



2026



De Witt County

Hazard Mitigation Plan Update

Mitigating Risk for a Safe, Secure, Sustainable Future

For more information, visit our website at:

<https://www.co.dewitt.tx.us/>

Written comments should be forwarded to:

H2O Partners, Inc.

P. O. Box 160130

Austin, Texas 78716

info@h2opartnersusa.com

www.h2opartnersusa.com

SECTION 1 – INTRODUCTION

Background.....	1
Scope	2
Purpose	2
Authority.....	3
Summary of Sections	3

SECTION 2 – PLANNING PROCESS

Plan Preparation and Development.....	1
Review and Incorporation of Existing Plans	8
Timeline for Implementing Mitigation Actions	11
Public and Stakeholder Involvement	12

SECTION 3 – COUNTY PROFILE

Overview.....	1
Population and Demographics	4
Population Growth	6
Economic Impact	6
Natural, Cultural, and Historic Resources.....	8
Existing Land Use and Development Trends	9
Changes in Vulnerability	11
Future Growth and Development	12

SECTION 4 – RISK OVERVIEW

Hazard Description	1
Disaster Declaration History.....	6
Natural Hazards and Climate Change.....	8
Overview of Hazard Analysis	12
Hazard Ranking	13
Risk Assessment Resources and Data Limitations	14

SECTION 5 – DAM FAILURE

Hazard Description	1
Location	3
Extent	4

Historical Occurrences	8
Probability of Future Events	8
Climate Change Considerations.....	8
Vulnerability and Impact.....	8

SECTION 6 – DROUGHT

Hazard Description	1
Location	2
Extent	2
Historical Occurrences	4
Probability of Future Events	5
Climate Change Considerations.....	5
Vulnerability and Impact.....	6

SECTION 7 – EARTHQUAKE

Hazard Description	1
Location	2
Extent	4
Historical Occurrences	7
Probability of Future Events	9
Climate Change Considerations.....	9
Vulnerability and Impact.....	10

SECTION 8 – EXPANSIVE SOILS

Hazard Description	1
Location	1
Extent	4
Historical Occurrences	5
Probability of Future Events	6
Climate Change Considerations.....	6
Vulnerability and Impact.....	6

SECTION 9 – EXTREME HEAT

Hazard Description	1
Location	1

Extent	1
Historical Occurrences	4
Probability of Future Events	5
Climate Change Considerations.....	5
Vulnerability and Impact.....	6

SECTION 10 – FLOOD

Hazard Description	1
Location	1
Extent	7
Historical Occurrences	10
Probability of Future Events	13
Climate Change Considerations.....	13
Vulnerability and Impact.....	13
National Flood Insurance Program (NFIP) Participation	19
NFIP Compliance and Maintenance.....	21
Repetitive Loss	21

SECTION 11 – HAIL

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	3
Probability of Future Events	6
Climate Change Considerations.....	6
Vulnerability and Impact.....	7

SECTION 12 – HURRICANE / TROPICAL STORM

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	2
Probability of Future Events	6
Climate Change Considerations.....	6

Vulnerability and Impact.....7

SECTION 13 – LIGHTNING

Hazard Description1
Location1
Extent1
Historical Occurrences2
Probability of Future Events3
Climate Change Considerations.....4
Vulnerability and Impact.....4

SECTION 14 – THUNDERSTORM WIND

Hazard Description1
Location1
Extent2
Historical Occurrences3
Probability of Future Events7
Climate Change Considerations.....7
Vulnerability and Impact.....7

SECTION 15 – TORNADO

Hazard Description1
Location1
Extent2
Historical Occurrences4
Probability of Future Events7
Climate Change Considerations.....7
Vulnerability and Impact.....7

SECTION 16 – WILDFIRE

Hazard Description1
Location2
Extent8
Historical Occurrences14
Probability of Future Events16

Climate Change Considerations.....	16
Vulnerability and Impact.....	17

SECTION 17 – WINTER STORM

Hazard Description	1
Location	3
Extent	3
Historical Occurrences	5
Probability of Future Events	7
Climate Change Considerations.....	7
Vulnerability and Impact.....	7

SECTION 18 – MITIGATION STRATEGY

Mitigation Goals	1
Goal 1	1
Goal 2	1
Goal 3	2
Goal 4	2
Goal 5	2
Goal 6	2
Goal 7	3

SECTION 19 – PREVIOUS ACTIONS

Summary	1
De Witt County.....	2
City of Cuero.....	13
City of Nordheim	27
City of Yorktown.....	36
Green-De Witt Drainage District.....	45

SECTION 20 – MITIGATION ACTIONS

Summary	1
De Witt County.....	4
City of Cuero.....	22
City of Nordheim	24

City of Yorktown.....	28
Green-De Witt Drainage District.....	31
Carryover Actions	32

SECTION 21 – PLAN MAINTENANCE

Plan Maintenance Procedures	1
Incorporation.....	1
Monitoring and Evaluation.....	4
Updating	5
Continued Public Involvement.....	6

APPENDIX A – HUMAN-CAUSED HAZARDS

APPENDIX B – PLANNING TEAM

APPENDIX C – PUBLIC SURVEY RESULTS

APPENDIX D – CRITICAL FACILITIES

APPENDIX E – DAM LOCATIONS

APPENDIX F – MEETING DOCUMENTATION

APPENDIX G – CAPABILITY ASSESSMENT

APPENDIX H – STATE AND FEDERAL FUNDING OPPORTUNITIES

ADOPTION RESOLUTIONS



Section 1

Introduction

SECTION 1: INTRODUCTION

Background.....	1
Scope	2
Purpose	2
Authority.....	3
Summary of Sections	3

BACKGROUND

De Witt County is located in southeast Texas. The largest city and county seat, City of Cuero, is 88 miles southeast of San Antonio. Gonzales County is adjacent to the northwest, Lavaca County borders the northeastern portion of the county, Goliad County is to the south, Karnes County is to the southwest, and Victoria County is to the southeast.

Texas is prone to extremely heavy rains and flooding, with half of the world record rainfall rates (48 hours or less)¹ While flooding is a well-known risk, De Witt County is susceptible to a wide range of natural hazards, including but not limited to tornadoes, extreme heat, wildfire, and drought. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for individuals.

While it is impossible to prevent an event from occurring, the impacts to people and property can be minimized through effective mitigation. The Federal Emergency Management Agency (FEMA) defines mitigation as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.*² Communities participate in hazard mitigation by developing hazard mitigation plans. The Texas Division of Emergency Management (TDEM) is required to review the plan, and FEMA has the authority to review and approve hazard mitigation plans through the Disaster Mitigation Act of 2000.

The Disaster Mitigation Act requires that hazard mitigation plans be reviewed and revised every five years to maintain eligibility for Hazard Mitigation Assistance (HMA) grant funding. In 2018, De Witt County developed their previous Hazard Mitigation Action Plan (HMAP) to be specific to De Witt County, 3 participating cities, and the De Witt County Drainage District.

FEMA approved the previous De Witt County Mitigation Action Plan in 2018, which then was set to expire in 2023. Therefore, the County began the process of developing a Hazard Mitigation Plan Update in order to regain eligibility for grant funding. The HMAP Update planning process provided an opportunity for De Witt County to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

De Witt County selected H2O Partners, Inc. to write and develop the 2026 Plan Update, hereinafter titled: “De Witt County Hazard Mitigation Action Plan Update 2026: Maintaining a Safe, Secure, and Sustainable Community” (Plan Update). This is a multi-jurisdictional plan; the participating jurisdictions include:

- De Witt County
- City of Cuero
- City of Nordheim
- City of Yorktown
- Green-De Witt Drainage District

¹ Source: <http://www.floodsafety.com/texas/regional-info/san-antonio-flooding/>

² Source: <http://www.fema.gov/hazard-mitigation-planning-resources>

SECTION 1: INTRODUCTION

Hazard mitigation activities are an investment in a community's safety and sustainability. It is widely accepted that the most effective hazard mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive review of a hazard mitigation plan addresses vulnerabilities to hazards that exist today and in the foreseeable future. Therefore, it is essential that a plan identify projected patterns of how future development will increase or decrease a community's overall hazard vulnerability.

SCOPE

The focus of the Plan Update is to identify activities to mitigate hazards classified as "high" or "moderate" risk, as determined through a detailed hazard risk assessment conducted for De Witt County and the participating jurisdictions and the Green-De Witt Drainage District. The hazard classification enables the participating jurisdictions and special district to prioritize mitigation actions based on hazards that can present the greatest risk to lives and property in the geographic scope.

PURPOSE

The Plan Update was prepared by De Witt County, participating jurisdictions, Green-De Witt Drainage District, and H2O Partners, Inc. The purpose of the Plan Update is to protect people and structures and to minimize the costs of disaster response and recovery. The goal of the Plan Update is to minimize or eliminate long-term risks to human life, property, operations, and the environment from known hazards by identifying risks and implementing cost-effective hazard mitigation actions. The planning process is an opportunity for participating jurisdictions and special district within De Witt County, stakeholders, and the general public to evaluate and develop successful hazard mitigation actions to reduce future risk of loss of life and damage to property resulting from a disaster in De Witt County.

The Mission Statement of the Plan Update is *"Maintaining a secure and sustainable future through the revision and development of targeted hazard mitigation actions to protect life and property."*

Participating jurisdictions and special district within De Witt County and planning participants identified 13 natural hazards to be addressed by the Plan Update. The specific goals of the Plan Update are to:

- Provide a comprehensive update to the 2018 HMAP;
- Minimize disruption to participating jurisdictions and special district within De Witt County following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grants and technical assistance programs offered by the State or Federal government. The Plan will enable participating jurisdictions and special district within De Witt County to take advantage of rapidly developing mitigation grant opportunities as they arise; and
- Ensure that participating jurisdictions and special district within De Witt County maintain eligibility for the full range of future Federal disaster relief.

SECTION 1: INTRODUCTION

AUTHORITY



FEMA

The Plan is tailored specifically for participating jurisdictions and special district within De Witt County and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA’s “Local Mitigation Planning Policy Guide” (April 2025), and the “Local Mitigation Planning Handbook” (June 2025).

SUMMARY OF SECTIONS

Sections 1 and 2 of the Plan Update outline the Plan’s purpose and development, including how Planning Team members, stakeholders, and members of the general public were involved in the planning process. Section 3 profiles the planning area’s population and economy.

Sections 4 through 17 present a hazard overview and information on individual natural hazards in the planning area. For each hazard, the Plan Update presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 18 presents hazard mitigation goals and objectives. Section 19 gives an analysis of the previous actions, and Section 20 presents hazard mitigation actions for De Witt County and the participating jurisdictions and special district. Section 21 identifies Plan maintenance mechanisms.

Human-caused hazards are included in Appendix A. The list of Planning Team members and stakeholders is located in Appendix B. Public survey results are presented in Appendix C. Appendix D contains a detailed list of critical facilities for the area. Appendix E contains information regarding dam locations within De Witt County. Appendix F contains information regarding workshops and meeting documentation. Capability Assessment results for the Plan participants are in Appendix G. Appendix H includes State and Federal Funding Opportunities. Resolutions denoting adoption of the Plan Update are located at the end of this document.³

³ Information contained in some of these appendices is exempt from public release under the Freedom of Information Act (FOIA).

Section 2

Planning Process



SECTION 2: PLANNING PROCESS

Plan Preparation and Development.....	1
Overview of the Plan	1
Planning Team	2
Planning Process.....	5
Kickoff Workshop.....	6
Hazard Identification.....	6
Risk Assessment	7
Mitigation Review and Development	7
Review and Incorporation of Existing Plans	8
Review	8
Incorporation of Existing Plans into the HMAP Process	8
Incorporation of the HMAP into Other Planning Mechanisms.....	9
Plan Review and Plan Update	11
Timeline for Implementing Mitigation Actions	11
Public and Stakeholder Involvement	12
Underserved Communities / Vulnerable Populations	12
Stakeholder Involvement	13
Public Meetings	18
Public Participation Survey	18

PLAN PREPARATION AND DEVELOPMENT

Hazard mitigation planning involves coordination with various constituents and stakeholders to develop a more disaster-resistant community. Section 2 provides an overview of the planning process including the identification of key steps and a detailed description of how stakeholders and the public were involved.

OVERVIEW OF THE PLAN

De Witt County hired H2O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the De Witt County Hazard Mitigation Action Plan Update 2026. The Consultant Team used the FEMA “Local Mitigation Planning Policy Guide” (April 2025), and the “Local Mitigation Planning Handbook” (June 2025) to develop the Plan Update. The overall planning process is shown in Figure 2-1 below.

SECTION 2: PLANNING PROCESS

Figure 2-1. Mitigation Planning Process



De Witt County, the participating jurisdictions, special district and the Consultant Team met in April 2025 to begin organizing resources, identify Planning Team members, and conduct a Capability Assessment.

PLANNING TEAM

Key members of H2O Partners, Inc. developed the Plan Update in conjunction with the Planning Team. The Planning Team was established using a direct representation model. Some of the responsibilities of the Planning Team included: completing Capability Assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies. An Executive Planning Team consisting of key personnel involved in hazard mitigation activities from each of the participating jurisdictions and special district within De Witt County, shown in Table 2-1, was formed to coordinate planning efforts and request input and participation in the planning process.

Table 2-2 reflects the Advisory Planning Team, consisting of additional representatives from area organizations and departments from the participating jurisdictions and special district within De Witt County that participated throughout the planning process. All Executive and Advisory Planning Team members are involved in hazard mitigation activities; those with the authority to regulate development are identified with an asterisk next to their title.

Table 2-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – Emergency Management	Emergency Management Coordinator
City of Cuero – Administration	City Secretary
City of Nordheim – Administration	City Secretary
City of Yorktown – Water / Utility / Permits	Field Director
Green-De Witt Drainage District – Administration	General Manager

Table 2-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – Administration	County Clerk
De Witt County – Administration	County Treasurer

SECTION 2: PLANNING PROCESS

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – County Auditor’s Office	County Auditor
De Witt County – County Judge’s Office	County Judge *
De Witt County – County Judge’s Office	Executive Secretary
De Witt County – Emergency Management	Safety Manager
De Witt County – Precinct #1	County Commissioner *
De Witt County – Precinct #1	Foreman
De Witt County – Precinct #4	County Commissioner *
De Witt County – Sheriff’s Office	County Sheriff
City of Cuero – Administration	City Manager
City of Cuero – Administration	Grants / Special Projects Director
City of Cuero – Government	Mayor *
City of Cuero – Chamber of Commerce	Director
City of Cuero – Code Enforcement / Inspection	Administrative Secretary
City of Cuero – Code Enforcement / Inspection	Code Enforcement
City of Cuero – Fire	Fire Chief
City of Cuero – Fire	Firefighter
City of Cuero – Fire	Firefighter ¹
City of Cuero – Government	Councilman *
City of Cuero – Parks and Recreation	Parks Director
City of Cuero – Police	Chief
City of Nordheim – Government	Mayor *
City of Nordheim – Volunteer Fire Department	Fire Chief
City of Yorktown – Administration	City Administrator
City of Yorktown – Government	Mayor *
City of Yorktown – Finance	Director
City of Yorktown – Public Works	Director

¹ Not a duplicate entry.

SECTION 2: PLANNING PROCESS

ORGANIZATION / DEPARTMENT	TITLE
City of Yorktown – Water / Utility / Permits	Director
Green-De Witt Drainage District – Administration	Board President
Green-De Witt Drainage District – Administration	Office Manager

Additionally, a Stakeholder Group was invited via email to participate in the planning process by attending meetings, commenting on draft versions of the Plan Update, and/or by providing data to inform the planning process. The Consultant Team, Planning Teams, and Stakeholder Group coordinated to identify mitigation goals, and develop mitigation strategies and actions for the Plan. Appendix B provides a complete listing of all participating Planning Team members and stakeholders from the participating jurisdictions and special district within De Witt County by organization, title, and stakeholder type. Stakeholder involvement is discussed further below.

Based on results of completed Capability Assessments, the participating jurisdictions and special district within De Witt County described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, each jurisdiction has an opportunity to identify opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the Texas Division of Emergency Management (TDEM) by monitoring classes and availability through TDEM Training Division Learning Management Site (LMS) (<https://tdem.texas.gov/preparedness/training>). In addition, each jurisdiction can identify Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff. Other options for improving capabilities for each jurisdiction are included in Table 2-3.

Table 2-3. Opportunities for Improving and Expanding Existing Capabilities by Jurisdiction

JURISDICTION	OPPORTUNITIES
De Witt County	<ul style="list-style-type: none"> • Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Develop a Comprehensive Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Develop a Community Wildfire Protection Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. • Review current building and land use ordinances for opportunities to increase resiliency such as modifying permitting or building codes.
City of Cuero	<ul style="list-style-type: none"> • Integrate risk information from HMAP into future updates to Capital Improvement Plan. • Integrate risk information from HMAP into future updates to Comprehensive Plan. • Develop a Community Wildfire Protection Plan based on information in the risk assessment and identified mitigation projects within the HMAP. • Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.

SECTION 2: PLANNING PROCESS

JURISDICTION	OPPORTUNITIES
	<ul style="list-style-type: none"> Review current building and land use ordinances for opportunities to increase resiliency such as modifying permitting or building codes.
City of Nordheim	<ul style="list-style-type: none"> Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop a Comprehensive Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop a Community Wildfire Protection Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop floodplain ordinances to increase resiliency such as modifying permitting or building codes. Develop building and land use ordinances that will require all new developments to conform to the highest mitigation standards.
City of Yorktown	<ul style="list-style-type: none"> Integrate risk information from HMAP into future updates to Capital Improvement Plan. Develop a Comprehensive Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop a Community Wildfire Protection Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes. Review current building ordinances for opportunities to increase resiliency such as modifying permitting or building codes. Develop land use ordinances that will require all new developments to conform to the highest mitigation standards.
Green-De Witt Drainage District	<ul style="list-style-type: none"> Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop a Comprehensive / Master Drainage Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop a Stormwater Management Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Develop an all-hazards outreach program in coordination with De Witt County and participating jurisdictions.

Sample hazard mitigation actions developed with similar hazard risk were shared at the meetings. These important discussions resulted in the development of multiple mitigation actions that are included in the Plan Update to further mitigate risk from natural hazards in the future.

The Planning Team developed hazard mitigation actions for mitigating risk from all of the hazards including potential flood, tornado, and wildfire events. These actions include but are not limited to constructing an emergency operations and training center as well as acquiring and distributing NOAA weather radios.

PLANNING PROCESS

The process used to prepare the Plan Update followed the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and

SECTION 2: PLANNING PROCESS

distributed at the Kickoff Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on De Witt County's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 21. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix F .

At the Plan development workshops held throughout the planning process described herein, the following factors were taken into consideration:

- The nature and magnitude of risks currently affecting the communities;
- Hazard mitigation goals to address current and expected conditions;
- Whether current resources will be sufficient for implementing the Plan Update;
- Implementation problems, such as technical, political, legal, and coordination issues that may hinder development;
- Anticipated outcomes; and
- How the participating jurisdictions and special district within De Witt County, agencies, and partners will participate in implementing the Plan Update.

KICKOFF WORKSHOP

The Kickoff Workshop was held on July 8, 2025 at the Anne Friar Thomas Homemaking Building in the City of Cuero. The initial workshop informed participating officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities and engaged stakeholder groups that focus on vulnerable populations and underserved communities including, but not limited to, public libraries, economic development agencies, local colleges, and surrounding communities. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process;
- Public survey access information;
- Hazard Ranking form; and
- Capability Assessment survey for completion.

A risk ranking exercise was conducted at the Kickoff Workshop to get input from the Planning Team and stakeholders pertaining to various risks from a list of natural hazards affecting the planning area. Each participant at the Kickoff Workshop was provided with a risk ranking sheet that asked participants to rank hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact. The results of the ranking sheets identified unique perspectives on varied risks throughout the planning area. The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses.

HAZARD IDENTIFICATION

At the Kickoff Workshop, and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. The Planning Team, in coordination with the Consultant Team, reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area, the 2023 State of Texas Hazard Mitigation Plan, and initial study results from reputable sources such as

SECTION 2: PLANNING PROCESS

federal and state agencies. Based on this initial analysis, the teams identified a total of 13 natural hazards which pose a significant threat to the planning area.

RISK ASSESSMENT

An initial risk assessment for the participating jurisdictions and special district within De Witt County was completed in July 2025 and results were presented to Planning Team members at the Risk Assessment Workshop held on August 6, 2025, in conjunction with the Mitigation Strategy Workshop, at the Anne Friar Thomas Homemaking Building in the City of Cuero. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

Property and crop damages were estimated by gathering data from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA). The assessment also examined the impact of various hazards on the built environment, including general building stock, critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Following the risk assessment workshop, past event data from NCEI was provided to the Planning Team for their review and assistance in identifying significant events. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 17.

MITIGATION REVIEW AND DEVELOPMENT

Developing the mitigation strategy for the Plan Update involved identifying mitigation goals and new mitigation actions. A Mitigation Strategy Workshop was held on August 6, 2025, in conjunction with the Risk Assessment Workshop, at the Anne Friar Thomas Homemaking Building in the City of Cuero. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, workshop participants emphasized the desire for flood projects. Additionally, the participating jurisdictions and special district were proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan Update.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the Plan Update. The prioritization method was based on FEMA's STAPLEE criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 20.

Planning Team members then developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources.

Specifically, the process involved:

- Listing optional hazard mitigation actions based on information collected from previous plan reviews, studies, and interviews with federal, state, and local officials. Workshop participants reviewed the optional mitigation actions and selected actions that were most applicable to their area of responsibility, cost-effective in reducing risk, easily implemented, and likely to receive institutional and community support.

SECTION 2: PLANNING PROCESS

- Workshop participants inventoried federal and state funding sources that could assist in implementing the proposed hazard mitigation actions. Information was collected, including the program name, authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact.
- Planning Team members considered the benefits that would result from implementing the hazard mitigation actions compared to the cost of those projects. Although detailed cost-benefit analyses were beyond the scope of the Plan Update, Planning Team members utilized economic evaluation as a determining factor between hazard mitigation actions.
- Planning Team members then selected and prioritized mitigation actions.

Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft Plan Update was maintained on file by De Witt County, participating jurisdictions, and the special district and was made available to the general public for review.

REVIEW AND INCORPORATION OF EXISTING PLANS

REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, the National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the Texas State Data Center, the Texas A&M Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan Update (Sections 5-17) summarize the relevant background information.

Specific background documents, including those from FEMA, provided information on hazard risk, hazard mitigation actions currently being implemented, and potential mitigation actions. Previous hazard events, occurrences, and descriptions were identified through NOAA's National Centers for Environmental Information (NCEI). Results of past hazard events were found through searching the NCEI Storm Events Database. The USACE studies were reviewed for their assessment of risk and potential projects in the region. Information from the State Demographer was reviewed for population and other projections and included in Section 3 of the Plan Update. Data from the Texas A&M Forest Service was used to appropriately rank the wildfire hazard, and to help identify potential grant opportunities. Materials from FEMA and TDEM were reviewed for guidance on Plan Update development requirements.

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

A Capability Assessment was completed by key departments from the participating jurisdictions and special district within De Witt County which provided information pertaining to existing plans, policies, ordinances, and regulations to be integrated into the goals and objectives of the Plan Update. The relevant information was included in a master Capability Assessment, Appendix G.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, the City of Cuero constructed and installed an additional water well. Subsequently, the Planning Team included mitigation actions such as improving communication capabilities for critical facilities and

SECTION 2: PLANNING PROCESS

enhancing the current SCADA system to build upon ongoing efforts to strengthen critical infrastructure and ensure continuity of operations during disaster events.

For a comprehensive list of actions from the previous De Witt County Mitigation Action Plan, please refer to Section 19.

The current Flood Insurance Study (FIS) as well as the current effective Digital Flood Insurance Rate Maps (DFIRM) were used in the flood hazard risk assessment (Section 10). The DFIRM panels for the De Witt County (map ID 48123C, panels 25-750, dated January 6, 2011) show the areas throughout De Witt County at greater risk of flooding. The FIS report contains detailed flood elevation data in flood profiles and data tables and is utilized in determining extent.

Additionally, policies and ordinances were reviewed by several of the participating jurisdictions and special district. Other plans were reviewed, such as Capital Improvement Plans and Emergency Operations Plans, to identify any additional mitigation actions.

Finally, the 2023 State of Texas Hazard Mitigation Plan, developed by TDEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2023 State Plan was also used as a guidance document, along with FEMA materials, in the development of the De Witt County Hazard Mitigation Action Plan Update 2026.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan Update with other planning mechanisms for De Witt County, such as the Emergency Operations Plan. Existing plans for the participating jurisdictions and special district will be reviewed and incorporated into the Plan Update, as appropriate. This section discusses how the Plan will be implemented by the participating jurisdictions and special district within De Witt County. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

The participating jurisdictions and special district within De Witt County will be responsible for implementing hazard mitigation actions contained in Section 20. Each hazard mitigation action has been assigned to a specific County, City, or District department that is responsible for tracking and implementing the action.

A funding source has been listed for each identified hazard mitigation action and may be utilized to implement the action. An implementation time period has also been assigned to each hazard mitigation action as an incentive and to determine whether actions are implemented on a timely basis.

The participating jurisdictions and special district within De Witt County will integrate hazard mitigation actions contained in the Plan Update with existing planning mechanisms such as ordinances, Emergency Operations or Management Plans, and other local and area planning efforts. De Witt County will work closely with area organizations to coordinate implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact.

Upon formal adoption of the Plan Update, Planning Team members from the participating jurisdictions and special district will review existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each of the jurisdictions

SECTION 2: PLANNING PROCESS

and the special district will be responsible for coordinating periodic reviews of the Plan Update with members of the Advisory Planning Team to ensure integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any revisions or updates in light of the approved Plan Update. The participating jurisdictions and special district within De Witt County will ensure that future long-term planning objectives will contribute to the goals of the Plan Update to reduce the long-term risk to life and property from moderate and high-risk hazards. Within one year of formal adoption of the Plan Update, existing planning mechanisms will be reviewed and analyzed as they pertain to the Plan Update.

Planning Team members will review and revise, as necessary, the long-range goals and objectives in its strategic plan and budgets to ensure that they are consistent with the Plan Update.

Furthermore, De Witt County will work with neighboring jurisdictions to advance the goals of the Plan Update as it applies to ongoing, long-range planning goals and actions for mitigating risk to natural hazards throughout the planning area.

Table 2-4 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts.

Table 2-4. Examples of Methods of Incorporation

PLANNING MECHANISM	INCORPORATION OF PLAN
Annual Budget Reviews	Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.
Capital Improvement Plans	Several participating jurisdictions within De Witt County have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Currently, the City of Cuero has a Comprehensive Land Use Plan in place. Since Comprehensive Plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan Update will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain Management Plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 10 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when the County and participating Cities within De Witt County update their management plans or develop new plans.

SECTION 2: PLANNING PROCESS

PLANNING MECHANISM	INCORPORATION OF PLAN
Grant Applications	The HMAP will be evaluated by the participating jurisdictions and special district within De Witt County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Currently, several Plan participants have regulatory plans in place or under development, such as Emergency Operations Plans, Land Use Plans, and/or Evacuation Plans. The Plan Update will be consulted when County, City, and District departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

Appendix G Capability Assessment provides an overview of Planning Team members’ existing planning and regulatory capabilities. These existing capabilities provide the mechanisms to implement the mitigation strategy objectives. For example, the adoption of building codes and implementation of land use regulations have been demonstrated to help communities avoid losses from natural hazard events. Currently, the County and the Cities of Cuero and Yorktown have building codes, zoning ordinances, and/or land use ordinances in place. Please refer to Appendix G for a complete inventory of each participating jurisdiction’s and special district’s capabilities.

It should be noted for the purposes of the Plan Update that the HMAP has been used as a reference when reviewing and updating all plans and ordinances for the entire planning area, including all participating jurisdictions and the special district. The Emergency Management Action Plans developed for De Witt County, the Cities of Cuero and Nordheim, and Green-De Witt Drainage District are updated every five years and incorporate goals, objectives and actions identified in the Mitigation Plan.

PLAN REVIEW AND PLAN UPDATE

As with the development of Plan Update, the participating jurisdictions and special district within De Witt County will oversee the review and update process for relevance and if necessary, make adjustments. At the beginning of each fiscal year, Planning Team members will meet to evaluate the Plan Update and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will also meet once a year, by conference call or presentation, to re-evaluate prioritization of the hazard mitigation actions. The Plan Update may be amended to include additional hazard mitigation actions as they are developed.

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

Both the Executive Planning Team (Table 2-1) and the Advisory Planning Team (Table 2-2) will engage in discussions regarding a timeframe for how and when to implement each hazard mitigation action. Considerations include when the action will be started, how existing planning mechanisms’ timelines affect implementation, and when the action should be fully implemented. Timeframes may be general, and there will be short-, medium-, and long-term goals for implementation based on prioritization of each action, as identified on the individual hazard

SECTION 2: PLANNING PROCESS

mitigation action tables included in the Plan Update for the participating jurisdictions and special district within De Witt County.

Both the Executive and Advisory Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by participating jurisdictions' and the special district's comprehensive planning process, budgetary constraints, and community needs. The participating jurisdictions and special district within De Witt County are committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan Update.

Overall, the Planning Team is in agreement that goals and actions of the Plan Update shall be aligned with the timeframe for implementation of hazard mitigation actions with respect to annual review and updates of existing plans and policies.

PUBLIC AND STAKEHOLDER INVOLVEMENT

An important component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implementing hazard mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals, and schools are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of the De Witt County Hazard Mitigation Action Plan Update 2026 at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan Update available for public review on the participating jurisdictions' and special district's websites.

The draft Plan Update was made available to the general public for review and comment on the participating jurisdictions' and special district's websites. The public was notified at the public meetings that the draft Plan Update would be available for review. No feedback was received on the draft Plan Update, although it was given on the public survey, and all relevant information was incorporated into the Plan Update. Public input was utilized to assist in identifying hazards that were of most concern to the citizens of the County and what actions they felt should be included and prioritized.

The Plan Update will be advertised and posted on De Witt County, participating jurisdictions', and the special district's websites upon approval from FEMA, and a copy will be kept at the De Witt County Courthouse.

UNDERSERVED COMMUNITIES / VULNERABLE POPULATIONS

A goal of the Planning Team was building equity into the planning process. Inviting organizations that aid underserved communities and socially vulnerable populations to participate in the Plan helps ensure equitable access to the planning process and the meaningful participation of all residents. In addition, these groups can make sure that the interests of vulnerable populations

SECTION 2: PLANNING PROCESS

are accurately represented and act as a valuable resource to share information with those vulnerable populations.

The Planning Team worked to identify local agencies, organizations, and community leaders that focus on reaching vulnerable populations and underserved communities. These organizations were included in the planning process as stakeholders and were invited to participate in the planning process via email. These agencies were encouraged to post public planning meetings as well as solicit feedback via the public survey.

All stakeholders and Planning Team members were invited to participate in the development of the Plan Update during this process, including all public meetings, and surveys. All stakeholders are listed in Table 2-5 below. Some stakeholders have been detailed below along with the agency's mission, including:

- CAMAL House – Cuero Area Ministerial Alliance (CAMAL) House is a food pantry dedicated to providing nourishment, compassion, and dignified support to residents of Cuero, Texas. The organization has proudly served the people for over thirty years by supplying food items and toiletries to 250-400 households per month in De Witt County.²
- Central De Witt County Wildlife Management Association – The association is a nonprofit organization composed of over 265 members / landowners covering over 130,000 acres in Central, Eastern, and Northern De Witt County. This organization promotes Wildlife Education and Game Management for its members. Their goal is to assist with good land stewardship for the benefit of native Texas wildlife and to provide college scholarships to persons from De Witt and neighboring counties.³
- Cuero Development Corporation – The CDC works to provide economic services to those interested in starting up, relocating, or expanding a business to Cuero, Texas, by providing services such as workforce development initiatives, grant opportunities, and site selection assistance to meet the unique needs of clients. The corporation is dedicated to the promotion, enhancement, and development of economic growth in the community.⁴

In addition, public notices were posted on public bulletin boards throughout the planning area, such as at the Green-De Witt Drainage District office as well as posted on the participating jurisdictions' websites and social media platforms. For a sample of these postings, please see Appendix F. In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders and to obtain input and feedback on the Mitigation Plan. For each form of engagement, all efforts were made to reach De Witt County's underserved communities and vulnerable populations throughout the planning process. Additional survey information is provided at the end of this section.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and from various points of view. Throughout the planning process, members of community groups, local businesses, and neighboring jurisdictions

² Source: <https://camalhouse.com/>

³ Source: <https://cdcwma.com/>

⁴ Source: <https://cuerodc.com/>

SECTION 2: PLANNING PROCESS

were invited to participate in development of the Plan Update. The Stakeholder Group (Table 2-5) included a broad range of representatives from both the public and private sectors and served as a key component in De Witt County’s outreach efforts for development of the Plan Update. Documentation of stakeholder meetings is found in Appendix F. A list of organizations invited to attend via email is found in Table 2-5. Those that participated in the public meetings are identified with a plus symbol (+) next to their stakeholder type.

Table 2-5. Stakeholder Working Group

AGENCY	TITLE	STAKEHOLDER TYPE
American Red Cross Central and South Texas Region	Community Preparedness	Non-Profit / Community Organization
Camal House	Executive Director	Non-Profit / Community Organization
Central De Witt County Wildlife Management Association	General Representative	Non-Profit / Community Organization
City of Cuero	Electric Supervisor	Utility Provider
City of Cuero	Environmental Services Supervisor	Utility Provider
City of Cuero	Water and Wastewater Foreman	Utility Provider
City of Yoakum	City Administrator	Neighboring Jurisdiction
ConocoPhillips	Stakeholder Relations Director	Utility Provider
Cuero Community Foundation	Secretary	Non-Profit / Community Organization
Cuero Development Corporation	Executive Director	Regional and Local Agency
Cuero Fire Department	Firefighter	Local Department
Cuero Fire Department	Lieutenant Firefighter	Local Department
Cuero ISD	Police Chief	Academia
Cuero ISD	School Resource Officer (SRO)	Academia
Cuero ISD	Superintendent	Academia +
Cuero Municipal Library	Librarian	Community Organization
Cuero Regional Hospital	Chief Executive Officer	Healthcare Agency
Cuero Regional Hospital	Chief Nursing Officer	Healthcare Agency
Cuero Regional Hospital	Emergency Department Director	Healthcare Agency +

SECTION 2: PLANNING PROCESS

AGENCY	TITLE	STAKEHOLDER TYPE
Cuero Regional Hospital	Emergency Medical Services Director	Healthcare Agency +
Cuero Regional Hospital	Trauma / Disaster Director	Healthcare Agency +
Cuero VFD	Fire Chief	Community Organization
Devon Energy	Emergency Management Director	Utility Provider
Disaster Response Warehouse	General Representative	Community Organization +
De Witt Community Emergency Response Team (CERT)	General Representative	Community Organization +
De Witt County	Deputy Clerk	Local Department
De Witt County Today	Reporter	Community Organization
De Witt County Veteran Service Office	Veteran Service Officer	Regional and Local Agency
Environmental Protection Agency (EPA)	Director of Superfund and Emergency Management Division	Federal Agency
Environmental Protection Agency (EPA)	Regional Administrator	Federal Agency
Friends of De Witt County	President	Non-Profit / Community Organization
Golden Crescent Regional Advisory Council (GCRAC)	Regional Representative	Regional and Local Agency +
Goliad County	Emergency Management Coordinator	Neighboring Jurisdiction
Gonzales County	Emergency Management Coordinator	Neighboring Jurisdiction
Guadalupe River Authority	Safety Manager	Utility Provider
Habitat for Humanity	General Representative	Non-Profit / Community Organization
Karnes County	Emergency Management Coordinator	Neighboring Jurisdiction
Lavaca County	Emergency Management Coordinator	Neighboring Jurisdiction
Meyersville ISD	Superintendent	Academia
Meyersville VFD	Fire Chief	Community Organization +
National Weather Service (NWS)	Meteorologist In Charge	Federal Agency

SECTION 2: PLANNING PROCESS

AGENCY	TITLE	STAKEHOLDER TYPE
Nordheim ISD	Superintendent	Academia
Nordheim VFD	Fire Chief	Community Organization
Pecan Valley Groundwater Conservation District	Vice-Chairman	Utility Provider
Southwest Texas Regional Advisory Council (STRAC)	Hospital Preparedness Coordinator	Healthcare Agency +
Texas A&M AgriLife Extension	County Coordinator	State Agency
Texas A&M Forest Service	Program Coordinator Mitigation and Prevention	State Agency
Texas Commission on Environmental Quality, Region 9	Dam Safety Program	State Agency
Texas Commission on Environmental Quality, Region 9	Executive Assistant	State Agency
Texas Commission on Environmental Quality, Region 9	Regional Director	State Agency
Texas Department of Health and Human Services, Region 8	Emergency Preparedness Coordinator	State Agency
Texas Department of Health and Human Services, Region 8	Preparedness Manager	State Agency
Texas Department of Homeland Security	Media Representative	State Agency
Texas Department of Housing and Community Affair	Director of Single Family and Homeless Program	State Agency
Texas Department of Housing and Community Affair	Manager of Single-Family Program	State Agency
Texas Department of Transportation	Cuero Engineer	State Agency
Texas Department of Transportation	District Engineer	State Agency
Texas Division of Emergency Management (TDEM), Region 6	Assistant Chief	State Agency
Texas Division of Emergency Management (TDEM), Region 6	County Liaison Officer	State Agency +
Texas Division of Emergency Management (TDEM), Region 6	District Chief, 17	State Agency
Texas Division of Emergency Management (TDEM), Region 6	Section Chief for Recovery and Mitigation	State Agency
Texas State Representative	House District 30 – District Director	State Legislature

SECTION 2: PLANNING PROCESS

AGENCY	TITLE	STAKEHOLDER TYPE
Texas State Representative	House District 30 – Representative	State Legislature +
Texas State Senate	Senate District 18	State Legislature +
Texas State Soil & Water	Program Administrator and Regional Office Coordinator	State Agency
Texas State Soil & Water	Program Supervisor	State Agency
Texas Water Development Board	Assistant National Flood Insurance Program State Coordinator	State Agency +
Texas Water Development Board	Program Specialist	State Agency +
Thomaston VFD	Fire Chief	Community Organization
United Ways of the Crossroads	General Representative	Non-Profit / Community Organization
U.S. Army Corps of Engineers	Fort Worth & Galveston District	Federal Agency
U.S. Fish & Wildlife	Southwest Regional Representative	Federal Agency
Victoria County	Emergency Management Coordinator	Neighboring Jurisdiction +
Westhoff ISD	Superintendent	Academia
Westhoff VFD	Fire Chief	Community Organization
Yoakum EMS	Director	Community Organization
Yoakum VFD	Fire Chief	Community Organization
Yorktown Chamber of Commerce	General	Local Government
Yorktown Economic Development Corporation	Executive Director	Regional and Local Agency
Yorktown EMS	Director	Community Organization
Yorktown ISD	Police Chief	Academia +
Yorktown ISD	Superintendent	Academia
Yorktown Medical Clinic	Public Health Director	Healthcare Agency
Yorktown Public Library	General Representative	Community Organization
Yorktown VFD	Fire Chief	Community Organization

SECTION 2: PLANNING PROCESS

Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, hurricanes / tropical storms were a concern to stakeholders, so De Witt County included an action to harden critical facilities to hazard-resistant levels.

PUBLIC MEETINGS

A series of public meetings were held throughout the planning area to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of natural hazards. Each participating jurisdiction and the special district within De Witt County released information regarding the public meetings in their area to increase public participation in the Plan Update development process, through posting on their website, on social media sources, and/or posting the information on bulletin boards in public facilities. A sampling of these notices can be found in Appendix F , along with the documentation on the public meetings.

Public meetings were held on the following dates:

- July 8, 2025, at the Anne Friar Thomas Homemaking Building in the City of Cuero
- August 6, 2025, at the Anne Friar Thomas Homemaking Building in the City of Cuero

PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on participating jurisdictions' and the special district's websites. A total of 63 surveys were completed online. The survey results are presented in Appendix C. Participating jurisdictions and special district within De Witt County reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, results indicate that extreme heat and flood are the hazards of highest concern for the public. Protecting and strengthening critical facilities as well as constructing, maintaining, or protecting infrastructure were the two main actions indicated that the local government should take to mitigate risk to these hazards. As a result, the Planning Team has included mitigation actions to acquire and install generators with hard-wired quick connections at all critical facilities, along with relocating critical facilities out of high-hazard areas. Additional actions have been included to require standards for burial of electrical, telephone, cable lines, and other utilities in new developments and to purchase and install an I-Info alert system.



Section 3

County Profile

SECTION 3: COUNTY PROFILE

Overview.....	1
Population and Demographics	4
Special District Population	5
Population Growth	6
Economic Impact	6
Natural, Cultural, and Historic Resources.....	8
Existing Land Use and Development Trends	9
Changes in Vulnerability	11
Future Growth and Development	12

OVERVIEW

De Witt County is located in the Gulf Coastal Plain of southeastern Texas, approximately 45 miles inland from Copano Bay. It shares borders with Victoria, Goliad, Karnes, Gonzales, and Lavaca counties. The county seat and largest city is Cuero, which serves as the administrative and economic center of the area.

Long before modern settlement, the area supported diverse Indigenous communities. Archaeological evidence from sites within the present-day boundaries of De Witt County indicates that human habitation in the area dates back to the Paleo-Indian period. For thousands of years, the Guadalupe River served as a vital lifeline, sustaining communities and shaping patterns of settlement. In later periods, the region became home to Coahuiltecan-speaking people, most likely the Aranamas and Tamíques, and was later joined by other groups that frequently traversed the area, including the Karankawas and Tonkawas. Eventually, the arrival of the Apaches and Comanches—both known for their exceptional horsemanship—brought a new era of mobility and conflict, as their raiding skills made them dominant forces in the region. The first Europeans to enter the area were likely survivors of the ill-fated Narváez expedition in 1528.

Although the region now known as De Witt County saw its first permanent settlements as early as 1825, its official establishment as a county came later. In April of that year, empresario Green De Witt received a grant from the Mexican government to settle 400 families in the area between the Guadalupe and Lavaca Rivers. This effort was part of the broader colonization of Texas under Mexican rule. The first settlers arrived at the mouth of the Lavaca River, founding a community known as Old Station. Of the 179 settlers who claimed 199 land grants in De Witt's colony, 39 established homesteads within what is now De Witt County, most of them along the fertile banks of the Guadalupe River. Two principal settlements took root in this early period: the Irish Creek Settlement and the Upper Cuero Creek Settlement, founded in 1827.

Despite this early development, De Witt County's path to formal recognition involved a few legal and political turns. The first official version of the County, known as De Witt County (Judicial), was created on February 2, 1842. However, this early attempt was short-lived; it was declared unconstitutional later that year along with several other judicial counties. The modern De Witt County was officially established in 1846, carved from portions of Goliad, Gonzales, and Victoria

SECTION 3: COUNTY PROFILE

counties. It was named in honor of Green De Witt, the empresario whose efforts were instrumental in the early colonization and development of the region.

The 1840s proved to be a transformative decade for the County. Although a courthouse was initially constructed in the town of Cameron, the location of the county seat changed four times over the next few years. These shifts were driven by a series of elections, vote recounts, appeals, and the Texas Supreme Court ruling. On November 28, 1850, the county court convened in Clinton, near Chisholm's Ferry, and Clinton remained the county seat until 1876, when the title passed to Cuero. Notably, the first post office in the area was established in 1846 at Friar's Store and was named Cuero, making it one of the earliest U.S. post offices in Texas.

By 1850, De Witt County had a population of 1,716, which grew to 5,108 by 1860. During this time, livestock grazing formed the backbone of the local economy, while large-scale agriculture and industry began to develop in the post-Civil War years. Nonetheless, crops such as corn, cotton, and tobacco gained importance. The economic value of livestock in the county rose significantly, from \$160,055 in 1850 to \$721,826 in 1860, highlighting De Witt County's growing reputation as a leader in Texas's cattle industry.

The Civil War and the Reconstruction era brought major economic shifts. Although the population increased to 6,443 by 1870, the war disrupted trade and infrastructure. The railroad from Victoria to Indianola was destroyed in 1863, but was rebuilt by the federal government in 1866. This rail line, operated by the Gulf, Western Texas and Pacific, was the first to reach De Witt County and extended west to San Antonio. It played a critical role in establishing new towns, including Cuero, soon to become the county seat, and Thomaston and Burns Station (now Verhelle).

Rail expansion continued in the late 19th century. Between 1887 and 1888, the San Antonio and Aransas Pass Railway connected Cuero, Yorktown, and Nordheim to San Antonio, facilitating the growth of new communities such as Yoakum and Edgar. In 1907, the Galveston, Harrisburg and San Antonio Railway extended its line through De Witt County, linking Cuero to Stockdale via Lindenau. By January 1925, these three railroads had merged under the control of the Southern Pacific system and operated as the Texas and New Orleans Railroad. Passenger service remained active until November 1950.

The arrival of the railroads spurred rapid growth in both population and agriculture. Census records reflect this upward trend, with the County's population rising from 10,082 in 1880 to 14,307 in 1890, reaching 21,311 by 1900. During the same period, the number of farms doubled—from 1,181 in 1880 to 2,137 by 1900. By 1930, De Witt County had 3,548 farms, with 88 percent of its agricultural land and 200,432 acres under cultivation. The value of farms also increased dramatically, from \$1.4 million in 1880 to \$6.8 million in 1900, confirming agribusiness as the County's economic cornerstone.

Today, agriculture continues to be a primary driver of De Witt County's economy. In addition, the County has diversified into industries such as wood, furniture, and leather goods manufacturing,

SECTION 3: COUNTY PROFILE

cotton weaving, and oil and gas production, ensuring a more resilient economic foundation for the future.¹

Figure 3-1 shows the general location of De Witt County and the cities within the County.

Figure 3-1. Location of De Witt County

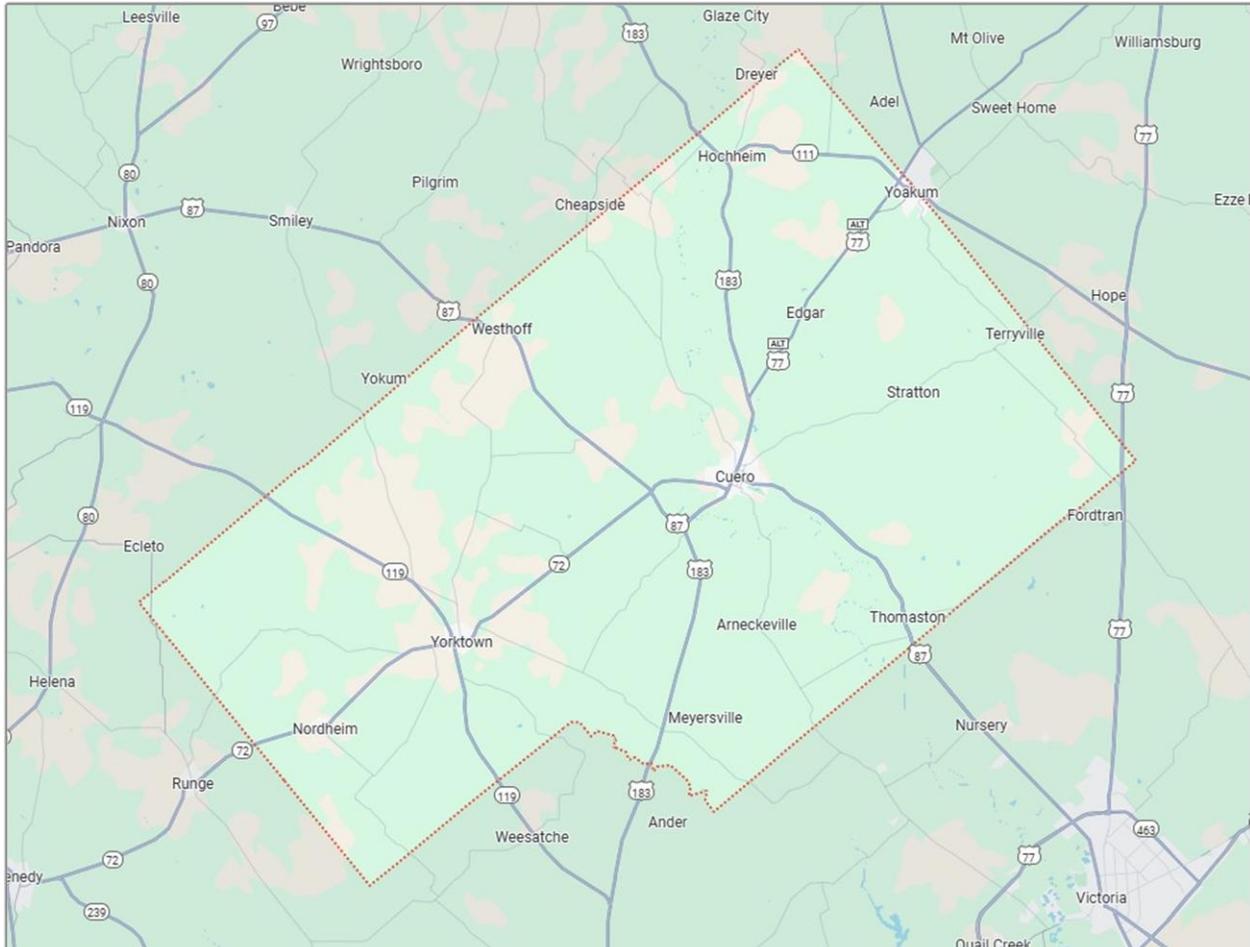


Table 3-1 below lists the jurisdictions and special district within De Witt County that participated in the De Witt County Hazard Mitigation Action Plan Update 2026.

Table 3-1. Participating Jurisdictions

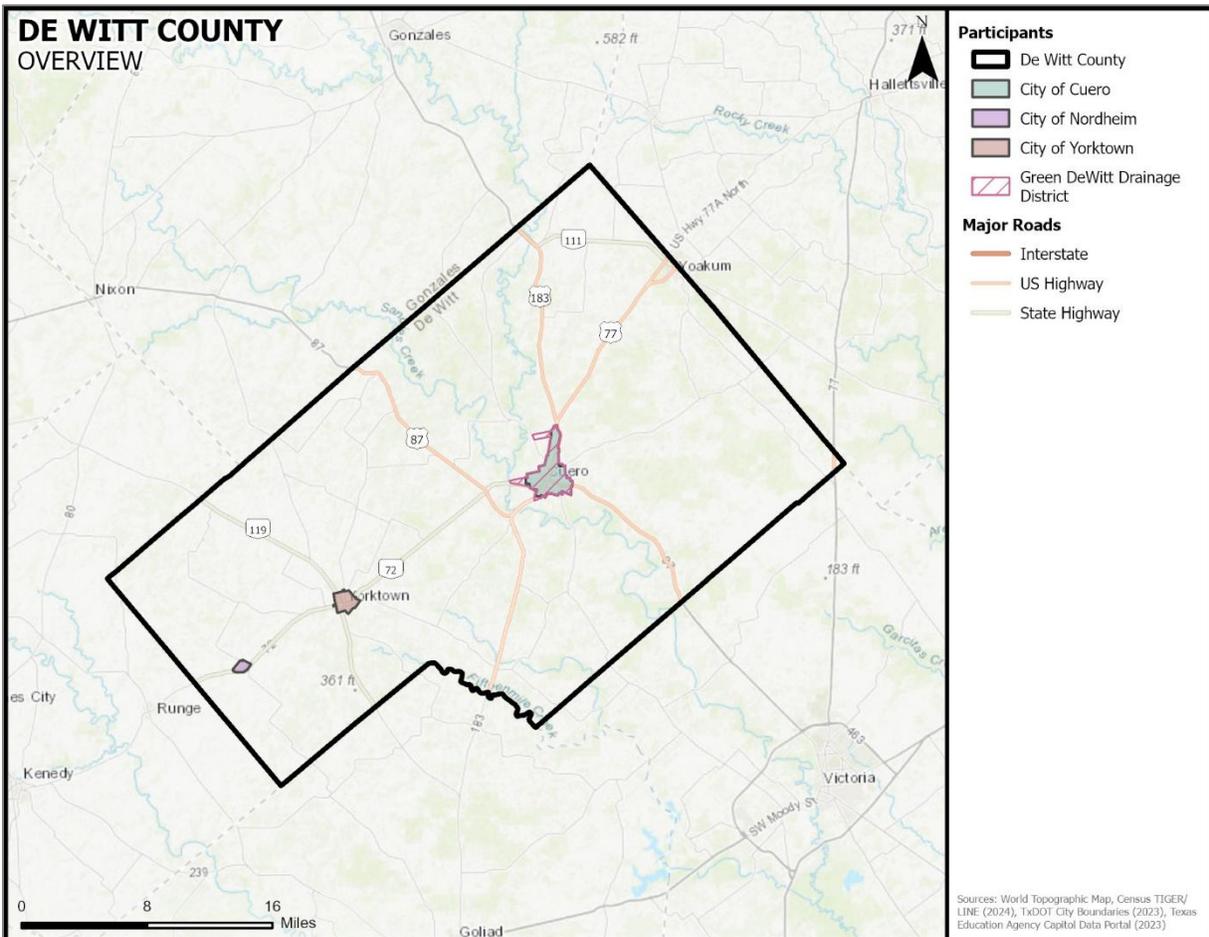
PARTICIPATING JURISDICTIONS	
De Witt County	
City of Cuero	City of Yorktown
City of Nordheim	Green-De Witt Drainage District

¹ Texas Historical Association: [https://www.tshaonline.org/handbook/entries/De Witt-county](https://www.tshaonline.org/handbook/entries/De-Witt-county)

SECTION 3: COUNTY PROFILE

Figure 3-2 shows the participating jurisdictions and special district within De Witt County that are covered in the risk assessment analysis of the Plan Update.

Figure 3-2. De Witt County Planning Area



POPULATION AND DEMOGRAPHICS

According to the 2020 Census, De Witt County has an official population of 19,824 residents, a one percent decrease since the 2010 census. Table 3-2 shows the population distribution in De Witt County and the participating jurisdictions in 2010, 2020 (Census population count), and 2023 (2023 American Community Survey (ACS) five-year estimates). Note that in some cases, the 2023 ACS estimates may differ from the 2020 census counts: the ACS estimates are used throughout this section for consistency.²

² Sources: <https://demographics.texas.gov/Data/Decennial/2010/>, <https://www.census.gov/en.html> and <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2023/>

SECTION 3: COUNTY PROFILE

Table 3-2. Population Distribution by Jurisdiction

JURISDICTION	TOTAL 2010 POPULATION (Census)	TOTAL 2020 POPULATION (Census)	TOTAL 2023 POPULATION (ACS Estimates)	POPULATION CHANGE (Percent)	
				2010-2020	2010-2023
De Witt County ³	20,097	19,824	19,853	-1	-1
City of Cuero	6,841	8,128	8,147	19	19
City of Nordheim	307	336	491	9	60
City of Yorktown	2,092	1,810	1,987	-13	-5

Table 3-3 summarizes select characteristics of vulnerable or sensitive populations in De Witt County and the participating jurisdictions using data from the U.S. Census Bureau 2023 American Community Survey (ACS) five-year estimates. Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate, and many variables are involved in achieving an accurate estimation of the number of people living in a given area at a given time.

Table 3-3. Populations at Greater Risk by Jurisdiction

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County ⁴	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

SPECIAL DISTRICT POPULATION

As shown above, Figure 3-2 shows the participating special district, Green-De Witt Drainage District, which is covered in the risk assessment analysis of the De Witt County Hazard Mitigation Action Plan Update 2026.

Established in 1914, the Green-De Witt Drainage District is a political subdivision of the State of Texas, operating within a jurisdictional area similar to that of Cuero, Texas. The District is committed to improving its ability to efficiently manage excess stormwater and to be proactive in its approach to this goal. The drainage district's mission is to "provide, improve, and maintain the

³ Note: County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

⁴ Note: County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

SECTION 3: COUNTY PROFILE

drainage systems within its jurisdiction, resulting in increased safety and enhanced quality of life within the community."⁵

Table 3-4 provides the number of people employed, population served, and vulnerable or sensitive populations as provided by the District.

Table 3-4. Special District Population

SPECIAL DISTRICT	EMPLOYEES	POPULATION SERVED	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS
			STAFF WORKS OUTDOORS
Green-De Witt Drainage District	5	8,204	3

POPULATION GROWTH

The official 2020 De Witt County population is 19,824. Overall, De Witt County experienced a population increase of 5 percent between 1990 and 2020, or 984 residents. Between 2010 and 2020, the Cities of Cuero and Nordheim experienced a population increase, while De Witt County and the City of Yorktown experienced slight population decreases. Table 3-5 provides historical growth rates in De Witt County.

Table 3-5. Population Growth by Jurisdiction 1990-2020⁶

JURISDICTIONS	1990	2000	2010	2020	POPULATION CHANGE			
					1990-2020	PERCENT	2010-2020	PERCENT
De Witt County ⁷	18,840	20,013	20,097	19,824	984	5	-273	-1
City of Cuero	6,700	6,571	6,841	8,128	1,428	21	1,287	19
City of Nordheim	344	323	307	336	-8	-2	29	9
City of Yorktown	2,207	2,271	2,092	1,810	-397	-18	-282	-13

ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore protecting infrastructure from risk due to natural hazards in the planning area is important to the participating jurisdictions within De Witt County. Whether it's expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

⁵ Source: <https://greenddd.com/>

⁶ U.S. Census Bureau

⁷ Note: County totals include the entire population within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

SECTION 3: COUNTY PROFILE

Based on the American Community Survey 2023 estimates, 47.7 percent of the population 16 years and over (15,874) is employed in the labor force. The per capita income is \$30,723 and the median household income countywide is \$64,014. Families with incomes below the poverty level in 2023 made up 12.9 percent of all families. Of families that have children under 18 years old, 19.5 percent are below the poverty level.

Tables 3-6 and 3-7 show the various occupations and industries within De Witt County, according to the 2023 estimates by the American Community Survey.

Table 3-6. Occupations of Employed Population in De Witt County⁸

OCCUPATION	ESTIMATE	PERCENT
Civilian employed population 16 years and over	7,579	
Management, business, science, and arts occupations	2,205	29.1
Sales and office occupations	1,666	22.0
Service occupations	1,388	18.3
Production, transportation, and material moving occupations	1,271	16.8
Natural resources, construction, and maintenance occupations	1,049	13.8

Table 3-7. Industries of Employed Population in De Witt County⁹

INDUSTRY	ESTIMATE	PERCENT
Civilian employed population 16 years and over	7,579	
Educational services, health care, and social assistance	1,864	24.6
Retail trade	1,048	13.8
Agriculture, forestry, fishing and hunting, and mining	788	10.4
Transportation and warehousing, and utilities	676	8.9
Arts, entertainment, and recreation, and accommodation and food services	656	8.7
Other services, except public administration	517	6.8
Manufacturing	502	6.6
Construction	480	6.3
Public administration	359	4.7
Finance and insurance, and real estate and rental and leasing	238	3.1

⁸ U.S. Census Bureau: 2023 American Community Survey 5-Year Estimates Data Profiles.

⁹ U.S. Census Bureau: 2023 American Community Survey 5-Year Estimates Data Profiles.

SECTION 3: COUNTY PROFILE

INDUSTRY	ESTIMATE	PERCENT
Professional, scientific, and management, and administrative and waste management services	216	2.8
Wholesale trade	202	2.7
Information	33	0.4

NATURAL, CULTURAL, AND HISTORIC RESOURCES

De Witt County experiences a humid subtropical climate characterized by hot summers and mild winters. Average temperatures range from a high of 96°F in July to a low of 44°F in January. Extreme temperatures have been recorded as low as 2°F in 1949 and as high as 110°F in 1954. The County enjoys a long growing season, with an average frost-free period of approximately 270 days, typically lasting from early March through late November.

Annual precipitation in the region averages 33.37 inches, most of which falls in thundershowers, contributing to the area's lush vegetation and agricultural productivity. The majority of De Witt County is drained by the Guadalupe River and its many tributaries, including various branches of Coletto Creek, as well as Sandies, Salt, Smith, McCoy, Irish, Cuero, and Clear creeks. Other river systems also influence smaller portions of the County, with the Lavaca River draining areas in the north and the San Antonio River covering a small section in the south.

One of the primary draws for outdoor enthusiasts in De Witt County is fishing and boating. The Guadalupe River, which flows along the County's eastern edge, provides excellent opportunities for freshwater fishing, kayaking, and canoeing. Anglers can catch catfish, bass, and sunfish in the river, especially near Cuero and Thomaston. Some smaller creeks and stock tanks throughout the County also offer quiet spots for fishing.

Thanks to its diverse wildlife population and abundant rural land, hunting is a significant recreational activity in De Witt County. White-tailed deer, wild hogs, doves, and turkeys are common game animals, and many local ranches offer seasonal hunting leases or guided hunts. The fall and winter months are especially popular for deer hunting, attracting hunters from across Texas.

For those who enjoy hiking and nature observation, the Cuero Municipal Park and Cuero City Lake provide trails and open areas for walking, birdwatching, and other outdoor activities, with the lake offering additional opportunities for light water recreation. The region's natural vegetation includes oak woodlands, open prairies, and brushlands that support a variety of birds and other wildlife, making it an appealing destination for birdwatchers and photographers. Camping opportunities are available with RV parks and camping areas near Cuero and the Guadalupe River.

In spring, the region becomes a hotspot for wildflower viewing, including bluebonnets and Indian paintbrush. Scenic drives through the County's rural roads are ideal for enjoying these seasonal displays. The annual Cuero Wildflower Trail, promoted locally, helps visitors find the best spots for viewing.

SECTION 3: COUNTY PROFILE

De Witt County is also known for preserving Texas history and culture; several outdoor spaces reflect this. The Cuero Heritage Museum and historic downtown Cuero are often included in scenic walking or driving tours.

To further understand natural resources that may be vulnerable to a hazard event and those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. A federally endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by federal law, and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

According to the U.S. Fish and Wildlife Service, as of November 2025, there are six federally endangered, threatened, or candidate species in De Witt County, listed in Table 3-8. Additionally, one species is listed as being resolved (Golden Orb) and one species is listed as in recovery (Bald Eagle).

Table 3-8. Endangered Species in De Witt County¹⁰

TYPE OF SPECIES	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
Clams	False Spike	Fusconaia mitchelli	Endangered
Clams	Guadalupe Orb	Cyclonaias necki	Endangered
Birds	Whooping Crane	Grus americana	Endangered
Mammals	Tricolored Bat	Perimyotis subflavus	Proposed Endangered
Birds	Rufa Red Knot	Calidris canutus rufa	Threatened
Insects	Monarch Butterfly	Danaus plexippus	Proposed Threatened

De Witt County's designated historic buildings and sites preserve a rich history. The County has 83 historic buildings and sites, as noted by the Cuero Chamber of Commerce¹¹. Historic buildings are vulnerable to natural hazards as their construction pre-dates modern building codes. There are also historic preservation considerations and requirements for historic structures when they are included in mitigation or recovery projects.

EXISTING LAND USE AND DEVELOPMENT TRENDS

A zoning ordinance sets forth regulations and standards related to the extent of land and structure uses that are allowed in certain areas. A zoning map shows the location of zoning districts and standards within a community, gives an overall picture of the types of developments, and is used

¹⁰ U.S. Fish and Wildlife Service: <https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=48123>

¹¹ Cuero Chamber of Commerce: <https://cuero.org/wp-content/uploads/2021/04/Historic-Sites-Narratives-1.pdf>

SECTION 3: COUNTY PROFILE

as a tool to inform continued growth efforts and initiatives. De Witt County and the City of Cuero have zoning ordinances in place.

A review of housing can also give a picture of the built environment and the changes in vulnerability to various hazards in a jurisdiction. Table 3-9 lists the total housing units for each jurisdiction, where data was available, between 2019 and 2023, utilizing 2020 Decennial Census data and American Community Survey (ACS) five-year estimates. Between official U.S. Census counts, the estimates use a formula based on the applicable Decennial Census Housing Units count, new residential construction, new mobile homes, and housing unit loss. The census data “residential construction” category calculates building permits issued utilizing permitted construction counts as well as permit completion rates. Estimates of decreasing housing units are computed by applying an annual loss rate to the housing stock. The rate is then added to an estimate of the number of units lost due to natural disasters. Housing loss rates are derived from prior American Housing Survey (AHS) at the regional level. A unit is counted as lost if a survey was completed in the AHS, but it was listed as a non-response (Type C, 30- Demolished) in the subsequent survey, indicating a permanent loss to the housing stock.¹² It is simply an estimate, and many variables are involved in achieving an accurate estimation of the number of housing units in a given area at a given time.

Table 3-9. Total Housing Units by Jurisdiction, 2019-2023¹³

JURISDICTION	TOTAL HOUSING UNITS					CHANGE 2019-2023	PERCENT OF CHANGE
	2019	2020	2021	2022	2023		
De Witt County ¹⁴	9,252	9,182	9,194	9,180	9,222	-30	0
City of Cuero	2,885	3,071	3,108	3,125	3,094	209	7
City of Nordheim	158	171	248	255	276	118	75
City of Yorktown	1091	969	1,132	1,057	1,003	-88	-8

Certain types of housing found in the De Witt County planning area are more vulnerable than typical site-built, newly constructed residential structures. This includes mobile or manufactured homes, of which 1,475 (approximately 16 percent of total housing stock) are in the planning area. Additionally, single-family residences (SFR) built before 1980 are typically built to lower or less stringent construction standards than newer construction, making these homes more susceptible to damage during hazard events. These older homes comprise 56 percent (9,222 structures) of housing stock in the planning area. Table 3-10 includes housing inventory data for the participating jurisdictions, per the 2023 American Community Survey five-year estimates.

¹² U.S. Census Bureau: <https://www.census.gov/programs-surveys/popest/technical-documentation/methodology.html>

¹³ U.S. Census Bureau: <https://www.census.gov>

¹⁴ Note: County totals include all housing units within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

SECTION 3: COUNTY PROFILE

Table 3-10. Housing Inventory and Vulnerable Structures by Jurisdiction¹⁵

JURISDICTION	HOUSING UNITS		
	TOTAL	SFR BUILT PRIOR TO 1980	MANUFACTURED HOMES
De Witt County ¹⁶	9,222	5,201	1,475
City of Cuero	3,094	1,895	399
City of Nordheim	276	175	100
City of Yorktown	1,003	834	81
Green-De Witt Drainage District	-	2	0

CHANGES IN VULNERABILITY

The De Witt County planning area experienced an overall population decrease of one percent between 2010 and 2020. The American Community Survey estimates the 2023 total housing units for the planning area to be 19,222, indicating no substantial change since 2019. The minimal change in population, combined with the slight increase in housing units, indicates a slight increase in vulnerability to all hazards in terms of populations and the built environment. Changes in vulnerability vary by jurisdiction based on each jurisdiction’s trends in population and development (Table 3-11).

Table 3-11. Changes in Vulnerability by Jurisdiction

JURISDICTION	POPULATION TREND	HOUSING TREND	CHANGES IN VULNERABILITY
De Witt County	Decrease	No Change	No Change
City of Cuero	Increase	Increase	Increase
City of Nordheim	Increase	Increase	Increase
City of Yorktown	Decrease	Decrease	No Change

Changes in vulnerability are applicable to all natural hazards except when discussing dam failure as vulnerability for this hazard is discussed in relation to changes in the estimated inundation areas for profiled dams. For the two dams profiled in Section 5, there is no known increase in vulnerability in the estimated inundation areas. While flood and wildfire hazards feature geographical boundaries, increases in population and building inventory can increase overall vulnerability for these hazards even when the trends occur outside of the known hazard boundary. Development decreases permeable surface areas and increases runoff, increasing flood risk. As

¹⁵ Note: The Housing Inventory and Vulnerable Structures are based off the 2023 American Community Survey 5-Year Estimates Data Profiles. The participating district does not have housing units; however, they did provide buildings built prior to 1980 and mobile buildings.

¹⁶ Note: County totals include all housing units within the county lines, including unincorporated areas and non-participating jurisdictions within the County.

SECTION 3: COUNTY PROFILE

population density increases, the Wildland Urban Interface (WUI) typically increases. WUI growth often results in more wildfire ignitions, which puts more houses and lives at risk.

FUTURE GROWTH AND DEVELOPMENT

To better understand how future growth and development in De Witt County might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Population projections from 2020 to 2060 are listed in Table 3-14, provided by the Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research. Projections are based on the 0.5 migration scenario, which assumes that future net migration will occur at fifty percent of the rate observed from 2000 to 2010. The total population growth rate accounts for natural increase (births minus deaths) as well as net migration. This information is only available at the county level; however, the population projection shows no notable change in population density, which would indicate no known change in vulnerability for the County.

Table 3-12. De Witt County Population Projections¹⁷

LAND AREA (square miles)	2020		2030		2040		2050		2060	
	POPULATION									
	Total Number	Density								
909.00	19,824	21.81	19,716	21.69	19,687	21.66	19,565	21.52	19,482	21.43

Comprehensive Plans are guiding documents in a community that set forth a vision, goals, policies, and guidelines to direct future physical, social, and economic development within a jurisdiction. They are part of a continuous process to provide a sustainable environment for citizens and consider the general desire of the community to conserve, preserve, and protect the natural environment of their jurisdiction. These plans present a future vision for each participating jurisdiction and special district, outlining recommendations on growth, community character, infrastructure, land use, economic development, zoning, mobility, and public facilities, while guiding staff, decision-makers, and citizens to weigh choice with an eye toward the future. The City of Cuero has a Comprehensive Plan in place. Refer to the Capability Assessment in Appendix G for a complete list of the plans, ordinances, and other resources for all participating jurisdictions and the special district.

¹⁷ Sources: Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research.



Section 4

Risk Overview

SECTION 4: RISK OVERVIEW

Hazard Description	1
Disaster Declaration History	4
Natural Hazards and Climate Change	6
Overview of Hazard Analysis	8
Hazard Ranking	9
Risk Assessment Resources and Data Limitations	10
Assumptions	11

HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment, providing background information for the hazard identification process and descriptions of the hazards identified. The Risk Assessment continues with Sections 5 through 17 and Appendix A, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating jurisdictions and special district within De Witt County identified 13 natural hazards that are addressed in the Hazard Mitigation Plan Update, and were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2023 State of Texas Hazard Mitigation Plan (State Plan). Readily available online information from reputable sources such as federal and state agencies was also evaluated and utilized to supplement information as needed.

In general, there are four main categories of natural hazards: atmospheric, geologic, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather-generated phenomena. The following have been identified as significant for the planning area: extreme heat, hail, hurricane / tropical storm, lightning, thunderstorm wind, tornado, and winter storm (Table 4-1).

Geologic hazards are events or incidents associated with the earth's crust. The geologic hazards identified as significant for the planning area are earthquake and expansive soils.

Hydrologic hazards are events or incidents associated with water-related damage and account for over 75 percent of federal disaster declarations in the United States. Hydrologic hazards identified as significant for the planning area include drought and flood.

Technological hazards refer to the origins of incidents that can arise from human activities, such as the construction and maintenance of dams. They are distinct from natural hazards primarily because they originate from human activity. Human activity may increase or decrease the risks presented by natural hazards; however, they are not inherently human-induced. Therefore, dam failure is classified as a quasi-technological hazard and referred to as "technological" in Table 4-1 for description purposes.

For the Risk Assessment, the wildfire hazard is considered "other" since this hazard is not considered atmospheric, geologic, hydrologic, or technological.

Human-caused hazards are events or incidents caused by human intent, human error, or failed systems. They can be caused or exacerbated by accidental or intentional human actions that

SECTION 4: RISK OVERVIEW

result in the loss of life or property. Appendix A includes the following human-caused hazards: civil unrest, hazardous materials, infectious disease, pipeline failure, and terrorism.

Table 4-1. Hazard Descriptions

HAZARD	DESCRIPTION
Atmospheric	
Extreme Heat	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period of time.
Hail	Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.
Hurricane/Tropical Storm	A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Thunderstorm Wind	Thunderstorm winds, often referred to as straight-line winds, are produced by severe thunderstorms and can reach speeds exceeding 100 mph. These winds are often caused by downbursts or microbursts, which are powerful columns of air that descend from a storm and spread outward upon hitting the ground. They can cause damage patterns similar to tornadoes but occur without rotation, spreading out in a straight path. Contrastingly, high wind events can occur in the absence of other definable hazard conditions, developing from strong pressure systems or terrain effects and causing similar impacts, especially in exposed or rural areas.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the location, intensity, size, and duration of the storm.

SECTION 4: RISK OVERVIEW

HAZARD	DESCRIPTION
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 mph, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
Geologic	
Earthquake	An earthquake is the sudden, rapid shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds.
Expansive Soils	Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Changes in soils volume present a hazard primarily to structures built on top of expansive soils.
Hydrologic	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.
Other	
Wildfire	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors.

SECTION 4: RISK OVERVIEW

HAZARD	DESCRIPTION
Technological	
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam.

Hazards that were not considered significant and were not included in the Plan Update are located in Table 4-2, along with the evaluation process used for determining the significance of each of these hazards. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

Table 4-2. Other Hazards Deferred

HAZARD CONSIDERED	REASON FOR DETERMINATION
Coastal Erosion	The planning area is not located on the coast. Therefore, coastal erosion does not pose a risk.
Land Subsidence	The planning area has no historical land subsidence occurrences, and it is in an area where occurrences are considered rare. Land subsidence has not impacted critical structures, systems, populations, or other community assets or vital services in the past and are not expected to do so in the future.

DISASTER DECLARATION HISTORY

One method of understanding hazards that pose a risk to De Witt County is to identify past hazard events that triggered federal or state disaster declarations. Federal and state declarations may be granted when the severity and magnitude of an event surpass the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. Table 4-3 lists state and federal disaster declarations received by De Witt County. Many of the disaster events were regional or statewide.

Between 1953 and November 2025, De Witt County received 22 federal disaster declarations. The largest share (9) was related to hurricanes, followed by declarations for floods (4), fire (2), biological (2), severe storms (2), severe ice storms (2), and drought (1).

Table 4-3. Disaster Declaration History of De Witt County, 1953- November 2025¹

YEAR	DECLARATION TITLE	HAZARD	DECLARATION TYPE	DISASTER NO.
1967	Hurricane Beulah	Hurricane	DR	DR-232
1991	Severe Thunderstorms	Flood	DR	DR-930

¹ FEMA: <https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2>

SECTION 4: RISK OVERVIEW

YEAR	DECLARATION TITLE	HAZARD	DECLARATION TYPE	DISASTER NO.
1993	Extreme Fire Hazard	Drought	EM	EM-3113
1994	Severe Thunderstorms and Flooding	Flood	DR	DR-1041
1998	Tropical Storm Charley	Severe Storm	DR	DR-1239
1998	Severe Storms, Flooding, and Tornadoes	Flood	DR	DR-1257
1999	Extreme Fire Hazards	Fire	EM	EM-3142
2002	Severe Storms and Flooding	Flood	DR	DR-1425
2003	Hurricane Claudette	Hurricane	DR	DR-1479
2005	Hurricane Katrina Evacuation	Hurricane	EM	EM-3216
2005	Hurricane Rita	Hurricane	EM	EM-3261
2005	Hurricane Rita	Hurricane	DR	DR-1606
2006	Extreme Wildfire Threat	Fire	DR	DR-1624
2008	Hurricane Gustav	Hurricane	EM	EM-3290
2008	Hurricane Ike	Hurricane	EM	EM-3294
2015	Severe Storms, Tornadoes, Straight-Line Winds, and Flooding	Severe Storm	DR	DR-4223
2017	Hurricane Harvey	Hurricane	DR	DR-4332
2020	Covid-19	Biological	EM	EM-3458
2020	Covid-19 Pandemic	Biological	DR	DR-4485
2021	Severe Winter Storm	Severe Ice Storm	EM	EM-3554
2021	Severe Winter Storms	Severe Ice Storm	DR	DR-4586
2024	Hurricane Beryl	Hurricane	DR	DR-4798

In addition to the 22 federally declared disasters, there have been 31 U.S. Department of Agriculture (USDA) Secretarial disaster designations between 2012 and 2025. The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. Of the 31 USDA designations for De Witt County, many listed multiple factors as having caused the disaster area designation. The leading cause was drought, which was

SECTION 4: RISK OVERVIEW

included in 27 designations. Other factors listed include excessive heat (8 designations), high wind (6), fire / wildfire (6), insects (6), and excessive rain (3).²

NATURAL HAZARDS AND CLIMATE CHANGE

Climate change is defined as a long-term shift in temperature and weather patterns. These shifts can increase or decrease the risk of natural hazards. Global climate change is expected to exacerbate the risks of certain types of natural hazards impacted by rising sea levels, warmer ocean temperatures, higher humidity, the possibility of stronger storms, and an increase in wind and flood damage due to storm surges. Texas is considered one of the more vulnerable states in the U.S. to both abrupt climate changes and the impact of gradual climate changes on the natural and built environments.

Climate change is expected to lead to an increase in average temperatures as well as an increase in the frequency, duration, and intensity of extreme heat events. With no reductions in emissions worldwide, the state of Texas is projected to experience an additional 30 to 60 days per year above 100°F than what is experienced now.³

The State Climatologist's *Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036* identifies ongoing and likely future trends through 2036 based on analysis of historical observations of temperatures, precipitation, and extreme weather. Table 4-4 highlights future trends in extreme weather from the report.

Table 4-4. Future Trends in Extreme Weather in Texas⁴

HAZARDS	EXPECTED TRENDS
Extreme Temperatures	<ul style="list-style-type: none">• The average annual surface temperature in 2036 is expected to be 3.0°F warmer than the 1950-1999 average and 1.8°F warmer than the 1991-2020 average.• The number of 100°F days is projected to double by 2036, with urban areas experiencing a higher frequency due to the urban heat island effect.• Fewer cold extremes and warmer minimum temperatures are projected, suggesting a continued decrease in freezing conditions and frost days, as well as a warming trend for the coolest days of summer.• The number of heatwaves per year and number of days per year classified as heatwaves are expected to increase.

² United States Department of Agriculture: <https://www.fsa.usda.gov/resources/disaster-assistance-program/disaster-designation-information>

³ Kloesel, K., B. Bartush, J. Banner, D. Brown, J. Lemery, X. Lin, C. Loeffler, G. McManus, E. Mullens, J. Nielsen-Gammon, M. Shafer, C. Sorensen, S. Sperry, D. Wildcat, and J. Ziolkowska, 2018: Southern Great Plains. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 987–1035. doi: 10.7930/NCA4.2018.CH23. <https://nca2018.globalchange.gov/chapter/23/>

⁴ Nielsen-Gammon, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. *Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update*. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>

SECTION 4: RISK OVERVIEW

HAZARDS	EXPECTED TRENDS
	<ul style="list-style-type: none"> Data suggests a recent increase in both the severity and frequency of extreme heat, while extreme cold has decreased in both aspects.
Precipitation	<ul style="list-style-type: none"> Precipitation has increased by 10 percent or more in eastern Texas, but no significant trends are evident in western Texas. Natural variability will substantially influence precipitation trends through 2036. Extreme precipitation has already intensified by about 7 percent from 1960 to 2020 and is projected to continue increasing statewide—by 6-10 percent in intensity relative to 1950–1999 (2-3 percent relative to 2001–2020), and by 30-50 percent in frequency compared to 1950–1999 (10-15 percent compared to 2001–2020).
Drought	<ul style="list-style-type: none"> Projected increases in temperature, rainfall variability, and other factors, such as improved plant water use efficiency, collectively indicate a decrease in water availability; however, the extent of this impact varies significantly across regions and applications. Sector-based variance in impact trends is expected, with agricultural areas potentially experiencing less impact than surface water supply.
Flood	<ul style="list-style-type: none"> Observational data suggests no long-term trend in river flooding, and this remains consistent for current projections, barring areas with normally high rainfall or for the most extreme flood events. Urban flooding is projected to increase due to both population growth and rising precipitation intensity, particularly in areas with fast-response drainage systems. The climate-driven trend in urban flood frequency should be similar to the climate-driven trend in extreme precipitation frequency: 30-50 percent in 2036 relative to 1950-1999 and 10-15 percent relative to 2001-2020. Areas already experiencing flooding are likely to see an increase in the frequency and magnitude of events.
Winter Weather	<ul style="list-style-type: none"> As the climate warms, the likelihood of winter weather decreases. Widespread snowfall events in Texas, such as the one in February 2021, remain extremely rare and have not shown an increase in frequency. However, with rising air temperatures, a decrease in both the frequency and intensity of such events is expected, reducing the overall snow hazard. Extreme cold has become less frequent and less severe overall but is subject to more variation than other temperate extremes, thus, massively cold temperatures will continue to be possible.
Thunderstorms (Wind, Hail, Lightning)	<ul style="list-style-type: none"> The evolution of reporting methods and magnitude scales, along with inconsistencies in observational data, has resulted in the absence of reliable, comprehensive records, limiting the ability to project trends and necessitating the use of indirect indicators. Indirect evidence supports an increase in the number of days capable of producing severe thunderstorms and very large hail; however, a substantial basis to quantify these trends remains lacking.

SECTION 4: RISK OVERVIEW

HAZARDS	EXPECTED TRENDS
Wildfire	<ul style="list-style-type: none"> • Reductions in precipitation, rising temperatures, increased surface dryness, stronger winds, lower humidity, and higher fuel loads are projected to vary in intensity across different regions of Texas, leading to non-uniform increases in wildfire risk. • The geographical boundaries of the area of the state commonly affected may expand.

OVERVIEW OF HAZARD ANALYSIS

The methodologies utilized to develop the Risk Assessment are a historical analysis and a statistical approach. Both methodologies provide an estimate of potential impact by using a common, systematic framework for evaluation.

Records retrieved from the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA) were reported for the participating jurisdictions and district within De Witt County. The remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated.

Geographic information system (GIS) technology was used to identify and assess risks for De Witt County and evaluate community assets and their vulnerability to hazards.

The four general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of the general vulnerability, and a statement of the hazard's impact.

The frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database was recording events. Frequency of return statements are defined in Table 4-5, and impact statements are defined in Table 4-6 below.

Table 4-5. Frequency of Return Statements

PROBABILITY	DESCRIPTION
Highly Likely	Event is probable in the next year.
Likely	Event is probable in the next three years.
Occasional	Event is probable in the next five years.
Unlikely	Event is probable in the next ten years.

SECTION 4: RISK OVERVIEW

Table 4-6. Impact Statements

POTENTIAL SEVERITY	DESCRIPTION
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities between one and four weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for up to one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and illnesses are treatable with first aid. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damage from a hazard based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damage, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community. Risk and consequences will be addressed and covered within each hazard profile under the Vulnerability and Impact section as well as under the Assessment of Impacts section, where applicable.

To better understand how future growth and development in the De Witt County region might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for all participating jurisdictions and the special district within De Witt County was reviewed based on recent development changes that occurred throughout the planning area. The population of De Witt County declined by one percent between 2010 and 2020, according to the U.S. Census Bureau. Therefore, the vulnerability to the population, infrastructure, and buildings has remained essentially unchanged for hazards that do not have a geographical boundary.

Once loss estimates and vulnerability were known, an impact statement was applied to relate the potential impact of the hazard on the assets within the area of impact.

HAZARD RANKING

During the 2025 planning process, the Planning Team conducted a risk ranking exercise to get input from the Planning Team and stakeholders. Table 4-7 portrays the results of the risk assessment analysis, including the frequency of occurrence and potential severity and the Planning Team’s self-assessment for hazard ranking based on local knowledge of past hazard events and impacts for each identified hazard. The definitions for frequency of occurrence and potential severity can be found in Table 4-5 and Table 4-6.

SECTION 4: RISK OVERVIEW

Table 4-7. Hazard Risk Ranking

HAZARD	FREQUENCY OF OCCURRING	POTENTIAL SEVERITY	RANKING
NATURAL HAZARDS			
Drought	Highly Likely	Limited	High
Extreme Heat	Highly Likely	Limited	High
Lightning	Highly Likely	Limited	High
Flood	Highly Likely	Substantial	Moderate
Hail	Highly Likely	Limited	Moderate
Hurricane / Tropical Storm	Occasional	Limited	Moderate
Thunderstorm Wind	Highly Likely	Limited	Moderate
Wildfire	Highly Likely	Limited	Moderate
Winter Storm	Likely	Limited	Moderate
Dam Failure	Unlikely	Limited	Low
Earthquake	Likely	Limited	Low
Expansive Soils	Highly Likely	Limited	Low
Tornado	Likely	Limited	Low

RISK ASSESSMENT RESOURCES AND DATA LIMITATIONS

The risk and vulnerability assessment relies heavily on the content of the National Oceanic and Atmospheric Administration (NOAA) National Center for Environmental Information (NCEI) Storm Events Database. This database covers weather-related hazards that affect the planning area and that are profiled in this Plan including winter weather (extreme cold and winter storm), drought, hail, lightning, thunderstorm wind, flood, extreme heat, hurricane / tropical storm, and tornado. Other hazards were analyzed using databases containing more comprehensive historical data specific to Texas such as the Texas A&M Forest Service (TFS) for wildfires or the Texas Geological Survey for expansive soil hazards. Historical dam incidents, including failures, were researched through the Association of State Dam Safety Officials database.

The NCEI Storm Events Database is a rich centralized repository of nationwide weather-related hazard events. Among other things, it is the source used by NOAA to populate its monthly storm data publication. The database contains recorded weather events of significance based on a range of potential criteria including intensity, duration, damages, injuries, or other noteworthy events. The history of data available in the NCEI database allows the study of impacts of individual hazards over an extended period of time. This data contributes to the framework for understanding relative risks over time.

SECTION 4: RISK OVERVIEW

While the NCEI is considered one of the most comprehensive national historical event databases it is not without limitations. Records of historical occurrences in the state show significant variations in the number of events recorded from one county to the next. Further research shows that the variations are more attributable to under-reporting of events than variations in weather occurrences. Only the events that have been reported or recorded in the database are factored into the risk assessment when no other reliable resources are available. It is accurate to assume that additional natural hazard occurrences have gone unreported or have been underreported. The risk assessment in this plan is considered the baseline for estimating potential future losses and frequency of events, which are assumed to be the minimum the planning area can anticipate. Additionally, significant events may be reported by both the county and local jurisdictions. This is due to reports from various locations impacted by a given event.

Finally, damages are not reported for the majority of events recorded in the NCEI, as property damage estimates are not always available. Natural hazard event damages are often covered by private insurance and statistical insurance data is not readily available in the public domain. The National Weather Service (NWS) regional forecast coordinators utilize the resources available to them to describe damages or impacts of events. However, local input is key to assigning damages to historical events.

ASSUMPTIONS

Event data is often reported at the county level only. This is primarily due to the nature of most natural hazards impacting areas larger than a single municipality. Winter storms or extreme heat, for example, impact large regions and are not confined to a single location. NWS regional coordinators typically gather event data from countywide or regional reporting and record it accordingly. Some exceptional events are captured by NWS regional coordinators when the impact of the event is severe or catastrophic. However, most events recorded at the municipality level are conveyed by local officials. Event data at the municipality level is often limited as a result. Due to the more robust reporting at the county level and limited reporting at the local level, summary vulnerability statements are formulated using both local and countywide event data. These vulnerability assessments assume that events impacting the county similarly impact the jurisdictions within that county. Therefore, the countywide assessment is considered similar for all participating jurisdictions, unless stated otherwise. Future risk and vulnerability assessments at the local, county, and state levels will benefit significantly from increased, detailed event reporting.

Section 5

Dam Failure



SECTION 5: DAM FAILURE

Section 5 is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Section 6

Drought

SECTION 6: DROUGHT

Hazard Description	1
Location	2
Extent	2
Historical Occurrences	4
Significant Events	5
Probability of Future Events	5
Climate Change Considerations	5
Vulnerability and Impact	6
Assessment of Impacts	8

HAZARD DESCRIPTION

Drought is a period of unusually persistent dry weather that persists long enough to cause serious problems such as crop damage and/or water supply shortages. The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Droughts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table 6-1 presents definitions for these different types of droughts.

Droughts are one of the most complex of all natural hazards as it is difficult to determine their precise beginning or end. In addition, droughts can create ideal conditions for other hazards such as extreme heat and wildfires. Their impact on wildlife and area farming is enormous, often killing crops, grazing land, edible plants, and even in severe cases, trees. A secondary hazard to drought is wildfire because dying vegetation serves as a prime ignition source. Therefore, a heat wave combined with a drought is a very dangerous situation.

Table 6-1. Drought Classification Definitions¹

METEOROLOGICAL DROUGHT	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
HYDROLOGIC DROUGHT	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
AGRICULTURAL DROUGHT	Soil moisture deficiencies relative to water demands of plant life, usually crops.
SOCIOECONOMIC DROUGHT	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

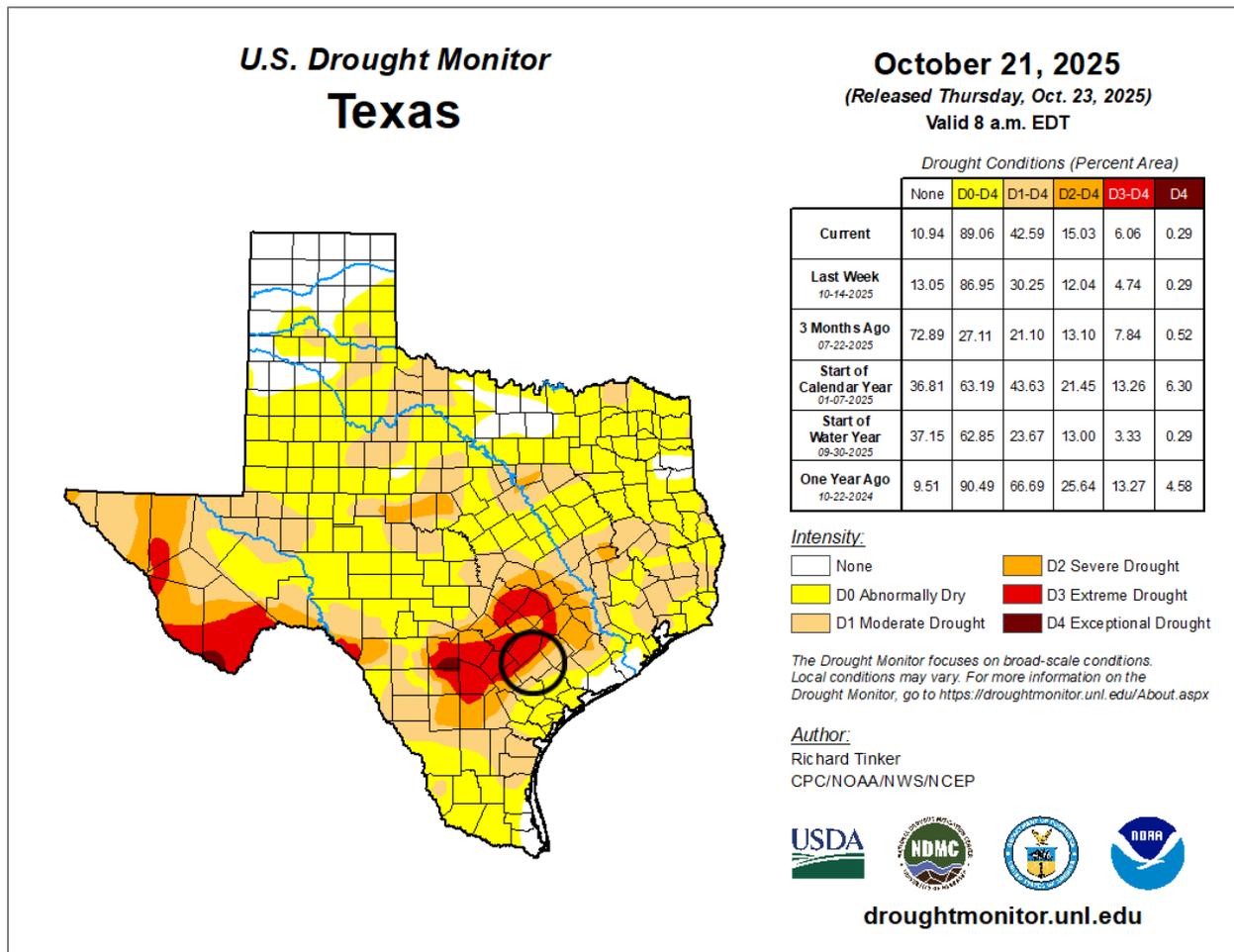
¹ Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

SECTION 6: DROUGHT

LOCATION

Droughts occur regularly throughout Texas including the De Witt County planning area and are considered a normal condition. However, they can vary greatly in their intensity and duration. The U.S. Drought Monitor, produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration, shows the planning area is currently experiencing moderate to extreme drought conditions (Figure 6-1) but has experienced a range of conditions from normal (none) to exceptional drought conditions over the last decade (Figure 6-2). There is no distinct geographic boundary to drought; therefore, it can occur anywhere throughout the De Witt County planning area.

Figure 6-1. U.S. Drought Monitor, October 2025



EXTENT

The Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought

SECTION 6: DROUGHT

(e.g., reservoir levels, groundwater levels, etc.) take longer to develop. Table 6-2 depicts magnitude of drought, while Table 6-3 describes the classification descriptions.

Table 6-2. Palmer Drought Index

DROUGHT INDEX	DROUGHT CONDITION CLASSIFICATIONS						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
Z Index	-2.75 and below	-2.00 to -2.74	-1.25 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	N/A
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Table 6-3. Palmer Drought Category Descriptions²

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS	PALMER DROUGHT INDEX
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. and correspond to the intensity of drought.

² Source: National Drought Mitigation Center

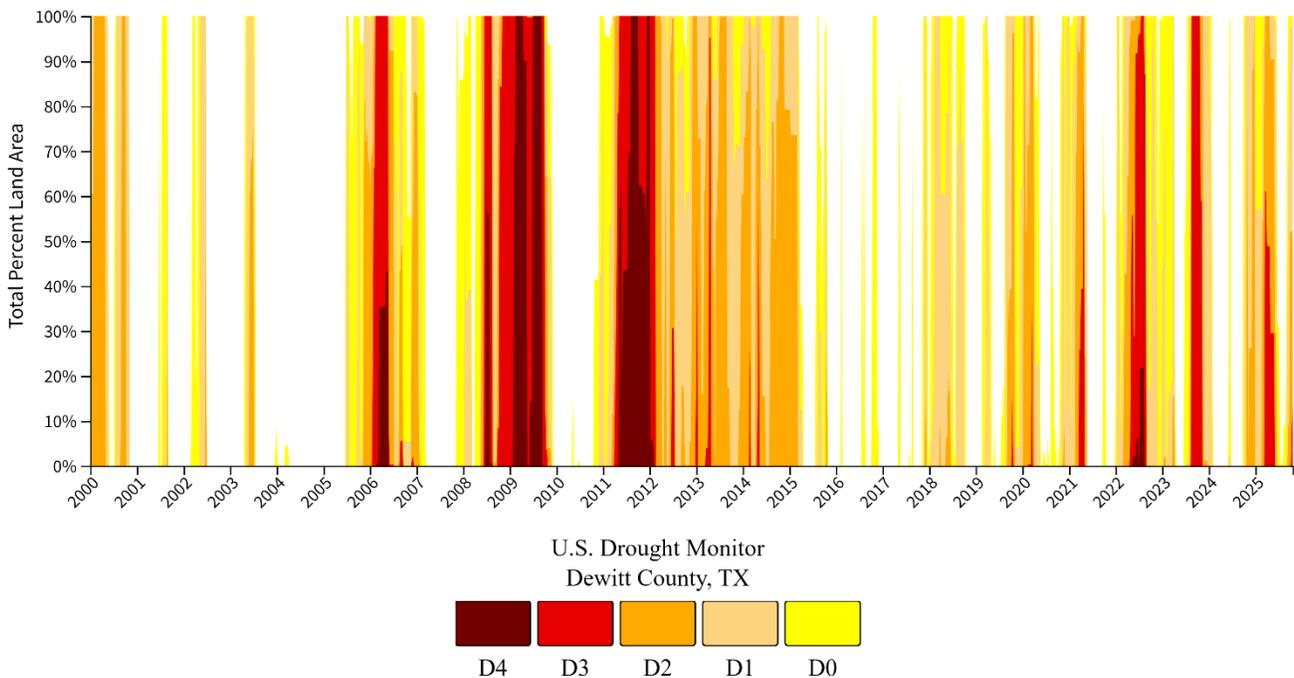
SECTION 6: DROUGHT

Based on the historical occurrences for drought and the location of the De Witt County planning area, the area can anticipate the full range of drought from abnormally dry to exceptional drought, or D0 to D4, based on the Palmer Drought Category. Exceptional drought (D4) is the highest level of drought severity and the most extreme drought conditions the planning area can anticipate in the future.

HISTORICAL OCCURRENCES

The De Witt County planning area may experience an extreme drought in any given year. According to the U.S. Drought Monitor, between January 2000 and June 2025, the De Witt County planning area spent 1,331 weeks (61%) in some level of drought as defined as Abnormally Dry (D0) or worse conditions. The longest drought during this period lasted for just over 4 years and 6 months. De Witt County has received 27 USDA disaster designations for drought from 2012 through 2024.

Figure 6-2. De Witt County Drought Intensity, 2000 – 2025³



Historical drought conditions reported for the De Witt County planning area over the 25.5-year reporting period have resulted in no known property or crop damages. The Green-De Witt Drainage District did not report any damages or additional events separately or apart from the county-wide drought events. Based on historical drought events for the De Witt County planning area, including all participating jurisdictions and special district, 11 unique drought periods were reported since the 2018 plan.

³ U.S. Drought Monitor

SECTION 6: DROUGHT

SIGNIFICANT EVENTS

December 2010 – March 2015

Following a weak La Nina event, rainfall remained below the normal average for most of South-Central Texas. By May of 2011, the De Witt County planning area was experiencing extreme (D3) drought conditions. The spring and summer months of 2011 continued with little to no rain which caused half of planning area to be in extreme (D3) drought conditions, while the other half of the planning area fell in exceptional (D4) drought conditions. In March of 2012, most of South-Central Texas, including the De Witt County planning area, finally received some above average rainfall amounts. With this rainfall, the planning area was downgraded to severe (D2) drought conditions. The planning area remained in these conditions until October 2012, which was when the county got downgraded to abnormally dry to moderate (D0 to D1) drought conditions. However, this only last a few months until January 2013, which was when the county was upgraded back to severe drought conditions following below normal rainfall. The county bounced back and forth between moderate and severe drought conditions from May 2013 until November 2013. After the first of the year 2014, severe to extreme drought conditions returned, with the planning area receiving below average rainfall. These conditions lasted around May, which was when the planning area began to receive much needed rain. This rain really helped in alleviating some of the drought until September. This pattern continued until May 2015, when the planning area finally received well above normal rainfall. In fact, the county received 3 times their normal rainfall. This finally caused the 4.5-year drought to come to an end.

August 2019 – April 2020

Following below average rainfall by nearly 50 percent in July and August 2019, De Witt County planning area began to experience abnormally dry (D0) drought conditions at the end of August. With the same weather patterns continuing through September and October, this caused most of the planning area to begin experiencing moderate (D1) drought conditions and small parts experiencing severe (D2) drought conditions. In October, some parts of the county even saw extreme (D3) drought conditions. The county continued to receive below average rainfall until April, which was when the planning area finally saw above normal rainfall. This eliminated the drought conditions for the planning area.

PROBABILITY OF FUTURE EVENTS

According to the U.S. Drought Monitor, 22 unique drought periods (ranging from five weeks to about 4 years and 6 months in duration) occurred over a 25.5-year reporting period, which provides a probability of approximately one event every year. This frequency supports a “Highly Likely” probability of future events for the De Witt County planning area, including all participating jurisdictions and special district.

CLIMATE CHANGE CONSIDERATIONS

With the range of factors influencing drought conditions, it is impossible to make quantitative statewide projections of drought trends; however, many factors point toward increased drought severity. Drought will continue to be driven largely by precipitation variability over multiple decades, with long-term precipitation trends expected to be relatively small. Other factors affecting drought impacts, such as increased temperatures and improved plant water use efficiency, can affect water availability. These impacts could cause drought impact trends to be

SECTION 6: DROUGHT

highly sector-specific, with the impacts possibly smaller for agriculture than for surface water supply.⁴

It is projected that future changes to De Witt County will include increased temperatures, which according to the U.S. Climate Explorer, the planning area may experience a 5°F increase in average extreme heat temperatures. Historically, extreme temperatures averaged 100°F in De Witt County, but between 2035 and 2064 the average will be 105°F, increasing the severity and frequency of drought events. Some projections show an even higher increase; however, the severity will be dependent on overall future emissions and is subject to change.

VULNERABILITY AND IMPACT

No loss estimates were available for the 25.5-year reporting period. A drought event frequency-impact was conducted to determine an impact profile on agriculture products and estimate potential losses due to drought in the area. All existing and future buildings, facilities, and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are mostly experienced in water shortages, breaks in water lines, or crop and livestock losses on agricultural lands and typically have minimal impact on buildings.

The De Witt County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by drought events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 6-4. Critical Facilities Vulnerable to Drought Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none">• Increased law enforcement activities may be required to enforce water restrictions.• Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.• Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none">• Strain on staff as drought may cause health problems related to low water flows and poor water quality.• Water main breaks due to soil shrinking and swelling cycles could lead to facility closures.• Building foundations may crack due to soil shrinking and swelling cycles.• Operations dependent on water supply may be adversely impacted.

⁴ Cleaveland, M. K., T. H. Votteler, D. K. Stahle, R. C. Casteel, and J. L. Banner, 2011: Extended Chronology of Drought in South Central, Southeastern and West Texas. Texas Water Journal, 2, 54-96, as cited in Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

SECTION 6: DROUGHT

CRITICAL FACILITIES	POTENTIAL IMPACTS
	<ul style="list-style-type: none"> Economic disruptions due to cracked foundations and infrastructure damages as a result of soil shrinking and swelling cycles.
Commercial Suppliers (food, gas, etc.)	<ul style="list-style-type: none"> Operations dependent on water supply may be adversely impacted. Economic disruptions due to cracked foundations and infrastructure damages as a result of soil shrinking and swelling cycles.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding. Water main breaks due to soil shrinking and swelling cycles could lead to facility closures. Operations dependent on water supply may be adversely impacted.

Even with the planning area relying on multiple water utility providers as well as local and private service, high demand can still deplete these resources during extreme drought conditions. As resources are depleted, potable water is in short supply and overall water quality can suffer, elevating health concerns for all residents but especially vulnerable populations – typically children, the elderly, and the ill. In addition, potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities.

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health – typically children, the elderly, and people with disabilities. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the De Witt County planning area is estimated at 20 percent of the total population and children under the age of 5 are estimated at 7 percent. The population with a disability is estimated at 15 percent of the total population. An estimated 16 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well” (Table 6-5).

Table 6-5. Populations at Greater Risk by Participating Jurisdiction

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10

SECTION 6: DROUGHT

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
City of Yorktown	525	167	428	293	53

The planning area is also vulnerable to food shortages when drought conditions exist, and potable water is in short supply. Potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities. All residents in the De Witt County planning area could be adversely affected by drought conditions, which could limit water supplies and present health threats.

The economic impact of droughts can be significant as they produce a complex web of impacts that spans many sectors of the economy and reach well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services. If droughts extend over several years, the direct and indirect economic impact can be significant.

De Witt County has a prominent agricultural sector and features 1,533 farms over 411,339 acres of land including grains, oilseeds, dry beans, dry peas, cattle and calves. De Witt County's annual market value of agricultural products sold is over \$31,438,000. An estimated 90 percent of sales are from livestock and poultry products and an estimated 10 percent of sales are from crops. Most of the county's agriculture sales are cattle and calves.⁵ A lactating dairy cow will consume 30 to 50 gallons of water a day. The average adult beef cow requires approximately 12 gallons of water a day. Drought can negatively affect nutrition sources, milk production, and future yields. Dry pastures lead to lower quality hay and increased fire danger. Decreases in feed availability can lead to overgrazing. Heat stress can decrease milk production in dairy cattle. Prolonged drought periods could have devastating impacts on the agricultural industry across the planning area.

Impacts of past droughts experienced in the De Witt County planning area have not resulted in reported injuries, fatalities, property, or crop damages supporting a "Limited" severity of impact meaning injuries and illnesses are treatable with first aid, the shutdown of critical facilities and services for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can have an impact on agriculture, business and industry; energy; fire; plants and wildlife; relief, response, and restrictions; society and public health; tourism and recreation; and water supply and quality. The reports are submitted from individuals to Federal, State, and local agencies, as well as the general public. Table 6-6 lists the drought impacts to De Witt County from January 2005 to June 2025 based on reports received by the Drought Impact Reporter.

⁵ Census of Agriculture. De Witt County, Texas County Profile. 2022.

SECTION 6: DROUGHT

Table 6-6. Drought Impacts, January 2005 – June 2025

DROUGHT IMPACTS	
Agriculture	95
Business & Industry	2
Energy	1
Fire	14
Plants & Wildlife	67
Relief, Response & Restrictions	18
Society & Public Health	9
Tourism & Recreation	3
Water Supply & Quality	31

Drought has the potential to impact people in the De Witt County planning area. While it is rare that drought, in and of itself, leads to a direct risk to the health and safety of people in the U.S., severe water shortages could result in inadequate supply for human needs. Future growth can cause concern for the current water infrastructure and demand for the planning area. Severe drought conditions can be frequently associated with a variety of impacts, including:

- Dry clay soils can lead to water main lines shifting and breaking. Often repair to water lines includes shutting off water to multiple homes at one time.
- The number of health-related low-flow issues (e.g., diminished sewage flows, increased pollution concentrations, reduced firefighting capacity, and cross-connection contamination) will increase as the drought intensifies.
- Public safety from forest/range/wildfires will increase as water availability and/or pressure decreases.
- Respiratory ailments may increase as the air quality decreases.
- There may be an increase in disease due to wildlife concentrations (e.g., rabies, Rocky Mountain spotted fever, Lyme disease).
- Residents may disagree with the County and City over water use / water rights, creating conflict.
- Political conflicts may increase between municipalities, counties, states, and regions.
- Water management conflicts may arise between competing interests.
- Increased law enforcement activities may be required to enforce water restrictions.
- Severe water shortages could result in inadequate supply for human needs as well as lower quality of water for consumption.
- Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.
- During drought there is an increased risk for wildfires and dust storms.

SECTION 6: DROUGHT

- The community may need increased operational costs to enforce water restriction or rationing.
- Prolonged drought can lead to increases in illness and disease related to drought.
- Utility providers can see decreases in revenue as water supplies diminish.
- Utilities providers may cut back energy generation and service to their customers to prioritize critical service needs.
- Hydroelectric power generation facilities and infrastructure would have significantly diminished generation capability. Dams simply cannot produce as much electricity from low water levels as they can from high water levels.
- Fish and wildlife food and habitat will be reduced or degraded over time during a drought and disease will increase, especially for aquatic life.
- Wildlife will move to more sustainable locations creating higher concentrations of wildlife in smaller areas, increasing vulnerability, and further depleting limited natural resources.
- There are six federally endangered, threatened or candidate species in De Witt County. Severe and prolonged drought can result in the reduction of a species or cause the extinction of a species altogether.
- Plant life will suffer from long-term drought. Wind and erosion will also pose a threat to plant life as soil quality will decline. The urban tree canopy, including county and city parks, are vulnerable to the impacts of prolonged drought.
- Dry and dead vegetation will increase the risk of wildfire.
- Drought poses a significant risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Drought-related declines in production may lead to an increase in unemployment.
- Drought may limit livestock grazing resulting in decreased livestock weight, potential increased livestock mortality, and increased cost for feed.
- Negatively impacted water suppliers may face increased costs resulting from the transport water or developing supplemental water resources.
- Long term drought may negatively impact future economic development.

The overall extent of damage caused by periods of drought is dependent on its extent and duration. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a drought event.



Section 7

Earthquake

SECTION 7: EARTHQUAKE

Hazard Description	1
Location	2
Extent	4
Historical Occurrences	7
Probability of Future Events	9
Climate Change Considerations.....	9
Vulnerability and Impact.....	10

HAZARD DESCRIPTION

An earthquake is the sudden movement of the Earth’s surface caused by the release of stress accumulated within or along the edge of the Earth’s tectonic plates, volcanic eruption, or by a manmade explosion. The majority of earthquakes occur along faults; however, earthquakes can occur within plate interiors. Over geologic time, plates move and plate boundaries change, pushing weakened boundary regions to the interior part of the plates. These areas of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust.

Earthquake locations are described by the focal depth and geographic position of the epicenter. The focal depth of an earthquake is the depth from the Earth’s surface to the region where an earthquake’s energy originates (the focus or hypocenter). The epicenter is the point on the Earth’s surface directly above the hypocenter. Earthquakes usually occur without warning, with their effects impacting great distances away from the epicenter.

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may influence an individual’s normal activities. Table 7-1 describes definition of examples.

Table 7-1. Definitions of Earthquake Hazards¹

HAZARD	DESCRIPTION
Surface Faulting	Displacement that reaches the earth's surface during slip along a fault. Commonly occurs with shallow earthquakes, those with an epicenter less than 20 kilometers.
Ground Motion (shaking)	The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.
Landslide	A movement of surface material down a slope.
Liquefaction	A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking.

¹ Source: USGS, 2012

SECTION 7: EARTHQUAKE

HAZARD	DESCRIPTION
Tectonic Deformation	A change in the original shape of a material due to stress and strain.
Tsunami	A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides, or exploding volcanic islands.
Seiche	The sloshing of a closed body of water from earthquake shaking.

LOCATION

Earthquake hazard areas are mapped by the USGS's National Seismic Hazard Model (NSHM). Figure 7-1 shows the most recent 2023 iteration of this USGS model. The NSHM defines the potential for earthquake ground shaking for various probability levels across the United States. The 2023 NSHM is an update to the previous 2018 version, and compiles data and findings from a number of sources including earthquake catalogs, geodetic- and geologic-based fault and deformation models, and ground motion models (GMMs), among others.² The map shows the percent chance that a given area will experience a category VI (or stronger) earthquake in 100 years, as defined by the Modified Mercalli Intensity (MMI) Scale (Table 7-3). The likelihood of a significant earthquake event is signified by the color-coding on the map. Densely populated areas are also highlighted on the map (purple and black dotting) to indicate areas of elevated vulnerability in relation to higher seismic risk. The De Witt County planning area, as identified in Figure 7-1, is located in a low hazard area, with a less than five percent chance of experiencing a strong earthquake every 100 years.

² A comprehensive overview of the modelling process can be found at the USGS website, <https://www.usgs.gov/programs/earthquake-hazards/science/2023-50-state-long-term-national-seismic-hazard-model-0#overview>

SECTION 7: EARTHQUAKE

Figure 7-1. U.S. Map of Peak Ground Acceleration³

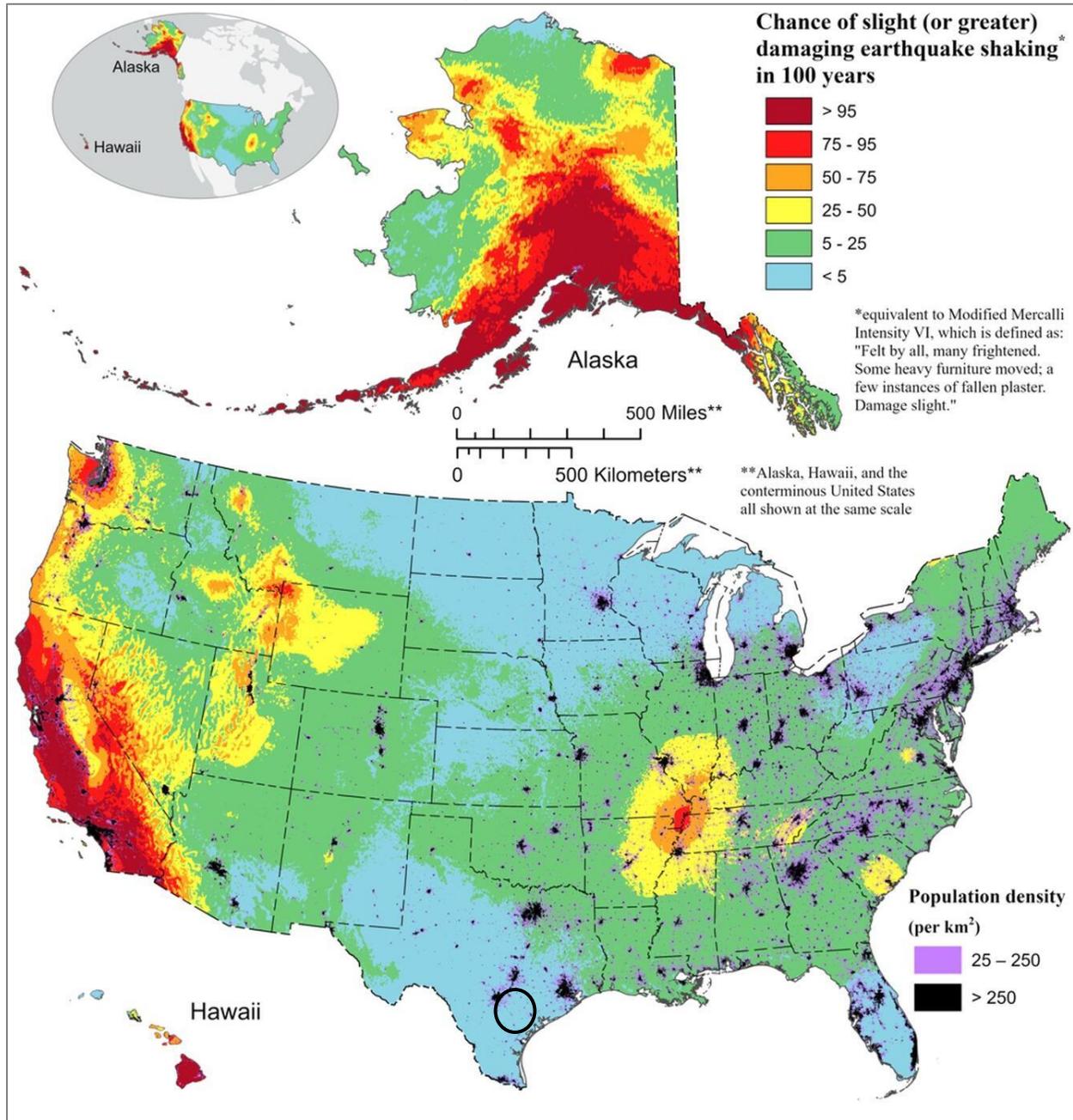
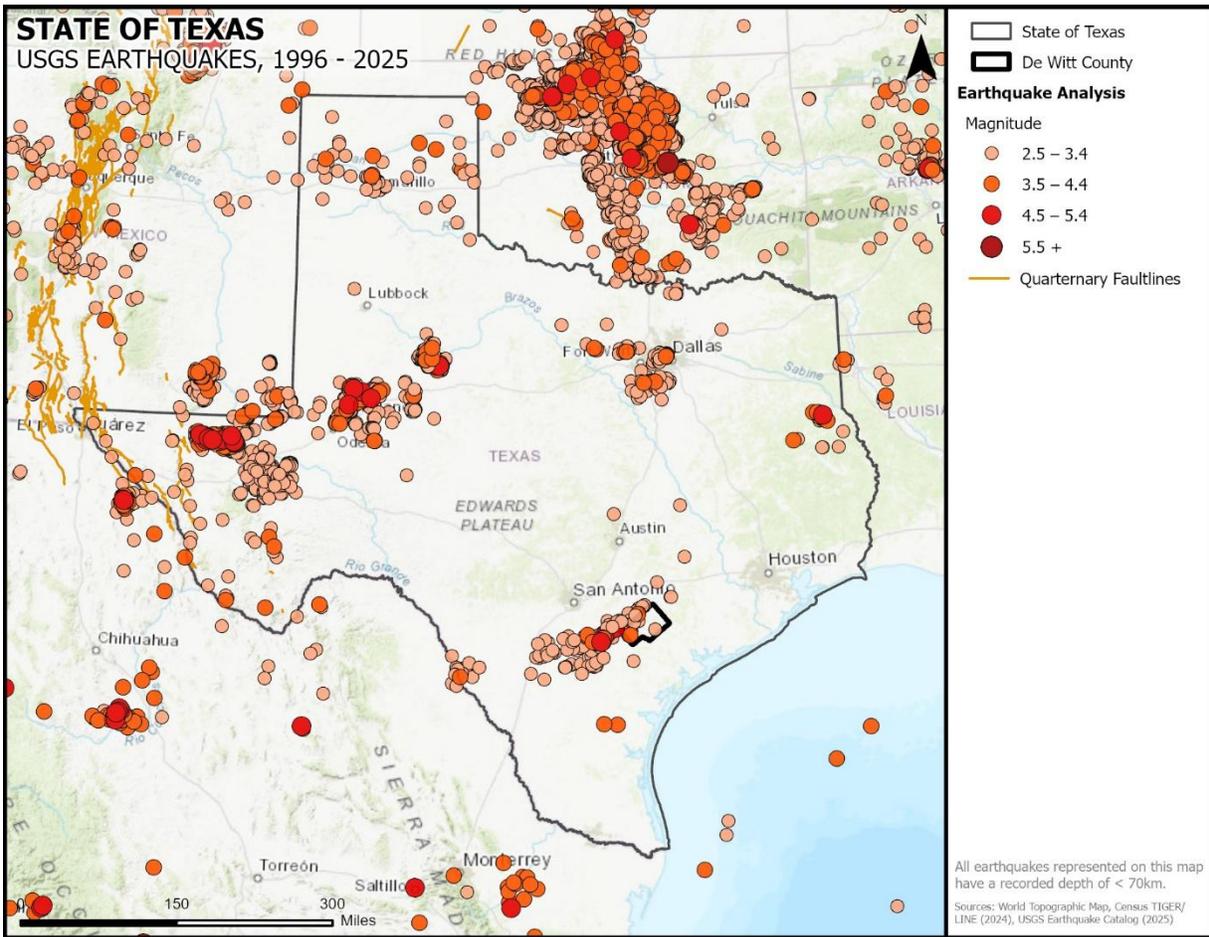


Figure 7-2 maps historic earthquake epicenters across Texas between 1996 and 2025.

³ The De Witt County planning area is indicated by the black circle.

SECTION 7: EARTHQUAKE

Figure 7-2. Historic Earthquake Epicenters in Texas, 1996-2025⁴



EXTENT

Earthquakes are measured in terms of magnitude and intensity. The prevalent magnitude measurement in use today is based on the Moment Magnitude Scale (MMS). MMS measures the movement of rock along the fault. It accurately measures larger earthquakes, which can last for minutes, affect a much larger area, and cause more damage. Magnitudes are based on a logarithmic scale (base 10), meaning that for each whole number you go up on the magnitude scale, the amplitude of the ground motion recorded by a seismograph goes up ten times. Using this scale, a magnitude 5 earthquake would result in ten times the level of ground shaking as a magnitude 4 earthquake (and about 32 times as much energy would be released).⁵ The USGS reports earthquake magnitudes above 4.0 as “moment magnitude,” often described in the press as “Richter” magnitude. Table 7-2 shows the magnitude levels for the current Richter / Moment Magnitude scale.

⁴ De Witt County is indicated by the black polygon.

⁵ (n.d.). How Do We Measure Earthquake Magnitude? Michigan Tech.

<https://www.mtu.edu/geo/community/seismology/learn/earthquake-measure/#:~:text=The%20moment%20magnitude%20scale%20is,the%20earthquake%20at%20multiple%20stations.>

SECTION 7: EARTHQUAKE

Table 7-2. Richter / Moment Magnitude Scale⁶

MAGNITUDE	CATEGORY	DESCRIPTION OF EFFECTS	EVENTS PER YEAR
< 3.0	Micro	Usually not felt, but can be recorded by seismograph	+100,000
3.0 – 3.9	Minor	Often felt, but causes no damage	12,000 - 100,000
4.0 – 4.9	Light	Felt by all, minor breakage of objects	2,000 - 12,000
5.0 – 5.9	Moderate	Some damage to weak structures	200 – 2,000
6.0 – 6.9	Strong	Moderate damage in populated areas	20 – 200
7.0 – 7.9	Major	Serious damage over large areas with loss of life expected	3 – 20
> 7.9	Great	Severe destruction and loss of life over large areas	Less than 3

Earthquake intensity measurement is an on-the-ground description. The measurement qualitatively explains the severity of earthquake shaking and its effects on people and their environment. Intensity measurements will differ depending on each location’s proximity to the epicenter or point on the surface of the earth directly above the focus where the earthquake started. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and total destruction. There can be multiple intensity measurements associated with an earthquake as opposed to one magnitude measurement.⁷ The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced at a specific location. The scale provides the intensity of the earthquake in values ranging from I to X. Table 7-3 describes the typical effects and intensities associated with earthquakes of various magnitudes. The intensity and effects depend on multiple factors (earthquake depth, epicenter location, site geology, population density, to name a few) and can vary widely.

⁶ (n.d.). Earthquakes. Britannica. <https://www.britannica.com/science/earthquake-geology>

⁷ Wood, H. O., and Neumann, Frank (1931). Modified Mercalli Intensity Scale of 1931: Seismological Society of America Bulletin, v. 21, no. 4, p. 277-283.

SECTION 7: EARTHQUAKE

Table 7-3. Magnitude and Modified Mercalli Intensity (MMI) Scale⁸

INTENSITY	CATEGORY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
I	Not Felt	Not felt except by a very few under especially favorable conditions	< 2.0
I	Not Felt	Felt only by a few persons at rest, especially on upper floors of buildings.	2.0 – 2.9
II – III	Weak	Felt quite noticeably by persons indoors, with shaking of indoor objects. Rarely causes damages.	3.0 – 3.9
IV – V	Light to Moderate	Noticeable shaking of indoor objects and rattling noises. Felt by most people in the affected area. Generally, no to minimal damage	4.0 – 4.9
VI – VII	Strong to Very Strong	Significant damages to poorly constructed buildings. Limited to moderate damages to well-built structures.	5.0 – 5.9
VIII – IX	Severe to Violent	Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures.	6.0 – 6.9
VIII +	Severe to Extreme	Damage considerable in specially designed structures. Damage substantial to most buildings, with partial or complete collapse. Felt across great distances with major damage mostly limited to 250 km from Epicenter.	7.0 – 7.9
VIII – IX	Severe to Violent	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	8.0 – 8.9
VIII +	Severe to Extreme	At or near total destruction. Severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations and permanent changes in ground topography.	9.0+

⁸ Source: USGS

SECTION 7: EARTHQUAKE

Taking into consideration the possible extent of an earthquake for the area, by reviewing Tables 7-2 and 7-3 in conjunction with no significant previous occurrences, as depicted in Figure 7-2, the De Witt County planning area, including all participating jurisdictions and special district, experiences on average less than 4.0 magnitude or Levels II-III (weak impact) on the Modified Mercalli Intensity scale. This is the greatest extent the entire planning area can anticipate in the future, based on historic records.

HISTORICAL OCCURRENCES

According to USGS, and the National Geophysical Data Center (NGDC), there are no “significant” earthquakes on record for the State of Texas and the entire De Witt County planning area from 2150 B.C. to present. A significant earthquake, as defined by NGDC, is one that has caused at least moderate damage (approximately \$1 million or more), has resulted in 10 or more deaths, has registered as a magnitude 7.5 or greater, has registered as Modified Mercalli Intensity (MMI) Scale X or greater, or generated a tsunami. None of these criteria have been met by any seismic activity known to have impacted the planning area.

The USGS database tracks all earthquakes with a magnitude 2.5 or greater across the United States. According to this database, there were 12 earthquakes reported within the planning area between 1996 and 2025 (Table 7-4). Of these, the strongest recorded event was a magnitude 3.9 earthquake, considered a Level II-III (weak). During that same period, 271 earthquakes occurred within a 50-mile radius of the planning area and 301 earthquakes occurred within a 100-mile radius. Many of these occurred to the west of the De Witt County planning area. The maximum magnitude recorded for earthquakes within the 50-mile and 100-mile radius was magnitude 4.8, considered a Level IV-V (light to moderate) earthquake.

Another aspect of earthquakes tracked by the USGS is the depth at which they occur. Shallow earthquakes tend to be more damaging and cause more intense shaking than deeper earthquakes, however deep earthquakes are more likely to be felt over a wider area. All recorded earthquakes in or near the De Witt County planning area have originated at depths categorized as shallow (1-70 km) or very shallow (<1 km).

While it is possible for the planning area to feel stronger earthquakes that occur inside county boundaries, or within the 100-mile area around the planning area, at this time, there are no known damages associated with these events for the De Witt County planning area. Table 7-5 summarizes historical earthquake events that have occurred inside or near the planning area.

SECTION 7: EARTHQUAKE

Figure 7-3. Historic Earthquake Events in or Near De Witt County, 1996 – 2025

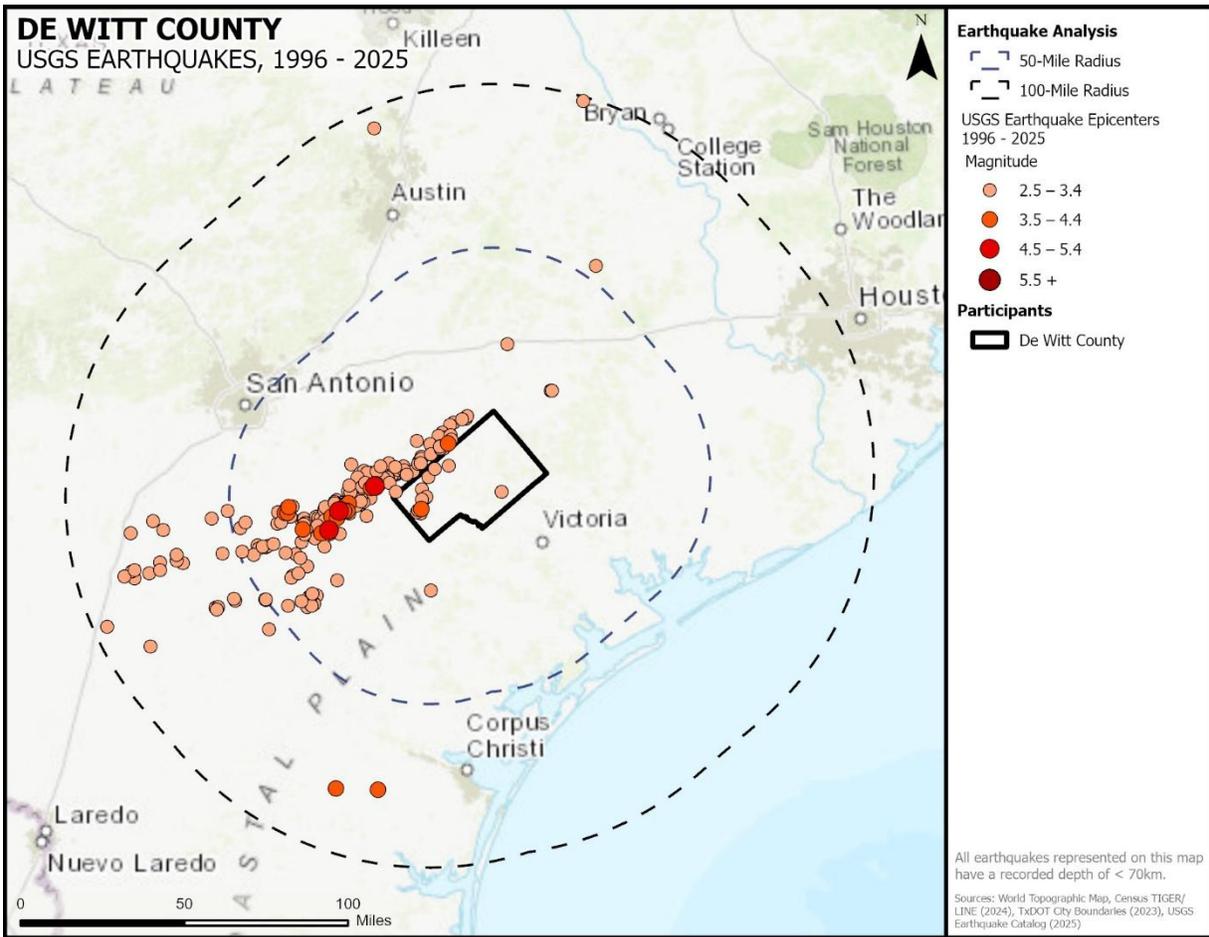


Table 7-4. Historic Earthquakes in De Witt County, 1996 – 2025⁹

JURISDICTION	DATE	EXTENT	DEPTH (km)	INJURIES & FATALITIES	PROPERTY & CROP DAMAGE
De Witt County	5/14/2017	2.8	1.9	0	\$0
De Witt County	8/16/2018	2.9	5.0	0	\$0
De Witt County	3/4/2019	3	5.0	0	\$0
De Witt County	5/12/2019	3.1	5.0	0	\$0
De Witt County	7/8/2022	2.6	7.6	0	\$0
De Witt County	7/12/2022	2.6	5.2	0	\$0
De Witt County	7/12/2022	2.6	3.7	0	\$0
De Witt County	7/12/2022	2.8	6.5	0	\$0

⁹ USGS; only earthquakes to occur inside the De Witt County planning area are listed.

SECTION 7: EARTHQUAKE

JURISDICTION	DATE	EXTENT	DEPTH (km)	INJURIES & FATALITIES	PROPERTY & CROP DAMAGE
De Witt County	8/18/2023	2.9	4.2	0	\$0
De Witt County	8/22/2023	2.6	4.0	0	\$0
De Witt County	9/1/2023	2.9	6.8	0	\$0
De Witt County	10/9/2023	3.9	4.5	0	\$0

Table 7-5. Historical Earthquake Event Summary, 1996 – 2024¹⁰

JURISDICTION	NUMBER OF EVENTS	MAXIMUM EXTENT	DEPTH RANGE (km)	INJURIES & FATALITIES	PROPERTY & CROP DAMAGE
De Witt County	12	3.9	4.5	0	\$0
50-Mile Radius	271	4.8	5.0	0	\$0
100-Mile Radius	301	4.8	5.0	0	\$0

PROBABILITY OF FUTURE EVENTS

Earthquake Hazard Maps show the distribution of earthquake shaking levels that have a certain probability of occurring over a given period. According to the USGS, the entire De Witt County, participating jurisdictions and special district, planning area has less than a five percent chance of a slightly damaging (or greater) earthquake within 100 years. Based on historical records, the probability of an earthquake affecting the De Witt County planning area, including all participating jurisdictions and special district, is “Likely,” meaning that an event is probable in the next three years.

CLIMATE CHANGE CONSIDERATIONS

Damaging earthquakes are rare within the State of Texas, including the De Witt County planning area. Changing conditions of weather patterns and climate change has not been established as having a direct impact on earthquake intensity or frequency.

According to the USGS, statistically there is an approximately equal distribution of earthquakes in all cold weather, hot weather, rainy weather, etc. Very large low-pressure changes associated with major storm systems, like typhoons and hurricanes, are known to trigger episodes of fault slip or slow earthquakes in the Earth’s crust and may also play a role in triggering some damaging earthquakes. However, the numbers are small and are not statistically significant.¹¹

The De Witt County planning area is located outside of any known earthquake hazard areas and is not located on or near any active fault lines. Climate change is assumed to have no impact on the probability or intensity of potential earthquakes in the planning area.

¹⁰ Source: USGS

¹¹ (n.d.). *Natural Hazards*. United States Geological Survey. <https://www.usgs.gov/faqs/there-earthquake-weather>

SECTION 7: EARTHQUAKE

VULNERABILITY AND IMPACT

Little warning is usually associated with earthquakes and can impact areas a great distance away from the epicenter. The amount of damage depends on the density of population and buildings, and infrastructure construction in the affected area. Some places may be more vulnerable than others based on soil type, building age, and building codes in the De Witt County planning area.

The De Witt County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by earthquake events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 7-6. Critical Facilities Vulnerable to an Earthquake

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none">• Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications. Impact can impede emergency response vehicle access to areas.• Power outages could disrupt communications, delaying emergency response times.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none">• Power outages could disrupt critical care.• Backup power sources could be damaged.• Evacuations may be necessary due to extended power outages or other associated damages to facilities.• Economic disruption due to power outages negatively impacts airport services as well as area businesses reliant on airport operations.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none">• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable.• Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none">• Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, and/or loss of communications. Impact can impede emergency service vehicle access to areas.• Power outages could disrupt communications, delaying emergency response times further straining the capacity and resources of emergency service personnel.

While the planning area has experienced 12 historical earthquake events over the 29.5 year reporting period, no damages, injuries or fatalities were reported. The potential severity of impact from an earthquake for the De Witt County planning area, including all participating jurisdictions and special district, is classified as “Limited,” meaning that less than 10 percent of infrastructure would be damaged with critical facilities being shut down for less than 24 hours.



Section 8

Expansive Soils

SECTION 8: EXPANSIVE SOILS

Hazard Description	1
Location	1
Extent	4
Historical Occurrences	5
Probability of Future Events	6
Climate Change Considerations.....	6
Vulnerability and Impact.....	6
Assessment of Impacts.....	8

HAZARD DESCRIPTION

Expansive soils are soils and soft rocks with a relatively high percentage of clay minerals that are subject to changes in volume as they swell and shrink with changing moisture conditions. Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When these clays absorb water, they increase in volume and expand. The change in soil volume and resulting expansion can exert enough force on a building or other structure to cause damage.



Expansive soils will also lose volume and shrink when they dry. Drought conditions can cause soils to contract in response to a loss of soil moisture. A reduction in soil volume can affect the support to buildings or other structures and result in damage. Fissures in the soil can also develop and facilitate the deep penetration of water when moist conditions or runoff occur. This produces a cycle of shrinkage and swelling that place repetitive stress on structures. The effect of expansive soil is most prevalent in regions prone to prolonged periods of drought followed by periods of moderate to high precipitation.

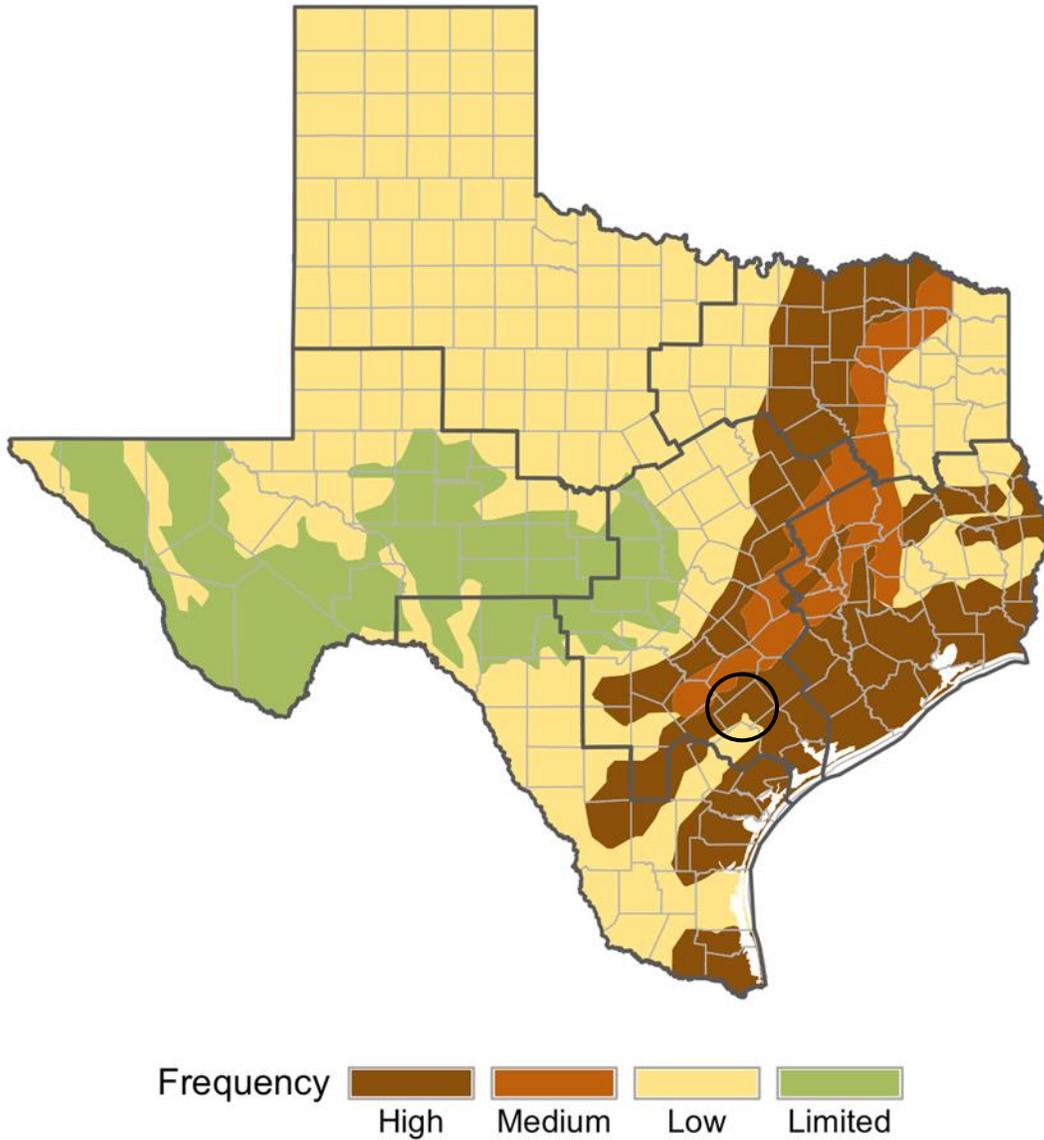
LOCATION

In Texas, the most expansive soils are in a band 200 miles west from the coastline, stretching approximately from Beaumont down to Brownsville. These areas receive the most moisture and are also vulnerable to droughts, which can cause the soil to contract. In the De Witt County planning area, the problems associated with expansive soil typically occur during drought periods. Expansive soils (bentonite, smectite, or other reactive clays) expand when the soil particles attract water and can shrink when the clay dries.

Figure 8-1 shows areas of expansive soil in Texas. De Witt County falls within the high-risk area, indicated in brown. Figure 8-2 depicts the types of land resources in the State of Texas due to their soil types.

SECTION 8: EXPANSIVE SOILS

Figure 8-1. Location of Expansive Soils in Texas¹

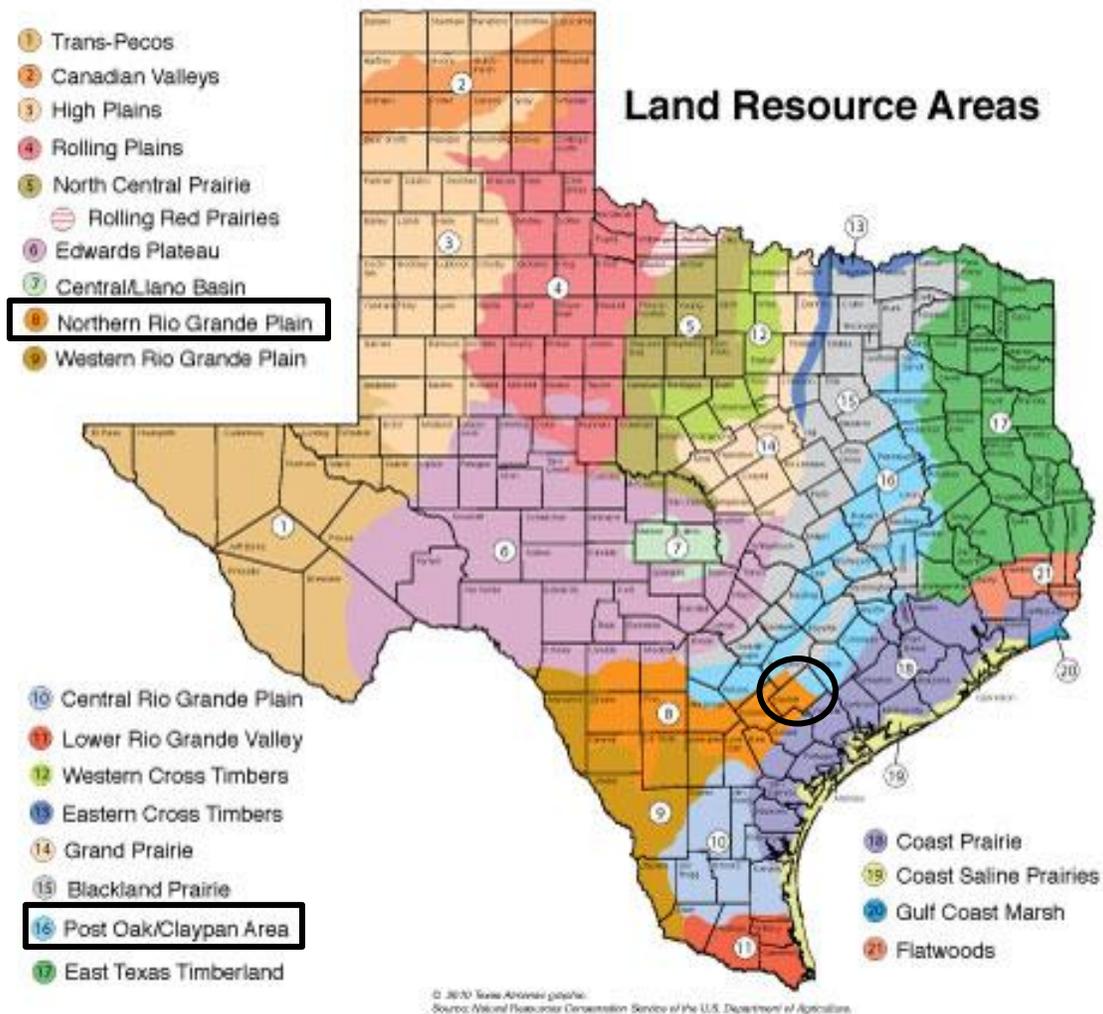


Source: Tavakoli, E. (2016). *Laboratory Evaluation of TX-PROCHEM as an Ionic Liquid Soil Stabilizer*. [Master's Thesis].

¹ Tavakoli, E. (2016). *Laboratory Evaluation of TX-PROCHEM as an Ionic Liquid Soil Stabilizer*. [Master's Thesis].

SECTION 8: EXPANSIVE SOILS

Figure 8-2. Texas Geological Survey²



The De Witt County planning area, including all participating jurisdictions and special district, is located primarily within two land resource areas as indicated by the black circle in Figure 8-2: Northern Rio Grande Plain and the Post Oak / Claypan Area. The entire planning area, including all participating jurisdictions and special district, is located in an area highly affected by expansive soils.

Northern Rio Grande Plain: The Northern Rio Grande Plain comprises about 6.3 million acres in South Texas extending from Uvalde to Beeville. The landscape is nearly level to rolling, mostly brush-covered plains with slow to rapid surface drainage.

The major upland soils are deep, reddish-brown or dark grayish-brown, neutral to alkaline loams and clays. Bottomland soils are mostly dark-colored loams.

² Source: USDA, <http://www.nrcs.usda.gov>

SECTION 8: EXPANSIVE SOILS

The area is mostly rangeland with significant areas of cropland. Grain sorghums, cotton, corn, and small grains are the major crops. Crops are irrigated in the western part, especially in the Winter Garden area, where vegetables such as spinach, carrots, and cabbage are grown. Much of the area is good deer and dove habitat; hunting leases are a major source of income. Brush control, soil fertility, and irrigation-water management are the major soil-management concerns.

Post Oak / Claypan Area: The Claypan Area consists of about 6.1 million acres in east-central Texas just east of the Blackland Prairie. The landscape is a gently undulating to rolling, moderately dissected woodland also known as the Post Oak Belt or Post Oak Savannah. Surface drainage is moderate.

Upland soils commonly have a thin, light-colored, acid sandy loam surface layer over dense, mottled red, yellow, and gray claypan subsoils. Some deep, sandy soils with less clayey subsoils exist. Bottomlands are deep, highly fertile, reddish-brown to dark-gray loamy to clayey soils.

Land use is mainly rangeland. Some areas are in improved pastures. Most cropland is in bottomlands that are protected from flooding. Major crops are cotton, grain sorghums, corn, hay, and forage crops, most of which are irrigated. Brush control on rangeland and irrigation water management on cropland are the major soil-management problems. Water erosion is a serious problem on the highly erosive claypan soils, especially where they are overgrazed.³

EXTENT

Expansive soils risk is measured by the degree to which soils may shrink or swell. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures.⁴

Table 8-1. NRCS Soil Linear Extensibility Risk Categories

POTENTIAL CATEGORY	LINEAR EXTENSIBILITY %	CLAY %
Low	< 3%	< 25%
Moderate	3% - 6%	25% - 35%
High	6% - 9%	35% - 45%
Very High	> 9%	> 45%

The Soil Survey was developed by the USDA Soils Conservation Service and contains information that can be applied in determining the suitability of soils in the planning area when selecting sites for roads, structures, and infrastructure. Based on Soil Survey data, roughly 43.9 percent of the De Witt County planning area is subject to the moderate (3-6%) linear extensibility category (Table 8-1). The next most common linear extensibility category is low (<3%) found in

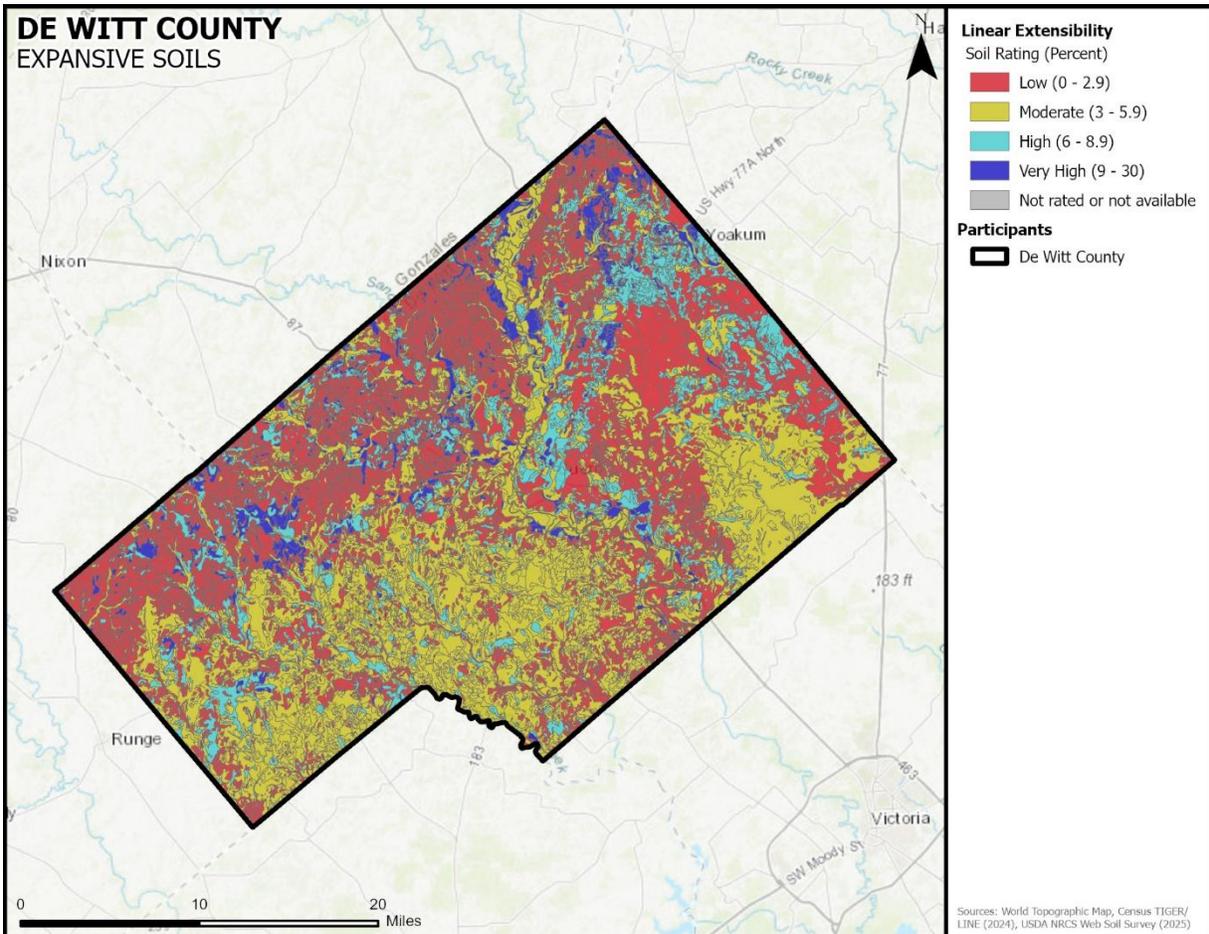
³ Texas Almanac. Soils of Texas. <https://www.texasalmanac.com/articles/soils-of-texas#:~:text=The%202022.7%20million%20acres%20of,cedar%20brakes%20in%20this%20area.>

⁴ (2009). *Soil Reports*. Natural Resources Conservation Service. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_016186.pdf

SECTION 8: EXPANSIVE SOILS

40.8 percent of the planning area, followed by roughly 9.5 percent subject to high (6-9%) linear extensibility. Only 5.2 percent of the planning area falls within the very high (>9%) linear extensibility category. The remaining 0.4 percent of the planning area consists of water, quarries, or sand and gravel pits which do not receive a linear extensibility rating.⁵ Figure 8-3 below illustrates the spatial distribution of linear extensibility across the De Witt County planning area, highlighting where expansive soils are most likely to occur.

Figure 8-3. De Witt County Soil Linear Extensibility Map



HISTORICAL OCCURRENCES

Expansive soil is a condition that is native to Texas soil characteristics and cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage. Extreme conditions can damage roads, structures, and infrastructure, including projects still under construction. Damages from expansive soils are typically associated with droughts. Previous occurrences for expansive soils can be correlated with previous occurrences of drought, the impacts of which are typically negligible. The De Witt County planning area has no known

⁵ Source: <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

SECTION 8: EXPANSIVE SOILS

recorded events of damaging expansive soils. Refer to the Drought profile (Section 6) of this plan for more information on the impacts of past drought events.

PROBABILITY OF FUTURE EVENTS

The Texas Department of Licensing and Regulation requires structures built after 2005 to include soil tests to be conducted for the likelihood of soil expansion, compression, or shifting. In such cases, top or subsoils are required to be removed and remaining soils stabilized. Builders must ensure that water drains away from the structure on all sides and building owners notified of the potential for damage if changes in drainage flow occur. These measures significantly reduce the probability of expansive soil impacts on newer and future development.

As noted above and shown in Figure 8-1, the De Witt County planning area, including all participating jurisdictions and special district, is subject to the full range of linear extensibility with the majority of the planning area falling into the low to moderate categories (84.7%). With the state regulations in place, structures built since 2005 are generally protected from the impacts of expansive soils. It is considered unlikely that the high-risk areas in the De Witt County planning area will experience expansive soil impacts such as problems with foundations, roadways, sidewalks and other structures and infrastructure in the future for newer development. However, structures pre-dating the state regulations are subject to the impacts of expansive soils in higher risk areas. Frequency of impacts to development prior to 2005 is considered “Highly Likely” with impacts probably every year depending, in part, on drought conditions that may exacerbate expansive soil conditions.

CLIMATE CHANGE CONSIDERATIONS

Expansive soils are directly connected to drought and flood conditions as they literally swell and shrink with changing moisture conditions. Impacts of climate change on drought and flood events indicate similar changes to expansive soil frequency and impacts. Refer to Probability of Future Events section in Section 6 (Drought) and Section 10 (Flood) for more information on those hazards.

VULNERABILITY AND IMPACT

The effects of expansive soils are most prevalent when periods of moderate to high precipitation are followed by drought and then again by periods of rainfall. Other cases of damage result from increases in moisture volume from such sources as broken or leaking water and sewer lines. Dry clays are capable of absorbing water and will increase in volume in an amount proportional to the amount of water absorbed. Soils capable of changes in volume present a hazard to structures built over them and to the pipelines buried in them. Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling clays than are multi-story buildings, which are usually heavy enough to counter swelling pressures. However, if constructed on wet clay, multi-story buildings may also be damaged by clay shrinkage when moisture levels are substantially reduced.



SECTION 8: EXPANSIVE SOILS

Cracked foundations and floors, jammed windows and doors, and ruptured pipelines are typical types of damage resulting from swelling soils. Damage to the upper floors of larger buildings can occur when motion in the structure is significant. While all infrastructure within the planning area is minimally vulnerable, slab on grade structures are more likely to suffer damages from expansive soils. In addition, older structures built to less stringent building codes may also be more susceptible to damage than new construction.

While the number of slab on grade structures is not available, the U.S. Census data indicates approximately 5,201 of the housing units (56 percent of all housing units) in the planning area were built before 1980 and may be more susceptible to damages.

Table 8-2. Residential Structures at Greater Risk

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
De Witt County	5,201
City of Cuero	1,895
City of Nordheim	175
City of Yorktown	834

Table 8-3. Special District Structures at Greater Risk

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
Green-De Witt Drainage District	2

The De Witt County Planning Team identified the following critical facilities (Table 8-4) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by expansive soils. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 8-4. Critical Facilities Vulnerable to Expansive Soils

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> • Uneven settling and shifting cause cracks in building foundations, impacting the integrity of critical facility structures and lead to doors being unable to open or close properly. • Damages and cracks in streets and highway infrastructure may lead to emergency vehicles being unable to access areas increasing the need for emergency operations. • Ruptured water pipes can lead to loss of function or water pressure impacting drinking water availability and firefighting capabilities.

SECTION 8: EXPANSIVE SOILS

CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> • Uneven settling and shifting cause cracks in building foundations, impacting the integrity of critical facility structures and lead to doors being unable to open or close properly. • Damages and cracks in streets and highway infrastructure may lead to emergency vehicles being unable to access areas increasing the need for emergency operations.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Wastewater and drinking water facilities and infrastructure may be damaged or destroyed resulting in services disruption or outage for multiple days or weeks. • Disruptions and outages impact public welfare as safe drinking water is critical. • A break in essential and effective wastewater collection and treatment is a health concern, potentially spreading disease. • Exposure to untreated wastewater is harmful to people and the environment.

ASSESSMENT OF IMPACTS

Expansive soils are generally influenced by how wet or dry reactive clay types of soils become. The climate of an area, and more specifically the seasonal precipitation-drought cycle associated with arid or semi-arid regions, influences the occurrence and severity of these hazards. Problems associated with expansive soils in De Witt County typically occur during extended periods of drought.

Expansive soils present a hazard to lightweight buildings and other infrastructure. Uneven settling and shifting in such structures may occur, causing cracks in foundations, walls, streets, driveways, and sidewalks; ruptured pipes; and windows and doors that do not open and close properly. Special provisions are necessary in the construction of footings and slabs resting on expansive soils to minimize damages due to the expansiveness. Homeowners and public agencies that assume they cannot afford preventative measures, such as more costly foundations and floor systems, often incur the largest percentage of damage and costly repairs from expanding soil. No figures are available for the total damage to homes in the planning area from expansive clays. The greatest damage occurs when structures are constructed when clays are dry (such as during a drought) and then subsequent soaking rains swell the clay.

Infrastructure such as pipelines can be damaged, causing increased maintenance and repairs, replacement, or damage to the point of failure. Sewer and water lines are also affected by shrinking and swelling soils. The movement of the soil can snap water and sewer lines, producing a minimum of temporary discomfort, and a maximum of serious health and welfare risk. Field monitoring and testing should be conducted on a regular basis, especially during extended drought periods, to avoid loss of function or water pressure, which could impact drinking water and firefighting capabilities. In addition, highways and other critical egress routes (such as U.S.

SECTION 8: EXPANSIVE SOILS

Highway 87, U.S. Highway 183, and State Highway 72) can be affected by expansive soils, causing possible closures during costly repair work.

Unlike many other environmental hazards, the effects of expansive soil are deceptive in that they are not revealed suddenly or caused by a single event but rather become increasingly evident and destructive over time. As such, the vast majority of expansive soil impacts are relatively benign in terms of emergency management and emergency response.

Expansive soil can directly impact infrastructure and, as a result, indirectly create impacts on residents. The impact of climate change could produce more severe expansive soils events, exacerbating the current expansive soils impacts. The following are a summary of impacts frequently associated with expansive soils:

- Expansive soils are influenced by the seasonal precipitation-drought cycle. Most impacts on De Witt County typically occur during extended periods of drought.
- Impacts to lightweight buildings and other infrastructure are most likely to occur. Impacts include uneven settling and shifting in structures; cracks in foundations, walls, streets, driveways, and sidewalks; ruptured pipes; and windows and doors that do not open and close properly.
- An estimated 56 percent of homes in De Witt County were built before 1980 leading them to more susceptible to damages from expansive soils. There are 83 buildings and sites in De Witt County based on the Cuero Chamber of Commerce, many of which pre-date modern building codes.
- Highways (such as U.S. Highway 87, U.S. Highway 183, and State Highway 72) can be affected by expansive soils.
- Economic impacts are limited to uninsured damages.
- Impacts on people are indirect, with impacts related to disruption in county and city services such as water and sewer.
- As the population grows and development increases in the county and cities, the potential risk to expansive soils will also increase.
- Limited impact is anticipated to the natural environment other than changes in soil characteristics.

The impact of expansive soils experienced in De Witt County, including all participating jurisdictions and special district, has resulted in no reported damages, supporting a “Limited” severity of impact meaning injuries and illnesses are treatable with first aid, shutdown of critical facilities and services for 24 hours or less, and less than 10 percent of property destroyed or with major damage.



Section 9

Extreme Heat

SECTION 9: EXTREME HEAT

Hazard Description	1
Location	1
Extent	1
Historical Occurrences	4
Significant Events	5
Probability of Future Events	5
Climate Change Considerations	5
Vulnerability and Impact	6
Assessment of Impacts	8

HAZARD DESCRIPTION

Extreme heat is a prolonged period of excessively high temperatures and exceptionally humid conditions. Extreme heat during the summer months is a common occurrence throughout the State of Texas, and the De Witt County planning area is no exception. The County typically experiences extended heat waves or an extended period of extreme heat and is often accompanied by high humidity.



Although heat can damage buildings and facilities, it presents a more significant threat to the safety and welfare of citizens. The major human risks associated with extreme heat include heat cramps; sunburn; dehydration; fatigue; heat exhaustion; and even heat stroke. The most vulnerable population to heat casualties are children and the elderly or infirmed who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being.

Critical infrastructure can also be damaged or impacted by extreme heat. High temperatures may cause a rise in electricity consumption as homes, schools, and businesses try to regulate the temperature. This may lead to energy shortages and possible blackouts.

LOCATION

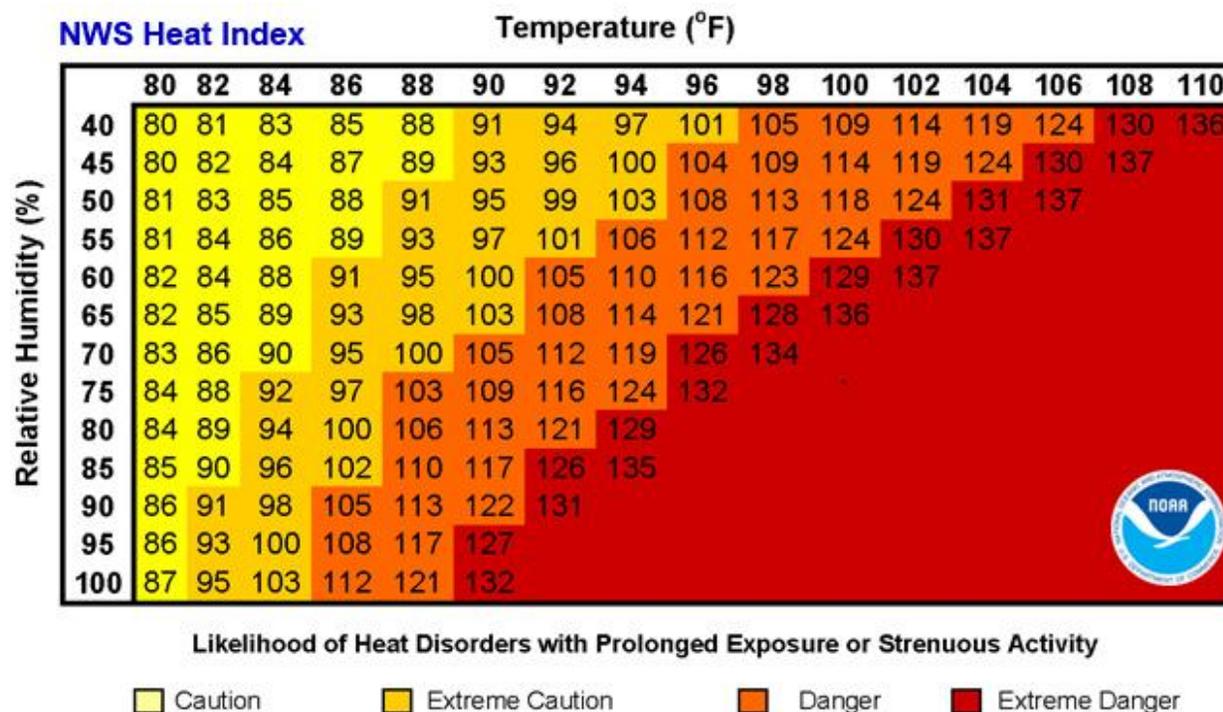
There is no specific geographic boundary to the extreme heat hazard. Extreme heat events can occur anywhere throughout the De Witt County planning area, including all participating jurisdictions and special district.

EXTENT

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index” and is depicted in Figure 9-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

SECTION 9: EXTREME HEAT

Figure 9-1. Extent Scale for Extreme Heat¹



The index in Figure 9-1 displays varying categories of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit (°F) or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first category of intensity, and it indicates when fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps, or heat exhaustion are possible, and a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown in Table 9-1.

Table 9-1. Heat Index and Warnings

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Danger	125°F and higher	Heat stroke or sun stroke likely.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.
Danger	103 – 124°F	Sunstroke, muscle cramps, and/or heat exhaustion are likely. Heatstroke possible with prolonged exposure and/or physical activity.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.

¹ Source: NOAA

SECTION 9: EXTREME HEAT

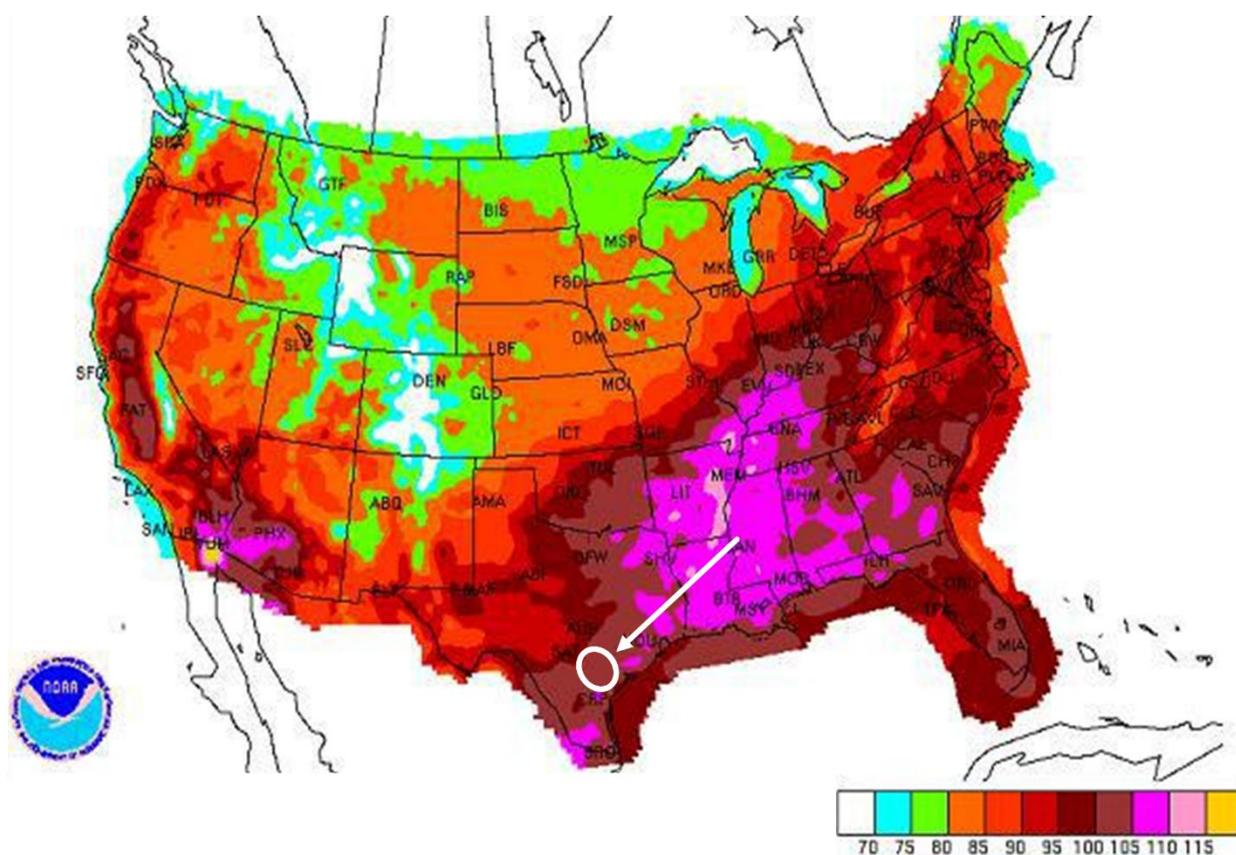
CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.	A Heat Advisory will be issued to warn that the Heat Index may exceed 105°F.

Due to its geography and its humid, hot, and subtropical climate, the De Witt County planning area can expect an extreme heat event each summer. Citizens, especially children and the elderly, should exercise caution by staying out of the heat for prolonged periods when a heat advisory or excessive heat warning is issued. In addition, those working or remaining outdoors for extended periods of time are at greater risk.

Figure 9-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1838 to 2015. The white circle shows the De Witt County planning area. The planning area is represented in a maroon color across the County. The maroon color indicates an average daily heat index of 100°F to 105°F. Therefore, De Witt County could experience dangerous heat from 100°F to 105°F and should mitigate to the extent of “Danger” which can include sunstroke, muscle cramps, heat exhaustion, and heatstroke. The planning area’s record high temperature of 114 °F was documented in the City of Cuero on August 29, 2011. This is the maximum temperature the planning area can anticipate based on historical events.

SECTION 9: EXTREME HEAT

Figure 9-2. Average Daily Maximum Heat Index Days²



HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration (NOAA). The NCEI is the largest archive available for historic storm events data. Previous occurrences for extreme heat are derived from the NCEI database, which identifies extreme heat events at the county level for each event. According to heat related incidents located within De Witt County, there have been four extreme heat events on record for the planning area (Table 9-2). Historical extreme heat information, as provided by the NCEI, shows extreme heat activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event, when applicable.

Historical data for all participating jurisdictions is provided on a county-wide basis per the NCEI database from 1996 through 2025. No injuries or damages were reported to the NCEI. It is highly likely additional extreme heat occurrences have gone unreported before and during the recording period. Due to the limited number of reported events, average high temperatures have been analyzed in order to determine the probability of future events.

² NRDC and the white circle indicates the De Witt County planning area.

SECTION 9: EXTREME HEAT

Table 9-2. Historical Extreme Heat Events, 1996 – 2025³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	7/13/2020	0	0	\$0	\$0
De Witt County	6/17/2023	0	0	\$0	\$0
De Witt County	7/10/2023	0	0	\$0	\$0
De Witt County	8/1/2023	0	0	\$0	\$0
TOTALS		0	0	\$0	\$0

Table 9-3. Historical Extreme Heat Events Summary, 1996 – 2025

JURISDICTION	NUMBER OF EVENTS	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	4	0	0	\$0	\$0

Based on the list of historical extreme heat events for the De Witt County planning area, four events were reported to the NCEI since the 2018 Plan.

SIGNIFICANT EVENTS

July 10, 2023

A strong high-pressure system settled over South Central Texas, sending temperatures soaring. The heat wave began on June 10th, with temperatures hitting 105°F in Blanco, Caldwell, De Witt, Hays, Llano, and Travis Counties, while Maverick County recorded a heat index of 114°F. From there, the extreme heat spread rapidly, affecting most of South Central Texas by June 12th. Widespread excessive heat persisted through the 21st and continued intermittently through the 28th.

PROBABILITY OF FUTURE EVENTS

According to historical records, the De Witt County planning area has experienced four events in a 29.5-year reporting period. Historical records in combination with an analysis of maximum average temperatures provide a probability of at least one event every year. This frequency supports an “Highly Likely” probability of future events for the planning area.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to lead to an increase in average temperatures as well as an increase in frequency, duration, and intensity of extreme heat events. With no reductions in emissions

³ NOAA, NCEI Storm Events Database

SECTION 9: EXTREME HEAT

worldwide, the state of Texas is projected to experience an additional 30 to 60 days per year above 100°F than what is experienced now.⁴

In addition, it is projected that future changes to De Witt County will include increased temperatures, which according to the U.S. Climate Explorer, the planning area may experience a 5°F increase in the average extreme heat temperatures. Historically, extreme temperatures averaged 100°F in De Witt County, but between 2035 and 2064 the average will be 105°F, increasing the severity and frequency of extreme heat events. Some projections show an even higher increase; however, the severity will be dependent on overall future emissions and is subject to change.

VULNERABILITY AND IMPACT

While the entirety of the De Witt County planning area is exposed to extreme temperatures, existing buildings, infrastructure, and critical facilities are not likely to sustain significant damage from extreme heat events. Therefore, any estimated property losses associated with the extreme heat hazard are anticipated to be minimal across the area.

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the United States. Mortality rates increase during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Extreme temperatures present a significant threat to life and safety for the population of the County as a whole. Heat casualties, for example, are typically caused by a lack of adequate air conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed who frequently live on fixed incomes and cannot afford to run air conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Children may also be more vulnerable if left unattended in vehicles. Populations living below the poverty level are often unable to run air conditioning on a regular basis and are limited in their ability to seek medical treatment.

Vulnerable and underserved populations are disproportionately impacted by extreme heat events as they may be more susceptible to health risks. Populations below the poverty level are less likely to be able to afford air conditioning during the hot summer months as well as less likely to have access to medical care. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the De Witt County planning area is estimated at 20 percent of the total population and children under the age of 5 are estimated at 7 percent. The population with a disability is estimated at 15 percent of the total population. An estimated 16 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well” (Table 9-4). Three Green-De Witt Drainage District employees also face higher vulnerability to extreme heat, as they regularly work outdoors and may be subject to extreme heat conditions.

⁴ Nielsen-Gammon, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>

SECTION 9: EXTREME HEAT

Table 9-4. Populations at Greater Risk by Participating Jurisdiction

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,223	321
City of Nordheim	162	7	125	125	10
City of Yorktown	525	167	428	428	53

Extremely high temperatures can have significant secondary impacts, leading to droughts, water shortages, increased fire danger, and prompt excessive demands for energy. The possibility of rolling blackouts increases with unseasonably high temperatures in what is a normally mild month with low power demands. Typically, more than 12 hours of warning time would be given before the onset of an extreme heat event.

High demand for air conditioning during extreme temperatures can strain transmission lines, and can cause transformers to overheat and fail, leading to short-term blackouts. It is possible that critical facilities could be shut down due to temporary power outages (Table 9-5). Roadways may be damaged during prolonged heat waves as asphalt softens, creating ruts and potholes, reducing the lifespan of critical infrastructure.

Based on historical records, annualized property and crop losses for the De Witt County planning area, including all participating jurisdictions and special district, are negligible. The potential impact of excessive summer heat is considered “Limited,” with illnesses and injuries possible depending on the extent and duration of the event.

The De Witt County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by extreme heat events. The following critical facilities would be vulnerable to extreme heat events in the De Witt County planning area. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 9-5. Critical Facilities Vulnerable to Extreme Heat Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none"> Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. Exposure to heat can cause heat illnesses in first responders, especially for those in heavy equipment. Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services.

SECTION 9: EXTREME HEAT

CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Power outages due to increased usage could disrupt critical care. • Backup power sources could be damaged. • Evacuations may be necessary due to extended power outages, breaks in water main lines or other associated damage to facilities. • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Economic disruption due to power outages negatively impacts airport services as well as area businesses reliant on airport operations.
Commercial Suppliers (food, gas, etc.)	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. • Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services. • Breaks in water main lines or other associated damage to facilities.

ASSESSMENT OF IMPACTS

The greatest risk from extreme heat is to public health and safety. Extreme heat conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (20 percent of total population), children under 5 (7 percent of total population), and those with a disability (15 percent of total population) can face serious or life-threatening health problems from exposure to extreme heat including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Response personnel, including utility workers, public works personnel, and any other professions where individuals are required to work outside, are more subject to extreme heat related illnesses since their exposure would typically be greater.
- High energy demand periods can outpace the supply of energy, potentially creating the need for rolling brownouts which would elevate the risk of illness to vulnerable residents.
- Highways and roads may be damaged by excessive heat causing asphalt roads to soften and concrete roads to shift or buckle.

SECTION 9: EXTREME HEAT

- Vehicle engines and cooling systems typically run harder during extreme heat events resulting in increases in mechanical failures.
- Extreme heat events during times of drought can exacerbate the environmental impacts associated with drought, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.
- Negatively impacted water suppliers may face increased costs resulting from the transport of water resources or development of supplemental water resources.
- Tourism and recreational activities at places may be negatively impacted during extreme heat events, reducing seasonal revenue.
- Outdoor activities may see an increase in school injury or illness during extreme heat events.

The economic and financial impacts of extreme heat on the community will depend on the duration of the event, demand for energy, drought associated with extreme heat, and many other factors. The level of preparedness and the amount of planning done by the community, local businesses, and citizens will impact the overall economic and financial conditions before, during, and after an extreme heat event.



Section 10

Flood

SECTION 10: FLOOD

Hazard Description	1
Location	1
Extent	7
Historical Occurrences	10
Significant Events	12
Probability of Future Events	13
Climate Change Considerations	13
Vulnerability and Impact	13
Assessment of Impacts	18
National Flood Insurance Program (NFIP) Participation	19
NFIP Compliance and Maintenance	21
Repetitive Loss	21

HAZARD DESCRIPTION

Floods generally result from excessive precipitation. The severity of a flood event is determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surfaces. Typically, floods are long-term events that may last for several days.

The primary types of general flooding are inland and coastal flooding. Due to De Witt County's inland location, only inland flooding is profiled in this section. Inland or riverine flooding is a result of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Inland or riverine flooding is overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area. Therefore, it is a naturally occurring and inevitable event. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

The De Witt County planning area is subject to extreme rainfall events, often in short durations, leading to dangerous flash flooding events. Floods are a natural and recurrent event and take place every year, in all seasons.

LOCATION

The Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide an overview of flood risk but can also be used to identify the areas of the County that are vulnerable to flooding. FIRMs are used to regulate new development and to control the substantial improvement and repair of substantially damaged buildings. Flood Insurance Studies (FIS) are often developed in conjunction with FIRMs. The FIS typically contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRMs. The FIS also contains flood profiles for studying flooding sources and can be used to determine Base Flood Elevations (BFEs) for some areas.

SECTION 10: FLOOD

The FIS for De Witt County is dated January 6, 2011. This compiles all previous flood information including data collected on numerous waterways. This study indicates that flooding comes from two main sources in the City of Cuero which includes Gohlke Creek and its tributary. Other principal flood problems include the annual occurrence of floods that cause agricultural damage and larger floods that occur every five to ten years that cause severe urban damage. This is directly related to the flat topography of the area and shallow stream channels.

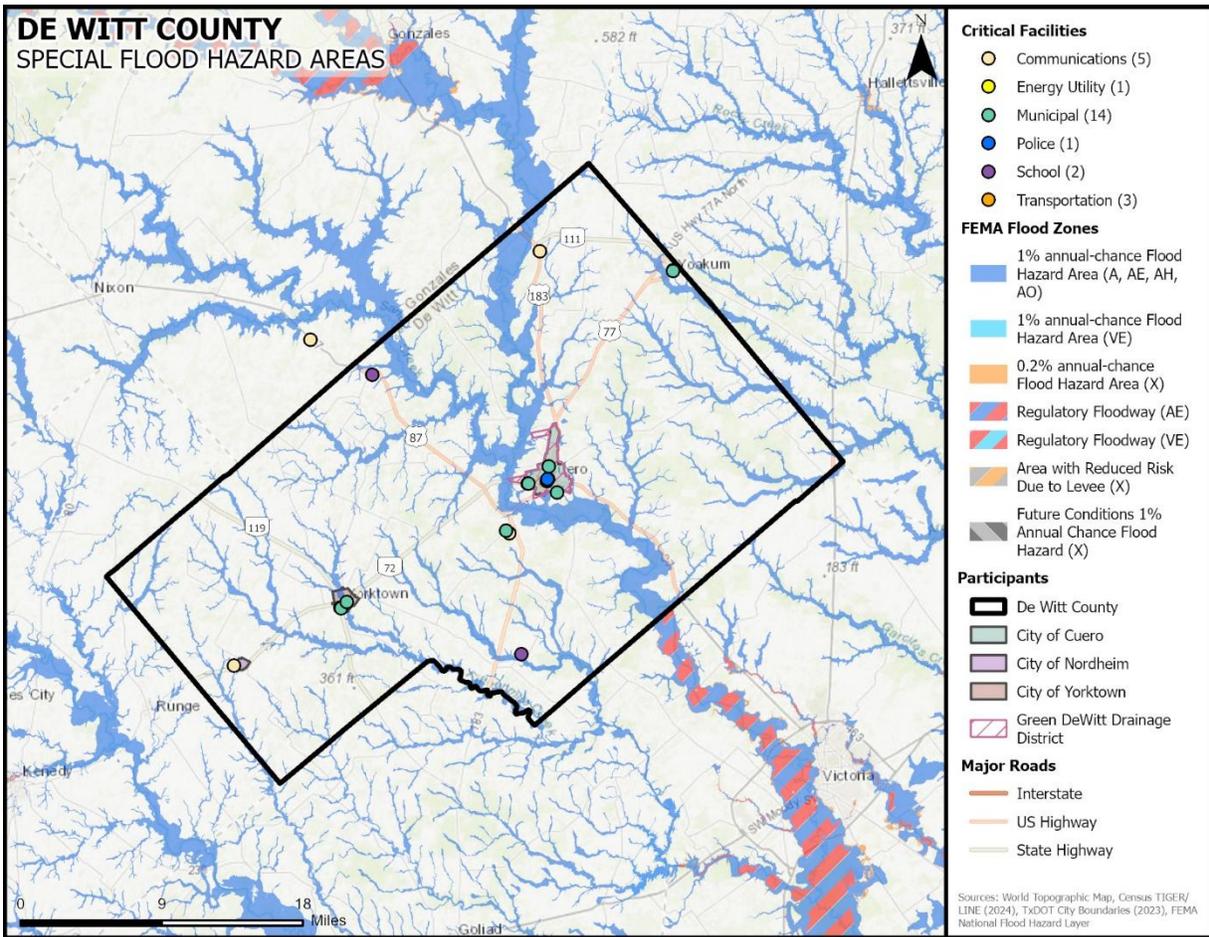
The current effective Digital Flood Insurance Rate Map or DFIRM (map ID 48123C, panels 25-750, dated January 6, 2011) data provided by FEMA for De Witt County shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.
- Zone AE: Areas subject to inundation by 1-percent-annual-chance shallow flooding. It is the base floodplain where BFEs are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.

Locations of flood zones in De Witt County based on the Digital Flood Insurance Rate Map (DFIRM) from FEMA are illustrated in Figures 10-1 through 10-5.

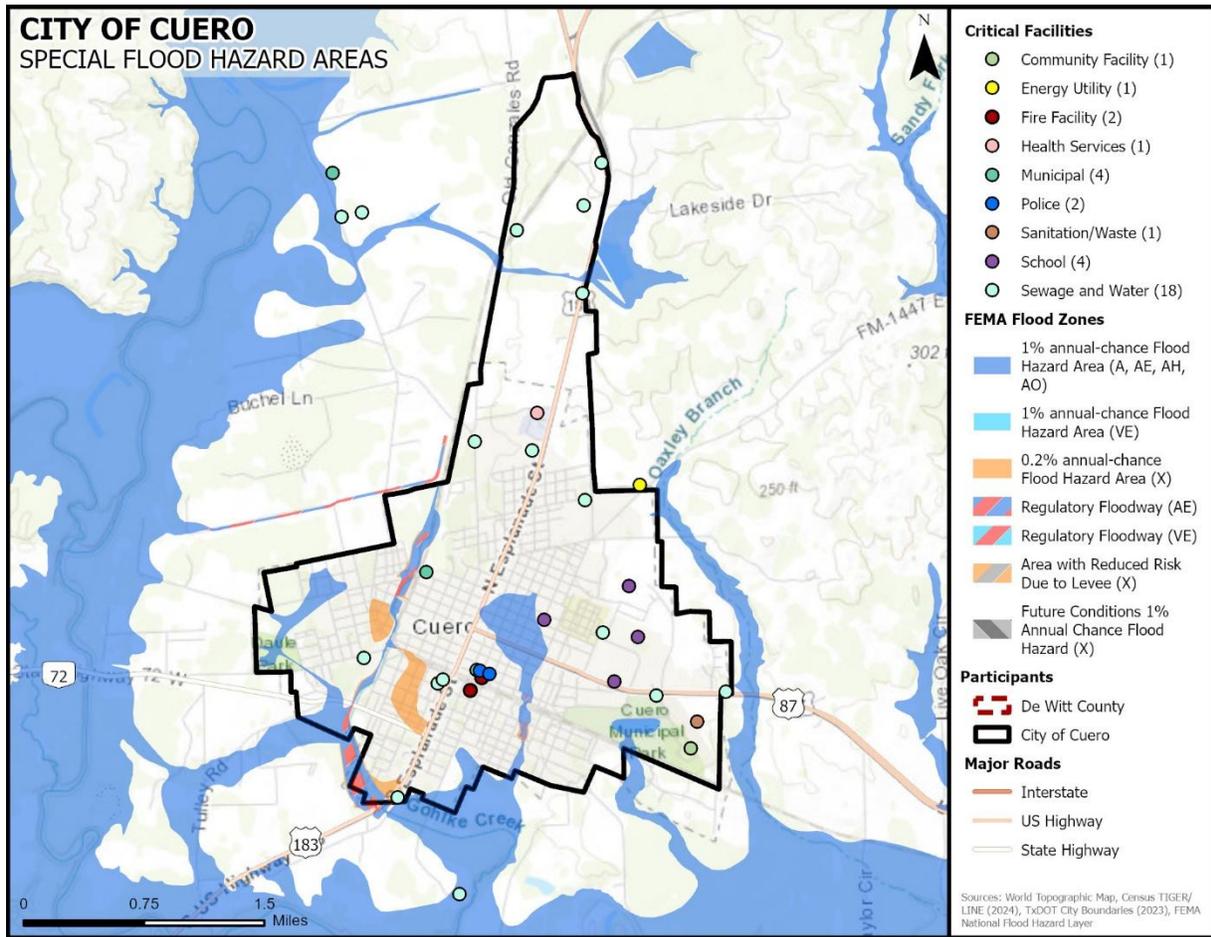
SECTION 10: FLOOD

Figure 10-1. Estimated Flood Zones in De Witt County



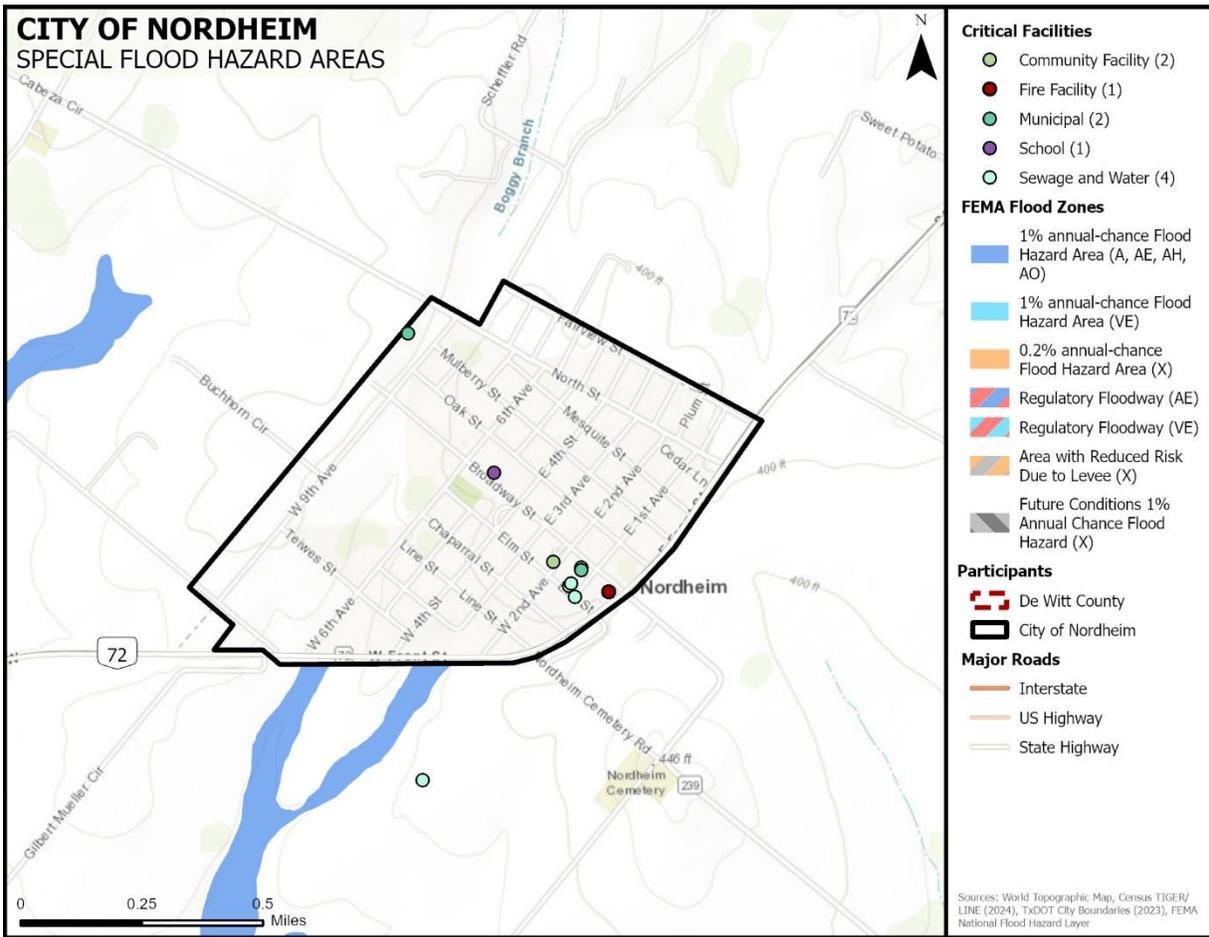
SECTION 10: FLOOD

Figure 10-2. Estimated Flood Zones in the City of Cuero



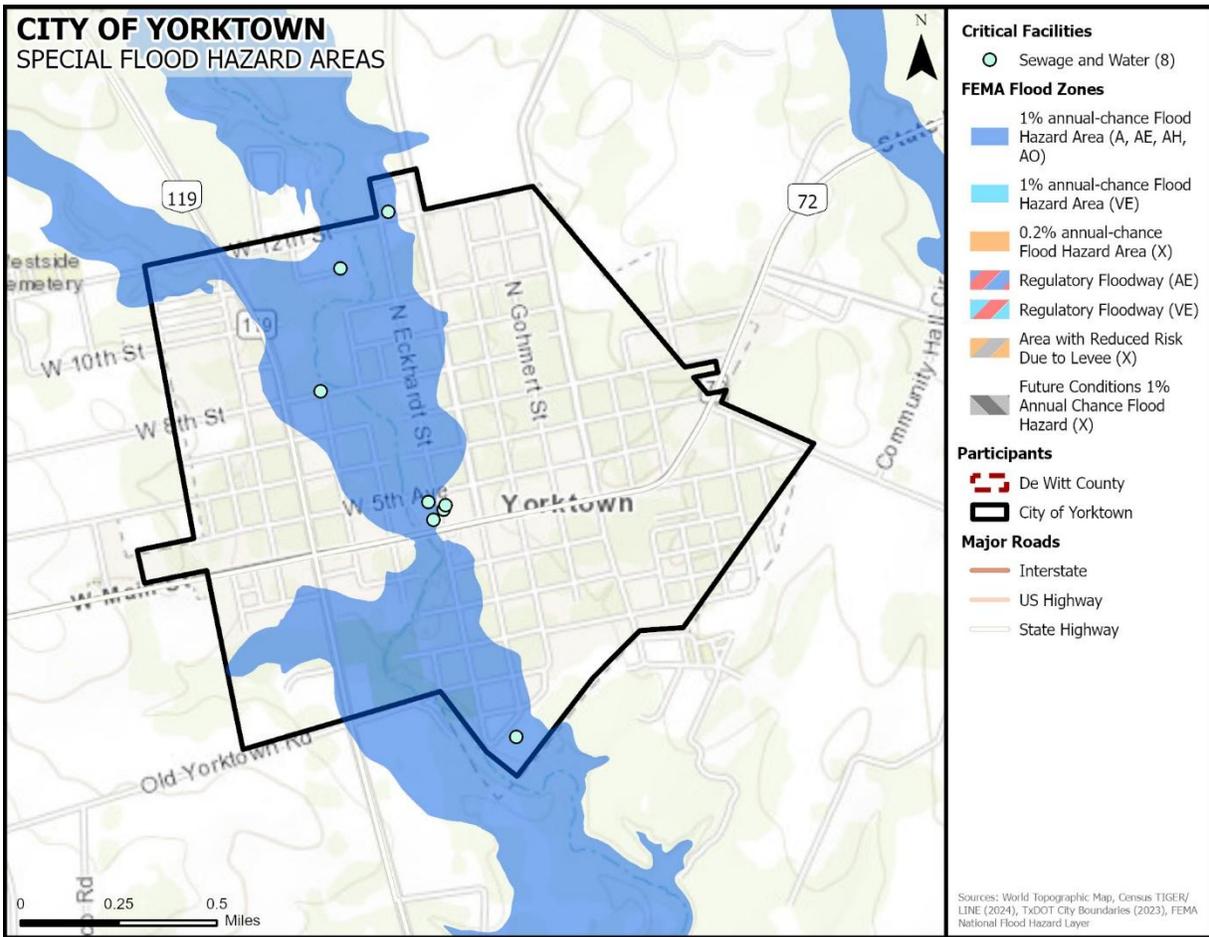
SECTION 10: FLOOD

Figure 10-3. Estimated Flood Zones in the City of Nordheim



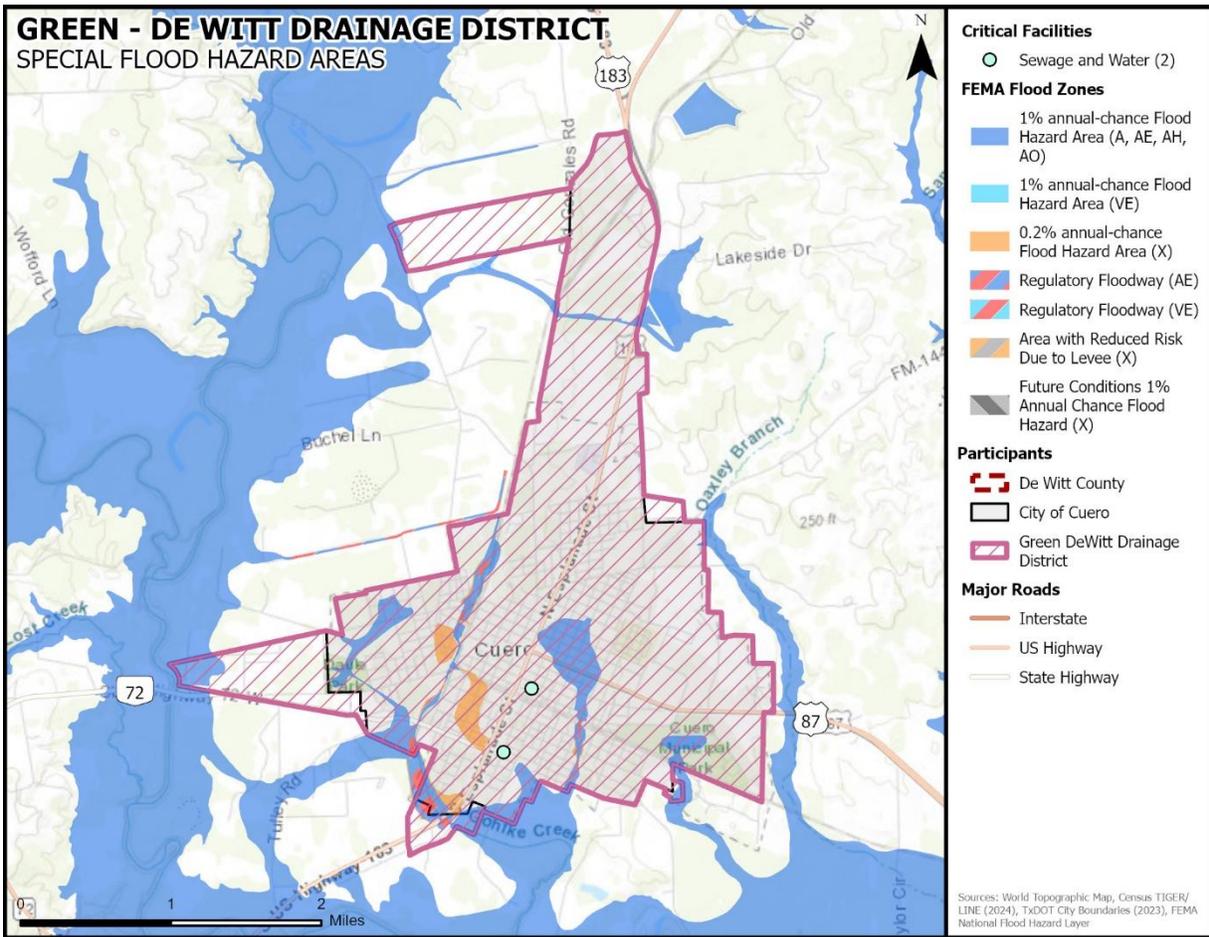
SECTION 10: FLOOD

Figure 10-4. Estimated Flood Zones in the City of Yorktown



SECTION 10: FLOOD

Figure 10-5. Estimated Flood Zones for the Green-De Witt Drainage District



EXTENT

The severity of a flood event is determined by a combination of several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surfaces. Typically, floods are long-term events that may last for several days.

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to the depths of floodwaters. The extent of flood damages can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey floodwater. Flood zones are the categories that are mapped on FIRMs. Table 10-1 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm. Flood Zones A and AE are the hazard areas mapped in the region. Figures 10-1 through 10-5 should be read in conjunction with the extent for flooding in Tables 10-1 and 10-2 to determine the intensity of a potential flood event.

SECTION 10: FLOOD

Table 10-1. Flood Zones

INTENSITY	ZONE	DESCRIPTION
High	Zone A	Areas with a 1-percent-annual-chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
	Zone A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	Zone AE	The base floodplain where BFEs are provided. AE Zones are now used on the new format FIRMs instead of A1-A30 Zones.
	Zone AO	River or stream flood hazard areas and areas with a 1-percent-annual-chance or greater of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
	Zone AH	Areas with a 1-percent-annual-chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. BFEs derived from detailed analyses are shown at selected intervals within these zones.
	Zone A99	Areas with a 1-percent-annual-chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or BFEs are shown within these zones.
	Zone AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
Moderate to Low	Zone X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

Zone A is interchangeably referred to as the 100-year flood, the 1-percent-annual-chance flood, the Special Flood Hazard Area (SFHA), or more commonly, the base flood. This is the area that will convey the base flood and constitutes a threat to the planning area. The impact from a flood event can be more damaging in areas that will convey a base flood.

SECTION 10: FLOOD

Structures built in the SFHA are subject to damage by rising waters and floating debris. Moving floodwater exerts pressure on everything in its path and causes erosion of soil and solid objects. If not elevated above Base Flood Elevation, utility systems, such as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems and water systems, may also be damaged.

The intensity and magnitude of a flood event is also determined by the depth of floodwater. Table 10-2 describes the stream gauge data provided by the United States Geological Survey (USGS). Peak flood data at the locations available in the planning area indicate a peak flood depth range of 0 to 25 feet above average peak flows.

Table 10-2. Extent for De Witt County¹

JURISDICTION ²	PEAK FLOOD EVENT
De Witt County	Sandies Creek near Westhoff, Texas reached an overflow elevation of 33 feet in July of 1936. The average peak flow is 20 feet at this site. This indicates a maximum flood depth of 13 feet above the average peak flow at this site.
City of Cuero	Guadalupe River in Cuero, Texas reached an overflow elevation of 50 feet in October of 1998. The average peak flow is 25 feet at this site. This indicates a maximum flood depth of 25 feet above the average peak flow at this site.
De Witt County	Guadalupe River near Hochheim, Texas reached an overflow elevation of 40 feet in August of 2017. The average peak flow is 32 feet at this site. This indicates a maximum flood depth of 8 feet above the average peak flow at this site.

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical occurrences, the planning area could expect to experience an average of 2 inches of rain within a 1-hour period, resulting in flash flooding.

The data described in Tables 10-1 and 10-2, together with Figures 10-1 through 10-5, and historical occurrences for the area, provides an estimated potential magnitude and severity for the De Witt County planning area.

Notably, the 2024 State Flood Plan developed by the Texas Water Development Board assessed future flood risk by estimating the potential extent of the 1-percent (100-year) and 0.2-percent (500-year) annual chance flood hazard areas projected 30 years into the future. Results indicated that the future 1-percent annual chance flood hazard area is expected to expand by approximately 11 percent, reaching an estimated 62,245 square miles across the state of Texas. Therefore, the De Witt County planning area may see an expansion of current flood hazard boundaries, placing more populations and development in high risk flood zones.

¹ Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on USGS data.

² Severity is provided where peak data was available for streams, creeks and rivers throughout the planning area.

SECTION 10: FLOOD

HISTORICAL OCCURRENCES

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment. It is likely that additional flood occurrences have gone unreported before and during the recording period. Table 10-3 identifies historical flood events that resulted in damages, injuries, or fatalities within the De Witt County planning area. Table 10-4 provides the historical flood event summary by jurisdiction. Historical data is provided by the Storm Prediction Center (NOAA), National Centers for Environmental Information (NCEI) database for De Witt County. There have been 123 recorded flood events in De Witt County.

Historical flood data events for the drainage district is primarily provided in the NCEI database within the county or city in which the drainage district is located. The Green-De Witt Drainage District reported no additional events, injuries, fatalities, or damages separate and apart from the NCEI.

Table 10-3. Historical Flood Events, January 1996 – June 2025³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	9/8/1996	0	0	\$10,200	\$0
De Witt County	4/2/1997	0	0	\$99,900	\$0
De Witt County	4/4/1997	0	0	\$6,000	\$0
De Witt County	4/10/1997	0	0	\$998,200	\$99,900
De Witt County	5/24/1997	0	0	\$10,000	\$0
De Witt County	6/21/1997	0	0	\$30,000	\$0
De Witt County	7/8/1997	0	0	\$39,900	\$0
De Witt County	10/7/1997	0	0	\$39,600	\$0
De Witt County	10/11/1997	0	0	\$39,600	\$0
De Witt County	10/13/1997	0	0	\$29,700	\$0
De Witt County	1/6/1998	0	0	\$39,600	\$0
De Witt County	2/21/1998	0	0	\$9,900	\$0
De Witt County	8/22/1998	0	0	\$58,800	\$97,900
De Witt County	8/23/1998	0	0	\$19,600	\$19,600
De Witt County	9/10/1998	0	0	\$48,900	\$97,800

³ Table only includes historical flood events that resulted in damages, injuries, or fatalities between January 1996 and June 2025 in the NCEI database. Values are in 2025 dollars.

SECTION 10: FLOOD

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	9/15/1998	0	0	\$5,900	\$0
De Witt County	9/16/1998	0	0	\$29,400	\$19,600
De Witt County	10/17/1998	0	50	\$97,500	\$1,950,000
De Witt County	10/17/1998	0	50	\$1,950,000	\$97,500
De Witt County	10/18/1998	0	500	\$58,499,900	\$975,000
De Witt County	10/18/1998	0	500	\$9,750,000	\$1,950,000
De Witt County	11/12/1998	0	0	\$19,500	\$97,500
De Witt County	11/13/1998	0	0	\$29,300	\$0
De Witt County	11/13/1998	0	0	\$58,500	\$0
De Witt County	11/13/1998	0	0	\$39,000	\$0
De Witt County	5/12/1999	0	0	\$28,900	\$0
De Witt County	6/25/1999	0	0	\$9,700	\$19,300
City of Cuero	6/10/2000	0	0	\$27,900	\$0
De Witt County	11/3/2000	0	0	\$9,200	\$0
De Witt County	11/23/2000	0	0	\$18,400	\$0
De Witt County	5/5/2001	0	0	\$90,000	\$0
De Witt County	8/30/2001	0	0	\$18,100	\$36,100
De Witt County	8/31/2001	0	20	\$450,500	\$180,200
De Witt County	9/4/2001	0	0	\$18,000	\$0
De Witt County	9/5/2001	0	0	\$18,000	\$0
De Witt County	11/15/2001	0	0	\$5,500	\$0
De Witt County	11/4/2002	0	0	\$17,700	\$0
De Witt County	2/20/2003	0	0	\$5,300	\$0
De Witt County	7/15/2003	0	0	\$87,000	\$0
De Witt County	9/2/2003	0	0	\$8,700	\$0
De Witt County	9/3/2003	0	0	\$17,300	\$0
De Witt County	11/17/2003	0	0	\$26,000	\$0

SECTION 10: FLOOD

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	1/16/2004	0	0	\$5,200	\$0
De Witt County	8/28/2017	0	0	\$3,907,700	\$0
TOTALS		0	1,120	\$76,728,000	\$5,640,400

Table 10-4. Summary of Historical Flood Events, January 1996 – June 2025

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	97	0	1,120	\$76,700,100	\$5,640,400
City of Cuero	18	0	0	\$27,900	\$0
City of Nordheim	4	0	0	\$0	\$0
City of Yorktown	4	0	0	\$0	\$0
Green-De Witt Drainage District	0	0	0	\$0	\$0
TOTALS	123	0	1,120	\$82,368,400	

Based on the list of historical flood events for the De Witt County planning area, including all participating jurisdictions and special district, 8 events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

Flood on October 17-18, 1998

In mid-October, days of relentless rain across South Central Texas sent creeks and rivers surging out of their banks. In De Witt County, Sandies Creek near Westhoff crested at 28.6 feet with water flowing over bridge railings and flooding rural roads and ranches. The rising Guadalupe River soon followed, reaching a devastating 49.8 feet in the City the Cuero, nearly 30 feet above flood stage.

Floodwaters spread miles beyond the river channel, washing through neighborhoods two miles east of the Guadalupe and carrying homes across Highway 87. One house was swept over the road and came to rest against a commercial building in Cuero’s eastbound lane. South of the city, the river expanded to nearly five miles wide, submerging farmland and flooding subdivisions such as River Haven and Cypress Valley with 20 feet of water over the lowest home slabs.

The destruction was immense. Hundreds of homes were damaged or washed away, and livestock losses exceeded 10,000 head. Entire pastures disappeared under the flood, roads and bridges were destroyed, and families returned to find their properties unrecognizable. The Great October Flood was one of the most catastrophic events in De Witt County’s history with 1,100 reported injuries, \$70,297,400 (2025 dollars) in property damages, and \$4,972,500 (2025 dollars) in crop damages.

SECTION 10: FLOOD

Flash Flood on August 31, 2001

Just after midnight, bands of heavy showers and thunderstorms pushed southeast into Lavaca and De Witt Counties, falling on ground already saturated from days of extreme rainfall. The storm unleashed another three to six inches of rain across most of De Witt County, with localized totals nearing ten inches between Cuero, Hochheim, and Smiley, and along the De Witt–Victoria County line.

By the early morning hours, floodwaters were rising rapidly around the City of Yorktown, where creeks overflowed and streets turned into swift channels. Water entered homes, forcing residents to seek safety. Police and firefighters launched rescue efforts, using boats and high-water trucks to move about twenty people to higher ground. This event resulted in 20 reported injuries and \$450,500 (2025 dollars) in property damages and \$180,200 (2025 dollars) in crop damages).

Flood on August 28, 2017

When Hurricane Harvey made landfall on August 25, 2017, it moved inland as a Category 1 hurricane and entered De Witt County the next morning. Rainfall was extreme at 23 inches near Yoakum and 10 to 15 inches across much of the county. The Guadalupe River at the City of Cuero crested at 44 feet, its second-highest level on record, causing widespread flash and river flooding. More than 100 homes in and around the City of Cuero were flooded as water spread well beyond the river's banks. This event resulted in \$3,907,700 (2025 dollars) in property damages for the county.

PROBABILITY OF FUTURE EVENTS

Based on 123 recorded historical occurrences within a 29.5-year reporting period within the De Witt County planning area, including all participating jurisdictions and special district, flooding is considered “Highly Likely,” meaning an event is probable within the next year.

CLIMATE CHANGE CONSIDERATIONS

River flooding in Texas is projected to have no substantial change through 2036. This is in large part due to the construction of dams and reservoirs for flood management in the 20th century. There is a mixture of historical trends categorized by season, with no one clear trend to project. In addition, meteorological drivers of river flooding (increased rainfall intensity, decreased soil moisture) are projected to have competing influences. On balance, if an increasing trend is present in river flooding, it will be at the most extreme flood events or in the wettest parts of the state where there is so much rainfall that a decrease in soil moisture would have little mitigating impact.⁴

VULNERABILITY AND IMPACT

Results from a Hot Spot Analysis conducted by the Texas General Land Office in the Lower Sandies Creek Watershed in De Witt County indicate that roadway, structural, and agricultural flood risks are primarily concentrated along U.S. Highway 87. This corridor represents a key area where transportation infrastructure, homes, and farmland are at elevated risk of recurring flood impacts and damage. Flooding along major highways can disrupt transportation by damaging

⁴ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

SECTION 10: FLOOD

road surfaces, washing out bridges and culverts, and cutting off critical travel routes needed for emergency response, commerce, and daily commuting.

A separate Hot Spot Analysis also shows that structural and roadway flood impacts occur throughout the Twelvemile Creek watershed area, with concentrated impacts around populated areas during rainfall. The largest impacts are typically within the City of Yorktown. Generally, areas with dense development, impervious surfaces, and limited natural drainage capacity experience the greatest flood impacts. These conditions increase the likelihood of localized flash flooding, property damages, and transportation disruptions.

Table 10-5 includes the comprehensive critical facilities identified in Appendix D that were considered the most important to the planning area that are subject to a range of impacts due to flood and are located in the regulatory floodplain. For a comprehensive list of identified critical facilities by participating jurisdiction and special district, please see Appendix D.

Table 10-5. Critical Facilities in the Floodplain by Participating Jurisdiction

CRITICAL FACILITY TYPES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	N/A	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by rising floodwaters. • Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way. • Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Washed out roads and bridges can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities, Evacuation	De Witt County: 2 Municipal Facilities, 1 Transportation Facility	<ul style="list-style-type: none"> • Structures can be damaged by rising floodwaters. • Power outages could disrupt critical care. • Backup power sources could be damaged, inundated or otherwise inoperable. • Critical staff may be impacted and unable to report for duty, limiting response capabilities.

SECTION 10: FLOOD

CRITICAL FACILITY TYPES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
Centers & Shelters, Governmental Facilities		<ul style="list-style-type: none"> • Evacuations may be necessary due to extended power outages, gas line ruptures, or inundation of facilities. • Additional emergency responders and critical aid workers may not be able to reach the area for days. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Suppliers (food, gas, etc.)	N/A	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<p>City of Cuero: 1 Sewage and Water Facility</p> <p>City of Yorktown: 6 Sewage and Water Facilities</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency service vehicles can be damaged by rising floodwaters. • Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing emergency service workers in harm's way. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • Service responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions.

Historic loss estimates due to flood are presented in Table 10-6 below. Considering 123 flood events over a 29.5-year period, frequency is approximately four events every year.

Table 10-6. Average Annualized Losses by Jurisdiction, January 1996 – June 2025

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$82,340,500	\$2,791,200
City of Cuero	\$27,900	\$900
City of Nordheim	\$0	\$0
City of Yorktown	\$0	\$0

SECTION 10: FLOOD

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Green-De Witt Drainage District	\$0	\$0
TOTALS	\$82,368,400	\$2,792,100

While all citizens are at risk of the impacts of a flood, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. In addition, due to factors like limited mobility, communication difficulties, medical needs, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, the elderly, children, and people with disabilities are also disproportionately affected by flooding events. People who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the De Witt County planning area is estimated at 20 percent of the total population and children under the age of 5 are estimated at 7 percent. The population with a disability is estimated at 15 percent of the total population. An estimated 16 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well.”

Table 10-7. Populations at Greater Risk by Jurisdiction⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

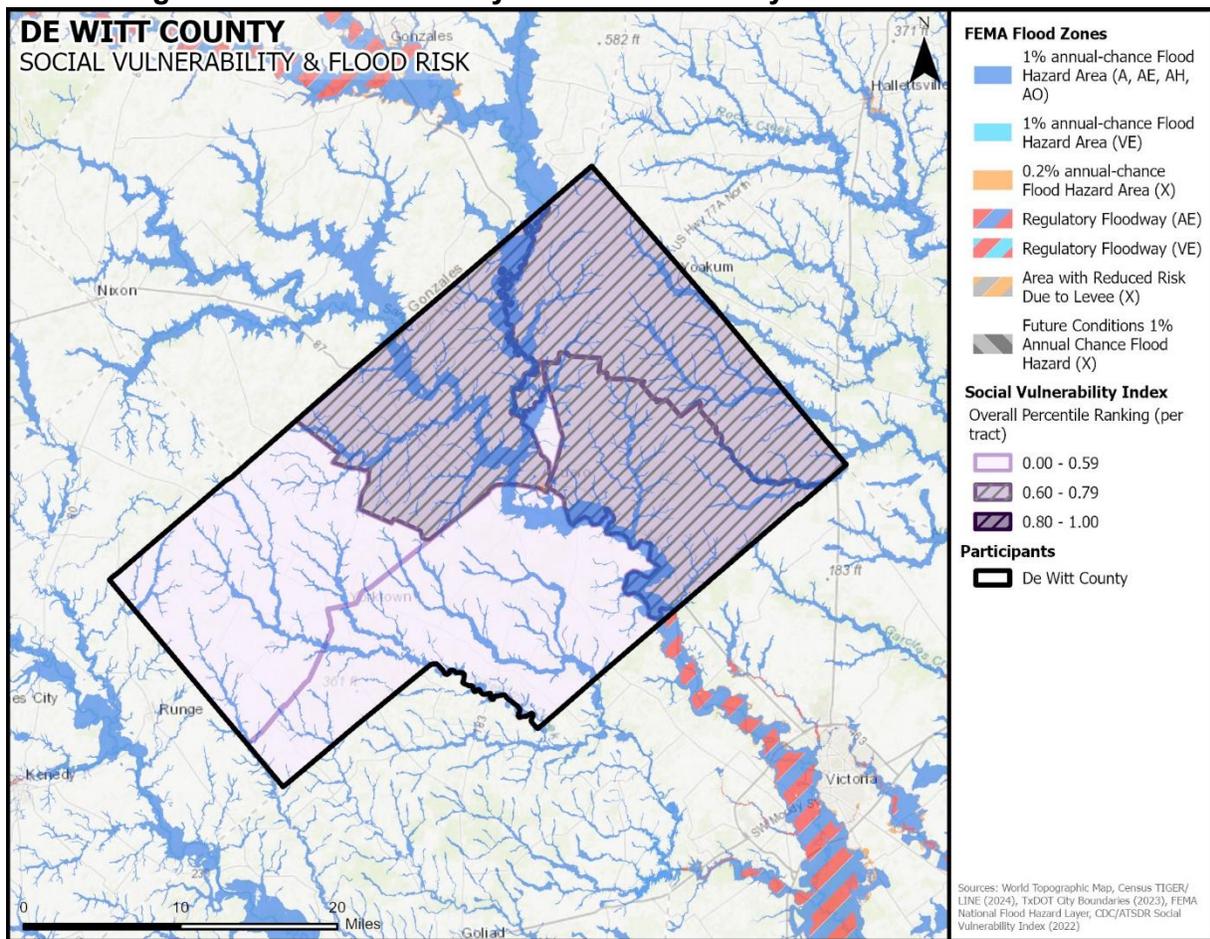
The Center for Disease Control (CDC) created a Social Vulnerability Index (SVI) which includes a database and mapping application that identifies and quantifies communities experiencing social vulnerability. The current CDC SVI uses 16 U.S. census variables from the 5-year American Community Survey (ACS) to identify communities that may need support before, during, or after disasters. All 16 variables fall under four broad categories including socioeconomic status (population in poverty, unemployment, etc.), household characteristics (age, disability status, etc.), racial and ethnic minority status, and housing type and transportation (mobile homes, no vehicles, etc.). Populations experiencing social vulnerability may be adversely impacted by natural hazards, disasters, and other community-level stressors. Figure 10-6 identifies areas of

⁵ U.S. Census Bureau Five-Year estimates.

SECTION 10: FLOOD

social vulnerability using the CDC's SVI and where these areas overlap with the De Witt County flood hazard areas.

Figure 10-6. De Witt County Social Vulnerability and Flood Hazard Areas



According to the 2024 State Flood Plan developed by the Texas Water Development Board, portions of agricultural land in De Witt County currently fall within mapped flood hazard areas, and this acreage is projected to increase over the next 30 years. The county's agricultural sector faces an existing and growing vulnerability to both flash flooding and prolonged inundation.

Flooding can lead to significant soil erosion, nutrient loss, and sediment deposition that reduce long-term soil fertility and productivity. Standing water can damage crops, delay planting and harvesting schedules, and create conditions favorable for pests and disease. In addition, floodwaters can destroy fencing, irrigation systems, and access roads, increasing repair costs for farmers and ranchers. Livestock operations may also be affected by loss of grazing land and contaminated water supplies.

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures. De Witt County promotes development outside of the floodplain. In terms of structure and infrastructure damages and service disruptions, the potential severity of impacts for flood events is considered Limited, with the complete shutdown of critical facilities for 24-hours or less

SECTION 10: FLOOD

and less than 10 percent of property destroyed or with major damage. However, due to reported injuries and fatalities, the impact of flooding in De Witt County is considered “Substantial” with multiple deaths possible, depending on the size and extent of the event.

ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the De Witt County planning area. Impacts to the planning area can include:

- Flood-related rescues may be necessary at swift water and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm’s way.
- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the floodwaters have receded due to contaminated floodwaters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.
- Significant flood events often result in widespread power outages, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise be impacted by a flood event and be unable to report for duty, limiting response capabilities.
- City or County departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the planning area and its residents rely on, such as utility providers, financial institutions, and medical care providers, may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.

SECTION 10: FLOOD

- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, as well as normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures substantially damaged by a flood may not be rebuilt for years and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.
- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psychosocial effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality, leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, increased livestock mortality due to stress and waterborne disease, and increased cost for feed.

The overall extent of damage caused by floods is dependent on the extent, depth, and duration of flooding, in addition to the velocities of flows in the flooded areas. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a flood event.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. De Witt County, the City of Cuero, and the City of Yorktown participate in the NFIP and are in good standing. The City of Nordheim does not have the capacity to administer and participate in the NFIP at this time. It is noted that special districts, like the Green-De Witt Drainage District, are not eligible participants in the NFIP.

As an additional indicator of floodplain management responsibility, communities may choose to participate in FEMA's Community Rating System (CRS). This is an incentive-based program that

SECTION 10: FLOOD

allows communities to undertake flood mitigation activities that go beyond NFIP requirements. Currently, none of the participating communities in De Witt County participate in the CRS. De Witt County and participating jurisdictions may evaluate their capacity for CRS participation in the next planning cycle.

De Witt County, the City of Cuero, and the City of Yorktown currently have in place minimum NFIP standards for new construction and substantial improvements of structures. All jurisdictions are considering adopting additional higher regulatory NFIP standards to limit floodplain development.

The flood hazard areas throughout De Witt County are subject to periodic inundation, which may adversely affect public safety, resulting in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief. Flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities. In addition, occupancy in flood hazard areas creates an increase in vulnerabilities to flood hazards as they typically are inadequately elevated, flood-proofed, or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from roadside ditches and bridges, and expanding drainage culverts and storm water structures to convey floodwater more adequately.

It is the purpose of De Witt County and all participating jurisdictions to continue to promote public health, safety, and general welfare by minimizing public and private losses due to flood conditions in specific areas. Each of the NFIP participating jurisdictions in the Plan Update are guided by their local Flood Damage Prevention Ordinance. These communities will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new and substantially developed construction. Further, the NFIP program promotes sound development in floodplain areas and includes provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in floodplains;
- Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and
- Ensure that potential buyers are notified that property is in a flood area.

In order to accomplish these tasks, De Witt County and all participating jurisdictions seek to observe the following guidelines in order to achieve flood mitigation:

- Restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, such as filling or dumping, that may cause excessive increases in flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction, as a method of reducing flood losses;

SECTION 10: FLOOD

- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- Control filling, grading, dredging, and other development, which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters, or which may increase flood hazards to other lands.

NFIP COMPLIANCE AND MAINTENANCE

All NFIP participating jurisdictions have developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions can be found in Section 20.

Flooding was identified as a significant risk hazard during hazard ranking activities at the Risk Assessment Workshop by the majority of the Planning Team. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP and implementing flood awareness programs. All participating jurisdictions recognize the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, each jurisdiction focuses on public flood awareness activities. This includes promoting the availability of flood insurance.

Each NFIP participating jurisdiction in this planning process has a designated floodplain administrator. All floodplain administrators in the planning area will continue to maintain compliance with the NFIP, including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by each participating jurisdiction outlines the minimum requirements for development in Special Flood Hazard Areas.

All jurisdictions have a permitting process in place, and each local floodplain administrator is responsible for coordinating inspections of damaged homes located in the floodplain. Following a flood event, local officials inspect damaged homes to make a substantial damage determination. Substantially damaged homes must be brought into compliance. Similarly, proposed improvements to homes located in the floodplain are reviewed by local building officials to determine if a substantial improvement is proposed. The floodplain administrator oversees permitted repairs and improvements to ensure compliance during the rebuilding or improvement process.

REPETITIVE LOSS

The Flood Mitigation Assistance (FMA) Grant Program under FEMA provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to buildings that are insured under the National Flood Insurance Program. The Texas Water Development Board (TWDB) administers the FMA grant program for the State of Texas. One of the goals of the FMA program is to reduce the burden of repetitive loss and severe repetitive loss properties on the NFIP through mitigation activities that significantly reduce or eliminate the threat of future flood damages.

Repetitive Loss properties are defined as structures that are:

- Any insurable building for which 2 or more claims of more than \$1,000 each, paid by the National Flood Insurance Program (NFIP) within any 10-year period, since 1978;

SECTION 10: FLOOD

- May or may not be currently insured under the NFIP.

Severe Repetitive Loss properties are defined as structures that are:

- Covered under the NFIP and have at least 4 flood related damage claim payments (building and contents) over \$5,000.00 each, and the cumulative amount of such claims payments exceed \$20,000; or
- At least 2 separate claim 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.

In either scenario, at least 2 of the referenced claims must have occurred within any 10-year period and must be greater than 10 days apart.⁶ Table 10-8 shows repetitive loss and severe repetitive loss properties for De Witt County and the City of Cuero. The City of Nordheim and the City of Yorktown have no repetitive loss or severe repetitive loss properties.

Table 10-8. Repetitive Loss and Severe Repetitive Loss Properties⁷

JURISDICTION	NUMBER OF STRUCTURES	NUMBER OF LOSSES	STRUCTURE TYPE
De Witt County	23	75	Single Family
City of Cuero	5	13	Single Family

⁶ Source: Texas Water Development Board

⁷ Some properties assumed single family type.

Section 11

Hail



SECTION 11: HAIL

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	3
Significant Events	6
Probability of Future Events	6
Climate Change Considerations	6
Vulnerability and Impact	7
Assessment of Impacts	9

HAZARD DESCRIPTION



Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a by-product of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

According to the National Insurance Crime Bureau (NICB), between 2018 and 2020 the State of Texas had the greatest number of hail loss claims in the U.S. with 605,866 loss claims (23 percent of total hail claims in the U.S.) due to hail events. In this two-year period Texas experienced a total of 584 severe hail days. Five of the top ten cities for hail loss claims between 2017 and 2019 were in Texas, three of which were in the Dallas-Fort Worth metropolitan area.¹

In 2021, 6.8 million properties in the U.S. experienced one or more damaging hail events, resulting in a total of \$16.5 billion in insured losses. Texas had the highest number of properties affected by hail with over 1.5 million properties or 17 percent of total properties in the state affected; an increase of 80,000 properties affected between 2020 and 2021. Texas hailstorms accounted for almost a quarter of total U.S. properties affected by hail in 2021.

LOCATION

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. As a result, they are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the entire De Witt County planning area, including all

¹ Manasek, Thomas, "2018-2020 United States Hail Loss Claims and Questionable Claims" (National Insurance Crime Bureau, March 15, 2021). <http://www.rmii.org/downloads/PUBLIC%202018%20-%202020%20Hail%20foreCAST-%20TJM.pdf>

SECTION 11: HAIL

participating jurisdictions and special district, is equally at risk to the hazard of hail. Refer to Figure 11-1 for the location of past hail events in the planning area.

EXTENT

The National Weather Service (NWS) classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 11-1.

Table 11-1. Hail Intensity and Magnitude²

SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants and crops
H3	Severe	0.80 – 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage, could cause fatal injuries
H10	Super Hailstorms	4.0 +	Baseball	Extensive structural damage, could cause fatal injuries

The intensity scale in Table 11-1 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on the best available data regarding the previous occurrences for the area, the De Witt County planning area may experience hailstorms ranging from an H0 (pea size) to an H10 (tennis ball size). The largest size hail to be reported since 1991 was 4.5 inches in diameter, or an H10, which is considered a super hailstorm that can cause extensive structural damage and potentially fatal injuries. An event of this

² NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

SECTION 11: HAIL

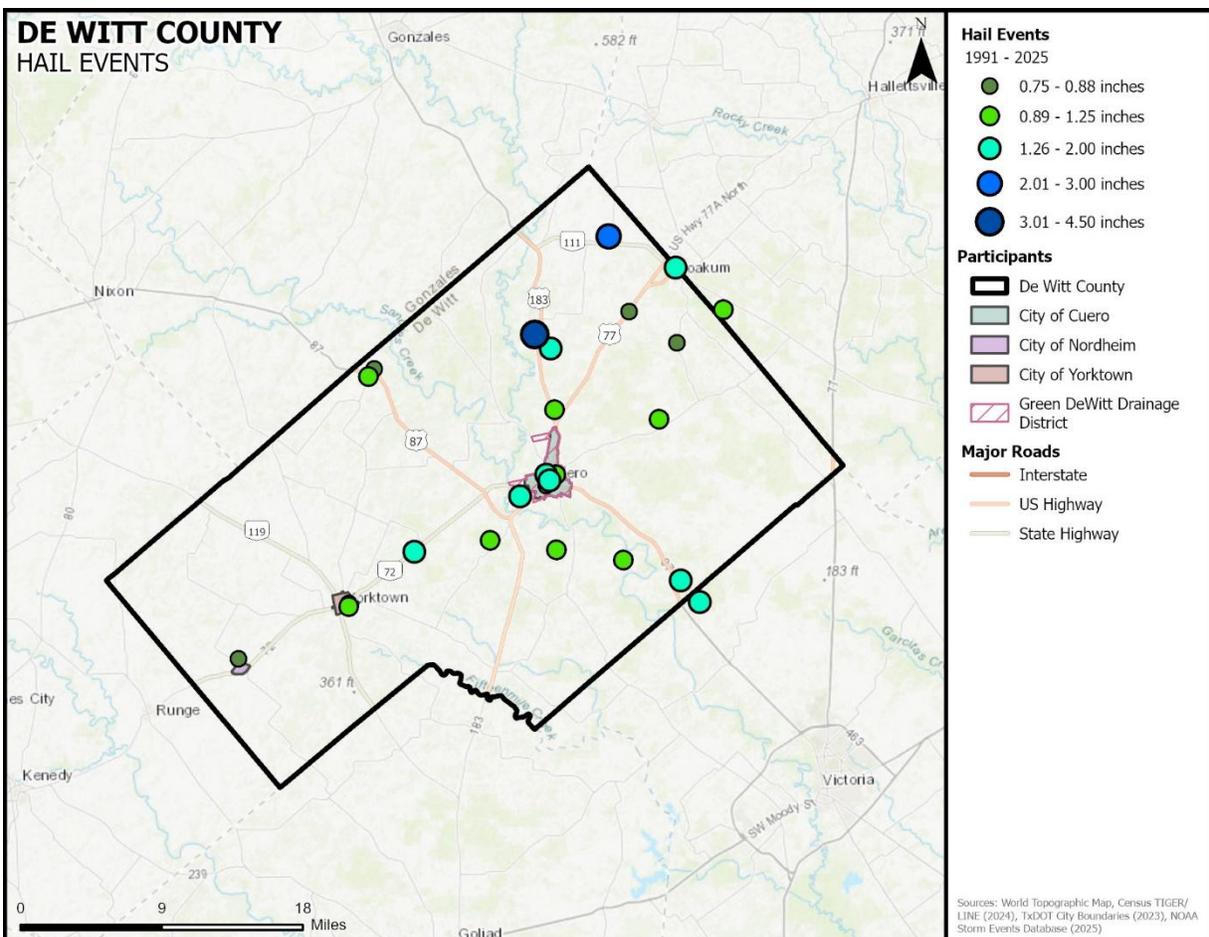
magnitude occurred in the planning area on February 19, 1991. This is likely the greatest extent the planning area can anticipate in the future, based on historical events.

HISTORICAL OCCURRENCES

Historical evidence shown in Figure 11-1 demonstrates that the planning area is vulnerable to hail events overall. Historical hail events in the De Witt County planning area are shown in Table 11-2. A total of 42 reported historical hail events impacted the De Witt County planning area between January 1991 and June 2025; these events were reported to NCEI and NOAA databases and may not represent all hail events to have occurred during the past 34.5 years. Only those events for the De Witt County planning area with latitude and longitude available were plotted (Figure 11-1).

Historical hail event data for the Green-De Witt Drainage District is provided within the De Witt County events or the participating jurisdictions in which the districts reside. In the NCEI database, special districts do not have events reported separate and apart from the reported county and jurisdiction events. The Green-De Witt Drainage District did not report any additional hail events or impacts which were not captured in the NCEI database.

Figure 11-1. Spatial Historical Hail Events, January 1991 – June 2025



SECTION 11: HAIL

Table 11-2. Historical Hail Events, January 1991 – June 2025³

JURISDICTION	DATE	MAGNITUDE (Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	2/19/1991	2.75	0	0	\$0	\$0
De Witt County	2/19/1991	4.5	0	0	\$0	\$0
City of Cuero	3/28/1991	0.88	0	0	\$0	\$0
De Witt County	5/28/1992	1.75	0	0	\$0	\$0
De Witt County	3/11/1993	0.75	0	0	\$0	\$0
City of Cuero	4/30/1993	0.88	0	0	\$0	\$0
De Witt County	5/9/1993	0.88	0	0	\$0	\$0
De Witt County	10/12/1993	2.75	0	0	\$0	\$0
De Witt County	10/12/1993	2.75	0	0	\$0	\$0
City of Cuero	10/12/1993	1.75	0	0	\$0	\$0
De Witt County	4/5/1994	1.75	0	0	\$108,500	\$1,084,800
De Witt County	4/5/1994	1.75	0	0	\$108,500	\$1,084,800
De Witt County	4/5/1994	1.75	0	0	\$108,500	\$108,500
De Witt County	4/15/1994	1.75	0	0	\$108,500	\$10,900
De Witt County	4/15/1994	0.88	0	0	\$10,848,000	\$1,084,800
City of Yorktown	5/13/1994	1	0	0	\$108,500	\$10,900
City of Cuero	12/17/1995	1.75	0	0	\$0	\$0
City of Cuero	12/18/1995	1.5	0	0	\$0	\$0
City of Cuero	6/13/1996	0.75	0	0	\$0	\$0
City of Cuero	9/21/1996	0.75	0	0	\$0	\$0
City of Cuero	6/17/1997	1	0	0	\$0	\$0
City of Cuero	12/23/1997	0.88	0	0	\$0	\$0
City of Cuero	12/23/1997	1	0	0	\$0	\$0
De Witt County	6/15/1998	1.5	0	0	\$0	\$0
City of Yorktown	3/16/2000	0.75	0	0	\$0	\$0

³ Monetary damages have been inflated to their 2025 value.

SECTION 11: HAIL

JURISDICTION	DATE	MAGNITUDE (Inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Nordheim	5/29/2002	0.75	0	0	0	0
City of Cuero	5/8/2005	1	0	0	\$0	\$0
City of Cuero	5/14/2006	1.85	0	0	\$0	\$0
De Witt County	2/16/2008	0.88	0	0	\$0	\$0
De Witt County	4/27/2009	1	0	0	\$0	\$0
De Witt County	5/17/2010	0.88	0	0	\$0	\$0
City of Cuero	5/17/2010	0.75	0	0	\$0	\$0
City of Yorktown	5/26/2011	1	0	0	\$0	\$0
De Witt County	4/20/2012	1	0	0	\$0	\$0
City of Yorktown	6/23/2020	1.5	0	0	\$0	\$0
De Witt County	3/2/2023	1	0	0	\$0	\$0
City of Cuero	3/2/2023	1.25	0	0	\$0	\$0
De Witt County	4/15/2023	1	0	0	\$0	\$0
De Witt County	4/21/2023	1.75	0	0	\$0	\$0
City of Cuero	4/23/2023	1.75	0	0	\$0	\$0
City of Cuero	4/23/2023	1.5	0	0	\$0	\$0
City of Cuero	4/23/2023	1.75	0	0	\$0	\$0
TOTALS		(MAX EXTENT)	0	0	\$11,390,500	\$3,384,700

Table 11-3. Historical Hail Events Summary, January 1991 – June 2025

JURISDICTION	NUMBER of EVENTS	MAX MAGNITUDE (inches)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	20	4.5	0	0	\$11,282,000	\$3,373,800
City of Cuero	17	1.85	0	0	\$0	\$0
City of Nordheim	1	0.75	0	0	\$0	\$0
City of Yorktown	4	1.5	0	0	\$108,500	\$10,900
Green-De Witt Drainage District	0	0	0	0	\$0	\$0
TOTALS	42	(MAX EXTENT)	0	0	\$14,775,200	

SECTION 11: HAIL

Based on the list of historical hail events for the De Witt County planning area, eight events were reported to the NCEI since the 2018 Plan.

SIGNIFICANT EVENTS

February 19, 1991

Overnight, severe storms brought strong winds and very large hail to De Witt County, causing extensive impacts. Softball-size hail, the largest historically reported in the county, caused widespread damage to windows and cars throughout the planning area. Monetary damage estimates are not available for this event.

April 5, 1994

The De Witt County Sheriff's Department reported golf ball-size hail in the Hochheim and Meyersville areas of the county throughout the night. Widespread property damage was reported, causing an estimated \$325,500 (2025 dollars) in damages to structures and cars. However, the greater impact was to crops, with an estimated \$2,278,100 (2025 dollars) in crop damages reported from this hail event.

April 15, 1994

Just 10 days after the previous severe hailstorm, another system brought hail ranging from marble to golf ball size to the De Witt County planning area. The hail, propelled by damaging winds, caused extensive damage to homes, trees, and crops between the cities of Nordheim and Yorktown. Vegetation was completely stripped from trees and shrubs in the area, birds and poultry were killed, and many fields of crops were also stripped in the area. Total property damage was estimated at \$10,956,500 (2025 dollars), with an additional \$1,095,700 (2025 dollars) in crop damage.

PROBABILITY OF FUTURE EVENTS

Based on available historic records, 42 events in a 34.5-year reporting period for De Witt County provides an average annual occurrence of approximately one event per year. This frequency supports a "Highly Likely" probability of future events for the De Witt County planning area with an event probable within the next year.

CLIMATE CHANGE CONSIDERATIONS

Although the impact of climate change on the frequency and severity of hail events is uncertain, some climate studies attempt to give insight into the future conditions of hailstorms. As ocean temperatures rise due to climate change, more moisture is evaporating into the atmosphere. The warm and moist air masses that fuel severe weather may become more unstable on average, which could favor the increased development of thunderstorms and hail. However, it is also suggested that in a warming climate, the average melting level will rise in thunderstorms, meaning small hailstones will have more of a chance to melt as they fall to the ground. Therefore, hail may become less frequent, but large hail can be expected when it does occur, leading to the possibility of increased damages.⁴

⁴ Yale Climate Connections, Hailstorms and Climate Change, March 17, 2022.

SECTION 11: HAIL

VULNERABILITY AND IMPACT

Crops are typically the most vulnerable to the impacts of hail. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are most damaged by hail. Utility systems on roofs of buildings and critical facilities would be vulnerable and could be damaged. Hail could cause a significant threat to people, as they could be struck by hail and falling trees and branches. Outdoor activities and events may elevate the risk to residents and visitors when a hailstorm strikes with little warning. Portable buildings typically utilized by schools and commercial sites such as construction areas would be more vulnerable to hail events than the typical site-built structures.

The De Witt County planning area features mobile or manufactured homes throughout the planning area. These homes are typically more vulnerable to hail events than typical site-built structures. The U.S. Census data indicates a total of 1,475 (16 percent of total housing stock) manufactured homes located in the De Witt County planning area. In addition, 56 percent (5,201 structures) of the housing structures in the De Witt County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during hail events.

Table 11-4. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
De Witt County	5,201	1,475
City of Cuero	1,895	399
City of Nordheim	175	100
City of Yorktown	834	81
Green-De Witt Drainage District	2	0

While all citizens are at risk of the impacts of hail, forced relocation and disaster recovery disproportionately impact low-income residents who lack the financial means to repair their homes. An estimated 16 percent of the planning area population live below the poverty level (Table 11-5). While warning times for this type of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. Three Green-De Witt Drainage District employees also face higher vulnerability to hail, as they regularly work outdoors and may be subject to severe weather conditions.

SECTION 11: HAIL

Table 11-5. Populations at Greater Risk by Jurisdiction⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

The De Witt County Planning Team identified the following critical facilities (Table 11-6) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by hail events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 11-6. Critical Facilities Vulnerable to Hail

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by hailstones. Power outages could disrupt communications, delaying emergency response times. Accumulated hail on the streets may impede emergency response vehicle access to areas.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> Structures can be damaged by hailstones. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.

⁵ US Census Bureau 2023 data for De Witt County.

SECTION 11: HAIL

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Power outages could disrupt communications, delaying emergency response times. • Accumulated hail on the streets may impede service response vehicle access to areas.

Hail has been known to cause injury to humans and occasionally has been fatal. Historically, no injuries or fatalities have been reported due to hail within De Witt County. Overall, the total loss estimate of property and crops in the planning area is \$14,775,200 (2025 dollars) with an average annualized loss of \$428,300. Based on historic loss and damages, the impact of hail on the De Witt County planning area, including all participating jurisdictions and special district, is considered “Limited” severity of impact, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 11-7. Estimated Annualized Losses by Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$14,655,800	\$424,800
City of Cuero	\$0	\$0
City of Nordheim	\$0	\$0
City of Yorktown	\$119,400	\$3,500
Green-De Witt Drainage District	\$0	\$0
TOTALS	\$14,775,200	\$428,300

ASSESSMENT OF IMPACTS

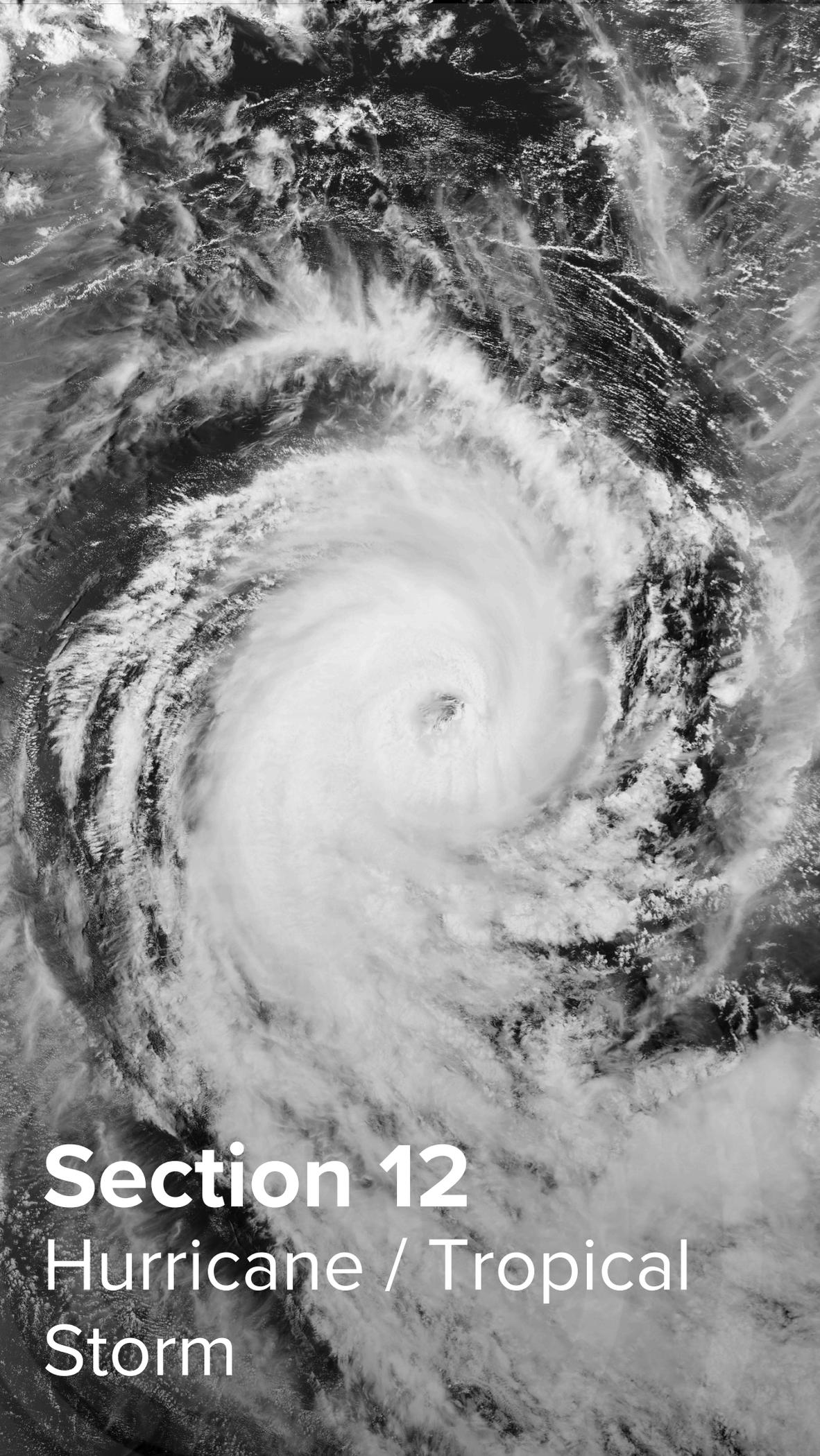
Hail events have the potential to pose a significant risk to people and can create dangerous situations. Hail conditions can be frequently associated with a variety of impacts, including:

- Hail may create hazardous road conditions during and immediately following an event, potentially delaying critical staff from reporting for duty as well as delaying first responders from providing for or preserving public health and safety.
- Individuals and first responders who are exposed to the storm may be struck by hail, falling branches, or downed trees resulting in injuries or possible fatalities.
- Large hail events will likely cause extensive roof damage to residential structures along with siding damage and broken windows, creating a spike in insurance claims and a rise in premiums, and potentially result in physical harm to occupants.
- Automobile damage may be extensive depending on the size of the hail and length of the storm.

SECTION 11: HAIL

- Hail events can result in power outages over widespread areas increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- First responders are exposed to downed power lines, damaged structures, hazardous spills, and debris that often accompany hail events, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Some businesses not directly damaged by the hail event may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.
- Depending on the severity and scale of damage caused by large hail events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A significant hail event could significantly damage agricultural crops, resulting in extensive economic losses for the community and surrounding area.
- Hail events may injure or kill livestock and wildlife or destroy wildlife habitat.
- A large hail event could impact the accessibility of recreational areas and parks due to extended power outages or debris clogged access roads.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 83 historical sites listed for De Witt County based on the Cuero Chamber of Commerce.

The economic and financial impacts of hail will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning conducted by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of any hail event.



Section 12

Hurricane / Tropical Storm

SECTION 12: HURRICANE / TROPICAL STORM

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	2
Significant Events	5
Probability of Future Events	6
Climate Change Considerations	6
Vulnerability and Impact	7
Assessment of Impacts	9

HAZARD DESCRIPTION

According to the National Oceanic and Atmospheric Administration (NOAA), a hurricane is an intense tropical weather system of strong thunderstorms with well-defined surface circulation and maximum sustained winds of 74 mph or higher. In the Northern Hemisphere, circulation of winds near the Earth's surface is counterclockwise.

Hurricanes often begin as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35–64 knots (39–73 mph). At these wind speeds, the storm becomes more organized and circular in shape and begins to resemble a hurricane. Tropical storms can be equally problematic without ever becoming a hurricane. Tropical storms resulting in high winds and heavy rainfall can be dangerous to people and property, as Tropical Storm Frances was for southeast Texas in September 1998. Once



sustained winds reach or exceed 74 mph, the storm becomes a hurricane. The intensity of a landfalling hurricane is expressed in categories relating wind speeds to potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them. For this reason, emergency managers plan to have evacuations completed and personnel sheltered before winds of tropical storm-force arrive, which precedes the arrival of hurricane-force winds.

LOCATION

The location of the De Witt County planning area is approximately 85 miles from the coast, making the planning area vulnerable to threats directly and indirectly related to a hurricane event, such as high-force winds and flooding. While De Witt County is not located along the Gulf Coast, due to the regional nature of hurricanes and tropical storms, the County is exposed and susceptible to the impacts of hurricane and tropical storm events. Hurricanes and tropical storms can impact De Witt County from June to November, the official Atlantic U.S. hurricane season. De Witt County planning area is in a low to moderate risk area for hurricane wind speeds up to 200 miles per hour (mph).

SECTION 12: HURRICANE / TROPICAL STORM

EXTENT

As a hurricane develops, the barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour, the storm is deemed a hurricane.

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (Table 12-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. However, a lower category storm can inflict greater damage than higher category storms depending on where they strike, the amount of storm surge, other weather they interact with, and how slow they move.

Table 12-1. Extent Scale for Hurricanes¹

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (mph)	MINIMUM SURFACE PRESSURE (Millibars)	STORM SURGE (Feet)
1	74 – 95	Greater than 980	3 – 5
2	96 – 110	979 – 965	6 – 8
3	111 – 130	964 – 945	9 – 12
4	131 – 155	944 – 920	13 – 18
5	155+	Less than 920	19+

Based on historical storm tracks, the majority of hurricanes in or near the planning area are tropical storms at landfall. While the average extent to be mitigated in De Witt County is a Category 2 storm, the maximum extent to be mitigated is a Category 5 hurricane.

HISTORICAL OCCURRENCES

De Witt County is located inland and is not directly along the coastline. As hurricanes typically form over the ocean and affect coastal areas, De Witt County is less prone to direct impacts from hurricanes. The hurricanes usually fade and downgrade to tropical storms or tropical depressions as they move away from the coast. However, it is important to note that the remnants of tropical systems, including hurricanes, can still bring heavy rainfall and potential flooding to inland areas.

Hurricanes and tropical storms do not typically track across the planning area. The last known system to track across De Witt County was Hurricane Francine in 2024. Historical systems that have tracked in close proximity to the planning area, bringing storm systems, excessive precipitation and potentially damaging wind to the De Witt County planning area are presented in Table 12-2 below.

¹ Source: National Hurricane Center, https://www.nhc.noaa.gov/HAW2/english/basics/saffir_simpson.shtml

SECTION 12: HURRICANE / TROPICAL STORM

Table 12-2. Historical Hurricane / Tropical Storm Events, January 1996 – June 2025²

DATE	STORM NAME	CATEGORY (Max)
7/16/1997 – 7/27/1997	Danny	Category 1
8/21/1998 – 8/24/1998	Charley	Tropical Storm
9/8/1998 – 9/13/1998	Frances	Tropical Storm
8/18/1999 – 8/25/1999	Bret	Category 4
8/13/2000 – 8/15/2000	Beryl	Tropical Storm
6/5/2001 – 6/19/2001	Allison	Tropical Storm
8/4/2002 – 8/9/2002	Bertha	Tropical Storm
9/5/2002 – 9/11/2002	Fay	Tropical Storm
9/21/2002 – 10/4/2002	Lili	Category 4
7/7/2003 – 7/17/2003	Claudette	Category 1
8/14/2003 – 8/17/2003	Erika	Category 1
8/30/2003 – 9/2/2003	Grace	Tropical Storm
9/2/2004 – 9/24/2004	Ivan	Category 5
7/11/2005 – 7/21/2005	Emily	Category 5
9/18/2005 – 9/26/2005	Rita	Category 5
8/15/2007 – 8/19/2007	Erin	Tropical Storm
9/12/2007 – 9/14/2007	Humberto	Category 1
7/20/2008 – 7/27/2008	Dolly	Category 2
8/3/2008 – 8/6/2008	Edouard	Tropical Storm
8/25/2008 – 9/5/2008	Gustav	Category 4
9/1/2008 – 9/15/2008	Ike	Category 4
9/4/2010 – 9/10/2010	Hermine	Tropical Storm
7/27/2011 – 7/30/2011	Don	Tropical Storm
9/2/2011 – 9/6/2011	Lee	Tropical Storm
6/16/2015 – 6/21/2015	Bill	Tropical Storm

² Source: NOAA Historical Hurricane Tracks, <https://coast.noaa.gov/hurricanes/#map=4/32/-80>

SECTION 12: HURRICANE / TROPICAL STORM

DATE	STORM NAME	CATEGORY (Max)
6/19/2017 – 6/24/2017	Cindy	Tropical Storm
8/16/2017 – 9/2/2017	Harvey	Category 4
7/10/2019 – 7/16/2019	Barry	Category 1
9/3/2019 – 9/5/2019	Fernand	Tropical Storm
9/17/2019 – 9/19/2019	Imelda	Tropical Storm
7/23/2020 – 7/26/2020	Hanna	Category 1
8/20/2020 – 8/25/2020	Marco	Category 1
8/20/2020 – 8/29/2020	Laura	Category 4
9/17/2020 – 9/25/2020	Beta	Tropical Storm
10/4/2020 – 10/11/2020	Delta	Category 4
9/12/2021 – 9/17/2021	Nicholas	Category 1
8/21/2023 – 8/23/2023	Harold	Tropical Storm
6/28/2024 – 7/11/2024	Beryl	Category 5
9/8/2024 – 9/14/2024	Francine	Category 2

According to the historical hurricane tracks from NOAA’s National Hurricane Center, there have been 43 storms known to have come within 300 miles of the De Witt County planning area from January 1996 through June 2025.

Table 12-3 lists the storms that have impacted the De Witt County planning area from January 1996 through June 2025, as reported in the NCEI. These events are related to Hurricane Claudette and Hurricane Harvey. Not all events reported by the NOAA National Hurricane Center are reported by the NCEI, so some damages and events may be underreported. Historical hurricane data for De Witt County is provided on a countywide basis per the NCEI and NOAA databases.³

Historical Hurricane impacts for Green-De Witt Drainage District are recorded under the county in which they are located, as they do not have events reported separately and apart from the events reported to the NCEI database. Green-De Witt Drainage District did not report any damages separate and apart from the NCEI.

³ Some of these events were reported under flooding in the NCEI database, and an analysis was performed to cross reference applicable hurricane and tropical storm events to create the most comprehensive dataset possible.

SECTION 12: HURRICANE / TROPICAL STORM

Table 12-3. Historical Hurricane Events, January 1996 – June 2025⁴

JURISDICTION	DATE	STORM NAME	CATEGORY (Max)	DEATHS	INJURIES	PROPERTY AND CROP DAMAGE
De Witt County	7/15/2003	Hurricane Claudette	Category 1	0	0	\$4,086,700
De Witt County	7/15/2003	Hurricane Claudette	Category 1	0	0	\$87,000
De Witt County	8/26/2017	Hurricane Harvey	Category 4	0	0	\$130,300
De Witt County	8/28/2017	Hurricane Harvey	Category 4	0	0	\$3,907,700
TOTALS				0	0	\$8,211,700

Based on the list of historical hurricane events for De Witt County planning area, no events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

There have been 9 declared disasters and emergency declarations between January 1996 and June 2025 (Table 12-4) related to hurricane or tropical storm events. These declarations were related to a variety of different Hurricanes and Tropical Storms, with major systems including Hurricane Claudette, Hurricane Harvey and Hurricane Beryl.

Table 12-4. Disaster Declarations for Hurricane/Tropical Storm, January 1996 – June 2025

YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
1998	Tropical Storm Charley	DR	1239
2003	Hurricane Claudette	DR	1479
2005	Hurricane Rita	DR	1606
2005	Hurricane Katrina Evacuation	EM	3216
2005	Hurricane Rita	EM	3261
2008	Hurricane Gustav	EM	3290
2008	Hurricane Ike	EM	3294
2017	Hurricane Harvey	DR	4332
2024	Hurricane Beryl	DR	4798

⁴ Values are in 2025 dollars.

SECTION 12: HURRICANE / TROPICAL STORM

Hurricane Claudette on July 07 – July 17, 2003 (DR-1479)

On July 7, 2003, Claudette began as a tropical wave in the eastern Caribbean before moving westward, skimming across the Yucatan Peninsula. It then turned northwest continuing through the Gulf of Mexico. Claudette remained a tropical storm until right before making landfall in Port O'Connor, Texas, which was when it ripened into a Category 1 hurricane. As Claudette began to make landfall, the outer bands of rain began to move into South Central Texas during the afternoon hours of Tuesday July 15th. As Claudette continued to roll into the De Witt County planning area, 70-80 mph winds began to knock over trees, power poles, and damaging roughly 50 homes. Hurricane Claudette was the third tropical storm and first hurricane of the 2003 Atlantic hurricane season.

Hurricane Harvey on August 16 – September 02, 2017 (DR-4332)

Hurricane Harvey developed as a tropical wave just to the east of Lesser Antilles on August 16th and reached tropical storm status the following day. Hurricane Harvey made landfall as a Category 4 hurricane just east of Rockport, Texas over San Jose Island on August 25th. As Harvey moved inland and began to enter the southern part of De Witt County, it weakened down to a Category 1 hurricane. Harvey continued to weaken as it moved further inland and began to loop around the neighboring counties. Harvey finally exited the De Witt County planning area during the afternoon hours of August 27th. While in De Witt County, estimated sustained winds were around 60 mph, with gusts being much stronger. These winds knocked down several large trees and damaged several buildings and homes across the county. Though the winds were strong, the main concern was the amount of rain the county received in such a short period of time. The maximum rainfall that was recorded was around 23 inches, which was near the City of Yoakum. More reports of around 10-15 inches were also reported. All this rain in such a short amount of time caused widespread flash flooding and river flooding on the Guadalupe River. The river crested around 44 feet, which is the second highest crest on record for the Guadalupe River. As a result, over 100 homes were affected by the high water in the area of Cuero. Hurricane Harvey became the costliest disaster to strike Texas at the time and was the first major hurricane to make landfall in the United States since Hurricane Wilma in 2005. Hurricane Harvey was also the eighth named storm, third hurricane, and first major hurricane of the 2017 Atlantic hurricane season.

PROBABILITY OF FUTURE EVENTS

Based on historical occurrences of significant hurricane events, the probability of future events is “Occasional”, with an event probable in the next five years for De Witt County planning area, including all participating jurisdictions and special district.

CLIMATE CHANGE CONSIDERATIONS

Hurricane and tropical storm events have the potential to pose a significant risk to people and property. Such events can create dangerous situations for public health and safety officials and cause catastrophic damages. The impact of climate change could produce larger, more severe hurricane events, exacerbating the current hurricane impacts. The economic and financial impacts of hurricanes and tropical storms will depend entirely on the scale of the events, what is damaged, and how quickly repairs to critical components of the economy can be implemented.

The current climate assessment report for Texas indicates an expected increase in the intensity of very strong hurricanes, despite an expected lack of increase, or even a decrease, in hurricane

SECTION 12: HURRICANE / TROPICAL STORM

frequency overall. Different research studies have produced some conflicting results. While some recent research has pointed to an apparent trend for U.S. tropical cyclones to move more slowly at landfall, much like Hurricane Harvey, other research suggests that Texas may be spared from such a slowdown. At this point, the enhanced risk is difficult to quantify, but substantial scientific progress on this topic is likely as climate models become better able to simulate the observed spatial distribution, frequency, and intensity of hurricanes.⁵

VULNERABILITY AND IMPACT

Hurricane and tropical storm events can cause major damage to large areas; hence, all existing buildings, facilities, and populations are equally exposed and vulnerable to this hazard and could potentially be impacted. De Witt County planning area features multiple mobile or manufactured homes throughout the planning area. These homes are typically more vulnerable to hurricane events than typical site-built structures. The U.S. Census data indicates a total of 1,475 (16 percent of total housing stock) manufactured homes located in De Witt County planning area (Table 12-5). In addition, 56 percent of the single family residential (SFR) structures in De Witt County were built before 1980.⁶ These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant events.

Table 12-5. Structures at Greater Risk⁷

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
De Witt County	5,201	1,475
City of Cuero	1,895	399
City of Nordheim	175	100
City of Yorktown	834	81

Table 12-6. Structures at Great Risk by Special Districts

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
Green-De Witt Drainage District	2

De Witt County identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by hurricane and

⁵ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

⁶ U.S. Census Bureau American Community Survey Five-Year Estimates 2019-2023 data for De Witt County.

⁷ U.S. Census Bureau American Community Survey Five-Year Estimates 2019-2023 data for De Witt County.

SECTION 12: HURRICANE / TROPICAL STORM

tropical storm events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 12-7. Critical Facilities Vulnerable to Hurricane and Tropical Storm Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> • Structures can be damaged by falling trees or flying debris. • Power outages could disrupt critical care. • Backup power sources could be damaged. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damages to facilities.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas.

SECTION 12: HURRICANE / TROPICAL STORM

CRITICAL FACILITIES	POTENTIAL IMPACTS
	<ul style="list-style-type: none"> • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.

Storm track data was available for the past 150 years; however, property and crop loss data records in the NCEI are only available since 1996. Losses during this period were only reported for two hurricane events so some damages and events may be unreported or underreported.

Table 12-8 shows impact or loss estimation for storms impacting De Witt County. Damages within the NCEI database are reported on a countywide basis. Annual loss estimates were based on the 29.5-year reporting period for such damages. The average annual loss estimate for the De Witt County planning area is approximately \$278,400 (2025 dollars).

Table 12-8. Summary of Annualized Losses, January 1996 – June 2025

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$8,211,700	\$278,400

With limited reported damages and no reported injuries or fatalities, the potential severity of impact from a hurricane event for De Witt County planning area is considered to be “Limited”, meaning injuries and illnesses are treatable with first aid, shutdown of critical facilities and services for 24-hours or less, and less than ten percent of property destroyed or with major damage.

ASSESSMENT OF IMPACTS

Hurricane and tropical storm events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. The impact of climate change could produce larger, more severe hurricane events, exacerbating the current hurricane impacts. Impacts to the planning area can include:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Driving conditions in the planning area may be dangerous during a hurricane event, especially over elevated bridges, elevating the risk of injury and accidents during evacuations if not timed properly.
- Emergency evacuations may be necessary prior to a hurricane landfall, requiring emergency responders, evacuation routing, and temporary shelters.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.

SECTION 12: HURRICANE / TROPICAL STORM

- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During hurricane landfall, first responders may be prevented from responding to calls as the winds may reach a speed in which their vehicles and equipment are unsafe to operate.
- Hurricane events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Extended power outages can also be deadly for individuals reliant on electricity to live independently in their homes.
- Extreme hurricane events may rupture gas lines and down trees and power lines, increasing the risk of structure fires during and after a storm event.
- Extreme hurricane events may lead to prolonged evacuations during search and rescue, and immediate recovery efforts requiring additional emergency personnel and resources to prevent entry, protect residents, and protect property.
- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- County and City departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the County, Cities, and residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by the hurricane may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to hurricane damage. In De Witt County, 56 percent of homes were built before 1980, and 83 buildings and sites are in the County based on the Cuero Chamber of Commerce, many of which pre-date modern building codes.
- Vegetation in urban parks may become flattened or oversaturated from high winds and heavy rains.
- Large scale hurricanes can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, as well as normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.
- As the De Witt County planning area may continue to increase in population, the number of people and housing developments exposed to the hazard increases. Continued public

SECTION 12: HURRICANE / TROPICAL STORM

education on the planning area's risks to hurricane and tropical storm events will continue to be key to the Planning Team's overall mitigation strategy.

The economic and financial impacts of hurricane events on the area will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any hurricane event.



Section 13

Lightning



SECTION 13: LIGHTNING

Hazard Description	1
Location	1
Extent	1
Historical Occurrences	2
Significant Events	3
Probability of Future Events	3
Climate Change Considerations	4
Vulnerability and Impact	4
Assessment of Impacts	7

HAZARD DESCRIPTION

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to the National Weather Service (NWS), the 10-year (2012–2021) average for fatalities is 23 people with an average of 300 injuries in the United States each year by lightning. Lightning can occur as cloud to ground flashes or as intra-cloud lightning flashes. Direct lightning strikes can cause significant damage to buildings, critical facilities, infrastructure, and communication equipment affecting emergency response. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire.

LOCATION

Lightning can strike in any geographic location and is considered a common occurrence in Texas. The De Witt County planning area is in a region of the country that is moderately susceptible to lightning strikes. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the entire De Witt County planning area is uniformly exposed to the threat of lightning.

EXTENT

According to the 2024 Annual Lightning Report by Vaisala, the State of Texas ranks fifth in the U.S. for lightning strike density with an average of 150.5 flashes per square mile.¹ Vaisala’s U.S. National Lightning Detection Network lightning flash density map shows an average of 182 lightning events per square mile per year for the De Witt County planning area. This rate equates

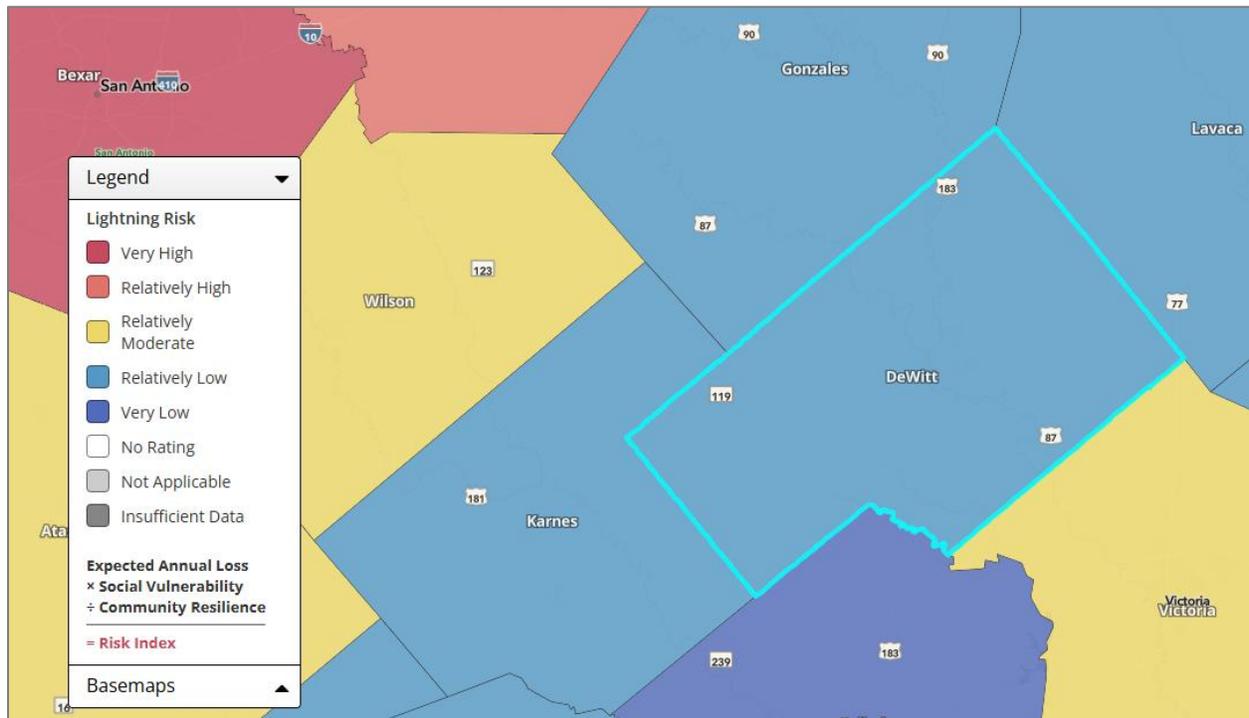
¹ Source: <https://www.xweather.com/annual-lightning-report>

SECTION 13: LIGHTNING

to approximately 165,400 flashes per year for the entire planning area, or four to five flashes per 15-minute interval during storm events.

FEMA's National Risk Index includes an analysis of the planning area's expected annual loss and the community's risk factor which incorporates social vulnerability as well as community resilience to determine the lightning risk for the area, compared to the rest of the United States. De Witt County is located in an area where the extent is classified as relatively low (Figure 13-1).

Figure 13-1. De Witt County Lightning Risk, National Risk Index, October 2025²



HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) database indicates two recorded lightning events for the De Witt County planning area. It is highly likely multiple lightning occurrences have gone unreported before and during the recording period. The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for hazards. However, the flash density for the planning area along with input from local team members indicates regular lightning occurrences that simply have not been reported.

Historical lightning event data for Green-De Witt Drainage District is provided within the De Witt County events or the participating jurisdictions in which drainage district resides. In the NCEI database, these entities do not have events reported separate and apart from the reported county and jurisdiction events. The Green-De Witt Drainage District did not report any additional lightning events or damages that were not captured in the NCEI data.

² Source: Map | National Risk Index, <https://hazards.fema.gov/nri/map>

SECTION 13: LIGHTNING

Table 13-1. Historical Lightning Events, 1996 – 2024³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Yorktown	8/12/2009	0	0	\$29,700	\$0
De Witt County	1/24/2003	0	0	\$53,500	\$0
TOTALS		0	0	\$83,200	

Table 13-2. Historical Lightning Events Summary, 1996 – 2024⁴

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGES	CROP DAMAGES
De Witt County	1	0	0	\$53,500	\$0
City of Cuero	0	-	-	-	-
City of Nordheim	0	-	-	-	-
City of Yorktown	1	0	0	\$29,700	\$0
Green-De Witt Drainage District	0	-	-	-	-
TOTALS	2	0	0	\$83,200	\$0

Based on the list of historical lightning events for the De Witt County planning area, there has been one reported event since the 2018 Plan.

SIGNIFICANT EVENTS

January 24, 2023

As a deep upper-level low pressure system moved across Texas, this caused a frontal system to develop across South Texas. As a result, thunderstorms developed ahead of the front. During these storms, lightning struck an oil tank battery northeast of the City of Cuero, igniting a fire. Damages for this incident were estimated to be \$53,500 (2025 dollars).

PROBABILITY OF FUTURE EVENTS

Based on historical records and input from the Planning Team the probability of occurrence for future lightning events in the De Witt County planning area is considered “Highly Likely”, or an event probable in the next year. The Planning Team indicated that lightning occurs regularly in the area. According to the 2024 Annual Lightning Report by Vaisala, the De Witt County planning area is located in an area of the country that experiences approximately 182 lightning flashes per square mile per year (approximately 165,400 flashes per year). Given this estimated probability

³ Values are in 2025 dollars. Database was searched for events between 1996 and 2024.

⁴ Participating jurisdictions with no reported events show a “-“ in table columns where damages, deaths or injuries would be otherwise reported.

SECTION 13: LIGHTNING

of events, it can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the planning area.

CLIMATE CHANGE CONSIDERATIONS

As CO₂ increases and the land surface warms, stronger updrafts are more likely to produce lightning. In a climate with double the amount of CO₂, we may see fewer lightning storms overall, but 25 percent stronger storms, with a 5 percent increase in lightning. Lightning damage is also likely to increase because of its role in igniting forest fires, where dry vegetation, also caused by rising temperatures, creates more 'fuel' for fires, so even a small climate change may have huge consequences. While the impact climate change will have on our weather still remains uncertain, researchers agree that implementing simple measures like lightning detection systems and installing grounding systems in buildings could go a long way in avoiding deaths and injuries.⁵

Lightning events have the potential to pose a significant risk to people and property throughout the De Witt County planning area. The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. While no increase in the number of hazard events is anticipated, the impact of the hazard may see an increase in losses. As populations grow and urban development continues to rise, the overall vulnerability and impact are expected to increase in the next five years.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and can create a broad range of damage depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the De Witt County planning area could potentially be impacted and remain vulnerable to possible injury and property loss from lightning strikes.

The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources. The entire population of the De Witt County planning area are considered exposed to the lightning hazard. The peak lightning season in the State of Texas is from June to August; however, the most fatalities occur in July. Fatalities occur most often when people are outdoors and/or participating in some form of recreation. The population located outdoors during a lightning event is considered at risk and more vulnerable to a lightning strike compared to those inside a structure. Moving to a lower risk location will decrease a person's vulnerability.

The entire general building stock and all infrastructure of the De Witt County planning area are considered exposed to the lightning hazard. Lightning can be responsible for damages to buildings, cause electrical, forest and/or wildfires, and damage infrastructure such as power transmission lines and communication towers.

While all citizens are at risk to the impacts of lightning, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16 percent of

⁵ Environmental Journal, Nathan Neal, January 11, 2021.

SECTION 13: LIGHTNING

the planning area population live below the poverty level. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. Table 13-3 lists these vulnerable populations and several others for De Witt County and the participating jurisdictions. Three Green-De Witt Drainage District employees also face higher vulnerability to lightning, as those working outdoors would be subject to greater lightning risk if working outdoors during periods of lightning activity.

Table 13-3. Populations at Greater Risk by Jurisdiction⁶

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

The De Witt County Planning Team identified the following critical facilities (Table 13-4) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by lightning events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 13-4. Critical Facilities Vulnerable to Lightning Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes. Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. Power outages could disrupt communications, delaying emergency response times. Downed trees due to lightning strikes can impede emergency response vehicle access to areas. Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel.

⁶ US Census Bureau, American Community Survey Five-Year Estimates, 2023.

SECTION 13: LIGHTNING

CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> Structures can be damaged by falling trees damaged by lightning. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, fires, or other associated damages to facilities.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. Essential supplies like medicines, water, food, and equipment deliveries may be delayed. Economic disruption due to power outages and fires negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes. Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. Power outages could disrupt communications, delaying emergency response times. Downed trees due to lightning strikes can impede emergency response vehicle access to areas. Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel.

There are no recorded fatalities or injuries within the De Witt County planning area due to lightning events. Overall, the total loss estimate of property and crops in the planning area is \$83,200 (2025 dollars) with an average annualized loss of \$2,900. Based on recorded impacts and best available data for the De Witt County planning area, including all participating jurisdictions and special district, the potential impact of lightning is considered “Limited” severity of impact, meaning minimal quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed.

Table 13-5. Estimated Annualized Losses by Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$53,500	\$1,900
City of Cuero	\$0	\$0
City of Nordheim	\$0	\$0

SECTION 13: LIGHTNING

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
City of Yorktown	\$29,700	\$1,000
Green-De Witt Drainage District	\$0	\$0
TOTALS	\$83,200	\$2,900

ASSESSMENT OF IMPACTS

Lightning events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Additional impacts to the planning area can include:

- The De Witt County planning area features developed parks and green spaces. Lightning events could impact recreational activities, placing residents and visitors in imminent danger, potentially requiring emergency services or park evacuation.
- Older structures built to less stringent building codes may suffer greater damage from a lightning strike as they are typically built with less fire-resistant materials and often lack any fire mitigation measures such as sprinkler systems. 56 percent of homes in De Witt County were built before 1980. Similarly, historic buildings may lack fire mitigation materials or measures due to their historic status. There are 83 historic building and sites in the De Witt County planning area, based on the Cuero Chamber of Commerce.
- Vegetation in urban parks may be destroyed by lightning caused brush fires and result in poor air quality impacting public health.
- Individuals exposed to the storm can be directly struck, posing significant health risks and potential death.
- Structures can be damaged or crushed by falling trees damaged by lightning, which can result in physical harm to the occupants.
- Lightning strikes can result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders.
- Emergency operations and services may be significantly impacted due to power outages and/or loss of communications.
- County and city departments may be damaged, delaying response and recovery efforts for the entire community.
- Economic disruption due to power outages and fires negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by lightning events may be negatively impacted while utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.

SECTION 13: LIGHTNING

The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any significant lightning event.



Section 14

Thunderstorm Wind

SECTION 14: THUNDERSTORM WIND

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	3
Significant Events	6
Probability of Future Events	7
Climate Change Considerations	7
Vulnerability and Impact	7
Assessment of Impacts	11

HAZARD DESCRIPTION

Thunderstorms create extreme wind events which includes straight-line winds. Wind is the horizontal motion of the air past a given point, beginning with differences in air pressures. Pressure that is higher at one place than another sets up a force pushing from high toward low pressure; the greater the difference in pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air accelerates.

Thunderstorms are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm.

According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms.



Straight-line winds are responsible for most thunderstorm wind damages. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous.

LOCATION

Thunderstorm wind events can develop in any geographic location and are considered a common occurrence in Texas. Therefore, a thunderstorm wind event could occur at any location within the De Witt County planning area. These storms develop randomly and are not confined to any geographic area within the planning area. It is assumed that the entire De Witt County planning area, including participating jurisdictions and special district, is uniformly exposed to the threat of thunderstorm winds.

SECTION 14: THUNDERSTORM WIND

EXTENT

The extent or magnitude of a thunderstorm wind event is measured by the Beaufort Wind Scale. Table 14-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

Table 14-1. Beaufort Wind Scale¹

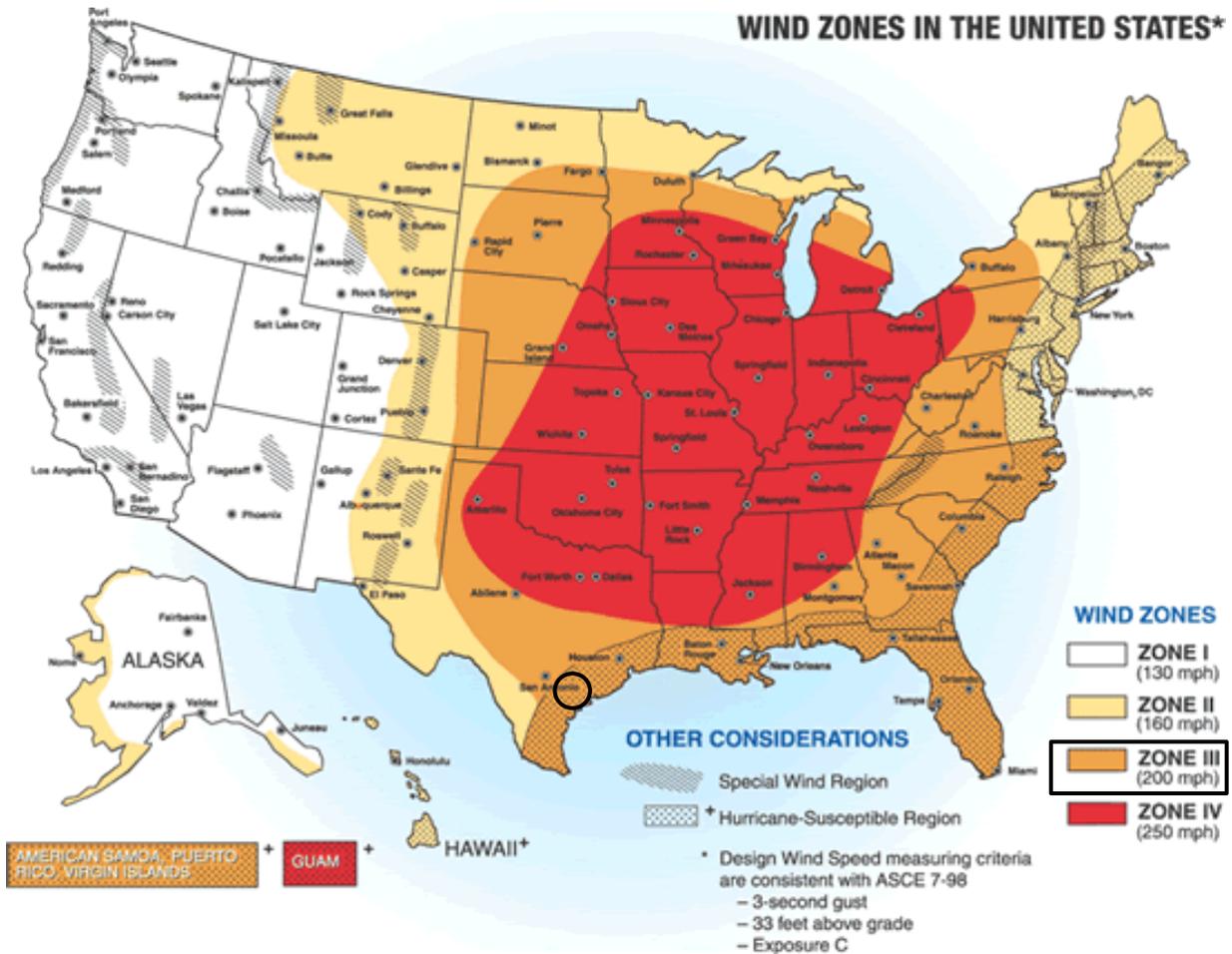
FORCE	WIND		WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS
	(mph)	(knots)		
0	Less than 1	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	11-16	Moderate Breeze	Dust, leaves and loose paper lifted, small tree branches move
5	19-24	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	34-40	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	48-55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	56-63	Violent Storm	If experienced on land, widespread damage
12	72-83	64-71	Hurricane	Violence and destruction

Figure 14-1 displays the wind zones as derived from NOAA.

¹ Source: World Meteorological Organization

SECTION 14: THUNDERSTORM WIND

Figure 14-1. Wind Zones in the United States²



On average, the planning area experiences approximately one to two thunderstorm wind events each year. The De Witt County planning area is located within Wind Zone III, meaning the planning area can experience maximum windspeeds up to 200 mph. The De Witt County planning area has experienced a significant wind event, or an event with winds in the range of “Force 12” on the Beaufort Wind Scale with winds above 72 mph. The highest magnitude events occurred in 2006 and 2017, with winds recorded at 70 knots, or approximately 81 mph. This is the worst to be anticipated for the entire planning area based on historic events.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration (NOAA). The NCEI is the largest archive available for historic storm events data; however, it is important to note that only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. It is likely that a high number of occurrences have gone unreported over the past

² The De Witt County planning area is indicated by the black circle.

SECTION 14: THUNDERSTORM WIND

32.5 years. Tables 14-2, 14-3, and 14-4 depict historical occurrences of thunderstorm wind events for the De Witt County planning area according to the NCEI database.

Since 1993, 48 thunderstorm wind events are known to have occurred in the De Witt County planning area. Table 14-3 presents information on known historical events impacting the De Witt County planning area. The highest magnitude events occurred in 2006 and 2017, with winds recorded at 70 knots, or approximately 81 mph.

It is important to note that high wind events associated with other hazards, such as tornadoes, are not accounted for in this section. Property damage estimates are not always available. Where an estimate has been provided in a table for losses, the dollar amounts have been modified for inflation to indicate the damage in 2025 dollars.

Historical thunderstorm wind event data for the Green-De Witt Drainage District are provided within the De Witt County events or the participating jurisdictions in which the districts reside. In the NCEI database, these entities do not have events reported separate and apart from the reported county and jurisdiction events. The Green-De Witt Drainage District did not report any additional thunderstorm wind events or impacts which were not captured in the NCEI database events.

Table 14-2. Historical Thunderstorm Wind Speeds, January 1993 – June 2025

MAXIMUM WIND SPEED RECORDED (knots)	NUMBER OF REPORTED EVENTS
0-30	0
31-40	1
41-50	7
51-60	16
61-70	3
71-80	0
81-90	0
91-100+	0
Unknown	21

Table 14-3. Damaging Historical Thunderstorm Wind Events, January 1993 – June 2025³

JURISDICTION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Cuero	5/9/1993	-	0	0	\$0	\$11,100
City of Cuero	5/18/1993	-	0	0	\$0	\$11,100

³ Magnitude is listed when available. Damage values are in 2025 dollars.

SECTION 14: THUNDERSTORM WIND

JURISDICTION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	4/15/1994	-	0	0	\$10,848,000	\$1,084,800
De Witt County	5/13/1994	-	0	0	\$1,084,100	\$108,500
De Witt County	5/13/1994	-	0	0	\$1,084,100	\$108,500
De Witt County	6/11/1995	-	0	0	\$10,500	\$10,500
City of Yorktown	4/28/1996	-	0	0	\$20,500	\$10,300
City of Cuero	6/13/1996	-	0	0	\$20,500	\$0
De Witt County	5/27/1997	-	0	0	\$10,000	\$0
City of Cuero	5/31/1997	-	0	0	\$20,000	\$0
City of Cuero	12/23/1997	-	0	0	\$138,800	\$0
City of Cuero	2/10/1998	-	0	0	\$197,600	\$19,800
De Witt County	2/10/1998	-	0	0	\$138,300	\$9,900
De Witt County	2/10/1998	-	0	0	\$39,600	\$9,900
De Witt County	8/20/1998	-	0	0	\$39,200	\$0
City of Cuero	5/17/1999	-	0	0	\$288,700	\$0
De Witt County	3/10/2000	-	0	0	\$18,700	\$0
City of Yorktown	3/10/2000	-	0	0	\$18,700	\$0
City of Yorktown	5/25/2001	-	0	0	\$54,000	\$90,000
City of Nordheim	5/29/2002	-	0	0	\$142,300	\$53,400
City of Yorktown	6/13/2003	55	0	0	\$174,100	\$0
City of Yorktown	7/24/2003	60	0	0	\$52,200	\$0
City of Cuero	8/11/2003	60	0	0	\$52,000	\$0
City of Cuero	3/12/2007	60	0	0	\$155,800	\$0
City of Cuero	6/10/2008	50	0	0	\$7,400	\$0
De Witt County	4/27/2009	52	0	0	\$150,000	\$0
De Witt County	8/26/2009	45	0	0	\$4,500	\$0
De Witt County	8/26/2009	39	0	0	\$3,000	\$0
De Witt County	8/26/2009	45	0	0	\$3,000	\$0

SECTION 14: THUNDERSTORM WIND

JURISDICTION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Cuero	3/20/2010	50	0	0	\$73,500	\$0
De Witt County	5/26/2014	60	0	0	\$67,300	\$0
De Witt County	6/4/2017	70	0	0	\$6,600	\$0
De Witt County	8/4/2017	52	0	0	\$13,100	\$0
De Witt County	6/6/2019	56	0	0	\$3,800	\$0
De Witt County	6/9/2019	65	0	0	\$6,300	\$0
TOTALS		(MAX EXTENT)	0	0	\$14,946,200	\$1,527,800

Table 14-4. Summary of Historical Events by Jurisdiction, January 1993 – June 2025

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	24	70	0	0	\$13,530,100	\$1,332,100
City of Cuero	15	70	0	0	\$954,300	\$42,000
City of Nordheim	2	56	0	0	\$142,300	\$53,400
City of Yorktown	7	60	0	0	\$319,500	\$100,300
Green-De Witt Drainage District	0	0	0	0	\$0	\$0
TOTALS	48	(MAX EXTENT)	0	0	\$16,474,000	

Based on the list of historical thunderstorm wind events for the De Witt County planning area, two events were reported to the NCEI since the 2018 Plan.

SIGNIFICANT EVENTS

April 15, 1994

Overnight, a combination of severe winds and marble to dime-sized hail caused extensive impacts in De Witt County. Wind gusts estimated over 58 mph knocked over several trees and completely stripped many more trees and shrubs. Widespread damage was reported to homes and automobiles, numerous birds and poultry were killed, and many crop fields were also stripped of their vegetation. This severe storm caused an estimated \$10,848,000 (2025 dollars) in property damage, with an additional \$1,084,800 (2025) in damage to crops.

May 13, 1994

The De Witt County Sheriff's Office reported downed power lines, uprooted trees, and damage to homes caused by a severe storm which brought damaging winds as well as lightning and hail. Much of the damage was reported east of the City of Yorktown and between the City of Cuero

SECTION 14: THUNDERSTORM WIND

and community of Hochheim. Total property damage was estimated at \$2,168,200 (2025 dollars), with an additional \$217,000 (2025 dollars) in reported crop damage.

March 20, 2010

In the morning, a cold front in South Central Texas brought damaging severe weather to De Witt County. Thunderstorms over the county produced wind gusts of approximately 58 mph which downed several trees and knocked down powerlines in the City of Cuero, blocking several rural roads. These impacts resulted in an estimated \$73,500 (2025 dollars).

PROBABILITY OF FUTURE EVENTS

Most thunderstorm winds occur during the spring and fall seasons and during the months of March, April, May, and September. Based on available records of historic events, there have been a total of 48 events in a 32.5-year reporting period, which provides an estimated frequency of one to two events each year. Even though the intensity of thunderstorm wind events is not always damaging for the De Witt County planning area, the frequency of occurrence for a thunderstorm wind event is “Highly Likely.” This means that an event is probable within the next year for the De Witt County planning area.

CLIMATE CHANGE CONSIDERATIONS

The impacts on the frequency and severity of severe thunderstorm wind events due to climate change are unclear. According to the Texas A&M 2021 Climate Report Update, changes in severe thunderstorm reports over time have been more closely linked to changes in population than changes in the hazard event. Currently there is low confidence of an ongoing trend in the overall frequency and severity of thunderstorm events, due to the lack of climate data records for severe thunderstorms. Based on climate models that are available, the environmental conditions needed for severe thunderstorms are estimated to become more likely, resulting in an overall increase in the number of days capable of producing a severe thunderstorm event.⁴

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since thunderstorm wind events can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of these events, all existing and future structures, and facilities within the De Witt County planning area, including all participating jurisdictions and special district, could potentially be impacted and remain vulnerable to possible injury and property loss from strong winds.

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In more severe instances, roofs have been reported as having been torn off of buildings. The portable buildings typically used at schools and

⁴ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 Update.

SECTION 14: THUNDERSTORM WIND

construction sites would be more vulnerable to thunderstorm wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris.

According to the American Community Survey (ACS) five-year estimates for 2023, a total of 1,475 manufactured homes are located in the De Witt County planning area (16 percent of total housing stock). In addition, 56 percent (5,201 structures) of the housing units were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events.

Table 14-5. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
De Witt County	5,201	1,475
City of Cuero	1,895	399
City of Nordheim	175	100
City of Yorktown	834	81
Green-De Witt Drainage District	2	0

While all citizens are vulnerable to the impacts of thunderstorm wind, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16 percent of the planning area population live below the poverty level (Table 14-6). While warning times for these types of hazard events should be substantial enough for these individuals to seek shelter, the elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. Several Green-De Witt Drainage District employees also face higher vulnerability to severe weather, as three employees reported regularly working outdoors and may be subject to severe weather conditions.

Table 14-6. Populations at Greater Risk by Jurisdiction⁵

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10

⁵ U.S. Census Bureau 2023 data for De Witt County.

SECTION 14: THUNDERSTORM WIND

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
City of Yorktown	525	167	428	293	53

The De Witt County Planning Team identified the following critical facilities (Table 14-7) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by thunderstorm wind events. The critical infrastructure with the greatest vulnerability to thunderstorms are power and communications facilities. Failures of these facilities can result in a loss of service and cascading impacts such as posing enormous risk to individuals dependent on electricity as a medical necessity. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 14-7. Critical Facilities Vulnerable to Thunderstorm Wind Event

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> Structures can be damaged by falling trees or flying debris. Power outages could disrupt critical care. Backup power sources could be damaged. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.

SECTION 14: THUNDERSTORM WIND

CRITICAL FACILITY TYPE	POTENTIAL IMPACTS
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. Essential supplies like medicines, water, food, and equipment deliveries may be delayed. Economic disruption due to power outages and fires negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.

A thunderstorm wind event can also result in traffic disruptions, injuries and in rare cases, fatalities. Thunderstorm winds experienced in the De Witt County planning area have not resulted in any reported injuries. Overall, in the past 32.5 years there has been an estimated total of \$16,474,000 in damages (2025 dollars) reported in the De Witt County planning area due to thunderstorm wind events. The estimated average annual loss from thunderstorm wind events is \$506,900. Based on historic loss and damages, the impact of thunderstorm wind on the De Witt County planning area, including all participating jurisdictions and special district, is considered “Limited” severity of impact, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 14-8. Estimated Annualized Losses by Participating Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$14,862,200	\$457,300
City of Cuero	\$996,300	\$30,700
City of Nordheim	\$195,700	\$6,000
City of Yorktown	\$419,800	\$12,900
Green-De Witt Drainage District	\$0	\$0
TOTALS	\$16,474,000	\$506,900

SECTION 14: THUNDERSTORM WIND

ASSESSMENT OF IMPACTS

Thunderstorm wind events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Thunderstorm wind conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Thunderstorm wind events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Critical staff may be unable to report for duty, limiting response capabilities.
- Private sector entities that residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures, specifically those built before 1980 (56 percent of the planning area), were built to less stringent building codes may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Recreational areas such as community parks and green spaces may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to associated businesses in the area.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 83 historical sites for De Witt County based on the Cuero Chamber of Commerce.

The economic and financial impacts of thunderstorm winds on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any thunderstorm wind event.

Section 15

Tornado



SECTION 15: TORNADO

Hazard Description	1
Location	1
Extent	2
Historical Occurrences	4
Significant Events	6
Probability of Future Events	7
Climate Change Considerations	7
Vulnerability and Impact	7
Assessment of Impacts	11

HAZARD DESCRIPTION



Tornadoes are among the most violent storms on the planet. A tornado is a rapidly rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction and have wind speeds of 250 miles per hour (mph) or more. In extreme cases, winds may approach 300 mph. Damage paths can be in excess of one mile wide and 50 miles long.

The most powerful tornadoes are produced by “Supercell Thunderstorms.” These thunderstorms are created when horizontal wind shears (winds moving in different directions at different altitudes) begin to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.

Table 15-1. Variations among Tornadoes

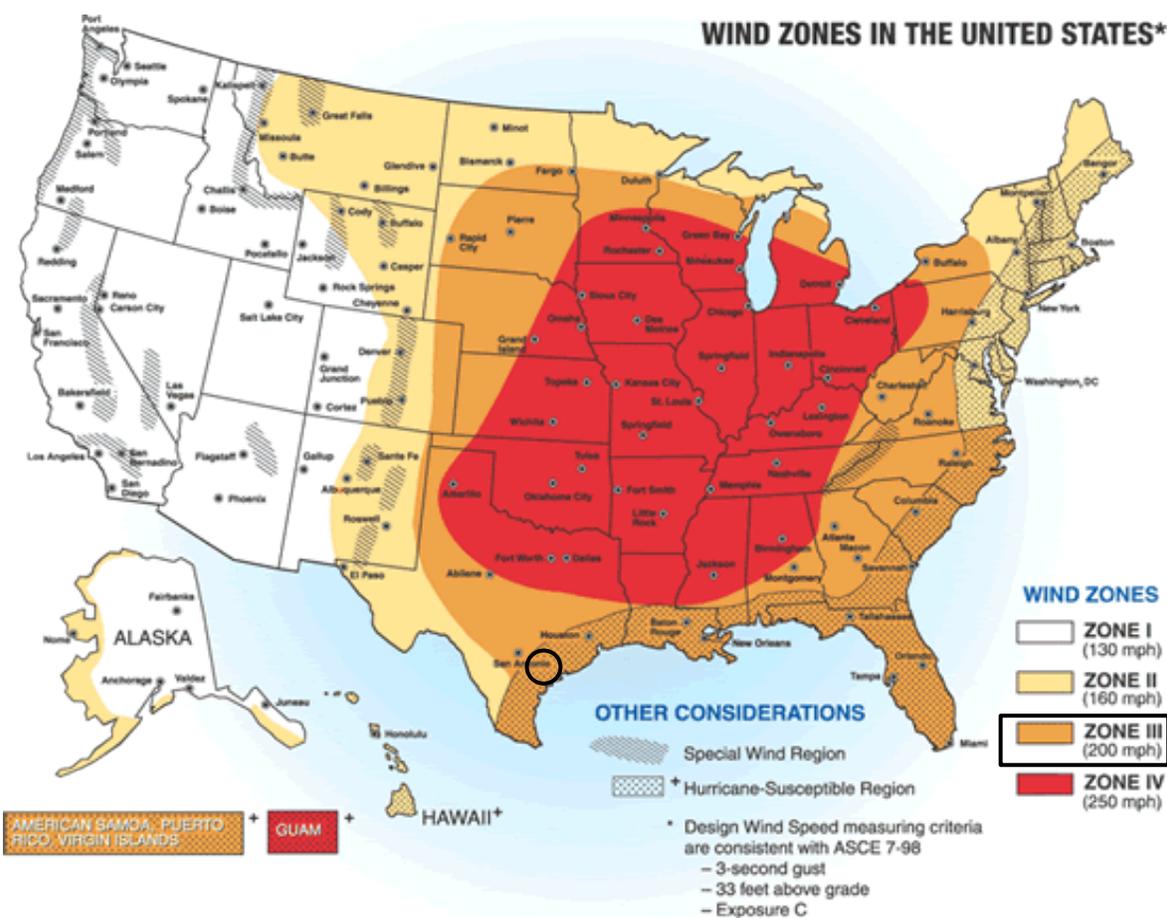
WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
<ul style="list-style-type: none"> • 69% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph 	<ul style="list-style-type: none"> • 29% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110–205 mph 	<ul style="list-style-type: none"> • 2% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the county uniformly. It is assumed that the entire De Witt County planning area, including all participating jurisdictions and special district, is uniformly exposed to tornado activity. The De Witt County planning area is in Wind Zone III, meaning tornado winds can be as high as 200 mph within the planning area.

SECTION 15: TORNADO

Figure 15-1. FEMA Wind Zones in the United States¹



EXTENT

The destruction caused by tornadoes ranges from light to inconceivable, depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes (particularly mobile homes).

Tornado magnitudes prior to 2007 were determined using the traditional version of the Fujita Scale, which estimated tornado wind speeds based on the damage caused by an event. Since February 2007, the Enhanced Fujita Scale has been utilized to classify tornadoes, which included improvements to the original scale. The original Fujita scale had limitations, such as a lack of damage indicators, no account for construction quality and variability, and no definitive correlation between damage and wind speed. These limitations led to some tornadoes being rated in an inconsistent manner and, in some cases, an overestimate of tornado wind speeds. The Enhanced Fujita scale retains the same basic design and six strength categories as the previous scale. The newer scale reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures. Table 15-2 includes both scales for reference when analyzing historical tornadoes, since tornado events prior to 2007 will follow the original Fujita Scale.

¹ The De Witt County planning area is indicated by the black circle.

SECTION 15: TORNADO

Table 15-2. The Fujita and Enhanced Fujita Tornado Scale²

ENHANCED FUJITA SCALE				FUJITA SCALE			
Category	Wind Speed	Damage Level	Damage	Category	Wind Speed	Intensity	Damage
EF0	65-85 MPH	Gale	The environment sustained minor damage: tree branches are broken, some shallow-rooted trees are uprooted, and some chimneys are damaged.	F0	45-78 MPH	Gale	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	86-110 MPH	Weak	The environment sustained moderate damage: mobile homes are tipped over, windows are broken, roof tiles may be blown off, and some tree trunks have snapped.	F1	79-117 MPH	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF2	111-135 MPH	Strong	The environment sustained considerable damage: mobile homes are destroyed, roofs are damaged, debris flies in the air, and large trees are snapped or uprooted.	F2	118-161 MPH	Significant	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165 MPH	Severe	The environment sustained severe damage: roofs and walls are ripped off buildings, small buildings are destroyed, and most trees are uprooted.	F3	162-209 MPH	Severe	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF4	166-200 MPH	Devastating	The environment sustained devastating damage: well-built homes are destroyed, buildings are lifted off their foundations, cars are blown away, and large debris flies in the air.	F4	210-261 MPH	Devastating	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
EF5	200+ MPH	Incredible	The environment sustained incredible damage: well-built homes are lifted from their foundations, reinforced concrete buildings are damaged, the bark is stripped from trees, and car-sized debris flies through the air.	F5	262-317 MPH	Incredible	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

² Source: <http://www.tornadoproject.com/fscale/fscale.htm>

SECTION 15: TORNADO

Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events that occurred before 2007 will follow the original Fujita Scale. The greatest magnitude reported within the planning area is F2 (an EF2 or EF3 when converted to the Enhanced Fujita Scale, depending on exact wind speed), a significant tornado capable of tearing roofs from frame-built homes, demolishing mobile homes, and snapping or uprooting large trees. Based on the planning area's location in Wind Zone III, the planning area has the potential to experience anywhere from an EF0 to an EF5 depending on the wind speed. Previous tornado events in the De Witt County planning area (converted from the Fujita Scale) have ranged between EF0 and EF3 magnitudes (Figure 15-2). This is the worst the planning area can anticipate based on historical events.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration (NOAA). The NCEI is the largest archive available for historic storm events data; however, it is important to note that only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. It is likely that a number of occurrences have gone unreported over time.

Figure 15-2 identifies the locations of previous occurrences in the De Witt County planning area from January 1960 through June 2025. A total of 15 events have been recorded by NOAA's Storm Prediction Center and the NCEI Storm Events databases for the De Witt County planning area. The strongest magnitude reported in the planning area was an F2 tornado which occurred on April 11, 1969 (Table 15-3).

Historical tornado event data for the Green-De Witt Drainage District is provided within the De Witt County events or the participating jurisdictions in which the district facilities and assets reside. In the NCEI database, special districts do not have events reported separate and apart from the reported county and jurisdiction events. The Green-De Witt Drainage District did not report any additional tornado events or impacts which were not captured in the NCEI database.

SECTION 15: TORNADO

Figure 15-2. Spatial Historical Tornado Events, January 1960 – June 2025³

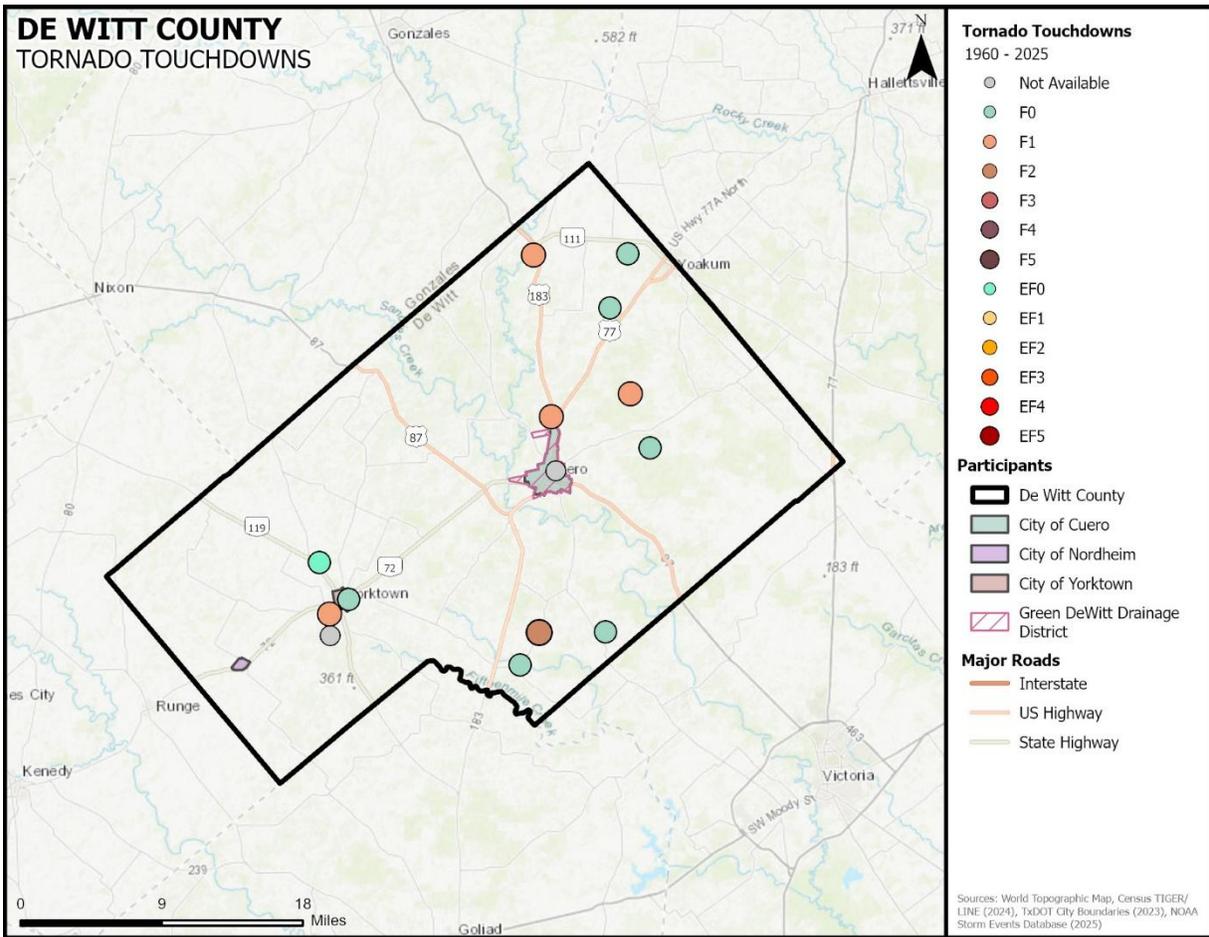


Table 15-3. Historical Tornado Events, January 1960 – June 2025⁴

JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	6/25/1960	F0	0	0	\$27,100	\$0
De Witt County	9/20/1967	-	0	0	\$0	\$0
City of Cuero	9/20/1967	-	0	0	\$0	\$0
De Witt County	4/11/1969	F2	0	0	\$22,100	\$0
De Witt County	5/16/1969	F1	0	0	\$219,700	\$0
De Witt County	8/3/1970	F0	0	0	\$0	\$0
De Witt County	7/30/1972	F0	0	0	\$19,100	\$0

³ Source: NOAA Storm Prediction Center

⁴ Damage values are in 2025 dollars. Magnitude is listed when available.

SECTION 15: TORNADO

JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	4/23/1978	F1	0	0	\$1,300	\$0
De Witt County	5/3/1983	F0	0	0	\$100	\$0
De Witt County	5/18/1993	F0	0	0	\$0	\$1,200
City of Cuero	5/18/1993	F0	0	0	\$0	\$0
City of Cuero	9/20/1996	F1	0	0	\$20,300	\$0
City of Cuero	11/23/2004	F1	0	0	\$0	\$0
City of Yorktown	11/23/2004	F0	0	0	\$0	\$0
De Witt County	4/27/2009	EF0	0	0	\$75,000	\$0
TOTALS		(MAX EXTENT)	0	0	\$384,700	\$1,200

Table 15-4. Summary of Historical Tornado Events, January 1960 – June 2025

JURISDICTION	NUMBER OF EVENTS	MAX MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	10	F2	0	0	\$364,400	\$1,200
City of Cuero	4	F1	0	0	\$20,300	\$0
City of Nordheim	0	0	0	0	\$0	\$0
City of Yorktown	1	F0	0	0	\$0	\$0
Green-De Witt Drainage District	0	0	0	0	\$0	\$0
TOTALS	15	(MAX EXTENT)	0	0	\$385,900	

Based on the list of historical tornado events for the De Witt County planning area, no events were reported to the NCEI since the 2018 Plan.

SIGNIFICANT EVENTS

May 16, 1969

A small, brief F1 tornado touched down near the Home Lumber Company in the City of Yorktown, demolishing a third of a 300-foot-long storage building. The length of the tornado's path was estimated at 104 feet long and 26 feet wide. Despite the tornado's brevity, it caused an estimated \$219,700 (2025 dollars) in property damage.

September 20, 1996

A small F1 tornado touched down northeast of the City of Cuero, tracking across Highway 77 for half a mile before dissipating. The tornado struck a car on the highway as it passed, knocking it

SECTION 15: TORNADO

off the road. No occupants of the car were injured, though the tornado caused an estimated \$20,300 (2025 dollars) in property damage.

April 27, 2009

A relatively weak EF0 tornado developed briefly north of the City of Yorktown during an episode of severe weather over South Central Texas. This tornado brought 70 to 80 mph winds which damaged a mobile home on VFW Road, resulting in an estimated \$75,000 (2025 dollars) in property damage.

PROBABILITY OF FUTURE EVENTS

Tornadoes can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. With 15 historical events over a 65.5-year reporting period, the De Witt County planning area can anticipate a tornado touchdown approximately once every three to four years, supporting a “Likely” probability of future events for the De Witt County planning area.

CLIMATE CHANGE CONSIDERATIONS

The impacts on the frequency and severity of tornado events due to climate change are unclear. According to the Texas A&M 2021 Climate Report Update, the most robust trend in tornado activity in Texas is a likelihood for a greater number of tornadoes in large outbreaks, although the factors contributing to this trend are not expected to continue. Tornadoes spawn from less than 10 percent of thunderstorms, usually supercell thunderstorms that are in a wind shear environment that promotes rotation.⁵ Based on climate models that are available, the environmental conditions needed for severe thunderstorm events are estimated to become more likely, resulting in an overall increase in the number of days capable of producing a severe thunderstorm event and potential tornadoes to develop from these storms.⁶

VULNERABILITY AND IMPACT

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities, and populations in the entire De Witt County planning area is considered to be exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

⁵ Treisman, Rachel. *The exact link between tornadoes and climate change is hard to draw. Here's why.* NPR. December 13, 2021. <https://www.npr.org/2021/12/13/1063676832/the-exact-link-between-tornadoes-and-climate-change-is-hard-to-draw-heres-why>

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

SECTION 15: TORNADO

- Manufactured Homes;
- Homes built of peer and beam construction (more susceptible to lift); and
- Buildings with large spans, such as shopping malls, gymnasiums, and factories.

Tornadoes can cause a significant threat to people as they could be struck by flying debris, falling trees or branches, utility lines, and poles. Blocked roads could prevent first responders from responding to calls. Tornadoes commonly cause power outages which could cause health and safety risks to residents and visitors, as well as to patients in hospitals.

The De Witt County planning area features mobile or manufactured homes throughout the planning area. These homes are typically more vulnerable to tornado events than typical site-built structures. The U.S. Census data indicates a total of 1,475 (16 percent of total housing stock) manufactured homes located in the De Witt County planning area. In addition, 56 percent (5,201 structures) of the housing structures in the De Witt County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant tornado events (Table 15-5).

Table 15-5. Structures at Greater Risk by Participating Jurisdiction

JURISDICTION	STRUCTURES	
	SFR BUILT BEFORE 1980	MANUFACTURED HOMES
De Witt County	5,201	1,475
City of Cuero	1,895	399
City of Nordheim	175	100
City of Yorktown	834	81
Green-De Witt Drainage District	2	0

While all citizens are at risk to the impacts of a tornado, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. The elderly, children, and people with a disability may have trouble taking shelter due to mobility issues or a lack of awareness, making them more susceptible to injury or harm. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures. The population over 65 in the De Witt County planning area is estimated at 20 percent of the total population and children under the age of 5 are estimated at 7 percent. The population with a disability is estimated at 15 percent of the total population. An estimated 16 percent of the planning area population live below the poverty level and 4 percent of the populations speak English “less than very well” (Table 15-6). Additionally, three Green-De Witt Drainage District employees reported working outdoors regularly, indicating that they may face elevated exposure to severe weather conditions.

SECTION 15: TORNADO

Table 15-6. Populations at Greater Risk by Jurisdiction⁷

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

The De Witt County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by tornado events (Table 15-7). The critical infrastructure with the greatest vulnerability to tornadoes are power and communications facilities. Failures of these facilities can result in a loss of service and cascading impacts such as posing enormous risk to individuals dependent on electricity as a medical necessity. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

Table 15-7. Critical Facilities Vulnerable to Tornado Event

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental	<ul style="list-style-type: none"> Structures can be damaged by falling trees damaged by tornadoes. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, fires, or other associated damage to facilities.

⁷ US Census Bureau 2023 data for De Witt County.

SECTION 15: TORNADO

CRITICAL FACILITIES	POTENTIAL IMPACTS
Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency vehicles can be damaged by falling trees or flying debris. • Power outages could disrupt communications, delaying emergency response times. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Debris/downed trees can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.

The total loss estimate due to tornado events in De Witt County is \$385,900 (2025 dollars), having an approximate average annual loss estimate of \$5,900. Historically, tornadoes have not resulted in any reported injuries or fatalities within the planning area. Based on historic loss and damages, the impact of tornadoes on the De Witt County planning area, including all participating jurisdictions and special district, is considered “Limited” severity of impact, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 15-8. Estimated Average Annual Losses by Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$365,600	\$5,600
City of Cuero	\$20,300	\$300
City of Nordheim	\$0	\$0

SECTION 15: TORNADO

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
City of Yorktown	\$0	\$0
Green-De Witt Drainage District	\$0	\$0
TOTALS	\$385,900	\$5,900

ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often, providing and preserving public health and safety is difficult. The impact of climate change could produce larger, more severe tornado events, exacerbating the current tornado impacts. More destructive tornado conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes (16 percent of total housing stock) may suffer substantial damage as they would be more vulnerable than typical site-built structures.
- Portable classrooms may also suffer substantial damage as they would be more vulnerable than other classroom structures.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- Private sector entities such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.

SECTION 15: TORNADO

- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue, especially if damage is sustained to major employers within the planning area.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures destroyed by a tornado may not be rebuilt for years, reducing the tax base for the community.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large tornado, devastating directly related local businesses.
- Tornadoes may destroy or degrade endangered species habitat; currently, there are seven federally endangered, threatened, or candidate species in the planning area.
- Historical sites and properties are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 83 historical buildings and sites for De Witt County based on the Cuero Chamber of Commerce.

The economic and financial impacts of a tornado event on the community will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a tornado event.



Section 16

Wildfire



SECTION 16: WILDFIRE

Hazard Description	1
Location	2
Extent	7
Historical Occurrences	13
Significant Events	15
Probability of Future Events	16
Climate Change Considerations	16
Vulnerability and Impact	17
Assessment of Impacts	26

HAZARD DESCRIPTION

Wildfire is an unplanned fire burning in natural or wildland areas such as forests, shrub lands, grasslands, or prairies.¹ Texas is one of the fastest growing states in the nation, with much of this growth occurring adjacent to metropolitan areas. This increase in population across the state will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk of wildfire. In Texas nearly 85 percent of wildfires occur within two miles of a community.

Wildfires have the potential to spread quickly given the right environmental conditions, particularly within the wildland urban interface and intermix. Most ignition sources for wildfires are a result of human activities, such as an electrical line sparking dry grasses, an improperly discarded cigarette, burning debris, or arson.

Development has increased in east Texas, resulting in more populated areas within the wildland interface / intermix. Additionally, the area is experiencing hotter, drier climatic conditions. These factors combine to make south Texas at risk from wildfires. While the planning area is continually at some risk for wildfires, that risk is elevated during two periods each year: the winter wildfire season (February through April) and the summer wildfire season (August through October).²

The De Witt County population is expected to decrease over time following population trends over the last few decades. However, any future housing development in the WUI will put more people at a greater risk of catastrophic wildfire and put more pressure on land managers and fire department personnel to mitigate fire risk.

Wildfires spread based on the type and quantity of fuel that surrounds it. Fuel can include everything from trees, underbrush and dry grassy fields to homes. The amount of flammable material that surrounds a fire is referred to as the fuel load. Conditions in the weather and environment, such as drought, winds and extreme heat, can cause a fire to spread more quickly.³

¹ FEMA: <https://hazards.fema.gov/nri/wildfire>

² Austin American Statesman, "Winter wildfire risk is rising in Central Texas. Here's what you should know." January 2023: <https://www.statesman.com/story/news/environment/2023/01/30/wildfire-risk-is-rising-in-central-texas-what-you-should-know/69845234007/>

³ NOAA Weather Forecasting: <https://scijinks.gov/wildfires/>

SECTION 16: WILDFIRE

A wildfire event often begins unnoticed and spreads quickly, lighting brush, trees, and homes on fire. For example, a wildfire may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, or arson. Additionally, the De Witt County planning team reports that wildfires are often caused by lightning and thunderstorm wind events.

Texas has seen a significant increase in the number of wildfires in the past 30 years, including wildland, urban interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation, while interface or intermix fires are urban / wildland fires in which vegetation and the built environment provide the fuel.

LOCATION

A wildfire incident can have devastating consequences due to human activities, drought conditions, lightning, or wind events, if the conditions allow. Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands.

The Texas A&M Forest Service Wildfire Risk Assessment Portal (TxWRAP) provides historical wildfire data for Texas counties along with mapping resources that include data layers on the WUI, ignition density, and fire damage potential for communities throughout the De Witt County planning area, along with multiple tips, recommendations and mitigation solutions for communities and residents. The TxWRAP portal was utilized to produce the maps found in this profile.

The threat to people and property from a wildfire event is greater in the fringe areas where developed areas meet open grass lands, such as the Functional Wildland Urban Interface (WUI) (Figures 16-1 through 16-5). The Functional WUI is based on a comprehensive building footprint dataset, fire intensity modeling, and a simulation of ember production and transport. The Zones used in the Functional WUI are described below. Critical facilities are only mapped within the Direct Exposure Zone of the WUI, as these structures face the greatest risk from wildfire due to their proximity to flammable vegetation and potential fire pathways.

The **Direct Exposure Zone** is burnable land cover within 75 meters of a structure. Reducing fire intensity and ember production in this zone would reduce the exposure of nearby buildings to heat and embers. Buildings in this zone also require hardening of the structure to resist ignition.

The **Indirect Exposure Zone** is non-burnable land cover within 1,500 meters of burnable land cover that is within 75 meters of a structure, meaning that embers and home-to-home spread could reach within this zone. Indirectly exposed structures would benefit from the hardening of the structure to resist ignition from embers and nearby structures, but defensible space is usually not required due to the heavily developed nature of the zone.

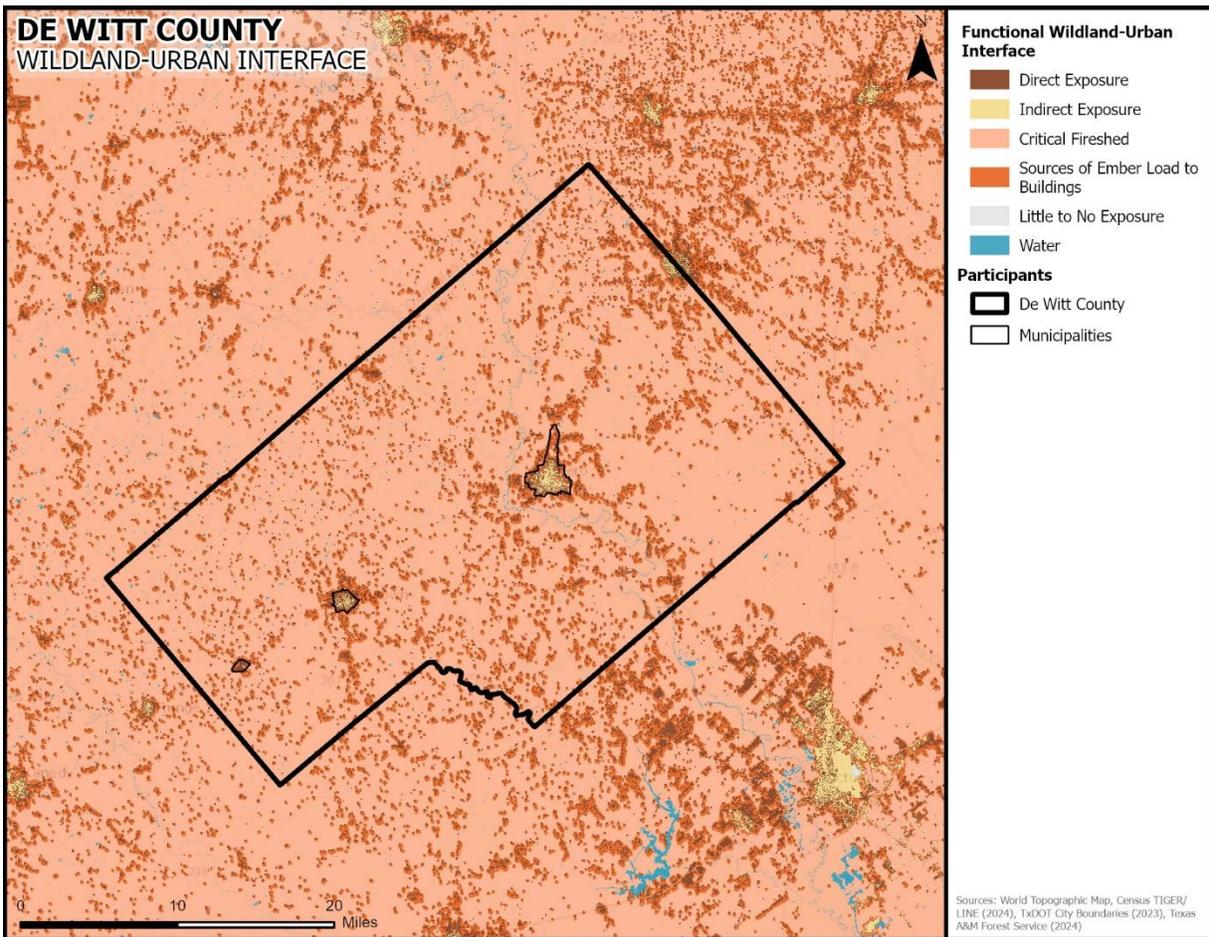
The **Critical Fireshed** is the unpopulated land within about 2.4 kilometers of a group of structures. Fires that originate within or spread to the Critical Fireshed have an immediate threat of reaching the nearby structures; fuel treatments that slow fire spread in this zone can reduce risk to these structures.

The **Sources of Ember Load to Buildings (SELB) Zone** is a critical area or burnable land cover that produces embers capable of reaching nearby buildings. Ember production is a function of fire type and intensity, and ember travel is a function of wind speed and direction. Fuel treatment in this zone is a priority for reducing ember load to the nearby buildings.

SECTION 16: WILDFIRE

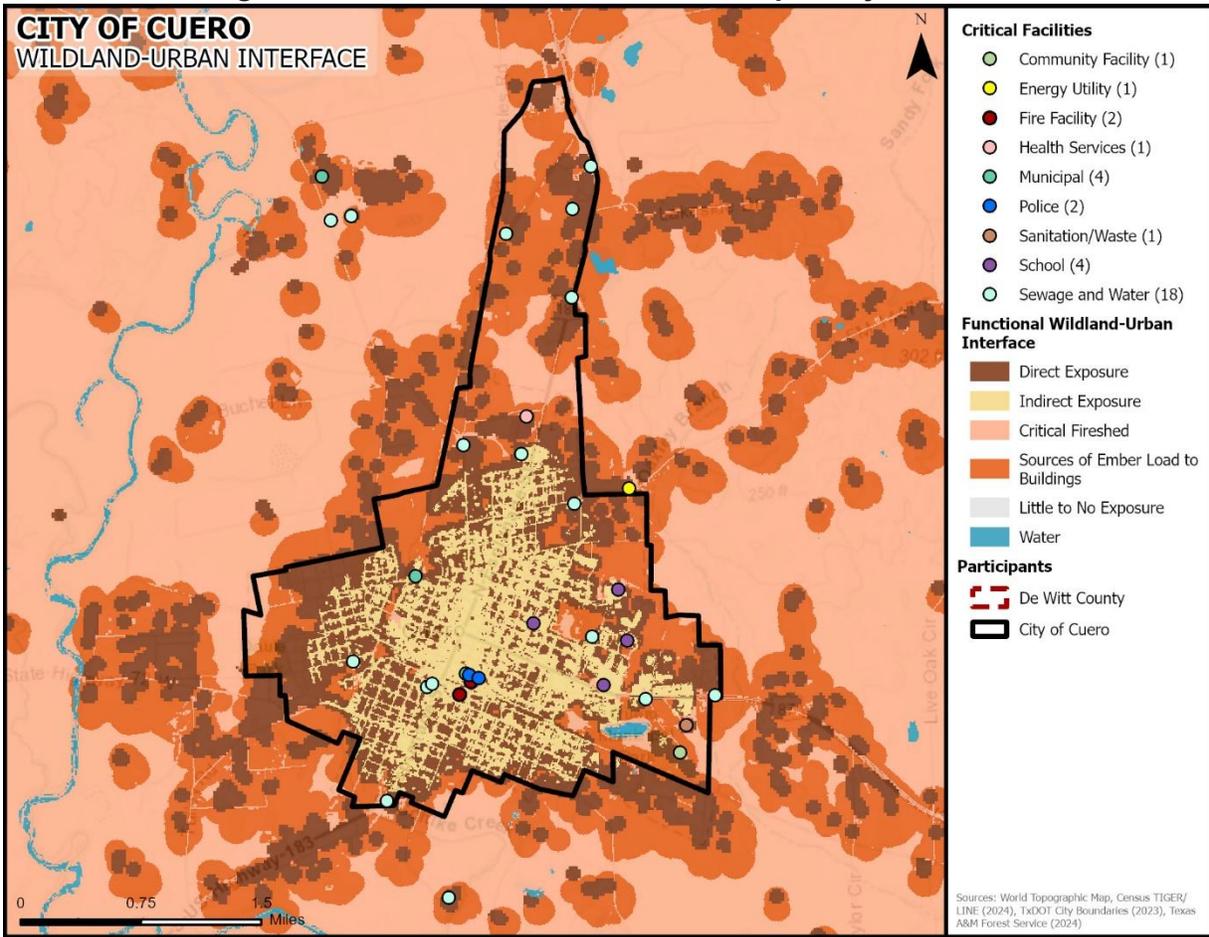
The **Little-to-No Exposure Zone** is non-burnable land that is within 75 meters of a structure but greater than 1,500 meters from a large contiguous block of burnable land cover. Flames, even from home-to-home spread, and embers are unlikely to reach the Little-to-No Exposure Zone. However, smoke and evacuations could still impact this area. Support should be given to those most vulnerable in the community. The need for a wildfire evacuation in this zone is unlikely.

Figure 16-1. Wildland Urban Interface Map – De Witt County



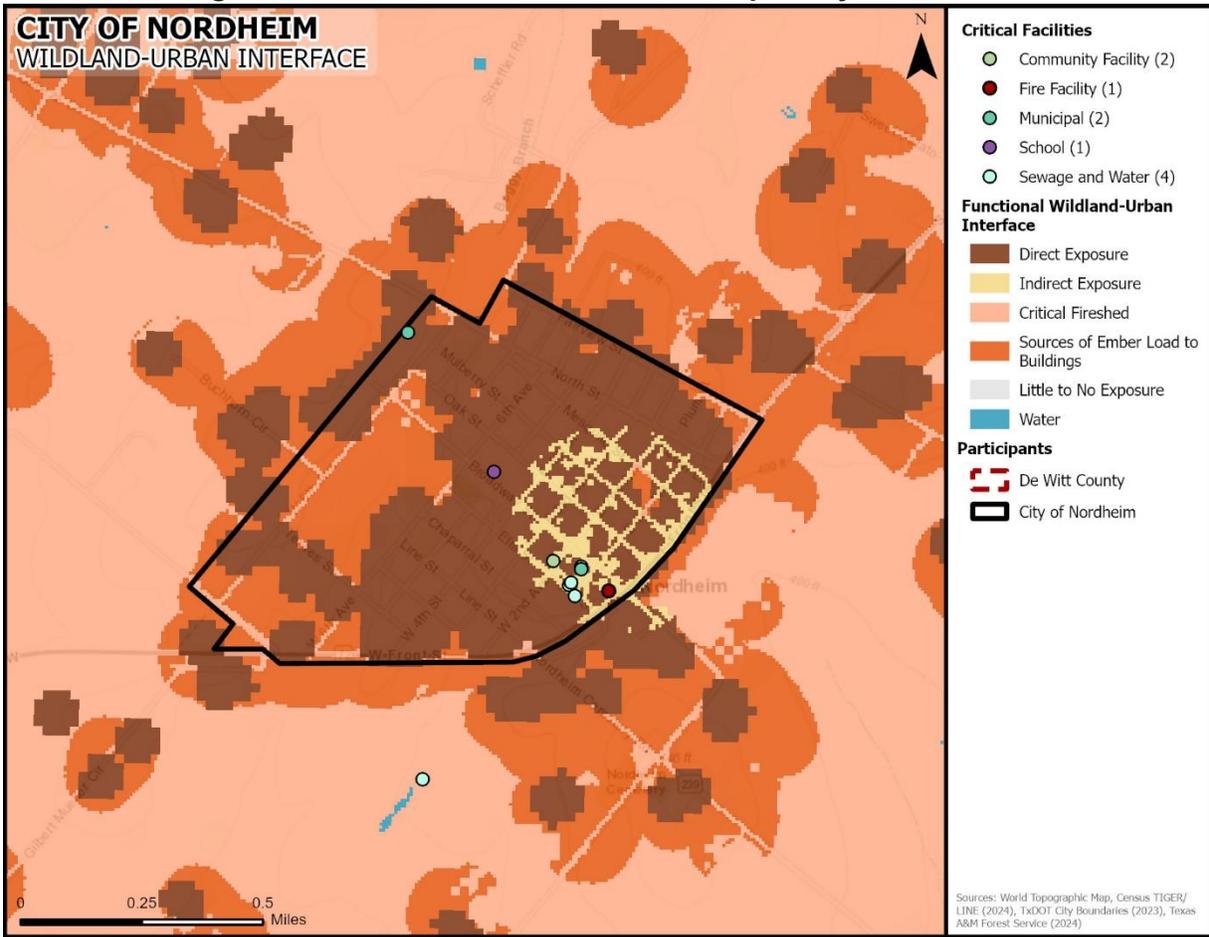
SECTION 16: WILDFIRE

Figure 16-2. Wildland Urban Interface Map – City of Cuero



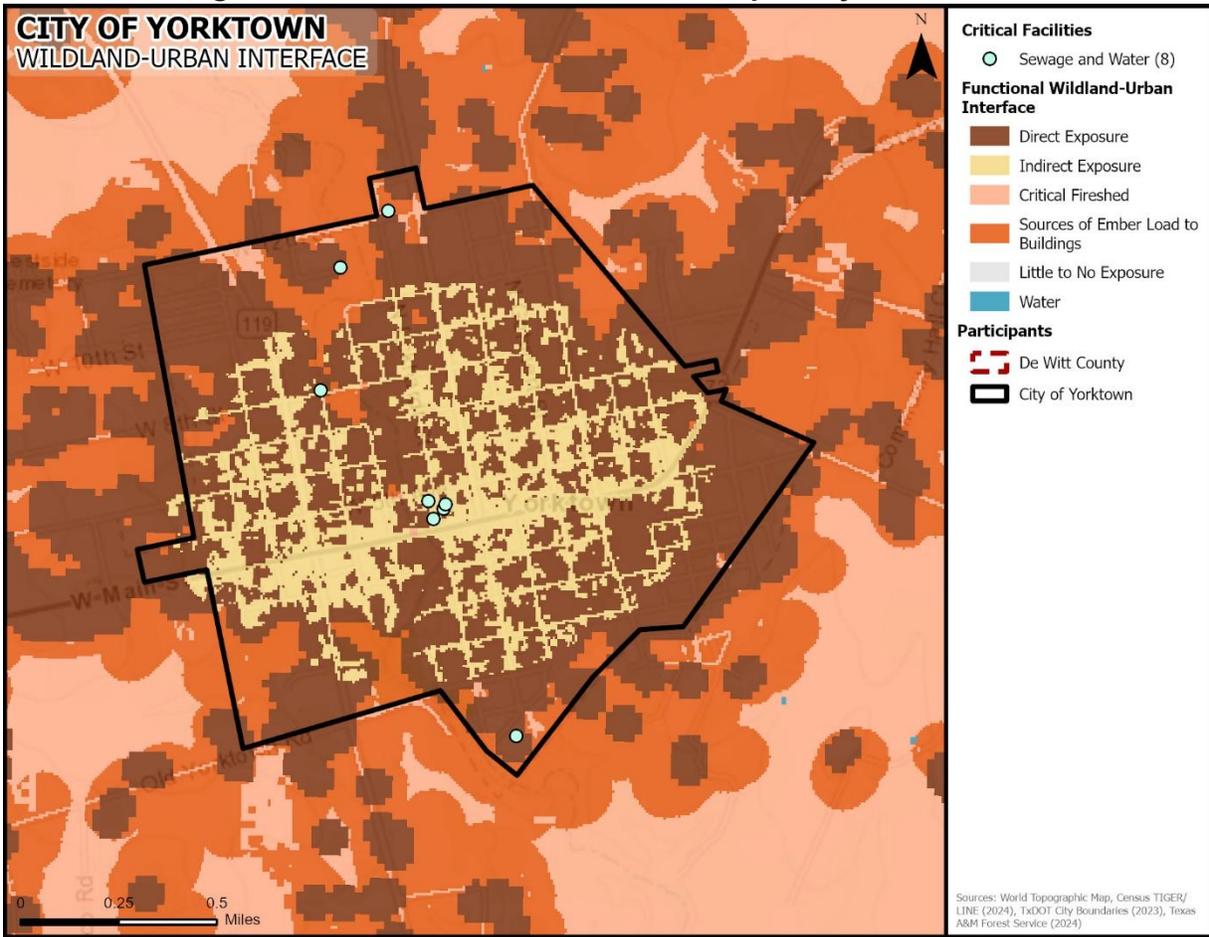
SECTION 16: WILDFIRE

Figure 16-3. Wildland Urban Interface Map – City of Nordheim



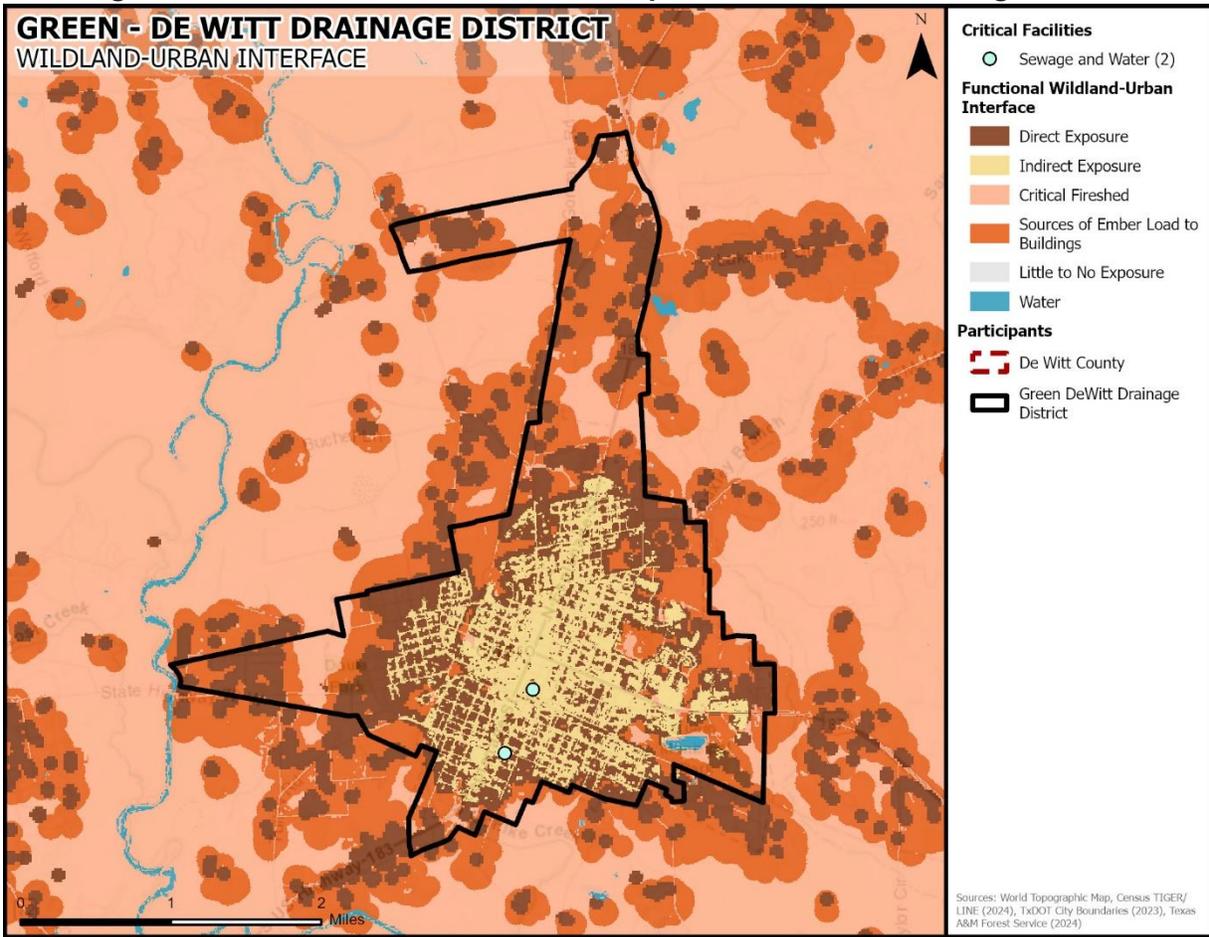
SECTION 16: WILDFIRE

Figure 16-4. Wildland Urban Interface Map – City of Yorktown



SECTION 16: WILDFIRE

Figure 16-5. Wildland Urban Interface Map – Green-De Witt Drainage District



EXTENT



The Texas Forest Service’s Fire Intensity Scale (FIS) identifies areas with high fuel hazards and dangerous fire behavior potential. This scale considers fuel conditions along with a range of wind and weather scenarios. These estimates include the contribution of crown fuel and crowning fire intensity. Crown fuels (the branches, leaves, and needles of tall trees) are the primary fuel layer in crown fires, and the intensity of a crown fire is determined by factors like fuel load, moisture content, and wind conditions, leading to rapid fire spread and high temperatures.

The FIS provides a standard scale to measure potential wildfire intensity. The FIS consists of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

SECTION 16: WILDFIRE

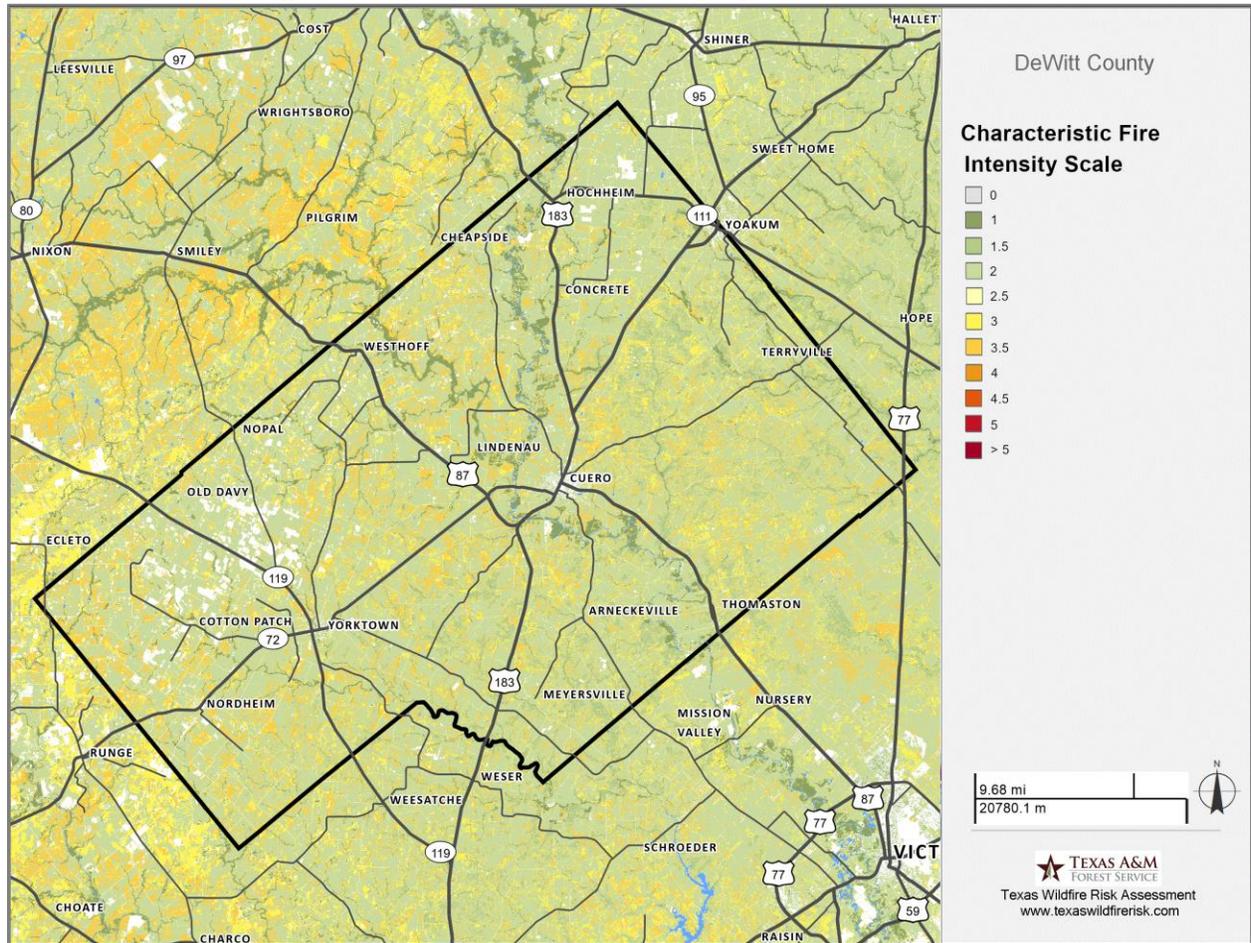
Table 16-1. Characteristic Fire Intensity Scale (FIS)

FIS CLASS	CLASS DESCRIPTION
Class 1 (Very Low)	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
Class 2 (Low)	Small flames, usually less than 2 feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Class 3 (Moderate)	Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
Class 4 (High)	Large Flames, up to 40 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
Class 5 (Very High)	Flames exceed 200 feet in length; expect extreme fire behavior.

The De Witt County planning area is susceptible to wildfires of varying intensities. Figures 16-6 through 16-10 identifies the wildfire intensity for the planning area.

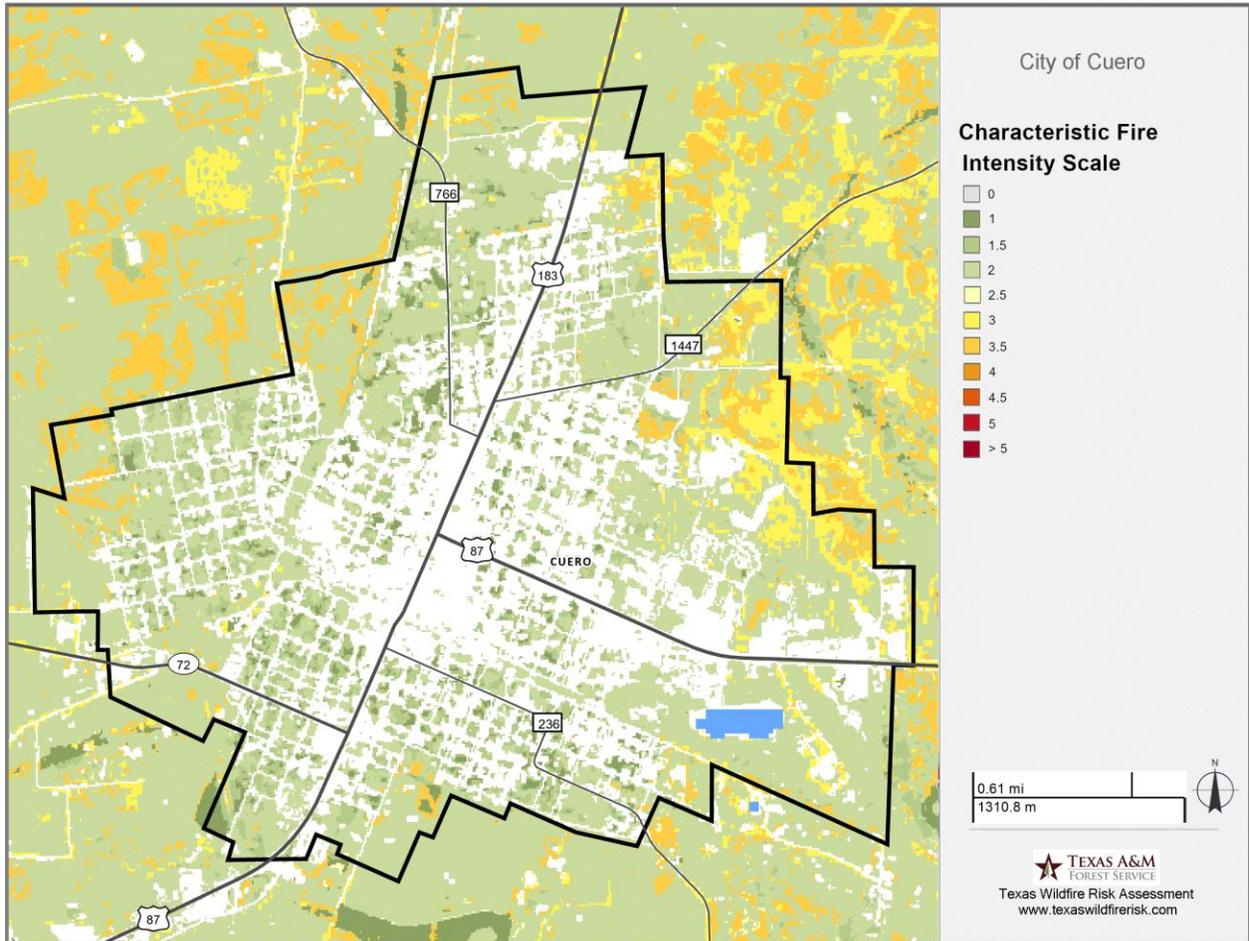
SECTION 16: WILDFIRE

Figure 16-6. Fire Intensity Scale Map – De Witt County



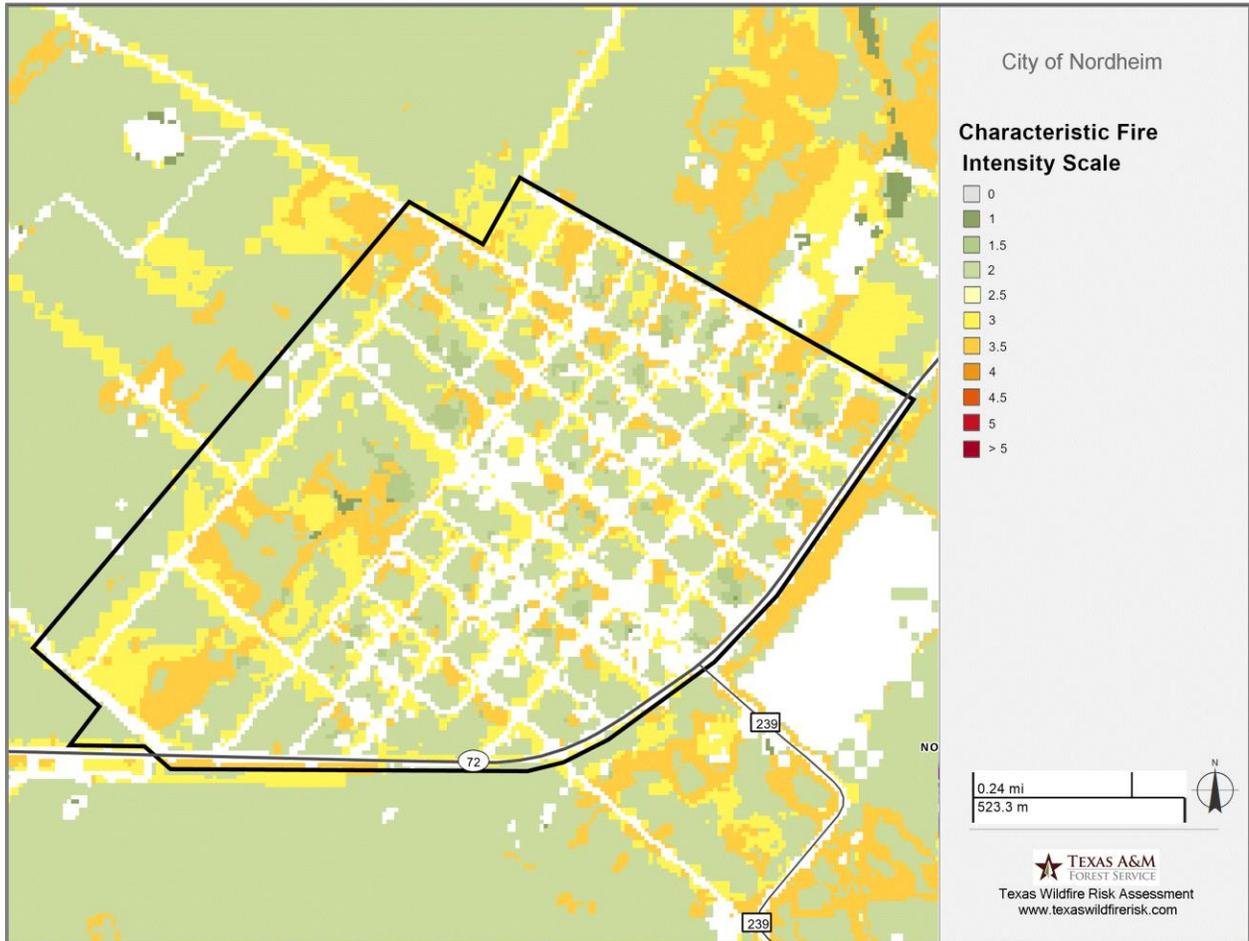
SECTION 16: WILDFIRE

Figure 16-7. Fire Intensity Scale Map – City of Cuero



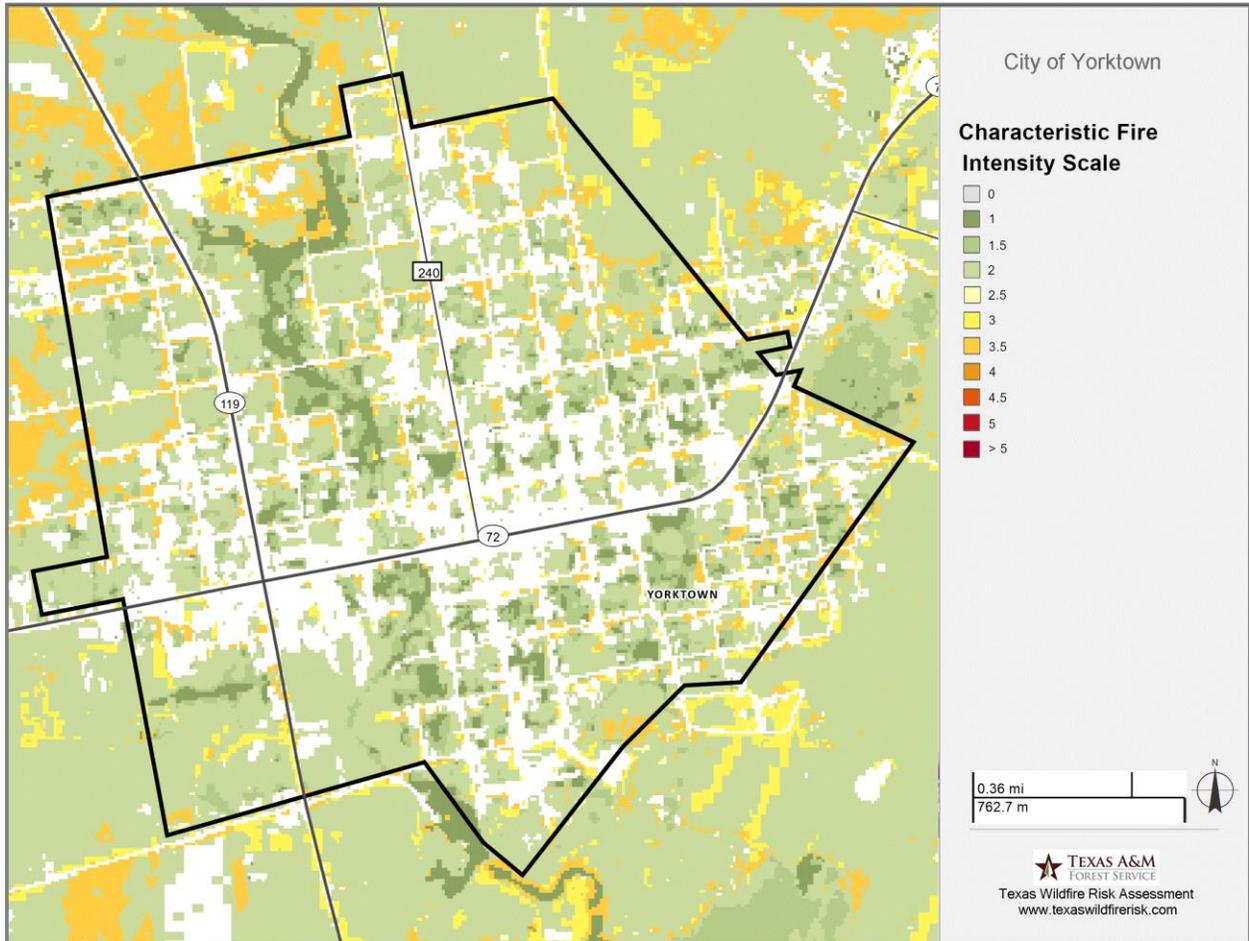
SECTION 16: WILDFIRE

Figure 16-8. Fire Intensity Scale Map – City of Nordheim



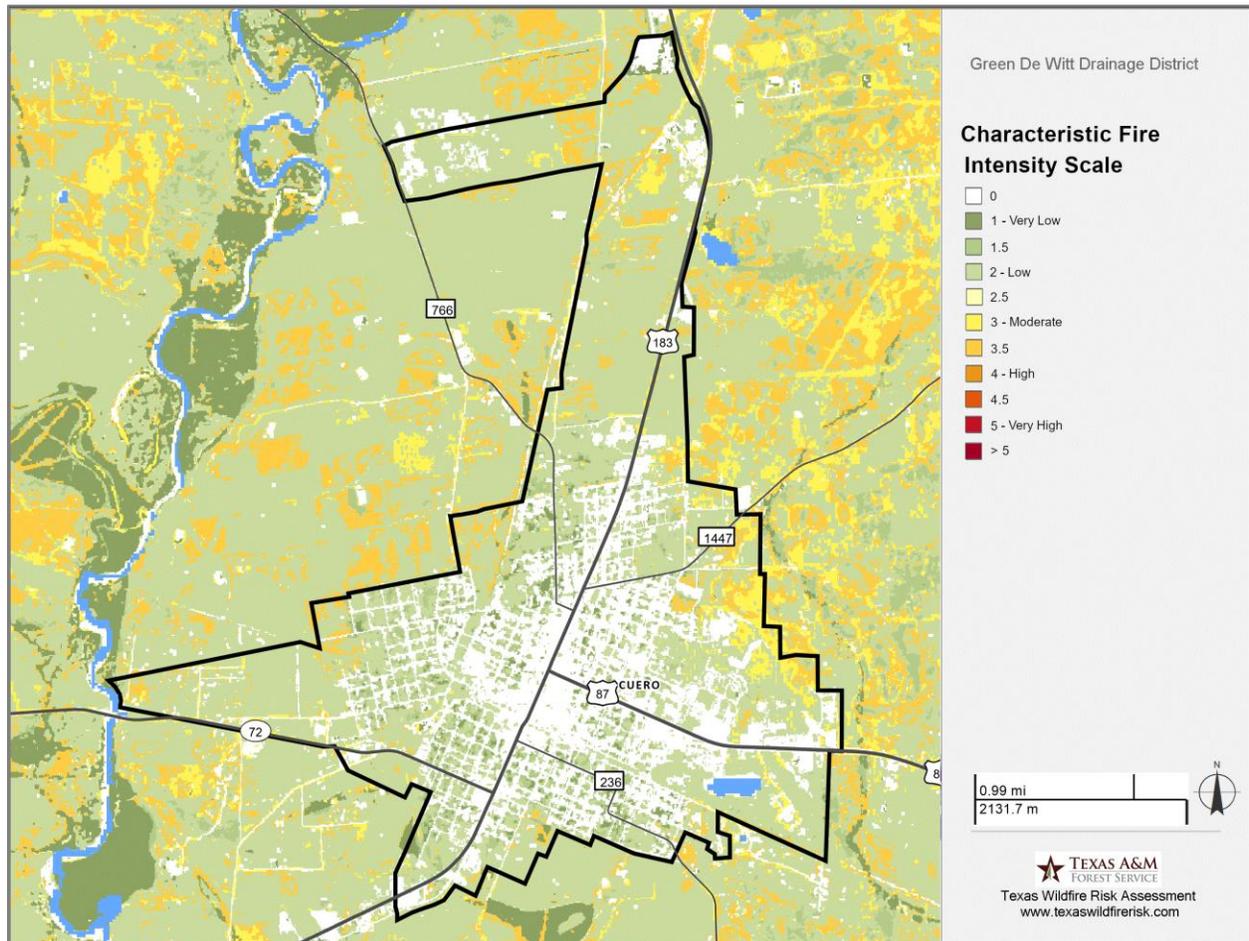
SECTION 16: WILDFIRE

Figure 16-9. Fire Intensity Scale Map – City of Yorktown



SECTION 16: WILDFIRE

Figure 16-10. Fire Intensity Scale Map – Green-De Witt Drainage District



HISTORICAL OCCURRENCES

The Texas A&M Forest Service (TFS) reported 826 wildfire events for the De Witt County planning area between 2005 and 2024. The TFS started collecting wildfire reported by volunteer fire departments in 2005. Due to a lack of recorded data for wildfire events prior to 2005 and after 2024, frequency calculations are based on a 20-year reporting period, using only data from recorded years. Tables 16-2 through 16-4 identify the number of wildfires and total acreage burned each year within the county boundaries.

Historical wildfire data for the Green-De Witt Drainage District does not have events reported separately and apart from the events reported to the TFS. The drainage district did not report any losses as a result of wildfire events over the reporting period.

Table 16-2. Historical Wildfire Events Summary, 2005 – 2024⁴

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
City of Cuero	51	230

⁴ Source: Texas A&M Forest Service. County totals include all incorporated and unincorporated areas.

SECTION 16: WILDFIRE

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
City of Nordheim	5	13
City of Yorktown	9	28
Green-De Witt Drainage District	-	-
De Witt County	826	9,574

Table 16-3. Historical Wildfire Events by Year

YEAR	CITY OF CUERO	CITY OF NORDHEIM	CITY OF YORKTOWN	DE WITT COUNTY
2005	1	0	0	10
2006	3	0	0	47
2007	1	0	0	41
2008	10	0	1	111
2009	5	0	0	52
2010	3	0	4	34
2011	10	0	2	89
2012	5	0	0	38
2013	6	0	0	28
2014	0	0	0	9
2015	0	0	0	8
2016	0	0	0	7
2017	3	0	2	111
2018	2	0	0	69
2019	1	0	0	36
2020	0	0	0	26
2021	0	2	0	26
2022	1	3	0	71
2023	0	0	0	7
2024	0	0	0	6
PLANNING AREA TOTAL				826

Based on the list of historical wildfire events for the De Witt County planning area (Table 16-2), 182 events have occurred since the 2018 plan.

SECTION 16: WILDFIRE

Table 16-4. Acreage of Suppressed Wildfire by Year

YEAR	CITY OF CUERO	CITY OF NORDHEIM	CITY OF YORKTOWN	DE WITT COUNTY
2005	5	0	0	63
2006	2	0	0	278
2007	0	0	0	123
2008	167	0	20	2,130
2009	3	0	0	1,355
2010	6	0	8	183
2011	27	0	0	659
2012	8	0	0	47
2013	4	0	0	82
2014	0	0	0	18
2015	0	0	0	32
2016	0	0	0	103
2017	1	0	0	1,726
2018	0	0	0	561
2019	0	0	0	142
2020	0	0	0	131
2021	0	2	0	58
2022	7	11	0	1,675
2023	0	0	0	22
2024	0	0	0	186
PLANNING AREA TOTAL				9,574

SIGNIFICANT EVENTS

There have been two declared disasters related to wildfire in De Witt County between 1996 and 2025 (Table 16-5). Additional details on certain wildfire events are described below.

Table 16-5. Disaster Declarations for Wildfire, 1996-2025

YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
1999	Extreme Fire Hazards	EM	EM-3142
2006	Extreme Wildfire Threat	DR	DR-1624

SECTION 16: WILDFIRE

February 11, 2017

Near-record high temperatures and gusty winds created ideal conditions for wildfire spread. The Turkey Bottom Road Fire, northeast of Hochheim, consumed 303 acres.

PROBABILITY OF FUTURE EVENTS

Wildfires can occur at any time of the year. As De Witt County communities move into wildland, the potential area of occurrence of wildfire increases. With 826 events in a 20-year period, an event within the De Witt County planning area, including all participating jurisdictions and special district, is “Highly Likely”, meaning an event is probable within the next year.

CLIMATE CHANGE CONSIDERATIONS

Wildfires require the alignment of a number of factors, including temperature, humidity, and the lack of moisture in fuels, such as trees, shrubs, grasses, and forest debris. All these factors have strong direct or indirect ties to climate variability and climate change. Research shows that changes in climate create warmer, drier conditions, leading to longer and more active fire seasons. Increases in temperatures and the thirst of the atmosphere due to human-caused climate change have increased aridity of forest fuels during the fire season.⁵

Vapor pressure deficit, an indicator of the ability of moisture to evaporate, is projected to increase as temperatures rise and carbon dioxide fertilization reduces transpiration, leading to both lower humidity and increased surface dryness. Overall, increased dryness should extend the wildfire season in places where the fire season is presently constrained by low levels of aridity, such as eastern Texas.⁶

Additionally, it is projected that future changes to De Witt County will include increased temperatures, which according to the U.S. Climate Explorer, the planning area may experience a 5°F increase in the average extreme heat temperatures. Historically, extreme temperatures averaged 100°F in De Witt County, but between 2035 and 2064 the average will be 105°F, increasing the severity and frequency of extreme heat events, contributing to favorable wildfire conditions.

Extreme heat and extended periods of drought contribute to wildfire risk in the planning area. Extreme temperatures and periods of drought destroy vegetation in the area, contributing to available fuels that spread wildfires. Additional climate change impacts from drought and extreme heat are discussed in Sections 6 and 9 of this Plan. The projected rise of severity in drought and extreme heat events suggest a growing likelihood of conditions that favor wildfires. Additional information and studies are needed to determine the degree and rate of any increased wildfire risk.

⁵ NOAA Wildfire Climate Connection, August 2022: wildfire-climate-connection.

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

SECTION 16: WILDFIRE

VULNERABILITY AND IMPACT

Periods of drought, dry conditions, high temperatures, and low humidity are factors that contribute to the occurrence of a wildfire event. Less developed areas, such as along interstates or in more remote areas where fuels are more prevalent have an increased risk of being affected by wildfire.

The more heavily populated areas of the planning area are not highly likely to experience large, sweeping fires. Unoccupied buildings and open spaces that have not been maintained have the greatest vulnerability to wildfire. The overall level of concern for wildfires is located across the county where wildland and urban areas interface. Figures 16-11 through 16-15⁷ illustrate the areas that are the most vulnerable to wildfire throughout the De Witt County planning area.

The De Witt County Planning Team identified the following critical facilities (Table 16-6) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by wildfire events. Critical facilities within the Direct Exposure Zone of the WUI are at the greatest risk from wildfire. For a comprehensive list of critical facilities by participating jurisdiction and special district, please see Appendix D.

Table 16-6. Critical Facilities and Critical Services Vulnerable to Wildfire Events

CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	De Witt County: 4 Communication Towers, 1 Correctional Facility City of Cuero: 1 Fire Station, 1 Hospital City of Nordheim: 1 Fire Station	<ul style="list-style-type: none"> Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty. First responders are at greater risk of injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area. Critical city departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted. Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility, slowing or preventing access for emergency response vehicles. Fire suppression costs can be substantial, exhausting the financial resources of the community. First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat. Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.

⁷ TxWRAP portal at the following site: <https://texaswildfirerisk.com/>

SECTION 16: WILDFIRE

CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
		<ul style="list-style-type: none"> • Power outages could disrupt communications, delaying emergency response times. • Structures can be damaged or destroyed in the path of the wildfire. • Power outages could disrupt critical care. • Backup power sources could be damaged or destroyed. • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	De Witt County: 1 Juvenile Service Building, 4 Maintenance Buildings, 4 Municipal Office Buildings, 2 Primary/Secondary Schools City of Cuero: 1 Gathering Center, 1 Animal Shelter, 1 Municipal Service Center, 3 Primary/Secondary Schools City of Nordheim: 1 Cultural/ Historic Building, 1 Recreation/Park, 1 City Hall, 1 Maintenance Building, 1 Primary/Secondary School	<ul style="list-style-type: none"> • Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. • Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed. • Additional emergency responders and critical aid workers may not be able to reach the area for days. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations.
Commercial Supplier (food, fuel, etc.)	De Witt County: 1 Fuel Station	<ul style="list-style-type: none"> • Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. • Essential supplies like medicines, water, food, and equipment deliveries may be delayed. • Economic disruption due to power outages and fires negatively impacts services as well as area businesses reliant on commercial suppliers.
Utility Services and Infrastructure (electric, water,	De Witt County: 1 Energy Utility	<ul style="list-style-type: none"> • Wastewater and drinking water facilities and infrastructure may be damaged or destroyed resulting

SECTION 16: WILDFIRE

CRITICAL FACILITIES	CRITICAL FACILITIES AT RISK	POTENTIAL IMPACTS
wastewater, communications)	<p>City of Cuero: 1 Electric Utility, 1 Department of Public Works, 1 Recycling Center, 5 Lift Stations, 1 Wastewater Treatment Plant, 2 Water Tank/Towers, 4 Wells</p> <p>City of Nordheim: 2 Water Wells</p> <p>City of Yorktown: 2 Lift Stations, 1 Pump Station, 1 Wastewater Treatment Plant</p>	<p>in service disruption or outage for multiple days or weeks.</p> <ul style="list-style-type: none"> • Disruptions and outages impact public welfare as safe drinking water is critical. • A break in essential and effective wastewater collection and treatment is a health concern, potentially spreading disease. • Exposure to untreated wastewater is harmful to people and the environment. • Any service disruptions can negatively impact or delay emergency management operations.

Within the De Witt County planning area, including all participating jurisdictions and special district, a total of 826 fire events were reported from 2005 through 2024 by Texas A&M Forest Service. All events were suspected wildfires. Historic loss and annualized estimates of acres burned due to wildfires are presented in Table 16-7 below. The average frequency is approximately 43 events every year.

Table 16-7. Average Annualized Acreage Losses⁸

JURISDICTION	TOTAL ACRES BURNED	AVERAGE ANNUAL ACRE LOSSES
City of Cuero	230	12
City of Nordheim	13	1
City of Yorktown	28	1
Green-De Witt Drainage District	-	-
De Witt County	9,574	479

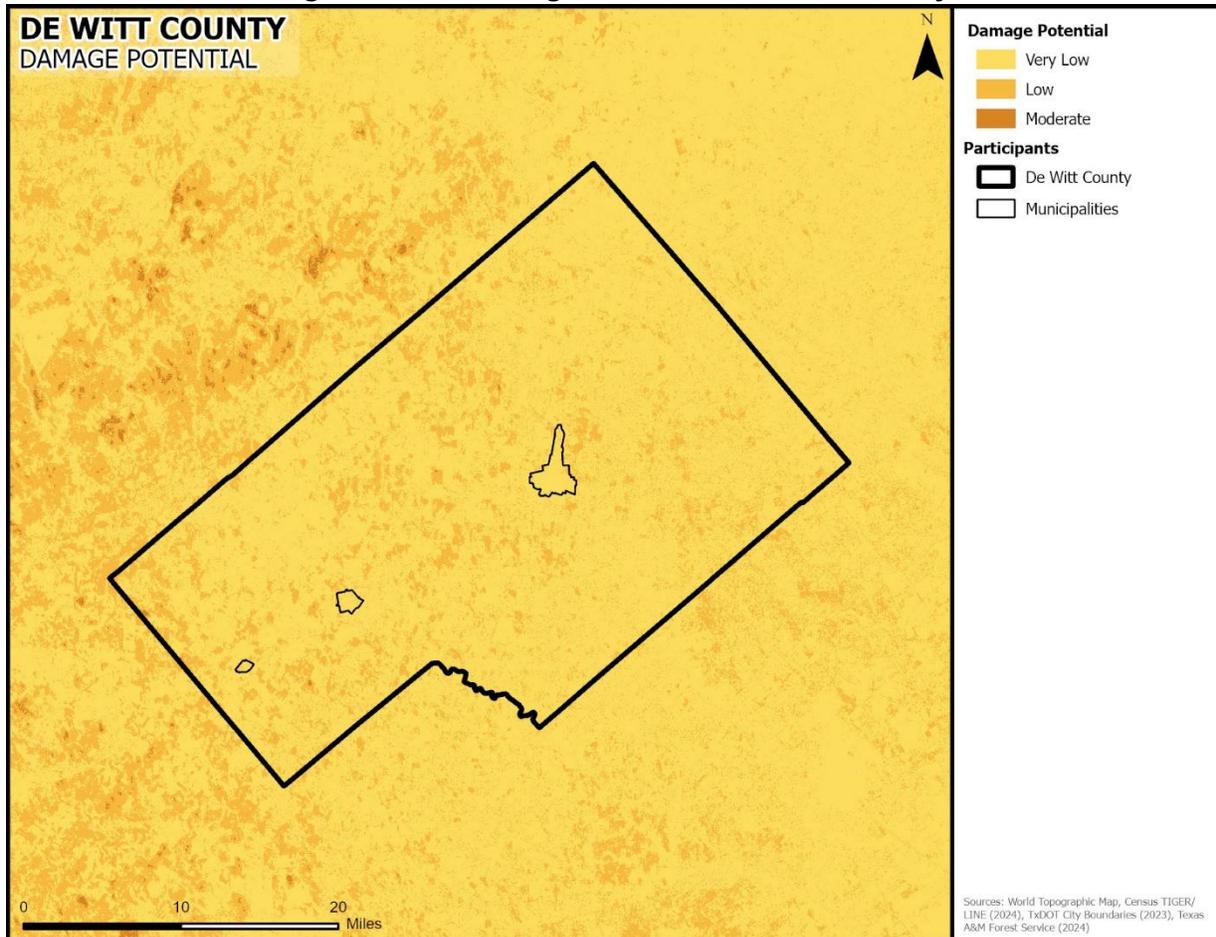
Damage Potential provides an index of potential damage to homes from wildfire. It considers factors like flame length and embers lofted from nearby fuel. Damage Potential is a relative index (from low to high), that provides a broad measure of the possible damage from wildfire, based generally on the landscape, rather than specific characteristics of a home or parcel. For planning uses and broad applications, the index is calculated for all areas regardless of whether a structure

⁸ Events divided by 20 years of data. County totals include all incorporated and unincorporated areas.

SECTION 16: WILDFIRE

currently exists at that location. This index does not incorporate a measure of wildfire likelihood.⁹ Figures 16-11 through 16-15 show the level of potential damage of wildfires in the De Witt County planning area.

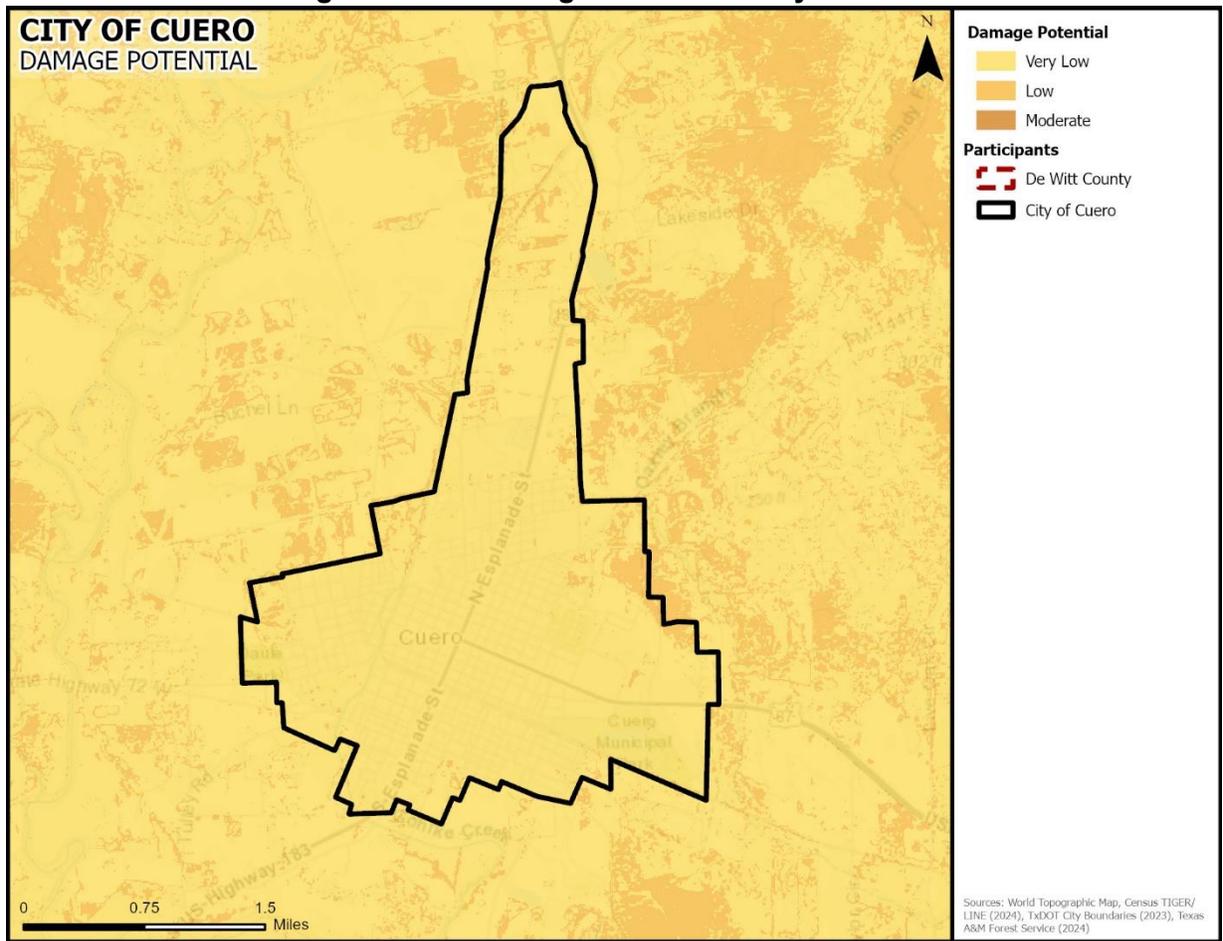
Figure 16-11. Damage Potential – De Witt County



⁹ TxWRAP portal at the following site: <https://texaswildfirerisk.com/>

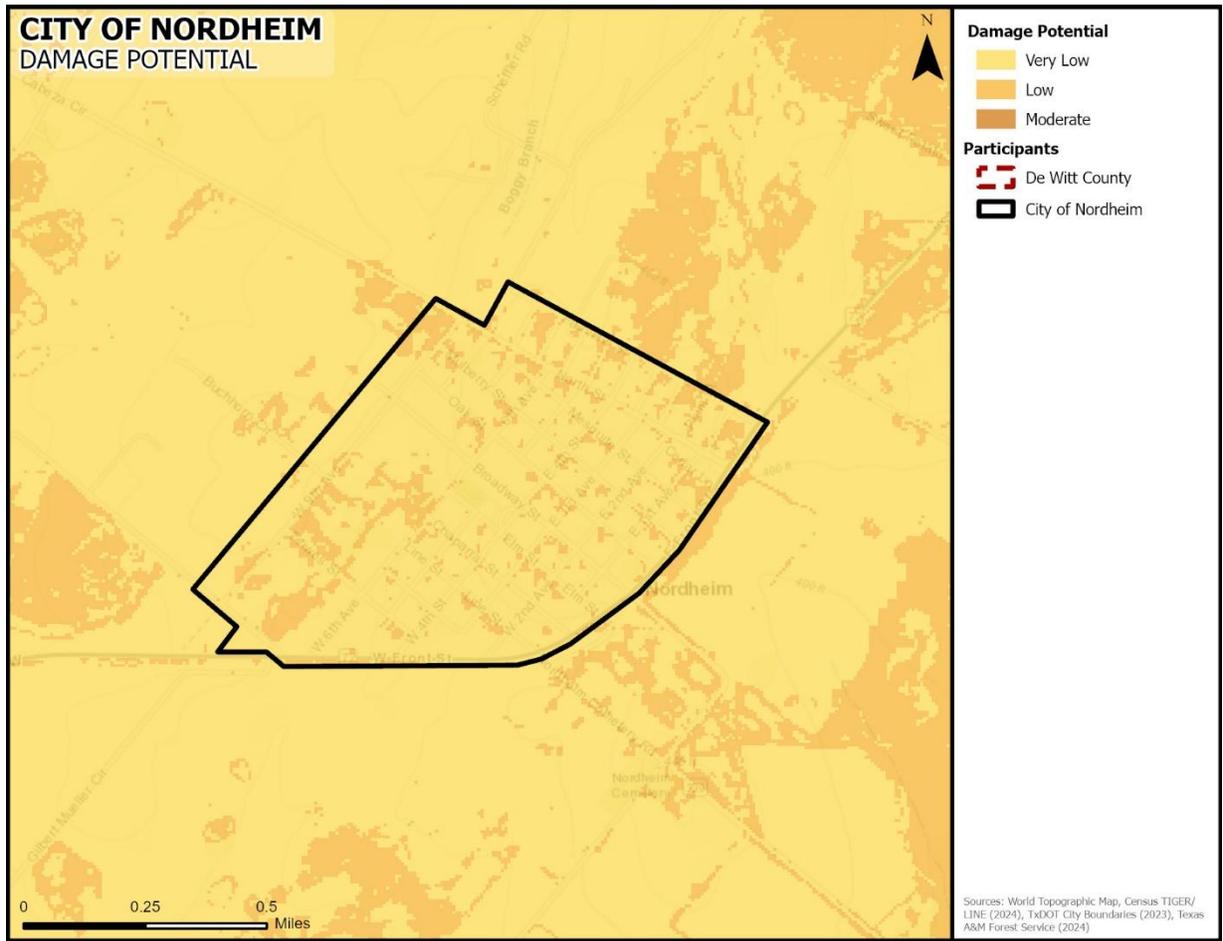
SECTION 16: WILDFIRE

Figure 16-12. Damage Potential – City of Cuero



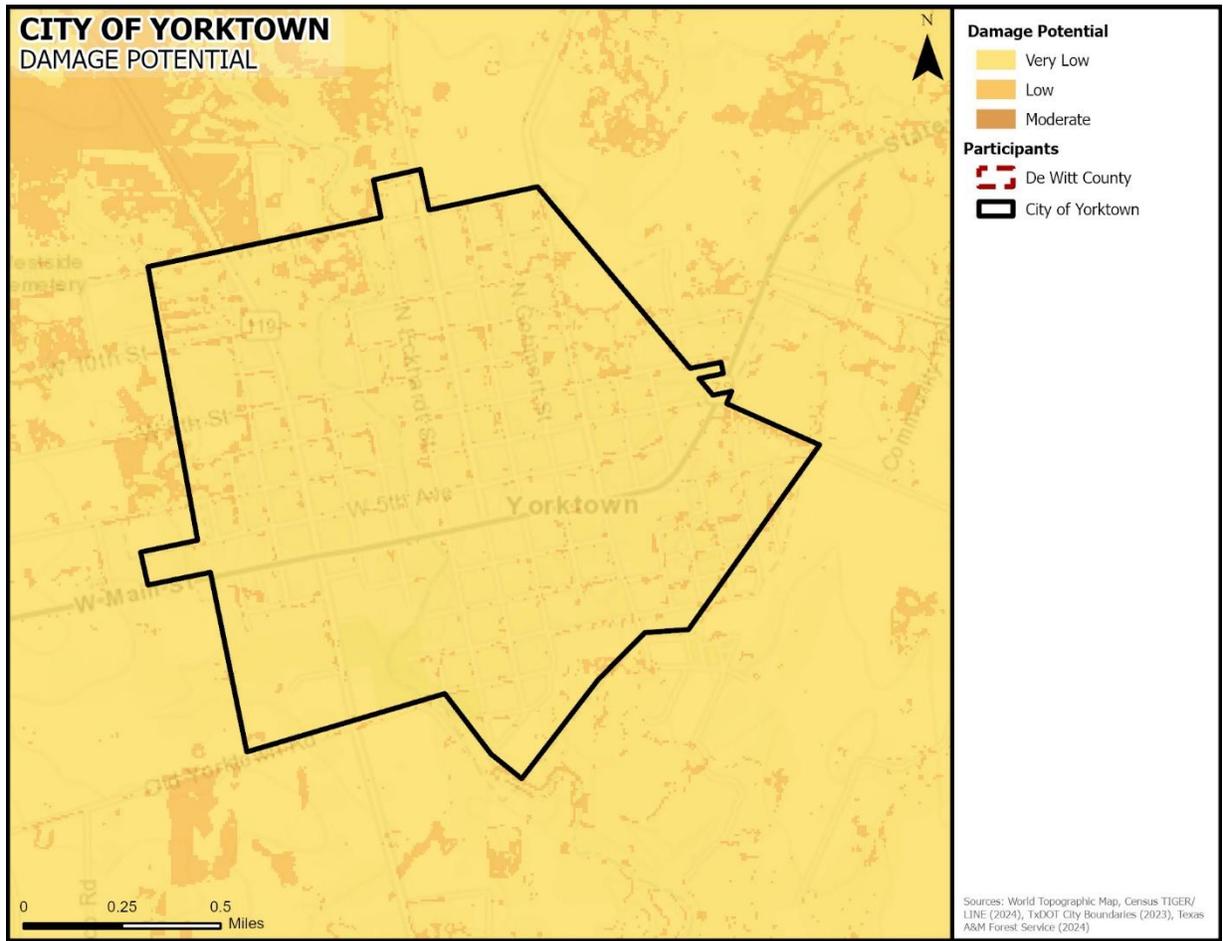
SECTION 16: WILDFIRE

Figure 16-13. Damage Potential – City of Nordheim



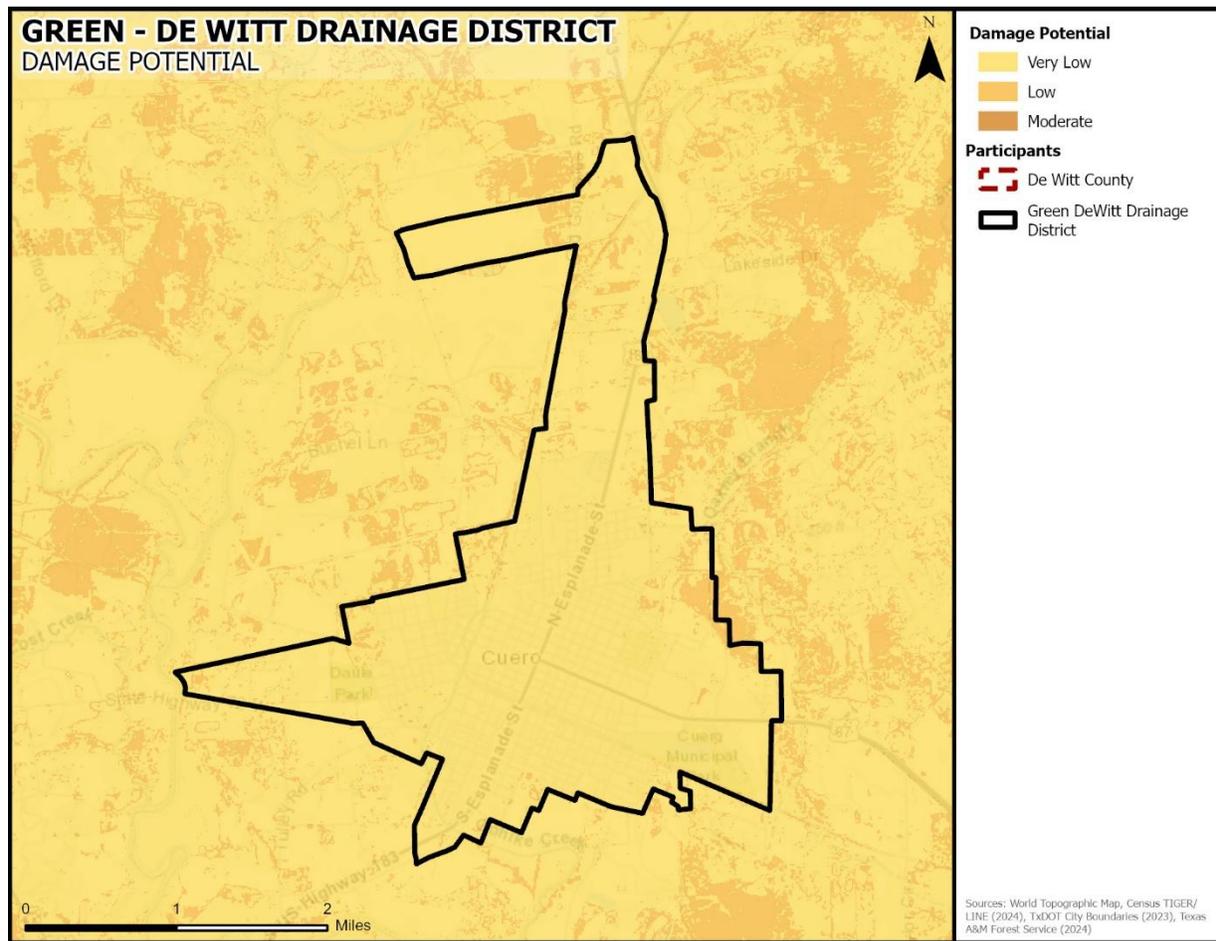
SECTION 16: WILDFIRE

Figure 16-14. Damage Potential – City of Yorktown



SECTION 16: WILDFIRE

Figure 16-15. Damage Potential – Green-De Witt Drainage District

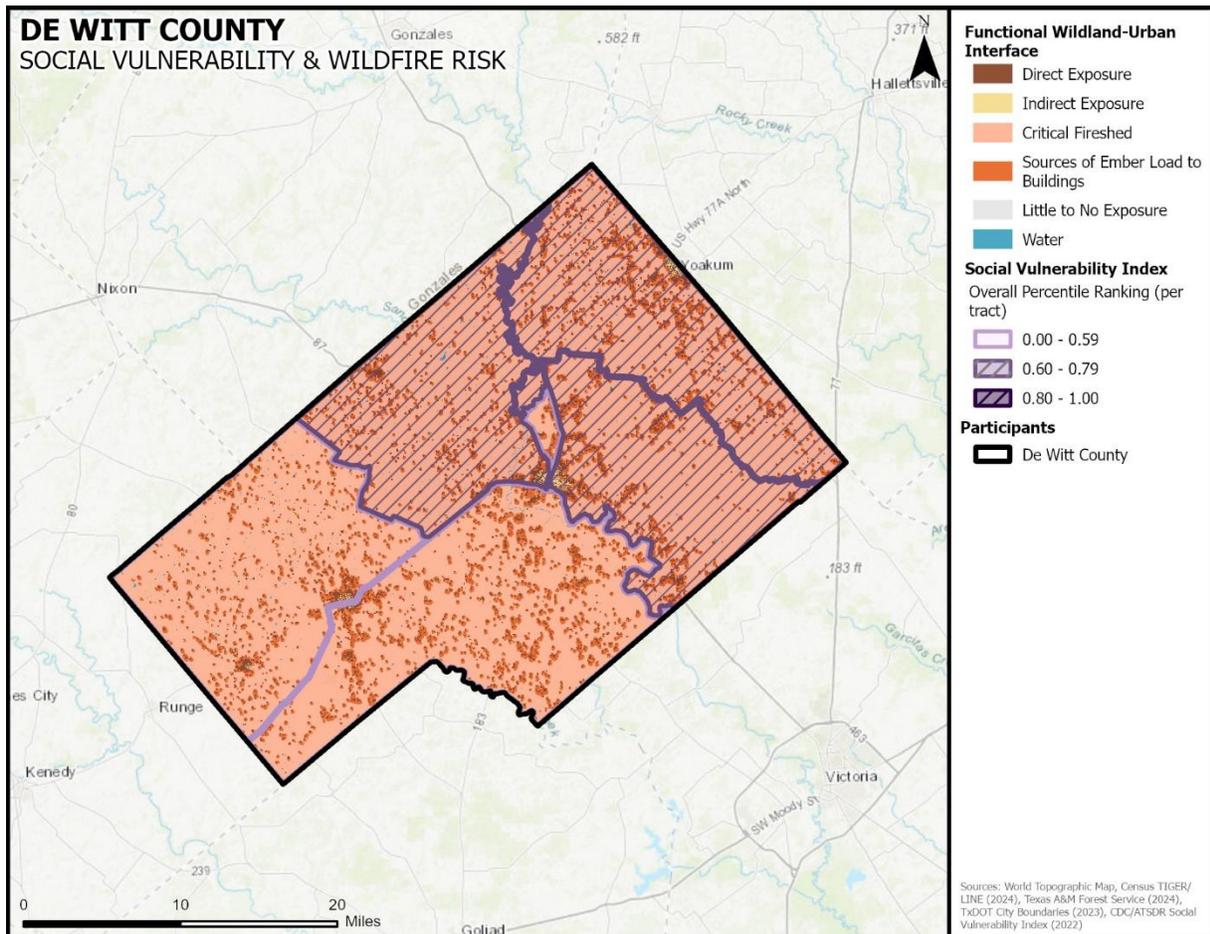


Diminished air quality is an environmental impact that can result from a wildfire event and pose a potential health risk. Wildfire smoke plumes may contain carcinogenic particles that can be inhaled. Fine particles of invisible soot and ash that are too small for the respiratory system to filter can cause immediate and possibly long-term health effects. The elderly or those individuals with compromised respiratory systems may be more vulnerable to the effects of diminished air quality after a wildfire event.

The Center for Disease Control (CDC) created a Social Vulnerability Index (SVI) which includes a database and mapping application that identifies and quantifies communities experiencing social vulnerability. The current CDC SVI uses 16 U.S. census variables from the 5-year American Community Survey (ACS) to identify communities that may need support before, during, or after disasters. All 16 variables fall under four broad categories including socioeconomic status (population in poverty, unemployment, etc.), household characteristics (age, disability status, etc.), racial and ethnic minority status, and housing type and transportation (mobile homes, no vehicles, etc.). Populations experiencing social vulnerability may be adversely impacted by natural hazards, disasters, and other community-level stressors. Figure 16-16 identifies areas of social vulnerability using the CDC's SVI and where these areas overlap with the De Witt County WUI areas, where wildfire risk is considered the highest.

SECTION 16: WILDFIRE

Figure 16-16. De Witt County's Social Vulnerability and WUI



Climatic conditions such as severe freezes and drought can significantly increase the intensity of wildfires since these conditions kill vegetation, creating a prime fuel source for wildfires. The intensity and rate at which wildfires spread are directly related to wind speed, temperature, and relative humidity.

The severity of impact from major wildfire events can be substantial. Such events can cause multiple deaths, shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage.

For the De Witt County planning area, including all participating jurisdictions and special district, the impact from a wildfire event is considered "Limited," meaning injuries and/or illnesses are typically treatable with first-aid, complete shutdown of facilities and services for 24 hours or less and less than 10 percent of property is destroyed or with major damage. The severity of impact is gauged by acreage burned, homes and structures lost, injuries and fatalities.

SECTION 16: WILDFIRE

Table 16-8. Impact for De Witt County

JURISDICTION	IMPACT	DESCRIPTION
De Witt County	Limited	A majority of the county (83 percent) is in the “very low” damage potential category. In addition, 17 percent is in the “low” category, 0 percent is in the “moderate” category, and 0 percent is in the “High” category. County residents may suffer injuries that are treatable with first aid. Critical facilities could be shut down for 24 hours, and less than 10 percent of total property could be damaged.
City of Cuero	Limited	A majority of the city (95 percent) is in the “very low” damage potential category. In addition, 5 percent is in the “low” category, 0 percent is in the “Moderate” category, and 0 percent is in the “little to none” category. City residents may suffer injuries that are treatable with first aid. Critical facilities could be shut down for 24 hours, and less than 10 percent of total property could be damaged.
City of Nordheim	Limited	A majority of the city (85 percent) is in the “very low” damage potential category. In addition, 15 percent is in the “low” category, 0 percent is in the “Moderate” category, and 0 percent is in the “little to none” category. City residents may suffer injuries that are treatable with first aid. Critical facilities could be shut down for 24 hours, and less than 10 percent of total property could be damaged.
City of Yorktown	Limited	A majority of the city (93 percent) is in the “very low” damage potential category. In addition, 7 percent is in the “low” category, 0 percent is in the “Moderate” category, and 0 percent is in the “little to none” category. City residents may suffer injuries that are treatable with first aid. Critical facilities could be shut down for 24 hours, and less than 10 percent of total property could be damaged.
Green-De Witt Drainage District	Limited	The Green-De Witt Drainage District is responsible for the drainage system, which consists of drainage channels, for the City of Cuero. Staff could be injured or suffer illnesses, but not permanent disability. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.

ASSESSMENT OF IMPACTS

A wildfire event poses a potentially significant risk to public health and safety, particularly if the wildfire is initially unnoticed and spreads quickly. The impacts associated with wildfire are not limited to direct damage. Significant wildfire events can be frequently associated with a variety of impacts, including:

- The De Witt County planning area contains numerous open space areas. Wildfire may adversely affect or destroy endangered species’ habitat, reduce air quality, increase erosion and risk of flash flooding, contribute to increased local temperatures, and disrupt other ecological functions.
- Recreation activities throughout the county and city parks may be unavailable and tourism can be unappealing for years following a large wildfire event, devastating directly related local businesses and negatively impacting economic recovery.

SECTION 16: WILDFIRE

- Persons, pets, and wildlife in the area at the time of the fire are at risk for injury or death from burns and/or smoke inhalation. First responders are at greater risk of physical injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area.
- First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat.
- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty.
- Critical county and city departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted.
- Non-critical businesses may be directly damaged, suffer loss of utility services, or be otherwise inaccessible, delaying normal operations and slowing the recovery process.
- Displaced residents may not be able to immediately return to work, slowing economic recovery.
- Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility.
- Older homes are generally exempt from modern building code requirements, which may require fire suppression equipment in the structure. An estimated 56 percent (5,201 structures) of homes in the planning area were built before 1980. Similarly, historic buildings may lack fire mitigation materials or measures due to their historic status. There are 83 historical buildings and sites for De Witt County based on the Cuero Chamber of Commerce.
- Some high-density neighborhoods feature small lots with structures close together, increasing the potential for fire to spread rapidly.
- Air pollution from smoke may exacerbate respiratory problems of vulnerable residents.
- Charred ground after a wildfire cannot easily absorb rainwater, increasing the risk of flooding and potential mudflows.
- Wildlife may be displaced or destroyed.
- Historical or cultural resources may be damaged or destroyed.
- Tourism can be significantly disrupted, further delaying economic recovery for the area.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Fire suppression costs can be substantial, exhausting the financial resources of the community.
- Residential structures lost in wildfire may not be rebuilt for years, reducing the tax base for the community.
- Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground delivery lines, and soil erosion or debris deposits into waterways after the fire.

The economic and financial impacts of a wildfire event on local government will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a wildfire event.



Section 17

Winter Storm



SECTION 17: WINTER STORM

Hazard Description	1
Location	3
Extent	3
Historical Occurrences	5
Significant Events	6
Probability of Future Events	7
Climate Change Considerations	7
Vulnerability and Impact	7
Assessment of Impacts	10

HAZARD DESCRIPTION



A severe winter storm event is identified as a storm with snow, ice, or freezing rain. This type of storm can cause significant problems for area residents. Winter storms are associated with freezing or frozen precipitation such as freezing rain, sleet, snow, and the combined effects of winter precipitation and strong winds. Wind chill is a function of temperature and wind. Low wind chill is a product of high winds and freezing temperatures.

Winter storms that threaten the De Witt County planning area usually begin as powerful cold fronts that push south from central Canada. Although the county is at risk of ice hazards, extremely cold temperatures, and snow, the effects and frequencies of winter storm events are generally mild and short-lived.

As indicated in Figure 17-1, the De Witt County planning area is located in USDA Hardiness Zone 9a, indicating annual minimum temperatures between 20°F and 25°F. During times of ice and snow accumulation, response times will increase until public works road crews are able to make major roads passable. Table 17-1 describes the types of winter weather possible to occur in the De Witt County planning area.

SECTION 17: WINTER STORM

Figure 17-1. Annual Minimum Temperature¹

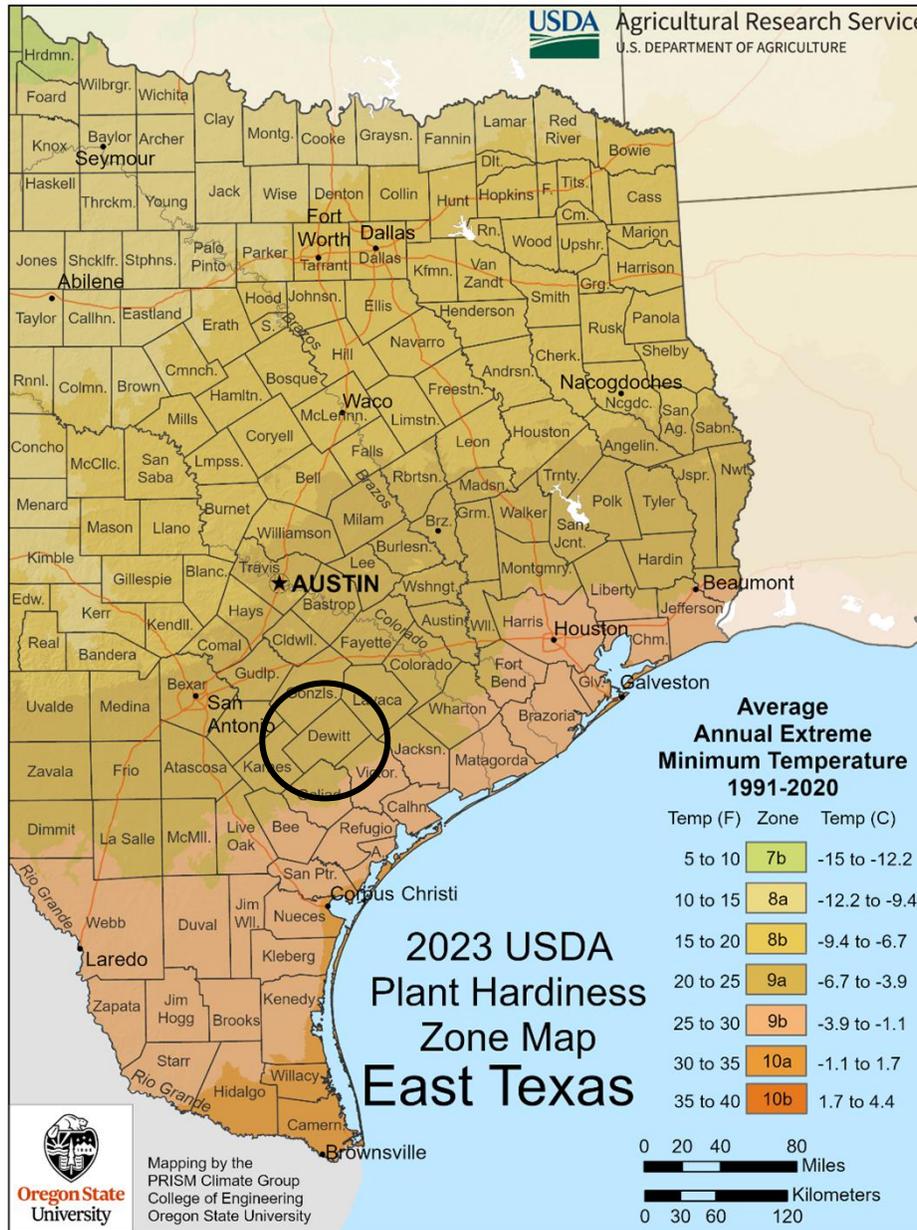


Table 17-1. Types of Winter Weather

TYPE OF WINTER WEATHER	DESCRIPTION
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.

¹ USDA

SECTION 17: WINTER STORM

TYPE OF WINTER WEATHER	DESCRIPTION
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost / Freeze	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

LOCATION

Winter storm events are not confined to specific geographic boundaries. Therefore, all existing and future buildings, facilities, and populations in the De Witt County planning area are vulnerable to a winter storm hazard and could potentially be impacted.

EXTENT

The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 17-2. Table 17-2 should be read in conjunction with the wind-chill factor described in Figure 17-2 to determine the intensity of a winter storm. The chart is not applicable when temperatures are over 50°F or winds are calm.

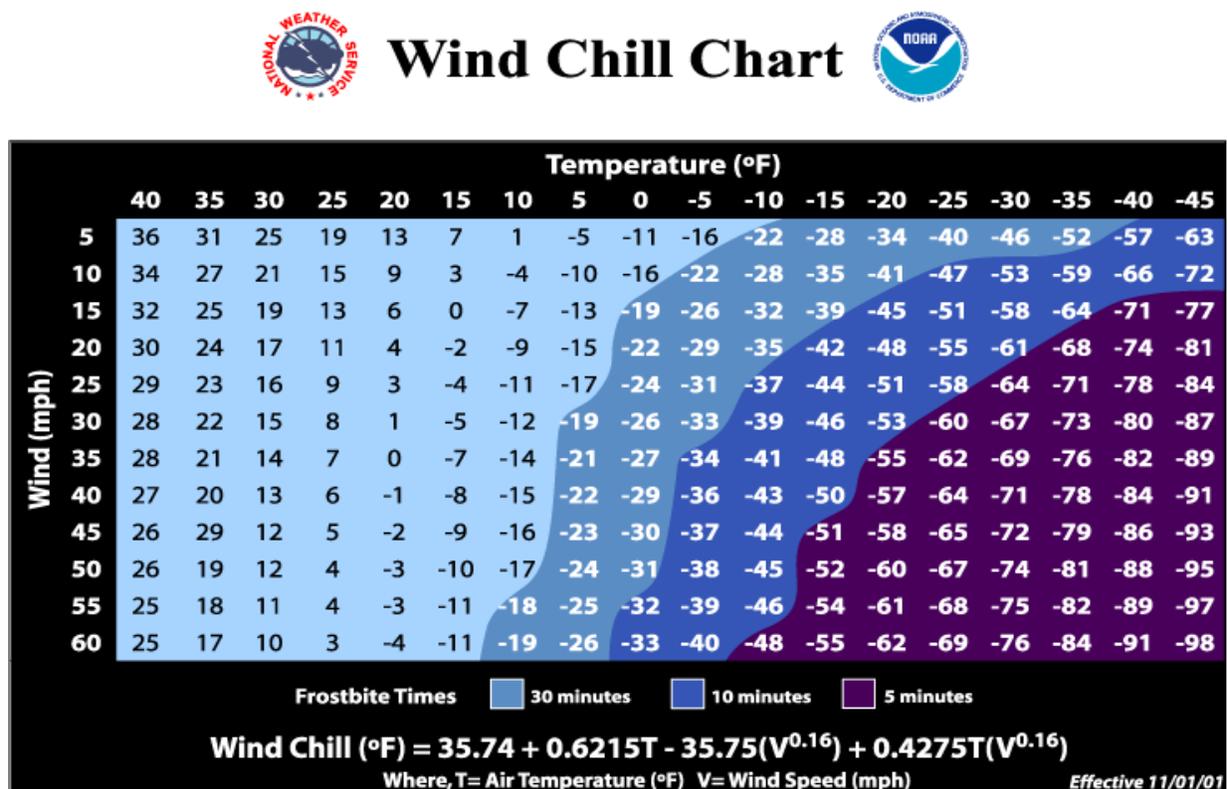
Table 17-2. Magnitude of Severe Winter Storms²

INTENSITY	TEMPERATURE RANGE (Fahrenheit)	EXTENT DESCRIPTION
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches
Significant	25° – 30°	Intense snow showers accompanied with strong gusty winds between 15 and 20 mph with significant accumulation
Extreme	20° – 25°	Wind driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to 5 millimeters in diameter
Severe	Below 20°	Winds of 35 mph or more and snow and sleet greater than 4 inches

² Source: National Weather Service

SECTION 17: WINTER STORM

Figure 17-2. Wind Chill Chart



Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 10°F temperatures. The De Witt County planning area has 13 previous occurrences recorded from 1996 through 2024 in the National Centers for Environmental Information (NCEI) Storm Events Database. The planning area has never experienced a blizzard, but it has been subject to heavy snow, frost / freeze, ice storm, cold / wind chill, winter storm, and winter weather.

The average number of cold days is similar for the entire planning area, with the average low for winter months being above 35°F.³ The intensity or extent of a winter storm event to be mitigated for the area ranges from moderate to severe according to the definitions in Table 17-2. The De Witt County planning area can expect anywhere between 0.1 to 1.0 inches of ice and 0.1 to 2.0 inches of snow during a winter storm event, and temperatures between 20°F and 25°F with winds ranging from 0 to over 50 mph. During Winter Storm Uri in February 2021, several days of persistent below-freezing temperatures, ice accumulations, and snow up to 2 inches were reported in De Witt County. These are likely the greatest extent the planning area can anticipate in the future, based on historical events.

The National Weather Service issues a winter storm watch, advisory or warning in advance of an event in order to give people enough time to prepare for an event. De Witt County could be under

³ National Weather Service

SECTION 17: WINTER STORM

any of these warning types in advance of a winter storm event. Table 17-3 describes when each warning type would be issued.

Table 17-3. Winter Storm Watch, Advisory, Warning Descriptions

TYPE OF WINTER WEATHER	DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet, or heavy snow may occur separately or in combination).
Winter Storm Warning	Severe winter weather conditions are imminent.
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost / Freeze	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

HISTORICAL OCCURRENCES

According to historical records and the best available data there have been 13 recorded winter storm events in the De Witt County planning area. Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event, when appropriate.

Historical winter storm data for the planning area is provided on a County-wide basis per the NCEI database. Table 17-4 shows historical incident information for the planning area.

Table 17-4. Historical Winter Storm Events, 1996 – 2024⁴

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	1/11/1997	0	0	\$0	\$0
De Witt County	12/24/2004	0	0	\$0	\$0

⁴ No reports of injuries or fatalities were recorded in the NCEI database. Monetary damages have been inflated to their 2025 value.

SECTION 17: WINTER STORM

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
De Witt County	2/3/2011	0	0	\$0	\$0
De Witt County	2/9/2011	0	0	\$0	\$0
De Witt County	12/7/2013	6	0	\$0	\$0
De Witt County	12/7/2017	0	0	\$0	\$0
De Witt County	1/16/2018	0	0	\$0	\$0
De Witt County	1/12/2021	0	0	\$0	\$0
De Witt County	2/13/2021	0	0	\$0	\$0
De Witt County	2/15/2021	0	0	\$0	\$0
De Witt County	2/1/2022	0	0	\$0	\$0
De Witt County	12/22/2022	0	0	\$0	\$0
De Witt County	1/20/2025	0	0	\$0	\$0
TOTALS	13	0	0	\$0	\$0

Table 17-5. Historical Winter Storm Events Summary, 1996 –2024

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGES	CROP DAMAGES
De Witt County	13	0	0	\$0	\$0

Based on the list of historical winter storm events for the De Witt County planning area, six of the events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

February 13, 2021 – Winter Storm Uri (DR-4586)

Winter Storm Uri was one of the most impactful winter events in the state’s history. The winter storm event lasted a week and brought snow, sleet, and freezing rain to much of the State of Texas. The presence of the storm began on February 10, 2021, when a cold front brought a surge of cold air to the Area. On February 13th, the winter storm hit the region, including De Witt County, and many areas were placed under a Winter Storm Warning.

Fatalities across the state were attributed to hypothermia, vehicle accidents, carbon monoxide poisoning, and chronic medical conditions complicated by a lack of electricity over several days. Statewide, more than 69 percent of households lost power at some point during the event, with

SECTION 17: WINTER STORM

average disruptions lasting 42 hours. Water service was also disrupted, with 49 percent of households losing running water with an average disruption of 52 hours.⁵

De Witt County had a minor impact from Winter Storm Uri. There were reports of responders sliding on the ice that had accumulated on Hwy 72. Ice was reported on the roadways in the cities of Nordheim and Cuero, and 1.7 inches of snow was reported in the Town of Meyersville.

PROBABILITY OF FUTURE EVENTS

According to historical records, the De Witt County planning area has experienced 13 winter storm events. The probability of a future winter storm event affecting the De Witt County planning area, including all participating jurisdictions and special district, is considered “Likely,” with a winter storm probable to occur within the next three years.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to reduce the number of extreme cold events statewide but increase in the variability of events.⁶ Extreme cold events will continue to be possible but overall winters are becoming milder, and the frequency of extreme winter weather events are decreasing due to the warming of the Arctic and less extreme cold air coming from that region.⁷ A trend that is expected to continue with winter extremes estimated to be milder by 2036 compared to extremes in the historic record.⁸

VULNERABILITY AND IMPACT

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for significant periods.

An economic impact may occur due to increased consumption of heating fuel, which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

The De Witt County Planning Team identified the following critical facilities (Table 17-6) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by winter storm events. For a comprehensive list by participating jurisdiction and special district, please see Appendix D.

⁵ Donald, Jess. “Winter Storm Uri. The Economic Impact of the Storm.” October 2021. Fiscal Notes. Texas Comptroller of Public Accounts. <https://comptroller.texas.gov/economy/fiscal-notes/2021/oct/winter-storm-impact.php>

⁶ Fourth National Climate Assessment. Chapter 23 Southern Great Plains. U.S. Global Change Program. 2018.

⁷ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

⁸ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

SECTION 17: WINTER STORM

Table 17-6. Critical Facilities Vulnerable to Winter Storm Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals and Medical Centers	<ul style="list-style-type: none"> Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. Exposure to extreme cold can cause illnesses in first responders if exposed for a period of time. Roads may become impassable due to snow and/or ice impacting response times by emergency services.
Airport, Academic Institutions, Animal Shelter, Evacuation Centers & Shelters, Governmental Facilities, Residential/ Assisted Living Facilities	<ul style="list-style-type: none"> Power outages due to increased usage could disrupt critical care. Backup power sources could be damaged. Increased number of patients due to exposure to cold temperatures could lead to a strain on staff. Water pipes can freeze and burst leading to flooding within facilities. Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. Essential supplies like medicines, water, food, and equipment deliveries may be delayed. Economic disruption due to power outages negatively impacts airport services as well as area businesses reliant on airport operations. Exposure risks to outdoor workers.
Commercial Supplier (food, fuel, etc.)	<ul style="list-style-type: none"> Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. Essential supplies like medicines, water, food, and equipment deliveries may be delayed.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. Roads may become impassable due to snow and/or ice impacting response times by emergency services. Power outages due to increased usage could disrupt critical care. Backup power sources could be damaged. Water pipes can freeze and burst leading to flooding within facilities.

People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the neighborhoods with older housing stock. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Due to factors like limited mobility, communication difficulties, medical needs, sensitivity to cold temperatures, reliance on support services, transportation challenges, housing accessibility issues, and possible shortages in emergency shelter accommodations, people with disabilities are particularly vulnerable to winter storms. Inclusive measures are crucial to address these vulnerabilities and ensure their safety during severe weather events.

SECTION 17: WINTER STORM

Populations living below the poverty level may not be able to afford to run heat on a regular basis or an extended period of time. In addition, people who speak a language other than English may face increased vulnerability due to language barriers that limit their access to important information such as weather-related warnings and instructions regarding safety measures.

The population over 65 in the De Witt County planning area is estimated at 20 percent of the total population and children under the age of 5 are estimated at 7 percent. The population with a disability is estimated at 15 percent of the total population. An estimated 16 percent of the planning area population live below the poverty level and 4 percent of the populations speaks English “less than very well” (Table 17-7). Several Green-De Witt Drainage District employees also face higher vulnerability to severe weather, as three employees reported regularly working outdoors and may be subject to winter storm conditions.

Table 17-7. Populations at Greater Risk of Winter Storm Events⁹

JURISDICTION	POPULATION				
	65 AND OLDER	UNDER 5	WITH A DISABILITY	BELOW POVERTY LEVEL	LIMITED ENGLISH SPEAKING
De Witt County	3,953	1,293	2,963	3,152	722
City of Cuero	1,126	546	1,223	1,739	321
City of Nordheim	162	7	125	51	10
City of Yorktown	525	167	428	293	53

Older homes tend to be more vulnerable to the impacts of winter storm events. Approximately, 56 percent (an estimated 5,201 structures) of the housing units in the planning area were built before 1980 (Table 17-8).

Table 17-8. Structures at Greater Risk of Winter Storm Events

JURISDICTION	STRUCTURES
	SFR BUILT BEFORE 1980
De Witt County	5,201
City of Cuero	1,895
City of Nordheim	175
City of Yorktown	834
Green-De Witt Drainage District	2

With no damages, injuries or fatalities reported in the county, the impact of winter storms on the De Witt County planning area, including participating jurisdictions and special district, can be

⁹ U.S. Census Bureau 2023 data for De Witt County.

SECTION 17: WINTER STORM

considered “Limited,” with a possible shutdown of critical facilities for 24 hours or less, less than 10 percent of property destroyed or with major damage, and injuries treatable with first aid.

Table 17-9. Winter Storm Event Damage Totals, 1996 - 2025

JURISDICTION	PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
De Witt County	\$0	\$0

ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. The impact of climate change could produce longer, more intense winter storm events, exacerbating the current winter storm impacts. Worsening winter storm conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (20 percent of total population), children under 5 (7 percent of total population), and those with a disability (15 percent of total population), can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- Winter storms can reduce the efficacy of shaded fuel breaks for wildfire mitigation as treated areas were more likely to have downed trees and limbs than untreated areas.
- Winter storms can result in damage to endangered species habitat and increased fuel loads within forested habitats.

SECTION 17: WINTER STORM

- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of winter storm events. Approximately 56 percent of homes in the County were built before 1980. Similarly, historic buildings and sites are placed at a higher risk of impact due to materials used and the inability to change properties due to their historic status. There are 83 historical buildings and sites for De Witt County based on Cuero Chamber of Commerce.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

The economic and financial impacts of winter weather on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of a winter storm event.



Section 18

Mitigation Strategy

SECTION 18: MITIGATION STRATEGY

Mitigation Goals	1
Goal 1.....	1
Goal 2.....	1
Goal 3.....	2
Goal 4.....	2
Goal 5.....	2
Goal 6.....	2
Goal 7.....	3

MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. This involved utilizing the results of both assessments and reviewing the goals and objectives that were included in the previous 2018 Plan. At the Mitigation Strategy Workshop in August 2025, Planning Team members reviewed the mitigation strategy from the previous Plan. The consensus among all members present was that the strategy developed for the 2018 Plan required realignment including expanding on existing goals.

GOAL 1

Protect public health and safety.

OBJECTIVE 1.1

Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

OBJECTIVE 1.2

Maximize utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

OBJECTIVE 1.3

Reduce the danger to and enhance protection of high-risk areas during hazard events.

OBJECTIVE 1.4

Protect critical facilities and services.

GOAL 2

Build and support local capacity and commitment to continuously become less vulnerable to hazards.

OBJECTIVE 2.1

Foster ongoing local partnerships and collaborations to improve long-term vulnerability to hazards.

OBJECTIVE 2.2

Establish a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

SECTION 18: MITIGATION STRATEGY

OBJECTIVE 2.3

Incorporate hazard mitigation concerns into County, City, and Drainage District planning and budgeting processes.

GOAL 3

Increase public understanding, support, and demand for hazard mitigation.

OBJECTIVE 3.1

Heighten public awareness regarding the full range of natural hazards the public may face.

OBJECTIVE 3.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards and increase individual efforts to respond to potential hazards.

OBJECTIVE 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

GOAL 4

Protect new and existing properties.

OBJECTIVE 4.1

Reduce National Flood Insurance Program (NFIP) repetitive loss occurrences through increased mitigative intervention to structures that have been identified to have sustained repeated damage from hazards

OBJECTIVE 4.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

OBJECTIVE 4.3

Enact and enforce regulatory measures to ensure that future development will not endanger or increase threats to people and existing properties.

GOAL 5

Maximize the resources for investment in hazard mitigation.

OBJECTIVE 5.1

Maximize the use of outside sources of funding.

OBJECTIVE 5.2

Maximize participation of property owners in protecting their properties.

OBJECTIVE 5.3

Maximize insurance coverage to provide financial protection against hazard events.

OBJECTIVE 5.4

Prioritize mitigation projects, based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

GOAL 6

Promote growth in a sustainable manner.

SECTION 18: MITIGATION STRATEGY

OBJECTIVE 6.1

Incorporate hazard mitigation activities into long-range planning and development activities.

OBJECTIVE 6.2

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

OBJECTIVE 6.3

Utilize regulatory approaches to prevent the creation of future hazards to life and property.

GOAL 7

Promote equity and protect vulnerable populations and underserved communities through hazard mitigation activities.

OBJECTIVE 7.1

Allocate resources and funding to implement hazard mitigation activities that directly benefit vulnerable and underserved communities.

OBJECTIVE 7.2

Build and support local partnerships to leverage resources and expertise in addressing hazard-related equity concerns.

OBJECTIVE 7.3

Establish internal decision-making processes that integrate equity into project selection.

OBJECTIVE 7.4

Monitor and evaluate the effectiveness of mitigation activities to ensure equitable outcomes and protection of vulnerable populations.



Section 19

Previous Actions

SECTION 19: PREVIOUS ACTIONS

Summary	1
De Witt County.....	2
City of Cuero.....	13
City of Nordheim.....	27
City of Yorktown.....	36
Green-De Witt Drainage District.....	45

SUMMARY

This section includes analysis from the 2018 De Witt County Hazard Mitigation Plan. Planning Team members were given copies of the previous mitigation actions submitted in the 2018 De Witt County Hazard Mitigation Plan at the mitigation workshop. Each previously participating jurisdiction reviewed the previous actions and provided an analysis as to whether the action had been completed, should be carried over as an ongoing activity, or be deleted from the Plan Update. The actions from the 2018 Plan are included in this section as they were written in 2018, except for the “2026 Analysis” section. **Any action in the analysis the team selected for future implementation (carried over) is considered a current action for potential implementation over the life cycle of this updated plan.** Additional new actions developed for this plan are detailed in Section 20.

SECTION 19: PREVIOUS ACTIONS

DE WITT COUNTY

De Witt County – Previous Action #1	
Proposed Action:	Purchase and Install countywide I-Info Alert System.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$100,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	County and Local Emergency Management Plan, Evacuation Procedures

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #2	
Proposed Action:	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Disseminate warnings and public education announcements; protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #3	
Proposed Action:	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Protect residents from injury and loss of life; increase disaster response time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	GIS Program, Emergency Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #4	
Proposed Action:	Purchase Generators and quick-connections to support critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enable continuation of essential services following disasters, increase emergency response, utility support.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes
Effect on New/Existing Buildings:	Retrofit critical facilities to provide essential services.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000-\$50,000, depending on generator type and size
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	County Emergency Management Office, City Manager's Office
Implementation Schedule:	2 years
Incorporation into Existing Plans:	Utility Plans, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #5	
Proposed Action:	Develop Mutual Aid agreements for disaster response and recovery.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #6	
Proposed Action:	Install tornado safe rooms in planning area.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #7	
Proposed Action:	Begin dam inundation mapping study.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on New/Existing Buildings:	New buildings can be built with an improved understanding of the risks of dam failure.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #8	
Proposed Action:	Relocate County Deed Records from Courthouse, located in 500-year floodplain, and within proposed 100-year floodplain of GBRA/ Corps study to offsite location outside flood-prone area.
BACKGROUND INFORMATION	
Site and Location:	County Courthouse
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Avoid loss of critical assets and records.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce structure flooding.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$200,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	2-5 years
Incorporation into Existing Plans:	NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #9	
Proposed Action:	Implement a program to post warning signage in vicinity of oil/gas pipelines.
BACKGROUND INFORMATION	
Site and Location:	Unincorporated areas of the county
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Educate property owners of risk and safety measures pertaining to ruptures and pipeline explosions; prevent injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure
Effect on New/Existing Buildings:	Install shatterproof glass on structures adjacent to major pipelines.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	HMGP, area pipeline companies
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Emergency Response Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #10	
Proposed Action:	Construct necessary barriers or berms to reduce impact of runoff from flash floods onto neighborhoods, streams and impacting community water wells from proposed Plot Nob landfill.
BACKGROUND INFORMATION	
Site and Location:	Pilot Nob area located in county in proximity to Nordheim corporate limits
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Minimize potential flooding of structures, maintain essential water utility service in event of flooding.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact of flooding on structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMA Grant, Pilot nob Landfill Contractor
Lead Agency/Department Responsible:	County Engineering Services, Nordheim Mayor's office
Implementation Schedule:	2-4 years
Incorporation into Existing Plans:	Stormwater Management Plan, NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

De Witt County – Previous Action #11	
Proposed Action:	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase of flood insurance through outreach.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/impact to flood prone structures.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact to new/existing structures in flood prone areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000
Potential Funding Sources:	HMGP grants/local revenue
Lead Agency/Department Responsible:	County Engineering Services, Nordheim Mayor's office
Implementation Schedule:	1-2 years
Incorporation into Existing Plans:	NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

CITY OF CUERO

City of Cuero – Previous Action #1	
Proposed Action:	Purchase and Install countywide I-Info Alert System.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$100,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	County and Local Emergency Management Plan, Evacuation Procedures

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #2	
Proposed Action:	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Disseminate warnings and public education announcements; protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #3	
Proposed Action:	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Protect residents from injury and loss of life; increase disaster response time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	GIS Program, Emergency Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #4	
Proposed Action:	Purchase Generators and quick-connections to support critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enable continuation of essential services following disasters, increase emergency response, utility support.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes
Effect on New/Existing Buildings:	Retrofit critical facilities to provide essential services.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000-\$50,000 depending on generator type and size
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	County Emergency Management Office, City Manager's Office
Implementation Schedule:	2 years
Incorporation into Existing Plans:	Utility Plans, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #5	
Proposed Action:	Develop Mutual Aid agreements for disaster response and recovery.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #6	
Proposed Action:	Install tornado safe rooms in planning area.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #7	
Proposed Action:	Begin dam inundation mapping study.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on New/Existing Buildings:	New buildings can be built with an improved understanding of the risks of dam failure.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #8	
Proposed Action:	Install berm or other structure to deflect blast from rupture or lightning strike to pipeline located in proximity of Cuero Hospital.
BACKGROUND INFORMATION	
Site and Location:	Cuero Hospital
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce risk to patients, staff, residents in vicinity of hospital complex; reduce injury and loss of life; reduce economic disruption to area businesses and hospital.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline, lightning
Effect on New/Existing Buildings:	Reduce blast effects to existing/future area structures.
Priority (High, Moderate, Low):	Low
Estimated Cost:	\$200,000-\$500,000
Potential Funding Sources:	Grant, Pipeline Company
Lead Agency/Department Responsible:	Cuero Emergency Management Office
Implementation Schedule:	2-3 years
Incorporation into Existing Plans:	Emergency Response and Evacuation Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #9	
Proposed Action:	Improve drainage and stormwater system to reduce drainage and flooding issues.
BACKGROUND INFORMATION	
Site and Location:	Encompass multiple areas and various locations including Bailey, Gonzales, Clayton, French Streets.
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce flooding to structures, road washouts; reduce injury and loss of life to residents; reduce repetitive flood losses, improve capacity of drainage channels to handle larger volumes of water in a shorter period of time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding potential to residents/ businesses.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1 million (possibly phased project)
Potential Funding Sources:	HMA grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	1-5 years
Incorporation into Existing Plans:	Stormwater Management Plan, NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #10	
Proposed Action:	Floodproof/retrofit older components of the Cuero Wastewater Treatment Plant subject of flooding.
BACKGROUND INFORMATION	
Site and Location:	Wastewater Treatment Plant
Risk Reduction Benefit: (<i>Current Cost/Losses Avoided</i>)	Maintain essential utility service during disaster and flood events.
Type of Action: (<i>Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness</i>)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMGP Grant
Lead Agency/Department Responsible:	Utility Service
Implementation Schedule:	1-3 years
Incorporation into Existing Plans:	Utility Maintenance Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #11	
Proposed Action:	Construct/install an additional water well.
BACKGROUND INFORMATION	
Site and Location:	San Antonio at French Street or other location to be determined.
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Provide adequate supply of water during drought; supplement existing wells that become inoperable during severe flooding. Maintain essential utility service during disaster and flood events.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Drought
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMGP Grant
Lead Agency/Department Responsible:	Utility Service
Implementation Schedule:	1-3 years
Incorporation into Existing Plans:	Utility Maintenance Plan

2026 ANALYSIS:
Complete.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #12	
Proposed Action:	Construct new sewer trunk line to Wastewater Plant.
BACKGROUND INFORMATION	
Site and Location:	Wastewater Plant
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Maintain essential wastewater service should main line become inoperable or overwhelmed during flood event.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMGP Grant
Lead Agency/Department Responsible:	Utility Service
Implementation Schedule:	1-3 years
Incorporation into Existing Plans:	Utility Maintenance Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #13	
Proposed Action:	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase flood insurance through outreach.
BACKGROUND INFORMATION	
Site and Location:	Throughout City of Cuero
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/ impact to flood prone structures.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact to new/ existing structures in flood prone areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000
Potential Funding Sources:	HMGP grant/local revenue
Lead Agency/Department Responsible:	Floodplain Management Office
Implementation Schedule:	1-2 years
Incorporation into Existing Plans:	NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Cuero – Previous Action #14	
Proposed Action:	Retrofit or floodproof City Public Service Station currently under renovation.
BACKGROUND INFORMATION	
Site and Location:	514 W Sarah Street
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce risk of flooding from main drainage ditch located in proximity to structure. Structure flooded in 1998 flood; continue to provide residents essential utility data and services during flood event.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact to renovated structure in proximity to flood prone area.
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMA grant
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	1-2 years
Incorporation into Existing Plans:	NFIP Program, Annual Budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

CITY OF NORDHEIM

City of Nordheim – Previous Action #1	
Proposed Action:	Purchase and Install countywide I-Info Alert System.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$100,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	County and Local Emergency Management Plan, Evacuation Procedures

2026 ANALYSIS:
Complete.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #2	
Proposed Action:	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Disseminate warnings and public education announcements; protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #3	
Proposed Action:	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Protect residents from injury and loss of life; increase disaster response time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	GIS Program, Emergency Response Plans

2026 ANALYSIS:	
Carryover to Plan Update.	

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #4	
Proposed Action:	Purchase Generators and quick-connections to support critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enable continuation of essential services following disasters, increase emergency response, utility support.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes
Effect on New/Existing Buildings:	Retrofit critical facilities to provide essential services.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000-\$50,000, depending on generator type and size
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	County Emergency Management Office, City Manager's Office
Implementation Schedule:	2 years
Incorporation into Existing Plans:	Utility Plans, Disaster Response Plans

2026 ANALYSIS:
Complete.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #5	
Proposed Action:	Develop Mutual Aid agreements for disaster response and recovery.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Complete.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #6	
Proposed Action:	Install tornado safe rooms in planning area.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #7	
Proposed Action:	Begin dam inundation mapping study.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on New/Existing Buildings:	New buildings can be built with an improved understanding of the risks of dam failure.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Delete action. The City no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #8	
Proposed Action:	Construct barriers or berms to reduce impact of runoff from flash floods onto neighborhoods, nearby streams, and impacting community water well from proposed Pilot Nob landfill.
BACKGROUND INFORMATION	
Site and Location:	Pilot Nob area located in county in proximity to corporate limits.
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Minimize potential flooding of structures, maintain essential water utility service in event of flooding.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact of flooding on structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	Assessment needed to determine cost.
Potential Funding Sources:	HMA Grant, Pilot Nob Landfill Contractor
Lead Agency/Department Responsible:	Mayor's Office
Implementation Schedule:	2-4 years
Incorporation into Existing Plans:	Stormwater Management Plan

2026 ANALYSIS:
Carryover to the Plan Update. In progress.

SECTION 19: PREVIOUS ACTIONS

City of Nordheim – Previous Action #9	
Proposed Action:	Develop and promote program for mitigating effects of extreme heat to address safety and health issues.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Inform and educate residents on dangers of working outdoors, and target groups such as low-income and elderly that may not have air conditioning; reduce injury, loss of life during extreme heat waves.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	City Administrator
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Annual Budget

2026 ANALYSIS:
Carryover to the Plan Update.

SECTION 19: PREVIOUS ACTIONS

CITY OF YORKTOWN

City of Yorktown – Previous Action #1	
Proposed Action:	Purchase and Install countywide I-Info Alert System.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$100,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	County and Local Emergency Management Plan, Evacuation Procedures

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #2	
Proposed Action:	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Disseminate warnings and public education announcements; protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #3	
Proposed Action:	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Protect residents from injury and loss of life; increase disaster response time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	GIS Program, Emergency Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #4	
Proposed Action:	Purchase Generators and quick-connections to support critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enable continuation of essential services following disasters, increase emergency response, utility support.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes
Effect on New/Existing Buildings:	Retrofit critical facilities to provide essential services.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000-\$50,000, depending on generator type and size
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	County Emergency Management Office, City Manager's Office
Implementation Schedule:	2 years
Incorporation into Existing Plans:	Utility Plans, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #5	
Proposed Action:	Develop Mutual Aid agreements for disaster response and recovery.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #6	
Proposed Action:	Install tornado safe rooms in planning area.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #7	
Proposed Action:	Begin dam inundation mapping study.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on New/Existing Buildings:	New buildings can be built with an improved understanding of the risks of dam failure.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #8	
Proposed Action:	Remove large trees and debris along area waterways and restore floodplain function of natural systems.
BACKGROUND INFORMATION	
Site and Location:	Coleta and Yorktown Creek
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Minimize damage and losses from flooding; reduce flood damage to homes and businesses in flood-prone areas of town; reduce injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA Grant Funds
Lead Agency/Department Responsible:	City Public Works
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	NFIP Program; Capital Improvement Plan

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

City of Yorktown – Previous Action #9	
Proposed Action:	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase of flood insurance through outreach.
BACKGROUND INFORMATION	
Site and Location:	Citywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/ impact to flood prone structures.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce impact to new/existing structures in flood.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000
Potential Funding Sources:	HMGP grant/local revenue
Lead Agency/Department Responsible:	Floodplain Management Office
Implementation Schedule:	1-2 years
Incorporation into Existing Plans:	NFIP Program

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

GREEN-DE WITT DRAINAGE DISTRICT

Green-De Witt Drainage District – Previous Action #1	
Proposed Action:	Purchase and Install countywide I-Info Alert System.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$100,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	County and Local Emergency Management Plan, Evacuation Procedures

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #2	
Proposed Action:	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Disseminate warnings and public education announcements; protect residents from injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #3	
Proposed Action:	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Protect residents from injury and loss of life; increase disaster response time.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	Increase warning times so residents may secure homes/businesses from disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$50,000
Potential Funding Sources:	HMGP, PDM grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	Within 5-year MAP cycle to secure funds
Incorporation into Existing Plans:	GIS Program, Emergency Response Plans

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #4	
Proposed Action:	Purchase Generators and quick-connections to support critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Enable continuation of essential services following disasters, increase emergency response, utility support.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes
Effect on New/Existing Buildings:	Retrofit critical facilities to provide essential services.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000-\$50,000, depending on generator type and size
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	County Emergency Management Office, City Manager's Office
Implementation Schedule:	2 years
Incorporation into Existing Plans:	Utility Plans, Disaster Response Plans

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #5	
Proposed Action:	Develop Mutual Aid agreements for disaster response and recovery.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,500
Potential Funding Sources:	Local Revenue
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #6	
Proposed Action:	Install tornado safe rooms in planning area.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	Fire Plans, NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #7	
Proposed Action:	Begin dam inundation mapping study.
BACKGROUND INFORMATION	
Site and Location:	Countywide
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on New/Existing Buildings:	New buildings can be built with an improved understanding of the risks of dam failure.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Local Revenue/HMGP Grants
Lead Agency/Department Responsible:	County Emergency Management Office
Implementation Schedule:	1 year
Incorporation into Existing Plans:	NFIP Program, Disaster Response Plans

2026 ANALYSIS:
Delete action. The District no longer considers this action a priority.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #8	
Proposed Action:	Remove large trees, logs, and debris from Thompson and Hellsgate bridges and restore floodplain function of natural systems.
BACKGROUND INFORMATION	
Site and Location:	Thompson and Hellsgate Bridges, Guadalupe River
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce flood damage and losses caused by debris backing up floodwaters outside banks; reduce flood damage to homes and businesses in flood prone areas; reduce injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #9	
Proposed Action:	Replace Thompson Bridge to eliminate center structural component that impedes conveyance of floodwaters, collects debris and large logs that continues to flood.
BACKGROUND INFORMATION	
Site and Location:	Thompson Bridge, Guadalupe River
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce flood damage and losses caused by debris backing up floodwaters outside banks; reduce flood damage to homes and businesses in flood prone areas; reduce injury and loss of life.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds, TXDOT
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #10	
Proposed Action:	Install drop basket structure and reconstruct drainage channels to control flooding and erosion. Structure will assist in stabilizing banks and holding bottoms of channel on grade.
BACKGROUND INFORMATION	
Site and Location:	City of Cuero to Guadalupe River
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Aid in protection of two main sewer truck lines which could become unstable due to erosion; increase carrying capacity of floodwater; strengthen vegetation management to protect against runoff and erosion; reduce flooding of low-lying areas.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #11	
Proposed Action:	Surveying and engineering services to provide the District with accurate and complete mapping of District ditches in order to study current capabilities and prioritize improvements.
BACKGROUND INFORMATION	
Site and Location:	City of Cuero
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Better understanding of drainage systems.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #12	
Proposed Action:	Improve bottleneck area(s) of the Valley Street ditch, especially by replacing bridges whose structural components impede drainage, and by widening areas of construction in said ditch.
BACKGROUND INFORMATION	
Site and Location:	City of Cuero
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Reduce constriction of the drainage system.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #13	
Proposed Action:	Improve Alexander Street Ditch west of Terrell Street, including widening of channel and adding stepped baskets to improve stability.
BACKGROUND INFORMATION	
Site and Location:	City of Cuero
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve performance of drainage system.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.

SECTION 19: PREVIOUS ACTIONS

Green-De Witt Drainage District – Previous Action #14	
Proposed Action:	Study, design and construct improvements to minimize damage and losses from flooding by constricting improved bottoms and side slopes, widening channels and improving road crossings of area waterways located within the District. Acquire additional land, right-of-way and/or easements within the District to construct the necessary improvements. Remove large trees and debris along area waterways located within the District to restore floodplain function.
BACKGROUND INFORMATION	
Site and Location:	City of Cuero
Risk Reduction Benefit: <i>(Current Cost/Losses Avoided)</i>	Improve performance of drainage system.
Type of Action: <i>(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)</i>	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on New/Existing Buildings:	Reduce flooding of structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	HMA grant funds
Lead Agency/Department Responsible:	Drainage District
Implementation Schedule:	2 years from funding
Incorporation into Existing Plans:	Annual budget

2026 ANALYSIS:
Carryover to Plan Update.



Section 20

Mitigation Actions



SECTION 20: MITIGATION ACTIONS

Summary	1
De Witt County.....	4
City of Cuero.....	21
City of Nordheim.....	23
City of Yorktown.....	27
Green-De Witt Drainage District.....	30
Carryover Actions	31

SUMMARY

The 44 CFR § 201.6(c)(3)(ii) states that the plan must include “A section that *identifies* and *analyzes* a comprehensive range of specific mitigation actions and projects *being considered* to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.” The mitigation planning process is designed to help communities identify feasible and cost-effective mitigation strategies, but implementation of actions is dependent on factors such as funding, staff time, and evolving community priorities, and there is no penalty for jurisdictions unable to implement projects throughout the plan's life.¹

As discussed in Section 2, at the Mitigation Strategy Workshop, the Planning Team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan Update. Each of the actions in this section were prioritized based on FEMA’s Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria necessary for the implementation of each action.

As part of the economic evaluation of the STAPLEE analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed the costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as “High” indicates that the action will be implemented as soon as funding is received. A “Moderate” action is one that may not be implemented right away, depending on the cost and number of citizens served by the action. Actions ranked as “Low” indicate that they will not be implemented without first seeking grant funding, and after “High” and “Moderate” actions have been completed.

Within each mitigation action , the Planning Team considered all potential funding sources that could be utilized to implement the proposed project. To ensure all potential funding resources are considered and are not limited to those sources identified within the action worksheet, please see Appendix H for a list of all available State and Federal grant programs as of 2025. The Planning Team will continue to seek out other available funding sources during the 5-year cycle as notices of funding opportunity (NOFO) are released.

All new mitigation actions created by Planning Team members are presented in this section in the form of a Mitigation Action Table. More than one hazard is sometimes listed for an action, if appropriate. Actions presented in this section represent a comprehensive range of mitigation

¹ Cost, funding sources, and implementation schedules are subject to change upon full scoping of project and grant availability.

SECTION 20: MITIGATION ACTIONS

actions per current State and FEMA Guidelines, including one action per hazard, and at least two different types for each participating jurisdiction and special district. Section 19 includes an analysis of the actions identified in the previous 2018 De Witt County Plan. **Any action in the analysis the team selected for future implementation (carried over) is considered a current action for potential implementation over the life cycle of this updated plan, in addition to the new actions outlined here in Section 20.**

De Witt County and the Cities of Cuero and Yorktown are participants in the National Flood Insurance Program (NFIP). Flooding was identified as a significant risk for the community; therefore, many of the mitigation actions were developed with flood mitigation in mind. Actions related to NFIP compliance include additional narrative when deemed appropriate.

SECTION 20: MITIGATION ACTIONS

Table 20-1. De Witt County Mitigation Action Matrix

TYPE OF ACTION	
Action #1 – Plans/Regulations (Blue)	Action #4 – Structural (Orange)
Action #2 – Education/Awareness (Red)	Action #5 – Preparedness/Response (Black)
Action #3 – Natural Systems Protections (Green)	

Jurisdiction	Dam Failure	Drought	Earthquake	Expansive Soils	Extreme Heat	Flood	Hail	Hurricane/Tropical Storm	Lightning	Thunderstorm Wind	Tornado	Wildfire	Winter Storm	Human-Caused Hazards
De Witt County	●●●	●●	●●●	●●	●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●●	●●●	●●
City of Cuero	●	●	●	●	●●	●●	●	●●	●	●	●	●	●●	●●
City of Nordheim	N/A	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●●	●●	●
City of Yorktown	N/A	●	●●	●	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●
Green-De Witt Drainage District	●	●	●	●	●	●●●	●	●	●	●	●	●	●	●

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	County-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Promotes public safety.
<p>Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Promote evacuation routes for the community; Drought: Promote drought tolerant landscaping guidance for home and business owners; Earthquake: Advise homeowners how to secure indoor appliances and furniture; Expansive Soils: Inform the community on how to manage moisture levels and reinforce structures; Extreme Heat: Promote the signs of heat exhaustion and heat stroke; Flood: Promote elevation of indoor and outdoor appliances or knowledge of the BFE; Hail: Promote hail resistant roofing, siding and windows.; Hurricane/Tropical Storm: Promote the use of hurricane shutters or waterproofing the home and business; Lightning: Make homeowners and businesses aware of indoor surge protection; Thunderstorm Wind: Promote securing of outdoor items and structures; Tornado: Inform home and business owners know when and where in their home or business they can take shelter; Wildfire: Create a defensible space for homeowners campaign; Winter Storm: Promote information on wrapping exposed and outdoor pipes.</p>														

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
2	Construct an Emergency Operations Center and Training Center to facilitate a four jurisdictional Emergency Operations Center.	County-wide	Ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Safety/Security	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	60 Months	Emergency Operations Plan	Protects infrastructure, reduces cost of repair, and prevents injury to residents.
3	Construct safe room/community shelters for communities during isolated emergencies and disasters.	County-wide	Reduce risk to citizens by providing shelter in high-risk areas during extreme weather events.	Structure and Infrastructure	Earthquake, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Safety/Security	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	60 Months	Emergency Management Action Plan	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
4	Acquire and distribute NOAA weather radios.	County-wide	Reduce risk to citizens through improved education.	Education and Awareness	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm	Communication	N/A	H	\$50,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Promotes public safety.
5	Acquire and install generators with hard wired quick connections at all critical facilities.	County-wide	Provide power for critical facilities during power outages and ensure continuity of critical services.	Structure and Infrastructure	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Energy (Power/Fuel)	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
6	Obtain certification in the National Weather Service StormReady Program.	County-wide	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.	Education and Awareness	Flood, Hail, Hurricane/Tropical Storm, Thunderstorm Wind, Winter Storm	Communication	Y	H	\$	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Promotes public safety.
7	Harden/retrofit critical facilities to hazard-resistant levels.	County-wide	Reduce damages at critical facilities.	Structure and Infrastructure	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm	Safety/Security	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Protects infrastructure, reduces cost of repair, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
8	Relocate critical facilities out of high hazard areas.	County-wide	Reduce damages at critical facilities.	Structure and Infrastructure	Dam Failure, Flood, Wildfire	Safety/Security	Y	H	\$2,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	36 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of repair, and prevents injury to residents.
9	Adopt on-site retention basin program in conjunction with development to address excessive stormwater/firefighting water source.	County-wide	Requiring developers to implement on-site retention basin for new developments will prevent downstream impacts, reduce impacts to floodplain and provide additional potential water sources for firefighting uses.	Local Plans and Regulations	Dam Failure, Flood, Wildfire	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
10	Implement and enhance an area-wide telephone Emergency Notification System ("Reverse 911").	County-wide	Reduce risk to citizens through improved communication and early warning.	Education and Awareness	Dam Failure, Earthquake, Flood, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado, Winter Storm, Wildfire, Human Caused	Communication	Y	M	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Promotes public safety.
11	Develop alternative evacuation routes/plans and designate emergency thoroughfares, particularly in areas with limited capacity. Educate citizens on evacuation routes and procedures.	County-wide	Reduce risk residents through improved evacuation alternatives and awareness efforts.	Education and Awareness	Dam Failure, Flood, Hurricane/Tropical Storm, Wildfire, Human Caused	Safety/Security	N/A	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Evacuation Plan	Promotes public safety.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
12	Require "safe rooms" to be added when constructing new schools, daycares, rest homes and critical care facilities.	County-wide	Reduce risk to citizens by providing shelter in new critical facilities during extreme weather events.	Local Plans and Regulations	Earthquake, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Safety/Security	N/A	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Building Codes	N/A
13	Build safe room shelters at community centers and/or manufactured home parks so that all park residents can reach shelter in less than five minutes.	County-wide	Reduce risk to citizens by providing shelter in new critical facilities during extreme weather events.	Structure and Infrastructure	Earthquake, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Safety/Security	N/A	M	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	48 Months	Building Codes	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
14	Adopt ordinance requiring tie-downs for mobile homes; Require manufactured housing be securely anchored to permanent foundations.	County-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	Earthquake, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Safety/Security	N/A	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Manufactured Home Restrictions	N/A
15	Strengthen building codes to mandate the use of steel connectors in new and existing construction.	County-wide	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.	Local Plans and Regulations	Earthquake, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Safety/Security	N/A	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Building Codes	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
16	Require standards for burial of electrical, telephone, cable lines and other utilities in new developments.	County-wide	Reduce damages to infrastructure.	Local Plans and Regulations	Dam Failure, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm	Safety/Security, Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Subdivision Regulations	Protects infrastructure, reduces cost of repair, and prevents injury to residents.
17	Require standard tie-downs of propane tanks.	County-wide	Reduce damages to structure and infrastructure.	Local Plans and Regulations	Dam Failure, Flood, Hurricane/Tropical Storm, Thunderstorm Wind, Tornado	Energy (Power/Fuel)	Y	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Subdivision Regulations Manufactured Home Restrictions	Protects infrastructure, reduces cost of repair, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
18	Adopt and implement a program for clearing debris from bridges, drains, and culverts.	County-wide	Reduce damages caused by flooding by maintaining or restoring drainage capacity.	Structure and Infrastructure	Flood	Safety/Security	Y	M	\$50,000 annually	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.
19	Identify flood-prone and repetitive loss properties through the Texas Water Development Board. Identify and implement actions to reduce or eliminate flooding at identified properties.	County-wide	Reduce risk of damages or injuries through flood mitigation at high-risk structures.	Structure and Infrastructure	Flood	Safety/Security	Y	M	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	36 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
20	Undertake a comprehensive study of flood risk and reduction alternatives, with the assistance of the US Army Corps of Engineers. Implement feasible alternatives for flood reduction.	County-wide	Reduce risk of damages or injuries through drainage improvements.	Structure and Infrastructure Local Plans and Regulations (for unmapped areas)	Flood	Communication, Safety/Security	Y	M	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	36 Months	Floodplain Ordinance	Protects communities and reduces risk of flooding.
21	Increase freeboard requirements for permitting structures in the SFHA; Adopt a "no-rise" in BFE in the 100-year floodplain; Update local flood ordinance to prohibit granting of variance in SFHA; Include "cumulative damage" provisions in local floodplain management ordinances.	County-wide	Reduce flood damages through development restrictions and improved construction requirements in flood-prone areas.	Local Plans and Regulations	Flood	Safety/Security	Y	H	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of repair, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
22	Upgrade undersized stormwater drains and culverts.	County-wide	Reduce risk of flood damages through improved drainage capacity.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Emergency Management Action Plan	Protects communities and reduces risk of flooding.
23	Implement a flood awareness program by providing FEMA/NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries.	County-wide	Reduce flood risk through education and awareness; Increase flood insurance coverage.	Education and Awareness	Flood	Communication	Y	H	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Floodplain Ordinance	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
24	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program.	County-wide	Reduce risk of injuries, fatalities and damages through education and awareness.	Education and Awareness	Flood	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Floodplain Ordinance	Promotes public safety.
25	Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the Texas Forest Service.	County-wide	Reduce risk and spread of wildfires through education and awareness program.	Education and Awareness	Wildfire	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Wildfire Ordinance	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
26	Work with state and local agencies to determine locations to reduce fuel on public and private lands. Implement fuels reduction program.	County-wide	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.	Natural Systems Protection	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	Wildfire Ordinance	N/A
27	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	County-wide	Reduce risk of wildfires and the spread of wildfire by increasing water access and firefighting capabilities	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	36 Months	Wildfire Ordinance	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
28	Install fire danger rating/burn ban signs.	County-wide	Reduce risk and spread of wildfires through education and awareness program.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Wildfire Ordinance	N/A
29	Implement a community education program regarding fire dangers for identified risk areas; Distribute pamphlets through neighborhood associations or insert flyers in water bills to make residents aware of wildfire hazard areas and fire protection measures for homes and yards.	County-wide	Reduce risk and spread of wildfires through education and awareness program.	Education and Awareness	Wildfire	Communication	N/A	H	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	12 Months	Wildfire Ordinance	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
30	Educate citizens on mitigation measures to prevent frozen pipes; Educate homeowners on carbon monoxide monitors/alarms.	County-wide	Reduce risk of damages and injuries through mitigation education and awareness.	Education and Awareness	Winter Storm	Communication	N/A	H	\$5,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	36 Months	N/A	N/A
31	Adopt and implement program to insulate outdoor pipes at critical and public buildings.	County-wide	Reduce risk of damages at public buildings resulting from freezing temperatures.	Structure and Infrastructure Local Plans and Regulations	Winter Storm	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	24 Months	N/A	N/A

SECTION 20: MITIGATION ACTIONS

DE WITT COUNTY MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
32	Implement a county-wide early flood warning system by installing and maintaining flood monitoring equipment and using real-time data to provide timely alerts.	County-wide	Reduce risk of damages and injuries through mitigation education and awareness.	Education and Awareness Structure and Infrastructure	Flood	Communication	Y	H	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	De Witt County Emergency Manager	48 Months	N/A	Promotes public safety.

SECTION 20: MITIGATION ACTIONS

CITY OF CUERO

CITY OF CUERO MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Cuero Administration	24 Months	Emergency Management Action Plan	Promotes public safety.
<p>Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Promote evacuation routes for the community; Drought: Promote drought tolerant landscaping guidance for home and business owners; Earthquake: Advise homeowners how to secure indoor appliances and furniture; Expansive Soils: Inform the community on how to manage moisture levels and reinforce structures; Extreme Heat: Promote the signs of heat exhaustion and heat stroke; Flood: Promote elevation of indoor and outdoor appliances or knowledge of the BFE; Hail: Promote hail resistant roofing, siding and windows.; Hurricane/Tropical Storm: Promote the use of hurricane shutters or waterproofing the home and business; Lightning: Make homeowners and businesses aware of indoor surge protection; Thunderstorm Wind: Promote securing of outdoor items and structures; Tornado: Inform home and business owners know when and where in their home or business they can take shelter; Wildfire: Create a defensible space for homeowners campaign; Winter Storm: Promote information on wrapping exposed and outdoor pipes.</p>														

SECTION 20: MITIGATION ACTIONS

CITY OF CUERO MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
2	Create and implement a program to improve communication capabilities to critical infrastructure i.e., fiber optics.	City-wide	Reduce damage to critical infrastructure.	Structure and Infrastructure	Extreme Heat, Flood, Hurricane/Tropical Storm, Winter Storm, Human-Caused Hazards	Safety/Security	Y	H	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Cuero Administration	24 Months	Capital Improvement Plan	Protects infrastructure, reduces cost of repair, and prevents injury to residents.
3	Conduct assessment on current SCADA system to enhance operations. Implement recommended improvements.	City-wide	Reduce damage to critical infrastructure.	Structure and Infrastructure	Human-Caused Hazards	Communication	Y	H	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Cuero Administration	36 Months	Capital Improvement Plan	N/A

SECTION 20: MITIGATION ACTIONS

CITY OF NORDHEIM

CITY OF NORDHEIM MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Nordheim Administration	24 Months	Emergency Management Action Plan	Promotes public safety.
<p>Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Drought: Promote drought tolerant landscaping guidance for home and business owners; Earthquake: Advise homeowners how to secure indoor appliances and furniture; Expansive Soils: Inform the community on how to manage moisture levels and reinforce structures; Extreme Heat: Promote the signs of heat exhaustion and heat stroke; Flood: Promote elevation of indoor and outdoor appliances or knowledge of the BFE; Hail: Promote hail resistant roofing, siding and windows.; Hurricane/Tropical Storm: Promote the use of hurricane shutters or waterproofing the home and business; Lightning: Make homeowners and businesses aware of indoor surge protection; Thunderstorm Wind: Promote securing of outdoor items and structures; Tornado: Inform home and business owners know when and where in their home or business they can take shelter; Wildfire: Create a defensible space for homeowners campaign; Winter Storm: Promote information on wrapping exposed and outdoor pipes.</p>														

SECTION 20: MITIGATION ACTIONS

CITY OF NORDHEIM MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
2	Harden/retrofit critical facilities to hazard-resistant levels. This could include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, impact-resistant doors, impact-resistant shutters, and similar.	City-wide	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.	Structure and Infrastructure	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm	Safety/Security	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Nordheim Administration	24 Months	Emergency Management Action Plan	Protects infrastructure, reduces cost of repair, and prevents injury to residents.
3	Develop a contingency plan for evacuating population endangered by a wildfire.	City-wide	Reduce risk and spread of wildfires through education and awareness programs; Reduce risk of damages and injuries.	Local Plans and Regulations	Wildfire	Safety/Security	Y	M	\$5,000 annually	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Nordheim Administration	36 Months	Emergency Management Action Plan	N/A

SECTION 20: MITIGATION ACTIONS

CITY OF NORDHEIM MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
4	Provide and maintain defensible space around public and school structures vulnerable to wildfires.	City-wide	Reduce risk of damages and injuries.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Nordheim Administration	48 Months	Emergency Management Action Plan	N/A
5	Create and Implement a program to initiate controlled burns of grasslands.	County-wide	Reduce risk of damages and injuries due to wildfire events.	Structure and Infrastructure	Wildfire	Safety/Security	Y	M	\$50,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Nordheim Administration	24 Months	Emergency Management Action Plan	N/A

SECTION 20: MITIGATION ACTIONS

CITY OF NORDHEIM MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
6	Join the National Flood Insurance Program (NFIP).	City-wide	Provide access to flood insurance for local residents; Reduce flood risk and build resiliency.	Local Plans and Regulations	Flood	Communication	Y	H	\$5,000	Local Funds (Staff Time)	City of Nordheim Administration, Floodplain Administrator	12 Months	N/A	Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 20: MITIGATION ACTIONS

CITY OF YORKTOWN

CITY OF YORKTOWN MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for residents.	City-wide	Promote hazard awareness and protect citizens from potential injuries and damages.	Education and Awareness	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Yorktown Administration	24 Months	N/A	Promotes public safety.
<p>Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Drought: Promote drought tolerant landscaping guidance for home and business owners; Earthquake: Advise homeowners how to secure indoor appliances and furniture; Expansive Soils: Inform the community on how to manage moisture levels and reinforce structures; Extreme Heat: Promote the signs of heat exhaustion and heat stroke; Flood: Promote elevation of indoor and outdoor appliances or knowledge of the BFE; Hail: Promote hail resistant roofing, siding and windows.; Hurricane/Tropical Storm: Promote the use of hurricane shutters or waterproofing the home and business; Lightning: Make homeowners and businesses aware of indoor surge protection; Thunderstorm Wind: Promote securing of outdoor items and structures; Tornado: Inform home and business owners know when and where in their home or business they can take shelter; Wildfire: Create a defensible space for homeowners campaign; Winter Storm: Promote information on wrapping exposed and outdoor pipes.</p>														

SECTION 20: MITIGATION ACTIONS

CITY OF YORKTOWN MITIGATION ACTIONS														
*Reduces risk to new and/or existing buildings and infrastructure														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
2	Acquire and install generators with hard wired quick connections at all critical facilities.	City-wide	Provide power for critical facilities during power outages and ensure continuity of critical services.	Structure and Infrastructure	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Energy (Power/Fuel)	Y	H	\$1,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Yorktown Administration	24 Months	Capital Improvement Plan	Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.
* Priority locations: 8 th Street Lift Station and pump house, 11 th Street Lift Station and pump house														
3	Upgrade undersized stormwater drains and culverts.	City-wide	Reduce risk of flood damages through improved drainage capacity.	Structure and Infrastructure	Flood	Safety/Security	Y	H	\$3,000,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Yorktown Administration	24 Months	N/A	Protects communities and reduces risk of flooding.

SECTION 20: MITIGATION ACTIONS

CITY OF YORKTOWN MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
4	Create and implement a plan to dredge, widen/deepen the creek and possibly remove the dam.	City-wide	Reduce damages to infrastructure.	Structure and Infrastructure	Dam Failure, Flood	Water Systems	Y	H	\$500,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	City of Yorktown Administration	48 Months	Capital Improvement Plan	Protects communities and reduces risk of flooding.
* Yorktown Creek running from 8 th Street to the 1 st Street Bridge														

SECTION 20: MITIGATION ACTIONS

GREEN-DE WITT DRAINAGE DISTRICT

GREEN-DE WITT DRAINAGE DISTRICT MITIGATION ACTIONS														
<i>*Reduces risk to new and/or existing buildings and infrastructure</i>														
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Community Lifeline	Infra.*	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans	NFIP
1	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate employees of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages. Include links to weather alerts and departmental phone listings with contact personnel for employees.	District-wide	Promote hazard awareness and protect employees from potential injuries and damages.	Education and Awareness	Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Human Caused	Communication	N/A	H	\$10,000	Local Budget; State Grants (GLO, TAMFS, TDA, TDEM, TWDB, TXDOT); Federal Grants (FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS)	Green-De Witt Drainage District General Manager	24 Months	N/A	N/A
<p>Description of the Solution: Monthly tips can be promoted for each hazard type via social media or other media outlets; Dam Failure: Promote evacuation routes for the community; Drought: Promote drought tolerant landscaping guidance for home and business owners; Earthquake: Advise homeowners how to secure indoor appliances and furniture; Expansive Soils: Inform the community on how to manage moisture levels and reinforce structures; Extreme Heat: Promote the signs of heat exhaustion and heat stroke; Flood: Promote elevation of indoor and outdoor appliances or knowledge of the BFE; Hail: Promote hail resistant roofing, siding and windows.; Hurricane/Tropical Storm: Promote the use of hurricane shutters or waterproofing the home and business; Lightning: Make homeowners and businesses aware of indoor surge protection; Thunderstorm Wind: Promote securing of outdoor items and structures; Tornado: Inform home and business owners know when and where in their home or business they can take shelter; Wildfire: Create a defensible space for homeowners campaign; Winter Storm: Promote information on wrapping exposed and outdoor pipes.</p>														

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
Countywide											
1	Purchase and Install countywide I-Info Alert System	Countywide	Reduce response time to disasters; alert residents of severe weather events; disseminate public education announcements such as water restrictions during drought, extreme heat cautions, protect residents from injury and loss of life.	Structure and Infrastructure	Flood, Hurricane/ Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes	M	\$100,000	HMGP, PDM grants	County Emergency Management Office; City of Cuero Emergency Management; City of Yorktown Emergency Management	Within 5-year MAP cycle to secure funds	County and Local Emergency Management Plan, Evacuation Procedures
2	Implement a program to educate residents on responding to alerts/ information disseminated through the countywide I-Info alert system in order to take actions to mitigate disaster event and/or protect people and property	Countywide	Disseminate warnings and public education announcements; protect residents from injury and loss of life.	Education and Awareness	Flood, Hurricane / Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes	M	\$50,000	HMGP, PDM grants	County Emergency Management Office; City of Cuero Emergency Management; City of Nordheim Emergency Management; City of Yorktown Emergency Management	Within 5-year MAP cycle to secure funds	NFIP Program, Emergency Management Plan, Emergency Response, Evacuation Plan

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
3	Develop a database program to track specific groups for notifications/ events and implement a process for disseminating and regulating warnings in conjunction with I-Info alert system.	Countywide	Protect residents from injury and loss of life; increase disaster response time	Local Plans and Regulations	Flood, Hurricane/Tropical Storm, Drought, Wildfire, Lightning, Dam Failure, Extreme Heat, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes	M	\$50,000	HMGP, PDM grants	County Emergency Management Office; City of Cuero Emergency Management; City of Nordheim Emergency Management; City of Yorktown Emergency Management	Within 5-year MAP cycle to secure funds	GIS Program, Emergency Response Plans
4	Purchase Generators and quick-connections to support critical facilities.	Countywide	Enable continuation of essential services following disasters, increase emergency response, utility support	Structure and Infrastructure	Flood, Hurricane/ Tropical Storm, Lightning, Tornadoes	H	\$15,000 - \$50,000 depending on generator type	HMGP	County Emergency Management Office, City of Cuero Emergency Management; City of Yorktown Emergency Management	2 years	Utility Plans, Disaster Response Plans
5	Develop Mutual Aid agreements for disaster response and recovery	Countywide	County and communities provide disaster response, equipment, time/labor support in event of disaster; improve response time in disasters, reduce injuries and loss of life; reduce cost of equipment, materials, supplies.	Local Plans and Regulations	Flood, Hurricane/ Tropical Storm, Wildfire, Hazardous Materials Release, Pipeline Failure, Chemical Spills, Tornadoes	H	\$1,500	Local Revenue	County Emergency Management Office; City of Cuero Emergency Management; City of Yorktown Emergency Management	1 year	Fire Plans, NFIP Program, Disaster Response Plans

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
6	Install tornado safe rooms in planning area	Countywide	Citizens will benefit from the placement of tornado saferooms. Tornado saferooms will reduce the risk of personal injury or death from a tornado	Structure and Infrastructure	Tornados	M	TBD	Local Revenue/ HMGP Grants	County Emergency Management Office; City of Cuero Emergency Management; City of Nordheim Emergency Management; City of Yorktown Emergency Management	1 year	Fire Plans, NFIP Program, Disaster Response Plans
7	Begin dam inundation mapping study	Countywide	Citizens and community officials will benefit from the improved data access from newly created dam failure inundation maps	Local Plans and Regulations	Dam Failure	M	TBD	Local Revenue/ HMGP Grants	County Emergency Management Office; City of Cuero Emergency Management; City of Yorktown Emergency Management	1 year	NFIP Program, Disaster Response Plans
De Witt County											
8	Relocate County Deed Records from Courthouse, located in 500-year floodplain, and within proposed 100-year floodplain of GBRA/ Corps study to offsite location outside flood-prone area.	County Courthouse	Avoid loss of critical assets and records	Structure and Infrastructure	Flood	M	\$200,000	HMGP, PDM grants	County Emergency Management Office	2-5 years	NFIP Program

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
9	Implement a program to post warning signage in vicinity of oil/gas pipelines.	Unincorporated areas of the county	Educate property owners of risk and safety measures pertaining to ruptures and pipeline explosions; prevent injury and loss of life	Education and Awareness	Pipeline Failure	M	\$20,000	HMGP, area pipeline companies	County Emergency Management Office	1 year	Emergency Response Plan
10	Construct necessary barriers or berms to reduce impact of runoff from flash floods onto neighborhoods, streams and impacting community water wells from proposed Plot Nob landfill.	Pilot Nob area located in county in proximity to Nordheim corporate limits	Minimize potential flooding of structures, maintain essential water utility service in event of flooding.	Structure and Infrastructure	Flood	H	Assessment to determine cost	HMA Grant, Pilot nob Landfill Contractor	County Engineering Services, Nordheim Mayor's office	2-4 years	Stormwater Management Plan, NFIP Program
11	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase of flood insurance through outreach.	Countywide	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/impact to flood prone structures.	Education and Awareness	Flood	H	\$25,000	HMGP grants/local revenue	County Engineering Services, Nordheim Mayor's office	1-2 years	NFIP Program
City of Cuero											
12	Install berm or other structure to deflect blast from rupture or lightning strike to pipeline located in proximity of Cuero Hospital	Cuero Hospital	Reduce risk to patients, staff, residents in vicinity of hospital complex; reduce injury and loss of life; reduce economic disruption to area businesses and hospital	Structure and Infrastructure	Pipeline, Lightning	L	\$200,000 - \$500,000	Grant, Pipeline Company	Cuero Emergency Management Office	2-3 years	Emergency Response and Evacuation Plan

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
13	Improve drainage and stormwater system to reduce drainage and flooding issues	Encompass multiple areas and various locations including Bailey, Gonzales, Clayton, French Streets	Reduce flooding to structures, road washouts; reduce injury and loss of life to residents; reduce repetitive flood losses, improve capacity of drainage channels to handle larger volumes of water in a shorter period of time.	Structure and Infrastructure	Flood	H	\$1 million (possibly phased project)	HMA grants	Public Works	1-5 years	Stormwater Management Plan, NFIP Program
14	Floodproof/retrofit older components of the Cuero Wastewater Treatment Plant subject of flooding	Wastewater Treatment Plant	Maintain essential utility service during disaster and flood events	Structure and Infrastructure	Flood	H	Assessment needed to determine cost	HMGP Grant	Utility Service	1-3 years	Utility Maintenance Plan
15	Construct new sewer trunk line to Wastewater Plant	Wastewater Plant	Maintain essential wastewater service should main line become inoperable or overwhelmed during flood event.	Structure and Infrastructure	Flood	H	Assessment needed to determine cost	HMGP Grant	Utility Service	1-3 years	Utility Maintenance Plan
16	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase flood insurance through outreach	Throughout City of Cuero	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/impact to flood prone structures.	Education and Awareness	Flood	H	\$25,000	HMGP Grant, Local Revenue	Floodplain Management Office	1-2 years	NFIP Program

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
17	Retrofit or floodproof City Public Service Station currently under renovation	514 W Sarah Street	Reduce risk of flooding from main drainage ditch located in proximity to structure. Structure flooded in 1998 flood; continue to provide residents essential utility data and services during flood event.	Structure and Infrastructure	Flood	H	Assessment needed to determine cost	HMA Grant	City Administration	1-2 years	NFIP Program, Annual Budget
18	Construct barriers or berms to reduce impact of runoff from flash floods onto neighborhoods, nearby streams, and impacting community water well from proposed Pilot Nob landfill.	Pilot Nob area located in county in proximity to corporate limits.	Minimize potential flooding of structures, maintain essential water utility service in event of flooding	Structure and Infrastructure	Flood	H	Assessment needed to determine cost	HMA Grant, Pilot Nob Landfill Contractor	Mayor's Office	2-4 years	Stormwater Management Plan
City of Nordheim											
19	Develop and promote program for mitigating effects of extreme heat to address safety and health issues.	Citywide	Inform and educate residents on dangers of working outdoors, and target groups such as low-income and elderly that may not have air conditioning; reduce injury, loss of life during extreme heat waves	Education and Awareness	Extreme Heat	H	\$500	Local Reserve	City Administrator	1 year	Annual Budget

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
City of Yorktown											
20	Remove large trees and debris along area waterways and restore floodplain function of natural systems	Coleta and Yorktown Creek	Minimize damage and losses from flooding; reduce flood damage to homes and businesses in flood prone areas of town; reduce injury and loss of life	Natural Systems Protection	Flood	H	To be determined	HMA Grant Funds	City Public Works	2 years from funding	NFIP Program; Capital Improvement Program
21	Develop and promote program on flood mitigation techniques to reduce flood risk through education and awareness; promote purchase of flood insurance through outreach	Citywide	Reduce economic loss due to flooding; inform and educate residents on flood to reduce injury, loss of life during flooding; reduce risk/impact to flood prone structures.	Education and Awareness	Flood	H	\$25,000	HMGP Grant, Local Revenue	Floodplain Management Office	1-2 years	NFIP Program
Green-De Witt Drainage District											
22	Remove large trees, logs, and debris from Thompson and Hellsgate bridges and restore floodplain function of natural systems	Thompson and Hellsgate Bridges, Guadalupe River	Reduce flood damage and losses caused by debris backing up floodwaters outside banks; reduce flood damage to homes and businesses in flood prone areas; reduce injury and loss of life	Natural Systems Protection	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
23	Replace Thompson Bridge to eliminate center structural component that impedes conveyance of floodwaters, collects debris and large logs that continues to flooding	Thompson Bridge, Guadalupe River	Reduce flood damage and losses caused by debris backing up floodwaters outside banks; reduce flood damage to homes and businesses in flood prone areas; reduce injury and loss of life	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds, TXDOT	Drainage District	2 years from funding	Annual Budget
24	Install drop basket structure and reconstruct drainage channels to control flooding and erosion. Structure will assist in stabilizing banks and holding bottoms of channel on grade.	City of Cuero to Guadalupe River	Aid in protection of two main sewer truck lines which could become unstable due to erosion; increase carrying capacity of floodwater; strengthen vegetation management to protect against runoff and erosion; reduce flooding of low-lying areas.	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget
25	Surveying and engineering services to provide the District with accurate and complete mapping of District ditches in order to study current capabilities and prioritize improvements.	City of Cuero	Better understanding of drainage systems	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
26	Improve bottleneck area(s) of the Valley Street ditch, especially by replacing bridges whose structural components impede drainage, and by widening areas of construction in said ditch.	City of Cuero	Reduce constriction of the drainage system.	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget
27	Improve Alexander Street Ditch west of Terrell Street, including widening of channel and adding stepped baskets to improve stability.	City of Cuero	Improve performance of drainage system	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget

SECTION 20: MITIGATION ACTIONS

CARRYOVER ACTIONS											
Action #	Proposed Action	Site	Benefit	Action Type	Hazards	Priority (High, Mod., Low)	Cost	Potential Funding Sources	Lead Agency	Timeline	Existing Plans
28	Study, design and construct improvements to minimize damage and losses from flooding by constricting improved bottoms and side slopes, widening channels and improving road crossings of area waterways located within the District. Acquire additional land, right-of-way and/or easements within the District to construct the necessary improvements. Remove large trees and debris along area waterways located within the District to restore floodplain function.	City of Cuero	Improve performance of drainage system	Structure and Infrastructure	Flood	H	To be determined	HMA Grant Funds	Drainage District	2 years from funding	Annual Budget



Section 21

Plan Maintenance

SECTION 21: PLAN MAINTENANCE

Plan Maintenance Procedures	1
Incorporation	1
Process of Incorporation	1
Monitoring and Evaluation	4
Monitoring	4
Evaluation	5
Updating	5
Plan Revisions	5
Five (5) Year Review	6
Continued Public Involvement	6

PLAN MAINTENANCE PROCEDURES

The following is an explanation of how the participating jurisdictions and special district within De Witt County, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. When the Plan is discussed in all maintenance procedures, it includes mitigation actions and hazard assessments. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

INCORPORATION

Participating jurisdictions and the special district within De Witt County will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the participating jurisdictions and special district. The following describes the process by which the participating jurisdictions and special district will incorporate elements of the mitigation plan into other planning mechanisms.

PROCESS OF INCORPORATION

Once the Plan Update is adopted, the participating jurisdictions and special district within De Witt County will implement actions based on priority and the availability of funding. The planning area currently implements policies and programs to reduce loss of life and property from hazards. The mitigation actions developed for this Plan Update enhance this ongoing effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

The participating jurisdictions and special district within De Witt County will integrate implementation of their mitigation actions with other plans and policies, such as construction

SECTION 21: PLAN MAINTENANCE

standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other planning efforts. Coordinating and integrating components of other plans and policies into the goals and objectives of the Plan Update will further maximize funding and provide possible cost-sharing of key projects, thereby reducing loss of lives and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan Update, Planning Team members from each participating jurisdiction and the special district will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, once per year at a minimum, and analyze the need for revisions in light of the approved Plan. The Planning Team will review all Comprehensive Land Use Plans (applicable jurisdictions only), Capital Improvement Plans (applicable jurisdictions only), annual budget reviews, Emergency Operations or Management Plans (applicable jurisdictions only), and Transportation Plans (applicable jurisdictions only) to guide and control development. Participating jurisdictions and the special district will ensure that capital improvement planning (applicable jurisdictions only) in the future will also contribute to the goals of this Hazard Mitigation Plan Update to reduce the long-term risk to life and property from all hazards. Within one year of formal adoption of the Hazard Mitigation Plan Update, existing planning mechanisms will be reviewed by each jurisdiction and special district.

De Witt County is committed to supporting the participating jurisdictions as they implement their mitigation actions. Planning Team members will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this Hazard Mitigation Action Plan Update. Additionally, the planning area will work to advance the goals of this Hazard Mitigation Plan through its routine, ongoing, long-range planning, budgeting, and work processes.

Table 21-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan Update into other planning efforts. The team members, listed in Table 21-2 below, will be responsible for the review of these planning mechanisms and their incorporation of the Plan, with the exception of the Floodplain Management Plans; the jurisdictions who have a Floodplain Administrator on staff will be responsible for incorporating the plan when Floodplain Management Plans are updated or new plans are developed.

Table 21-1. Methods of Incorporation of the Plan

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Annual Budget Reviews	<p>De Witt County – Emergency Management: Emergency Management Coordinator City of Cuero – Administration: City Secretary City of Nordheim – Administration: City Secretary City of Yorktown – Water / Utility / Permits: Field Director Green-De Witt Drainage District – Administration: General Manager</p>	<p>Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.</p>

SECTION 21: PLAN MAINTENANCE

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Capital Improvement Plans	City of Cuero – Administration: City Secretary City of Yorktown – Water / Utility / Permits: Field Director	<p>Several participating jurisdictions within De Witt County have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.</p>
Comprehensive Plans	City of Cuero – Administration: City Secretary	<p>Currently, the City of Cuero has a Comprehensive Land Use Plan in place. Since Comprehensive Plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.</p>
Floodplain Management Plans	De Witt County – Floodplain Administrator City of Cuero – Floodplain Administrator City of Yorktown – Floodplain Administrator	<p>Floodplain Management Plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 10 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when the County and participating Cities within De Witt County updates their Floodplain Management Plan or develop new plans.</p>
Grant Applications	De Witt County – Emergency Management: Emergency Management Coordinator City of Cuero – Grants: Special Projects Director City of Nordheim – Administration: City Secretary City of Yorktown – Water / Utility / Permits: Field Director Green-De Witt Drainage District – Administration: General Manager	<p>The HMAP will be evaluated by the participating jurisdictions and special district within De Witt County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.</p>

SECTION 21: PLAN MAINTENANCE

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Regulatory Plans	<p>De Witt County – Emergency Management: Emergency Management Coordinator</p> <p>City of Cuero – Administration: City Secretary</p> <p>City of Nordheim – Administration: City Secretary</p> <p>Green-De Witt Drainage District – Administration: General Manager</p>	<p>Currently, several Plan participants have regulatory plans in place or under development, such as Emergency Management Action Plans, Land Use Plans, and/or Evacuation Plans. The Plan Update will be consulted when County, City, and District departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.</p>

MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. When the Plan is discussed in these sections, it includes the risk assessment and mitigation actions as a part of the monitoring, evaluating, updating, and review process. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and reviews. Table 21-2 indicates the department and title of the party responsible for monitoring, evaluating, updating, and review of the Plan.

Table 21-2. Team Members Responsible for Monitoring, Evaluating, Updating, and Reviewing of the Plan

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – Emergency Management	Emergency Management Coordinator
City of Cuero – Administration	City Secretary
City of Nordheim – Administration	City Secretary
City of Yorktown – Water / Utility / Permits	Field Director
Green-De Witt Drainage District – Administration	General Manager

MONITORING

Designated Planning Team members are responsible for monitoring, evaluating, updating, and reviewing the Plan, as shown in Table 21-2. Individuals holding the title listed in Table 21-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various County, City, and District departments to determine if mitigation actions need to be re-evaluated and updated; evaluating and updating the Plan as necessary; and

SECTION 21: PLAN MAINTENANCE

monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any changes in the implementation process needed for continued success. A summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events, including but not limited to state and federally declared disasters.

EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan, identify any needed changes, and assess the effectiveness of the Plan in achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented along with the loss reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political, or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events, including but not limited to state and federally declared disasters.

UPDATING PLAN REVISIONS

At any time, minor technical changes may be made to update the De Witt County Hazard Mitigation Action Plan Update 2026. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it must be subject to formal adoption by the participating jurisdictions and special district.

The participating jurisdictions and special district within De Witt County will review proposed revisions and vote to accept, reject, or amend the proposed change. Upon ratification, the Revision will be transmitted to the Texas Division of Emergency Management (TDEM) .

In determining whether to recommend approval or denial of a Plan Revision request, participating jurisdictions will consider the following factors:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan Update;
- New issues or needs that were not adequately addressed in the Plan Update; and
- Changes in information, data, or assumptions from those on which the Plan Update was based.

SECTION 21: PLAN MAINTENANCE

FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to hazards, disaster declarations, increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the participating jurisdictions within De Witt County an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the full Executive and Advisory Planning Team (Section 2, Tables 2-1 and 2-2) meet to review the Plan at the end of three years because grant funds may be necessary for the development of a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan Revision process outlined herein. Upon completion of the review, update, and revision process the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The public will be directly involved in the annual evaluation, monitoring, reviews, and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on the participating jurisdictions' and special district's websites, where officials and the public are invited to provide ongoing feedback, via email.

The Planning Team may also designate voluntary citizens from the planning area or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning Team is responsible for notifying stakeholders and community members on an annual basis and maintaining the Plan.

Media, including local newspapers and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, the status of grant applications, and project implementation. Local and social media outlets will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.



Appendix A

Human-Caused Hazards



APPENDIX A: HUMAN-CAUSED HAZARDS

Appendix A is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix B

Planning Team



APPENDIX B: PLANNING TEAM

Planning Team Members	1
Stakeholders	2

PLANNING TEAM MEMBERS

The De Witt County Hazard Mitigation Action Plan Update 2026 was organized using a direct representative model. An Executive Planning Team from the participating jurisdictions and special district, shown in Table B-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table B-2 reflects the Advisory Planning Team, consisting of area organizations and departments that participated throughout the planning process. Table B-3 is comprised of stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation are provided in Appendix F.

Table B-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – Emergency Management	Emergency Management Coordinator
City of Cuero – Administration	City Secretary
City of Nordheim – Administration	City Secretary
City of Yorktown – Water / Utility / Permits	Field Director
Green-De Witt Drainage District – Administration	General Manager

Table B-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
De Witt County – Administration	County Clerk
De Witt County – Administration	County Treasurer
De Witt County – County Auditor’s Office	County Auditor
De Witt County – County Judge’s Office	County Judge
De Witt County – County Judge’s Office	Executive Secretary
De Witt County – Emergency Management	Safety Manager
De Witt County – Precinct #1	County Commissioner
De Witt County – Precinct #1	Foreman
De Witt County – Precinct #4	County Commissioner
De Witt County – Sheriff’s Office	County Sheriff
City of Cuero – Administration	City Manager

APPENDIX B: PLANNING TEAM

ORGANIZATION / DEPARTMENT	TITLE
City of Cuero – Administration	Grants / Special Projects Director
City of Cuero – Government	Mayor
City of Cuero – Chamber of Commerce	Director
City of Cuero – Code Enforcement / Inspection	Administrative Secretary
City of Cuero – Code Enforcement / Inspection	Code Enforcement
City of Cuero – Fire	Fire Chief
City of Cuero – Fire	Firefighter
City of Cuero – Fire	Firefighter ¹
City of Cuero – Government	Councilman
City of Cuero – Parks and Recreation	Parks Director
City of Cuero – Police	Chief
City of Nordheim – Government	Mayor
City of Nordheim – Volunteer Fire Department	Fire Chief
City of Yorktown – Administration	City Administrator
City of Yorktown – Government	Mayor
City of Yorktown – Finance	Director
City of Yorktown – Public Works	Director
City of Yorktown – Water / Utility / Permits	Director
Green-De Witt Drainage District – Administration	Board President
Green-De Witt Drainage District – Administration	Office Manager

STAKEHOLDERS

The following groups listed in Table B-3 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include members of community groups, non-profit organizations, private businesses, utility providers, neighboring counties, schools, state and federal agencies. The public were also invited to participate via e-mail throughout the planning process. Many of the invited organizations and stakeholders

¹ Not a duplicate entry.

APPENDIX B: PLANNING TEAM

participated and were integral to providing comments and data for the Plan. For a list of attendees at meetings, please see Appendix F.²

Table B-3. Stakeholders

AGENCY	TITLE	STAKEHOLDER TYPE
American Red Cross Central and South Texas Region	Community Preparedness	Non-Profit / Community Organization
Camal House	Executive Director	Non-Profit / Community Organization
Central De Witt County Wildlife Management Association	General Representative	Non-Profit / Community Organization
City of Cuero	Electric Supervisor	Utility Provider
City of Cuero	Environmental Services Supervisor	Utility Provider
City of Cuero	Water and Wastewater Foreman	Utility Provider
City of Yoakum	City Administrator	Neighboring Jurisdiction
ConocoPhillips	Stakeholder Relations Director	Utility Provider
Cuero Community Foundation	Secretary	Non-Profit / Community Organization
Cuero Development Corporation	Executive Director	Regional and Local Agency
Cuero Fire Department	Firefighter	Local Department
Cuero Fire Department	Lieutenant Firefighter	Local Department
Cuero ISD	Police Chief	Academia
Cuero ISD	School Resource Officer (SRO)	Academia
Cuero ISD	Superintendent	Academia
Cuero Municipal Library	Librarian	Community Organization
Cuero Regional Hospital	Chief Executive Officer	Healthcare Agency
Cuero Regional Hospital	Chief Nursing Officer	Healthcare Agency
Cuero Regional Hospital	Emergency Department Director	Healthcare Agency
Cuero Regional Hospital	Emergency Medical Services Director	Healthcare Agency

² Information contained in Appendix F is exempt from public release under the Freedom of Information Act (FOIA).

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Cuero Regional Hospital	Trauma / Disaster Director	Healthcare Agency
Cuero VFD	Fire Chief	Community Organization
Devon Energy	Emergency Management Director	Utility Provider
Disaster Response Warehouse	General Representative	Community Organization
De Witt Community Emergency Response Team (CERT)	General Representative	Community Organization
De Witt County	Deputy Clerk	Local Department
De Witt County Today	Reporter	Community Organization
De Witt County Veteran Service Office	Veteran Service Officer	Regional and Local Agency
Environmental Protection Agency (EPA)	Director of Superfund and Emergency Management Division	Federal Agency
Environmental Protection Agency (EPA)	Regional Administrator	Federal Agency
Friends of De Witt County	President	Non-Profit / Community Organization
Golden Crescent Regional Advisory Council (GCRAC)	Regional Representative	Regional and Local Agency
Goliad County	Emergency Management Coordinator	Neighboring Jurisdiction
Gonzales County	Emergency Management Coordinator	Neighboring Jurisdiction
Guadalupe River Authority	Safety Manager	Utility Provider
Habitat for Humanity	General Representative	Non-Profit / Community Organization
Karnes County	Emergency Management Coordinator	Neighboring Jurisdiction
Lavaca County	Emergency Management Coordinator	Neighboring Jurisdiction
Meyersville ISD	Superintendent	Academia
Meyersville VFD	Fire Chief	Community Organization
National Weather Service (NWS)	Meteorologist In Charge	Federal Agency
Nordheim ISD	Superintendent	Academia

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Nordheim VFD	Fire Chief	Community Organization
Pecan Valley Groundwater Conservation District	Vice-Chairman	Utility Provider
Southwest Texas Regional Advisory Council (STRAC)	Hospital Preparedness Coordinator	Healthcare Agency
Texas A&M AgriLife Extension	County Coordinator	State Agency
Texas A&M Forest Service	Program Coordinator Mitigation and Prevention	State Agency
Texas Commission on Environmental Quality, Region 9	Dam Safety Program	State Agency
Texas Commission on Environmental Quality, Region 9	Executive Assistant	State Agency
Texas Commission on Environmental Quality, Region 9	Regional Director	State Agency
Texas Department of Health and Human Services, Region 8	Emergency Preparedness Coordinator	State Agency
Texas Department of Health and Human Services, Region 8	Preparedness Manager	State Agency
Texas Department of Homeland Security	Media Representative	State Agency
Texas Department of Housing and Community Affair	Director of Single Family and Homeless Program	State Agency
Texas Department of Housing and Community Affair	Manager of Single-Family Program	State Agency
Texas Department of Transportation	Cuero Engineer	State Agency
Texas Department of Transportation	District Engineer	State Agency
Texas Division of Emergency Management (TDEM), Region 6	Assistant Chief	State Agency
Texas Division of Emergency Management (TDEM), Region 6	County Liaison Officer	State Agency
Texas Division of Emergency Management (TDEM), Region 6	District Chief, 17	State Agency
Texas Division of Emergency Management (TDEM), Region 6	Section Chief for Recovery and Mitigation	State Agency
Texas State Representative	House District 30 – District Director	State Legislature
Texas State Representative	House District 30 – Representative	State Legislature

APPENDIX B: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Texas State Senate	Senate District 18	State Legislature
Texas State Soil & Water	Program Administrator and Regional Office Coordinator	State Agency
Texas State Soil & Water	Program Supervisor	State Agency
Texas Water Development Board	Assistant National Flood Insurance Program State Coordinator	State Agency
Texas Water Development Board	Program Specialist	State Agency
Thomaston VFD	Fire Chief	Community Organization
United Ways of the Crossroads	General Representative	Non-Profit / Community Organization
U.S. Army Corps of Engineers	Fort Worth & Galveston District	Federal Agency
U.S. Fish & Wildlife	Southwest Regional Representative	Federal Agency
Victoria County	Emergency Management Coordinator	Neighboring Jurisdiction
Westhoff ISD	Superintendent	Academia
Westhoff VFD	Fire Chief	Community Organization
Yoakum EMS	Director	Community Organization
Yoakum VFD	Fire Chief	Community Organization
Yorktown Chamber of Commerce	General	Local Government
Yorktown Economic Development Corporation	Executive Director	Regional and Local Agency
Yorktown EMS	Director	Community Organization
Yorktown ISD	Police Chief	Academia
Yorktown ISD	Superintendent	Academia
Yorktown Medical Clinic	Public Health Director	Healthcare Agency
Yorktown Public Library	General Representative	Community Organization
Yorktown VFD	Fire Chief	Community Organization



Appendix C

Public Survey Results

APPENDIX C: PUBLIC SURVEY RESULTS

Overview 1
Public Survey Results 2

OVERVIEW

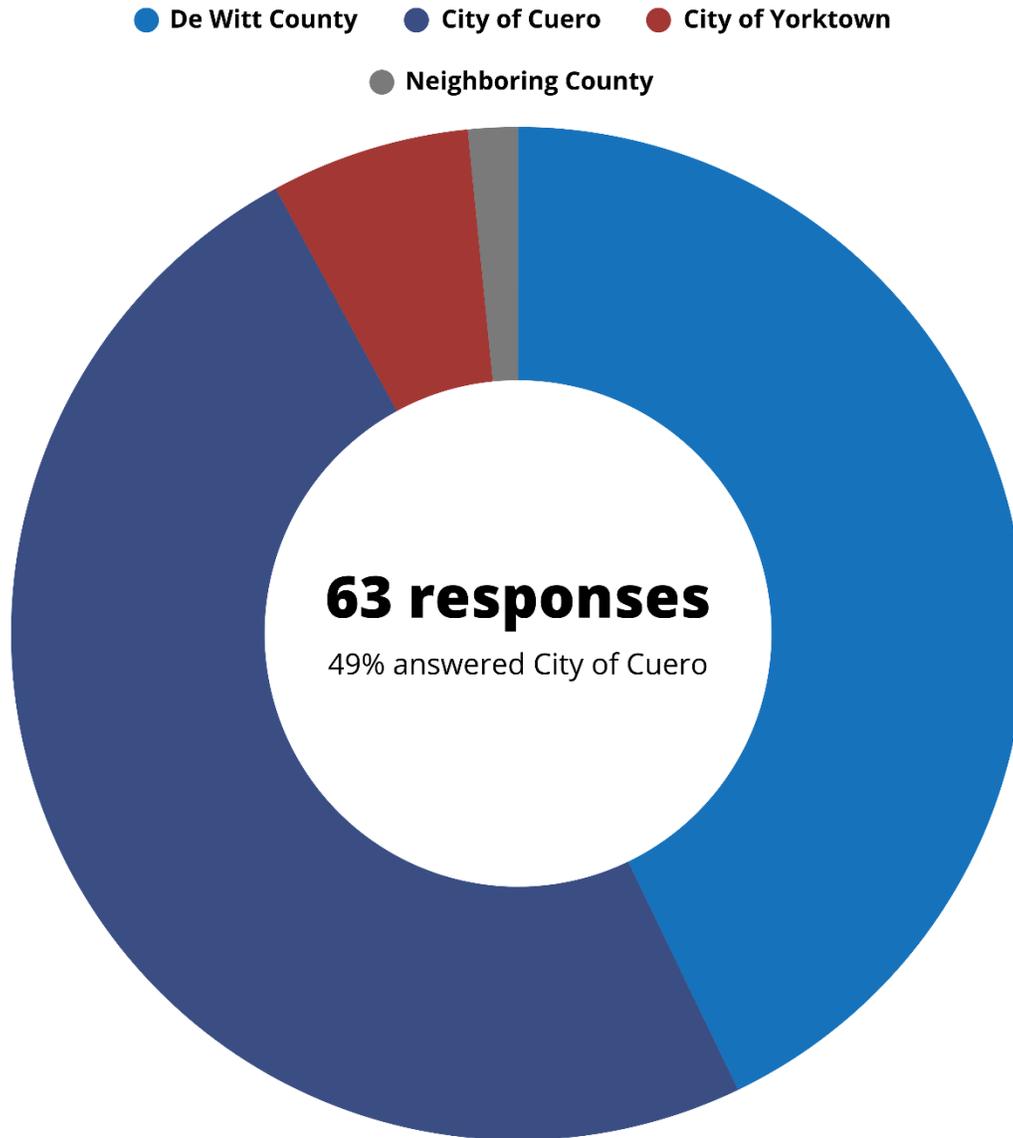
De Witt County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available via the participating jurisdictions’ and special district’s websites and social media. This survey link was also distributed at public meetings and stakeholder events throughout the planning process.

A total of 63 surveys were collected, the results of which are presented in Appendix C. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

All public survey results were discussed and shared with the Planning Team during the Mitigation Strategy Workshop. These results are also provided below. The survey results provide information regarding the public’s experience with natural hazards, their perceived hazards of concern, recommended mitigation actions, and additional valuable insights. Overall, this survey enhances the mitigation planning process by ensuring the plan properly represents the planning area, is informed through local knowledge, and by promoting equity.

APPENDIX C: PUBLIC SURVEY RESULTS

PUBLIC SURVEY RESULTS



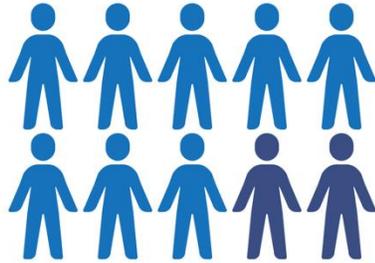
Survey responses were not provided from the other participating jurisdictions

Some respondents were in neighboring counties, and due to their proximity to the planning area, their responses were included in the survey results.

Responses were received from Victoria County.

APPENDIX C: PUBLIC SURVEY RESULTS

Have you ever experienced or been impacted by a disaster?



75%
Responded
'Yes'

Personal experiences shared in survey responses included:

"The freeze of 2021 was without electricity for days."

"Hurricane Harvey, Winter Storm Uri."

"Hurricane, flooding and snow storms."

"Flood of 1998."

"High winds causing damage to the roof and other structures."

"Flood of 98 both myself and spouse lost employment because businesses hit by flood. Also had family members homes flooded and up to three families lived with us and too years to repair and rebuild home. Hurricane Harvey knocked down 5 trees on our house. Destroyed our roof and foundation and inside water damage and insurance would not repair inside water or foundation damage. The most recent two horrible hail storms destroyed our roof again and all of our vehicles were damaged."

"Hurricane Harvey. Power Outages due to weather and hot temperatures.
Flooding. Hail damage."

57% of those who have been impacted by a disaster mentioned flooding in their explanations.

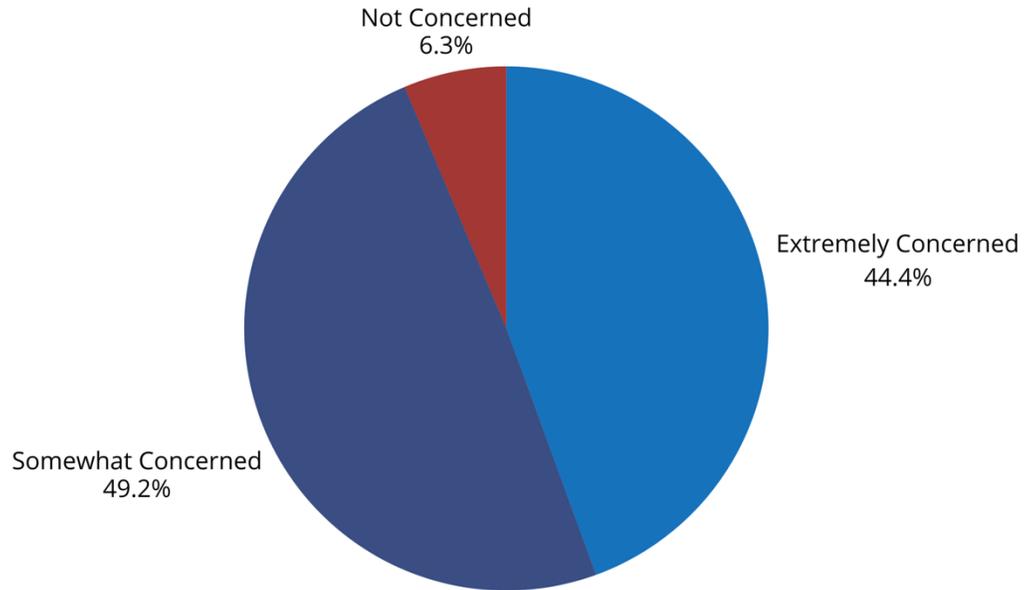


55% of those who have been impacted by a disaster mentioned hurricanes in their explanations.



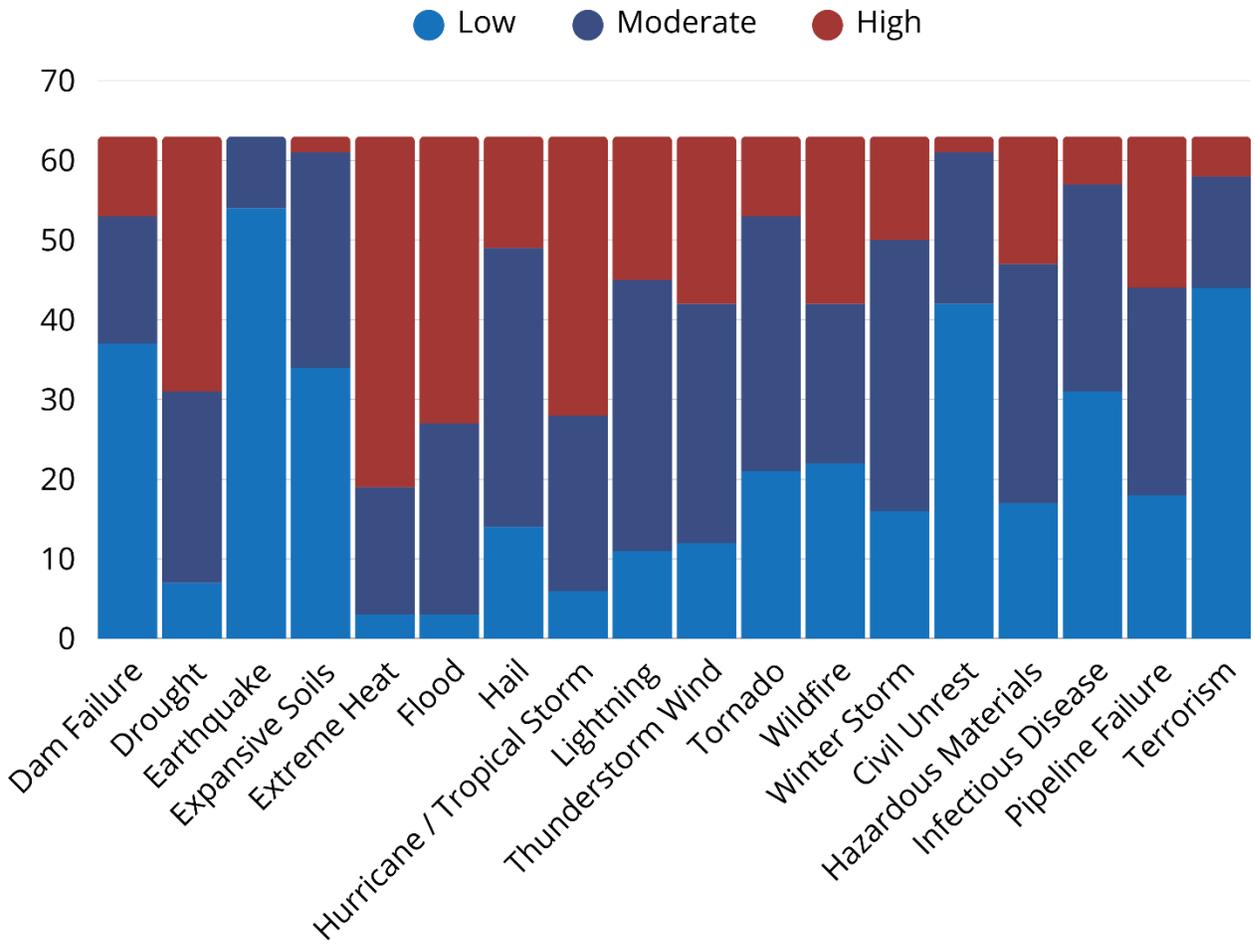
APPENDIX C: PUBLIC SURVEY RESULTS

Concern level for the possibility of their community being impacted by a disaster.



APPENDIX C: PUBLIC SURVEY RESULTS

With the consideration of frequency of occurrence and potential impact severity, please select the one hazard you think is the highest and second highest threat to your neighborhood:



Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?



Cyber Attack



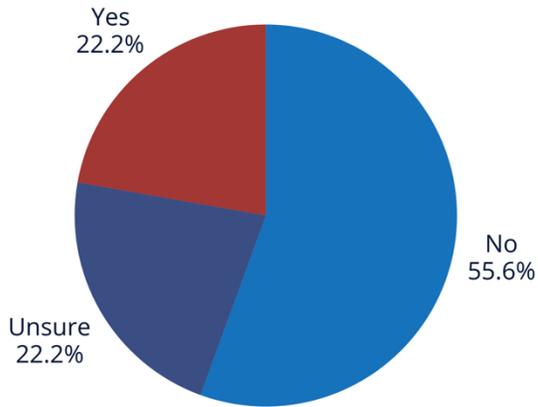
Pipeline Explosion



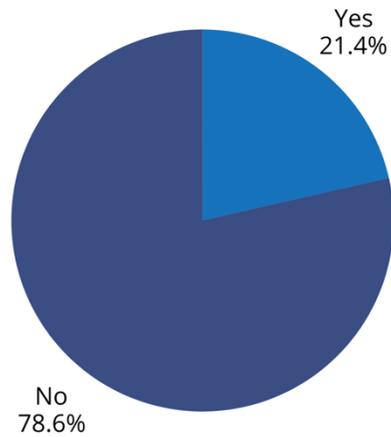
Utility Disruption

APPENDIX C: PUBLIC SURVEY RESULTS

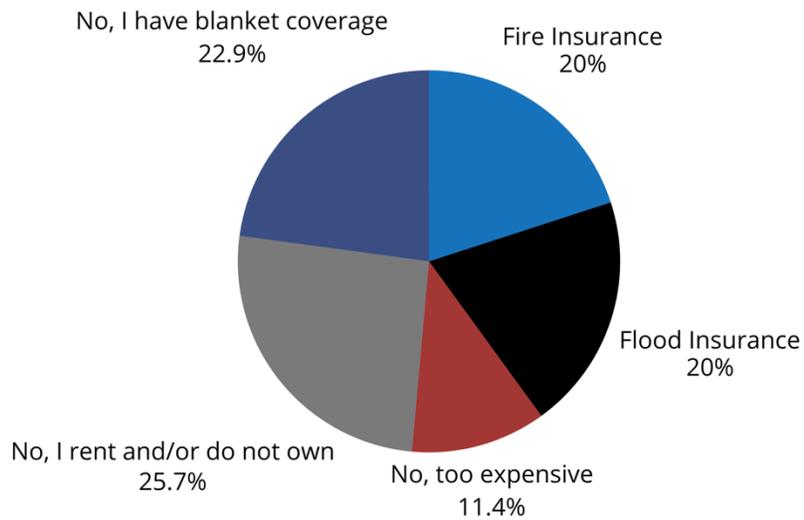
To your knowledge, is your home located in any high hazard risk zones?



Have you had any issues getting homeowners or renters insurance due to risks of hazardous events?

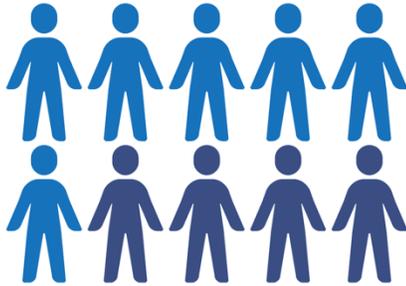


Do you have any hazard specific insurance? If not, why?

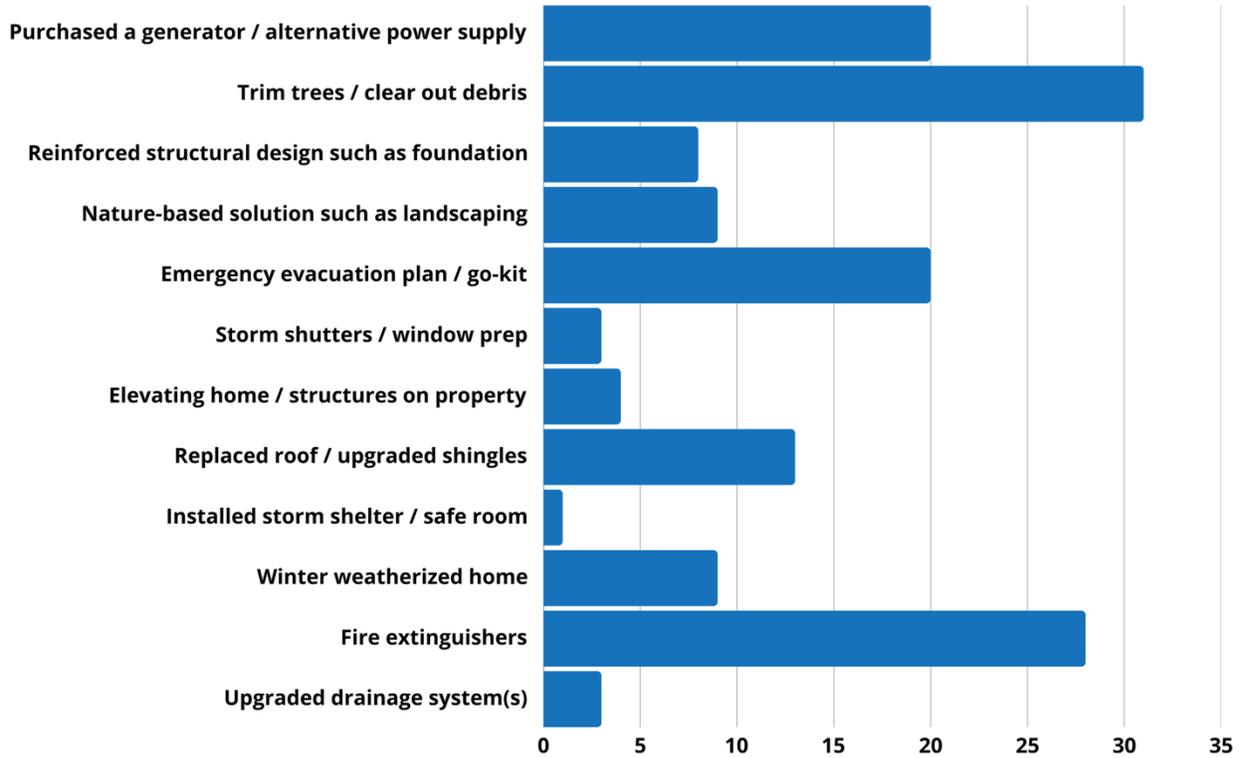


APPENDIX C: PUBLIC SURVEY RESULTS

Have you taken any actions to make your home or neighborhood more resistant to hazards?



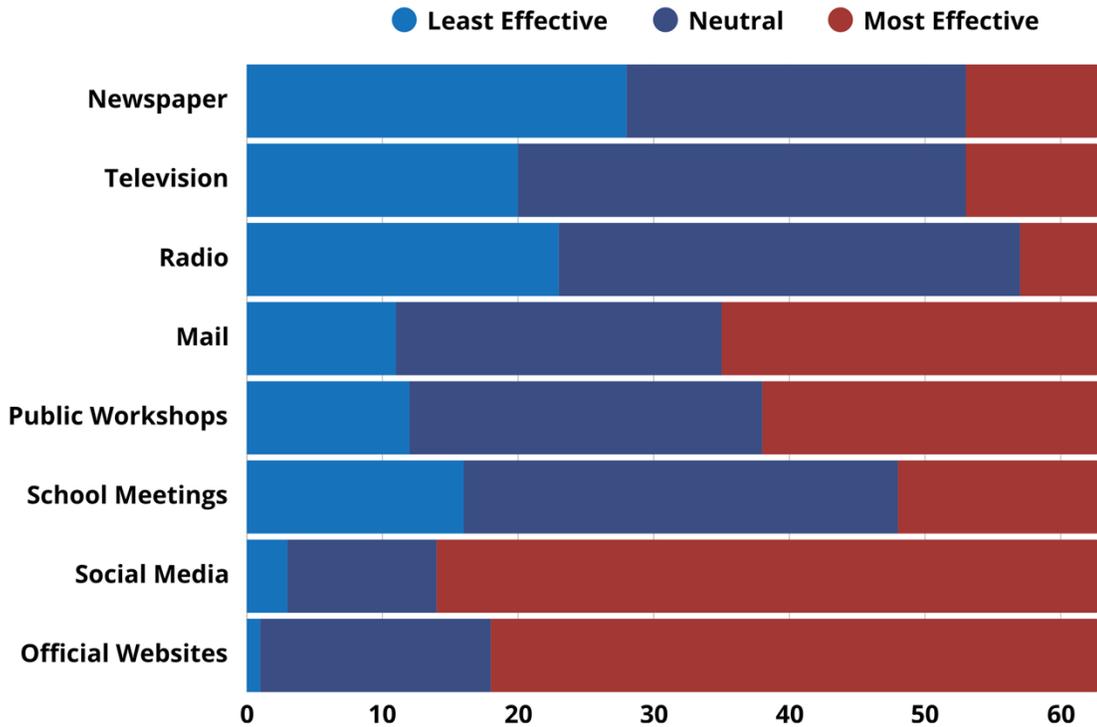
59%
Responded
'Yes'



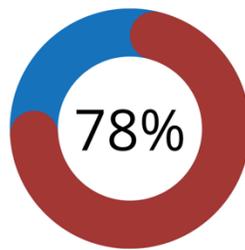
73% of survey responders are
interested in making their homes or
neighborhoods more resistant to
hazards.

APPENDIX C: PUBLIC SURVEY RESULTS

What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?



Effectiveness of communication methods for receiving information about how to make your home and neighborhood more resistant to hazards



Social Media

Additional communication methods recommended:



Text / Alert



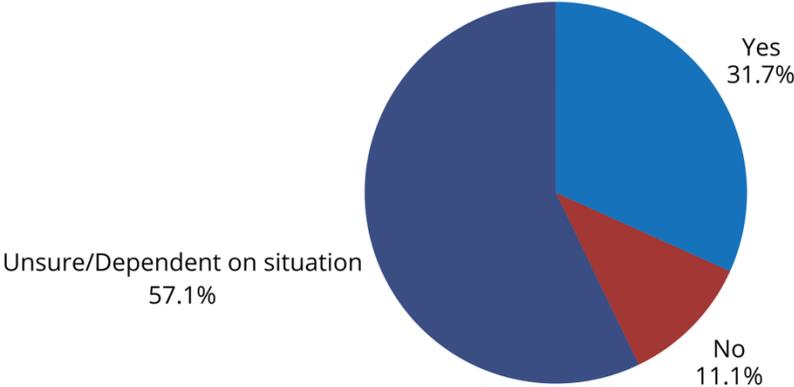
Email



Billboards

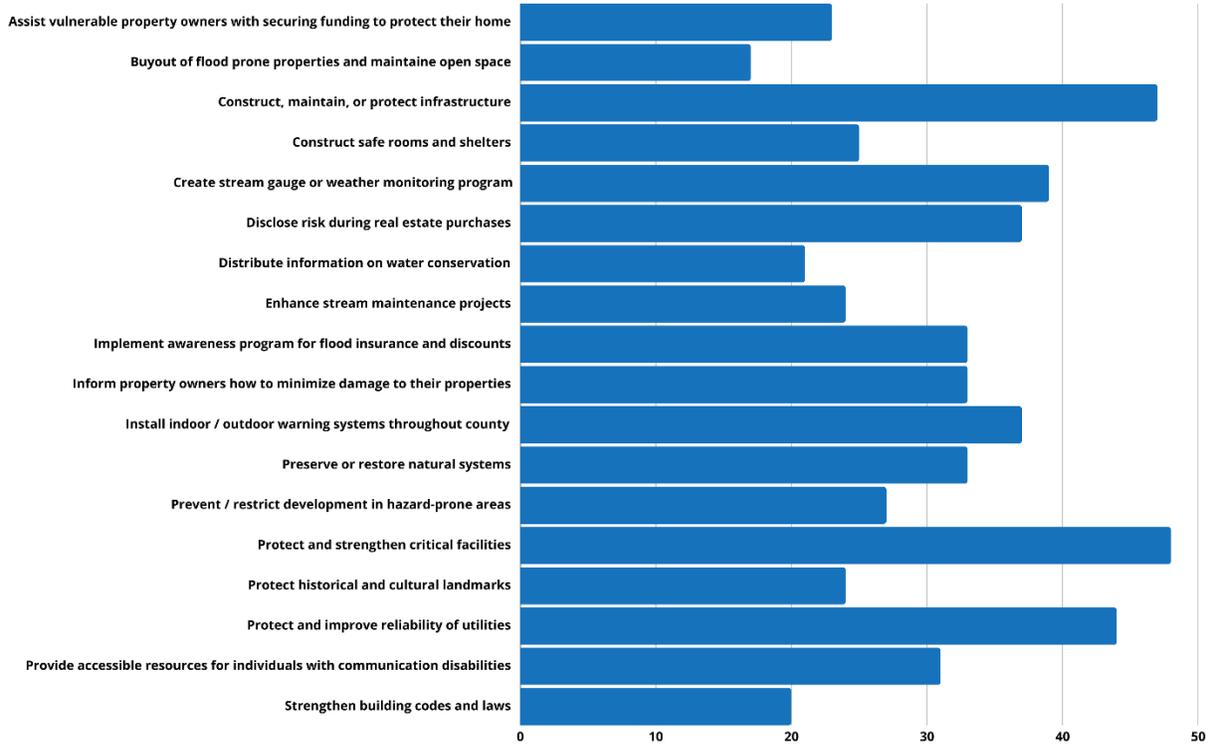
APPENDIX C: PUBLIC SURVEY RESULTS

Would you support regulation (restrictions) on land uses within known high hazard areas?



APPENDIX C: PUBLIC SURVEY RESULTS

In your opinion, please select steps your local government should prioritize to reduce or eliminate the risk of future hazard damages in your neighborhood.



Are there any other projects you would like to see implemented to protect your community from hazardous events?



Warning Sirens



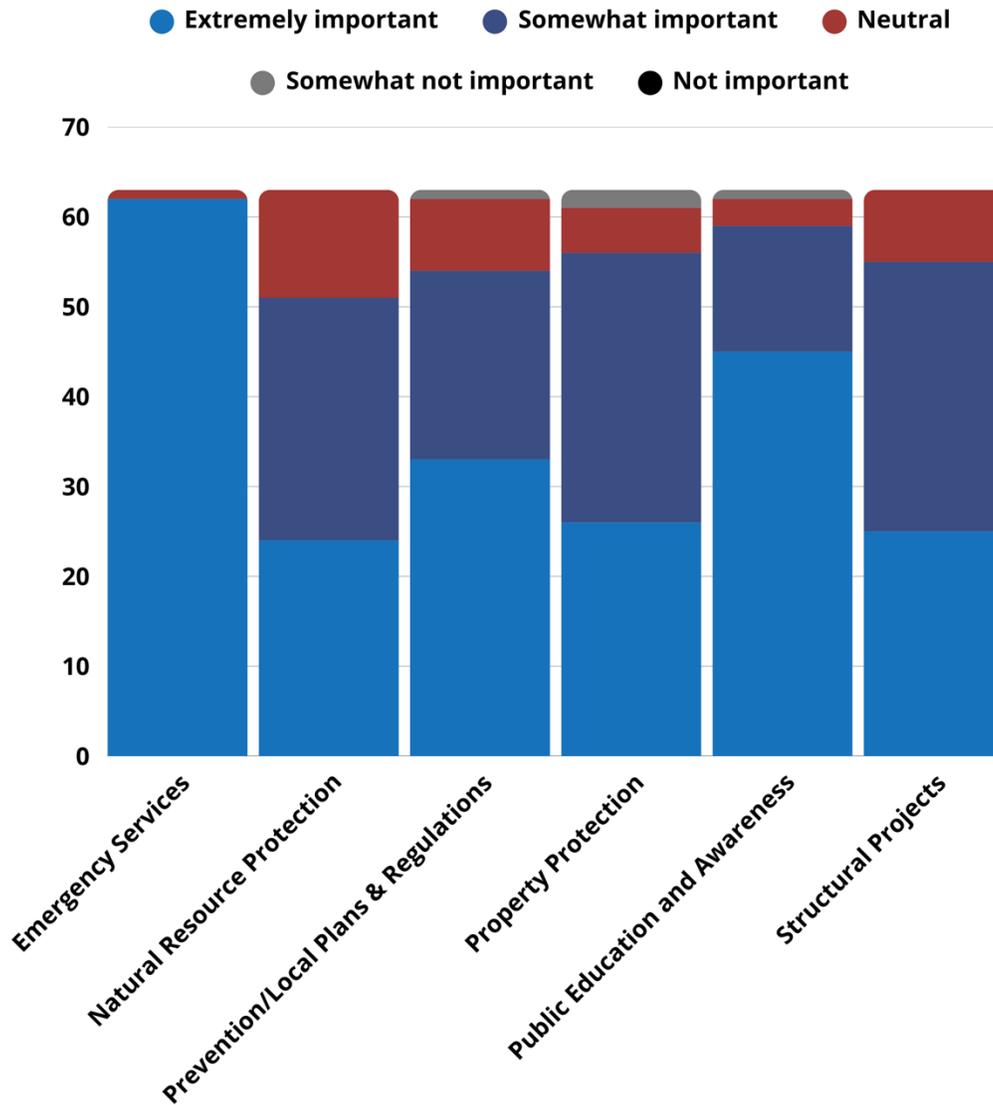
Infrastructure Maintenance



Community Shelter

APPENDIX C: PUBLIC SURVEY RESULTS

A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



Emergency Services: Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

Natural Resource Protection: Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

APPENDIX C: PUBLIC SURVEY RESULTS

Prevention / Local Plans & Regulations: Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

Property Protection: Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

Public Education and Awareness: 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, and demonstration events.

Structural Projects: Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention / retention basins, channel modification, retaining walls, and storm sewers.

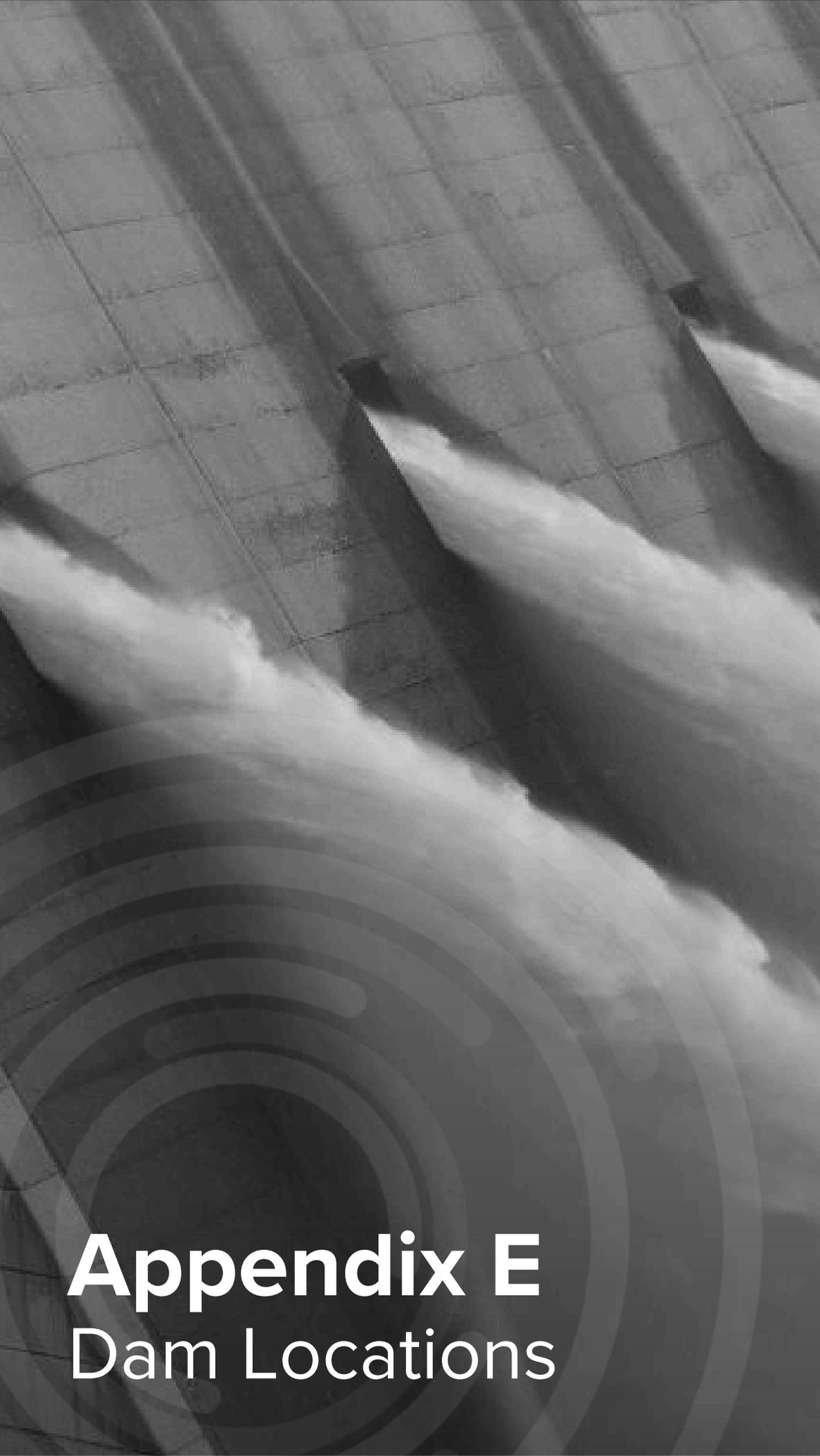


Appendix D

Critical Facilities

APPENDIX D: CRITICAL FACILITIES

Appendix D is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

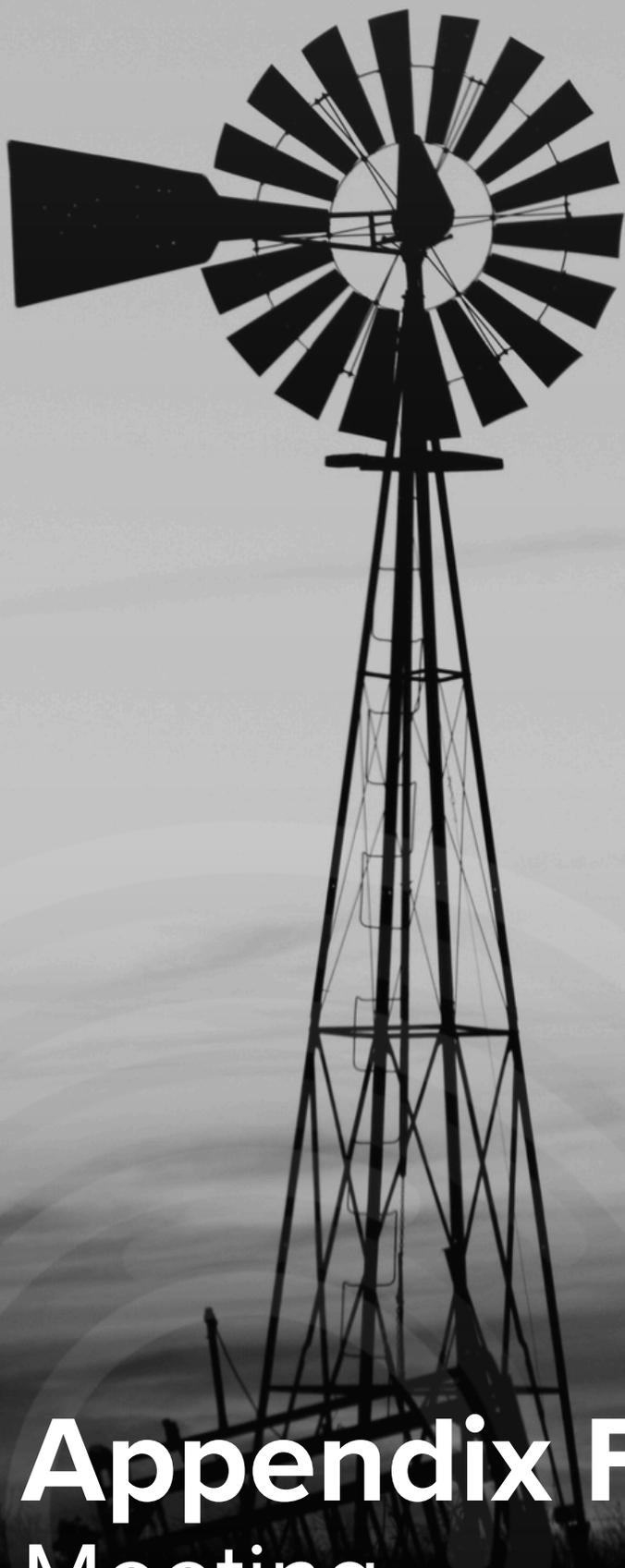


Appendix E

Dam Locations

APPENDIX E: DAM LOCATIONS

Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix F

Meeting

Documentation

APPENDIX F: MEETING DOCUMENTATION

Appendix F is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix G

Capability Assessment



APPENDIX G: CAPABILITY ASSESSMENT

Appendix G is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



Appendix H

State and Federal Funding Opportunities

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

Overview..... 1

OVERVIEW

Texas utilizes state funds to improve statewide hazard mitigation capabilities and advance their hazard mitigation goals to help identify, understand, and manage various risks associated with natural hazards. State funds also provide funding for state facility and infrastructure upgrades, hazard mapping, mitigation planning, and other mitigation programmatic activities. Table H-1 describes a variety of loan and grant programs offered by state agencies for which mitigation activities may be eligible.

Table H-1. Summary of State Funded Mitigation Programs

AGENCY	FUNDING PROGRAM
Texas A&M Forest Service (TAMFS)	<ul style="list-style-type: none"> • Community Fire Protection Program • Community Wildfire Defense Grant • Fire-Adapted Communities Program (FAC) • Firewise USA Program • Forest Land Enhancement Program • Forest Legacy Program • Mitigation Project Support Fund Prescribed Fire Grants • Resilient Landscapes Program • Rural Fire Assistance Grant • State Fire Assistance for Mitigation (SFAM) - Mechanical Fuels Grants • State Fire Assistance for Mitigation (SFAM) - Vegetative Fuel Break Grant • Texas Longleaf Conservation Assistance Program • Urban Tree Canopy Project (UTC)
Texas Commission on Environmental Quality (TCEQ)	<ul style="list-style-type: none"> • Clean Water Act Section 319 Grants • High Hazard Potential Dam Program (HHPD) • Nonpoint Source Grant Program • U.S.-Mexico Border Water Infrastructure Program
Texas Department of Agriculture (TDA)	<ul style="list-style-type: none"> • Agricultural Management Assistance (AMA) • Agricultural Water Enhancement Program (AWEP) • Community Development Block Grant • Community Development Block Grant for Rural Texas • Conservation Innovation Grants (CIG) • Environmental Quality Incentives Program (EQUIP)
Texas Department of Housing and Community Affairs (TDHCA)	<ul style="list-style-type: none"> • Texas HOME Disaster Relief

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

AGENCY	FUNDING PROGRAM
Texas Department of State Health Services (TXDSHS)	<ul style="list-style-type: none"> • Hospital Preparedness Program (HPP) Cooperative Agreement • Public Health Emergency Preparedness (PHEP) Cooperative Agreement
Texas Department of Transportation (TXDOT)	<ul style="list-style-type: none"> • Bridge Preventative Maintenance Program • Emergency Relief (ER) Program • Highway Bridge Replacement and Rehabilitation Program • Safe Rest Stops Program • Transportation Enhancement Program
Texas Division of Emergency Management (TDEM)	<ul style="list-style-type: none"> • Emergency Management Performance Grant (EMPG) • Fire Management Assistance Grants (FMAG) • Hazard Mitigation Planning Grants Program (HMGP) • Homeland Security Grant Program (HSGP) • Individual Assistance (IA) • National Earthquake Hazard Reduction Program (NEHRP) • Public Assistance (PA) Section 406 Funds
Texas Economic Development & Tourism (EDT)	<ul style="list-style-type: none"> • Economic Development Administration Grants and Investments
Texas General Land Office (TXGLO)	<ul style="list-style-type: none"> • Beach Grants • Beach Maintenance Reimbursement Fund • Coastal Erosion Planning and Response Act (CEPRA) • Coastal and Estuarine Land Conservation Program (CELCP) • Coastal Management Program (CMP) • Community Development Block Grant – Disaster Recovery (CDBG-DR) • Community Development Block Grant – Mitigation (CDBG-MIT) • Gulf of Mexico Energy Security Act (GOMESA) • Hazard Mitigation Grant Program Supplemental – LHMP
Texas Parks and Wildlife Department (TPWD)	<ul style="list-style-type: none"> • Nation Resources Damage Assessment (NRDA) • National Wildlife Wetland Refuge System • North American Wetland Conservation Fund • Partners for Fish and Wildlife • Texas Farm and Ranch Lands Conservation Program (TFRLCP) • Wildlife Habitat Incentive Program (WHIP)
Texas State Soil and Water Conservation Board (TSSWCB)	<ul style="list-style-type: none"> • Clean Water Act Section 319 Grants • Nonpoint Source Grant Program

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

AGENCY	FUNDING PROGRAM
<p>Texas Water Development Board (TWDB)</p>	<ul style="list-style-type: none"> • Agricultural Water Conservation Grants • Agricultural Water Conservation Loans • Clean Water State Revolving Fund (CWSRF) • Community Assistance Program (CAP) • Drinking Water State Revolving Fund (DWSRF) • Economically Distressed Areas Program • Emergency Community Water Assistance Grants • Flood Infrastructure Fund (FIF) • Flood Mitigation Assistance (FMA) Program • Flood Protection Planning Program • Groundwater Conservation District Loan Program • Planning Assistance to States • Regional Facility Planning Grant Program • Regional Water Planning Group Grants • Research and Planning Fund and Fund Development Program • Risk MAP Program • Rural Development Grants • Rural Water Assistance Fund (RWAF) • Silver Jackets • Small Flood Control Projects (USACE Section 205) • State Participation Program – Regional Water and Wastewater Facilities • State Water Implementation Fund for Texas (SWIFT) • State Water Resources Research Act Program • Texas Infrastructure Resiliency Fund (TIRF) • Texas Water Development Fund (DFund) • Water Research Grant Program • WaterSMART - Drought Response Program

In addition to state-funded programs, many local jurisdictions benefit from federal mitigation funding opportunities. FEMA’s Hazard Mitigation Assistance is a primary source for the implementation of mitigation projects throughout the nation. Table H-2 describes additional federal, state, local, and nonprofit mitigation funding sources specifically within the State of Texas.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

Table H-2. Federal, State, Local and Non-Profit Mitigation Funding Sources in Texas

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Agricultural Conservation Easement Program (ACEP)	Federal	NRCS		Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.
Agricultural Management Assistance (AMA)	Federal	USDA, NRCS	TDA	Provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation methods into their farming operations.
Agricultural Water Enhancement Program (AWEP)	Federal	USDA, NRCS	TDA	Voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement water enhancement activities on agricultural land to conserve surface and ground water and improve water quality.
Agricultural Water Conservation Grants	State	TWDB	TWDB	Funding is available to state agencies and political subdivisions for projects that advance the implementation of conservation or water management strategies identified in state and regional water plans. Applications are accepted annually, with up to \$1.2 million in total funding available each year. Grant categories are subject to change annually.
Agricultural Water Conservation Loans	State	TWDB	TWDB	Agricultural water conservation loans to use either for facility improvements or as loans to individuals. Low-interest, fixed rates. Up to 10-year repayment terms. U.S. Iron and Steel requirements apply to certain projects. Eligible loan applicants include political subdivisions.
AmeriCorps - Corporation for National & Community Service (CNCS)	Federal	AmeriCorps	N/A	Provides funding for volunteers to serve communities, including disaster prevention. AmeriCorps/Vista has assisted local communities with wildfire mitigation projects.
American Recovery and Reinvestment Act (ARRA)	Federal	EPA		Provides significant funding for states to finance high priority water infrastructure projects through a \$2 billion appropriation to the Drinking Water State Revolving Fund (DWSRF) program and a \$4 billion appropriation to the Clean Water State Revolving Fund (CWSRF) program.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
American Recovery and Reinvestment Act (ARRA)	Federal	DOT Federal Transit Administration	TDA	The American Recovery and Reinvestment Act (ARRA), commonly referred to as the Recovery Act, is a stimulus package enacted by the 111th U.S. Congress and signed into law by President Barack Obama in February 2009. Designed in response to the Great Recession, the primary goal of the Act was to preserve existing jobs and generate new employment opportunities as quickly as possible. Additional objectives include providing temporary relief to individuals most affected by the recession and investing in infrastructure, education, healthcare, and renewable energy.
Aquatic Ecosystem Restoration	Federal	DOD-USACE		Direct support for carrying out aquatic ecosystem restoration projects that will improve the equality of the environment.
Assistance to Firefighters program - Fire Prevention & Safety (FP&S) Grants	Federal	FEMA, AFG		Fire Prevention & Safety (FP&S) Grants support projects that enhance the safety of the public and firefighters from fire and related hazards.
Beach Grants	Federal	EPA	TXGLO	EPA awards grants under the authority of the BEACH Act to eligible states, territories, and tribes with beaches on oceans and the Great Lakes coasts to develop and implement programs to monitor their beaches and notify the public when it is not safe to swim.
Beach Maintenance Reimbursement Fund	State	GLO	TXGLO	Allocates approximately \$750,000 per year to help communities maintain their beaches. Applications are distributed to eligible participants in early fall and are due within a specified amount of time, no less than 30 days. Contracts are renewable annually.
Bridge Preventative Maintenance Program	State	TXDOT	TXDOT	A planned, cost-effective treatment that preserves, improves, or delays future deterioration of the condition of a bridge. To be eligible, a bridge must have a condition rating of 5 or 6 for at least one of the following: deck, superstructure, substructure, culvert, or channel. Safety and improvements to the physical condition of the State's on-system bridges are TxDOT's main goals in the prioritization of the bridges using BMIP funds. Each FY, the Bridge Division develops and distributes an initial list of eligible bridges in each district for the annual program call.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Carbon Reduction Program (CRP)	Federal	USDOT	TXDOT, TCEQ	Provides funds for projects that are designed to reduce transportation emissions (CO ₂). This program can fund a wide range of projects designed to reduce carbon dioxide emissions from on-road highway sources.
Center for Integration of Natural Disaster Information	Federal	DOI/USGS, The Center for Integration of Natural Hazards Research	Texas A&M	Technical Assistance: Develops and evaluates technology for information integration and dissemination.
Clean School Bus Program	Federal	EPA	TCEQ	Provides assistance in replacing existing school buses with zero-emission and low-emission models.
Clean Water Act Section 319 Grants	Federal	EPA	TCEQ and TSSWCB	Provides grants for a wide variety of activities related to non-point source pollution runoff mitigation.
Clean Water State Revolving Fund (CWSRF)	Federal	EPA	TWDB	Provides low-cost financing for a wide range of wastewater, stormwater, reuse, and other pollution control projects.
Climate Pollution Reduction Grant	Federal	EPA	TCEQ	Supports the state in creating two climate action plans (i.e., one priority plan and one comprehensive plan) for implementing effective greenhouse gas reduction strategies while ensuring the benefits of these actions are delivered to Texans, especially Low Income or Disadvantaged communities (LIDAC) as defined by U.S. EPA. This grant will give Texas communities the opportunity to collaborate with the state to build projects and programs that provide high-quality jobs, improve health, and keep families safe where they live.
Coastal Erosion Planning and Response Act (CEPRA)	State	GLO	TXGLO	Since its inception in 2000, the Texas General Land Office's Coastal Erosion Planning and Response Program has secured over \$62 million in state funding, complemented by an additional \$62 million in matching funds. This program has facilitated the completion of more than 200 coastal erosion projects and studies. The application process for non-emergency project funding opens every even-numbered year in February and closes in early June of the same year.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Coastal and Estuarine Land Conservation Program (CELCP)	Federal	NOAA	TXGLO	When the National Oceanic and Atmospheric Administration (NOAA) provides funding for CELCP, the General Land Office (GLO) offers coastal communities the opportunity to submit up to three project applications per year. Federal grant awards for individual projects may not exceed \$3 million.
Coastal Management Program (CMP)	Federal	NOAA	TXGLO	Texas receives approximately \$2 million annually in grants from NOAA and 90 percent of the funds are passed through to local governments and entities to address environmental needs and promote sustainable economic development along the coast. Projects must improve the management of the state's coastal resources and ensure long-term ecological and economic productivity. Section 306 administrative funds can be used for non- construction, coastal planning and education, and research. Section 306A improvement funds can be utilized for construction and land acquisition projects, preservation, and restoration. CMP funding categories include Coastal Natural Hazards Response, Critical Areas Enhancement, Public Access, Water/Sediment Quantity and Quality Improvements, Waterfront Revitalization and Ecotourism Development, Permit Streamlining/ Assistance, Governmental Coordination and Local Government Planning Assistance.
Community Assistance Program (CAP)	Federal	FEMA, NFIP	TWDB	Product-oriented financial assistance program directly related to the flood loss reduction objectives of the National Flood Insurance Program (NFIP).
Community Development Block Grant (CDBG)	Federal	HUD	TDA	The primary objective is to develop viable communities by providing decent housing and suitable living environments and expanding economic opportunities principally for persons of low- to moderate- income. Eligible applicants are non-entitlement cities under 50,000 in population and non-entitlement counties that have a non-metropolitan population under 200,000 and that are not eligible for direct CDBG funding from HUD may apply for funding through any of the Texas CDBG programs.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Community Development Block Grant for Rural Texas	State	TDA	TDA	TDA administers the Community Development Block Grant for Rural Texas. The primary objective of the CDBG is to develop viable communities by providing decent housing and suitable living environments and expanding economic opportunities principally for persons of low- to moderate-income. Eligible applicants are non-entitlement cities under 50,000 in population and non-entitlement counties that have a non-metropolitan population under 200,000 and that are not eligible for direct CDBG funding from HUD may apply for funding through any of the Texas CDBG programs.
Community Development Block Grant – Disaster Recovery (CDBG-DR)	Federal	HUD	TXGLO	Often following a disaster, the state may receive a CDBG-DR Supplement intended for mitigation and disaster recovery projects in the affected areas. Funding can be used to acquire properties in hazard prone areas. Since CDBG funds lose their federal identify they can also be used to supplement state or local match requirements on other funds such as FEMA HMA grants. Funding also supports public facilities including water and wastewater.
Community Development Block Grant – Mitigation (CDBG-MIT)	Federal	HUD	TXGLO	Eligible grantees can use this assistance in areas impacted by recent disasters to carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses. In February of 2018, Congress appropriated \$12 billion dollars in Community Development Block Grant (CDBG) funds specifically for mitigation activities for qualifying disasters in 2015, 2016, and 2017. HUD was able to allocate an additional \$3.9 billion, bringing the amount available for mitigation to nearly \$16 billion.
Community Fire Protection Program	Federal	USDA	TAMFS	Mitigation is delivered via the USDA Forest Service and Private Forestry Coop Fire Program.
Community Rating System (CRS)	Federal	FEMA		A voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. CRS not only assists communities in reducing flood risks, but also enhances public safety, reduces damage to property and public

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
CRS (continued)				infrastructure, avoids economic disruption and losses, reduces human suffering, and protects the environment. Technical assistance in designing and implementing some activities is available at no charge. Participating in the CRS provides an incentive to maintain and improve a community's floodplain management program over the years. Implementing some CRS activities can help the project qualify for certain other Federal assistance funds.
Community Wildfire Defense Grant	Federal	USFS	TAMFS	Offers financial assistance to at-risk local communities with planning for and against the risk of catastrophic wildfire. This program is authorized in Public Law 117-58, the Infrastructure Investment and Jobs Act. Two primary objectives: The development and revision of Community Wildfire Protection Plans (CWPP), and the implementation of projects described in a CWPP that is less than ten years old. Prioritizes at-risk communities that are in an area identified as having high or very high wildfire hazard potential, are low-income, and/or have been impacted by a severe disaster with no minimum federal funding limit for projects.
Conservation Contracts	Federal	USDA-FSA		Debt reduction for delinquent and non-delinquent borrowers in exchange for conservation contracts placed on environmentally sensitive real property that secures FSA loans.
Conservation Innovation Grants (CIG)	Federal	USDA, NRCS	TDA	A voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production.
Conservation Technical Assistance (CTA) Program	Federal	USDA-NRCS		Technical assistance for run-off retardation and soil erosion prevention to reduce hazards to life and property.
Decision, Risk, and Management Science Program	Federal	NSF		Funding is provided for research and related educational activities focused on risk, perception, communication, and management, with an emphasis on technological hazards.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Disaster Mitigation Planning and Technical Assistance	Federal	DOC, EDA		Technical and planning assistance grants for capability building and mitigation project activities focusing on creating disaster resistant jobs and workplaces.
Division of Homeland Security Financial Assistance	Federal	US Department of Homeland Security	OOG	Supports a wide variety of funding and financial assistance programs that promote preparedness, resilience, and post-disaster relief.
Drinking Water State Revolving Fund (DWSRF)	Federal	EPA	TWDB	Provides funding for infrastructure improvements to drinking water systems. The program also emphasizes providing funds to small and disadvantaged communities and for programs that encourage pollution prevention as a tool for ensuring safe drinking water.
Economic Development Administration Grants and Investments	Federal	U.S. DOC, EDA	EDT	Provides grants and investments for community construction projects, including mitigation activities.
Economically Distressed Areas Program	State	TWDB	TWDB	Provides financial assistance for projects serving economically distressed areas where water or sewer services do not exist, or systems do not meet minimum state standards. Eligible EDAP applicants include cities, counties, water districts, nonprofit water supply corporations, and all other political subdivisions. The city or county where the project is located must adopt and enforce Model Subdivision Rules for the regulation of subdivisions prior to application for financial assistance. Projects must also be in an economically distressed area where the median household income is not greater than 75 percent of the median state household income.
Economic Injury Disaster Loan	Federal	SBA		The COVID EIDL program ceased accepting applications on December 31, 2021, however, the disaster EIDL program continues to be available to businesses impacted by other publicly declared disasters.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Emergency Community Water Assistance Grants	Federal	USDA	TWDB	\$150,000 to \$500,000 available to rural communities with populations over 10,000 people with a median household income of less than \$65,900. Aids communities that have experienced a decline in quantity or quality of drinking water as a result of an emergency, including drought.
Emergency Management / Mitigation Training	Federal	FEMA		Training in disaster mitigation, preparedness, and planning.
Emergency Management Institute	Federal	FEMA		Education training programs to prepare emergency management professionals to prepare for, respond to, and recover from disasters and emergencies.
Emergency Management Performance Grant (EMPG)	Federal	FEMA	TDEM	Provides a yearly allocation of funding to support state and local emergency management programs. This has included providing funding for local mitigation plans, mitigation-oriented studies, and related activities.
Emergency Relief (ER) Program	Federal	US DOT - FHWA	TXDOT	Provides funding for the repair or reconstruction of roads and bridges on Federal-aid highways that have sustained damage as a direct result of a natural disaster or a catastrophic failure due to an external cause.
Emergency Watershed Protection (EWP)	Federal	USDA, NRCS	TWDB	Provides funding and technical assistance for emergency measures, including floodplain easements in impaired watersheds. Funding is available through Simplified Acquisition Procedures (SAP), typically ranging from \$25,000 to \$100,000. Support is provided through contracts between project sponsors and the Natural Resources Conservation Service (NRCS); grants are not offered under this program. The NRCS covers up to 75 percent of total project costs.
Environmental Justice Government-to-Government Program (EJG2G)	Federal	EPA		Provides funding to support government activities that lead to measurable environmental or public health impacts in communities disproportionately burdened by environmental harms.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Environmental Justice Collaborative Problem Solving Program	Federal	EPA		Provides funding directly to community-based organizations to address environmental injustices.
Environmental Quality Incentives Program (EQUIP)	Federal	USDA, NRCS	TDA	Provides funding and technical assistance to farmers and ranchers to promote agricultural production and environmental quality as compatible goals.
Farm Ownership Loans	Federal	USDA-FSA		Direct loans, guaranteed / insured loans, and technical assistance to farmers so that they may develop, construct, improve, or repair farm homes, farms, and service buildings, and to make other necessary improvements.
Federal Land Transfer / Federal Land to Parks Program	Federal	DOI-NPS		Identifies, assesses, and transfers available federal real property for acquisition for use in state and local parks and recreation, such as open space.
Fire-Adapted Communities Program (FAC)	Federal	FEMA, USFA	TAMFS	Collaborates to identify wildfire risk and take actionable steps to reduce risk of loss by protecting property and enhancing the safety of firefighters and residents.
Fire Management Assistance Grants (FMAG)	Federal	FEMA	TDEM	Provides fire suppression support to states when loss of life and property is imminent. Wildfire mitigation is also eligible under emergency protection if life is in imminent danger.
Fire Prevention and Safety Grant Program	Federal	US Fire Administration		Provides funding for projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death.
Firewise USA Program	Federal	USDA, DOI, NASFF, NFPA	TAMFS	Provides a collaborative framework to help neighbors in a geographic area organize and enhance ignition resistance of their homes and community to reduce wildfire risks at the local level.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Flood Infrastructure Fund (FIF)	State	TWDB	TWDB	Provides financial assistance in the form of loans and grants for flood control, flood mitigation, and drainage projects. The Flood Intended Use Plan (Flood IUP) details the structure of each funding cycle and the SWIFT Advisory Committee serves as the oversight entity.
Flood Mitigation Assistance Program (FMA)	Federal	FEMA	TWDB	Repetitive flood loss property reduction and projects that mitigate losses to NFIP-insured properties.
Floodplain Management Services	Federal	DOD-USACE		Provides technical and planning assistance at the local, regional, or national level needed to support effective floodplain management.
Flood Protection Planning Program	State	TWDB	TWDB	Grant funding available to political subdivisions of the State of Texas for the evaluation of structural and nonstructural solutions to flooding problems. Upstream and/or downstream effects of proposed solutions must be considered in the planning and must be regional in nature by considering the flood protection needs of the entire watershed. Eligible planning activities include, but are not limited to, determining and describing flooding-related problems ; conducting hydrologic and hydraulic studies; identifying potential solutions; estimating the benefits and costs of potential solutions, including structural and nonstructural measures; determining the views and needs of the affected public regarding flooding problems; recommending feasible flood protection solutions; evaluating environmental, social, and cultural factors; and ensuring proposed solutions are consistent with regional or statewide plans as well as relevant laws and regulations.
Forest Land Enhancement Program	Federal	USDA, NRCS	TAMFS	Provides educational, technical, and financial assistance to help landowners implement sustainable forestry management objectives.
Forest Legacy Program	Federal	USFS	TAMFS	Provides funding to protect private forest lands that are environmentally, economically, and socially critical, thereby reducing development in the wildland-urban interface.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Greenhouse Gas Reduction Fund (GGRF)	Federal	EPA		The program is designed to combat the climate crisis by mobilizing financing and private capital for greenhouse gas- and air pollution-reducing projects in communities across the country.
Grid Resilience Program (GRIP)	Federal	DOE		Enhance grid flexibility and improve the resilience of the nation’s power grid against threats of extreme weather and climate change.
Hazard Mitigation Grant Program (HMGP)	Federal	FEMA	TDEM	Post-disaster multi-hazard mitigation funding for federally declared disasters. HMGP Post Fire funds are available for FMAG declarations.
Hazard Mitigation Grant Program Supplemental – Local Hazard Mitigation Plan Program (LHMPP)	Federal	FEMA	TXGLO	The Local Hazard Mitigation Plan Program (LHMPP) assists eligible entities by providing grants to develop or update local hazard mitigation plans, or to provide cost share for hazard mitigation planning activities funded through other federal sources. Grant awards range from \$20,000 to \$100,000.
Hazardous Materials Emergency Preparedness (HMEP) Grant Program	Federal	DOT	TDEM	Funding is available to help facilitate preparedness in transporting hazardous materials. The program recognizes Local Emergency Planning Committees (LEPCs) as applicants to maximize funding impact through regional partnerships.
Healthy Forests Reserve Program (HFRP)	Federal	NRCS		Assist landowners, on a voluntary basis, in restoring, enhancing and protecting forestland resources on private lands through various means, including conservation easements and cost-sharing agreements.
High Hazard Potential Dam Program (HHPD)	Federal	FEMA	TCEQ	Provides assistance for technical, planning, and design activities related to the repair, removal, and/or structural or nonstructural rehabilitation of eligible non-federal high hazard dams classified as high hazard potential by the state / territory dam safety agency, with an approved Emergency Action Plan (EAP) and rated in poor condition, through a pre-disaster or annual cycle.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Highway Bridge Replacement and Rehabilitation Program	Federal	FHWA	TXDOT	Provides funding to enable states to improve the condition of highway bridges through replacement, rehabilitation, and systematic preventive maintenance. Also includes the National Historic Covered Bridge Preservation Program.
Homeland Security Grant Program (HSGP)	Federal	DHS	TDEM	Funding supports homeland security activities identified in state and local strategic plans, including threat and hazard risk identification for natural, technological, and human-caused hazards.
Hospital Preparedness Program (HPP) Cooperative Agreement	Federal	HHS	TXDSHS	The HPP is the primary source of federal funding for health care system preparedness and response. In collaboration with public health, it prepares health-care delivery systems to save lives through the development of health care coalitions (HCCs). Under the direction of the HPP providers, the HCCs develop plans, provide training, and coordinate regional exercises.
Hydrologic Research Grants	Federal	NOAA		Offers up to \$125,000 to conduct joint research and development on pressing surface water hydrology issues common to national, regional, and local operational offices. Eligible applicants include federally recognized agencies of state or local governments, quasi-public institutions such as water supply or power companies, hydrologic consultants and companies involved in using and developing hydrologic forecasts.
Groundwater Conservation District Loan Program	State	TWDB	TWDB	Provides short-term loans to finance the start-up costs of Groundwater Conservation Districts. Funding is available for any Groundwater District or Authority with the ability to regulate water well spacing and/or production. The program is authorized under Texas Water Code Chap. 36, Subchapter. L, and governed by TWDB rules in 31 Tex. Admin. Code Chap. 363, Subchapter. H.
Gulf of Mexico Energy Security Act (GOMESA)	Federal	DOI	TXGLO	GOMESA significantly enhances oil and gas leasing activities and creates revenue sharing provisions for the oil- and gas-producing states of Alabama, Louisiana, Mississippi, Texas, and their coastal political subdivisions (CPSs). The funds are used for coastal conservation, restoration, and hurricane protection. The second phase of

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Gulf of Mexico Energy Security Act (GOMESA) (continued)				GOMESA revenue sharing, which began in Fiscal Year 2017, expands the definition of qualified Outer Continental Shelf revenues to include receipts from Gulf of Mexico leases that are subject to withdrawal or moratoria restrictions. A revenue-sharing cap of \$500 million per year for the four Gulf-producing states, their CPSs and the Land and Water Conservation Fund, effective from fiscal years 2016 through 2055.
Indian Housing Assistance - Housing Improvement Program (HIP)	Federal	DOI-BIA		The Housing Improvement Program (HIP) is a home repair, renovation, replacement and new housing grant program administered by the Bureau of Indian Affairs (BIA) and federally recognized Indian tribes. It is designed to assist American Indian and Alaska Native (AI/AN) individuals and families who lack immediate standard housing resources.
Individual Assistance (IA)	Federal	FEMA	TDEM	Following a disaster, funds can be used to mitigate hazards when repairing individual and family homes.
In-Lieu Fee Program Mitigation Projects	Federal	USACE	Community Applicants	Supports the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Department of the Army permits.
Land Acquisition	Federal	DOI-FWS		Acquires high-quality lands and waters, or easements thereon, for inclusion in the National Wildlife Refuge System.
Landowner Incentive Program	Federal	USFWS	EMNRD	Collaborates with the Forestry Division and private landowners to protect the habitats of at-risk species on private lands. Landowner involvement is voluntary.
Mapping Standards Support	Federal	DOI/USGS		Provides mapping and digital data standards expertise in support the National Flood Insurance Program (NFIP).

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Mitigation Banks	Federal	USACE	Community Applicants	Mitigation Banks are Corps-approved sites that sell compensatory mitigation credits for projects that cause unavoidable impacts to waters of the U.S. When a permit requires compensatory mitigation, it specifies the number of credits to be purchased from an approved mitigation bank.
National Dam Safety Program	Federal	FEMA		Provides technical assistance, training, and grants to enhance state dam safety programs.
National Digital Orthophoto Program	Federal	DOI-USGS		Develops topographic quadrangles for use in flood mapping and other hazards.
National Earthquake Hazards Reduction Program (NEHRP)	Federal	FEMA	TDEM	Provides funding to support enhanced earthquake risk assessments in local hazard mitigation plans, as well as other earthquake hazard mitigation and preparedness activities.
National Earthquake Hazard Reduction Program (NEHRP) in Earth Sciences	Federal	NSF		Conducts research on basic and applied earth and building sciences.
National Earthquake Hazard Reduction Program	Federal	DOI-USGS		NEHRP's work encompasses research, development, and implementation activities. Research helps to advance our understanding of why and how earthquakes occur and impact the natural and built environments. The program develops strategies, tools, techniques, and other measures that can reduce the adverse effects of earthquakes and facilitates and promotes implementation of these measures, thereby strengthening earthquake resilience among at-risk communities.
Natural Resources Damage Assessment (NRDA)	Federal	EPA	TPWD	Evaluates the likelihood of adverse ecological effects that are occurring or may occur as a result of exposure to physical (e.g., cleanup) or chemical (e.g., hazardous release) stressors at a site.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
National Flood Insurance Program (NFIP)	Federal	FEMA	TWDB	Provides affordable insurance to property owners and encourages communities to adopt and enforce floodplain management regulations.
National Flood Insurance Program: Technical Mapping Advisory Council	Federal	DOI-USGS		Provides technical guidance and advice to coordinate FEMA's map modernization efforts for the National Flood Insurance Program (NFIP).
National Training and Education (NTE)	Federal	FEMA		Offers educational and training programs through online course catalog, which provides searchable, integrated information on courses provided or managed by FEMA's Center for Domestic Preparedness (CDP), Emergency Management Institute (EMI), and National Training and Education Division (NTED).
National Weather Service (NWS)	Federal	NOAA - NWS		The National Weather Service (NWS) offers storm spotter training as well as weather and flood safety guides. It may also provide funding to support severe weather signage in parks and other public areas.
National Wildlife Wetland Refuge System	Federal	USFWS	TPWD	Provides funding for the acquisition of land for inclusion in the National Federal Wildlife Refuge System.
Nonpoint Source Grant Program	Federal	EPA	TCEQ, TSSWCB	The Clean Water Act (CWA) requires states to develop programs to protect the water quality from the adverse effects of nonpoint source (NPS) water pollution. The Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) administer federal grants for activities that prevent or reduce NPS pollution.
Non-Structural Alternatives to Structural Rehabilitation of Damaged Flood Control Works	Federal	DOD-USACT		Provides planning and construction grants for non-structural alternatives to the rehabilitation of flood control works damaged by floods or coastal storms.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
North American Wetland Conservation Fund	Federal	USFWS	TPWD	Provides funding for wetland conservation projects.
NRCS Conservation Programs	Federal	USDA, NRCS	Community Applicants	Provides funding through various programs for the conservation of natural resources.
Office of Disaster Assistance	Federal	SBA		Provides financial assistance through low interest disaster loans to businesses of all sizes, private non-profit organizations, homeowners, and renters to repair or replace real estate, personal property, machinery and equipment, inventory and business assets that have been damaged or destroyed in a declared disaster.
Partners for Fish and Wildlife	Federal	USFWS	TPWD	Provides financial and technical assistance to landowners for wetland restoration projects in “focus areas” of the state.
Planning Assistance to States	Federal	USACE	TWDB	Aids states in planning for development, utilization, and conservation of water and related land resources.
Pollution Prevention Grant: Environmental Justice in Communities	Federal	EPA		Provides technical assistance to businesses aiming to improve human health and the environment in disadvantaged communities.
Pollution Prevention Grant: Environmental Justice Through Safer and More Sustainable Products	Federal	EPA		Provides technical assistance to businesses to increase the supply, demand, and use of safer, more sustainable products.
Post-Disaster Economic Recovery Grants and Assistance	Federal	DOC-EDA		Provides funding to assist with the long-term economic recovery of communities, industries, and firms adversely impacted by disasters.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Pre-Disaster Mitigation Loan Program	Federal	SBA		Provides low-interest loans to small businesses for mitigation projects.
Pre-Disaster Mitigation (PDM)	Federal	FEMA		Congressional funding for local governments, tribes, and states to plan and implement sustainable, cost-effective measures designed to reduce risk to individuals and property from future natural hazards.
Preparedness (Non-Disaster) Grants	Federal	FEMA		Provides financial assistance to state and local governments for preparedness programs. Funding is allocated to enhance the capacity of emergency responders to prevent, respond to, and recover from terrorism incidents involving weapons of mass destruction—chemical, biological, radiological, nuclear, and explosive devices—as well as cyber-attacks.
Prescribed Fire Grants	State	TAMFS	TAMFS	<p>The Texas A&M Forest Service’s Mitigation & Prevention Department annually implements four prescribed fire grants to protect communities and restore ecosystems.</p> <ol style="list-style-type: none"> (1) SFAM Plains Prescribed Fire Grant – Supports prescribed burns to reduce hazardous fuels near Texas communities at high risk for wildfires—specifically those threatened by Southern Plains Wildfire Outbreaks. Treatment areas are located adjacent to identified priority communities. (2) The Community Protection Program Grant – Funds prescribed burns on private lands within 10 miles of a National Forest boundary to reduce high-risk fuels. The goal is to protect nearby communities and forest resources by lowering the risk of catastrophic wildfire across public and private lands. (3) The State Fire Assistance for Mitigation Central & East Texas Grant – Provides funding for prescribed burns on private lands in 43 Central and East Texas counties that have approved Community Wildfire Protection Plans (CWPPs). The goal is to protect high-risk communities and restore ecosystems by reducing hazardous vegetation. Priority is given to sites that are within a CWPP, near Firewise communities or residential areas (as identified by the Texas Wildfire Risk Assessment Portal), and support ecosystems that benefit from prescribed fire. (4) Neches River and Cypress Basin Watershed Restoration Program – Assists landowners with

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				<p>prescribed burns to improve ecological health in the Neches River and Cypress Basin watersheds. The program benefits water quality and quantity, controls invasive species, and enhances wildlife habitat. Priority is given to treatment areas on private land that promote native ecosystem restoration, fall within priority watershed protection zones, and are located near public lands.</p>
<p>Project Modifications for Improvement of the Environment</p>	<p>Federal</p>	<p>DOD-USACE</p>		<p>Provides funds for ecosystem restoration by modifying structures and/or operations of water resources projects constructed by the U.S. Army Corps of Engineers (USACE), or by restoring areas where a USACE project contributed to environmental degradation.</p>
<p>Protection of Essential Highways, Highway Bridge Approaches, and Public Works</p>	<p>Federal</p>	<p>USACE</p>		<p>Provides technical assistance to ensure bank protection for highways, highway bridges, essential public works, churches, hospitals, schools, and other nonprofit public services endangered by flood-caused erosion.</p>
<p>Public Assistance</p>	<p>Federal</p>	<p>FEMA</p>	<p>DHSEM</p>	<p>Funds are allocated to states and communities to repair damaged infrastructure and public facilities, and to help restore government or government-related services.</p>
<p>Public Assistance (PA) Section 406 Funds</p>	<p>Federal</p>	<p>FEMA</p>	<p>TDEM</p>	<p>Following a disaster, funds can be used to mitigate hazards while repairing damages to public structures or infrastructure. Wildfire mitigation is also eligible under emergency protection if lives are in imminent danger.</p>
<p>Public Health Emergency Preparedness (PHEP) Cooperative Agreement</p>	<p>Federal</p>	<p>CDC</p>	<p>TXDSHS</p>	<p>Aids health departments in building and strengthening their ability to effectively respond to a range of public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events. Preparedness activities funded by the PHEP Cooperative Agreement specifically target the development of emergency-ready public health departments that are both flexible and adaptable.</p>
<p>Public Housing Capital Fund</p>	<p>Federal</p>	<p>HUD</p>		<p>Funding available towards public housing agencies for modernization needs resulting from natural disasters including elevation, flood proofing, and retrofitting.</p>

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Regional Facility Planning Grant Program	State	TWDB	TWDB	Provides funds to political subdivisions in Texas for studies and analyses to evaluate and determine the most feasible alternatives to meet regional water supply and wastewater facility needs, estimate the costs associated with implementing these alternatives, and identify institutional arrangements for providing regional water supply and wastewater services.
Regional Water Planning Group Grants	State	TWDB	TWDB	Developed to guide and support the planning of the State's water resources, this program administers and assists in the development of regional and state water plans. It aims to improve the planning process by providing clear guidance for stakeholders and utilizing the best available data, methodologies, and technical innovations for each funding cycle.
Repetitive Flood Claims Program	Federal	FEMA	DHSEM	Provides funds to assist states and communities reduce flood damages to insured properties that have had one or more claims under the National Flood Insurance Program (NFIP).
Research and Planning Fund and Fund Development Program	State	TWDB	TWDB	Provides funds to eligible applicants for the development or revision of regional water plans. Eligible activities include the development, revision, or improvement of regional water plans including public meetings, hearings, and special studies. Plans must comply with Texas Water Code, §16.053 and Chapter 357, or other special studies approved by the Texas Water Development Board (TWDB) that enhance water planning efforts in the region.
Resilient Landscapes Program	Federal	USDA, USFS	TAMFS	Provides coordination to restore healthy, resilient, fire-adapted ecosystems. Restoration efforts include thinning crowded forests and using prescribed fire on two to three million acres annually, which helps prevent the buildup of flammable vegetation that feeds extreme wildfires.
Risk MAP Program	Federal	FEMA, NFIP	TWDB	Establishes or updates floodplain mapping and multi-hazard risk products.
Rural Development Grants	Federal	USDA-Rural Development	TWDB	Provides grants and loans for the development and enhancement of infrastructure and public safety in rural areas, offering up to \$100,000 or 75 percent of the total project cost, whichever is less.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Rural Fire Assistance Grant	Federal	NIFC	TAMFS	Funds fire mitigation activities in rural communities.
Rural Utilities Service (RUS)	Federal	USDA-Rural Development		Programs designed to provide needed infrastructure or infrastructure improvements to rural communities, including water and wastewater treatment, electric power, and telecommunications services.
Rural Water Assistance Fund (RWAFF)	State	TWDB	TWDB	Provides low-cost financing to assist small rural utilities with water and wastewater projects. The Rural Water Assistance Fund (RWAFF) offers tax-exempt equivalent interest rate loans and long-term financing options.
Safe Rest Stops Program	State	TXDOT	TXDOT	Texas has 21 major highways that function as long-distance travel corridors. Along these routes, rest areas serve as critical safety features designed to reduce accidents caused by driver fatigue. These facilities provide travelers with an opportunity to pause, rest, and return to the road more alert and refreshed.
Section 108 Loan Guarantee Program	Federal	HUD		Provides loans to public entities for community and economic development projects, including mitigation measures.
Section 502 Loan Guaranteed Loan Program	Federal	USDA-RHS		Provides loans, loan guarantees, and technical assistance to very low- and low-income applicants seeking to purchase, build, or rehabilitate homes in rural areas.
Section 504 Loans for Housing	Federal	USDA-RHS		Provides repair loans, grants, and technical assistance to low-income senior homeowners in rural areas to address home repairs and eliminate health and safety hazards.
Societal Dimensions of Engineering, Science, and Technology Program	Federal	NSF		Provides funding for research and educational activities on topics such as ethics, values, risk assessment, communication, risk management, and risk perception.
Soil Survey	Federal	USDA-NRCS		Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
State Fire Assistance for Mitigation (SFAM) - Mechanical Fuels Grants	State	TAMFS	TAMFS	Provides financial assistance for hazardous fuel reduction on private lands to decrease wildfire risk. The grant targets high-risk communities within 32 counties in Central Texas, as identified by the Texas A&M Forest Service Mitigation and Prevention Department. Priority is given to landowners who reside in one of the 32 high-risk counties, are located within a city or county with an active Community Wildfire Protection Plan (CWPP) or live in a recognized Firewise USA site.
State Fire Assistance for Mitigation (SFAM) - Vegetative Fuel Break Grant	State	TAMFS	TAMFS	Provides financial assistance for the creation of vegetative fuel breaks on private lands in Texas. Vegetative fuel breaks are trees and shrubs systematically planted adjacent to fields, homesteads, or feedlots to reduce or redirect wind. The goal of the grant is to protect high-risk communities by reducing the risk of catastrophic wildfires on private and public lands. Grant recipients will be reimbursed up to \$2,500 for actual costs associated with creating a green, vegetative fuel break, consisting of a minimum of three rows of trees and 400 feet in length. Eligible projects must be located within the Texas High Plains.
Silver Jackets	Federal	USACE	TWDB	Provides funding for flood-related studies, public awareness efforts, risk analysis, flood response plans, and the construction of small flood control projects.
Small Flood Control Projects (USACE Section 205)	Federal	USACE	TWDB	Authorizes the U.S. Army Corps of Engineers (USACE) to conduct feasibility studies and construct small flood control projects.
State Participation Program – Regional Water and Wastewater Facilities	State	TWDB	TWDB	Provides funding and assumes a temporary ownership interest in regional water, wastewater, or flood control projects when local sponsors are unable to assume debt for an optimally sized facility. The program is intended to encourage the optimum regional development of projects by funding excess capacity for future use, where benefits can be documented and such development is otherwise unaffordable without state participation. The goal is to enable the rightsizing of projects by accounting for future demand.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
State Water Implementation Fund for Texas (SWIFT)	State	TWDB	TWDB	The SWIFT program helps communities develop and optimize water supplies at cost-effective rates. It offers low-interest loans, extended repayment terms, deferred loan repayments, and incremental repurchase terms for projects with state ownership aspects.
State Water Resources Research Act Program	Federal	USGS	TWDB	The U.S. Geological Survey (USGS), in cooperation with the National Institutes for Water Resources (NIWR), issues an annual call for proposals that address water challenges and concerns of regional or interstate significance, or that relate to a specific program priority identified by the Secretary of the Interior and the Institutes.
Stream Gauging and Flood Monitoring Network	Federal	DOE-USGS		Operation of a network of over 7,000 stream gauging stations that provide data on river flooding characteristics.
Surface Transportation Program	Federal	USDOT/ FHWA		Provides funding for activities such as safety-related construction and transportation enhancements. These enhancements include a broad range of initiatives, from safety education to environmentally and historically focused activities.
Texas Farm and Ranch Lands Conservation Program (TFRLCP)	State	TPWD	TPWD	Maintains and enhances the ecological and agricultural productivity of lands through Agricultural Conservation Easements. The TFRLCP supports responsible stewardship and conservation of working lands, water, fish and wildlife, and agricultural production through: <ul style="list-style-type: none"> • Generating interest and awareness in easement programs and other options for conserving working lands. • Leveraging available monies to fund as many high-quality projects as possible. • Highlighting the ecological and economic value of working lands and the long-term opportunities for their conservation.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Texas HOME Disaster Relief	Federal	TDHCA	TDHCA	<p>The Texas HOME Disaster Relief Program is a long-term housing initiative designed to help eligible organizations assist income-qualified households affected by disasters. Funds are available for federal or state-declared disasters, as well as other natural or man-made events. It is the Department’s practice to maintain a HOME Disaster Relief Fund balance of \$1 million whenever possible. These funds may be used to support affected households located outside communities that receive HOME funds directly from the U.S. Department of Housing and Urban Development (HUD).</p>
Texas Longleaf Conservation Assistance Program	Federal	National Fish and Wildlife Foundation (NFWF)	TAMFS	<p>Provides eligible landowners with financial and technical assistance for establishing, enhancing, and managing longleaf pine. Landowners with property within 11 East Texas counties—including Angelina, Hardin, Jasper, Nacogdoches, Newton, Polk, San Augustine, Sabine, San Jacinto, Trinity, and Tyler—are eligible to apply. Approved participants may receive up to 50 percent payment not to exceed a standard cap rate, for implementing approved conservation practices. Approved conservation practices include prescribed burning, reforestation, site preparation, and forest stand improvement.</p>
Texas Infrastructure Resiliency Fund (TIRF)	State	TWDB	TWDB	<p>The purpose of this program is to provide loans, grants, and matching funds for flood projects through four separate accounts. It was enacted through Senate Bill 7 to address needs identified following the flood disasters of 2015, 2016, and 2017. Senate Bill 500 appropriated \$685 million to support the program. Each account serves a distinct purpose. The oversight entity is the Texas Infrastructure Resiliency Fund (TIRF) Advisory Board, with the SWIFT Advisory Committee and the Texas Division of Emergency Management (TDEM) Director as non-voting members.</p>
Texas Water Development Fund (DFund)	State	TWDB	TWDB	<p>Provides financing for various types of eligible infrastructure projects, including planning, design, acquisition, and construction of projects for: water supply (such as reservoirs and well fields), conservation, water quality enhancement, flood control, and wastewater. This program enables the Texas Water Development Board (TWDB) to</p>

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				fund multi-purpose projects (e.g., water and wastewater) through a single commitment. Eligible applicants include political subdivisions and nonprofit water supply corporations.
Transfers of Inventory Farm Properties to Federal and State Agencies for Conservation Purposes	Federal	USDA-FSA		Transfers the titles of certain inventory farm properties owned by the FSA to federal and state agencies for conservation purposes, including the restoration of wetlands and floodplain areas to reduce future flood potential.
Transportation Enhancement Program	Federal	FHWA	TXDOT	This program supports non-traditional transportation-related activities that extend beyond standard infrastructure initiatives. Eligible projects must demonstrate thoughtful integration with the surrounding environment, contributing meaningfully to community vitality, environmental quality, and the visual character of transportation corridors. Reimbursement of up to 80 percent of allowable costs is available for qualifying enhancement activities.
United States Geological Survey (USGS)	Federal	USGS		The U.S. Geological Survey (USGS) issues competitive grants and cooperative agreements to support research in earthquake hazards, the physics of earthquakes, earthquake occurrence, and earthquake safety policy.
Urban Tree Canopy Project (UTC)	Federal	USDA, USFS	TAMFS	The urban tree canopy (UTC) refers to the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. In urban environments, the UTC plays a crucial role in stormwater management by intercepting rainfall that would otherwise run off paved surfaces and enter local waterways through storm drainage systems, carrying pollutants along the way. Additionally, the UTC mitigates the urban heat island effect, reduces heating and cooling costs, lowers air temperatures, improves air quality, increases property values, provides wildlife habitat, and offers aesthetic and community benefits, including an enhanced quality of life.
Urban Waters Small Grants	Federal	EPA		Funding is allocated to improve urban water quality through activities that also support community revitalization and other local priorities,

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				which may include the implementation of green infrastructure.
USDA Conservation Programs	Federal	USDA/FSA		These programs ¹ work to address a large number of farming and ranching related conservation issues including drinking water protection, soil erosion reduction, wildlife habitat preservation, the preservation and restoration of forests and wetlands, and aiding farmers whose farms have been damaged by natural disasters.
U.S.- Mexico Border Water Infrastructure Program	Federal	EPA	TCEQ	Provides grant assistance to U.S. and Mexican communities located within 60 miles of the border for the development and construction of high-priority drinking water and wastewater facilities. The program furthers EPA's mission to protect human health and the environment by providing critical resources for what is often an area's first drinking water and basic sanitation services.
Water Research Grant Program	State	TWDB	TWDB	The Texas Water Development Board (TWDB) funds a variety of water planning and research studies and projects designed to support regional water planning efforts and address region-specific water resource questions.
Water Conservation Field Services Program	Federal	HUD	Texas A&M AgriLife	Encourage beneficiaries of federal water projects to conserve water and assists agricultural and urban water districts in developing and implementing water conservation plans in accordance with the Reclamation Reform Act (RRA) of 1982. Through the WCFSP, cost-shared financial assistance is available for developing water conservation plans, identification of water management improvements through System Optimization Reviews (SORs), design of water management improvements, and promotion of water conservation techniques through demonstration activities. WaterSMART also supports Reclamation's priorities to increase water reliability and resilience, advance racial and economic equity, and enhance water conservation, ecosystem health, and climate resilience.

¹ Programs include Conservation Reserve Program, Conservation Reserve Enhancement Program, Emergency Conservation Program, Emergency Forest Restoration Program, Farmable Wetlands Program, Grassland Reserve Program, Source Water Protection Program.

APPENDIX H: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Water2025 Challenge Grant Program for Western States	Federal	Bureau of Reclamation	TWDB	Provides up to \$25,000 in funding for projects that enhance water use efficiency and promote improved water management practices.
Watershed Processes and Water Resources	Federal	Bureau of Reclamation	TWDB	Promotes up to \$250,000 for projects that can be completed within 24 months and that reduce conflicts through water conservation, efficiency, and markets.
Watershed Processes and Water Resources – National Research Initiative Standard Research (Part T)	Federal	USDA	TWDB	Provides \$100,000 in funding to support research in two key areas: (1) understanding fundamental watershed processes; and (2) developing technologies and management practices that enhance the efficient use of water—both consumptive and non-consumptive—while protecting or improving water quality for agricultural and forestry production.
WaterSMART – Drought Response Program	Federal	USDA	TWDB	Provides \$500,000 to support innovative research focused on: (1) understanding the fundamental processes that influence the quality and quantity of water resources across diverse spatial and temporal scales; (2) improving water resource management in agricultural, forested, and rangeland watersheds; and (3) developing appropriate technologies to achieve these objectives.
Wetlands Protection – Development Grants	Federal	EPA		Provides funding to support the development and enhancement of state and tribal wetlands protection programs.
Wetlands Reserve Program	Federal	USDA, NRCS		Provides financial and technical assistance to protect and restore wetlands through the use of easements and restoration agreements.
Wildlife Habitat Incentive Program (WHIP)	Federal	USDA, NRCS	TPWD	A voluntary program for conservation-minded landowners seeking to develop and improve wildlife habitat on agricultural land, nonindustrial private forest lands, and tribal lands.



Adoption Resolutions

