will cancel outdoor events if lightning becomes a concern, although that system is vulnerable to varying perceptions of the severity of a lightning event.

Although significant lightning has not hit the City of Lawton in recent memory, previous events recorded in NCDC account for close to $1 million in damages. On September 12, 1995, lightning struck an apartment building in the City of Lawton, igniting and damaging the roof, and on June 6, 1996, lightning struck another apartment building knocking a two foot hole in the wall. On October 22, 2000, lightning struck an insulator, resulting in power outage to 1,100 homes and businesses.

3.5.2 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

The entire planning area is vulnerable to hail.

Extent

The City of Lawton uses the Hail Size/Diameter in Relation to TORRO Hailstorm Intensity Scale chart below when considering hail severity.

Hail Size/Diameter in Relation to TOTTO Hailstorm Intensity Scale

Size Code	Maximum Diameter (in)	Description
H0	Up to 0.39	Pea
H1	0.40 – 0.60	Mothball
H2	0.61 – 0.80	Grape
H3	0.81 – 1.20	Walnut
H4	1.21 – 1.60	Pigeon's Egg > Squash Ball
H5	1.61 – 1.99	Goff Ball > Pullet's Egg
H6	2.00 – 2.40	Hen's Egg
H7	2.41 – 2.99	Tennis Ball > Cricket Ball
H8	3.00 – 3.50	Large Orange > Softball
H9	3.51 – 3.99	Grapefruit
H10	4+	Melon

The City of Lawton considers:

- A **minor severity** hail event: any hail of H3 and below
- A **major severity** hail event: any hail of H4 or higher.

Previous Occurrences

Hail Events from 2012 to 2016

Date of Event	Disaster #	Location	TORRO Size Code	Information/Damages
4/2/12	NA	Lawton	H3 - 1.00 in	NA – No information available
4/13/12	NA	Lawton	H3 - 1.00 in	NA – No information available
4/19/12	NA	Lawton	H3 - 1.00 in	NA – No information available
6/3/12	NA	Lawton	H2 - 0.75 in	NA – No information available
5/18/13	NA	Lawton	H4 - 1.25 in	NA – No information available
5/31/13	NA	Lawton	H7 - 2.50 in	NA – No information available
6/6/14	NA	Lawton	H3 - 1.00 in	NA – No information available
3/25/15	NA	Lawton	H4 - 1.25 in	NA – No information available
3/31/15	NA	Lawton	H4 - 1.25 in	NA – No information available
4/22/15	NA	Lawton	H4 - 1.25 in	NA – No information available
5/28/15	NA	Lawton	H4 - 1.50 in	NA – No information available
12/26/15	NA	Lawton	H3 - 1.00 in	NA – No information available
3/26/16	NA	Lawton	H4 - 1.25 in	NA – No information available
4/29/16	NA	Lawton	H6 - 2.00 in	NA – No information available
5/8/16	NA	Lawton	H3 - 1.00 in	NA – No information available
5/26/16	NA	Lawton	H3 - 1.00 in	NA – No information available

Probability of Future Events

The probability of hail events in the planning area is **high**.
The City of Lawton has had 490 hail events recorded in the last 61 years, 490/ 61 = 8.03 x 100% = 803%.

Impact and Vulnerability

Hail is capable of causing considerable damage to crops, buildings, homes, vehicles, and occasionally death to animals and livestock. While large hail poses a threat to people caught outside in a storm, it seldom causes loss of human life.

Although a catastrophic hail storm has not hit the City of Lawton in recent memory, several large events have occurred in Altus, only 30 miles to the west of the City. On May 3, 1999, softball size hail occurred north of Altus, resulting in over $800,000 in damage. On April 15, 2000, baseball size hail hit Altus, resulting in $2.6 million in damages.

Some local builders and roofing companies offer high-impact roofing materials, but due to the additional costs these options are not widely used.

3.5.3 Tornado

Description

Tornados are violently rotating columns of air that reach from the bottom of a cumulonimbus cloud to the ground. Tornados are found in severe thunderstorms, but not all severe thunderstorms produce tornados. While all tornados 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. They can appear in a variety of shapes and sizes, ranging from thin, rope-like 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 tornados can have wind speeds in excess of 200mph. In Oklahoma, most tornados occur between 3PM and 9PM, during the months of March through May, but may occur anytime the necessary atmospheric conditions of wind shear, lift, instability, and moisture are present.

Location

The entire planning area is vulnerable to tornados.

Extent

The Fujita Scale has been used to rate tornados since its development in 1971. In 2007 the scale was further developed into the Enhanced Fujita Scale, which has been used since. Tornado wind speeds are estimated after-the-fact based on the damage they produce. The City of Lawton uses the Enhanced Fujita Scale when considering tornado severity.

Enhanced Fujita (EF) Scale

EF Category	Wind Speed (mph)	Potential Damage
EF0	65 – 85	Light Damage – Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over
EF1	86 – 110	Moderate Damage – Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken
EF2	111 – 135	Considerable Damage – Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
EF3	136 – 165	Severe Damage – Entire stories of well-constructed houses destroyed; sever damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance
EF4	166 – 200	Devastating Damage – Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated
EF5	Over 200	Incredible Damage – Strong framed, well-build houses leveled off foundations are swept away; Steel-reinforced concrete structures are critically damaged; Tall buildings collapse or have sever structural damage; vehicles can be thrown up to 1 mile.

The City of Lawton considers:

- A **minor severity** event: any tornado of EF1 and below.
- A **major severity** event: any tornado of EF2 or higher.

Previous Occurrences

Tornados from 2012 to 2016

Date of Event	Disaster #	Location	EF Scale	Information/Damages
4/8/1922	NA	Lawton	NA	3 deaths 18 injuries
4/10/1979	NA	Lawton	EF3	3 deaths 109 injuries

There are no reported damages from recent tornado events in Lawton. Neighboring communities of Cache (2013), Wichita Mountains (2014), Faxon (2014) and Geronimo (2015) experienced EF0 tornados totaling $200,000 in damages. Meers (2015) and Elgin (2016) experienced EF1 tornados totaling $10,000 in damages.

April 10, 1979: The Red River Valley tornado outbreak. A thunderstorm system that produced the Vernon, Texas, tornado crossed the Red River and left a 50-mile-long skipping track of tornado damage through Oklahoma. Later in the evening another tornado (F3) spawned by the same thunderstorm system crashed into the City of Lawton. As a result of the early

warning, the casualty list of 3 dead and 109 injured was relatively small despite the destruction of several hundred homes and businesses. Overall, this outbreak resulted in 56 deaths and 1,916 injuries.

April 8, 1922: A tornado hit the west side of the City of Lawton resulting in 3 deaths and 18 injuries.

Probability of Future Events
The probability of tornados in the planning area is **high**.
The City of Lawton and surrounding areas have had 50 tornado events recorded in the last 61 years, 50 / 61 = 0.8197 x 100% = 82%.

Impact and Vulnerability
Every structure in the planning area is vulnerable to tornados. Loss of utility service can affect large segments of the population for long periods of time. Economic losses to homeowners and businesses can be devastating. Cascading effects of power loss may include loss of water and sewer services, inability to fuel vehicles, and food spoilage, adding new challenges to disaster-stricken communities.

To date, 420 safe rooms have been installed and registered within the City of Lawton. Citizens without a safe room are encourage to participate in Oklahoma Emergency Management's Sooner Safe Room Program.

3.5.4 High Wind

Description
High winds result from a strong cold front passages, or gradient winds between high and low pressure. Damaging winds are often called "straight-line" winds to differentiate the damage they cause from tornado damage. 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.

Location
The entire planning area is vulnerable to high winds.

Extent
The Beaufort wind scale is used to measure wind classifications between 1 and 12. The City of Lawton may be impacted by winds encompassing the entire range shown in the scale.

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

The City of Lawton considers:

- A **minor severity** event: any high winds Beaufort number of 8 and below.
- A **major severity** event: any high winds Beaufort number of 8 or higher.

Previous Occurrences

High Winds from 2012 to 2016

Date of Event	Disaster #	Location	Beaufort Number	Information/Damages
5/31/99	NA	Lawton	12	100mph
5/27/01	NA	Lawton	12	90mph – 1fatality
3/4/04	NA	Lawton	11	67mph
6/16/11	NA	Lawton	11	70mph
3/4/13	NA	Lawton	10	60mph
5/29/13	NA	Lawton	11	70mph - $1,000 damages
6/8/13	NA	Lawton	10	62mph
7/26/13	NA	Lawton	10	62mph
11/10/14	NA	Lawton	10	58mph
3/31/15	NA	Lawton	11	64mph - $1,000 damages
5/16/13	NA	Lawton	11	70mph
11/17/15	NA	Lawton	11	72mph
4/26/16	NA	Lawton	12	75mph - $2,000 damages
5/8/16	NA	Lawton	11	69mph - $50,000 damages
6/14/16	NA	Lawton	10	60mph
7/14/16	NA	Lawton	11	66mph

Probability of Future Events
The probability of high winds in the planning area is **high**.
The City of Lawton had 131 high winds events recorded in the last 61 years, 131/ 61 = 2.1475 x 100% = 215%.

Impact and Vulnerability
Damages from high winds may exceed those caused by tornados. Structural impacts might include window and roof damage, and inundation of facilities by heavy rain. In addition to structural issues, high winds can also affect electrical and other utilities with service outages due to power lines grounding out or being knocked down. Transportation can be disrupted with the loss of stop lights and street lights, and dangerous cross winds could make travel difficult. Wind-driven debris can penetrate windows, roofs, and even reinforced masonry walls, posing a threat to both property and occupants. The potential for injury or property damage due to flying debris exists in all of planning area.

3.5.5 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 last several days. Blowing snow is wind-driven snow that reduces visibility and causes significant drifting. Blizzards occur when falling and blowing snow combine with high winds of 35 mph or greater, reducing visibility to near zero. Freezing rain is precipitation that falls, as liquid, into a layer of freezing air near the surface. When the precipitation makes contact with the surface, it forms into a coating or glaze of ice and even a small accumulation 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 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 major travel hazards. Ice loads on overhead power lines, combined with windy conditions, may cause the lines to "gallop." This forceful motion often causes the lines to break away from the connectors and poles, resulting in widespread power failure. 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
The entire planning area is vulnerable to winter storms.

Extent
Wind Chills in the City of Lawton can reach -19 as shown on the National Weather Service Wind Chill Chart below. A typical winter storm in the City of Lawton will deposit 1-3 inches of snow, accompanied by sleet and ice. A 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. Ice accumulations of only ½ inch can immobilize the town and cause damage to infrastructure. As little as 2 inches of snow combined with strong winds can cause blizzard conditions.

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 (SPIA). 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 City of Lawton considers:

The City of Lawton considers:

- A **minor severity** event: 1 or below on the SPIA chart.
- A **major severity** event: 2 or above on the SPIA chart.

NWS Windchill Chart

Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

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.)

Previous Occurrences

Winter Storms from 2012 to 2016

Date of Event	Disaster #	Location	Information/Damages
12/25/12	NA	Lawton	6.8 inches of snow
4/9/13	DR-4109	Lawton	One quarter inch or less of ice on elevated surfaces
11/24/13	NA	Lawton	2 inches of snow 3 miles east of Lawton
12/5/13	NA	Lawton	2 inches of snow
12/20/13	NA	Lawton	1/3 to 2/3 inch ice accumulations on trees, power lines and other elevated surfaces
2/2/14	NA	Lawton	5 inches of snow
12/27/14	NA	Lawton	6 inches of snow
2/23/15	NA	Lawton	1 inch of snow
2/27/15	NA	Lawton	2 to 3 inches of snow
3/4/15	NA	Lawton	1 to 2 inches of snow
11/27/15	NA	Lawton	Freezing rain, temperatures in the 20s to lower 30s $53,000 in damages
12/27/15	DR-4247	Lawton	Sleet, freezing rain and snow combined with high winds caused extensive damage to trees and power lines $488,000 in damages

Probability of Future Events

The probability of winter storms in the planning area is **high**.

The City of Lawton had 50 winter storm events recorded in the last 61 years, 50 / 61 = 0.8197 x 100% = 82%.

Impact and Vulnerability

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, and frostbite. Historically, power outages due to downed lines have occurred in areas of the City of Lawton, and have lasted for periods of days to weeks. As a result, electric utilities have contingency plans and mutual aid agreements with neighboring utility providers. These plans identify priority facilities such as hospitals that need power service restored as quickly as possible. As new lines are considered and/or replacement lines are needed, the providers should thoroughly investigate underground lines.

The primary impact of winter storms on school districts in the City of Lawton is school closure, sometimes for extended periods of time. Therefore school districts should have plans for early dismissal of students, as well as protection of buildings from the effects of extreme cold during periods of inaccessibility.

3.5.6 Flood

Description

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. 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.

Floods in the City of Lawton 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.

Location

Areas located within the SFHA are most susceptible to riverine flooding. Additional areas may receive roadway, flash flood or sheet flooding.

Extent

Severity of flooding is determined by several factors including rainfall intensity, duration, and location. Topography and ground cover are contributing factors for floods. The extent of flooding in the City of Lawton will be determined by the Zone A, 100 year flood hazard areas on the FIRM maps. Even short periods of heavy rainfall can cause flooding throughout the City. The majority of severe flooding in the City is caused by intense rainfall resulting from localized thunderstorms. The effects are generally aggravated in areas where man-made and natural constructions in the floodplain impeded the passage of large flows. The City of Lawton considers a rainfall event of 2" per hour a minimum severity and a rainfall event with more than 2" per hour to be a major severity.

Previous Occurrences

Flooding from 2012 to 2016

Date of Event	Disaster #	Location	Information/Damages
5/7/15	NA	Lawton	1.59in of rain $10,000 in damages
5/8/15	NA	Lawton	0.83in of rain. Rainfall rates of two inches per hour observed. Numerous streets flooded, with water flooding yards and encroaching on homes. $10,000 in damages
5/23/15	NA	Lawton	0.66in of rain. Water over some lanes of I-44 north of Lawton
5/28/15	NA	Lawton	1.78in of rain. Street flooding at several locations, with the most significant flooding at Lee blvd and I-44. Water up over vehicle tires. $20,000 in damages
7/7/15	NA	Lawton	2.27in of rain. Water was flowing over 53rd street and Gore blvd
2/10/16	DR-4256	Lawton	Public Assistance to Public Utility Co's. Countywide per capita impact equaled $3.93
5/8/16	NA	Lawton	0.04in of rain. Water rescues on the west side of Lawton. Many roads were reported impassable or closed. Closed Cache road a quarter mile east of NE 75th street due to flooding. $20,000 in damages
5/26/16	DR-4222	Lawton	1.43in of rain. A city park was reported under water with up to 3 feet of water present. At least one vehicle was stranded. $25,000 in damages
6/12/16	NA	Lawton	0.02 in of rain. A 94 year old man was on his way to church when his truck was swept off the road and into a flooding creek. His body was recovered, still in his truck, Monday afternoon. Several vehicles stranded in high water near Sheridan and B streets. Water was over one foot deep at the intersection of 27th street and G ave. 11th Street near Numu was closed due to high water. Interstate 44 was closed by high water near Rogers Lane. One foot deep water flowed over Flowermound Road and Cache Road. SE 60th and Bishop was impassable due to high water. A car was stranded in rushing water one mile east of I-44 on Gore Ave. Several high water rescues were ongoing. $10,000 in damages
7/15/16	DR4274	Lawton	Public Assistance provided but not individual assistance. Countywide per capita impact equaled $22.24
9/24/16	NA	Lawton	1.88in of rain. Eight to ten inch deep water was flowing across SW 11th and Tennessee Street in southern portions of Lawton. Vehicle was stranded in high water at the intersection of Sheridan and Lee Boulevard. High water rescue at the intersection of SW 9th and SW Washington Avenue.

Probability of Future Events
The probability of flooding in the planning area is **high**.
The City of Lawton had 66 flooding events recorded in the last 61 years, 66 / 61 = 1.0820 x 100% = 108%.

Impact and Vulnerability
Typical impacts from flooding in the City of Lawton include inundated homes and roadways, road closures, and water rescues. In May 2015 flooding was substantial in Lawton. Residential flooding is common due to Numu Creek. Homes in the area have historically been inundated with floodwater. Drainage channels experience substantial damage from flood events. The flood inundation to homes and businesses creates a financial burden to the owners and economy.

Lawton has a floodplain management plan that describes special flood hazard areas of the City that are subject to periodic inundation. Lawton participates in the National Flood Insurance Program (NFIP) and is in good standing with no compliance violations. The most recent Community Assistance Visit (CAV) was conducted in July 2016. Lawton also participates in the Community Rating System (CRS). A five-year cycle review and field verification was completed in November 2017 that determined Lawton retained the rating as a CRS Class 6 community. Participation in both programs requires routine review and updates to repetitive loss areas, Flood Insurance Rate Maps (FIRM), and floodplain ordinances.

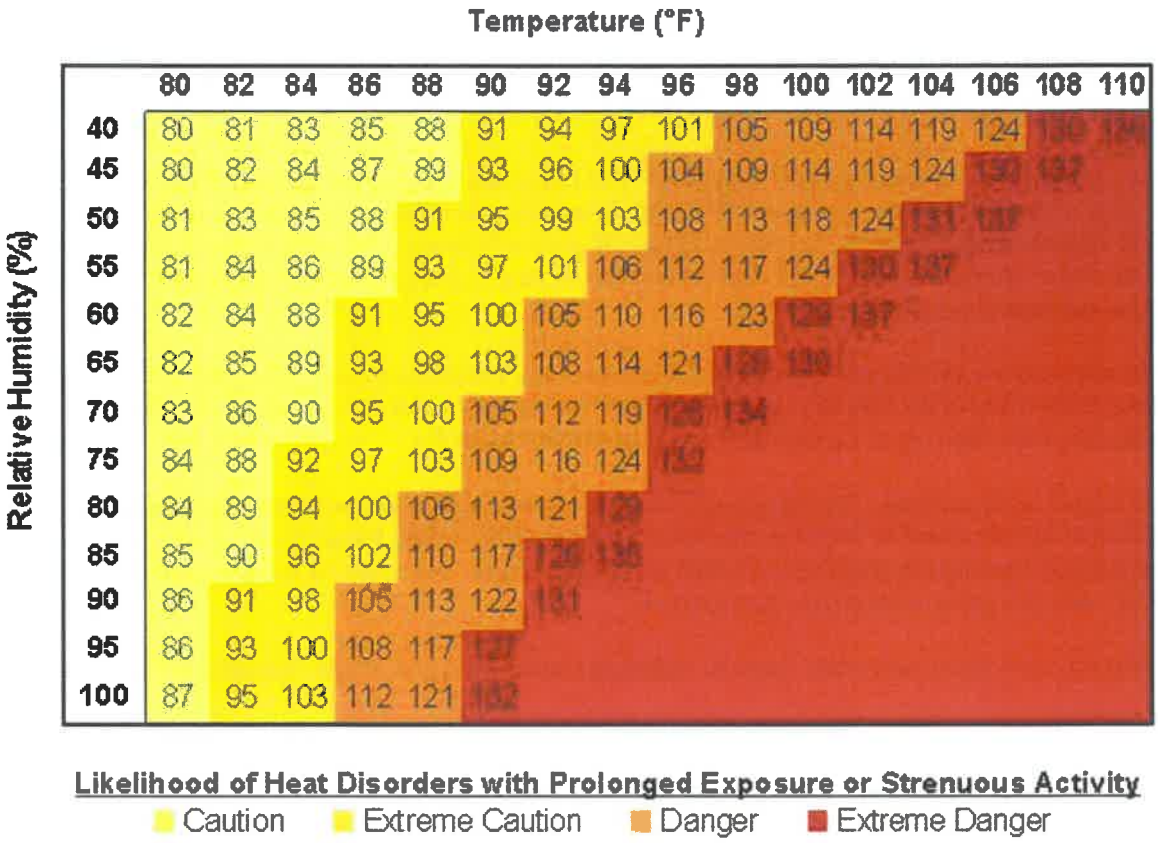
Another issue Lawton faces is the general public not heeding public safety notifications, going around barricades, and driving through flooded roadways. The City has put up signs for *Turn Around, Don't Drown.*

3.5.7 Extreme Heat

Description
Summertime temperatures routinely climb above the 100-degree mark, which can create very uncomfortable conditions when combined with high dew point. Temperatures that hover 10 degrees or more above the average heat temperature for an area, and last for several days or longer is one measure of extreme heat. In addition, humid or muggy conditions can persist and air quality can deteriorate during the summer when a dome of high atmospheric pressure creates a temperature inversion that traps a stagnant air mass near the ground.

Location
The entire planning area is vulnerable to extreme heat.

Extent
There are no uniform set of attributes that define extreme heat, although the NOAA/NWS Heat Index is widely used.



The City of Lawton considers:

- A **minor severity** event: any extreme heat event in extreme caution category and below.
- A **major severity** event: any extreme heat event in danger category and above.

Previous Occurrences

Extreme Heat Events from 2012 to 2016

Date of Event	Disaster #	Location	Information/Damages
June 2012	NA	Lawton	Temperature at or exceeded 105 degrees 4 times. Highest reading was 109 degrees.
July 2012	NA	Lawton	Temperature at or exceeded 105 degrees 9 times. Highest reading was 111 degrees.
August 2012	NA	Lawton	Temperature at or exceeded 105 degrees 7 times. Highest reading was 113 degrees.
September 2012	NA	Lawton	Temperature at or exceeded 105 degrees 6 times. Highest reading was 107 degrees.
June 2013	NA	Lawton	Temperature at or exceeded 105 degrees 1 time. Highest reading was 107 degrees.
July 2013	NA	Lawton	Temperature at or exceeded 105 degrees 2 times. Highest reading was 106 degrees.
August 2013	NA	Lawton	Temperature at or exceeded 105 degrees 2 times. Highest reading was 106 degrees.
July 2014	NA	Lawton	Temperature at or exceeded 105 degrees 1 time. Highest reading was 108 degrees.
August 2014	NA	Lawton	Temperature at or exceeded 105 degrees 1 time. Highest reading was 105 degrees.
August 2015	NA	Lawton	Temperature at or exceeded 105 degrees 2 times. Highest reading was 105 degrees.
August 2016	NA	Lawton	Temperature at or exceeded 105 degrees 3 times. Highest reading was 107 degrees.

Probability of Future Events
The probability of extreme heat events in the planning area is **high**.
The City of Lawton had 38 extreme heat events recorded in the last 61 years, 38 / 61 = 0.6229 x 100% = 62.29%.

Impact and Vulnerability
Extreme heat has many negative consequences. Most significant is its impact on humans and animals, because prolonged exposure to extreme heat can result in death. Young children, elderly people, and those who are sick or overweight are more likely to become victims to extreme heat. This can also include generally healthy individuals whose job consists 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.

Roadways can also be affected by extreme heat. Most of the side streets in Lawton are asphalt, which are susceptible to softening and buckling. Main roads in the City of Lawton are primarily concrete, which are susceptible to cracking. Road damage due to extreme heat costs the City of Lawton an average of $20,000 annually.

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. Factories, automobiles, lawn equipment, and other internal combustion machines emit high particulate matter. The resulting stagnant, dirty, and toxic air does not move away until a weather front arrives to disperse it.

Prolonged extreme heat can also lead to secondary hazards, including elevated wildfire danger, drought, and expansive soil issues.

The local Red Cross, public utilities and volunteer organizations implement short term programs such as fan and air conditioner distribution, senior checkups, and voluntary/mandatory water conservation.

3.5.8 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 low precipitation. A wildfire often begins unnoticed and can spread quickly, lighting brush, trees, and structures. 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
Those locations within the City of Lawton and its outskirts, as defined by the Wildland Urban Interface, pose the highest risk of Wildland fire to the City of Lawton.

Extent
The Keetch-Byram Drought Index is useful for indicating the likelihood of wildfire based on soil moisture conditions. The National Fire Danger Rating System is used to convey the relative potential over a large area for fires to ignite, spread, and require suppression action.

Keetch-Byram Drought Index with Fire Danger Rating Data Incorporated

0 – 200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200 - 400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400 - 600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600 - 800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity

Fire Danger Rating System		
Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) COLOR CODE: Green	Fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) COLOR CODE: Blue	Fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel - especially draped fuels - may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
CLASS 3: High Danger (H) COLOR CODE: Yellow	Fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) COLOR CODE: Orange	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics – such as long-distance spotting – and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) COLOR CODE: RED	Fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger Class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

The City of Lawton considers:

- A **minor severity** event: any wildfire event in Class 3 and below.
- A **major severity** event: any wildfire heat event in Class 4 and above.

Previous Occurrences

Wildfire Events from 2012 to 2016

Date of Event	Disaster #	Location	Information/Damages
NA	NA	NA	NA

The City of Lawton has not experienced any wildfires damaging more than an acre of land since the last plan update.. The City responds to mutual aid calls outside of the city limits to help those volunteer departments. The Wichita Mountains Wildlife Refuge has experienced many wildfires that are difficult to fight due the refuge's rocky, mountainous terrain. City of Lawton is proactive in enforcing burn bans issued by Comanche County Emergency Management during periods of extended high fire danger conditions.

Probability of Future Events

The probability of wildfires in the planning area is **high**.
The City of Lawton had 63 wildfires recorded in the last 17* years, 63 / 17 = 3.7059 x 100% = 371%.
*Records for different classifications of fires can only be found for the last 17 years.

Impact and Vulnerability

Periods of drought, dry conditions, high temperatures, and low humidity set the stage for wildfires. Four out of five wildfires are human caused. Lightning strikes are another leading cause of wildfires. Other sources of ignition include railroads, catalytic converters on automobiles, and spontaneous ignition of hay bales. 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 impact of wildfires.

3.5.9 Drought

Description
A drought is a period of drier-than-normal conditions. If dry weather persists and water supply problems develop, the dry period can become a drought.

Location
The entire planning area is vulnerable to drought.

Extent
The Palmer Index varies roughly between -4.0 and +4.0. Weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are on the World Wide Web from the Climate Prediction Center. The planning area may experience -4.0 on the PDSI.

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

The City of Lawton considers:

- A **minor severity** event: any drought event in moderate and below category of Palmer Drought Severity Index.
- A **major severity** event: any drought event in severe and above category of Palmer Drought Severity Index

Previous Occurrences

Drought Events from 2012 to 2016

Date of Event	Disaster #	Location	Information/Damages
7/1/12-8/31/12	NA	Lawton	Plamer Drought Severity Index - Severe Drought
9/1/12-9/30/12	NA	Lawton	Plamer Drought Severity Index - Extreme Drought
11/1/12-2/28/13	NA	Lawton	Plamer Drought Severity Index - Severe Drought
5/1/14-10/31/14	NA	Lawton	Plamer Drought Severity Index - Severe Drought

Probability of Future Events
The probability of drought in the planning area is **high**.
The City of Lawton had 32 droughts recorded in the last 61 years, 32 / 61 = 0.5246 x 100% = 52.46%.

Impact and Vulnerability
Drought impacts all areas within the City of Lawton. Hot weather during the summer increases demand and subsequent use of supplies, as well as evaporation. The most direct impact of drought is a decrease in the public water supply. This could result in mandated water conservation steps to include a ban on washing cars or watering lawns. One of the other potential impacts of drought is economic rather than loss of life or destruction of property. The City of Lawton revenue generation is partially dependent on water sales. A long-term drought has the potential to cause widespread economic decline due to decreased revenue projections which would result in increased service fees or reduction of services.
The City of Lawton has policies established to implement during a drought event.

3.5.10 Dam Failure

Description
A dam is an artificial barrier constructed to impound water. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. The dams located within Lawton are subject to State regulations. A dam that impounds water in the upstream area is referred to as a reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

FEMA Dam Failure Hazard Classification:

LOW HAZARD POTENTIAL: Dams assigned the low hazard potential classification are those where failure or misoperation results in no probably loss of human life and low economic and/or environmental losses.

SIGNIFICANT HAZARD POTENTIAL: Dams where failure or misoperation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant Hazard Potential dams are often located in predominantly rural or agricultural areas, but could be located in areas with population and significant infrastructure.

HIGH HAZARD POTENTIAL: Dams where failure or misoperation will probably cause loss of human life.

Location
The entire planning area is vulnerable to dam failure. According to the Oklahoma Water Resources Board (OWRB) and the National Inventory of Dams (NID), there are 15 dams in the City of Lawton or could potentially affect Lawton. Of those dams, 5 are classified as High Hazard Potential, 3 are Significant Hazard Potential and7 are Low Hazard Potential.

High Hazards include: Lawtonka, Ellsworth, Dolese, B2, Lake George

Significant Hazard Potential: B1, Lawton Lake, PSO Comanche Lake Station

Low Potential: Lake Hellen, OK12855, OK12854, OK12843, OK12871, OK12853, OK12852

Extent
Based on the information provided by the OWRB and the NID, the City of Lawton considers:

Minor Severity Event: A dam failure when seepage or small breach where the water stays within the downstream river channel.

Major Severity Event: A breach large enough to exceed the capacity of the river or creek channel and overflow causing damage to homes, businesses, critical facilities, and state buildings, and putting people at risk.

Appendix X provides flood inundation maps for all the high hazard dams except Lake George. Action Item 15 will provide the missing inundation map for Lake George on the 2020 update of the Emergency Action Plan.
The maps contain water depths with 2' contours.

Previous Occurrences
There is no history of dam failure within the City of Lawton.

Probability of Future Events
The probability of dam failures in the planning area is **low**.
The City of Lawton had 0 dam failures recorded in the last 61 years, 0 / 61 = 0.00 x 100% = 0%.

Impact and Vulnerability
Dam failure within the City of Lawton would affect personal safety, property, the economy, power and utilities, roadways

and travel, recreation, and the environment. The City of Lawton is required by FEMA to develop an Emergency Action Plan (EAP), in the event of a dam breach or failure. As part of the EAP, this plan includes maps of inundation areas. The maps identify a Probable Max Flood (PMF) event of the identified dams and the inundation of some areas of Lawton.

Lake Ellsworth and Lake Lawtonka are located far enough upstream to provide a relatively long lead time for warning purposes. However, Lake George is located roughly 1 mile upstream and would have a much shorter warning time. Due to the large floodplain capacity of East Cache Creek, damage from any breach event is expected to have minimal damage to the surrounding area.

If a dam failure were to occur this would result in evacuation of residences and businesses downstream of the failure. Depending on the severity of the dam this could result in structures being uninhabitable from flooding; resulting in the need to rebuild or relocate. Businesses would have to do the same and in some cases would have to close their doors for good. If utilities and infrastructure are damaged residents would have to look for supplemental power. Roadways would become flooded possibly resulting in essential facilities becoming isolated or emergency services rerouted in response to calls. A catastrophic dam failure, without ample warning and evacuation, could lead to injury and death.

3.5.11 Earthquake

Description
An earthquake occurs when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane. The location below the earth's surface where the earthquake starts is called the hypocenter, and the location directly above it on the surface of the earth is called the epicenter. Most earthquakes occur as the result of slowly accumulating pressure that causes the ground to slip abruptly along a geological fault plane on or near a plate boundary. The resulting waves of vibration within the earth create ground motion at the surface that vibrates in a very complex manner.

Location
Earthquakes affect the entire planning area.

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

Modified Mercalli Intensity Scale

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	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	Light	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.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
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.
VIII	Severe	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.
IX	Violent	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	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

The City of Lawton considers the following earthquake events to be minor/major:

Minor Event: An earthquake that registers as magnitude 3.9 or below.
Major Earthquake Event: An earthquake that registers as magnitude 4.0 or above.

Previous Occurrences
There is no history of earthquakes within the City of Lawton.

Probability of Future Events
The probability of earthquakes in the planning area is **low**.
The City of Lawton had 0 earthquakes recorded in the last 61 years, 0 / 61 = 0.00 x 100% = 0%.

Impact and Vulnerability
Earthquake damage can range from minor cracks in walls to collapse of buildings and roadways. Secondary impacts can include fires from ruptured pipelines, and catastrophic infrastructure failure leading to death, destruction, and long-term displacement of business and commerce within affected areas

The Meers fault is located north of the City of Lawton and is the most prominent seismic feature in the state. This is the only fault in Oklahoma with evidence of surface-rupturing earthquakes in the last 3,000 years.

Most facilities in the City of Lawton have not been constructed to withstand an earthquake, nor have residents been educated on what they can do to prevent injury from an earthquake event.

CHAPTER FOUR: MITIGATION STRATEGY

4.1 Capabilities Assessment

Lawton has a unique set of capabilities, including authorities, policies, programs, staff, and funding, and resources to accomplish mitigation and reduce long- term vulnerability. By reviewing the existing capabilities, the planning committee identified capabilities that currently reduce disaster losses or could be used to reduce losses in the future. Lawton completed a capability assessment in February 2018, and that information is included at the end of this section.

4.1.1 Existing Institutions, Plans, and Ordinances

The City of Lawton has 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	Post-Disaster Recovery
City of Lawton	X	X	X	X	X	X	X	X	X	X	X

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

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

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

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

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

Growth Management Ordinance
Growth management ordinances are enacted 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 also 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 Response Plan

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

Post-Disaster Recovery Plan

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

Stormwater/Floodplain Management Plan

The floodplain management plan describes special flood hazard areas of the City that are subject to periodic inundation. Lawton participates in the National Flood Insurance Program (NFIP) and is in good standing with no compliance violations. The most recent Community Assistance Visit (CAV) was conducted in July 2016. Lawton also participates in the Community Rating System (CRS). A five-year cycle review and field verification was completed in November 2017 that determined Lawton retained the rating as a CRS Class 6 community. Participation in both programs requires routine review and updates to repetitive loss areas, Flood Insurance Rate Maps (FIRM), and floodplain ordinances.

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 City of Lawton maintains staff positions for the given functions.

Jurisdiction	Planners/Engineers with knowledge of land development	Engineers trained in construction practices	Floodplain Management	Surveyors	Staff with education to assess communities vulnerability	Staff for GIS and HAZUS	Scientist familiar with community hazards	Emergency Manager	Grant Writer
City of Lawton	X	X	X	X	X	X	X	X	X

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.

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
Geographical Information Systems (GIS) takes geographic information in the form of data layers and can use it to create and view maps for the City. This capability can be used to view hazard information and determine areas at risk and help to inform mitigation strategies.

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

The City of Lawton adopts an annual budget that includes some funds relevant to hazard mitigation. The designated accounts include General Fund, Emergency Communications, Drainage Maintenance, Wastewater Maintenance, Sewer System Rehab, Sinking Fund/Debt Service/CIP/ GO Bond, Stormwater Mitigation and Police & Fire Training Fund.

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	Federal funding programs	Federal funding programs
City of Lawton	X	X	X	X	X	X	X	X

4.1.4. Education and Outreach Capabilities

The City of Lawton has developed and implemented actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, municipal website and demonstration events.

Jurisdiction	Local citizen groups/Non-profit organizations	Ongoing public education or information programs	Natural disaster or safety related programs	StormReady Certification	Firewise Communities Certification	Public-Private partnership initiatives addressing disaster-related issues
City of Lawton	X	X	X	X	X	X

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.

Firewise

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structure damage. Firewise techniques include minimizing the risk of home ignition by carefully landscaping around residential structures such as thinning trees and brush and choosing fire-resistant plants, selecting ignition-resistant building materials, and positioning structures away from slopes.

4.1.5 Opportunities for Public Education and Outreach

Education opportunities exist for disseminating emergency preparedness information to diverse populations. Most, if not all of the following entities / capabilities were identified in the City of Lawton:

- Agribusiness organizations (OSU Extension, Future Farmers of America, CO-OPs)
- Amateur radio organizations
- 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
- Coalition meetings
- Direct mailing pieces
- FEMA and other free online training venues
- Insurance groups
- Local Emergency Planning Committees (LEPCs)
- 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
- Utility companies
- Volunteer Organizations Active in Disaster
- Web sites, public white boards, Facebook® pages
- Wednesday newspaper inserts or display advertising
- Youth groups (YMCA, Boys & Girls Club, Scouting, and entrepreneurial groups).

4.1.6 Conclusion

The capability assessment finds that the City of Lawton has a significant level of legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies. Lawton has the legal capabilities, ordinances, and codes in place that have the potential to reduce loss due to a disaster. Lawton has a range of staff who have knowledge about hazards and their impact including an Emergency Manager. Lawton has financial resources that can be used towards mitigation. The City of Lawton has local citizen groups that are willing to assist in emergency management efforts. The City of Lawton has incorporated a community wildfire plan and utilizes burn bans.

The City of Lawton Planning Committee 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 city/county 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 NFIP Participation

The City of Lawton has been a National Flood Insurance Program (NFIP) Community since 1978, CID # 400049, and has adopted a Floodplain Management Ordinance that restricts development in floodplain areas, through a building development permit system. A copy of this ordinance may be found at the City of Lawton City Clerk's Office. Floodplain Management Ordinances are reviewed annually for compliance. In addition, the City provides reference material on flood hazards, flood insurance, and proper construction measures to all builders and residents applying for building permits. The City of Lawton additionally will maintain compliance and required updates of the NFIP by maintaining state accreditation requirements for local floodplain administrators. The Floodplain Administrator and the Public Works Director within the Public Works Department oversee the compliance and continued participation in the NFIP.

Lawton has three major drainage basins that are subject to flooding: East Cache Creek, Numu Creek and Meadowbrook/Wolf Creek. Lawton offers the following information regarding the flood program:

- Offers information on flood proofing and flood protection including onsite visits, financial assistance and local contractors
- Provides information/ technical assistance/ advice on flood insurance
- Provides information about floodways, local drainage problem areas, flood inundation areas, possible flood depths, benefits of floodplains, open spaces and historical floods
- Reviews retrofitting and offers advice on siting a structure
- Maintains elevation certificates
- Issues special flood hazard development permits
- Depository of the official Flood Insurance Rate Maps
- Provides assistance in locating properties on the FIRM.

There are 42 Repetitive Loss and 3 Severe Repetitive Loss Properties (all residential) in the City of Lawton. A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. A SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000;

(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

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

4.3 Mitigation Goals

During the update of the City of Lawton Hazard Mitigation Plan the goals were reviewed and revised for the update of the plan:

Goal 1: To increase ability to communicate and respond quickly and efficiently to disasters.
Goal 2: To enhance public awareness and understanding of hazard mitigation.
Goal 3: To protect community from loss of life and personal injury.
Goal 4: To protect integrity of critical facilities and infrastructure
Goal 5: To minimize the effects to personal property and cost of disaster response

4.4 Action Items

The specific actions to be taken in order to achieve these goals and objectives are called strategies. They need to be targeted actions that are easily translatable to every-day activities. A wide range of activities was considered to help achieve the regional goals while addressing the specific hazard concerns of each participating party. All activities

considered by the Steering Committee can be classified under one of the following six broad categories of mitigation techniques:

- Prevention
- Property Protection
- Natural Resource Protection
- Structural Projects
- Emergency Services
- Public Education and Awareness

See appendix B for list of mitigation action strategies.

4.5 Action Item Prioritization

The City of Lawton Hazard Mitigation Planning Committee reviewed, analyzed, and prioritized the action items using the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) Method. This enabled the committee to ensure that an appropriate Cost Benefit performance was maintained. The mitigation goals previously listed were determined to have the greatest benefit in hazard reduction to the City. This priority remains the same from the previous plan, and will be readdressed in the five-year update to account for any growth and development in the planning area. When prioritizing existing and new items a benefit-cost review will be conducted. Benefits include losses avoided, such as the number and values of structures and infrastructure protected by the action and the population protected from injury and loss of life. Pros and cons of different action alternatives will also be weighed.

STAPLEE Evaluation

Acronym	Criteria
S Social	• Is the proposed action socially acceptable to the community(s)? • Are there equity issues involved that would mean that one segment of a community is treated unfairly? • Will the action cause social disruption?
T Technical	• Will the proposed action work? • Will it create more problems than it solves? • Does it solve a problem or only a symptom? • Is it the most useful action in light of other community(s) goals?
A Administrative	• Can the community(ies) implement the action? • Is there someone to coordinate and lead the effort? • Are sufficient funding, staff, and technical support available? • Are there ongoing administrative requirements that need to be met?
P Political	• Is the action politically acceptable? • Is there public support both to implement and to maintain the project?
L Legal	• Is the community(ies) authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity? • Are there legal side effects? Could the activity be construed as a taking? • Is the proposed action allowed by a comprehensive plan, or must a comprehensive plan be amended to allow the proposed action? • Will the community(ies) be liable for action or lack of action? • Will the activity be challenged?
E Economic	• What are the costs and benefits of this action? • Do the benefits exceed the costs? • Are initial, maintenance, and administrative costs taken into account? • Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)? • How will this action affect the fiscal capability of the community(ies)? • What burden will this action place on the tax base or local economy? • What are the budget and revenue effects of this activity? • Does the action contribute to other community goals, such as capital improvements or economic development? • What benefits will the action provide?
E Environmental	• How will the action affect the environment? • Will the action need environmental regulatory approvals? • Will it meet local and State regulatory requirements? • Are endangered or threatened species likely to be affected?

In addition to the 25 new mitigation actions, the Planning Committee chose to continue 13 of the 2012 and 7 of the 2004 mitigation actions in this planning cycle. Those actions are included in Appendix B to include responsible parties, funding sources, interim measures of success, and priority level.

4.6 Integration of Data, Goals, and Action Items

The City of Lawton Hazard Mitigation Plan will be incorporated on multiple levels. To begin with, the mitigation goals, action items and strategies will be posted onto each Lawton's website to begin the process of public "buy-in." This is an important first step in educating the public on the benefits of hazard mitigation and encouraging community members to invest in proposed projects.

This plan will be reviewed annually by local governments to look for opportunities for hazard mitigation into existing Emergency Action Plans, Capital Improvement Plans, building codes, and local regulations. The Hazard Mitigation Point of Contact will participate in plan reviews and updates to provide information on action item integration. City staff will evaluate all applicable mitigation action items annually to determine which ones can be incorporated into proposed budget areas. The items will be prioritized by Department Directors, Emergency Manager, City Manager and City Council using the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) Method and listed as additional items in budget preparations. Additional opportunities for funding and implementation will be evaluated on a continual basis.

The current Capital Improvement Program was approved August 11, 2018 and modified on January 8, 2019. The next program is scheduled to begin in 2025. A committee will be formed prior to this time to evaluate and identify projects for consideration. The Hazard Mitigation Plan point of contact will participate on this committee to provide information on action item integration.

CHAPTER FIVE: PLAN UPDATE PRIORITIZATION AND REVIEW

5.1 Changes in Jurisdictional Development

The City of Lawton experienced some changes in development since the previous plan. Since 2012 there was a slight increase in population and new housing growth. There are presently 14 new housing subdivisions and one new housing subdivision under construction. Since 2012 Silverline Plastics has doubled the size of their manufacturing facility, now employing 185 workers. Lawton has added several major commercial facilities, including 2 shopping centers, 2 hotels, 2 food stores, 2 convenience stores and 1 nursing home. However, the hazard potential and mitigation goals have not changed due to growth and development.

5.2 Status of Previous Mitigation Action Items

Since the *All Hazards Mitigation Plan 2004 and 2012 Update*, the City has made numerous efforts to incorporate mitigation planning principles into other City planning efforts. The persons responsible for the mitigation plan reviewed the plan at least annually and coordinated with other City departments in order to review the status of current mitigation strategies, and to advocate for adoption and implementation of additional strategies by that agency. The result of all this outreach was the allocation of City funds for mitigation projects, successful implementation of the plan's mitigation strategies, and adoption of mitigation planning principles into the City's primary planning documents. The City hopes to further expand and incorporate mitigation principles into its planning documents. Over the coming five years, the personnel responsible for this plan will continue to advocate for their inclusion and adoption in other planning efforts.

In the planning process, the mitigation strategies from the 2004 HMP were reviewed. They were assessed for current status of completion, as well as relevancy for the updated plan. Those strategies that were determined to be ongoing or incomplete were considered for inclusion in this plan update.

Action Items Accomplished
The status of previous mitigation action strategies accomplished has been reviewed and detailed. See appendix C for list and status of 2012 mitigation action strategies.

Action Items Not Accomplished
The status of previous mitigation action strategies not accomplished has been reviewed, detailed and updated. See appendix C for list and status of 2012 mitigation action strategies.

5.3 Changes in Jurisdictional Priorities

The mitigation strategies and priorities that are being adopted by the City remains the same as those under previous plan. The representatives of the City of Lawton take mitigation principle seriously and will work to integrate risk reduction principles into all of their actions as public servants, and to ensure the safety and security of the residents of this community.

5.4 Conclusion

The City of Lawton Planning Committee understands that regular evaluation of this plan, to include the action items listed, will guarantee that this plan serves as a useful tool. The public also has a vital role to serve in this process. Continuing to canvas public feedback and incorporating it into the evaluation process is a critical step in ensuring our mitigation resources and actions will benefit the highest number of the City of Lawton citizens.

APPENDIX A

Review of 2012 Plan

Hazards Summary Worksheet Results

Hazard	Location (%)				Magnitude (%)				Probability (%)				Significance (%)		
Type	N	L	S	E	W	M	S	E	U	O	L	H	L	M	H
Avalanche	100				100				100				100		
Dam Failure		100				25	50	25	100				50	50	
Drought		25	25	50			75	25		25	25	50	25	50	25
Earthquake	50			50	50		50		25	50	25		50	50	
Erosion	50	50			50	50				50	25	25	50	50	
Expansive Soils	25		50	25	50	25	25			75		25		100	
Extreme Cold	25			75	25	25	50			50	50		25	75	
Extreme Heat		25	25	50	25	50	25			25	25	50		100	
Flood		50	25	25		25	50	25			50	50			100
Hail			75	25	75	25				25		75		75	25
Hurricane	100				75			25	100				100		
Landslide	100				75	25			100				100		
Lightning		25	50	25	25	75				25	25	50	25	75	
Sea Level Rise	100				100				100				100		
Severe Wind			50	50		75	25			25		75			100
Severe Winter Weather	25			75	25	25	50			25	50	25		50	50
Storm Surge	75			25	75	25			75		25		75		25
Tornado		25	25	50		25		75	25	25	25	25		50	50
Tsunami	100				75			25	100				100		
Wildfire		25	75			75	25			25	50	25		75	25

Capability Assessment Worksheet

Planning and Regulatory

Plans	Yes/No - Year	Does the plan address hazards? Does the plan identify projects to include in mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes	Planning
Capital Improvements Plan	Yes	
Economic Development Plan	Yes	LEDA
Local Emergency Operations Plan	Yes	County
Continuity of Operations Plan	Yes	City/County EOP
Transportation Plan	Yes	Planning
Stormwater Management Plan	Yes	Current SWMP and Drainage Masterplan
Other		
Other		

Building Code, Permitting and Inspections	Yes/No	Are codes adequately enforced?
Building Code	Yes	Version/Year:
BCEGS		Score:
Fire ISO	Yes	Rating: 1
Site plan review requirements	Yes	

Land Use Planning and Ordinances	Yes/No	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	Yes	Yes
Subdivision ordinance	Yes	Yes
Floodplain ordinance	Yes	Yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Yes	Yes
Flood insurance rate maps	Yes	Yes
Acquisition of land for open space and public recreation uses	Yes	Yes
Other		

How can these capabilities be expanded and improved to reduce risk?

Hazards Summary Worksheet

Definitions for Classifications

Location (Geographic Area Affected)
- Negligible: Less than 10 percent of planning area or isolated single-point occurrences
- Limited: 10 to 25 percent of the planning area or limited single-point occurrences
- Significant: 25 to 75 percent of planning area or frequent single-point occurrences
- Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

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

Hazard	Scale / Index	Weak	Moderate	Severe	Extrem
Drought	Palmer Drought Severity Index[3]	-1.99 to +1.99	-2.00 to -2.99	-3.00 to -3.99	-4.00 ar below
Earthquake	Modified Mercalli Scale[4]	I to IV	V to VII	VII	IX to XI
	Richter Magnitude[5]	2, 3	4, 5	6	7, 8
Hurricane Wind	Saffir-Simpson Hurricane Wind Scale[6]	1	2	3	4, 5
Tornado	Fujita Tornado Damage Scale[7]	F0	F1, F2	F3	F4, F5

Probability of Future Events
- Unlikely: Less than 1 percent probability of occurrence in the next year or a recurrence interval of greater than every 100 years.
- Occasional: 1 to 10 percent probability of occurrence in the next year or a recurrence interval of 11 to 100 years.
- Likely: 10 to 90 percent probability of occurrence in the next year or a recurrence interval of 1 to 10 years
- Highly Likely: 90 to 100 percent probability of occurrence in the next year or a recurrence interval of less than 1 year.

Overall Significance
- Low: Two or more criteria fall in lower classifications or the event has a minimal impact on the planning area. This rating is sometimes used for hazards with a minimal or unknown record of occurrences or for hazards with minimal mitigation potential.
- Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is sometimes used for hazards with a high extent rating but very low probability rating.
- High: The criteria consistently fall in the high classifications and the event is likely/highly likely to occur with severe strength over a significant to extensive portion of the planning area.

APPENDIX B

2018 Mitigation Action Strategies

Action Items in labeled file inside this folder

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
1	Print and distribute a new educational brochure for all natural hazards with mitigation Ideas for the public.	x	x	x	x	x	x	x	x	x	x	x	x	Public Works	FEMA HMGP	2020	Summit draft for approval by December 2019 for Lawton's Home Show	H	
2	Identify, acquire, relocate, or demolish structures within SFHA (RL/SRL priority).						x					x		Public Works	FEMA HMGP	2022	Develop list of potential properties to acquire. Mitigate as many properties as funds allow.	H	
3	Upgrade flood control gates at Lake Ellsworth.						x					x		WTR & WWTR	FEMA HMGP	2022	Repair and replace damaged equipment	H	
4	Improve slope stability at Ellsworth Dam						x					x	x	WTR & WWTR	FEMA HMGP	2022	Improve drainage, anchor system and reduce discharge velocity	H	
5	Evaluate the City's storm sirens and upgrade the system based on the results of the evaluation.							x		x				WTR & WWTR	FEMA HMGP	2020	Storm sirens are upgraded to be cost effective while also reaching the largest target audience possible.	H	
6	Install Generator at the City Fueling Station	x	x	x	x	x	x	x	x	x	x	x	x	EMER MGMT	FEMA HMGP	2020	Acquire and install items by 2020 or when funds are available	H	
7	Instaling quick-connect emergen y generator hook-ups for all critical facilities w/o generators.	x	x	x	x	x	x	x	x	x	x	x	x	EMER MGMT	FEMA HMGP	2020	Acquire and install items by 2020 or when funds are available	H	

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
8	Apply for a FEMA Safe Room Grant that allows home owners to be reimbursed 75% of the cost to install a storm shelter or safe room.	x						x		x				EMER MGMT	FEMA HMGP	2021	The maximum allowable homeowners, as outlined in the grant, install new storm shelters or safe rooms.	H	
9	Maintain the City website to include all-hazards preparedness information.	x	x	x	x	x	x	x	x	x	x	x	x	IT	Internal City Funds	CONT	Refine information as needed	H	
10	Maintain City's Emergency Operations Plan, ensure that it is current, and coordinate it with the Hazard Mitigation Plan's Hazard Identification and Risk Assessment.	x	x	x	x	x	x	x	x	x	x	x	x	EMER MGMT	DEPT HLSG	CONT	Refine information as needed	H	
11	Identify new tools to educate the public on the hazards at most risk to the community, to include all social media outlets.	x	x	x	x	x	x	x	x	x	x	x	x	IT	Internal City Funds	CONT	Evaluate methods (e.g., newspaper, electronic media) to reach all intended audiences, to help direct research/identification efforts. This may include conducting a public survey.	M	
12	Maintain dedicated easements and restrict construction in those easements.	x	x	x	x	x	x	x	x	x	x	x	x	PW, AEP, PSO & CTRP ENR	Internal City Funds	CONT	Refine maintenance activities as needed.	M	
13	Enforce the City's floodplain ordinance; more specifically, prohibit critical structures from being built in the 500-year floodplain.						x					x		Public Works	Internal City Funds	CONT	Refine enforcement requirements as needed.	H	

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
14	Maintain a supply of spill prevention/cleanup materials.					x								FIRE DEPT	DEPT HLSG	CONT	Acquire and replenish items as needed	H	
15	Update the two Emergency Action Plans for Lake Ellsworth and Lake Lawtonka. Secure and update dam breach studies for Lake Ellsworth, Lake Lawtonka and Lake George as needed **for EAP & HM Plan.**											x		WTR, WWTR & ENG	FEMA HMGP	2022	Develop a working group, or identify responsible parties, to conduct the updates by 2020.	M	
16	Coordinate with the County to maintain a Community Wildfire Protection Plan, focusing on wildland-urban interface.								x					FIRE DEPT	FEMA HMGP	CONT	Refine plan as needed	H	
17	Replace low water crossings.						x					x		Public Works	FEMA HMGP	2022	Develop a prioritized list of low water crossing roads to replace by 2020. Design plans to address improvements. Oversee constructions and implementation of design.	L	
18	Design projects to address drainage and flood control improvements						x					x		Public Works	FEMA HMGP	2022	Develop a prioritized list of drainage and flood control projects by 2020. Design plans to address improvements. Oversee constructions and implementation of design.		

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
19	Inspect key roads and bridges after an event.					x	x					x		Public Works	Internal City Funds	CONT	Refine inspection checklists as needed. Perform activities as needed.	L	
20	Spread sand /salt mixture on iced roadways.										x			Public Works	Internal City Funds	CONT	Ensure budget item included in annual budget for sand/salting.	L	
21	Maintain the current HazMat Response Team					x								FIRE DEPT	Internal City Funds	CONT	Refine capabilities as needed	H	
22	Work with Comanche County and Fort Sill on vegetation control				x				x					FIRE DEPT	Internal City Funds	CONT	Respond to requests for resources as appropriate	L	
23	Develop a GIS map identifing vulinable people i.e. but not limited to the elderly, and the handicaped for evacuation persons whose homes are in danger.					x	x	x	x	x	x	x	x	POLICE DEPT AND FIRE DEPT	Internal City Funds & FEMA HMGP	CONT	Identify critical points at which the decision to evacuate should occur. Develop evacuation plans and routes. Review capabilities. Obtain additional resources as needed	H	
24	Provide real time warning and notification to citizens about hazards and road closures to be displayed on City Website.	x	x	x	x	x	x	x	x	x	x	x	x	GIS	FEMA HMGP	2020	Develop online mapping system to alert citizens of hazards and road closures.	M	
25	Develop maps illustrating evacuation routes and locations of know hazard areas	x	x	x	x	x	x	x	x	x	x	x	x	GIS	FEMA HMGP	2020	Identify hazard areas affected by heavy rainfall.	M	

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
26	Develop interactive electronic warning an app for android and IOS mobile devices which also allows for reporting specific engagement emergency data.	x	x	x	x	x	x	x	x	x	x	x	x	INFO	FEMA HMGP	2022	Develop citizen information distribution application	M	
27	Water conservation regulation for usage of City supplied water during prolonged drought events.				X									Public Works	City	2020			
28	Continue lobbying efforts to encourage City officials to gain access to the County's current and timely records.	x	x	x	x	x	x	x	x	x	x	x	x	CITY MGR, MAYOR	Internal City Funds	2022	Refine information exchange procedures as needed.	M	Ongoing.
29	Build upon the City's Emergency Reserve Fund by increasing the deposits into the fund by 5% each year.	x	x	x	x	x	x	x	x	x	x	x	x	CITY MGR, MAYOR	Internal City Funds	Yearly	Determine potential budget items that may be able to withstand a temporary cutback.	M	Ongoing. By ordinance an 5% increase in the Emergency Reserve Fund is budgeted.
30	Maintain a supply of spill prevention/cleanup materials.					x								FIRE DEPT	Dep't of HLSG	2022	Determine items to acquire by 2013.	H	Ongoing. The Fire Department maintains supplies for spill prevention/cleanup. Supplies are replenished as needed. Funded through the supply cost recovery ordinance.

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
31	Determine feasibility of developing a Drought Preparedness and Response Plan.				x									Public Works	FEMA HMGP	2022	Review hazard data and evaluate available resources.	M	Ongoing. Water restrictions updated by Ordinance 15-04 on 3/24/1. LCC 22-2-218 Garver Engineering was hired to perform a study on alternative water sources. Preliminary report was submitted in September 2015.
32	Limit development in areas of steep slope.													COM SERV	Internal City Funds	CONT	Identify all areas of steep slope within the City.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
33	Evaluate the need to retrofit existing cell towers that are not built to current wind code.									x				COM SERV	Internal City Funds	2022	Determine requirements for retrofitting.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
34	Seek support for a statewide insurance program to cover hail damage to property and vehicles.	x												CITY MGR, MAYOR	Internal City Funds	2022	Determine data collection needs in order to assess vulnerability.	M	Ongoing. Bill Phelps lobbies on behalf of the City on statewide issues.
35	When glass windows in critical facilities are being replaced or remodeled pass building codes that require tempered glass.	x						x		x				COM SERV	Internal City Funds	2022	Prioritize critical facilities list based upon hazard vulnerability and evaluate highest ranking structures first.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
36	Promote retrofitting of wiring all pre-building code structures; promote upgrade of wiring to Ground Fault Circuit Interrupter.			x										COM SERV	Internal City Funds	CONT	Compile a list of critical facilities to be retrofitted and determine estimated costs to update to GFCI.	M	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
37	Update current building code on snow load requirements that are insufficient or where requirements should be more stringent.										x			COM SERV	Internal City Funds	2022	Conduct research to determine appropriate design requirements.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
38	Ensure that NRCS soil survey maps are overlayed to City of Lawton zoning regulations (i.e. maps) to ensure that new structures in areas with shrink/swell soils have appropriate foundation systems.													COM SERV	FEMA HMGP	2022	Obtain soil survey data and assign responsibilities.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
39	Consider retrofit options or changes (strengthening) to building code in earthquake hazard areas.												x	COM SERV	Internal City Funds	2022	Determine areas vulnerable to earthquakes and evaluate existing building codes.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
40	Retrofit the Emergency Operations Center and other public critical facilities.	x	x	x	x	x	x	x	x	x	x	x	x	Public Works	Dep't of HLSG	2022	Identify critical facilities to retrofit and determine what parts of the buildings to retrofit by 2012.	M	Ongoing.
41	Continue / codify stronger foundation construction practices.	x	x	x	x	x	x	x	x	x	x	x	x	PW & COM SERV	Internal City Funds	CONT	Identify existing construction manuals, or guidance, and educate builders on the resources they can use when constructing foundations.	M	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
42	Replace low water crossings.						x					x		Public Works	FEMA Unified Hazard	2022	Develop a prioritized list of low water crossing roads to replace by 2013.	L	Ongoing. Low water crossings locations are being evaluated.

#	Project Description	Hail	Extreme Heat	Lightning	Drought	Haz Mat	Flood	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
43	Inspect key roads and bridges after an event.					x	x					x	x	Public Works	Internal City Funds	CONT	Develop, or finalize, an inspection checklist by January 2013	L	Ongoing. Checklists have been developed. Roads and bridges are inspected after emergency events.
44	Meadowbrook Creek Flood Control Project Area						x					x		Public Works	Internal City Funds	2022	Develop a list of projects to be completed in the area and schedule construction based on priority	L	Ongoing. List of projects is being developed and prioritized.
45	Replace SW 52nd St. Bridge over Wolf Creek Tributary (Area #22)						x					x		Public Works	Internal City Funds	2022	Evaluate the structure and prioritize its reconstruction	L	Ongoing. List of projects is being developed and prioritized.
46	Spread sand /salt mixture on iced roadways.										x			Public Works	Internal City Funds	CONT	Ensure budget item included in DPW annual budget for sand/salting.	L	Ongoing. Sand/salting is budgeted for and applied as needed.

APPENDIX C

Status of 2012 Mitigation Action Strategies

2012 Mitigation Action Strategies Status Update

#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
1	2012	Coordinate with Comanche County in the development and maintenance of spatial data for building footprints and critical facilities to ensure City databases are accurate.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	GIS	Internal City Funds	2013	Obtain reliable financial data for each facility (historical damage data, building and content values, primary use) for use in HIRA update.	H	Lawton GIS receives information except for financial data from Comanche County on buildings.
2	2012	Develop an all-hazards brochure to display and distribute at public events.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2012	Develop draft brochure by March 2012 for Lawton's Home Show	H	Complete 2014. Stormwater Management developed brochure that is distributed at public events. It is on display at City Hall and Stormwater Office.
3	2012	Upgrade the City website to include all-hazards preparedness information.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Information Technology	Internal City Funds	2012	Hire a Public Relations person for the City	H	Complete 2014. City did not hire Public Relations employee but task was completed by IT Division. http://www.cityof.lawton.ok.us/alerts.htm
4	2012	Investigate the update cycle of the County/City's Emergency Operations Plan, ensure that it is current, and coordinate it with the Hazard Mitigation Plan's Hazard Identification and Risk Assessment.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works	Department of Homeland Security Grants	2012	Contact the person responsible for maintaining the EOP at the County by March 2012.	H	Complete 2014. Clint Wagstaff provided information regarding the EOP.
5	2012	Broaden the participation of the Mitigation Steering Committee to include other City representatives and partner organizations. Educate them on the importance of their participation in the plan updates and other periphery endeavors.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	City Manager & Public Works	Internal City Funds	2012	Schedule an informational meeting and invite all department heads to educate them on the purpose of the EMAC and who in their organizations should participate.	H	Complete 2014. A PowerPoint presentation was given to Department Directors during the October staff meeting. Directors were encouraged to participate in steering committee meetings and annual reviews.
6	2012	Participate in lobbying efforts to encourage City officials to gain access to the County's current and timely records.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	City Manager, Mayor	Internal City Funds	2012	Identify appropriate personnel to lobby, and who internally should be lobbying.	M	Ongoing.
7	2012	Identify new tools to educate the public on the hazards at most risk to the community, to include all social media outlets.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Information Technology	Internal City Funds	Continuous	Determine the best method (e.g., newspaper, electronic media) to reach all intended audiences, to help direct research/identification efforts. This may include conducting a public survey.	M	Ongoing. Stormwater Management performed survey on how residents receive communications. Facebook has been added as a tool to educate the public on hazards.

#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
8	2012	Build upon the City's Emergency Reserve Fund by increasing the deposits into the fund by 5% each year.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	City Manager - Mayor	Internal City Funds	Yearly	Determine potential budget items that may be able to withstand a temporary cutback.	M	Ongoing. By ordinance an 5% increase in the Emergency Reserve Fund is budgeted.
9	2012	Maintain dedicated easements and restrict construction in those easements.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works, AEP/PSO & Centerpoint Energy	Internal City Funds	Continuous	Develop a maintenance schedule by 2014.	M	Complete 2014. Easements and restricted construction in those easements is being maintained.
10	2012	Enforce the City's floodplain ordinance; more specifically, prohibit critical structures from being built in the 500-year floodplain.							x						x			Public Works	Internal City Funds	Continuous	Refine enforcement requirements as needed.	H	Ongoing. Floodplain ordinances are being enforced.
11	2012	Acquire, relocate, or demolish RL/SRL properties by at least 2 properties in the next 5 years.							x						x			Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2017	Determine RL/SRL properties to acquire.	H	Ongoing. Potential properties are under review. 3 structures have been identified. Grant application submitted to acquire properties.
12	2012	Compliant with the new, soon-to-be- released 2012 CRS standards, the City will develop a detailed and compliant plan to reduce the City's CRS rating from 6 to 5 by 2012. Details of the City 's approach will be included in the next amendment of this plan or as soon as the new standards have been released.							x						x			Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2012	Develop a compliant and detailed approach utilizing the criteria in the soon to be released 2012 Updated CRS Standards.	M	Complete. Lawton's CRS program was reviewed May 2015 by the Regional Flood Specialist, ISO Community Hazard Mitigation Specialist for compliance with the 2012 standards. Lawton maintained CRS rating
13	2012	Maintain a supply of spill prevention/cleanup materials.						x										Fire Department	Department of Homeland Security Grants	2015	Determine items to acquire by 2013.	H	Ongoing. The Fire Department maintains supplies for spill prevention/cleanup. Supplies are replenished as needed. Funded through the supply cost recovery ordinance.
14	2012	Update the two Emergency Action Plans for Lake Ellsworth and Lake Lawtonka by 2013. Secure dam breach studies for Lake Ellsworth, Lake Lawtonka and Lake George.													x			Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2014	Develop a working group, or identify responsible parties, to conduct the updates by 2012.	M	Complete 2014. Dam breach studies performed. EAP's have been updated.
15	2012	Communicate earthquake preparedness, to include insurance coverage, to citizens via Public Service Announcements and social media outlets.															x	Information Technology	FEMA Unified Hazard Mitigation Assistance Grants	2013	Upgrade the City website to include all-hazards preparedness information by June 2012	L	Complete 2014. Information about earthquake preparedness has been added to City website. Facebook is used to educate the public about hazard preparedness.

16	2012	Pursue measures to secure, document, and maintain better hazard data (i.e. GIS data). This might include critical infrastructure attributes and mapping, dam inundation studies, geographic and historical accounts for flooding, expansive soils, wind, hail and lighting, drought, wildfire, winter storm, dam failure, landslide and sinkholes.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Information Technology & Public Works	Internal City Funds	2015	Develop planning process to document and maintain all new development and occurrence of natural hazard events. Identify parties responsible for implementation.	M	Ongoing. Information added to GIS as events occur. 2015 flood damage information was added to the database.
#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
17	2012	Determine feasibility of developing a Drought Preparedness and Response Plan.					x											Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2012	Review hazard data and evaluate available resources.	M	Ongoing. Water restrictions updated by Ordinance 15-04 on 3/24/1. LCC 22-2-218 Garver Engineering was hired to perform a study on alternative water sources. Preliminary report was submitted in September 2015.
18	2012	Coordinate with the County to develop a Community Wildfire Protection Plan, focusing on wildland-urban interface.										x						Fire Department	FEMA Unified Hazard Mitigation Assistance Grants	2014	Assign responsibilities and develop an outline of the contents. Determine information gathering needs and outside agencies to be included in the planning process.	H	Complete. Lawton Fire Department has a mutual aid agreement with the county to respond to wildfires.
19	2012	Limit development in areas of steep slope.								x								Community Services	Internal City Funds	Continuous	Identify all areas of steep slope within the City.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
20	2012	Evaluate the need to retrofit existing cell towers that are not built to current wind code.											x					Community Services	Internal City Funds	2013	Determine requirements for retrofitting.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
21	2012	Distribute 100 NOAA weather radios to residents that are most vulnerable to hazard events. Determine which facilities currently have radios and feasibility of hard-wiring. Further instigate Storm Ready programs.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Emergency Management	FEMA Hazard Mitigation Assistance Grants & Internal Funds	2015	Identify vulnerable areas for intended distribution and identify funding sources and submit grant application.	H	Complete 2014. Vulnerable areas were identified. 100 NOAA radios were distributed to residents within floodprone areas on a first come-first served basis.
22	2012	Seek support for a statewide insurance program to cover hail damage to property and vehicles.	x															City Manager, Mayor	Internal City Funds	2014	Determine data collection needs in order to assess vulnerability.	M	Ongoing. Bill Phelps lobbies on behalf of the City on statewide issues.

#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
23	2012	Evaluate glass windows in critical facilities and switch to tempered glass where appropriate.	x															Community Services	Internal City Funds	2014	Prioritize critical facilities list based upon hazard vulnerability and evaluate highest ranking structures first.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
24	2012	Promote retrofitting of wiring all pre-building code structures; promote upgrade of wiring to Ground Fault Circuit Interrupter.				x												Community Services	Internal City Funds	Continuous	Compile a list of critical facilities to be retrofitted and determine estimated costs to update to GFCI.	M	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
25	2012	Determine if current building code design snow load requirements are sufficient or if requirements should be more stringent.												x				Community Services	Internal City Funds	2013	Conduct research to determine appropriate design requirements.	H	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
26	2012	Ensure that NRCS soil survey maps are overlayed to City of Lawton zoning regulations (i.e. maps) to ensure that new structures in areas with shrink/swell soils have appropriate foundation systems.			x													Community Services	FEMA Unified Hazard Mitigation Assistance Grants	2015	Obtain soil survey data and assign responsibilities.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
27	2012	Limit development in sink hole prone areas. Consider developing "sink hole conservation zones."														x		Public Works	Internal City Funds	Continuous	Assess current Karst data and existing zoning requirements, as well as development trends.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
28	2012	Establish cooling centers to shelter at-risk populations.		x														Emergency Management	Internal City Funds	2013	Gather list of current shelter facilities and establish their utilization as a cooling center.	M	N/A - At this time, the City does not operate public shelters.
29	2012	Consider retrofit options or changes (strengthening) to building code in earthquake hazard areas.															x	Community Services	Internal City Funds	2015	Determine areas vulnerable to earthquakes and evaluate existing building codes.	L	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
30	2004	Hazard Mitigation public education program.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works & American Red Cross	FEMA Unified Hazard Mitigation Assistance Grants	Continuous	Develop a work plan that identifies how best to reach the intended audience by 2012.	M	Ongoing. Program for Public Information has been developed and will be reviewed/revised annually.

#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
31	2004	Retrofit the Emergency Operations Center and other public critical facilities.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works	Department of Homeland Security Grants	2017	Identify critical facilities to retrofit and determine what parts of the buildings to retrofit by 2012.	M	Ongoing.
32	2004	Continue / codify stronger foundation construction practices.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	Public Works/ Community Services	Internal City Funds	Continuous	Identify existing construction manuals, or guidance, and educate builders on the resources they can use when constructing foundations.	M	Ongoing. No action needed at this time. Compliant with regulation under current adopted code.
33	2004	Evaluate and upgrade existing outside siren warning system	x	x	x	x	x	x	x	x	x	x	x	x	x		x	Public Works	FEMA Unified Hazard Mitigation Assistance Grants	Continuous	Evaluate need and prioritize needed improvements.	M	Ongoing. Warning systems are being evaluated.
34	2004	**Replace low water crossings.**							x						x			Public Works	FEMA Unified Hazard Mitigation Assistance Grants	2017	Develop a prioritized list of low water crossing roads to replace by 2013.	L	Ongoing. Low water crossings locations are being evaluated.
35	2004	Inspect key roads and bridges after an event.						x	x						x			Public Works	Internal City Funds	Continually, as needed	Develop, or finalize, an inspection checklist by January 2013	L	Ongoing. Checklists have been developed. Roads and bridges are inspected after emergency events.
36	2004	**Meadowbrook Creek Flood Control Project Area**							x						x			Public Works	Internal City Funds	2017	Develop a list of projects to be completed in the area and schedule construction based on priority	L	Ongoing. List of projects is being developed and prioritized.
37	2004	Replace SW 52nd St. Bridge over Wolf Creek Tributary (Area #22)							x						x			Public Works	Internal City Funds	2017	Evaluate the structure and prioritize its reconstruction	L	Ongoing. List of projects is being developed and prioritized.
38	2004	**Replace Santa Fe Bridge on NW 41st St (Area #5)**							x						x			**Public Works**	**Internal City Funds**	**2013**	**Oversee project construction**	L	**Complete. Santa Fe Bridge on NW 41st St was replaced in 2013.**

#	Year	Project Description	Hail	Extreme Heat	Expansive Soils	Lightning	Drought	Haz Mat	Flood	Landslide	Tornado	Wildfire	High Wind	Winter Storm	Dam Failure	Sinkhole	Earthquake	Lead & Support Agency	Funding Source	Target Completion Date	Interim Measure of Success	Priority	Status
39	2004	Design Greer Addition Drainage (NW 35th & Arlington) (Area #3)							x						x			Public Works	Internal City Funds	2013	Identify key staffing and aspects of the design	L	Complete 2017.
40	2004	Design Greer Addition Drainage (NW 31st to NW 25th) (Area #4)							x						x			Public Works	Internal City Funds	2013	Identify key staffing and aspects of the design	L	Complete 2017.
41	2004	Legion Addition Channelization (Area #17)							x						x			Public Works	General Fund	2014	Identify key staffing and aspects of the design	L	Complete 2015
42	2004	Spread sand /salt mixture on iced roadways.												x				Public Works	Internal City Funds	Continually, as needed	Ensure budget item included in DPW annual budget for sand/salting.	L	Ongoing. Sand/salting is budgeted for and applied as needed.
44	2004	Maintain the current HazMat Response Team						x										Fire Department	Internal City Funds	Continuous	Develop a target capabilities checklist by January 2013	H	Ongoing. Annual refresher training provided to all technicians. Standard Operating Guidelines for emergency deployment of personnel has been completed and is in place.
45	2004	Establish a regional HazMat Response Team						x										Fire Department	Internal City Funds	Continuous	Coordinate with other jurisdictions to determine their current capabilities	L	Completed. Response team established in 2006.
46	2004	Work with Comanche County and Fort Sill on vegetation control					x			x		x						Fire Department	Internal City Funds	Continuous	Respond to requests for resources as appropriate	L	Ongoing. Lawton Fire Department has a control burn mutual aid agreement with Fort Sill for vegetation control.
47	2004	Evacuate persons whose homes are in danger						x	x	x	x	x	x	x	x	x	x	Police Department	Internal City Funds	Continuous	Identify critical points at which the decision to evacuate should occur	H	Ongoing. Evacuations are made according to standard operating procedures.

APPENDIX D

Committee Meetings & Public Involvement Materials

AGENDA
City of Lawton All Hazard Mitigation Plan Review

January 9, 2018

9:30 A.M.

City Hall 3rd Floor Conference Room

212 SW 9th Street
Lawton, OK 73501

1. WELCOME & INTRODUCTION OF HAZARD MITIGATION PLAN
2. CONFIRM PLANNING COMMITTEE MEMBERS & RESPONSIBILITIES
3. DETERMINE PLANNING AREA
4. ESTABLISH PLAN PURPOSE
5. REVIEW CURRENT MITIGATION PLAN
6. REFINE PLAN SCOPE AND SCHEDULE
7. DEVELOP OUTREACH STRATEGY
8. ADJORN

x

AGENDA MINUTES

City of Lawton All Hazard Mitigation Plan Review

January 9, 2018
9:30 A.M.

City Hall 3rd Floor Conference Room
212 SW 9th Street

Lawton, OK 73501

Members:

Jerry Ihler, City Manager

Dewayne Burk, Fire Chief

Rusty Whisenhunt, Utilities Director

Larry Wolcott, Public Works Director

Cynthia Williams, Stormwater Manager

Michael Merrit, Emergency Manager

Chloe Lewis, Assistant Emergency Manager

1. WELCOME & INTRODUCTION OF HAZARD MITIGATION PLAN (Larry Wolcott, LW)
   - Plan serves as the roadmap to mitigation of natural disasters in the City of Lawton for a five year cycle (20017-2022). The plan is required to be eligible to apply for and receive federal funding to implement mitigation measures. Funding is made available through the HMGP and pre-disaster mitigation grant program.
   - 2012 AHMP was prepared by the City's consultant, Dewberry. Public Works will be updating the current plan and aligning with template provided by Oklahoma Emergency Management.
   - The EMAC provides oversight and input into the development and maintenance of the plan.

2. CONFIRM PLANNING COMMITTEE MEMBERS & RESPONSIBILITIES (LW)
   - The Planning Committee provides oversight and input into the development and maintenance of the hazard mitigation plan.
   - Representative from agencies involved in hazard mitigation activities, agencies with the authority to regulate development, and offices responsible for enforcing local ordinances are required members of the team.
   - It is essential for all members to attend and take an active role in the meetings.
   - Members will be asked to make decisions on the planning process and content, collect data, submit mitigation action implementation worksheets and review drafts.
   - Documentation of each member contribution to the planning effort will be recorded.
   - Who is missing from this group? (Jerry Ihler, JI) Member list presented.
   - Do any additional members need to be added to the committee? Unanimous "No"

3. DETERMINE PLANNING AREA (LW)

- The planning area refers to the geographic area covered by the plan. Generally, the planning area follows local government jurisdictional boundaries.
- What lessons were learned from the previous planning process?
  - The approval process is very long. (Michael Merritt, MM)
  - It is hard to get public participation. (Cynthia Williams, CW)
  - The current plan is very lengthy. (Dewayne Burk, DB)
- Were the community's mitigation planning needs met by the previous planning effort? Unanimous "yes"
- Would Lawton benefit from adjusting the planning area?
  - Previous plan did not clearly state the planning area. It is suggested to add wording that states the planning area refers to area within City of Lawton jurisdictional boundaries. (LW)
  - The plan should cover City owned properties outside city limits/ corporate boundaries. (JI)
- Confirm boundaries on jurisdictional map.

4. ESTABLISH PLAN PURPOSE (LW)
   - Current plan list the Lawton Hazard Mitigation Plan as the City's roadmap to mitigation and preparedness over the next five year planning cycle. It defined the revised comprehensive city-wide mitigation strategy and provided a detailed action plan for its accomplishment.
   - Is this consistent with committee's purpose of the plan or should the wording be revised? Unanimous "Current wording is still valid."
   - Consider adding "Completion of these strategies will help to protect life and property in the City of Lawton. The plan symbolizes the continued commitment and dedication of the City to enhancing the safety of its residents and businesses by taking action before a disaster strikes. The City strives to minimize the disruption and devastation that accompanies disasters." All in agreement

5. REVIEW CURRENT MITIGATION PLAN (LW)
   - The current plan is very lengthy.
   - The plan is on the City's website. Cynthia will send a link to everyone.
   - Suggest revising the plan and aligning with OEM's template

6. REFINE PLAN SCOPE AND SCHEDULE (LW)
   - Limiting the loss of life and property and the associated costs from natural and man-made hazards through cost effective recommendation of publicly accepted, prioritized and multi-objective actions.
   - Are any changes required? Unanimous "No changes to scope needed"
   - The current plan has expired. Review and adoption of an updated plan should be completed as soon as possible.

7. DEVELOP OUTREACH STRATEGY (LW)
   - Stakeholder's and the public's input is needed during the plan process update.
   - A stakeholder is any person, group, or institution that can affect or be affected by a course of action. Involving stakeholders in the planning process helps to develop support for the plan and identify barriers to implementation. At a minimum, the stakeholders that must be included in the planning process are neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests. Unlike planning team members, stakeholders need not be involved in all stages of the planning process, but may inform the planning team on a specific topic or provide input from different points of view in the community. Lawton must also invite stakeholder participation from neighboring communities that are not part of the planning area and participating jurisdictions. These may be adjacent counties and municipalities, such as those that are affected by similar threat or hazard events or may be partners in mitigation and response activities.
   - See list of Stakeholders. Do any additional stakeholders need to be added? Unanimous "No"

- What input is needed from stakeholders?
  - Their concerns of natural disaster vulnerability. (CW)
  - Knowledge of historic events. (DB)
  - What type of emergency plans and capabilities they have and what assistance they might need from the City. (MM)
- What input do you want from the public?
  - Gather information on activities they think will reduce the risk of injury or property damage. (CW)
  - How prepared they feel for a natural disaster. (CW)
  - What types of disasters are they most concerned about. (DB)
  - What type of damage have they experienced. (JI)
- How can stakeholders and the public contribute to the development of the capability review, risk assessment, and mitigation strategy? Need to have a way for them to express their ideas. (DB)
- What are appropriate outreach methods? A variety of informational materials and methods, such as news media, social media, fliers, surveys, and websites, are useful for reaching out to the public during the planning process. Consider messages for Twitter and content for sharing on Facebook. Public involvement activities should include methods designed to improve public awareness by presenting information (one-way communication), as well as to solicit input to inform the plan's content (two-way communication). (CW)
- Develop clear and consistent messages that align with community values

8. ADJOURNMENT (LW)
   - Next Meeting February 13, 2018 at 9:30am

AHMP Planning Meeting
January 9, 2018
9:30am
City Hall Conference Room

City of Lawton
All Hazard Mitigation Plan

Attendance / Signature	Last Name	First Name	Representing	Phone #	E-mail
Dewayne Buck	Buck	Dewayne	Lawton Fire	704-3060	dbuck@lawtonok.gov
	Wolcott	Larry	Public Works	581-3410	Lwolcott@lawtonok.com
	whisenhunt	Rusty	Field Activities	581-3482	Rwhisenhunt@Lawtonok.Gov
	Ihler	Jerry	City Manager's	581-3301	jihler@lawtonok.gov
				355-0535	emr@comanchecounty.us
Michael Merritt	Merritt	Michael	CCEM	↓	↓
Chloe Lewis	Lewis	Chloe	CCEM	355-0535	cc-em@cableone.net
			Lawton Fire	581-3433	Dsmith@lawtonok.gov

AGENDA
City of Lawton All Hazard Mitigation Plan Review

February 13, 2018

9:30 A.M.

City Hall 3rd Floor Conference Room

212 SW 9th Street

Lawton, OK 73501

1. HOW TO EVALUATE FEEDBACK FROM OUTREACH ACTIVITIES
2. REVIEW COMMUNITY CAPABILITIES
3. CONDUCT RISK ASSESSMENT
4. ADJORN

AGENDA MINUTES
City of Lawton All Hazard Mitigation Plan Review

February 13, 2018
9:30 A.M.

City Hall 3rd Floor Conference Room
212 SW 9th Street

Lawton, OK 73501

Members:

Jerry Ihler, City Manager

Bart Hadley, Assistant City Manager

Richard Rogalski, Planning Director

Rusty Whisenhunt, Utilities Director

Larry Wolcott, Public Works Director

Cynthia Williams, Stormwater Manager

Craig Akard, Fire Representative

9. HOW TO EVALUATE FEEDBACK FROM OUTREACH ACTIVITIES (Larry Wolcott, LW)
   - A process for organizing and evaluating the documents received as well as documenting them in the plan needs to be developed. Suggested to have a series of public meetings where participants can review the current plan, ask questions and complete hazard surveys.
   - Lawton could also utilize local media, post information on website and keep copies of plan in library.

10. REVIEW COMMUNITY CAPABILITIES (LW)
   - The plan must describe each jurisdiction's existing authorities, policies, programs, and resources available to accomplish hazard mitigation.
   - To review capabilities, begin by reviewing existing plans, reports, and information and interviewing local departments and agencies to gain a better understanding of relevant programs, regulations, resources, and practices.
   - Cynthia will resend the capability worksheets. They should be completed and returned by 2/23/18.

11. CONDUCT RISK ASSESSMENT (LW)
   - Multiple hazards could affect Lawton
   - The hazard summary sheet will help analyze risks and categorize them as low, medium or high.
   - Cynthia will resend the hazard worksheets. They should be completed and returned by 2/23/18

12. ADJOURNMENT (LW)
   - Next Meeting March 13, 2018 at 9:30am

AHMP Planning Meeting
February 13, 2018
9:30am
City Hall Conference Room

City of Lawton
All Hazard Mitigation Plan

Attendance / Signature	Last Name	First Name	Representing	Phone #	E-mail
	Fitch	Fred	Mayor	581-3279	ffitch@lawtonok.gov
	Ihler	Jerry	City Manager	581-3301	jihler@lawtonok.gov
	Hadley	Earl	City Manager	581-3301	bradley@lawtonok.gov
	Burk	Dewayne	Fire	704-3060	dburk@lawtonok.gov
	Smith	James	Police	581-3201	jsmith@lawtonok.gov
	Wolcott	Larry	Public Works	581 3410	lwolcott@lawtonok.gov
	Rogalski	Richard	Planning	581 3375	rrogalski@lawtonok.gov
	Jabbar	Afsaneh	Water/Wastewater	581 3410	ajabbar@lawtonok.gov
	Whisenhunt	Rusty	Utilities	581-3405	rwhisenhunt@lawtonok.gov
	Williams	Cynthia	Stormwater Management	581-3478	cywilliams@lawtonok.gov
	Merritt	Michael	Lawton/County Emergency Management	355-0535	em@comanchecounty.us

AGENDA
City of Lawton All Hazard Mitigation Plan Public Meeting

March 13, 2018

10:30 A.M.

City Hall Banquet Room

212 SW 9th Street

Lawton, OK 73501

1. INTRODUCTION OF CURRENT MITIGATION PLAN
2. OPEN FLOOR FOR QUESTIONS AND ANSWERS
3. PUBLIC SURVEY
4. ADJORN

MINUTES
City of Lawton All Hazard Mitigation Plan Public Meeting

March 13, 2018

10:30 A.M.

City Hall Banquet Room

212 SW 9th Street

Lawton, OK 73501

13. INTRODUCTION OF CURRENT MITIGATION PLAN (Larry Wolcott, LW)

- Electronic and paper copies of the current plan are available for review.

14. OPEN FLOOR FOR QUESTIONS AND ANSWERS

- Bonnie Blackburn – Her biggest concern is flooding. She feels that the intensity and frequency continues to increase. Her property located along I Ave. has flooded numerous times. In 2016 the water entered the main house which it had not done before. She is aware of Lawton's Property Acquisition Program and has registered her property. She is also knows that elevating the structures is an option but is not interested in pursuing it. She would like the City to consider flood walls and barriers to help mitigate the water in this area. She also wants to ensure that the drainage ways and inlets are clear.
- Fred Fitch – He is also concerned about flooding. He has lived on the East and West sides of town and has experienced flooding. Citizen was not aware that Numu creek was underground along I Ave. from 9th to 2th Street.
- Michael Merritt – He also stated that flooding is a concern and believes that it has increased within the past 5 years. He stated that he thinks it is partly due to the lack of programs that they had in the past such as ASCOG that did cost sharing for cleaning debris from the creeks.

15. PUBLIC SURVEY

- No surveys were submitted during the meeting

16. ADJORN

AHMP Public Meeting March 13, 2018 10:30am City Hall Banquet Room	City of Lawton All Hazard Mitigation Plan	

Attendance / Signature	Last Name	First Name	Address	Phone #	E-mail
Bonnie Black	BLACKBURN	Bonnie	407 SW I AVE, LAWTON OK 73501	214-710-3455	bjfrancis@sbcglobal.net
[illegible]	Merritt	Michael	315 SW 5th St Suite 101	580-357-0553	cmr@cityoflawtonok.us
[illegible]	[illegible]	[illegible]	2105 NE EVANS AVE	580-699-[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AGENDA
City of Lawton All Hazard Mitigation Plan Review

June 5, 2018

10:00 A.M.

City Hall Banquet Room

212 SW 9th Street

Lawton, OK 73501

1. WELCOME & INTRODUCTION OF HAZARD MITIGATION PLAN
2. RESPONSIBILITIES OF STAKEHOLDERS
3. REVIEW PLANNING AREA AND PLAN PURPOSE
4. REVIEW CURRENT MITIGATION ACTION ITEMS
5. GAIN INPUT FROM STAKEHOLDERS POINT OF VIEW
6. DEVELOP ADDITIONAL ACTION WITH STAKEHOLDERS
7. ADJORN

AGENDA MINUTES
City of Lawton All Hazard Mitigation Plan Review
STAKEHOLDERS MEETING
June 5, 2018
10:00 A.M.

City Hall Banquet Room
212 SW 9th Street

Lawton, OK 73501

Members:

Fred Fitch, Mayor

Jerry Ihler, City Manager

Dewayne Burk, Fire Chief

Richard Rogalski, Planning Director

Rusty Whisenhunt, Utilities Director

Afsaneh Jabbar, Director of Water/Wastewater

Larry Wolcott, Public Works Director

Cynthia Williams, Stormwater Manager

Ranon Adams, Fire Representative

Sierra Cantrell, Lawton Intern

Lynn Cordes, Lawton Public Schools

Ashleigh Hensch, Comanche Emergency Management

17. WELCOME & INTRODUCTION OF HAZARD MITIGATION PLAN (Larry Wolcott, LW)
    a. Plan serves as the roadmap to mitigation of natural disasters in the City of Lawton for a five year cycle (20017-2022). The plan is required to be eligible to apply for and receive federal funding to implement mitigation measures. Funding is made available through the HMGP and pre-disaster mitigation grant program.
    b. Revised list of hazards and ranking was given.
18. RESPONSIBILITIES OF STAKEHOLDERS (LW)
    - The Planning Committee provides oversight and input into the development and maintenance of the hazard mitigation plan.
    - It is essential for all members to attend and take an active role in the meetings.
    - Members will be asked to make decisions on the planning process and content, collect data, submit mitigation action implementation worksheets and review drafts.
    - Documentation of each member contribution to the planning effort will be recorded.
    - No additional stakeholders were identified
19. REVIEW PLANNING AREA AND PLAN PURPOSE (LW)

- The planning area follows local government jurisdictional boundaries.
- The plan will strive to help to protect life and property and minimize disruption and devastation that accompanies disasters.

20. REVIEW CURRENT MITIGATION ACTION ITEMS (LW)
    - Number 26 is a duplicate item
    - Revise wording on 13 and 23
21. GAIN INPUT FROM STAKEHOLDERS POINT OF VIEW (LW)
22. DEVELOP ADDITIONAL ACTION WITH STAKEHOLDERS (Lynn Cordes, LC)
    - Consider adding road closure road maps to website
    - Consider adding "trouble area" maps to website
    - Consider adding COL App for communications on an electronic citizen engagement system

23. ADJORN

AHMP Planning Meeting
June 5, 2018
10:00am
City Hall Banquet Room

City of Lawton
All Hazard Mitigation Plan

Attendance/Signature	Last Name	First Name	Representing	Phone #	E-mail
	Fitch	Fred	Mayor	581-3275	ffitch@lawtonok.gov
	Ihler	Jerry	City Manager	581-3301	jihler@lawtonok.gov
	Hadley	Bart	City Manager	581-3301	bhadley@lawtonok.gov
	Burk	Dewayne	Fire	704-3060	dburk@lawtonok.gov
	Smith	James	Police	581-3201	jsmith@lawtonok.gov
	Wolcott	Larry	Public Works	581-3410	lwolcott@lawtonok.gov
	Rogalski	Richard	Planning	581-3375	rrogalski@lawtonok.gov
	Jabbar	Afsaneh	Water/Wastewater	581-3410	ajabbar@lawtonok.gov
	Whisenhunt	Rusty	Utilities	581-3405	rwhisenhunt@lawtonok.gov
	Williams	Cynthia	Stormwater Management	581-3478	cywilliams@lawtonok.gov
	Merrill	Michael	Lawton/County Emergency Management	355-0535	em@comanchecounty.us

AHMP Planning Meeting
June 5, 2018
10:00am
City Hall Banquet Room

City of Lawton
All Hazard Mitigation Plan

Attendance / Signature	Last Name	First Name	Representing	Phone #	E-mail
	Fitch	Fred	Mayor	581-3279	ffitch@lawtonok.gov
	Ihler	Jerry	City Manager	581-3301	jihler@lawtonok.gov
	Hadley	Bart	City Manager	581-3301	bhadley@lawtonok.gov
	Burk	Dewayne	Fire	704-3000	dburk@lawtonok.gov
	Smith	James	Police	581-3201	jsmith@lawtonok.gov
	Wolcott	Larry	Public Works	581-3410	lwolcott@lawtonok.gov
	Rogalski	Richard	Planning	581-3375	rrogalski@lawtonok.gov
	Jabbar	Afsaneh	Water/Wastewater	581-3410	ajabbar@lawtonok.gov
	Whisenhunt	Rusty	Utilities	581-3405	rwhisenhunt@lawtonok.gov
	Williams	Cynthia	Stormwater Management	581-3478	cywilliams@lawtonok.gov
	Merritt	Michael	Lawton/County Emergency Management	355-0535	em@comanchecounty.us
	Kantner	Sheila	Lawton/Stormwater Engineer	581-3410	skantner@lawtonok.gov
	Cordes	Lynn	Lawton Public Schools	357-6900	lcordes@lawtonps.org
	Hensch	Ashleigh	Emergency Management	355-0535	ahensch@comanchecounty.us

AGENDA
City of Lawton All Hazard Mitigation Plan Public Meeting

July 24, 2018

10:00 A.M.

City Hall Banquet Room

212 SW 9th Street

Lawton, OK 73501

1. INTRODUCTION OF MITIGATION PLAN
2. OPEN FLOOR FOR QUESTIONS AND ANSWERS
3. ADJORN

MINUTES
City of Lawton All Hazard Mitigation Plan Public Meeting

July 24, 2018

10:00 A.M.

City Hall Banquet Room

212 SW 9th Street

Lawton, OK 73501

24. INTRODUCTION OF MITIGATION PLAN

- Electronic and paper copies of the draft were available for review

25. OPEN FLOOR FOR QUESTIONS AND ANSWERS

- City Manager's Office did not have comments for revisions
- Comanche County Emergency Management Office did not have any comments.

26. ADJORN

City of Lawton Hazard Mitigation Public Opinion Survey

Mitigation means fixing or lessening a hazard to minimize or remove the effects of that hazard on infrastructure, critical facilities and communities. Hazards in the current All-Hazard Mitigation Plan includes: Floods, lightning, Hail , Tordados, High Winds, Winter Storms, Extreme Heat, Wildfires, Drought, Dam Failure and Earthquakes.

The current All-Hazard Mitigation Plan is available for review at City Clerk's Office, Lawton Library and on website at www.lawtonok.gov.

Return survey to:

City of Lawton – Stormwater
212 SW 9th Street
Lawton, OK 73501
Email: cywilliams@lawtonok.gov

1. Which option best defines your role in the community
   (A.) Resident
   B. Business Operator
   C. Landowner
   D. Local Official
   E. Other (Please specify)

2. How concerned are you about your community as a whole being impacted by a natural disaster?
   (A.) Extremely Concerned
   B. Somewhat Concerned
   C. Not Concerned

3. Have you been impacted by a natural disaster in your community?
   (A.) Yes
   B. No

   If yes, please describe:

Flooding - Six or more events where property damage occurred

4. What hazards do you have in your local community? Please prioritized with a being the highest priority. Also list who you think should mitigate the local priorities.

A.	Flooding	City of Lawton
B.		
C.		
D.		
E.		

Additional Comments:

5. How vulnerable do you consider your home/business/organization to impacts of natural hazards?
   A. Not Vulnerable
   B. A Little Vulnerable
   (C.) Very Vulnerable

6. Have you taken any actions to make your home/business/organization more resistant to natural hazards?
   (A.) Yes
   B. No

   If yes, please describe:

Flood proofing materials on interior that dry out faster. Indoor / outdoor Smart sump pumping up 4 ft on walls, Styrofoam insulation up 4 ft, raised electrical outlets, ceramic tile vs carpet.

7. What is the most effective way for you to receive information about how to make your home/business/organization more resistant to natural hazards? Check all that apply.

- ☐ Local Newspaper
- ☐ Television
- ☐ Local Cable Access Channel
- ☐ Radio
- ☐ Information in Utility Bills
- ☐ Direct Mailings
- ☒ Email
- ☐ Town/City Website
- ☐ Town/City Meetings
- ☐ School Meetings and Messages
- ☐ Information at Local Library
- ☐ Roadside Message Boards
- ☐ Phone Info through "Code Red" Systems (where applicable)
- ☐ Social Media (Facebook, Twitter, etc.)

8. How do you generally receive warning regarding severe weather events? Check all that apply.

- ☒ Television
- ☐ Radio
- ☐ Phone Info through "Code Red" Systems (where applicable)
- ☐ NOAA Weather Radios
- ☒ Cell Phone Services/Apps
- ☐ Email
- ☒ Social Media (Facebook, Twitter, etc.)
- ☐ Cable TV System Alerts

APPENDIX E

Adoption Resolution

RESOLUTION NO. 19-67

A RESOLUTION APPROVING THE CITY OF LAWTON'S HAZARD MITIGATION PLAN.

WHEREAS, the City of Lawton and its citizens are subject to danger and damage from a wide range of natural and man-made hazards; and

WHEREAS, there is an overriding need for a comprehensive, coordinated plan to assess the vulnerability of the City and the measures that can be taken to reduce this vulnerability; and

WHEREAS, the Disaster Mitigation Act of 2000 mandates that communities must have an approved hazard mitigation plan to continue to be eligible for Hazard Mitigation Assistance Grant funding; and

WHEREAS, the City has prepared a Hazard Mitigation Plan as defined in 44 CFR Part 201.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of Lawton, Oklahoma that:

SECTION 1: The City of Lawton 2019 Hazard Mitigation Plan, made a part of this resolution, together with any and all graphic representations referenced in this Hazard Mitigation Plan are hereby approved.

PASSED and APPROVED by the Council of the City of Lawton, Oklahoma this 23rd day of July, 2019.

STANLEY BOOKER, MAYOR

ATTEST:

TRACI L. HUSHBECK, CITY CLERK

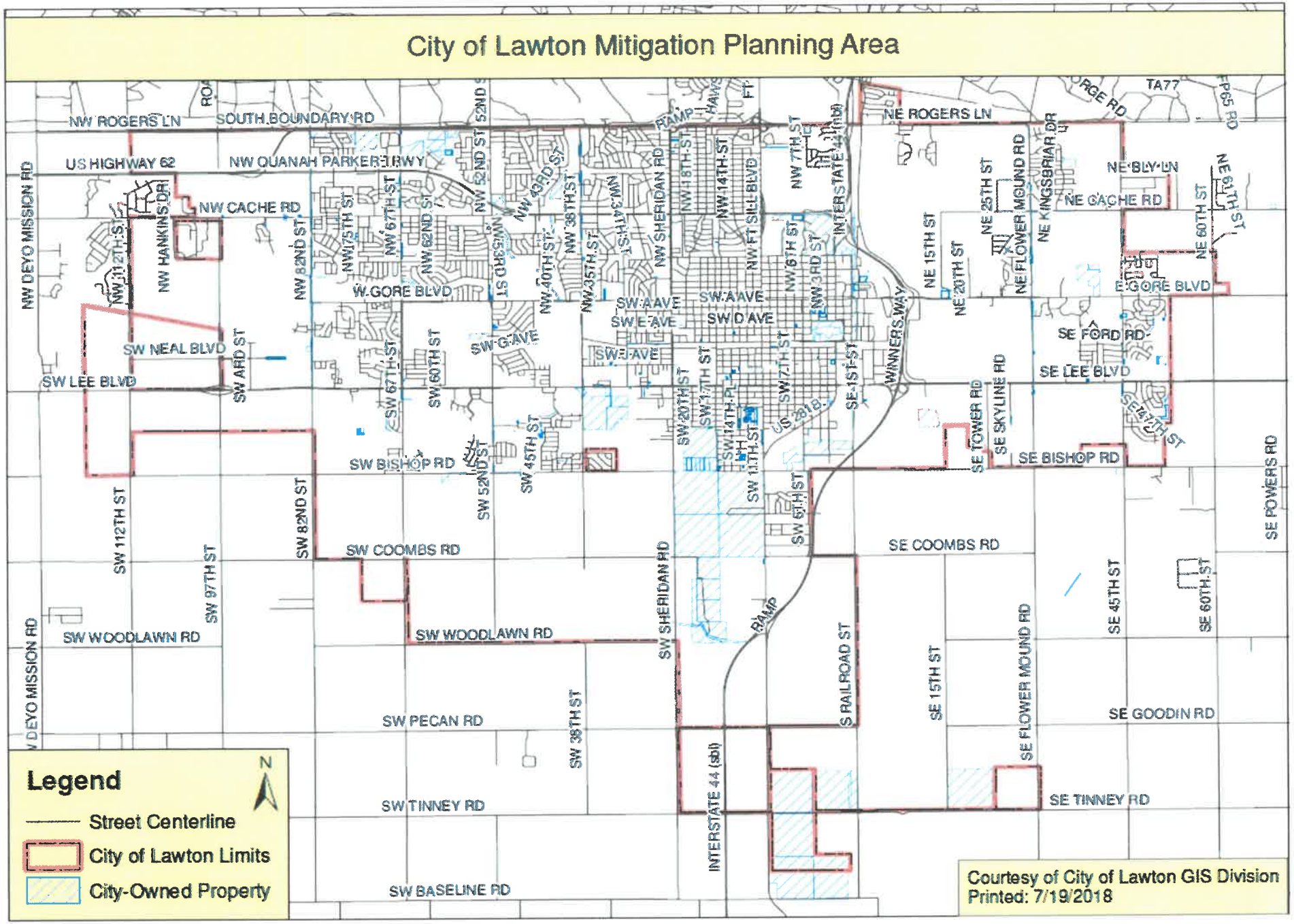
APPROVED as to form and legality this 9th day of July, 2019.

FRANK V. JENSEN, CITY ATTORNEY

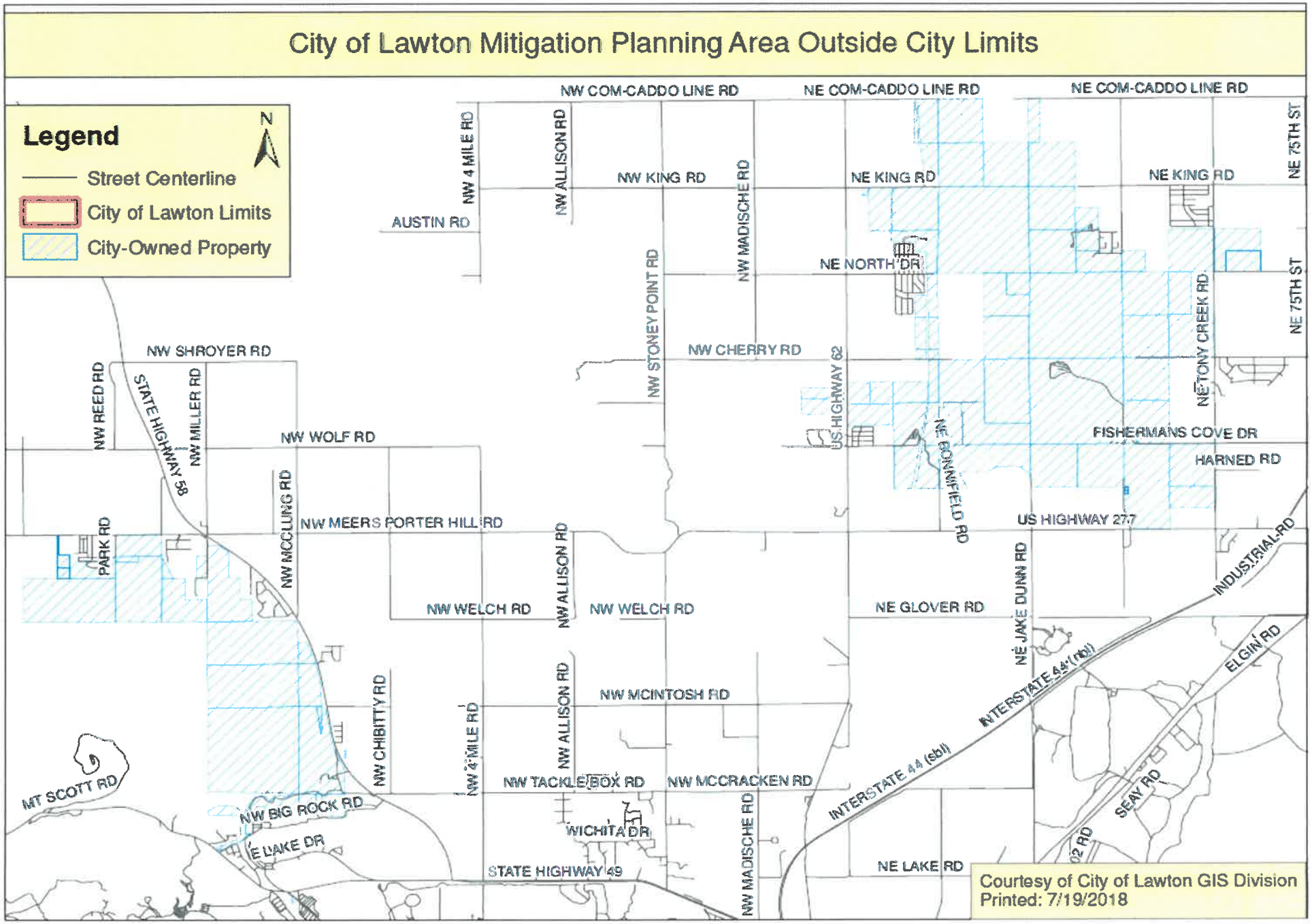
APPENDIX F

Lawton Jurisdictional Boundaries/ Planning Area

City of Lawton Mitigation Planning Area



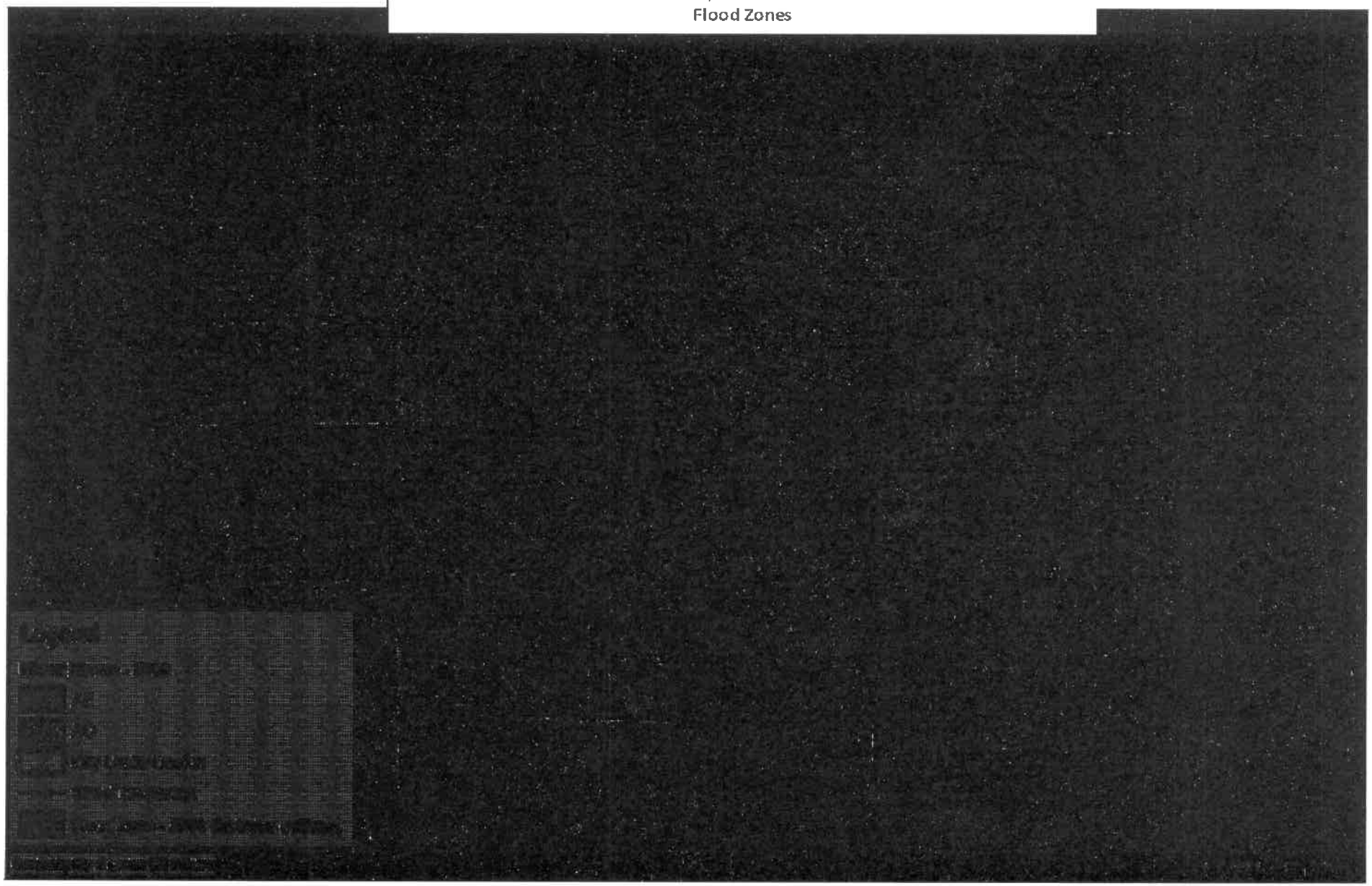
City of Lawton Mitigation Planning Area Outside City Limits



APPENDIX G

Lawton Flood Maps

City of Lawton
Flood Zones



Repetitive Loss Area:	Meadow Brook Addition
Cause of Flooding:	Overflow from Meadow Brook Creek
Number of Repetitive Loss Structures:	7
Number of Structures in Repetitive Loss Area:	49

Repetitive Loss Area:	Heinz Addition
Cause of Flooding:	Overflow from Wolf Creek
Number of Repetitive Loss Structures:	2
Number of Structures in Repetitive Loss Area:	62

Repetitive Loss Area:	West Highland Addition & Zorger Replat of Highland Park Addition
Cause of Flooding:	Overflow from Numu Creek
Number of Repetitive Loss Structures:	7
Number of Structures in Repetitive Loss Area:	91

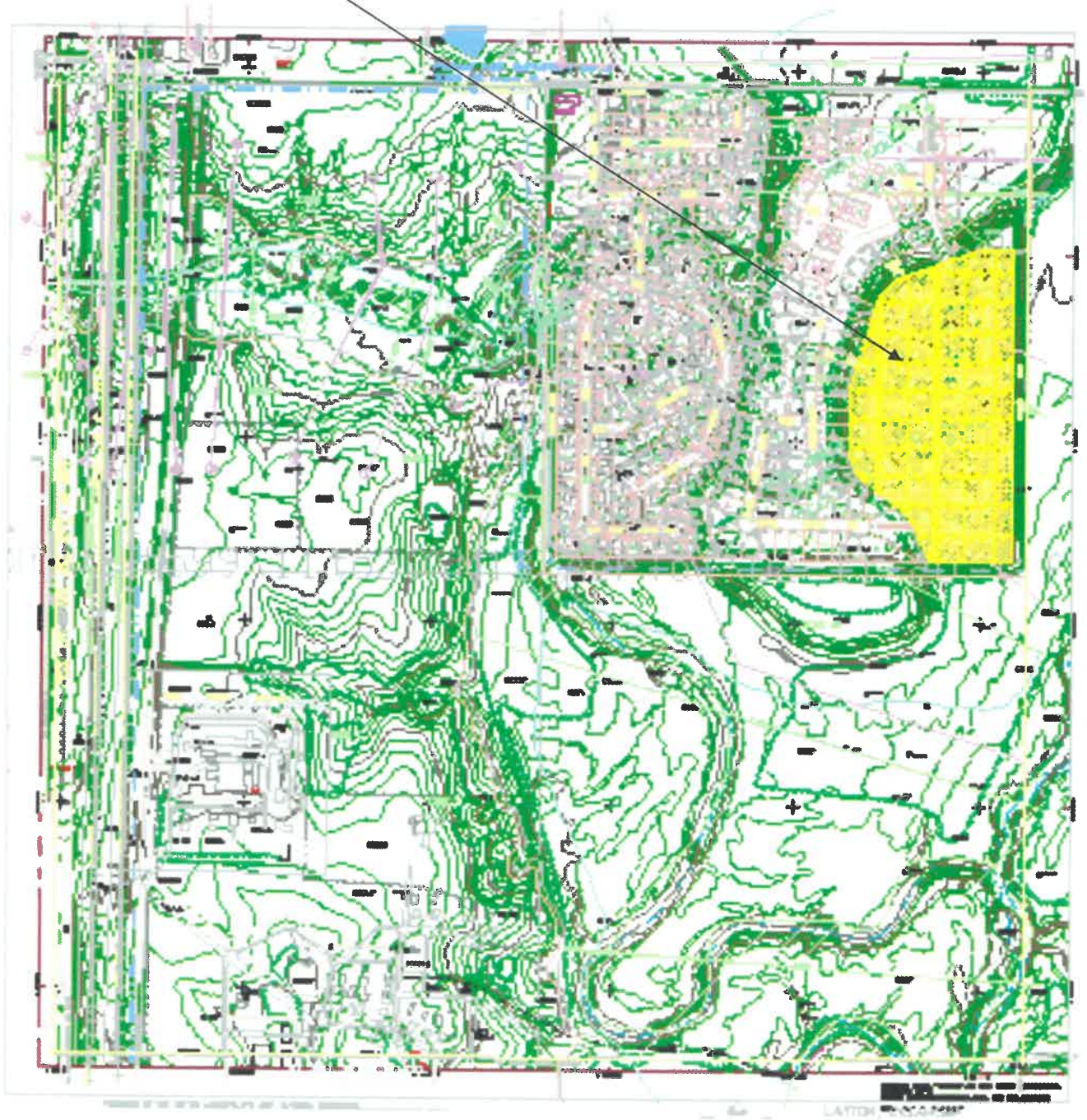
Repetitive Loss Area:	Garden Village Addition
Cause of Flooding:	Overflow from East Cache Creek
Number of Repetitive Loss Structures:	3
Number of Structures in Repetitive Loss Area:	81

Repetitive Loss Area:	Woods Addition
Cause of Flooding:	Overflow from Numu Creek
Number of Repetitive Loss Structures:	2
Number of Structures in Repetitive Loss Area:	2

Repetitive Loss Area:	Woodland Hills
Cause of Flooding:	Local Drainage
Number of Repetitive Loss Structures:	1
Number of Structures in Repetitive Area:	1

Repetitive Loss Area:	Sneed Acres
Cause of Flooding:	Local Drainage
Number of Repetitive Loss Structures:	1
Number of Structures in Repetitive Area:	1

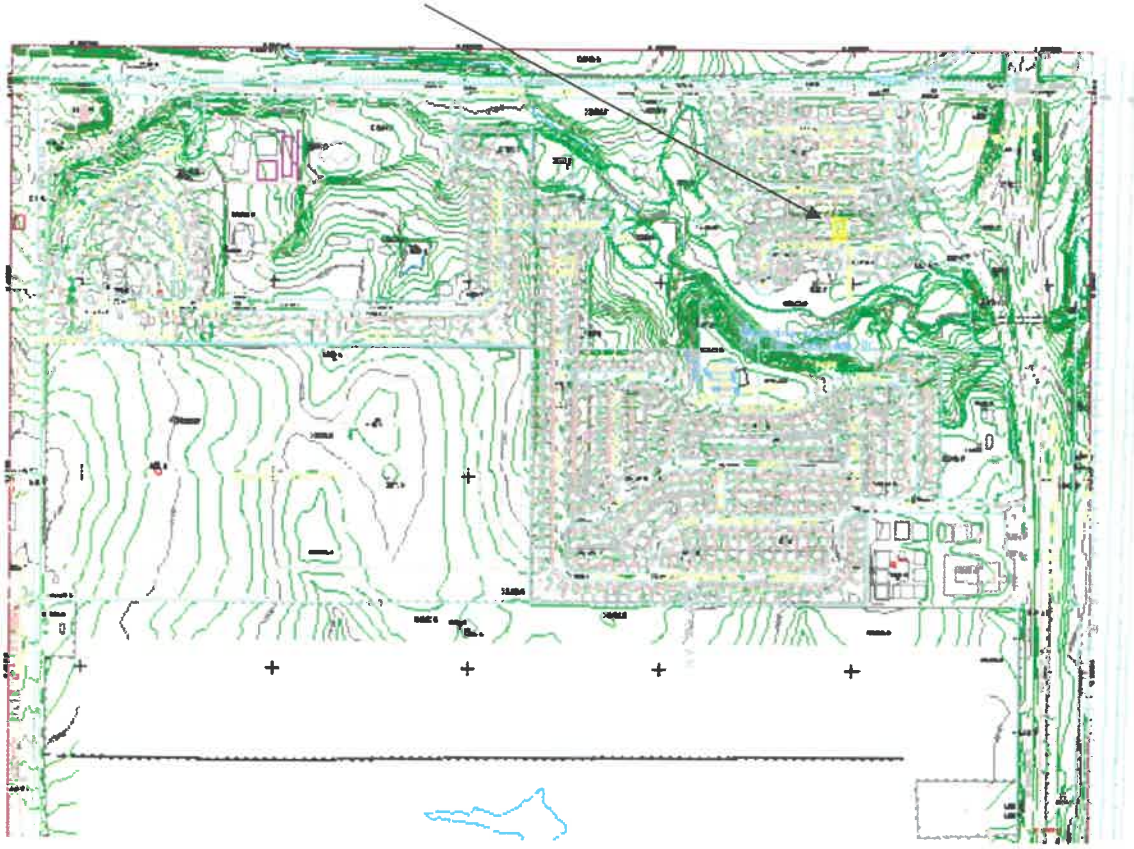
Garden Village RLS Area in yellow



MEADOWBROOK RLS AREA IN YELLOW

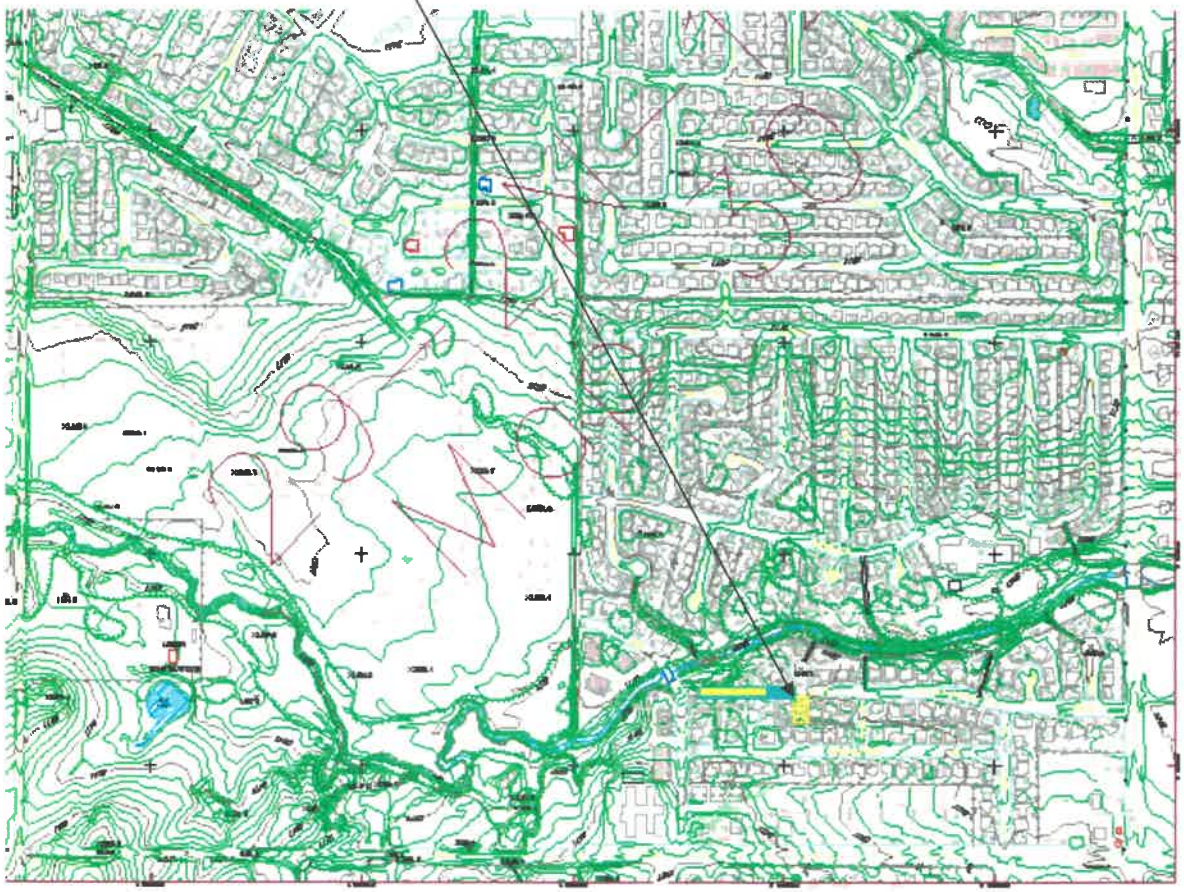
HEINZ RLS AREA IN YELLOW

SNEED ACRES RLS AREA IN YELLOW



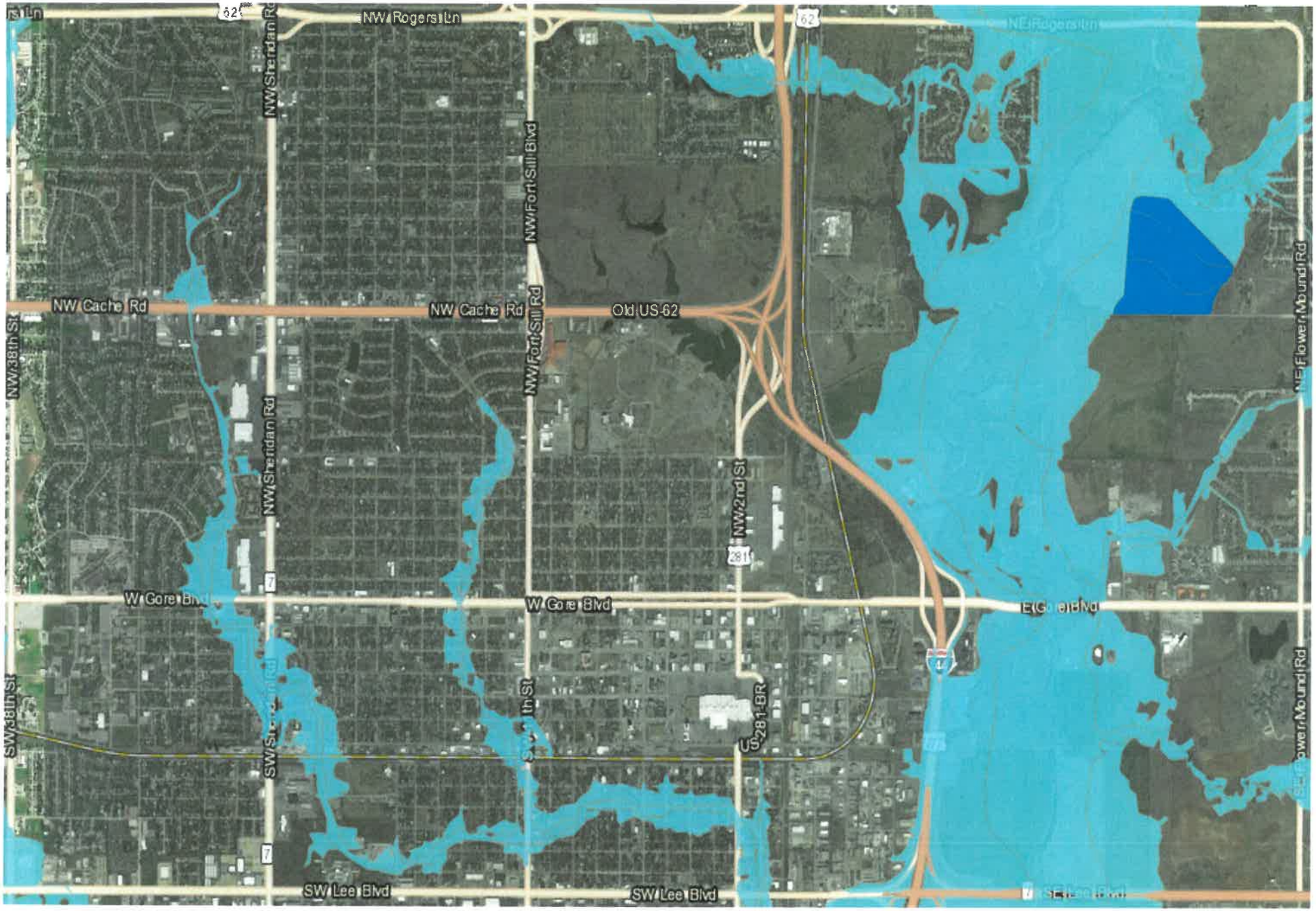
West Highland and Zorger Replat RLS area outlined in yellow

Woodland Hills RLS area in yellow



Woods RLS Area colored yellow

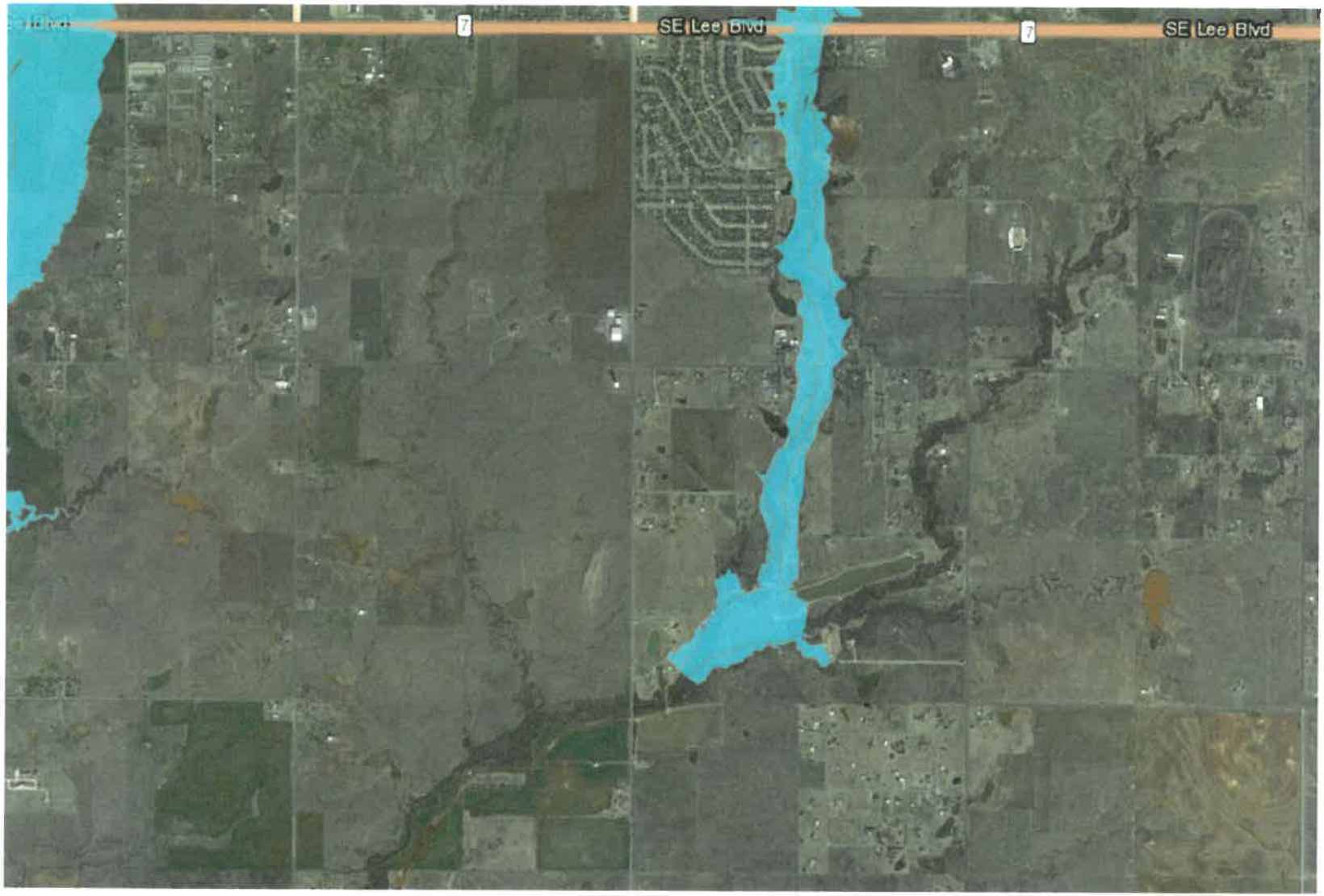
Cache Rd
SW 97th St
NW Goodyear Blvd
62
NW Rogers Ln
SW Lee Blvd
SW 82nd St
NW 82nd St
NW Cache Rd
NW Quanah Parker Trailway
SW 67th St
NW 67th St
W Gore Blvd
NW Quanah Parker Trailway
NW Cache Rd
SW 52nd St
NW 53rd St
NW 52nd St
W Gore Blvd
SW 38th St
NW 38th St
NW Rogers


NW Rogers Ln
NW Sheridan Rd
NW Fort Sill Blvd
NW Cache Rd
NW Cache Rd
Old US-62
NW 38th St
NW Sheridan Rd
NW Fort Sill Rd
NW 2nd St
NE Flower Mound Rd
W Gore Blvd
W Gore Blvd
SW 38th St
SW Lee Blvd
SW Lee Blvd
US-281-BR


SE Flower Mound Rd
NE Flower Mound Rd
E Gore Blvd
SE 45th St
SE Lee Blvd

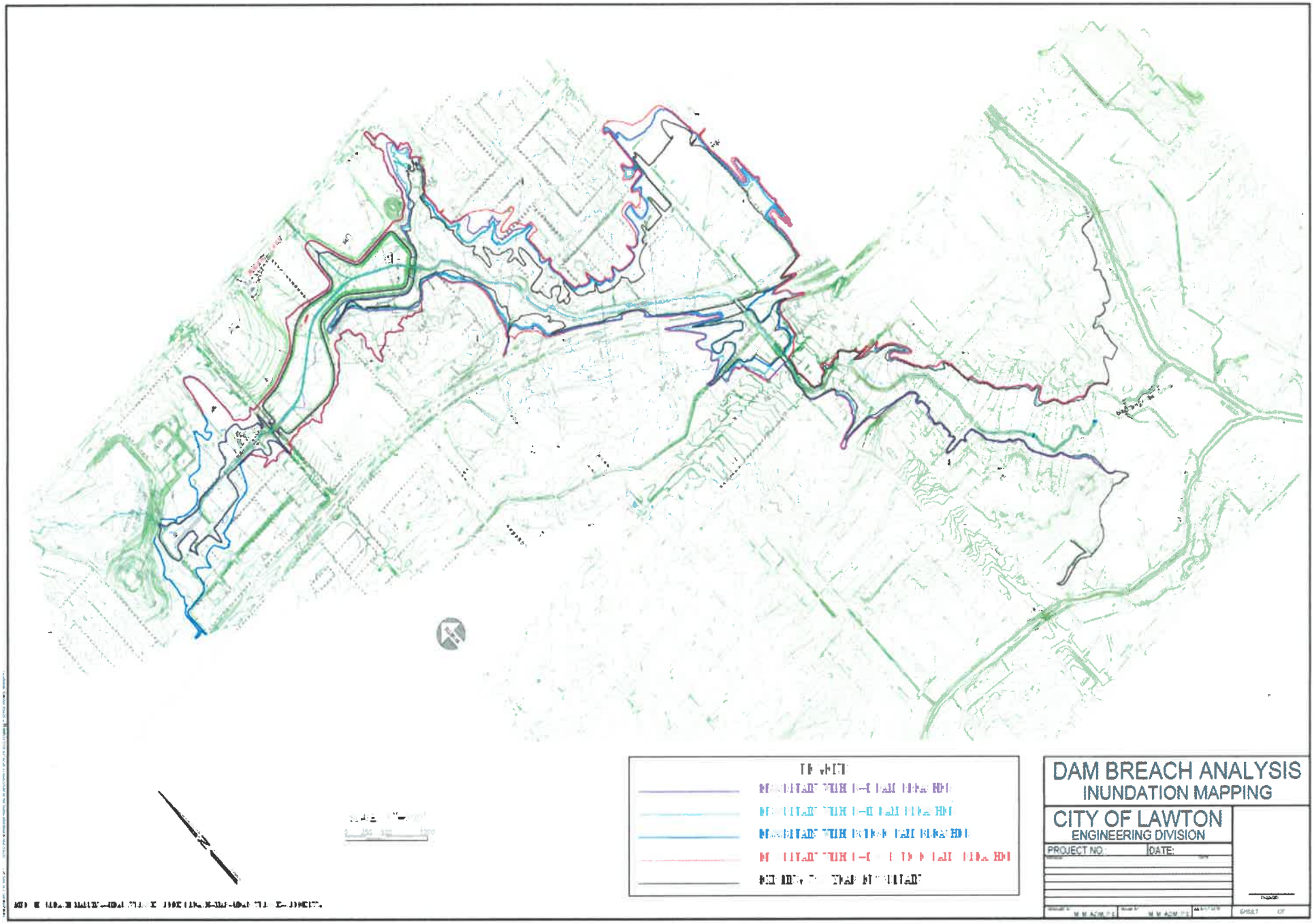
SW 82nd St
SW Bishop Rd
SW Lee Blvd
SW 67th St
SW 52nd St
SW Bishop Rd
SW Lee Blvd
SW 38th St

SW 38th St
SW Sheridan Rd
SW Lee Blvd
Lawton-Fort Sill Regl Airport
SW 11th St
Martin Luther King Fwy
SH Highway 277
SW Lee Blvd


7
SE Lee Blvd
7
SE Lee Blvd

APPENDIX H

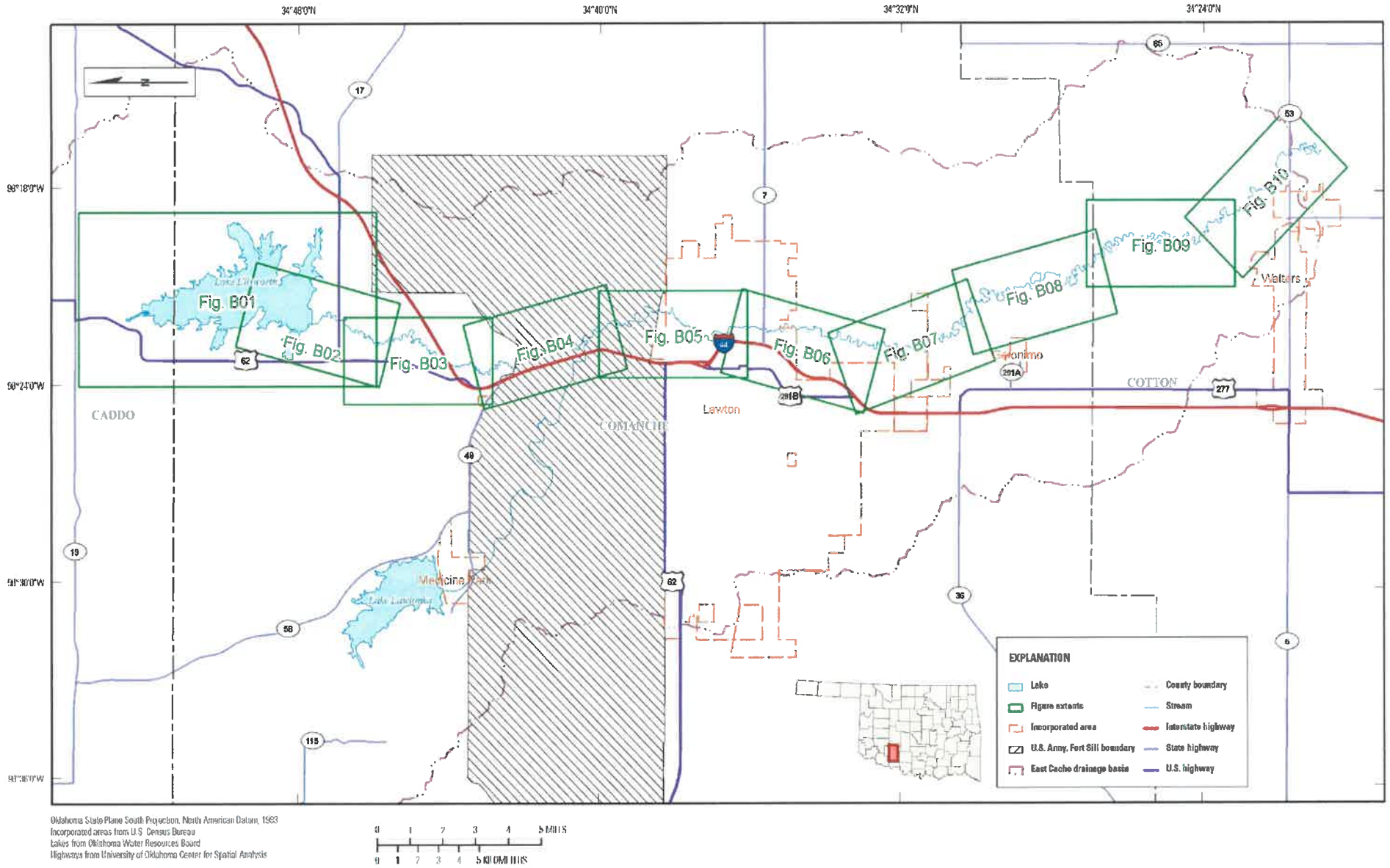
Dam Inundation Maps



DAM BREACH ANALYSIS
INUNDATION MAPPING

CITY OF LAWTON
ENGINEERING DIVISION

PROJECT NO.: DATE:



Tile Index for figures B01 through B10

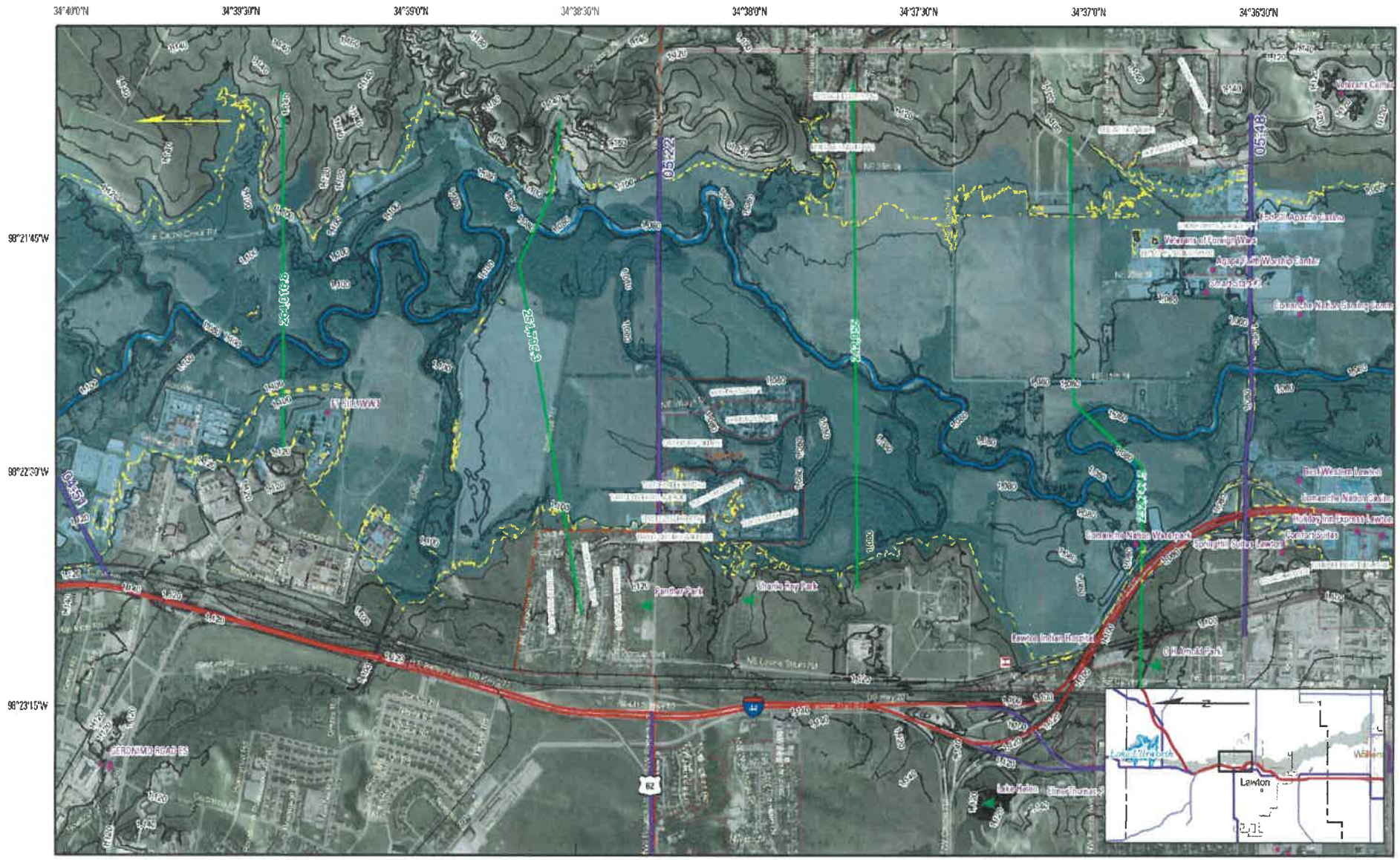
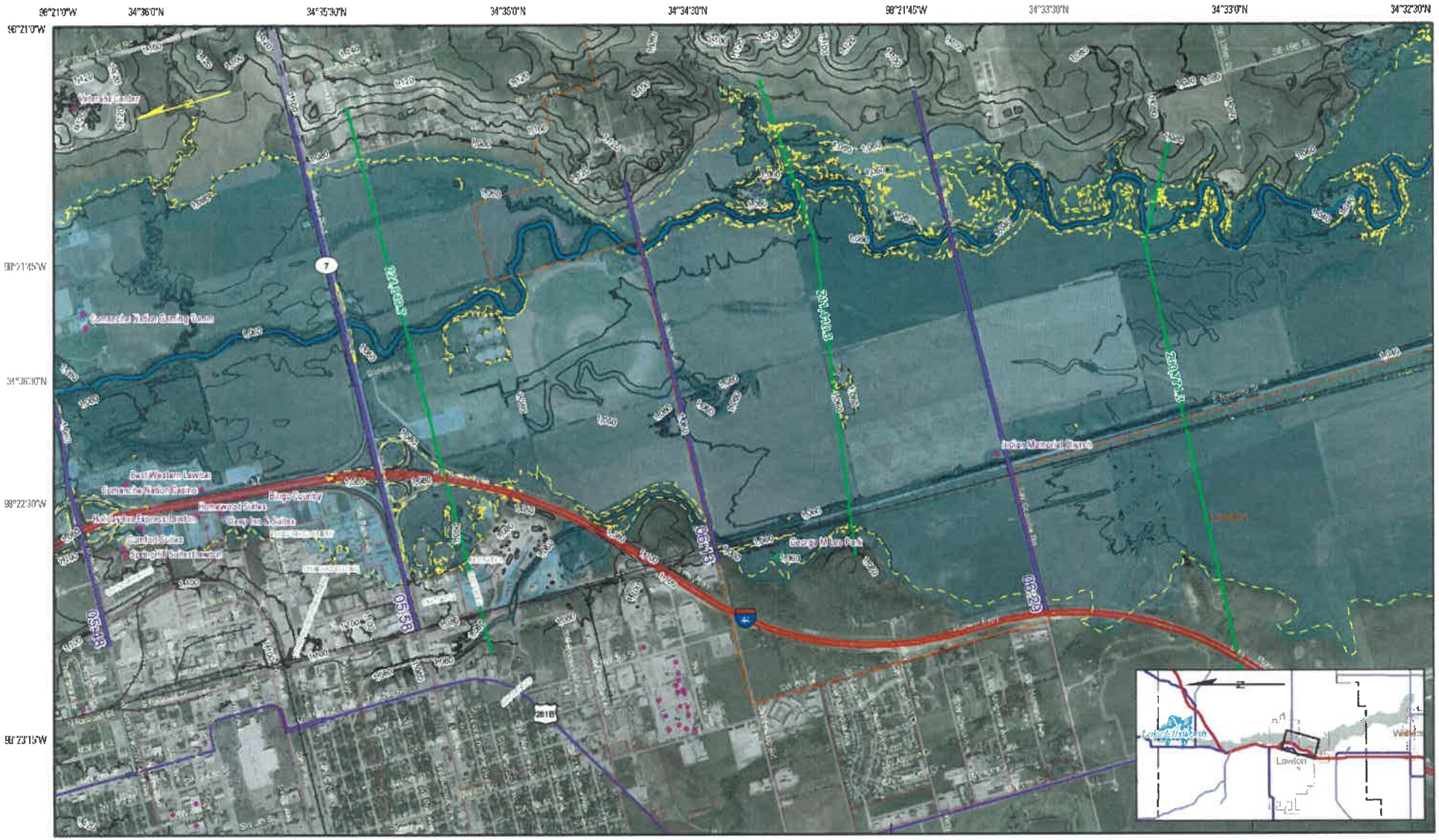


Figure B05 Inundated areas for Lake Ellsworth dam-breach scenarios.



Oklahoma State Plane South Projection, North American Datum, 1983
Incorporated areas from U.S. Census Bureau
Lakes from Oklahoma Water Resources Board
Aerial photography from National Agriculture Imagery Program (NAIP), 2010
Highways from University of Oklahoma Center for Spatial Analysis
Railroads from National Transportation Atlas Database: 2003
Topographic contours are shown at 10-foot intervals

0 1,000 2,000 3,000 4,000 5,000 FEET
0 200 400 600 800 1,000 METERS

EXPLANATION

- Ellsworth model study area
- Sunny-day inundation area
- Maximum probable inundation area
- Incorporated area
- County boundary
- Interstate highway
- State highway
- U.S. highway
- Elevation contour (10-foot interval)
- Primary
- Secondary
- Stream
- Railroad
- Bridge
- Index cross section
- USGS stream gage
- USGS lake-stage gage
- 03:54 Time to maximum stage, in hours:minutes

Figure B06. Inundated areas for Lake Ellsworth dam-breach scenarios.

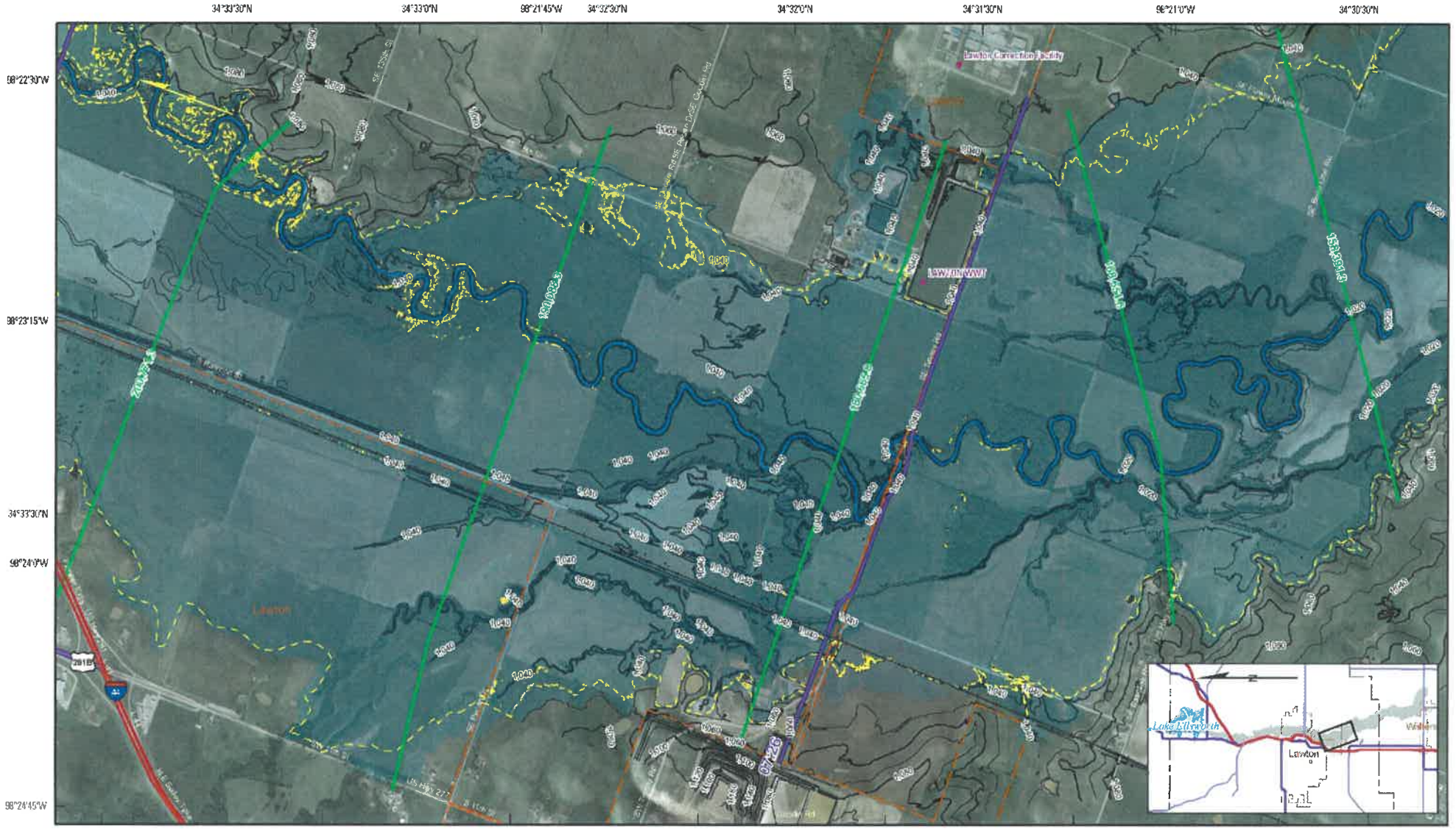
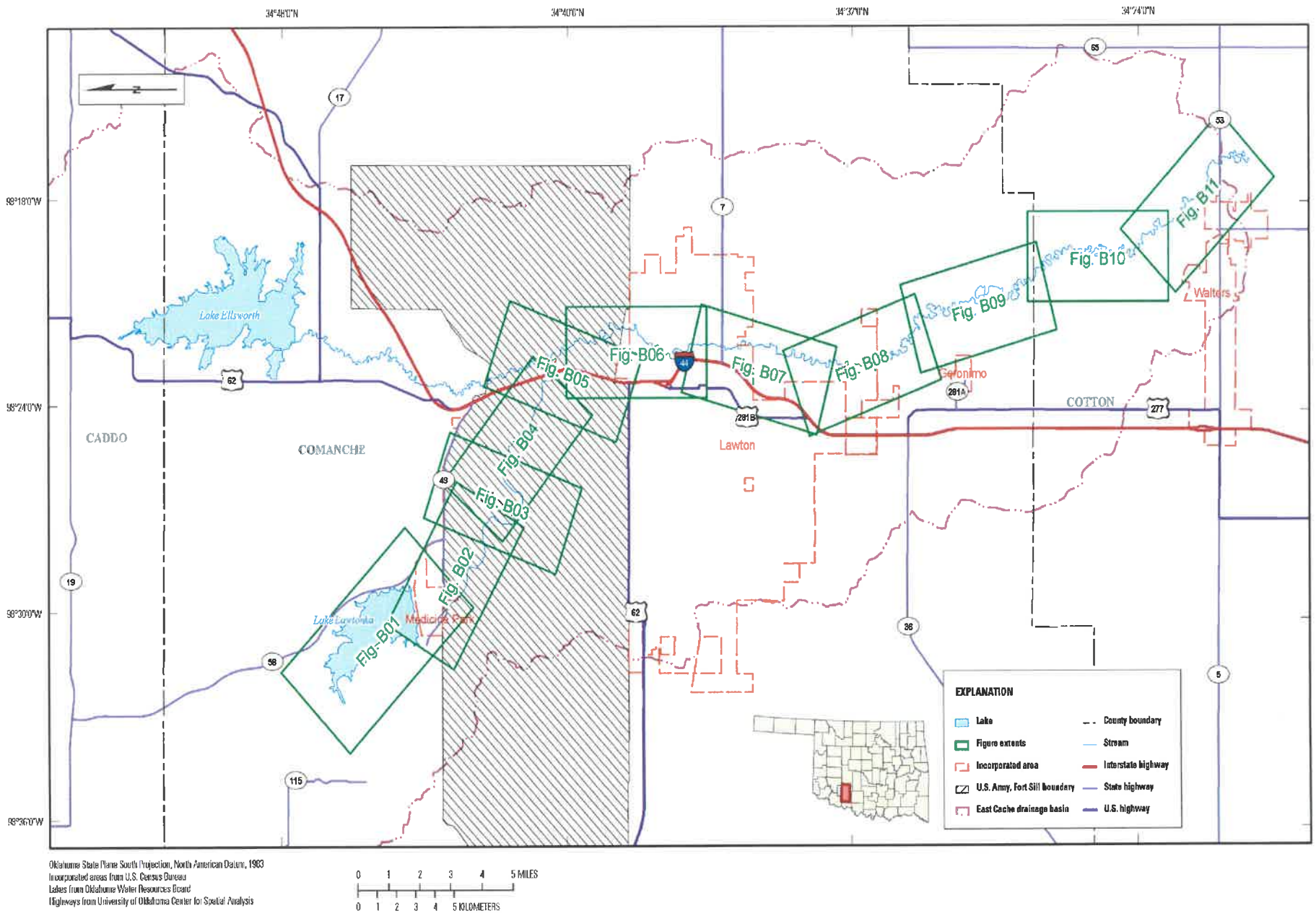
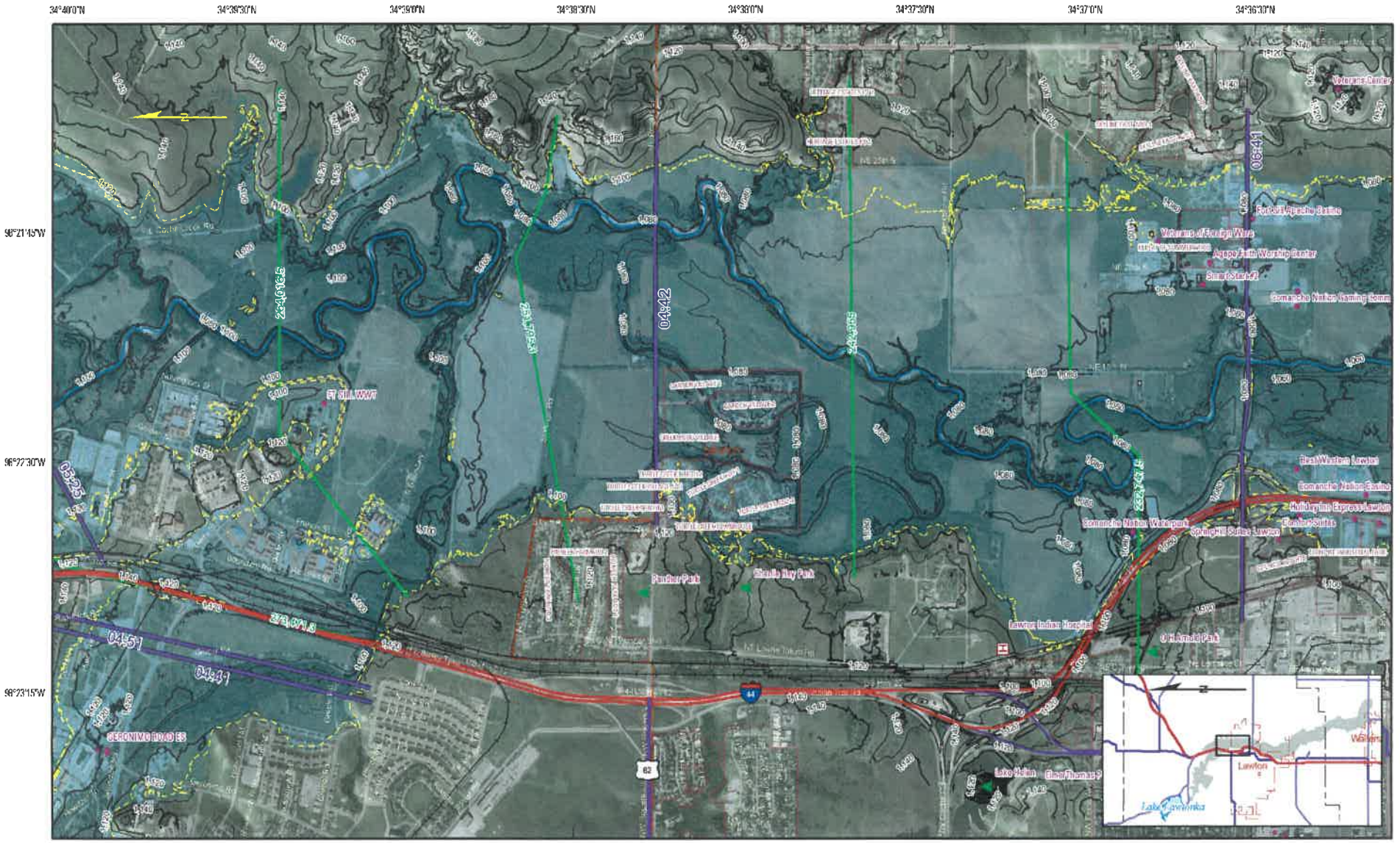


Figure B07. Inundated areas for Lake Ellsworth dam-breach scenarios.



Tile Index for figures B01 through B11



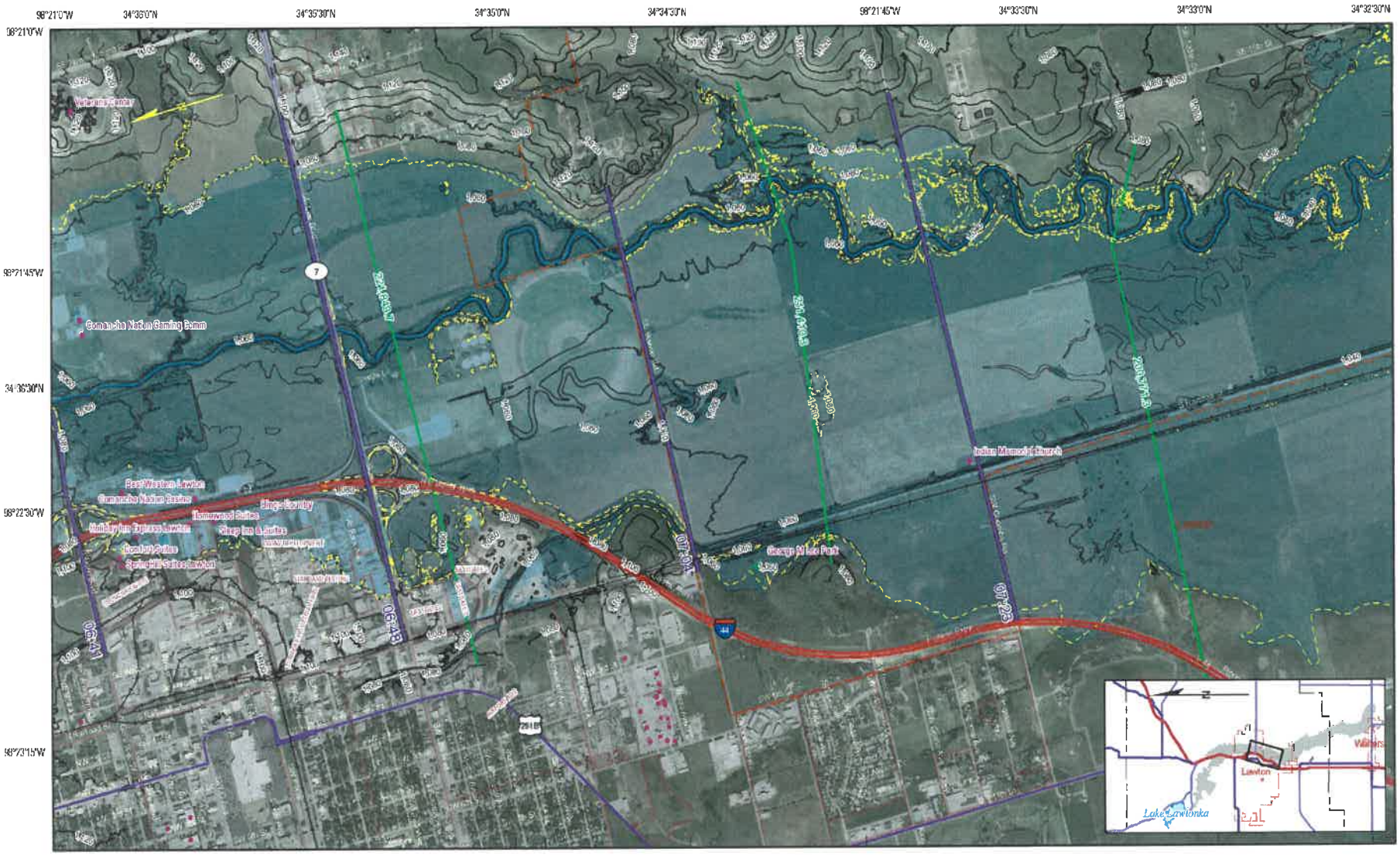
Oklahoma State Plane South Projection, North American Datum, 1983
Incorporated areas from U.S. Census Bureau
Lakes from Oklahoma Water Resources Board
Aerial photography from National Agriculture Imagery Program (NAIP), 2010
Highways from University of Oklahoma Center for Spatial Analysis
Railroads from National Transportation Atlas Database, 2008
Topographic contours are shown at 10 foot intervals

0 1,000 2,000 3,000 4,000 5,000 FEET
0 200 400 600 800 1,000 METERS

EXPLANATION

- Lawtonka model study area
- Sunny-day inundation area
- Maximum probable inundation area
- Incorporated area
- County boundary
- Interstate highway
- State highway
- U.S. highway
- Elevation contour (10-foot interval)
- Primary
- Secondary
- Stream
- Railroad
- Bridge
- Index cross section
- USGS stream gage
- USGS lake-stage gage
- 03:54 Time to maximum stage, in hours:minutes

Figure B06. Inundated areas for Lake Lawtonka dam-breach scenarios.



Oklahoma State Plane South Projection, North American Datum, 1983
Incorporated areas from U.S. Census Bureau
Lakes from Oklahoma Water Resources Board
Aerial photography from National Agriculture Imagery Program (NAIP), 2010
Highways from University of Oklahoma Center for Spatial Analysis
Railroads from National Transportation Atlas Database, 2003
Topographic contours are shown at 10-foot intervals

Figure B07. Inundated areas for Lake Lawtonka dam-breach scenarios.

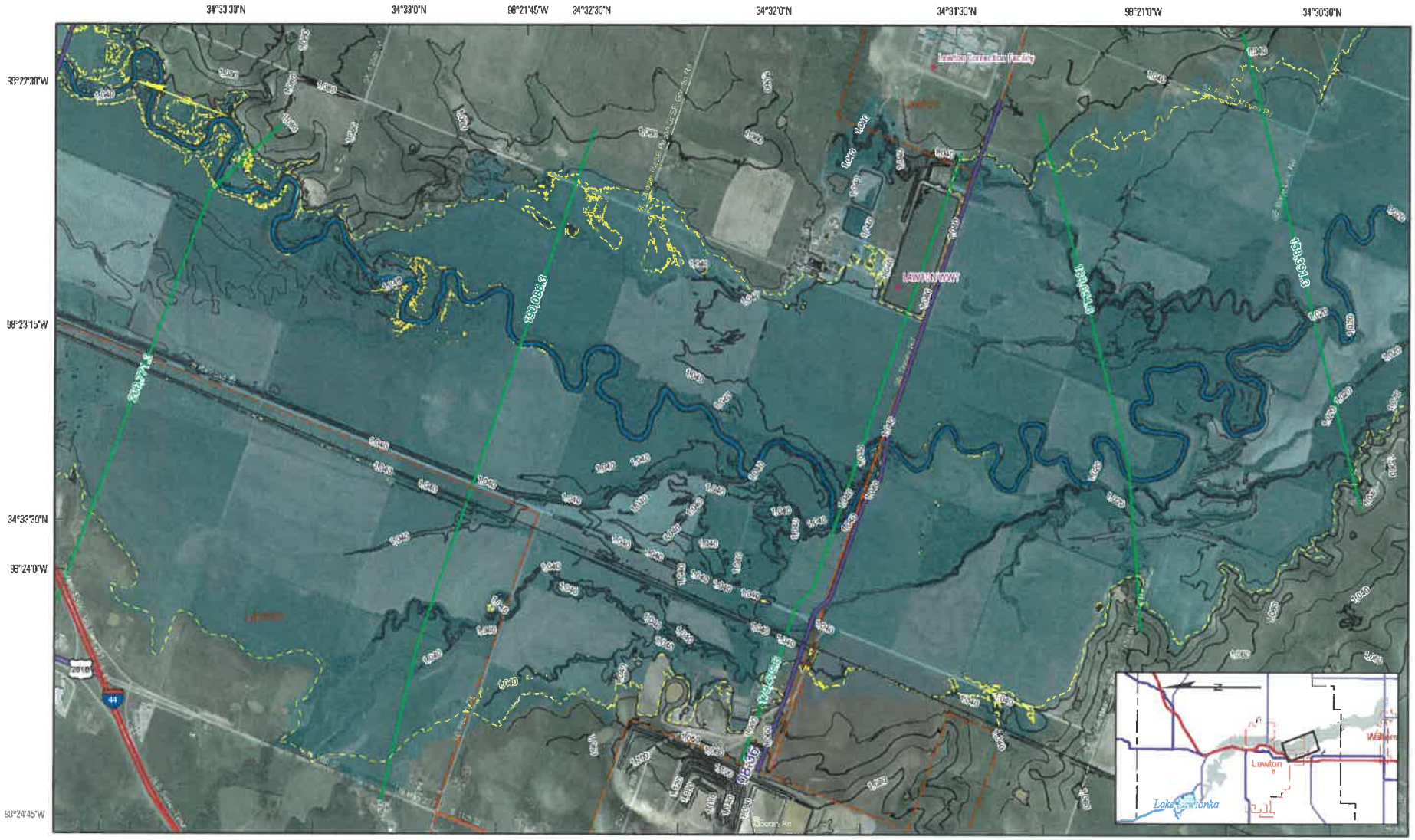
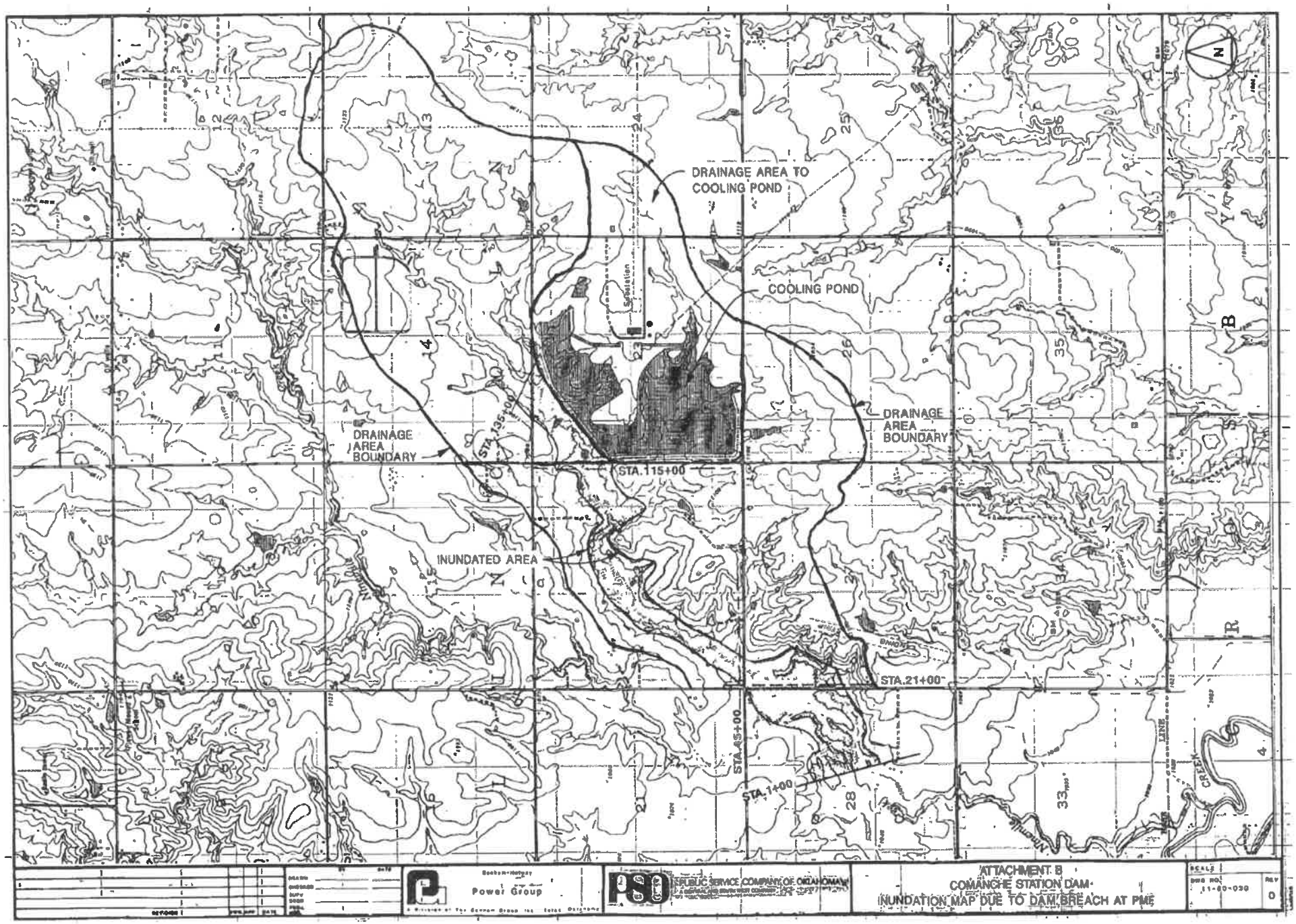


Figure B08. Inundated areas for Lake Lawtonka dam-breach scenarios.



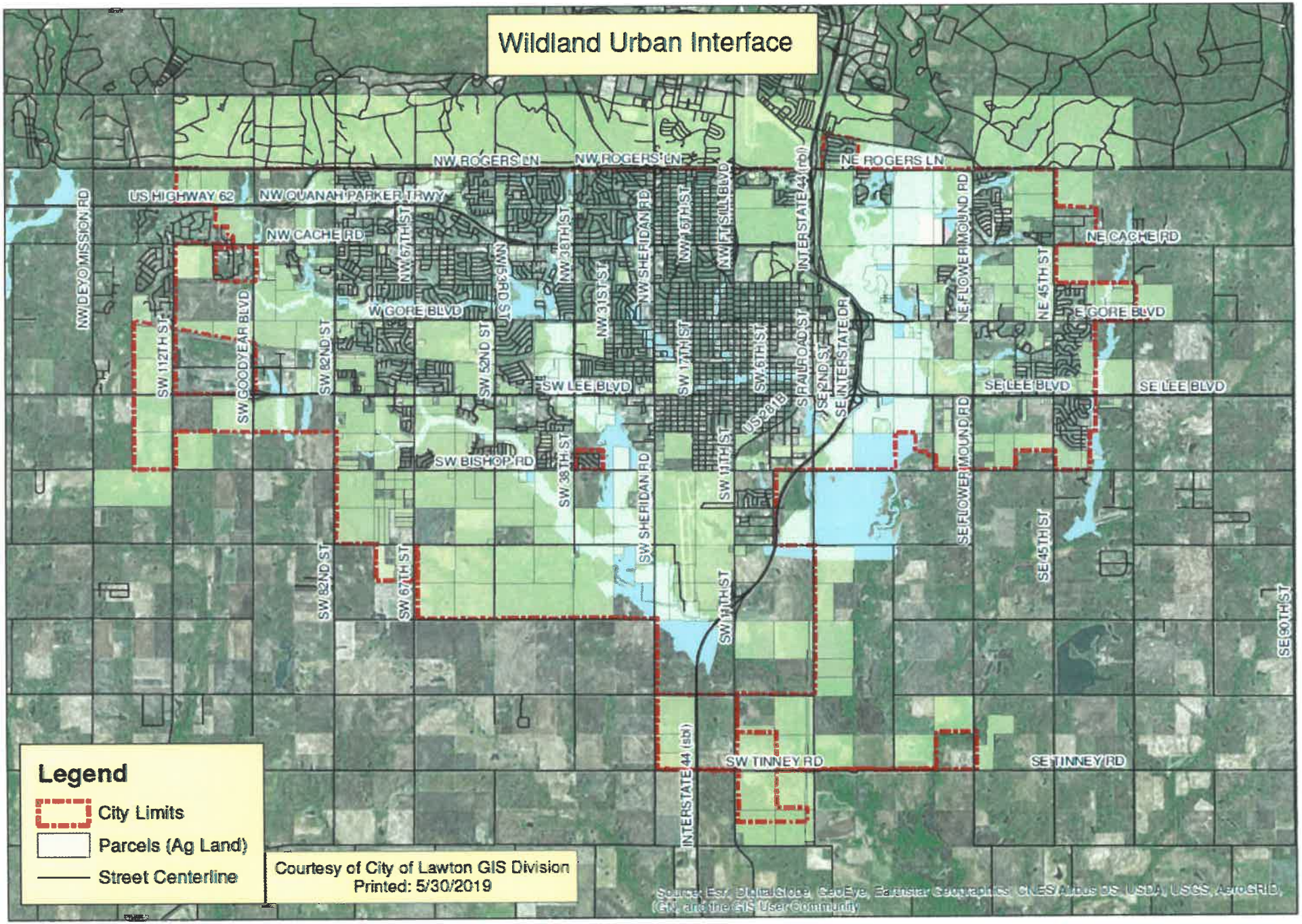
Power Group

PUBLIC SERVICE COMPANY OF OKLAHOMA

ATTACHMENT B
COMANCHE STATION DAM
INUNDATION MAP DUE TO DAM BREACH AT PMF

APPENDIX I

Wildland Urban Interface Map


Wildland Urban Interface
NW ROGERS LN
NW ROGERS LN
NE ROGERS LN
US HIGHWAY 62
NW QUANAH PARKER TRWY
NW CACHE RD
NE CACHE RD
NW DEYO MISSION RD
NW 67TH ST
NW 38TH ST
NW 31ST ST
NW SHERIDAN RD
NW 16TH ST
NW FT SILL BLVD
INTERSTATE 44 (rd)
NE FLOWERMOUND RD
NE 45TH ST
W GORE BLVD
E GORE BLVD
SW 112TH ST
SW GOODYEAR BLVD
SW 82ND ST
SW 52ND ST
NW SAD ST
SW LEE BLVD
SE LEE BLVD
SW 17TH ST
SW 6TH ST
SE 2ND ST
SE INTERSTATE DR
RAILROAD ST
US 281B
SW BISHOP RD
SW 38TH ST
SW SHERIDAN RD
SW 11TH ST
SE FLOWERMOUND RD
SE 45TH ST
SW 67TH ST
SW 82ND ST
SE 90TH ST
SW TINNEY RD
SE TINNEY RD
INTERSTATE 44 (sb)
Legend
City Limits
Parcels (Ag Land)
Street Centerline
Courtesy of City of Lawton GIS Division
Printed: 5/30/2019
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, (GN, and the GIS User Community

MARK GOWER
State Director

J. KEVIN STITT
Governor

STATE OF OKLAHOMA
DEPARTMENT OF EMERGENCY MANAGEMENT

August 29, 2019

Honorable Stan Booker
Mayor, City of Lawton
212 SW 9th Street
Lawton, OK 73501

Re: **FEMA Approval of the City of Lawton, Oklahoma**
Single Jurisdictional Hazard Mitigation Plan Update

Dear Mayor Booker,

Congratulations! OEM has received the letter of approval from FEMA Region VI, dated August 15, 2019, acknowledging the City of Lawton's Single Jurisdiction Hazard Mitigation Plan has successfully met the criteria established by Federal regulations. Based upon this approval, the participating jurisdiction retains eligibility for the Hazard Mitigation Grant Program (HMGP) and the Pre-Disaster Mitigation (PDM) Grant Program for the next five (5) years from the date of the FEMA letter of approval.

This approval does not demonstrate eligibility or pre-approval of projects contained in this plan. FEMA has provided the enclosed Local Hazard Mitigation Planning Tool (PRT), with reviewer's comments, to assist the community in refining the plan further. The City of Lawton may begin the process of seeking eligibility and approval for mitigation project action items by submitting a NOI (Notice of Intent) through OEMGrants. Instructions for registering and submission of the NOI can be accessed at the following website: https://www.ok.gov/OEM/Programs_&_Services/Mitigation/index.html.

If you have any questions regarding the above, please contact me at (405) 521-3140 or via email at Matthew.Rollins@oem.ok.gov.

Sincerely,

Matthew Rollins
State Hazard Mitigation Officer

Enclosures

cc: Michael Cleghorn, City Manger
Larry Wolcott, Public Works Director/Floodplain Administrator

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: City of Lawton, Oklahoma	**Title of Plan:** City of Lawton All Hazards Mitigation Plan	**Date of Plan:** 2018
Local Point of Contact: Larry Wolcott	**Address:** 212 SW 9th Street Lawton, OK 73501	
Title: Public Works Director		
Agency: Public Works Department		
Phone Number: (580) 581-3410	**E-Mail:** Lwolcott@LawtonOK.gov	

State Reviewer: Mike Bradford Jim Rosser	**Title:**	**Date:** June 2019

FEMA Reviewer: Shanene Thomas	**Title:** HM Planner	**Date:** August 15, 2019
Date Received in FEMA Region 6	August 14, 2019	
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved	August 15, 2019	

LOCAL MITIGATION PLAN REVIEW TOOL

SECTION 1:

REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	P3-7	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	P3-6	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	P 6	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	P 7	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	P 7	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	P 7	X	
ELEMENT A: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 3	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 3	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 3	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	P 33	X	
ELEMENT B: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	P29-30	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	P29	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	P33	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Appendix B	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	P34	X	

C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	P35	X	
ELEMENT C: REQUIRED REVISIONS			
1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	P36	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	P36, Appendix C	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	P33-34	X	
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))		X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))		n/a	
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (optional for State reviewers only; not to be completed by FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISION			

SECTION 2:
PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);
- Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);
- Diverse methods of participation (meetings, surveys, online, etc.); and
- Reflective of an open and inclusive public involvement process.

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

1) A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;
2) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and
3) A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.

The plan should include previous occurrences up to at least one year prior to approval. Many previous occurrences provided include data that was collected more than 3 years ago. For plan updates, add at least 4 years of data from the previous plan approval.

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- Key problems identified in, and linkages to, the vulnerability assessment;
- Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;
- Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;
- An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);
- Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;
- Integration of mitigation actions with existing local authorities, policies, programs, and resources; and
- Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.

Element D: Plan Update, Evaluation, and Implementation (Plan Updates Only)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- Status of previously recommended mitigation actions;
- Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;
- Documentation of annual reviews and committee involvement;
- Identification of a lead person to take ownership of, and champion the Plan;
- Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;
- An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);
- Discussion of how changing conditions and opportunities could impact community resilience in the long term; and
- Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.

B. Resources for Implementing Your Approved Plan

This section provides examples of possible resources plan implementation.

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?
- What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?
- What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?
- Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?
- What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?

FEMA Mitigation grants are available to eligible applicants. Search grants.gov for additional resources for implementing mitigation actions.

LOCAL MITIGATION PLAN REVIEW TOOL

SECTION 3:

MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

INSTRUCTIONS: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET												
							Requirements Met (Y/N)					
#	Jurisdiction Name	Jurisdiction Type (city/borough/ township/ village, etc.)	Plan POC	Mailing Address	Email	Phone	A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Require-ments
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												