

# ECTOR COUNTY

CITY OF ODESSA • CITY OF GOLDSMITH



## Multi-jurisdictional Hazard Mitigation Plan



2011-2016



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## Background



Ector County is a west Texas hub rich in heritage. Ector County is committed to providing the highest level of service to its citizens, and comprehensive planning is integral in realizing this goal

The Cities of Goldsmith and Odessa are host to schools, colleges, museums and other critical infrastructure, which are subject to natural and man-caused or technological hazards. 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 a hazard event from occurring, the impact of hazards can be lessened in terms of their effect on people and property. This concept is known as hazard mitigation, which is defined by the Federal Emergency Management Agency (FEMA) as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*<sup>1</sup>. Communities participate in hazard mitigation by developing hazard mitigation plans. The Texas Division of Emergency Management (TDEM) and FEMA have authority to review and approve of hazard mitigation plans through the Disaster Mitigation Act of 2000.



In order to mitigate against natural and technological hazards, the City of Odessa applied for a Hazard Mitigation Grant Program grant to develop a Hazard Mitigation Action Plan (hereinafter “HMAP” or “Plan”) for Ector County, Odessa and the City of Goldsmith.

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<sup>1</sup>[www.fema.gov](http://www.fema.gov)

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Once approved, the Plan will allow the County and participating jurisdictions to leverage funding under FEMA grant programs.

After receiving the grant award, the City of Odessa hired the consultant team of H2O Partners, Inc. and subcontractor PBS&J to write and develop the Plan, which provides an opportunity for Ector County and the cities of Odessa and Goldsmith to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

It is widely accepted that the most effective mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation plan addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

## Scope



This Hazard Mitigation Action Plan for Ector County and the Cities of Odessa and Goldsmith is intended as a blueprint for future hazard mitigation. This Plan is designed to help maintain a sustainable community that, when confronted by natural or man-caused disasters will sustain fewer losses and recover more quickly.

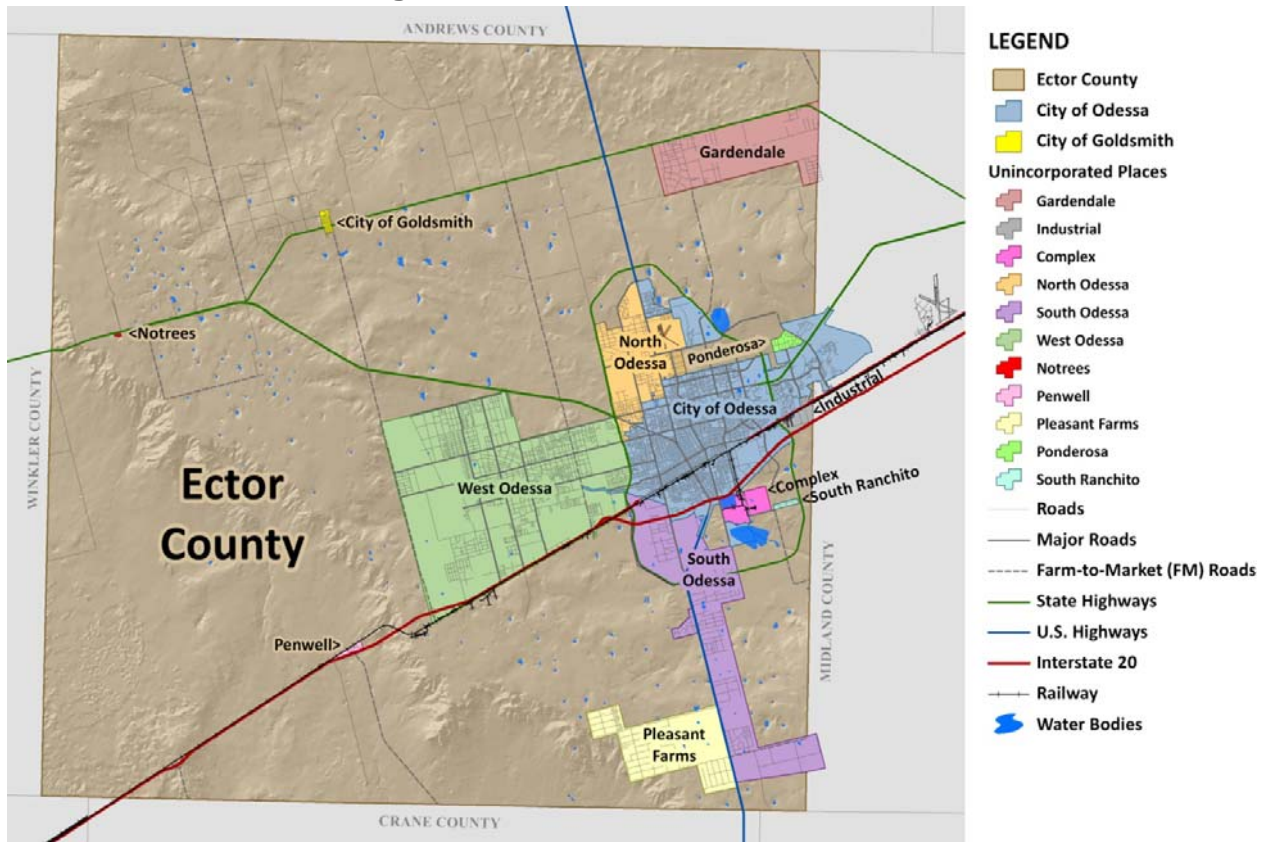
The focus of the Plan is to mitigate those hazards classified as “high” or “moderate” risk as determined through a detailed hazard risk assessment conducted for Ector County. Hazards that pose a “low” or “negligible” risk will continue to be evaluated during future updates to the plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables mitigation actions to be prioritized based on hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes all unincorporated areas within Ector County and the cities Goldsmith of Odessa as depicted in Figure 1-1.

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**Figure 1-1. Area Covered in the Plan**



## Purpose

The overarching goal of the Plan is to minimize or eliminate long-term risks to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. The purpose is twofold: to protect people and structures, and to minimize the costs of disaster response and recovery.

Through this Plan, the communities seek to:

- Create a comprehensive HMAP;
- Minimize disruption 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;

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- Serve as a basis for future funding that may become available through grant and technical assistance programs offered by the State or Federal government; and
- Ensure that Ector County, Odessa and Goldsmith maintain their eligibility for the full range of future Federal disaster relief.

The Mission Statement for the Plan is, *“Preparing for a secure future with proactive, strategic planning.”*

## Authority



The Plan will be tailored specifically for Ector County and the Cities of Odessa and Goldsmith and their planning partners<sup>2</sup>. When complete, the Plan will comply with all requirements promulgated by the 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). It will also comply with FEMA’s February 26, 2002 Interim Final Rule (“the Rule”) at 44 CFR Part 201 which specifies the criteria for approval of mitigation plans required in Section 322 of the DMA 2000. The plan will also be developed in accordance with FEMA’s Community Rating System (CRS) Floodplain Management Plan standards and policies.

## Summary of Sections

Sections 1 and 2 of the Plan outline the purpose and the process of development. Section 3 describes Ector County region in terms of population and demographics, economy and education among other subjects. This section is designed to provide a snapshot of the community and planning area to assist officials in recognizing factors that play a role in determining community vulnerability to hazards.

Section 4 begins the Risk Assessment and identifies the hazards facing the participating communities. Sections 5 and 6 complete the Risk and Vulnerability Assessment by profiling, analyzing and assessing the natural and man-caused hazards that present an overall risk to Ector County.

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<sup>2</sup> For a full list of planning partners, see Appendix A.

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Through an inventory of existing plans as well as a detailed questionnaire submitted by local officials, a Capability Assessment was developed to assess and examine each jurisdictions' capabilities, including: planning and regulatory capability; staff and organizational (administrative) capability; technical capability; fiscal capability; and political capability. Information from surveys and previous plans was compiled and analyzed to determine any existing gaps in planning capabilities. This information along with identified repetitive loss properties and NFIP compliance is found in Section 7.



Section 8 discusses mitigation strategy and consists of broad mitigation goal statements as well as an analysis of hazard mitigation techniques for the county to consider in reducing hazard vulnerabilities. The specific local mitigation actions are found in Section 9.

Section 10 identifies plan maintenance procedures. This includes the measures that each jurisdiction will take to ensure the continuous long-term implementation of the Plan. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

Appendix A contains a list of Planning Team members and stakeholders. Public survey results are analyzed in Appendix B. Appendix C contains a list of toxic sites for the area, and Appendix D lists critical facilities<sup>3</sup>. Appendix E contains documentation of meetings in the form of newspaper ads, sign in sheets and online announcements.

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<sup>3</sup> For privacy concerns, Appendix C and Appendix D will not be made available to the general public.



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## Plan Preparation and Development

Mitigation planning involves bringing together multiple components and players to create a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

### Overview of Plan Preparation

Ector County and the City of Odessa received funding under the Hazard Mitigation Grant Program to create a Hazard Mitigation Plan. The Plan was developed in accordance with the provisions of the Disaster Mitigation Act of 2000 (Public Law 106-390), the Pre-Disaster Mitigation Grant Program, 44 Code of Federal Regulations Part 206, and the planning standards adopted by the Texas Division of Emergency Management.

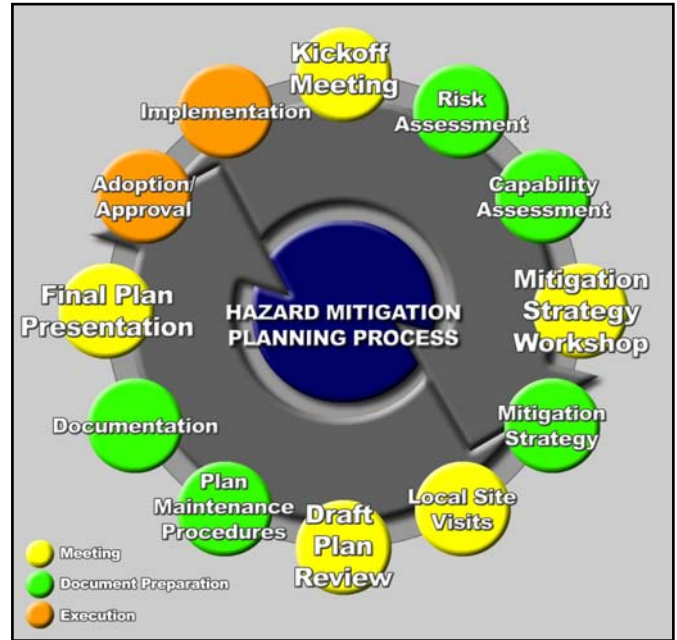
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The planning process began in March of 2009 with a Kickoff Workshop at the Odessa Police Department.

At this workshop and other meetings following this initial workshop, the following factors were taken into consideration when developing the Plan:

- Identifying hazards
- existing vulnerabilities
- goals
- implementation resources
- How communities, agencies and partners will be able to implement a plan.



## Planning Team

The planning team was established using a direct representation model. Key members of the City of Odessa, Ector County, and H2O Partners, Inc. developed the plan. Several partners in planning were also instrumental at meetings throughout the process. These team members included representatives from City and County Departments, including the City of Goldsmith, Odessa College, UT Permian Basin, Odessa Regional Medical Center, and the Medical Center Hospital. A complete list of planning team members as well as a list of stakeholders can be found in Appendix A. Some of the responsibilities of the planning team included: providing input regarding the identification of hazards, creating mitigation goals, and developing mitigation strategies.

## Planning Process

The process used to prepare this Plan included four (4) major steps that were applied and completed beginning in January of 2010. Each of these planning steps resulted in critical work products and outcomes that collectively make up the Plan. Documentation for participation at each workshop is found in Appendix E.

## Kickoff Workshop

The initial Kickoff Meeting was held at the Odessa Police Department headquarters building on March 30, 2009. This initial meeting was an opportunity to inform participants about the planning process, develop a timeline, solicit input about the previous plan and



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collect critical information. In addition to the Kickoff presentation, all team members received presentation materials with the following information:

- background paperwork about the plan;
- public participation survey for distribution<sup>1</sup>; and
- capability assessment survey for completion

## Hazard Identification

Planning team members developed the list of significant hazards included in this Plan by reviewing: the State of Texas Hazard Mitigation Plan and initial results from reputable



sources such as federal and state agencies. Based on this initial analysis, the team identified a total of fifteen (15) natural and man-caused hazards that could affect the area.

## Risk Assessment

An initial risk assessment for the County was completed in October of 2009, with the final product produced in November of 2009. The results of the assessment were presented at the Risk Assessment

Workshop held on November 12, 2009. Participants and stakeholder groups were invited. At this workshop, the characteristics and consequences of each hazard were evaluated to determine how much of the area would be affected, in terms of potential danger to property and citizens.

Potential dollar losses from each hazard were estimated, using the Federal Emergency Management Agency's Hazards U.S. (HAZUS) Multi-Hazards (MH) Model (HAZUS-MH) and other HAZUS-like modeling techniques. The assessments examined the impact of various hazards on the built environment, including on general building stock (e.g., residential, commercial, industrial), 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. Each participant was also given a risk ranking sheet where hazards were ranked in terms of the probability or frequency of occurrence,

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<sup>1</sup> This survey was also posted on five regional websites and promoted from April 2009 to January 2010.

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extent of spatial impact, and magnitude of impact. The assessments were also used to set priorities for mitigation based on potential dollar losses and loss of lives.

## Mitigation Development

The mitigation strategy development involved prioritizing mitigation goals and developing mitigation actions. A Mitigation Workshop was held at the same location on December 10, 2009.

In the creation of mitigation actions, team members evaluated and prioritized actions based on FEMA's STAPLE+E criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors that are necessary for the implementation of each action. As a result of this exercise, an overall priority was assigned to each mitigation action. The overall priority was denoted within each action by team members identifying actions as High (H), Moderate (M), or Low (L) as shown in Section 9.

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

## Review and Incorporation of Existing Plans

A variety of existing studies, plans, reports, and technical information were reviewed as part of the planning process. Sources of the information included FEMA, the United States Army Corps of Engineers (USACE), Center for Disease Control (CDC), the Texas Forest Service, 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 State Comptroller, the Texas State Data Center, the Texas Railroad Commission and information provided by the Texas Division of Emergency Management (TDEM).

The hazard-specific sections of the Plan (Sections 4-6) summarize the findings from sources such as the National Climatic Data Center (NCDC) through NOAA's website, which provided histories of disasters in the area.

Materials from FEMA and the Texas Division of Emergency Management were reviewed and referred to throughout the planning process for guidance on plan development

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requirements. Existing plans were also reviewed by planning team members as a source of hazard information and potential mitigation actions.

## Public and Stakeholder Involvement

An important component of mitigation planning is public participation and stakeholder involvement. The draft of the Plan will be made available on the Ector County and City of Odessa websites for review and comment by team members, stakeholders and the general public.

### Public Participation

Public involvement in the development of the Plan was sought at three separate periods of the planning process<sup>2</sup>: (1) during the beginning of the planning process; (2) during the drafting stage of the Plan; and (3) will be made available upon completion of a final draft Plan but prior to official plan approval and adoption.

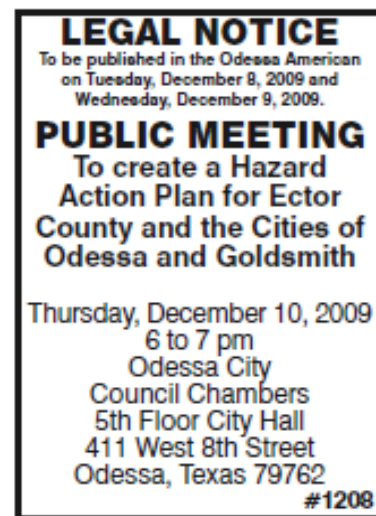
### Locations and Notification of Public Meetings

Three open public meetings were held during the development of this Plan. Meetings were held in the City Council Chambers in Odessa City Hall at 6 pm on the evenings of March 30, 2009, November 12, 2009, and December 10, 2009.

The meetings were advertised through a variety of means including: notices in the Odessa American newspaper; invitations were sent via e-mail to community members; notices were posted at the Ector County Public Library, Odessa City Hall, and the Ector County Courthouse, Library, and Annex.

### Public Meetings

Three public meetings were held to give the public an opportunity to learn about the hazards they face and ways to protect themselves and their families and to provide an opportunity for public input into the Plan. These meetings were scheduled specifically for seeking public and



<sup>2</sup> Documentation of meeting attendance and notices for meetings is found at Appendix E

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stakeholder input. Topics of discussion included the purpose of hazard mitigation; the reason for the plan; and options for hazards both natural and man-caused.

## Public Participation Survey

In addition to the open public meetings, the County was able to solicit input from citizens and stakeholders through the use of a public participation survey. This survey was designed to obtain data and information from residents in the Cities of Odessa, Goldsmith, and Ector County.

Copies of the public participation survey were distributed at each of the public meetings and made available online at five websites; Ector County, City of Odessa, Odessa Regional Hospital, Medical Center Hospital, and the Red Cross of Southwest Texas. A total of 303 responses to the survey were received either from hard copies filled out, or surveys completed online. The information received provided valuable input in the development of the Plan, and a summary of the survey findings is provided in Appendix B.

## Stakeholder Involvement

Stakeholders provide an essential service in hazard mitigation planning; therefore, throughout the planning process, members of state and federal agencies, community groups, local businesses, schools, and hospitals were invited to workshops held throughout the planning process.

The Kick Off meeting provided a stakeholder meeting platform. It was held on March 31, 2009 at Odessa Police Department headquarters. At this meeting attendees were informed of the process and invited to the Risk and Mitigation Workshops as well as all future public meetings. A full list of stakeholders is included at Appendix A.



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## Overview

Ector County is located in the Heart of the Permian Basin. It is 321 miles west of Fort Worth and 280 miles east of El Paso. The county is a 901 square mile area<sup>1</sup> having 134 persons per square mile. It is landlocked and bound by Andrews, Midland, Upton, Crane, Ward, and Winkler Counties. While no major rivers runs through Ector County, it is situated on the boundary of two major river basins. The southwestern half is in the Rio Grande River Basin and the northeast half is in the Colorado River Basin. The waters of the Colorado River are nearly 50 miles to the north east and a tributary of the Pecos River begins at the southern border of the County and flows southerly to eventually meet the Rio Grande.



Ector County was named after Matthew Ector, a Confederate General. It was organized in 1886 and platted in 1891. The City of Odessa is the county seat with a population 131,941 (Census 2000). The City of Goldsmith is far smaller having only a population of 241. Odessa, Goldsmith, and the unincorporated areas of Ector County are participating in this Plan. The participating jurisdictions range

<sup>1</sup> United States Census Bureau



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from larger urbanized areas to small rural communities out on the open desert plains. In a 900 square mile area, the hazards each community faces will be similar thereby allowing for an in depth look at community resources, mitigation needs, and mitigation projects to reduce the threat of the natural and man-caused hazards discussed in Sections 4-6 of this Plan. This section looks at a general profile of the county as a whole, providing data where available for each jurisdiction, including:

- Population and Demographics;
- Housing and Household Income; and
- Economy and Industry



## Population and Demographics

The population distribution (based on the United States Census Bureau for 2000) for Ector County is depicted in Figure 3-1 on the following page. This image displays the county as a whole, including unincorporated areas and the two participating jurisdictions of Odessa and Goldsmith. Census 2000 data was used to determine population distribution, as it was collected at the census block level. Table 3-1 below provides a numeric breakdown of the population by jurisdiction, including a breakdown of the special needs population (elderly and low income).

**Table 3-1. Population Distribution and Special Needs by Jurisdiction**

JURISDICTION	TOTAL POPULATION (CENSUS 2000)	ESTIMATES OF SPECIAL NEEDS POPULATIONS	
		Elderly (Over 65)	Low Income (< \$20,000)
City of Odessa	90,943	10,548	10,740
City of Goldsmith	253	14	8
Unincorporated Ector County	29,927	2,798	3,393
<b>TOTALS</b>	<b>121,123</b>	<b>13,360</b>	<b>14,141</b>

Source: HAZUS-MH MR4

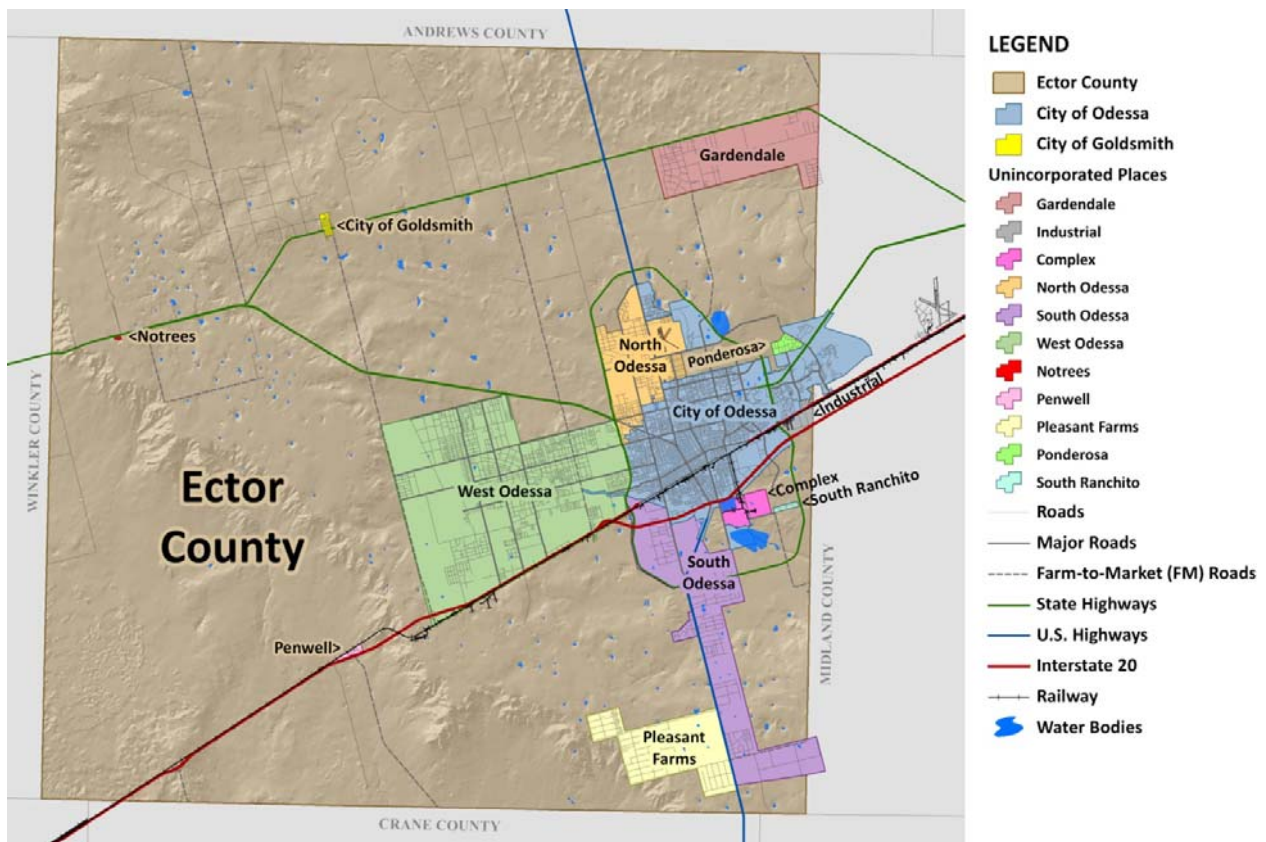
All areas of Ector County are covered in this risk assessment, including small portions of the City of Odessa and the community of South Odessa that extend into neighboring Midland

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County. Named places within unincorporated Ector County that are discussed in this risk assessment and shown on the map illustrations include: Gardendale, Complex, Industrial, North Odessa, Notrees, Penwell, Pleasant Farms, Ponderosa, South Odessa, South Ranchito and West Odessa. Other named places that are referenced in the hazards history data presented in this risk assessment include: Greenfield Acres, North Cowden and Westover.

**Figure 3-1. Map for Ector County**



Population estimates from 1970 to 2007 and population projections from 2010 to 2040 are listed in Table 3-2 and illustrated in Figure 3-2 respectively, as provided by the U.S. Census Bureau. Over the past four decades, Ector County population has increased 42%. By 2040, the county's population is projected to increase 25 percent of the 2008 population, for a projected population count of 163,093.

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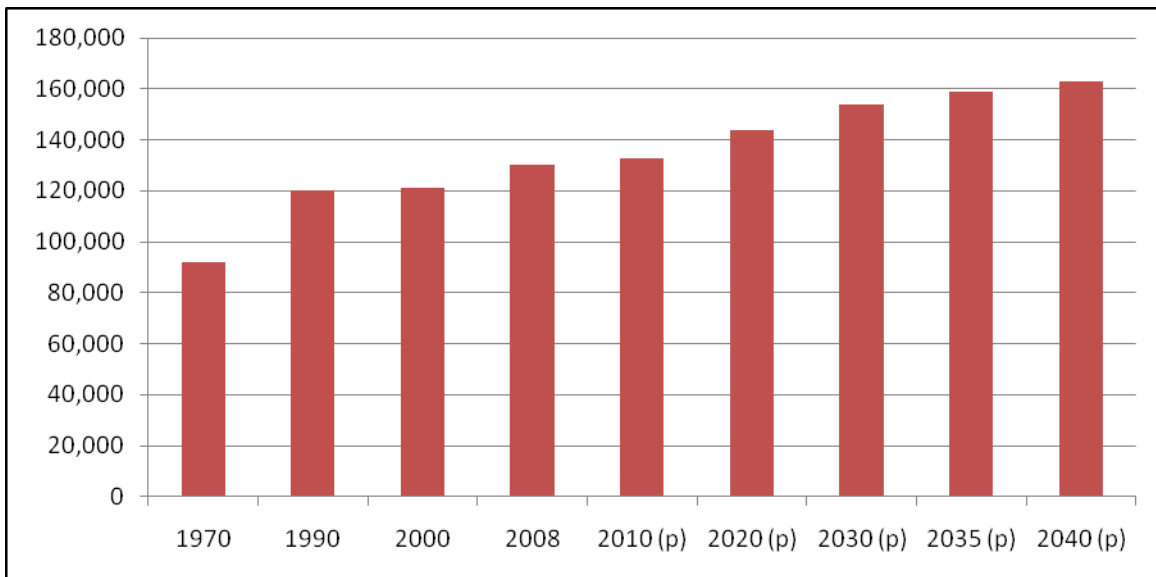
**Table 3-2. Ector County Population Projections and Estimates**

Year	Population	
	Ector County	State of Texas
1970	91,805	11,196,730
1990	119,934	16,986,510
2000	121,123	20,851,820
2008	130,333	23,614,497
2010 (p)	132,775	24,330,646
2020 (p)	143,926	28,005,740
2030 (p)	153,884	31,830,575
2035 (p)	158,776	33,789,697
2040 (p)	163,093	35,761,165

(p) = population projection

Source for projections-<http://txsdc.utsa.edu/cgi-bin/prj2008totnum.cgi>

**Figure3-2. Ector County Population Projections and Estimates**



(p) = population projection

Table 3-3 provides the estimated population density by square mile during 1970 to 2008, and projected population density from 2010 to 2040, as tabulated by the U.S. Census



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Bureau. As of 2008, the population density in Ector County was 145 people per square mile. By 2040, the population density is projected to increase to 181 people per square mile; an increase of 25 percent.

**Table 3-3. Estimated and Projected Population Density**

Year	Population	Population Density (Per Sq Mile)
1970	91,805	102
1990	119,934	133
2000	121,123	134
2008	130,333	145
2010 (p)	132,775	147
2020 (p)	143,926	160
2030 (p)	153,884	171
2035 (p)	158,776	176
2040 (p)	163,093	181

## Ethnicity

The ethnic makeup of Ector County according to estimates for 2008 by the United States Census Bureau is shown in Table 3-4 below.

**Table 3-4. 2008 Ethnicity - Ector County**

Description	Percentage <sup>2</sup>
Hispanic Alone	50.6
White Alone	92.2
African American Alone	4.8
American Indian and Alaska Native Alone	1.1
Asian Alone	0.8
Native Hawaiian/Pacific Islander Alone	0.1
Multi-Racial	1.0

<sup>2</sup> Total Percent equals more than 100 as some individuals indicate more than one race.

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Table 3-5 depicts numerical and percent change among ethnic and racial groups for Ector County, while Table 3-6 displays ethnic makeup for the entire state. From 2000 to 2040 it is estimated that the Anglo population in Ector County will decrease by 39 percent, compared to a 4 percent increase statewide. The Hispanic population is projected to increase by 125 percent by 2040 for the county and by 182 percent for the State. African-Americans and other racial and ethnic groups are also projected to increase by proportions ranging from 41 to 196 percent for both state and county estimates (See Tables 3-5 and 3-6).

**Table 3-5 Present and Projected Ethnic and Racial Composition of Ector County, 2000-2040<sup>3</sup>**

Ethnicity	2000	2010	2020	2030	2040	Numerical Change	Percentage Change
White	62,823	58,176	52,343	45,328	38,481	-24,342	-39%
African American	5,577	6,114	6,467	6,792	6,970	+1,393	+25%
Hispanic	51,306	66,818	83,234	99,706	115,524	+64,218	+125%
Other	1,417	1,667	1,882	2,058	2,118	+701	+49%
All	121,123	132,775	143,926	153,884	163,093	41,970	+40%

Source: US Census

**Table 3-6. Present and Projected Ethnic and Racial Composition of the State of Texas, 2000-2040<sup>4</sup>**

Ethnicity	2000	2010	2020	2030	2040	Numerical Change	Percent Change
White	11,074,716	11,533,976	11,796,448	11,789,274	11,525,089	450,373	4%
African American	2,421,653	2,754,751	3,052,417	3,268,623	3,403,163	981,510	41%

<sup>3</sup> Source: Texas State Data Center and Office of State Demographer, Institute for Demographic and Socioeconomic Research (IDSER)

<sup>4</sup> Source: Texas State Demographer, IDSER

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Ethnicity	2000	2010	2020	2030	2040	Numerical Change	Percent Change
Hispanic	6,669,666	9,080,459	11,882,980	15,140,100	18,804,311	12,134,645	182%
Other	685,785	961,460	1,273,895	1,632,578	2,028,602	1,342,817	196%
All	20,851,820	24,330,646	28,005,740	31,830,575	35,761,165	14,909,345	106%

Source: US Census

## Age

According to US Census estimates for the year 2007, the median age for persons living in Ector County is 25 to 34 years totaling 14.9 percent of the County's population. Concurrently, the median age of the State is the same with 15 percent of the State's population. Members of Ector County's population aged 17 and under and 65 and older are slightly higher than the State's. The 2000 Census results for age for Ector County are depicted in Table 3-7 below.

**Table 3-7. Age of Population in Ector County**

Ector County	Number	Percent	Percent	Number	Texas
Under 5 years	11,698	9.1%	8.0%	1,906,500	Under 5 years
5 to 9 years	9,930	7.7%	7.1%	1,704,137	5 to 9 years
10 to 14 years	9,263	7.2%	7.2%	1,721,492	10 to 14 years
15 to 19 years	10,213	8.0%	7.7%	1,840,936	15 to 19 years
20 to 24 years	10,256	8.0%	7.6%	1,817,622	20 to 24 years
25 to 34 years	18,186	14.2%	15.0%	3,574,817	25 to 34 years
35 to 44 years	15,070	11.8%	14.6%	3,483,444	35 to 44 years

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Ector County	Number	Percent	Percent	Number	Texas
45 to 54 years	17,043	13.3%	13.6%	3,248,945	45 to 54 years
55 to 59 years	6,953	5.4%	5.3%	1,277,760	55 to 59 years
60 to 64 years	5,251	4.1%	4.1%	981,731	60 to 64 years
65 to 74 years	7,562	5.9%	5.4%	1,285,874	65 to 74 years
75 to 84 years	5,122	4.0%	3.3%	778,616	75 to 84 years
85 years and over	1,674	1.3%	1.2%	282,506	85 years and over

## Education

Ector County Independent School District comprises the County with a student population of 27,394<sup>5</sup>. The county is also home to one college and one university, Odessa College and the University of Texas of the Permian Basin. Table 3-8 depicts level education by jurisdiction based on U.S. Census data.

**Table 3-8. Level of Education**

Jurisdiction	High School Diploma or higher (%)	Bachelor's Degree or higher (%)
Goldsmith	72.4	1.8
Odessa	70.7	14.7
Ector County	68.0	12.0
Texas	75.7	23.2

## Housing and Household Income

According to the 2000 U.S. Census, the 43,846 total households in Ector County increased to 45,982 by 2008. Of these, nearly 41 percent had children under the age of 18 living with

<sup>5</sup> Source: <http://nces.ed.gov/surveys/sdds/ed/index.asp?st=TX>

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them in 2008 and 22 percent had individuals over the age of 65. The average household size in year 2000 was 2.72 persons, while the average family size was 2.77 persons. Income estimates from the Texas Comptroller report the median household income for the county has increased to \$66,969 dollars from \$41,080 dollars in 2000.

**Table 3-9. Households**

	City of Odessa		City of Goldsmith		Ector County	
	2000	2008	2000	2008	2000	2008
<b>Total number of households</b>	33,661	35,096	101		43,846	45,982
<b>Households with individuals under 18 years</b>	42.2%	40.7%	38.8%	Data set not available	43.4%	40.9%
<b>Households with individuals 65 years and over</b>	22.7%	22.7%	31.7%		22.0%	22.3%
<b>Average household size</b>	2.65	2.72	2.50		2.72	2.77
<b>Average household income</b>	\$42,225	\$69,000	\$43,329		\$68,392	\$41,080

Source: US Census and Texas Comptroller

## Economy and Industry

The economy and industry of Ector County has continued to develop in spite of the recent national economic downturn. The average wage per job was estimated at \$44,310 dollars in 2008 compared to \$27,178 dollars in 2000. However, unemployment rates for the county decreased from 5.8 percent in 2004 to 3.4 percent in 2008. The unemployment rate decreased from 2005 to 2008 is in part due to the fact that the leading industry is mining; an

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industry that will induce market-wide fluctuations and not suffer them. Mining had an average wage per job of \$70,485 in 2008. It is the leading industry of this region and increases in the number of jobs reflects how mining is at least in part insulated from the recent economic downturn felt State wide.

**Table 3-10. Economic Growth by Jurisdiction<sup>6</sup>**

Jurisdiction	2002 jobs	2009 jobs	% change
Odessa	50,308	63,095	+ 25%
Goldsmith	159	251	+ 58 %
Ector County	50,733	63,791	+ 26%
State of Texas	9,460,829	10,588,862	+ 12%

Source: Texas Comptroller

Employment growth rate for the county from 2005 to 2008 increased three percent from 2.8 percent to 5.8 percent. Economic growth by year is depicted in Table 3-11 below. Per capita income grew by 31.3% between 1997 and 2007 (adjusted for inflation).

The US Census (2000) reported the largest industry in the county was mining; however, industries for the area vary by each jurisdiction. Table 3-11 lists main local industries in order of prominence for each community, as well as median income.

**Table 3-11. Industry and Per Capita Income by Jurisdiction<sup>7</sup>**

Jurisdiction	Median Income (per capita)	Major Industries (by number of jobs)
Odessa	\$42,585	Mining, Retail trade, Construction, Wholesale trade
Goldsmith	\$72,864	Mining, Transportation and warehousing, Wholesale trade
Ector County	\$42,790	Mining, Retail trade, Construction, Wholesale trade
State of Texas	\$45,329	Retail trade, Manufacturing, Construction,

<sup>6</sup> Texas Comptroller's Office

<sup>7</sup> Texas Workforce Commission and Texas Comptroller's Office

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<b>Jurisdiction</b>	<b>Median Income (per capita)</b>	<b>Major Industries (by number of jobs)</b>
		Wholesale trade

Source: Texas Comptroller, 2009

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This is the first section of the risk assessment, which also includes hazard profiles found in Section 5 and the vulnerability assessment found in Section 6. The purpose of this section is to provide background information for the hazard identification process as well as descriptions for the natural and technological hazards identified.

## Hazards Considered

After the initial Kickoff workshop, and upon a review of the full range of natural hazards suggested under FEMA planning guidance, Ector County identified fifteen hazards to be addressed in the Plan. These hazards were identified through an extensive process utilizing input from planning team members, research of past disaster declarations and a review of the current State of Texas Hazard Mitigation Plan (“State Plan”). Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information as needed.

## Disaster Declarations

In order to identify risks to the area, an examination of historic trends was conducted for relevant background information. This included reviewing disaster declarations for the area.

The State of Texas claims the highest number of disaster declarations, at 83, for any state or territory from 1953 to 2008. From 2000 to 2008, the state experienced fifteen declared disasters, including Hurricanes Dolly and Ike. In 2008 alone the state suffered 36 fatalities, 103 injuries and over 15 million dollars worth of property damage.



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Ector County, has had a significantly lower amount of declarations than the state as a whole. Table 4-1 lists disaster declarations from 1991 to 2009 for Ector County.

**Table 4-1. Disaster Declarations for Ector County, Texas (1991-2009)<sup>1</sup>**

Year	Event	Declaration Number
2008	Texas Wildfires	DR 3284
2008	South Odessa Fire	DR 2745
2006	Extreme Wildfire Threat	DR 1624
2005	Hurricane Rita <sup>2</sup>	DR 1606
2005	Hurricane Katrina <sup>3</sup>	DR 1425
1999	Extreme Fire Hazard	DR 3142

## State and Local Plan Review

In addition to the Presidential Disaster Declarations depicted in Table 4-1, Ector County has experienced many small-scale hazards. Because these smaller scale disasters threaten public safety and can cost the county and city governments, businesses and residents millions of dollars in direct and indirect damages, an extensive range of hazards were considered in the identification process. This included an evaluation of the State Plan and federal and state resources.

Table 4-2 on the following page lists the full range of natural and technological hazards initially identified for consideration. The table documents the evaluation process used for determining the significance of each hazard. Only hazards identified as significant were included in the Plan. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

**Table 4-2. Hazard Identification Process**

Hazard Considered	Identified as Significant	Reason for Determination
Dam Failure	NO	The National Inventory of Dams shows only three dams for the County, all of which are low risk.

<sup>1</sup> Data is unavailable for declarations by county prior to 1991.

<sup>2</sup> Ector County was not directly affected by Rita, but all counties in Texas were declared for Public Assistance for debris removal and emergency protective measures.

<sup>3</sup> All Texas counties declared.

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<b>Hazard Considered</b>	<b>Identified as Significant</b>	<b>Reason for Determination</b>
Drought	YES	Drought is included as a threat in the State Plan and can occur throughout the state. The County experienced a period of extreme drought in 2009.
Earthquake	YES	According to the National Geophysical Data Center (NGDC), earthquake is a low risk for Ector County. However two previous events have been recorded for the area.
Expansive Soils	NO	According to the State of Texas Mitigation Plan, expansive soils are a threat for coastal counties; therefore Ector County is not at risk.
Extreme Heat	YES	Extreme Heat is included in the State Plan and has a high frequency of occurrence.
Flood	YES	While flooding is a lower threat due to the low frequency of occurrence, because of the geography of the County, there is a potential for high floodwaters in a short amount of time.
Hail	YES	Federal sources, including FEMA, list Ector County as a moderate risk for frequency of hail events.
Hazardous Materials Release	YES	The County has toxic sites, and although releases are rare, an occurrence can have a substantial effect.
High Wind	YES	The County is located in a Wind Zone III, with the possibility of winds reaching up to 200 mph.
Infectious Disease/Pandemic	YES	Communicable diseases can occur at any geographic location.
Land Subsidence	NO	There is no historical occurrence of land subsidence. Due to the geography and structures of the County, land subsidence is an extremely low risk according to geologists at the University of Texas of the Permian Basin.
Lightning	YES	Lightning separate from thunderstorm events will be addressed in this Plan due to the high frequency of occurrence of lightning storms for the area.
Pipeline Failure	YES	Fuel pipelines are located throughout the County, and incidents of failure have occurred, according to the Texas Railroad Commission.
Terrorism	YES	Although there has been no past occurrence in the County, the potential impact of a Terrorism event could be great.
Thunderstorm	YES	Thunderstorms have a high frequency of occurrence for the County.
Tornado	YES	Federal and state sources indicate tornadoes are a threat to

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Hazard Considered	Identified as Significant	Reason for Determination
		the area.
Winter Storm	YES	Review of the State Plan and the NOAA National Climatic Data Center (NCDC) indicate that winter storms are a significant threat.
Wildfire	YES	Included in the State Plan; high probability of occurrence.

## Hazard Descriptions

The fifteen hazards identified as significant according to Table 4-2 are divided into two main categories: natural and technological. Natural hazards include hazards categorized as atmospheric, hydrologic, and other.

Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards identified as significant include: extreme heat; hail; high wind events; lightning; severe thunderstorms; tornadoes; and winter storms. 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 include drought and inland flooding. For the purposes of the risk assessment, “other” natural hazards consist of earthquake, wildfire and infectious disease.

The term “technological hazards” refers to the origins of incidents that can arise from human activities such as the use of gas and oil pipelines; the manufacture, transportation, storage, and use of hazardous materials; and an act of terrorism. These hazards are distinct from natural hazards primarily in that they originate from human activity. While the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced.

Table 4-3 provides descriptions for each of the natural and technological hazards included in the Plan.

**Table 4-3. Hazard Descriptions**

Hazard	Description
ATMOSPHERIC	

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Hazard	Description
<b>Extreme Heat</b>	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period.
<b>Hailstorm</b>	Any storm that produces hailstones that fall to the ground; usually used when the amount or size of the hail is considered significant.
<b>High Wind</b>	An event with sustained wind events of 40 m.p.h. or greater, lasting for one hour or longer; or an event with winds of 58 m.p.h. or greater for any duration.
<b>Lightning</b>	An abrupt, discontinuous natural electric discharge in the environment.
<b>Thunderstorm</b>	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms.
<b>Tornado</b>	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.
<b>Winter Storm</b>	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 miles per hour, 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.
<b>HYDROLOGIC</b>	
<b>Drought</b>	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.
<b>Flood</b>	The accumulation of water within a water body, 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, or shallow flooding.
<b>OTHER</b>	
<b>Earthquake</b>	An earthquake is a tremor of the earth's surface usually triggered by the release of underground stress along fault lines. This release causes movement in masses of rock and resulting shock waves.

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Hazard	Description
<b>Wildfire</b>	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.
<b>TECHNOLOGICAL</b>	
<b>Hazardous Materials Release</b>	Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. A hazardous material (HAZMAT) incident involves a substance outside normal safe containment in sufficient concentration to pose a threat to life, property, or the environment.
<b>Pipeline Failure</b>	An estimated 2.2 million miles of pipelines in the United States carry hazardous materials such as oil and natural gas. Pipelines are out of sight and unnoticed, yet have caused fires and explosions that have killed more than 200 people and injured more than 1,000 people nationwide in the last decade.
<b>Infectious Disease/Pandemic</b>	Illness due to a specific infectious agent or its toxic products that arises through transmission of that agent or its products from an infected person, animal, or reservoir to a susceptible host, either directly or indirectly through an intermediate plant or animal host, vector, or the inanimate environment.
<b>Terrorism</b>	Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.

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## Overview

This section contains profiles for the natural and technological hazards identified in Section 4. Each hazard is discussed in terms of location, extent, historical occurrences and probability of future events, including any specific or detailed items noted by the planning team as it relates to historical hazard information. A full vulnerability assessment for each is included in Section 6.

The detailed profiles in this section are discussed according to category, and included in the following order:

- Atmospheric
  - Extreme Heat
  - Hail
  - High Wind
  - Lightning
  - Thunderstorm
  - Tornado

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- Winter Storm
- Hydrologic
  - Drought
  - Flood
- Other Natural Hazards
  - Earthquake
  - Wildfire
- Technological / Man-Caused
  - Hazardous Materials Release
  - Pipeline Failure
  - Infectious Disease
  - Terrorism

## Extreme Heat

Extreme heat during the summer months is a common occurrence throughout the State of Texas, and Ector County is no exception. The unincorporated areas of the County and the Cities of Goldsmith and Odessa typically experience extended heat waves.



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 severe summer 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.

### Location

Though injuries or deaths from extreme heat have been recorded at different locations throughout the County, there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur at any area of the County.

### Extent

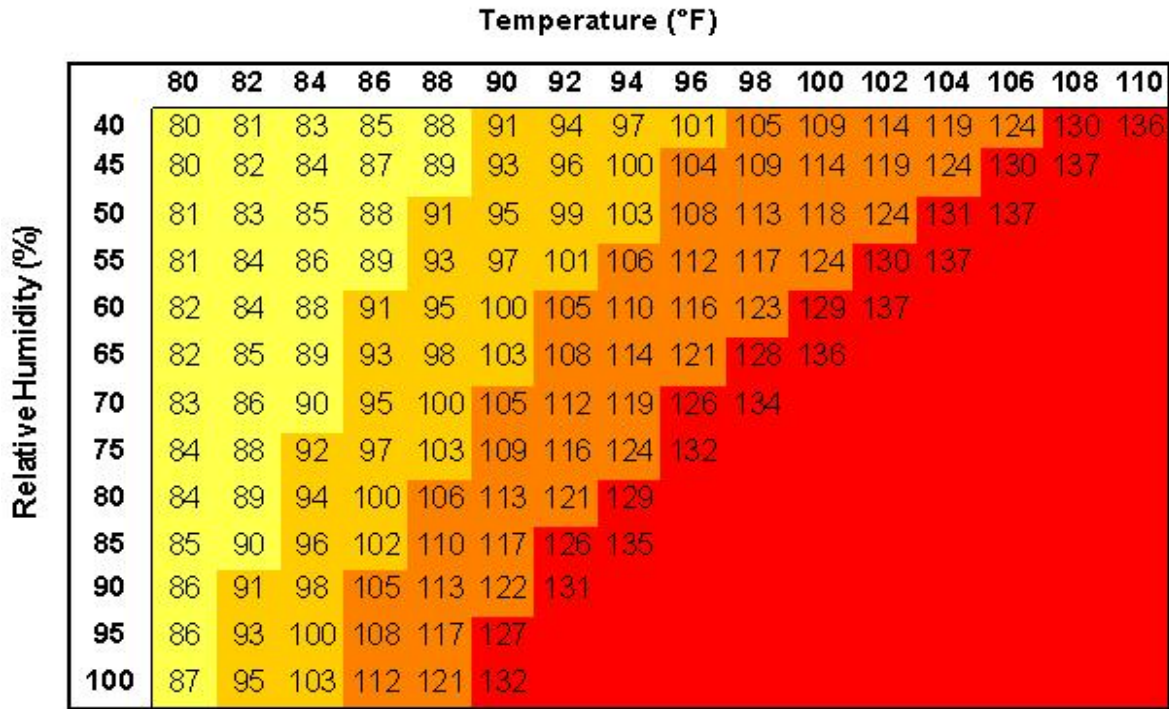
The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index,” and is depicted

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in Figure 5-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

**Figure 5-1. Extent Scale for Extreme Summer Heat**



**Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity**

■ Caution   
 ■ Extreme Caution   
 ■ Danger   
 ■ Extreme Danger

The extent scale in Figure 5-1 displays varying degrees of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit 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 level of intensity where fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps or heat exhaustion are possible, whereas 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 5-1.



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**Table 5-1. Heat Index & Warnings**

Category	Heat Index	Possible heat disorders	Warning
Extreme Danger	130° F and higher	Heat stroke or sun stroke likely.	A heat advisory will be issued to warn that the Heat Index may exceed 105° F.
Danger	105 – 129° F	Sunstroke, muscle cramps, and/or heat exhaustion are likely. Heatstroke possible with prolonged exposure and/or physical activity.	
Extreme Caution	90 – 105° F	Sunstroke, muscle cramps, and/or heat exhaustion 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.
Caution	80 – 90° F	Fatigue is possible with prolonged exposure and/or physical activity.	

Most of the County is relatively flat with small areas of slightly rolling hills. The area is known for its stark flat landscape. There are few naturally occurring trees, the majority of which are mesquite trees that more closely resemble large bushes. Due to its geography, and its warm, sunny, semiarid climate, Ector County 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. Also at risk are those working or remaining outdoors.

## Previous Occurrences

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the US. Mortality from all causes increases during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Preliminary data suggest that by August 21, 2009, record high summer temperatures in Texas resulted in more than 120 heat-related deaths statewide. Texas residents comprised 70 of these deaths. The United States Immigration and Naturalization Service reported that 51 foreign nationals died along the Texas/Mexico border. None of the reported deaths occurred in Ector County. Table 5-2 depicts historical occurrences of mortality from heat from 1994 to 2004 from the Texas Department of State Health Services.

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**Table 5-2. Deaths due to Extreme Heat – Texas (1999-2004)**

State	1999	2000	2001	2002	2003	2004	TOTAL
TEXAS	67	81	42	58	62	53	363

Because the Texas Department of State Health Services reports on total events statewide, previous occurrences for extreme heat and all other natural hazards for the County are derived from the National Climatic Data Center (NCDC). The NCDC is a national data source organized under the National Oceanic and Atmospheric Administration. The NCDC is the largest archive available for climate data; however, the only incidents recorded are those that are reported to the NCDC. In the tables that follow throughout this section, some occurrences seem to appear multiple times in one table. This is due to reports from various locations throughout the County. In addition, property damage estimates are not always available. When this occurs, estimates are provided. Where an estimate has been provided in a table for losses, the dollar amounts have been altered to indicate the damage in 2009 dollars.

According to heat related incidents located solely within Ector County, from the NCDC reports, there is one heat wave<sup>1</sup> on record for Ector County. This event occurred between June 25, 1994 and June 30, 1994. The forecast zone impacted by this event consisted of over 60 counties and “areas” including Ector County and caused a reported \$75,724 in crop damages throughout this region. An area of strong high pressure caused a record heat wave across West Texas; high temperatures in most areas were between 105 and 110 degrees each day, setting many daily and monthly records (and all-time records as well). June 27 was one of the hottest days, with most towns in West Texas experiencing heat between 110 and 120 degrees. All-time records were set on June 27 in Midland (in neighboring Midland County) at 116 degrees.

## Probability of Future Events

The likelihood or future probability of excessive summer heat in Ector County is high, meaning there is more than a 50 percent chance of an event in any given year.

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<sup>1</sup> Even though the County experiences heat waves each summer, NCDC data only records events reported. Based on reports, only one event is on record.

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## Hail

Hailstorms are a potential 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 the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until having developed sufficient weight they fall as precipitation—as balls or irregularly shaped masses of ice greater than 0.75 inches in diameter. The size of hailstones is a direct function 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 function of the intensity of heating at the Earth’s surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

## Location

Hailstorms can vary greatly in terms of size, location, intensity and duration but are considered frequent occurrences throughout the County. Figure 5-2 shows average number of days for damaging hail over a 20-year period, as compiled from hail reports from the 1950’s to 1990s by the Institute for Business and Home Safety (IBHS)<sup>2</sup>. From the estimates, Ector County can expect an average of three to six days of hail damage per year. It is assumed that all areas of the County are uniformly exposed to hailstorms.

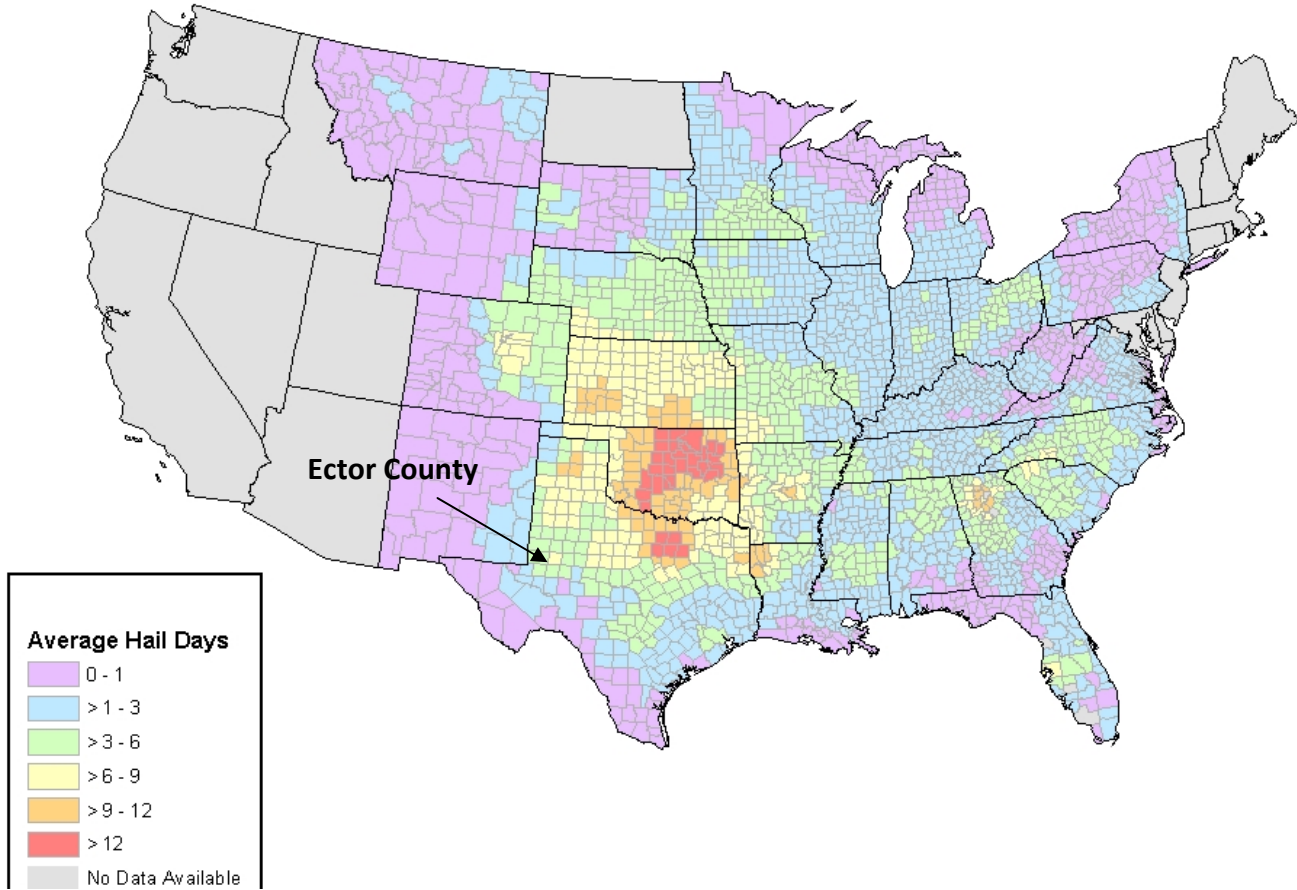
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<sup>2</sup> Available at: <http://www.disastersafety.org/publications/view.asp?id=8854&cid=1085>

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**Figure 5-2. Average Number of Hail Days (Damaging Hail)**



## Extent

The National Weather Service classifies a storm as severe if hail of  $\frac{3}{4}$  of an inch in diameter (approximately the size of a penny) or greater is imminent based on radar intensity or seen by observers. The intensity of a hailstorm depends on the damage potential related to size as depicted in the NCDC Intensity Scale in Table 5-3, based on the TORRO Hailstorm Intensity Scale.

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**Table 5-3. Hailstorm Intensity Scale (H0 to H10)**

	<b>Intensity Category</b>	<b>Typical Hail Diameter (in)<sup>3</sup></b>	<b>Description</b>	<b>Probable Kinetic Energy, J-m<sup>2</sup></b>	<b>Typical Damage Impacts</b>
<b>H0</b>	Hard Hail	Up to 0.33	Pea	0-20	No damage
<b>H1</b>	Potentially Damaging	0.33 – 0.60	Marble	>20	Slight general damage to plants, crops
<b>H2</b>	Significant	0.60-0.80	Dime	>100	Significant damage to fruit, crops, vegetation
<b>H3</b>	Severe	0.80-1.2	Nickel	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
<b>H4</b>	Severe	1.2-1.6	Half Dollar	>500	Widespread glass damage, vehicle bodywork damage
<b>H5</b>	Destructive	1.6-2.0	Ping	>800	Widespread destruction of glass, damage to tiled roofs, significant risk of injuries
<b>H6</b>	Destructive	2.0-2.4	Hen’s Egg		Bodywork of grounded aircraft dented, brick walls pitted
<b>H7</b>	Destructive	2.4-3.0	Golf Ball		Severe roof damage, risk of serious injuries
<b>H8</b>	Destructive	3.0-3.5	Hen’s Egg		Severe damage to all structures
<b>H9</b>	Super Hailstorms	3.5-4.0	Tennis Ball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
<b>H10</b>	Super Hailstorms	>4.0	Baseball		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The scale in Table 5-3 extends from H0 to H10 with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind.

<sup>3</sup> Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

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Although hail events for the County are common, the majority of events are at or below an intensity category of H4. Historical occurrences are discussed in the following section, but it is important to note three super hailstorms that occurred. Two of these events, in 1973 and 1992, had a hail intensity of H9, and a third in May of 2007 brought hail as large as 4.25 inches or an intensity of H10.

## Previous Occurrences

Figure 5-3 shows a map of 215 historical hail events reported to NCDC by size, that are known to have impacted the City of Odessa, the City of Goldsmith and unincorporated



areas of Ector County between 1950 and 2009. Table 5-4 provides details for each event including the general location, date and time of occurrence, magnitude, number of deaths and/or injuries and property and crop damages in adjusted dollars, as reported to NCDC<sup>4</sup>.

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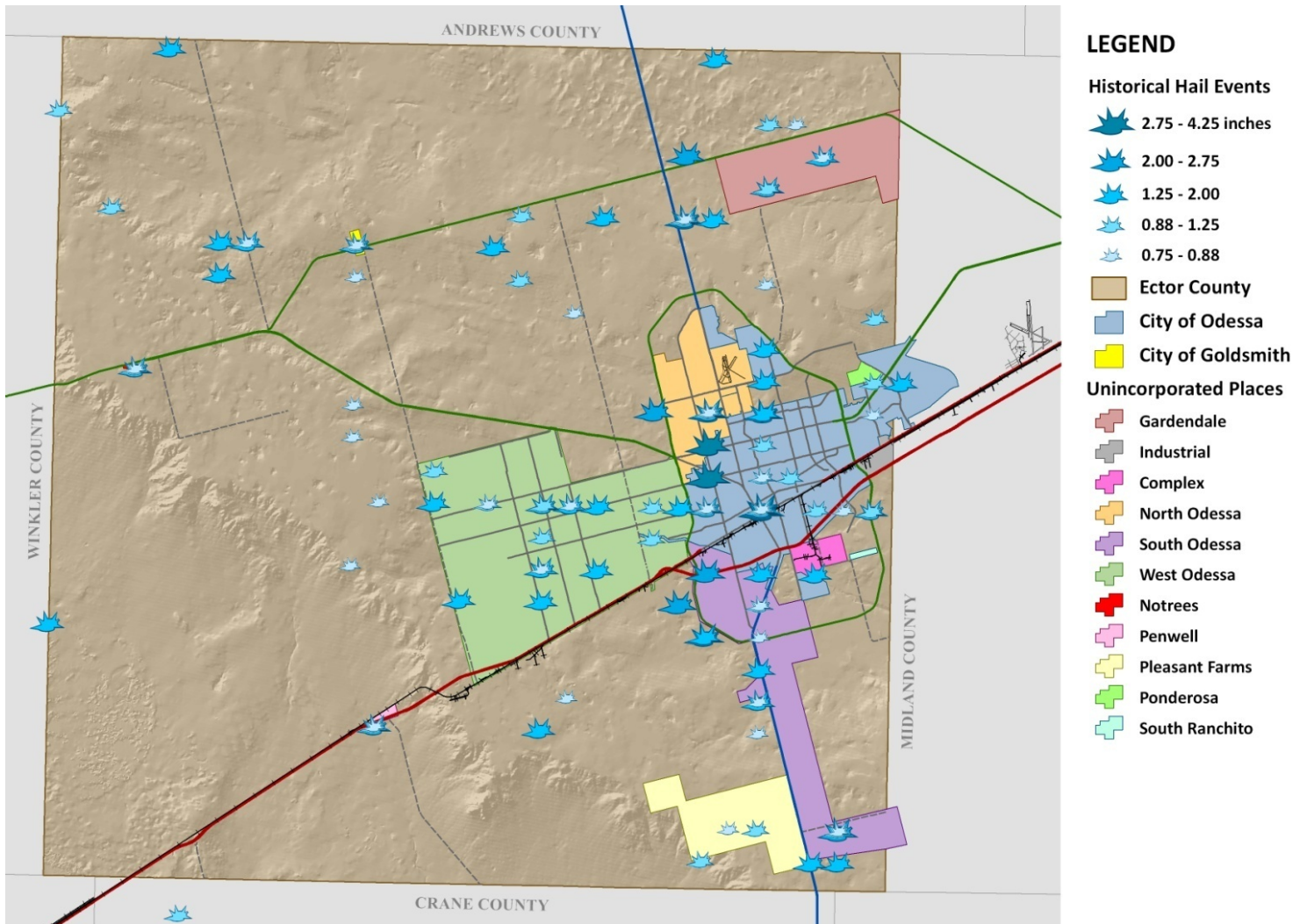
<sup>4</sup> In some instances, historical occurrence data may appear to contain duplicate entries. However, when all fields of the NCDC records are compared, there are differences (such as unique spatial coordinates or handwritten accounts) that establish these as individual events. Similarities in dollar losses and magnitudes can likely be attributed to estimations made at the time the event was reported.



# HAZARD PROFILE

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**Figure 5-3. Point Locations for Historical Hail Events (NCDC 1950–2009)**





# HAZARD PROFILE

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**Table 5-4. Historical Hail Occurrences (NCDC 1950-2009)**

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	07/05/1958	1737	1.50 in.	0	0	\$0	\$0
Ector County	07/05/1958	1737	1.50 in.	0	0	\$0	\$0
Ector County	10/01/1959	1835	1.75 in.	0	0	\$0	\$0
Ector County	10/01/1959	1912	2.75 in.	0	0	\$0	\$0
Ector County	05/13/1965	1643	1.00 in.	0	0	\$0	\$0
Ector County	05/15/1965	1233	0.75 in.	0	0	\$0	\$0
Ector County	05/25/1965	1510	1.75 in.	0	0	\$0	\$0
Ector County	06/13/1966	2350	1.75 in.	0	0	\$0	\$0
Ector County	05/09/1968	0915	1.75 in.	0	0	\$0	\$0
Ector County	05/10/1968	1920	2.75 in.	0	0	\$0	\$0
Ector County	06/07/1968	1808	1.75 in.	0	0	\$0	\$0
Ector County	06/07/1968	1842	2.75 in.	0	0	\$0	\$0
Ector County	06/09/1968	1754	1.75 in.	0	0	\$0	\$0
Ector County	10/15/1968	1910	1.75 in.	0	0	\$0	\$0
Ector County	05/04/1969	1445	0.75 in.	0	0	\$0	\$0
Ector County	05/04/1969	1555	2.00 in.	0	0	\$0	\$0
Ector County	05/06/1969	0215	0.75 in.	0	0	\$0	\$0
Ector County	05/29/1971	0520	1.75 in.	0	0	\$0	\$0
Ector County	06/29/1973	2050	4.00 in.	0	0	\$0	\$0
Ector County	05/04/1974	1900	2.75 in.	0	0	\$0	\$0
Ector County	06/12/1974	1844	1.00 in.	0	0	\$0	\$0
Ector County	05/24/1975	0215	2.00 in.	0	0	\$0	\$0
Ector County	05/08/1977	1920	1.25 in.	0	0	\$0	\$0
Ector County	03/02/1979	1310	1.75 in.	0	0	\$0	\$0
Ector County	05/21/1982	1650	2.00 in.	0	0	\$0	\$0
Ector County	05/27/1982	1659	2.75 in.	0	0	\$0	\$0
Ector County	07/10/1982	1843	0.75 in.	0	0	\$0	\$0
Ector County	05/24/1985	1628	1.75 in.	0	0	\$0	\$0
Ector County	05/25/1985	1825	1.00 in.	0	0	\$0	\$0
Ector County	10/13/1985	2112	1.00 in.	0	0	\$0	\$0
Ector County	08/31/1986	2110	0.75 in.	0	0	\$0	\$0
Ector County	03/22/1987	2023	0.75 in.	0	0	\$0	\$0
Ector County	04/16/1988	2025	1.00 in.	0	0	\$0	\$0
Ector County	05/19/1988	2200	1.00 in.	0	0	\$0	\$0
Ector County	06/03/1989	1851	1.00 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	06/03/1989	1930	1.00 in.	0	0	\$0	\$0
Ector County	06/03/1989	2035	0.88 in.	0	0	\$0	\$0
Ector County	06/03/1989	2050	0.75 in.	0	0	\$0	\$0
Ector County	06/03/1989	2059	1.75 in.	0	0	\$0	\$0
Ector County	06/10/1989	1448	1.75 in.	0	0	\$0	\$0
Ector County	06/10/1989	1610	1.75 in.	0	0	\$0	\$0
Ector County	08/22/1989	1611	1.00 in.	0	0	\$0	\$0
Ector County	08/31/1989	2022	1.75 in.	0	0	\$0	\$0
Ector County	03/13/1990	2220	1.00 in.	0	0	\$0	\$0
Ector County	03/13/1990	2230	1.00 in.	0	0	\$0	\$0
Ector County	04/01/1990	1525	1.00 in.	0	0	\$0	\$0
Ector County	04/23/1990	2130	1.75 in.	0	0	\$0	\$0
Ector County	05/29/1990	1258	0.75 in.	0	0	\$0	\$0
Ector County	05/29/1990	1320	1.00 in.	0	0	\$0	\$0
Ector County	08/13/1990	1735	0.75 in.	0	0	\$0	\$0
Ector County	08/13/1990	1750	0.75 in.	0	0	\$0	\$0
Ector County	08/14/1990	1612	0.75 in.	0	0	\$0	\$0
Ector County	05/10/1991	1928	0.75 in.	0	0	\$0	\$0
Ector County	05/13/1991	2130	0.75 in.	0	0	\$0	\$0
Ector County	05/28/1991	2126	0.75 in.	0	0	\$0	\$0
Ector County	06/06/1991	1544	1.00 in.	0	0	\$0	\$0
Ector County	06/21/1991	1744	1.75 in.	0	0	\$0	\$0
Ector County	10/27/1991	1607	1.75 in.	0	0	\$0	\$0
Ector County	10/27/1991	1619	1.75 in.	0	0	\$0	\$0
Ector County	10/27/1991	1704	1.75 in.	0	0	\$0	\$0
Ector County	10/27/1991	2040	2.75 in.	0	0	\$0	\$0
Ector County	10/27/1991	2055	1.00 in.	0	0	\$0	\$0
Ector County	03/31/1992	2015	4.00 in.	0	0	\$0	\$0
Ector County	05/24/1992	2229	1.50 in.	0	0	\$0	\$0
Ector County	05/24/1992	2335	2.00 in.	0	0	\$0	\$0
Ector County	05/24/1992	2356	2.75 in.	0	0	\$0	\$0
Ector County	06/06/1992	1804	1.00 in.	0	0	\$0	\$0
Ector County	06/26/1992	1930	1.75 in.	0	0	\$0	\$0
Ector County	06/27/1992	1626	1.75 in.	0	0	\$0	\$0
Ector County	06/27/1992	1643	1.00 in.	0	0	\$0	\$0
Ector County	06/27/1992	1701	1.50 in.	0	0	\$0	\$0
Ector County	07/18/1992	0210	1.75 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	09/01/1992	1949	1.25 in.	0	0	\$0	\$0
Ector County	09/03/1992	1735	1.75 in.	0	0	\$0	\$0
Ector County	09/03/1992	1801	1.25 in.	0	0	\$0	\$0
Ector County	09/10/1992	1707	0.75 in.	0	0	\$0	\$0
Ector County	09/10/1992	1710	1.75 in.	0	0	\$0	\$0
Odessa	02/09/1993	1728	0.75 in.	0	0	\$0	\$0
Odessa	04/28/1993	1538	1.75 in.	0	0	\$0	\$1,554
Penwell	04/28/1993	1540	1.00 in.	0	0	\$0	\$0
Odessa	04/28/1993	1550	1.75 in.	0	0	\$776,996	\$0
Gardendale	04/28/1993	1608	1.75 in.	0	0	\$776,996	\$77,700
Goldsmith	05/23/1993	1901	0.75 in.	0	0	\$0	\$0
Goldsmith	05/23/1993	2036	0.75 in.	0	0	\$0	\$0
West Odessa	08/23/1993	1852	1.00 in.	0	0	\$0	\$0
West Odessa	08/25/1993	0005	1.75 in.	0	0	\$1,554	\$0
West Odessa	10/19/1993	0925	0.75 in.	0	0	\$0	\$0
Odessa	12/12/1993	1550	0.75 in.	0	0	\$0	\$0
Odessa	05/11/1994	1417	1.75 in.	0	0	\$0	\$0
Odessa	05/11/1994	1440	2.75 in.	0	0	\$0	\$0
Odessa	05/11/1994	1458	0.75 in.	0	0	\$0	\$0
Odessa	05/12/1994	1510	1.00 in.	0	0	\$1,514	\$0
Odessa	05/12/1994	1515	0.75 in.	0	0	\$0	\$0
Odessa	05/12/1994	1530	0.88 in.	0	0	\$0	\$0
Gardendale	05/26/1994	2100	0.75 in.	0	0	\$0	\$0
Odessa	06/11/1994	2315	0.75 in.	0	0	\$0	\$0
Odessa	11/19/1994	2211	0.75 in.	0	0	\$1,514	\$0
Odessa	05/05/1995	1342	1.00 in.	0	0	\$0	\$0
Penwell	05/15/1995	1952	1.00 in.	0	0	\$0	\$0
Penwell	05/15/1995	2020	1.75 in.	0	0	\$0	\$0
Odessa	05/26/1995	1720	0.88 in.	0	0	\$0	\$0
Odessa	06/23/1995	1819	0.75 in.	0	0	\$0	\$0
Odessa	06/23/1995	1827	0.75 in.	0	0	\$0	\$0
Odessa	06/23/1995	1931	0.75 in.	0	0	\$0	\$0
Gardendale	09/24/1995	2238	1.00 in.	0	0	\$0	\$0
Odessa	10/02/1995	1414	0.75 in.	0	0	\$0	\$0
Odessa	06/02/1996	10:05 PM	0.75 in.	0	0	\$0	\$0
Odessa	06/02/1996	10:18 PM	1.75 in.	0	0	\$0	\$0
Odessa	06/06/1996	10:05 PM	1.75 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Odessa	06/06/1996	10:25 PM	0.75 in.	0	0	\$0	\$0
Gardendale	09/02/1996	4:22 PM	1.75 in.	0	0	\$0	\$0
Odessa	04/10/1997	10:55 PM	1.75 in.	0	0	\$0	\$0
Odessa	04/10/1997	11:11 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/08/1997	11:45 PM	2.75 in.	0	0	\$13,976	\$0
Odessa	05/15/1997	6:32 PM	1.75 in.	0	0	\$0	\$0
Goldsmith	05/28/1997	6:35 PM	1.75 in.	0	0	\$0	\$0
Goldsmith	06/11/1997	5:04 PM	1.75 in.	0	0	\$0	\$0
Gardendale	06/14/1997	3:15 PM	2.75 in.	0	0	\$0	\$0
Odessa	06/20/1997	3:35 PM	1.00 in.	0	0	\$0	\$0
Odessa	07/09/1997	6:35 PM	0.75 in.	0	0	\$0	\$0
North Cowden	05/26/1998	6:05 PM	1.00 in.	0	0	\$0	\$0
Gardendale	05/26/1998	6:35 PM	1.50 in.	0	0	\$0	\$0
Gardendale	01/28/1999	10:45 PM	1.75 in.	0	0	\$0	\$0
Odessa	04/02/1999	8:34 PM	1.00 in.	0	0	\$0	\$0
Odessa	04/02/1999	8:40 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/26/1999	6:00 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/26/1999	6:05 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/26/1999	6:15 PM	2.75 in.	0	0	\$114,232,892	\$0
Odessa	05/26/1999	6:25 PM	1.75 in.	0	0	\$0	\$0
Gardendale	05/26/1999	7:02 PM	1.75 in.	0	0	\$0	\$0
Pleasant Farms	06/30/1999	4:55 PM	2.75 in.	0	0	\$0	\$0
Notrees	03/22/2000	1:20 AM	0.88 in.	0	0	\$0	\$0
Goldsmith	03/22/2000	2:23 PM	1.75 in.	0	0	\$0	\$0
Gardendale	03/22/2000	3:00 PM	1.00 in.	0	0	\$0	\$0
Odessa	05/19/2000	11:30 AM	1.00 in.	0	0	\$0	\$0
Notrees	10/24/2000	4:44 PM	0.75 in.	0	0	\$0	\$0
Goldsmith	10/24/2000	5:10 PM	0.88 in.	0	0	\$0	\$0
Odessa	10/24/2000	6:30 PM	1.75 in.	0	0	\$0	\$0
Gardendale	10/24/2000	6:31 PM	0.75 in.	0	0	\$0	\$0
Odessa	10/24/2000	7:27 PM	1.75 in.	0	0	\$0	\$0
Odessa	10/24/2000	7:39 PM	0.88 in.	0	0	\$0	\$0
Odessa	10/24/2000	8:14 PM	1.75 in.	0	0	\$0	\$0
Gardendale	10/24/2000	9:15 PM	1.00 in.	0	0	\$0	\$0
Odessa	05/02/2001	3:55 PM	1.00 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Penwell	03/29/2002	6:20 PM	0.75 in.	0	0	\$0	\$0
Penwell	05/25/2002	6:33 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/25/2002	6:35 PM	1.75 in.	0	0	\$61,494	\$0
Goldsmith	05/25/2002	6:40 PM	1.75 in.	0	0	\$0	\$0
Odessa	05/25/2002	7:05 PM	0.75 in.	0	0	\$0	\$0
Goldsmith	05/26/2002	6:55 PM	1.75 in.	0	0	\$0	\$0
Gardendale	05/27/2002	3:40 PM	1.75 in.	0	0	\$0	\$0
Gardendale	05/27/2002	3:55 PM	0.88 in.	0	0	\$0	\$0
Goldsmith	05/28/2002	4:37 PM	0.88 in.	0	0	\$0	\$0
Odessa	05/29/2002	7:00 PM	0.88 in.	0	0	\$0	\$0
Pleasant Farms	05/29/2002	7:32 PM	0.75 in.	0	0	\$0	\$0
Penwell	08/13/2002	6:19 PM	0.88 in.	0	0	\$0	\$0
Odessa	09/13/2002	5:35 PM	1.75 in.	0	0	\$0	\$0
Odessa	09/14/2002	6:10 PM	1.25 in.	0	0	\$0	\$0
Odessa	10/06/2002	8:20 PM	1.75 in.	0	0	\$0	\$0
Odessa	10/18/2002	6:30 PM	0.75 in.	0	0	\$0	\$0
Gardendale	10/28/2002	6:23 PM	0.75 in.	0	0	\$0	\$0
Odessa	05/24/2003	7:10 PM	0.75 in.	0	0	\$0	\$0
Odessa	05/24/2003	8:20 PM	1.00 in.	0	0	\$0	\$0
Penwell	06/03/2003	4:46 PM	1.75 in.	0	0	\$0	\$0
Odessa	06/03/2003	4:55 PM	0.75 in.	0	0	\$0	\$0
Odessa	07/23/2003	7:25 PM	1.75 in.	0	0	\$0	\$0
Notrees	10/05/2003	7:12 PM	1.75 in.	0	0	\$0	\$0
Notrees	03/20/2004	10:23 PM	1.00 in.	0	0	\$0	\$0
Goldsmith	03/26/2004	6:20 PM	0.88 in.	0	0	\$0	\$0
Penwell	06/12/2004	4:40 PM	1.00 in.	0	0	\$5,796	\$0
Odessa	06/12/2004	4:55 PM	1.00 in.	0	0	\$0	\$0
Gardendale	06/12/2004	5:33 PM	2.50 in.	0	0	\$17,389	\$0
Odessa	07/05/2004	5:06 PM	0.88 in.	0	0	\$0	\$0
Pleasant Farms	07/05/2004	6:08 PM	0.88 in.	0	0	\$0	\$0
Odessa	08/12/2004	5:24 AM	0.75 in.	0	0	\$0	\$0
Odessa	08/30/2004	5:30 PM	0.75 in.	0	0	\$0	\$0
Gardendale	09/23/2004	7:23 PM	0.88 in.	0	0	\$0	\$0
West Odessa	10/04/2004	8:45 AM	1.00 in.	0	0	\$0	\$0
Pleasant	07/04/2005	9:48 PM	0.88 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Farms							
Pleasant Farms	08/12/2005	5:15 PM	0.88 in.	0	0	\$0	\$0
Gardendale	08/12/2005	6:10 PM	0.88 in.	0	0	\$0	\$0
West Odessa	04/20/2006	8:48 PM	1.00 in.	0	0	\$0	\$0
Pleasant Farms	05/02/2006	3:48 PM	1.00 in.	0	0	\$0	\$0
Pleasant Farms	05/07/2006	6:55 PM	2.75 in.	0	0	\$0	\$0
Odessa	03/24/2007	12:54 AM	1.00 in.	0	0	\$0	\$0
West Odessa	03/28/2007	22:36 PM	1.00 in.	0	0	\$0	\$0
Pleasant Farms	03/28/2007	22:48 PM	2.00 in.	0	0	\$1,061	\$0
Odessa	03/30/2007	7:40 AM	1.75 in.	0	0	\$3,183	\$0
Pleasant Farms	04/29/2007	15:35 PM	1.75 in.	0	0	\$0	\$0
Notrees	05/02/2007	7:43 AM	2.75 in.	0	0	\$0	\$0
Odessa	05/02/2007	8:14 AM	1.75 in.	0	0	\$0	\$0
West Odessa	05/02/2007	8:26 AM	1.75 in.	0	0	\$0	\$0
Goldsmith	05/02/2007	8:32 AM	0.88 in.	0	0	\$0	\$0
Odessa	05/02/2007	8:40 AM	1.75 in.	0	0	\$0	\$0
West Odessa	05/02/2007	8:42 AM	2.00 in.	0	0	\$0	\$0
Odessa	05/02/2007	8:46 AM	4.25 in.	0	0	\$0	\$0
Odessa	05/02/2007	8:58 AM	1.75 in.	0	0	\$0	\$0
Airport	05/02/2007	9:13 AM	1.00 in.	0	0	\$0	\$0
Odessa	05/02/2007	9:19 AM	2.75 in.	0	0	\$0	\$0
West Odessa	05/08/2007	12:15 PM	0.88 in.	0	0	\$0	\$0
Odessa	06/03/2007	14:51 PM	0.75 in.	0	0	\$0	\$0
Pleasant Farms	06/03/2007	16:23 PM	1.00 in.	0	0	\$0	\$0
Odessa	10/11/2007	15:52 PM	1.75 in.	0	0	\$5,305	\$0
Westover	04/09/2008	20:30 PM	1.25 in.	0	0	\$0	\$0
Odessa	04/09/2008	20:38 PM	2.50 in.	0	0	\$103,000	\$0
Gardendale	05/27/2008	18:51 PM	1.75 in.	0	0	\$10,300	\$0
Odessa	06/18/2008	12:20 AM	0.75 in.	0	0	\$0	\$0
West Odessa	06/18/2008	12:21 AM	1.75 in.	0	0	\$5,150	\$0
Notrees	04/11/2009	17:18 PM	1.00 in.	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Odessa	04/11/2009	17:47 PM	1.00 in.	0	0	\$0	\$0
Goldsmith	04/11/2009	17:48 PM	1.00 in.	0	0	\$0	\$0
Greenfield Acres	04/11/2009	17:48 PM	1.00 in.	0	0	\$0	\$0
Odessa	04/11/2009	17:50 PM	1.00 in.	0	0	\$0	\$0
Odessa	04/11/2009	17:53 PM	0.88 in.	0	0	\$0	\$0
Gardendale	04/16/2009	18:04 PM	1.00 in.	0	0	\$0	\$0
<b>TOTALS</b>	-	-	-	<b>0</b>	<b>0</b>	<b>\$116,018,120</b>	<b>\$79,254</b>

## June 23, 1973 Event

Official reports for the June 23, 1973 event are not available, but the intensity of this storm was an H9 according to the size reported to the NCDC.

## March 31, 1992 Event

An official description and damage reports are not available through the NCDC; however, this storm, with an intensity of H9, brought hail up to four inches in diameter.

## May 26, 1999 Event

A notable hail event from Table 5-4 involves a reported \$85 million<sup>5</sup> in property damages that occurred in the City of Odessa on May 26, 1999. According to the official record for this event, this convection fired along an outflow boundary moving to the southwest in northern Crane County (which borders Ector County to the south). The initial cell immediately split with the left-split storm moving north toward Odessa, while the right-split storm moved to the east/southeast into Upton County where it dissipated. The left-split storm developed a mesoanticyclone as it neared Odessa. As the heart of the updraft moved northward along West Loop 338, baseball-size hail was reported near the West County Road/University Boulevard intersection. The storm continued to the north where golfball-size hail forced more than 1,000 people attending a graduation practice to seek cover. In downtown Odessa, 1-inch size hail reached a depth of several inches. The storm moved over the junction of Ector, Midland and Andrews counties where golfball-size hail was reported. The storm then began to fade near the Andrews/Martin county line. As a line of non-severe storms approached from the west, this storm quickly dissipated. This storm was

<sup>5</sup> When adjusted for 2009 dollars, \$114,232,892, as indicated in Table 5-4.



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the most costly storm in the region for many years. Insurance agencies set up special claims stations and brought in numerous out-of-town employees to handle the workload.

## May 2, 2007 Event

Baseball sized hail was reported on Farm to Market road 1936, one mile north of Interstate 20 during a thunderstorm that resulted in flash flooding for the County. Official damage reports have not been estimated by the NCDC.

## Probability of Future Events

Because severe thunderstorm events will remain a very frequent occurrence in Ector County, the probability of future occurrences of hail is highly likely, meaning that an event is probable in the next year. It can be expected that future hail events will continue to cause minor damages to property and vehicles throughout the county. Most hailstorms occur during the spring (March, April and May) and in the fall during the month of September.

## High Wind

A high wind is a very strong wind with air moving at considerable force from an area of high pressure to an area of low pressure. High wind events can occur during winter storms and thunderstorms, resulting in falling objects and downed power lines. The high wind conditions can be especially dangerous when this occurs as it can lead to wildfires. In addition to a singular windstorm event and high winds associated with thunderstorms or winter storms, Ector County is also susceptible to the accompanying hazard effects of extreme wind from a hurricane despite its distance from the coast. High wind conditions have the potential to cause property damage, injury and even death.

## Location

Figure 5-4 depicts wind zones for the United States. Ector County is right on the border between Wind Zone II and Wind Zone III, indicating that the County experiences wind events up to 160 miles per hour, but with the potential for wind events up to 200 miles per hour. Within the County, there are no exact geographic boundaries for high wind as an event could occur at any location.

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Figure 5-4. Wind Zones in the United States (FEMA)

## Wind Zones in the United States



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## Extent

Table 5-5 profiles the average potential wind speeds in miles per hour that could be expected in Ector County during a high wind event for seven return periods (ranging from a 10-year scenario to a 1,000-year scenario).

**Table 5-5. Average Wind Speeds in Ector County by Return Period<sup>6</sup>**

WIND SPEED [MPH] PER RETURN PERIOD						
10-YEAR	20-YEAR	50-YEAR	100-YEAR	200-YEAR	500-YEAR	1,000-YEAR
<5	<5	<5	<5	<5	<5	55

Table 5-6 describes the intensity of a wind in terms of speed and effects, from calm to violent and destructive.

**Table 5-6. Beaufort Wind Scale<sup>7</sup>**

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted,

<sup>6</sup> Source: HAZUS-MH MR4

<sup>7</sup> Source: World Meteorological Organization (WMO)

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Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects
			"considerable structural damage"
11	64-72	Violent Storm	If experienced on land, widespread damage
12	73+	Hurricane	Violence and destruction

## Previous Occurrences

Historical high wind events reported to the NCDC for the County are included in Table 5-7.

**Table 5-7. Historical High Wind Events (NCDC)**

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Odessa	06/29/1994	0135	N/A	0	0	\$7,572	\$0
Permian Basin	04/17/1995	12:00 AM	N/A	0	0	\$0	\$0
Ector County	04/19/1995	12:00 AM	N/A	0	0	\$0	\$0
Ector County	07/05/1997	10:00 PM	67 kts.	0	0	\$55,904	\$0
Ector County	06/17/1998	4:05 PM	52 kts.	0	0	\$13,762	\$0
Ector County	02/22/2000	3:30 PM	N/A	0	0	\$6,524	\$0
Ector County	03/07/2000	8:00 AM	52 kts.	0	0	\$131,782	\$0
Ector County	06/05/2003	1:18 AM	57 kts.	0	0	\$3,582	\$0
Ector County	03/04/2004	3:00 PM	39 kts.	0	0	\$11,593	\$0
Odessa	02/27/2007	10:00 AM	50 kts.	0	0	\$42,440	\$0
Ector County	02/10/2009	3:55 PM	50 kts.	0	0	\$0	\$0
Ector County	04/01/2009	11:15 PM	54 kts.	0	0	\$0	\$0
<b>TOTALS</b>	-	-	-	<b>0</b>	<b>0</b>	<b>\$273,159</b>	<b>\$0</b>

## Probability of Future Events

Based on the reports available from the NCDC, beginning in 1994, and looking at the average of high wind events, the probability for a future wind event for the County is likely, meaning that an event could occur in the next two to three years.

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## Lightning

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.

Lightning is generally considered a common occurrence in the state of Texas. These events are typically strong and fast in their approach and can be accompanied by flash flooding, hail, tornadoes and high winds.



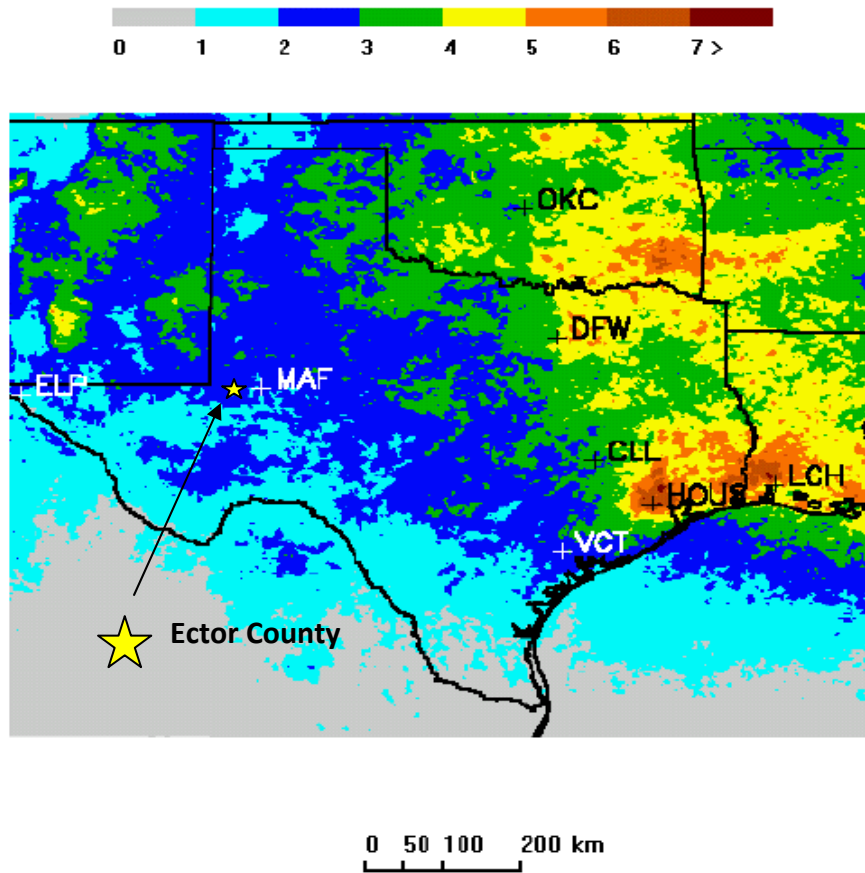
## Location

Lightning occurs randomly, therefore it is impossible to predict where it will strike. Ector County is an area of low to moderate risk for lightning according to the climatological lightning flash density map depicted in Figure 5-5. It is assumed that all of Ector County is uniformly exposed to lightning which strikes in very small, specific geographic areas.

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**Figure 5-5. Lightning Flash Density Map<sup>8</sup> (1989-2000)**



## Extent

The intensity for lightning is measured by the Lightning Activity Level (LAL) from the National Weather Service. Table 5-8 depicts the magnitude for an event by measuring the most common lightning occurrences, cloud-to-ground (CG) lightning discharges, from a severity of one to six, with a level six being the most intense.

**Table 5-8. Lightning Activity Level**

SCALE	DESCRIPTION	AREAL COVERAGE	COUNTS (CG/5 MIN)	COUNTS (CG/15 MIN)	AVERAGE CG/MIN
1	No lightning or thunderstorms	None	0	0	0
2	Cumulus clouds are common but only a	<15%	1-5	1-8	<1

<sup>8</sup> Source: U.S. National Lightning Detection Network

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SCALE	DESCRIPTION	AREAL COVERAGE	COUNTS (CG/5 MIN)	COUNTS (CG/15 MIN)	AVERAGE CG/MIN
	few reach the towering stage. A single thunderstorm must be confirmed in the rating area. Lightning is very infrequent				
3	Cumulus clouds are common. Thunderstorms are few, but 2 to 3 occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	15% to 24%	6-10	9-15	1-2
4	Swelling cumulus and towering cumulus cover 2-3/10 of the sky. Thunderstorms are scattered but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.	25% to 50%	11-15	16-25	2-3
5	Towering cumulus and thunderstorms are numerous. They cover more than 3/10 and occasionally obscure the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>50%	>15	>25	>3
6	Dry lightning outbreak.	>15%	-	-	-

According to Figure 5-5, Ector County experiences two lightning flashes per square kilometer per year. The intensity for Ector County can range from an LAL of one to an LAL of six, indicating that in some storms lightning may be infrequent, but it is possible for the area to be affected by a dry lightning outbreak or LAL of six.

Depending on the intensity of a lightning event, damage can result in electrocution of humans and animals; vaporization of materials along the path of the strike; fire caused by the high temperature produced by the strike, and a sudden power surge that can damage electrical and electronic equipment. Millions of dollars of direct and indirect damages result from lightning strikes on electric utility substations and distribution lines. While property damage is the major hazard associated with lightning, it should be noted that lightning strikes kill nearly 100 people each year in the United States<sup>9</sup>.

<sup>9</sup> National Weather Service



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A worst case scenario involving lightning strikes would be a solid or redeveloping line of severe thunderstorms moving through the entire county. Large economic loss to agriculture and/or major damage to buildings and other property can result if such storms are accompanied by high winds. High winds and lightning associated with such storms can also down trees and highline poles and result in power outages capable of affecting large areas of a county. With thunderstorms comes lightning. Each second there are 50 to 100 CG lightning strikes across the U.S. These strikes can kill humans and animals, disrupt utilities, and start wildfires.

## Previous Occurrences

Table 5-9 presents information on three lightning events reported to NCDC from 2003 to 2009. It is assumed that these records may be incomplete and that additional lightning strikes have occurred within the study area since 1950. Property damages are shown in adjusted dollars.

**Table 5-9. Historical Lightning Events (NCDC 2003–2009)**

LOCATION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
West Odessa	05/25/2003	12:00 AM	0	0	\$71,643	\$0
Odessa	06/09/2003	9:30 PM	0	0	\$41,792	\$0
Odessa	05/15/2005	5:50 AM	0	0	\$84,413	\$0
<b>TOTALS</b>	-	-	<b>0</b>	<b>0</b>	<b>\$197,848</b>	<b>\$0</b>

## May 25, 2003 Event

A lightning event on May 25, 2003, was responsible for setting a warehouse on fire in West Odessa. The warehouse was destroyed but no injuries were reported. An active round of severe thunderstorms, including a serious flash flood situation, affected parts of West Texas on May 24. The situation evolved as numerous thunderstorms developed along an outflow boundary which was roughly oriented along Interstate 20 corridor in the Permian Basin. Storms trained along the boundary and continuously moved across parts of Ector County and neighboring Andrews and Midland counties. The combination of these factors and

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urban effects resulted in a deadly flash flood event in the City of Odessa. Large hail in addition to lightning also accompanied the strongest storms.

## June 9, 2003 Event

A lightning strike sparked a fire which destroyed a home in the City of Odessa on June 9, 2003. Severe thunderstorms that developed along the mountains of West Texas moved east across the Permian Basin through the evening hours and evolved into a squall line that produced widespread severe weather, including damaging winds, lightning and hail.

## May 15, 2005 Event

Emergency management officials in the City of Odessa reported that lightning was responsible for starting two structure fires in the city. The heavy rainfall that occurred over the city aided the firefighter's efforts and helped limit structural damage. Isolated occurrences of hail and damaging winds were also associated with this lightning event.

## Probability of Future Events

The probability of occurrence for future lightning events in Ector County is highly likely. According to the National Lightning Detection Network (See Figure 5-5), Ector County is located in an area of the country that experiences two lightning flashes per square kilometer per year. Given this regular frequency of occurrence, it can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the County.

## Thunderstorm

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

All thunderstorms, regardless of severity, must have three conditions present in order to form. The first necessary condition is moisture in the lower to mid levels of the atmosphere. As air rises in a thunderstorm updraft, moisture condenses into small water drops which form clouds (and eventually precipitation). When the moisture condenses, heat is released into the air, making it warmer and less dense than its surroundings. The added heat allows the air in the updraft to continue rising.

The second necessary condition is instability. If the airmass is unstable, air which is pushed upward by some force will continue upward. An unstable airmass usually contains relatively warm (usually moist) air near the earth's surface and relatively cold (usually dry) air in the

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mid and upper levels of the atmosphere. As the low-level air rises in an updraft, it becomes less dense than surrounding air and continues to rise. This process is often augmented by added heat due to condensation as discussed above. The air will continue to move upward until it becomes colder and denser than its surroundings.

The third necessary condition is a source of lift. Lift is the mechanism used for starting an updraft in a moist, unstable airmass. The lifting source can take on several forms. The most common source is called differential heating. As the sun heats the earth's surface, portions of the surface (and the air just above the surface) will warm more readily than nearby areas. These "warm pockets" are less dense than the surrounding air and will rise. If unstable air has sufficient moisture, a thunderstorm may form.

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. Along with rolling thunder, lightning detection networks routinely track cloud-to-ground flashes to help track thunderstorms.

## Location

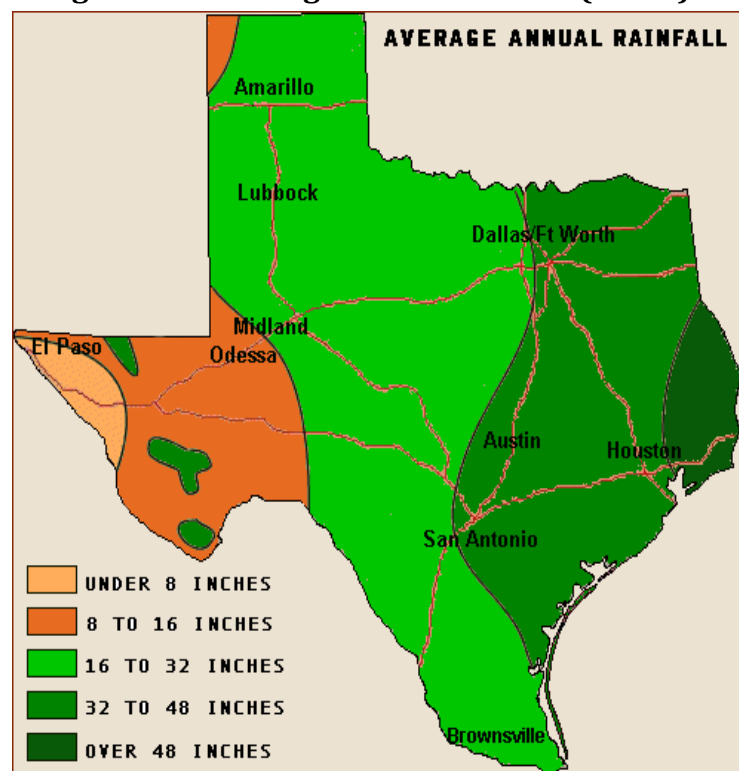
Thunderstorms occur randomly, and it is impossible to predict where they will strike within the area. Therefore, it is assumed that Ector County is uniformly exposed to the threat of thunderstorms.

## Extent

A wide range of damages have been associated with thunderstorm activity in the study area.

Reading Table 5-10 in conjunction with Table 5-6 (Beaufort Wind Scale) the maximum wind speeds sustained in the area from a thunderstorm were 71 knots, which is classified as a violent storm by the Beaufort Wind Scale. Therefore, the area could experience a range of wind speeds from 1 to 72 knots, or calm winds to violent storms. In

**Figure 5-6. Average Annual Rainfall (NOAA)**



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terms of rain fall during thunderstorm events, the area could experience a range from eight to 16 inches per year (See Figure 5-6).

Damages to trees, power lines and poles, signage, manufactured housing, radio towers, lighting, concrete block walls, storage barns, windows, garbage receptacles, brick facades and vehicles have also been reported, as well as serious structural damage to buildings. 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 numerous instances roofs have been reported as having been torn off of buildings. In one instance, during an event that occurred on June 26, 2007, local broadcasters reported that a front porch was torn from a house and thrown in pieces approximately 50 yards.

A severe event can result in heavy rains and extensive damage to personal property and critical facilities as accompanying winds can down trees and powerlines. Traffic disruptions, injuries and in rare cases, fatalities can occur. There have been a total of five injuries from severe thunderstorms for Ector County as discussed in the next section.

## Previous Occurrences

Table 5-10 depicts historical occurrences of thunderstorm events for the county according to NCDC data.

**Table 5-10. Historical Severe Thunderstorm Events (NCDC 1950–2009)**

LOCATION	DATE	TIME	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	05/02/1958	1200	N/A	0	0	\$0	\$0
Ector County	08/13/1962	1950	65 kts.	0	0	\$0	\$0
Ector County	04/11/1969	0140	N/A	0	0	\$0	\$0
Ector County	05/29/1971	0520	62 kts.	0	0	\$0	\$0
Ector County	06/29/1973	2050	64 kts.	0	0	\$0	\$0
Ector County	06/12/1974	1846	N/A	0	0	\$0	\$0
Ector County	07/09/1979	1730	N/A	0	0	\$0	\$0
Ector County	07/09/1979	1800	N/A	0	0	\$0	\$0
Ector County	07/09/1979	1805	N/A	0	0	\$0	\$0
Ector County	05/30/1983	1830	N/A	0	0	\$0	\$0
Ector County	10/19/1983	0030	N/A	0	0	\$0	\$0

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LOCATION	DATE	TIME	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	06/16/1986	1920	52 kts.	0	0	\$0	\$0
Ector County	09/10/1987	1945	52 kts.	0	0	\$0	\$0
Ector County	05/31/1988	0521	N/A	0	0	\$0	\$0
Ector County	08/09/1988	1640	N/A	0	0	\$0	\$0
Ector County	08/09/1988	1730	N/A	0	2	\$0	\$0
Ector County	08/12/1988	1700	N/A	0	2	\$0	\$0
Ector County	04/22/1989	1634	54 kts.	0	0	\$0	\$0
Ector County	04/22/1989	1700	55 kts.	0	0	\$0	\$0
Ector County	06/03/1989	1810	52 kts.	0	0	\$0	\$0
Ector County	06/06/1989	1625	52 kts.	0	1	\$0	\$0
Ector County	06/10/1989	1627	70 kts.	0	0	\$0	\$0
Ector County	06/22/1989	1815	N/A	0	0	\$0	\$0
Ector County	03/11/1990	0350	53 kts.	0	0	\$0	\$0
Ector County	06/14/1991	1945	52 kts.	0	0	\$0	\$0
Ector County	04/15/1992	1902	52 kts.	0	0	\$0	\$0
Ector County	05/22/1992	1845	52 kts.	0	0	\$0	\$0
Ector County	05/22/1992	1900	55 kts.	0	0	\$0	\$0
Ector County	06/08/1992	1955	52 kts.	0	0	\$0	\$0
Ector County	06/26/1992	2135	N/A	0	0	\$0	\$0
Odessa	04/28/1993	1550	N/A	0	0	\$77,700	\$0
Gardendale	04/28/1993	1608	65 kts.	0	0	\$77,700	\$0
Odessa	05/17/1993	1800	N/A	0	0	\$776,996	\$0
West Odessa	08/23/1993	1910	52 kts.	0	0	\$1,554	\$0
East Portion	08/24/1993	2352	52 kts.	0	0	\$0	\$0
Goldsmith	08/25/1993	0100	52 kts.	0	0	\$1,554	\$0
Maf	09/24/1993	1800	52 kts.	0	0	\$0	\$0
Odessa	11/13/1993	1915	52 kts.	0	0	\$0	\$0
Goldsmith	05/26/1994	2141	52 kts.	0	0	\$0	\$0
Maf	07/07/1994	2224	52 kts.	0	0	\$0	\$0
Odessa	07/13/1994	2030	52 kts.	0	0	\$1,514	\$0
Odessa	11/19/1994	2006	65 kts.	0	0	\$757,242	\$0
Odessa	11/19/1994	2042	52 kts.	0	0	\$0	\$0
Odessa	11/19/1994	2210	52 kts.	0	0	\$7,572	\$0
Gardendale	05/06/1995	12:00 AM	71 kts.	0	0	\$44,171	\$0
West Odessa	05/26/1995	12:00 AM	52 kts.	0	0	\$0	\$0
Odessa	05/26/1995	12:00 AM	59 kts.	0	0	\$0	\$0
Odessa	07/21/1995	12:00 AM	N/A	0	0	\$44,171	\$0

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LOCATION	DATE	TIME	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Goldsmith	10/02/1995	12:00 AM	N/A	0	0	\$14,724	\$0
Odessa	05/08/1996	5:50 PM	57 kts.	0	0	\$0	\$0
Odessa	05/08/1997	11:50 PM	N/A	0	0	\$27,952	\$0
Odessa	06/12/1997	7:20 PM	57 kts.	0	0	\$0	\$0
Odessa	06/19/1997	5:54 PM	52 kts.	0	0	\$0	\$0
Odessa	06/20/1997	3:45 PM	N/A	0	0	\$13,976	\$0
Penwell	07/28/1997	6:20 PM	57 kts.	0	0	\$83,856	\$0
Pleasant Farms	08/10/1997	3:05 PM	52 kts.	0	0	\$0	\$0
Pleasant Farms	08/18/1997	6:25 PM	55 kts.	0	0	\$0	\$0
Odessa	09/12/1997	5:48 PM	52 kts.	0	0	\$0	\$0
Odessa	10/09/1997	2:55 PM	N/A	0	0	\$13,976	\$0
Odessa	10/09/1997	3:32 PM	N/A	0	0	\$27,952	\$0
Odessa	04/08/1998	2:35 PM	N/A	0	0	\$1,376	\$0
Odessa	06/10/1998	5:42 PM	N/A	0	0	\$1,376	\$0
Gardendale	06/10/1998	5:55 PM	N/A	0	0	\$2,752	\$0
Goldsmith	07/21/1998	6:35 PM	N/A	0	0	\$4,129	\$0
Odessa	07/31/1999	6:00 PM	N/A	0	0	\$13,439	\$0
Ector County	03/07/2000	8:00 AM	52 kts.	0	0	\$131,782	\$0
Penwell	05/02/2001	3:22 PM	52 kts.	0	0	\$0	\$0
Penwell	05/25/2002	6:33 PM	52 kts.	0	0	\$0	\$0
Pleasant Farms	05/29/2002	7:32 PM	57 kts.	0	0	\$2,460	\$0
Gardendale	08/01/2002	8:00 PM	61 kts.	0	0	\$18,448	\$0
Odessa	08/13/2002	6:45 PM	52 kts.	0	0	\$0	\$0
Odessa	09/13/2002	5:10 PM	70 kts.	0	0	\$36,896	\$0
Odessa	09/13/2002	5:25 PM	70 kts.	0	0	\$184,481	\$0
Odessa	09/13/2002	6:10 PM	61 kts.	0	0	\$18,448	\$0
Gardendale	09/13/2002	6:27 PM	52 kts.	0	0	\$0	\$0
Odessa	10/06/2002	8:25 PM	65 kts.	0	0	\$92,241	\$0
Odessa	10/18/2002	6:00 PM	57 kts.	0	0	\$86,091	\$0
Central Portion	06/03/2003	4:39 PM	62 kts.	0	0	\$553,443	\$0
Penwell	06/05/2003	11:07 PM	53 kts.	0	0	\$125,375	\$0
Odessa	06/09/2003	8:35 PM	60 kts.	0	0	\$0	\$0
Penwell	06/23/2003	7:12 PM	52 kts.	0	0	\$0	\$0
Pleasant Farms	08/22/2003	4:55 PM	57 kts.	0	0	\$29,851	\$0
Odessa	10/05/2003	8:26 PM	70 kts.	0	0	\$119,405	\$0
Ector County	01/26/2004	8:00 AM	43 kts.	0	0	\$25,504	\$0
West Odessa	10/07/2004	1:35 AM	57 kts.	0	0	\$17,389	\$0

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LOCATION	DATE	TIME	MAGNI-TUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Goldsmith	12/06/2004	10:19 AM	57 kts.	0	0	\$40,575	\$0
Odessa	05/15/2005	4:47 AM	52 kts.	0	0	\$5,628	\$0
Gardendale	06/03/2005	1:00 AM	52 kts.	0	0	\$0	\$0
Odessa	07/26/2005	5:15 PM	50 kts.	0	0	\$0	\$0
Pleasant Farms	07/26/2005	5:20 PM	52 kts.	0	0	\$22,510	\$0
Odessa	08/04/2005	4:30 AM	63 kts.	0	0	\$0	\$0
<b>TOTALS</b>	-	-	-	<b>0</b>	<b>5</b>	<b>\$3,387,475</b>	<b>\$0</b>

\*NR indicates "not reported."

## Probability of Future Events

Most thunderstorms occur during the spring (March, April and May) and fall, during the month of September. The frequency of occurrence for a thunderstorm event is highly likely, meaning that an event is probable within the next year.

## Tornado

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries<sup>10</sup>. They are more likely to occur during the months of March through May and can occur at any time of day, but are likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

<sup>10</sup> NOAA



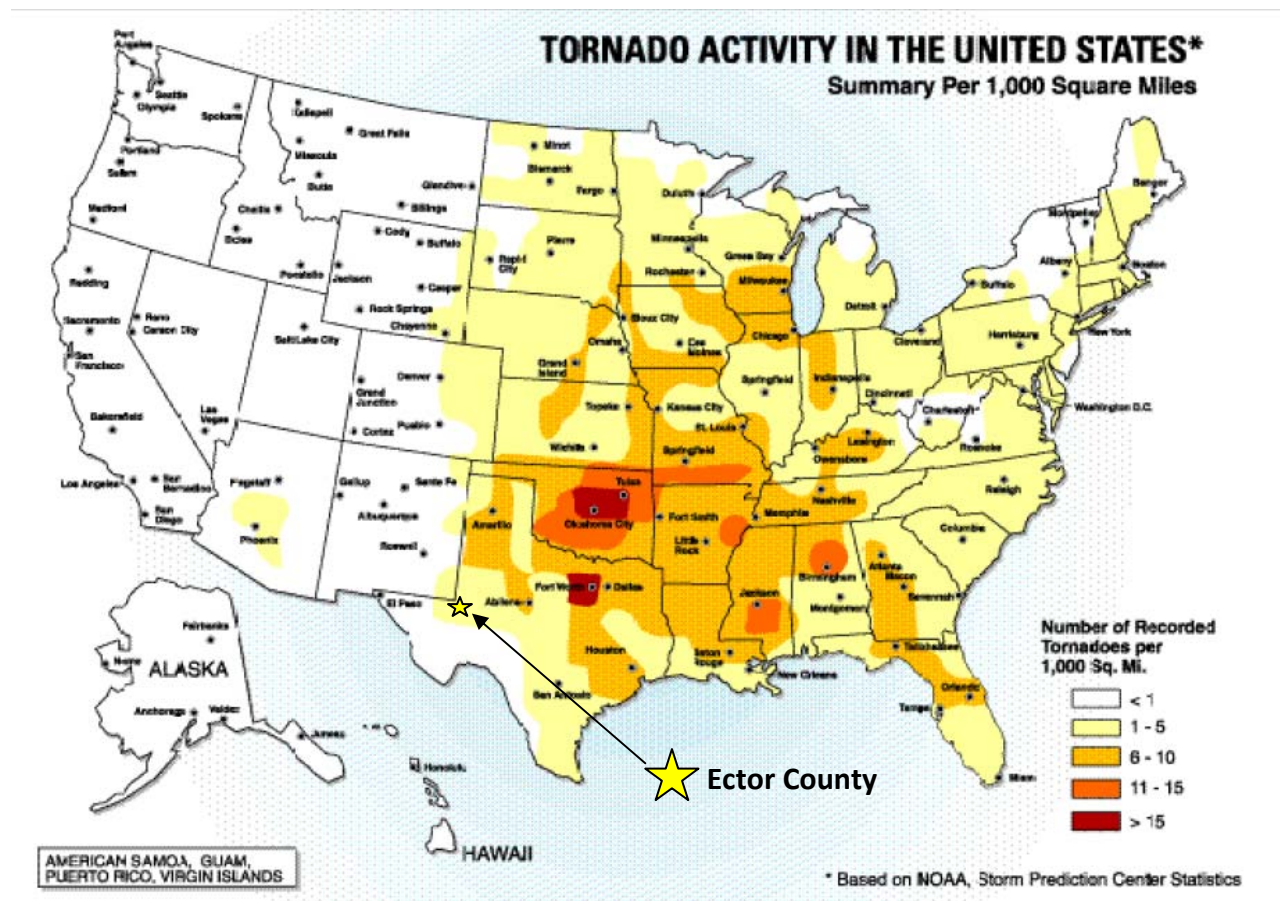
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## Location

Tornadoes occur randomly, and therefore it is impossible to predict where they will strike within the County. Historical evidence shows that most of the area is vulnerable to tornadic activity, and it is assumed that the Ector County is uniformly exposed to this hazard. Figure 5-7 depicts the location and frequency of tornadoes throughout the United States per 1,000 square miles according to FEMA. Ector County is located in an area that experiences one to five tornadoes per square mile.

Figure 5-7. Tornado Activity in the United States (NOAA)



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## 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). Additionally, it should be noted that tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 5-11). Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale<sup>11</sup> (Table 5-12). The largest magnitude reported within the study area is F2 on the Fujita Scale. Based on this data, the area could experience anywhere from an EF0 to an EF3 depending on the wind speed.

**Table 5-11. The Fujita Scale (Effective Prior to 2005)**

F-SCALE NUMBER	INTENSITY	WIND SPEED	TYPE OF DAMAGE DONE
F0	GALE TORNADO	40–72 MPH	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE TORNADO	73–112 MPH	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT TORNADO	113–157 MPH	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE TORNADO	158–206 MPH	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING TORNADO	207–260 MPH	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE TORNADO	261–318 MPH	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

<sup>11</sup> Source: National Weather Service

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<b>F6</b>	INCONCEIVABLE TORNADO	319–379 MPH	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.
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**Table 5-12. The Enhanced Fujita Scale (Effective 2005 and Later)**

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

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## Previous Occurrences

It is important to note that only tornadoes that have been reported have been factored into this risk assessment. It is likely that a number of occurrences have gone unreported over the past 59 years. Historical evidence shows that most of the area is vulnerable to tornadic activity. Figure 5-8 presents a map of historical tornado point locations for the study area from 1950 to 2007.

**Figure 5-8. Point Locations for Historical Tornado Events (NCDC 1950–2007)**

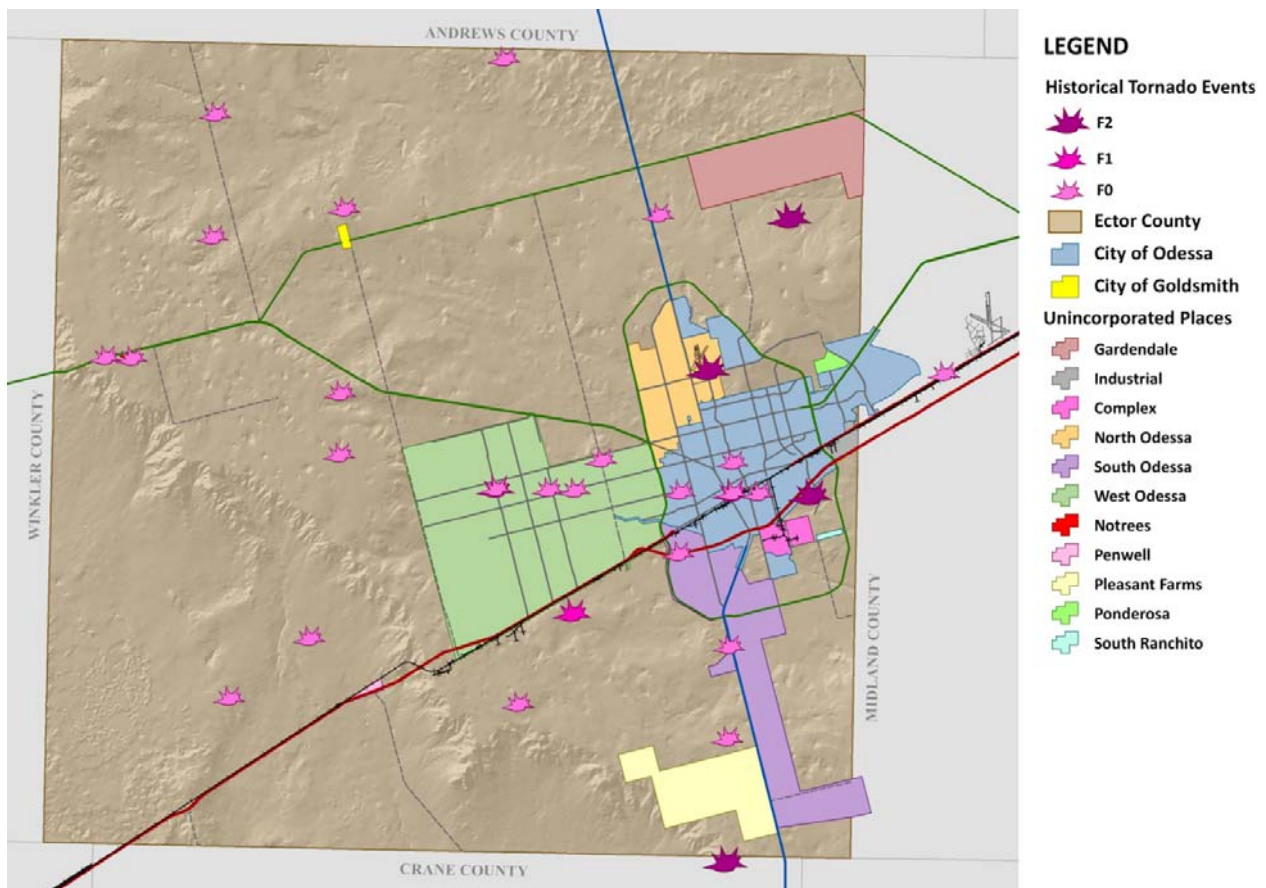


Table 5-13 shows details for 38 tornado events specifically associated with the study area. Property damage is shown in adjusted dollars.

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**Table 5-13. Historical Tornado Occurrences (NCDC 1950–2007)**

LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Ector County	04/22/1957	1530	F0	0	0	\$0	\$0
Ector County	07/21/1961	2000	F2	0	0	\$0	\$0
Ector County	06/14/1968	1655	F0	0	0	\$19,320	\$0
Ector County	06/03/1969	2200	F2	0	0	\$0	\$0
Ector County	06/29/1972	1615	F0	0	0	\$0	\$0
Ector County	05/12/1973	0320	F2	0	0	\$1,262,962	\$0
Ector County	04/19/1977	1410	F0	0	0	\$0	\$0
Ector County	07/19/1979	1135	F0	0	0	\$0	\$0
Ector County	08/28/1981	1538	F0	0	0	\$0	\$0
Ector County	10/15/1981	2130	F2	0	2	\$61,730	\$0
Ector County	05/12/1982	1328	F0	0	0	\$0	\$0
Ector County	05/27/1982	1445	F0	0	0	\$0	\$0
Ector County	07/02/1982	1937	F1	0	0	\$6,974	\$0
Ector County	05/25/1983	1503	F0	0	0	\$0	\$0
Ector County	05/30/1983	1720	F0	0	0	\$0	\$0
Ector County	05/25/1985	1814	F0	0	0	\$0	\$0
Ector County	06/01/1985	2010	F0	0	0	\$0	\$0
Ector County	10/13/1985	2108	F0	0	0	\$0	\$0
Ector County	05/26/1987	1620	F0	0	0	\$0	\$0
Ector County	05/26/1987	1634	F0	0	0	\$0	\$0
Ector County	05/26/1987	1652	F1	0	0	\$49,367	\$0
Ector County	06/03/1989	1747	F0	0	0	\$0	\$0
Ector County	06/06/1989	1650	F1	0	0	\$45,243	\$0
Ector County	06/10/1989	1520	F0	0	0	\$0	\$0
Ector County	06/10/1989	1527	F0	0	0	\$0	\$0
Ector County	08/02/1989	1654	F0	0	0	\$0	\$0
Ector County	09/08/1989	1655	F0	0	0	\$0	\$0
Ector County	09/21/1990	1255	F0	0	0	\$0	\$0
Ector County	05/24/1992	2350	F0	0	0	\$0	\$0
Ector County	06/26/1992	2155	F0	0	0	\$0	\$0
Ector County	06/26/1992	2240	F0	0	0	\$0	\$0
Goldsmith	04/22/1994	1153	F0	0	0	\$0	\$0
Goldsmith	05/12/1994	1225	F0	0	0	\$0	\$0
Goldsmith	05/01/1999	2:46 PM	F0	0	0	\$0	\$0
Goldsmith	03/22/2000	1:42 PM	F0	0	0	\$13,048	\$0
Gardendale	05/27/2002	3:49 PM	F0	0	0	\$2,460	\$0



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LOCATION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
Odessa	07/26/2005	3:20 PM	F0	0	0	\$0	\$0
Notrees	06/03/2007	15:48 PM	F0	0	0	\$0	\$0
TOTALS	-	-	-	0	2	\$1,461,104	\$0

## March 22, 2000 Event

A weak F0 tornado formed in western Ector County and knocked down two sets of utility poles on March 22, 2000. The tornado moved northeast through open country damaging a line of 11 utility poles about 2 miles west of Farm-to-Market (FM) Road 866, then proceeded to the northeast and knocked down four additional poles at the intersection of FM 866 and State Highway 302. The decision to classify this as a tornado was made due to the extreme intensity of low level radar signatures as well as the fairly narrow damage path sustained over a three mile track. The storms associated with this event also produced hail up to golf-ball size, damaging thunderstorm winds and some flash flooding. An estimated \$10,000 in property damage was reported, which is equivalent to approximately \$13,048 in 2009 dollars.

## June 3, 2007 Event

An F0 tornado three quarters of a mile wide was reported near the Ector/Winkler county line along Highway 302 on June 3, 2007. A large upper level low was situated over the northern plains with a west coast ridge edging into West Texas. This produced favorable northwest flow aloft and contributed to several days of severe weather over the area. Instability and wind shear combined to produce several weak tornadoes across West Texas. These tornadoes remained over open country and did no significant damage.

## Probability of Future Events

The probability of future tornado occurrences affecting Ector County is likely. According to historical records, Ector County experiences a confirmed tornado touchdown at least every three years. While the majority of these events are small in terms of size, intensity and duration, they do pose a significant threat should the county experience a direct tornado strike.

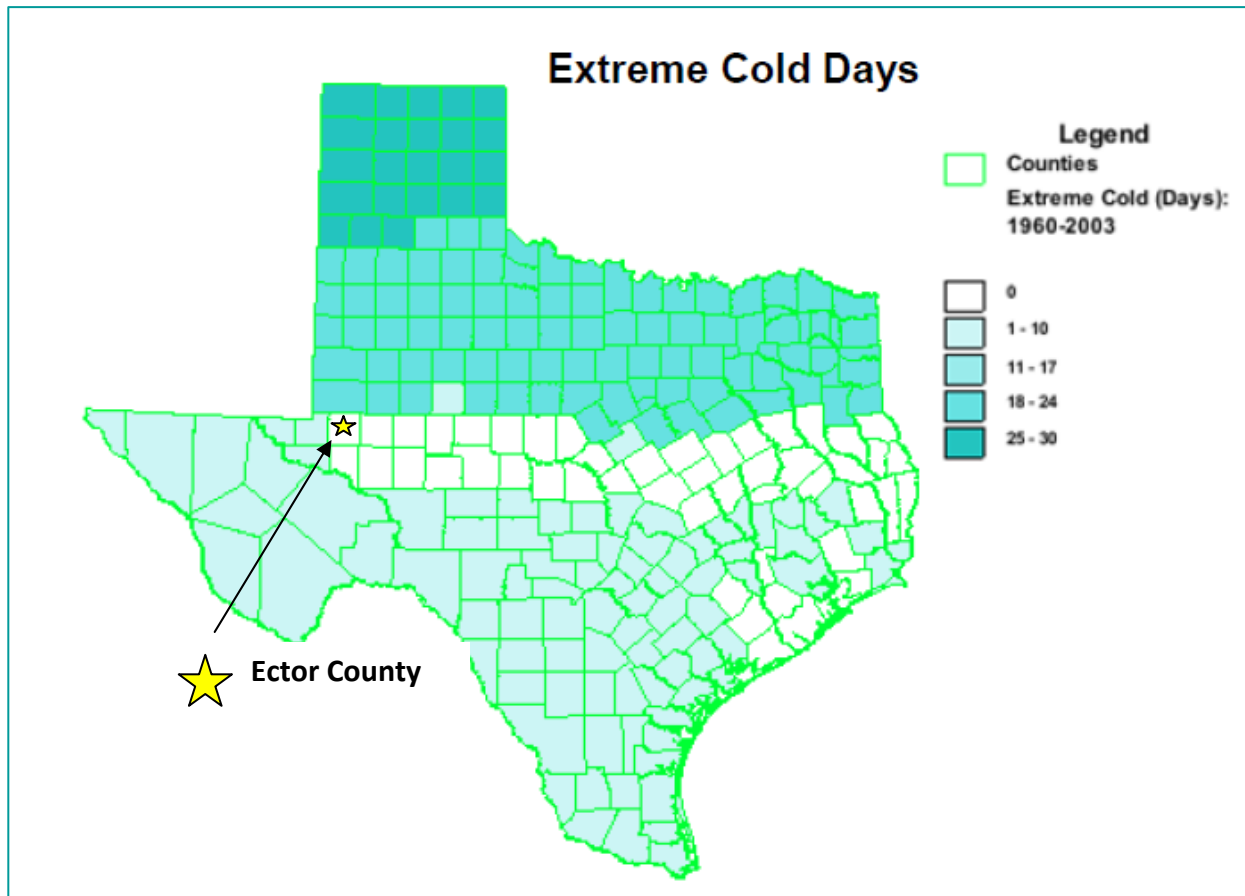
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## Severe Winter Storm

In general, the study area is at risk to ice hazards and extreme cold temperatures, as well as snow. Winter storms that threaten the area usually begin as powerful cold fronts that push south from central Canada. As indicated in Figure 5-9, relatively no extreme cold days a year, meaning less than 10 days at or around freezing temperatures. However there is the potential for ice and snow accumulation, meaning response times will increase until public works road crews are able to assist in making the major roads passable.

Figure 5-9. Extreme Cold Days 1960-2003 (NWS)





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## Location

Because winter storm events are not confined to specific geographic boundaries, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted.

## Extent

Table 5-14 displays the magnitude of severe winter storms. The wind-chill factor is further described in Figure 5-10. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50° or winds are calm.

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body, similar to the heat index for extreme heat (Figure 5-1). Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures.

**Table 5-14. Extent Scale for Severe Winter Storm**

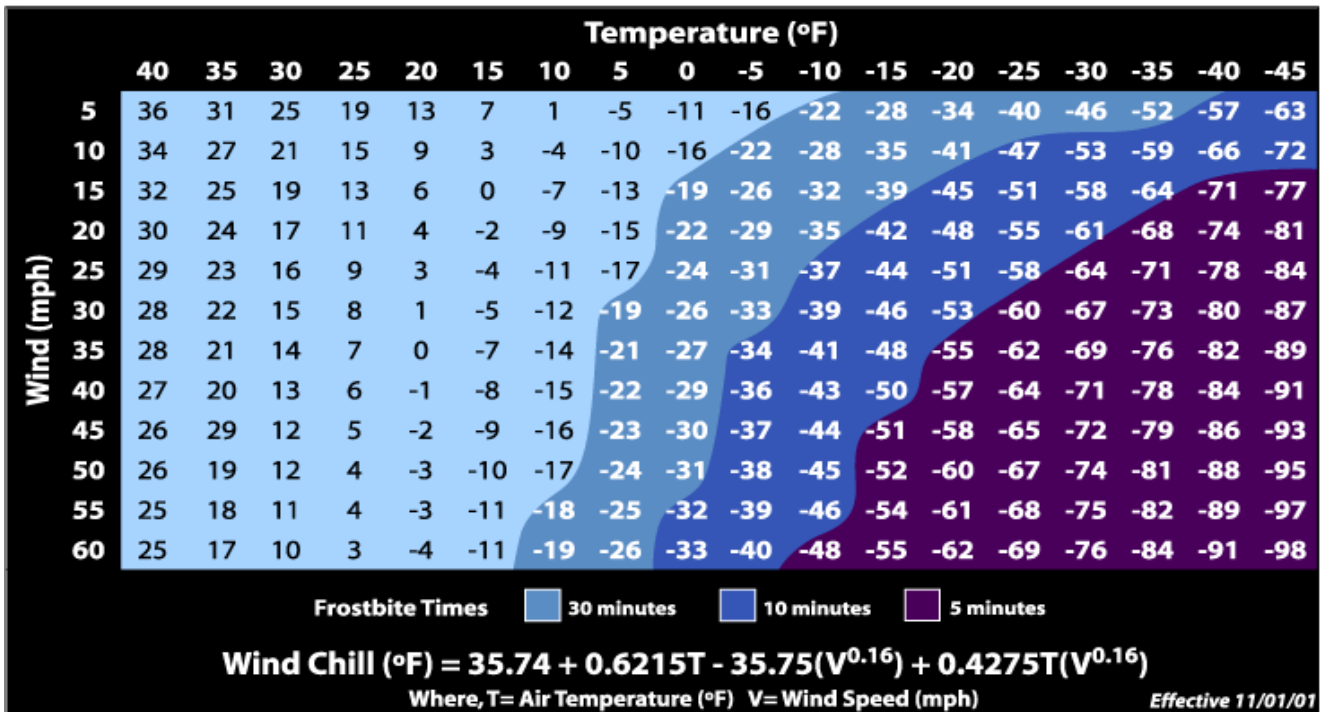
<b>Winter weather advisory</b>	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
<b>Winter storm watch</b>	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination).
<b>Winter storm warning</b>	Severe winter weather conditions are imminent.
<b>Freezing rain or freezing drizzle</b>	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
<b>Sleet</b>	Small particles of ice, usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
<b>Blizzard warning</b>	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.
<b>Frost/freeze warning</b>	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.
<b>Wind chill</b>	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.

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Based on previous occurrences, Ector County has been subject to winter storm watches, warnings, freezing rain, sleet, snow and wind chill. Although Ector County typically experiences a low amount of extreme cold days (Figure 5-9), it has reached a record low temperature, set in February of 1985, of -11 degrees Fahrenheit<sup>12</sup>. It is also possible, although it has not occurred in the past, for the wind speed to reach 60 miles per hour. Therefore the possible intensity or magnitude of a severe winter storm event that could affect the County, ranges from a wind chill of 36 with no frostbite, to a wind chill of -48, with frost bite setting in at five minutes as shown in Figure 5-10.

Figure 5-10. Wind Chill Chart



<sup>12</sup> Source: <http://www.weatherbase.com/weather/weather.php3?s=056227&refer=>

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## Previous Occurrences

Table 5-15 presents information on historical winter storms reported to NCDC during a period of time ranging from December 1998 to January 2007. While this covers only an eight-year period, a variety of winter storm conditions were documented during this time, including heavy snow, wintry mix and ice. These events were recorded at the county level, as severe winter weather typically impacts a geographic area greater than a city or town's incorporated limits.

**Table 5-15. Historical Severe Winter Storms (NCDC 1998–2007)**

DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)
12/11/1998	2:00 AM	1	0	None Reported	None Reported
02/12/2004	7:00 AM	5	8	None Reported	None Reported
01/12/2007	6:10 PM	0	0	None Reported	None Reported
01/18/2007	3:45 PM	0	0	None Reported	None Reported
<b>TOTALS</b>	-	<b>6</b>	<b>8</b>	-	-

### December 11, 1998 Event

A strong upper level storm system interacted with copious amounts of Gulf and Pacific moisture to produce a heavy snow event across portions of West Texas on December 11, 1998. This storm system moved from west to east across the area with snowfall amounts up to 12 inches in western Reeves County (which is southwest of Ector County). According to NCDC, this was the “snow storm of the century” for the Midland/Odessa area as the 9.75 inches recorded at the Midland International Airport set new records for the greatest daily snowfall, the greatest single event snowfall and the greatest monthly snowfall ever recorded (Midland International Airport is close to the eastern boundary of Ector County). Most of this snow fell in an intense four to five hour period. Numerous traffic accidents were reported on icy roads with one fatality recorded. The heavy snowfall also resulted in loss of power for some communities.

### February 12-14, 2004 Event

An upper level storm system took up residence over the border area west of El Paso late on February 11, 2004 and persisted until it ejected east over West Texas during the overnight hours of February 13 and the early morning of the 14th. An Arctic cold front swept south across the region in advance of the upper low. An extended period of weak isentropic upglide over the shallow surface cold dome resulted in a light freezing drizzle and snow flurries across much of West Texas. A thin sheet of ice (1/8 to 1/4-inch thick) coated

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driving surfaces including bridges and overpasses. Numerous traffic accidents occurred across the area. Five fatalities and eight injuries were indirectly attributed to the icy conditions. The frozen precipitation began early on the 12th immediately behind the passing cold front. The onset of wintry weather just before rush hour resulted in approximately 65 traffic accidents on overpasses in the Midland/Odessa area. A head-on collision was reported on an icy overpass along the Andrews Highway north of Odessa in the pre-dawn hours. Dangerous conditions brought traffic to a standstill and caused up to 20 accidents along I-20 between West Odessa and Monahans shortly after sunrise. One such accident included a school bus that rolled over just west of Penwell. No children were aboard and no injuries were reported. The upper level storm system began to track east across West Texas late on the 13th. As it did, cooling associated with large scale deep layer lift resulted in light to moderate snowfall mixing with freezing drizzle. The already hazardous driving conditions on area roadways and highways deteriorated further.

## January 12, 2007 Event

Moisture streamed in from the southwest on January 12, 2007, as an upper level storm system approached southeastern New Mexico and West Texas and combined with an Arctic airmass to produce freezing rain and freezing fog across much of the area. The combination of these two phenomena resulted in a thin coating of ice over many exposed surfaces, including area roadways, bridges and overpasses, as well as reduced visibilities down to one quarter of a mile at times. The icy roads and the lack of any significant winter weather in the previous winter season contributed to numerous accidents, especially along I-20. I-20 was closed in Ector County due to icy conditions from Penwell to Farm-to-Market (FM) Road 1788. Numerous other roads were closed throughout the warning area, some due to the ice and others due to accidents resulting from the slick roads. Ice accumulated on power lines and tree branches resulting in power outages throughout much of West Texas. Ice accumulations ranged from 1/10-inch to 3/16-inch across the area.

## January 18, 2007 Event

Another cold front and upper level storm system coincided over West Texas and southeastern New Mexico on January 18, 2007, to produce another round of winter weather. Snow, sleet and freezing rain all occurred across the region making travel hazardous and leading to school closings. Numerous accidents were reported across the area, especially overnight when precipitation that had melted during the day re-froze on the roads. This led to several roads being closed overnight.

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## Probability of Future Events

Based on the available data for previous occurrences of winter storms, the probability of a future event is likely, with a winter storm possible every three years or less.

## Drought

Drought is a normal part of virtually all climatic regimes, including areas with high and low average rainfall and is considered a major threat to Texas agricultural industries and water supplies. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural and socioeconomic. Table 5-16 presents definitions for these different types of drought.

**Table 5-16. Drought Classification Definitions<sup>13</sup>**

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

## Location

Drought can occur throughout the area and is not confined to any specific location.

## Extent

Droughts are slow-onset hazards, but over time can have very damaging affects to crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant. Table 5-17 displays the Palmer Drought Index and Table 5-18 depicts the extent or magnitude of drought that can be experienced in the county.

<sup>13</sup> Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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**Table 5-17. Palmer Drought Index<sup>14</sup>**

Drought Index	Drought Condition Classifications						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
<b>Z index</b>	-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
<b>Meteorological</b>	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above
<b>Hydrological</b>	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above

**Table 5-18. Palmer Drought Category Descriptions<sup>15</sup>**

Category	Description	Possible Impacts	Palmer Drought Index
<b>D0</b>	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
<b>D1</b>	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
<b>D2</b>	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 to -3.9
<b>D3</b>	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 to -4.9
<b>D4</b>	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

Droughts are slow-onset hazards, but over time can have damaging effects on crops, municipal water supplies, recreation and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

<sup>14</sup> Source: U.S. Drought Monitor

<sup>15</sup> Source: National Drought Mitigation Center

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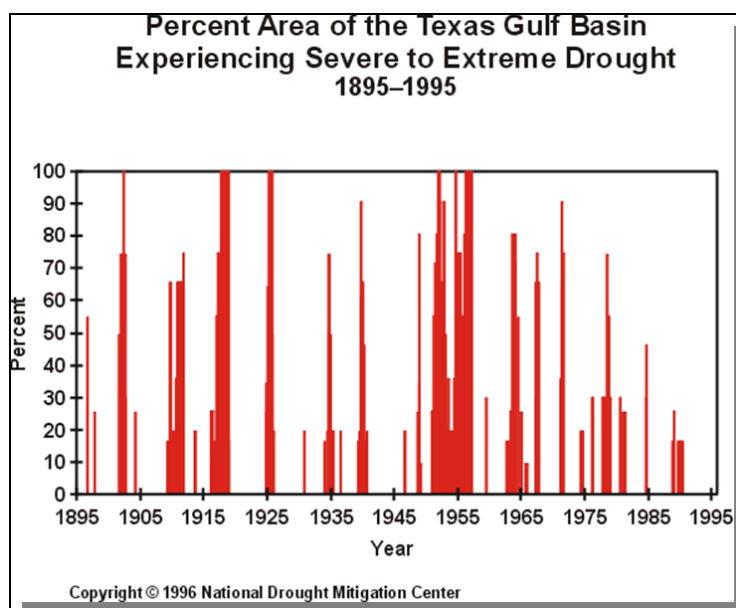
Drought warnings are issued by the State Drought Preparedness Council, as directed by H.B. 2660, based upon input from NOAA, the Office of the State Climatologist, the U.S. Geological Service, the Texas Water Development Board, Texas Commission on Environmental Quality, and the Texas Agricultural Statistics Service. Warnings utilize five “levels of concern” and take into account assessments of climatology, agriculture and water availability for each of 10 climatic regions of the state.

The West Texas area has experienced periods of moderate, severe and extreme drought, both agricultural and hydrological, according to Palmer Drought Index classifications and U.S. Drought Monitor. The real danger with drought of this magnitude is the amount of crop failure and the potential for wildfires to break out.

## Previous Occurrences

Figure 5-11 depicts drought throughout the Texas Gulf Basin and Table 5-19 shows details for 16 drought events associated with the Ector County study area and the surrounding region ranging from 1996 to 2006 based on NCDC records. It is important to note that the property and crop losses reported for these events are for the region as a whole. An averaged allocation was produced for estimation purposes by dividing the total amount of damages by the number of counties in the affected region. All dollar amounts are shown in adjusted values.

**Figure 5-11. Drought in the Texas Gulf Basin**





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**Table 5-19. Drought Events (NCDC 1996–2006)**

DATE	NUMBER OF COUNTIES IMPACTED	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)	CROP DAMAGE (IN 2009 DOLLARS)	ALLOCATED AVERAGE FOR ECTOR COUNTY	ALLOCATED AVERAGE FOR ECTOR COUNTY
05/01/1996	25	0	0	0	0	0	0
08/01/1996	25	0	0	\$18,013,886	\$271,209,061	\$720,555	\$10,848,362
04/01/1998	25	0	0	0	0	0	0
05/01/1998	25	0	0	0	0	0	0
06/01/1998	25	0	0	0	0	0	0
07/01/1998	25	0	0	0	0	0	0
08/01/1998	25	0	0	0	0	0	0
09/01/1998	25	0	0	0	0	0	0
10/01/1998	25	0	0	0	0	0	0
11/01/1998	25	0	0	0	0	0	0
12/01/1998	25	0	0	\$20,642,556	\$344,042,593	\$825,702	\$13,761,704
01/01/1999	25	0	0	0	0	0	0
02/01/1999	25	0	0	0	0	0	0
03/01/1999	25	0	0	0	0	0	0
04/01/1999	25	0	0	0	0	0	0
08/01/2006	25	0	0	0	0	0	0

## 1996 Drought Conditions

During this period of drought, which began four years prior and arguably lasted through the end of 1996, extreme failures of crops and pastureland were reported across the impacted area. Due to the lack of grasses for cattle, approximately half the cattle in the region had to be sold early. This flooding of the cattle market sent cattle prices plummeting. In a few locations, wells dried up making irrigation impossible. The commodity losses for the impacted area included losses to cotton, rangeland/pastureland, grain sorghum, wheat and peanuts.

In addition to the events reported to the NCDC in Table 5-19, Ector County and the state as a whole experienced record drought in the summer of 2009. High temperatures and below normal levels of rainfall resulted in a hydrologic and agricultural drought throughout the state. Although estimates are not available at this time for damage to the county alone, Texas farmers and ranchers suffered approximately \$3.6 billion in economic damage.

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## Probability of Future Events

The future probability of occurrence of a drought in West Texas and Ector County is likely, with an event probable in the next two to three years.

## Flood

The severity of a flooding event is typically determined by a combination of several 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 surface. Floods resulting from excessive precipitation can be classified under two categories: general floods, precipitation over a given river basin for an extended period of time combined with storm-induced wave or tidal action; or flash floods, the product of heavy localized precipitation in a short time period.

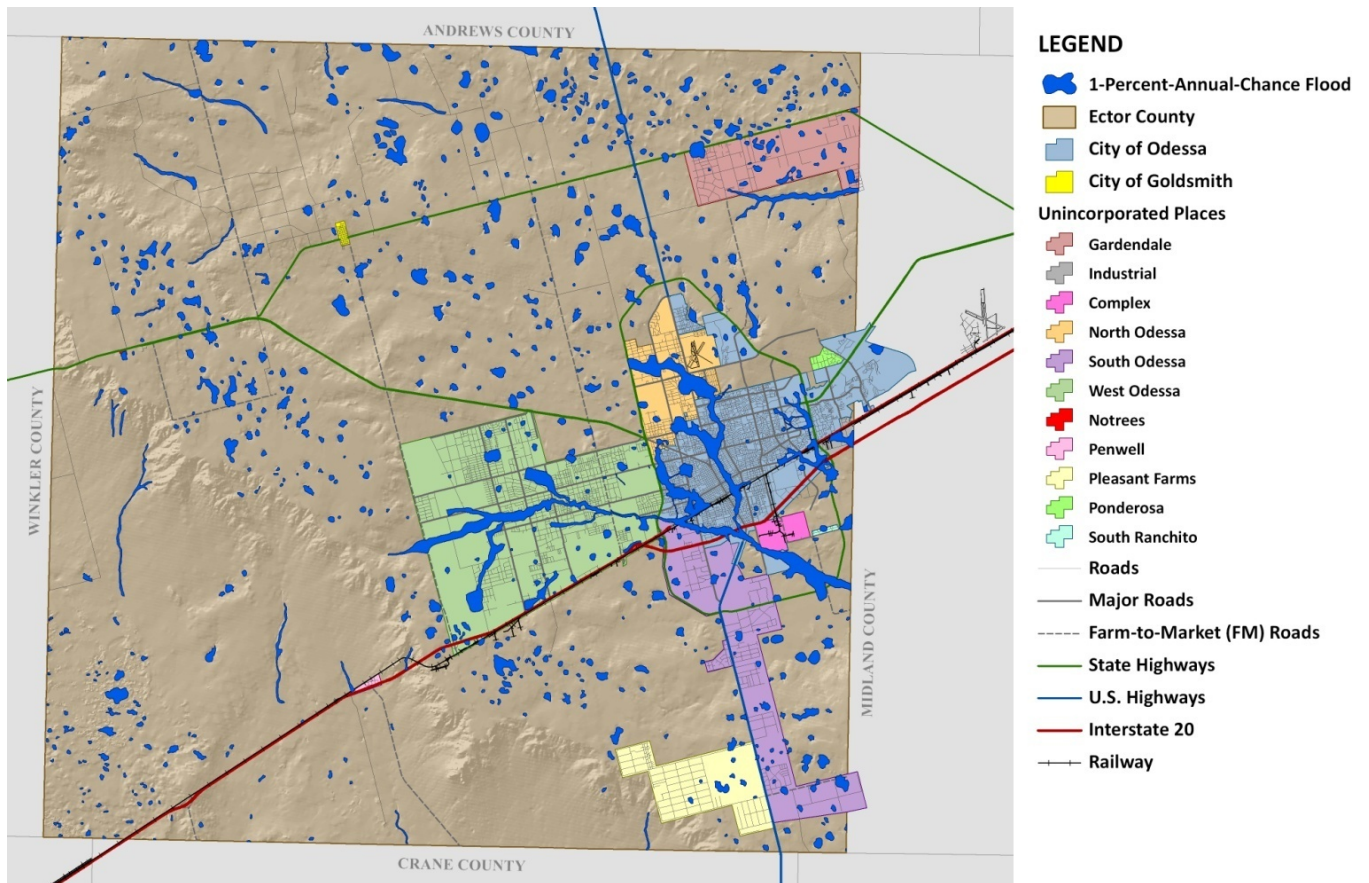
## Location

Figure 5-12 shows the 1-percent-annual-chance flood zone (also known as the 100-year floodplain) in Ector County, which provides an indication of where there is potential for damage to property and loss of life from the flood hazard in the overall study area. Figure 5-13 and Figure 5-14 show flood zones in the City of Odessa and the City of Goldsmith respectively, along with critical facilities locations.

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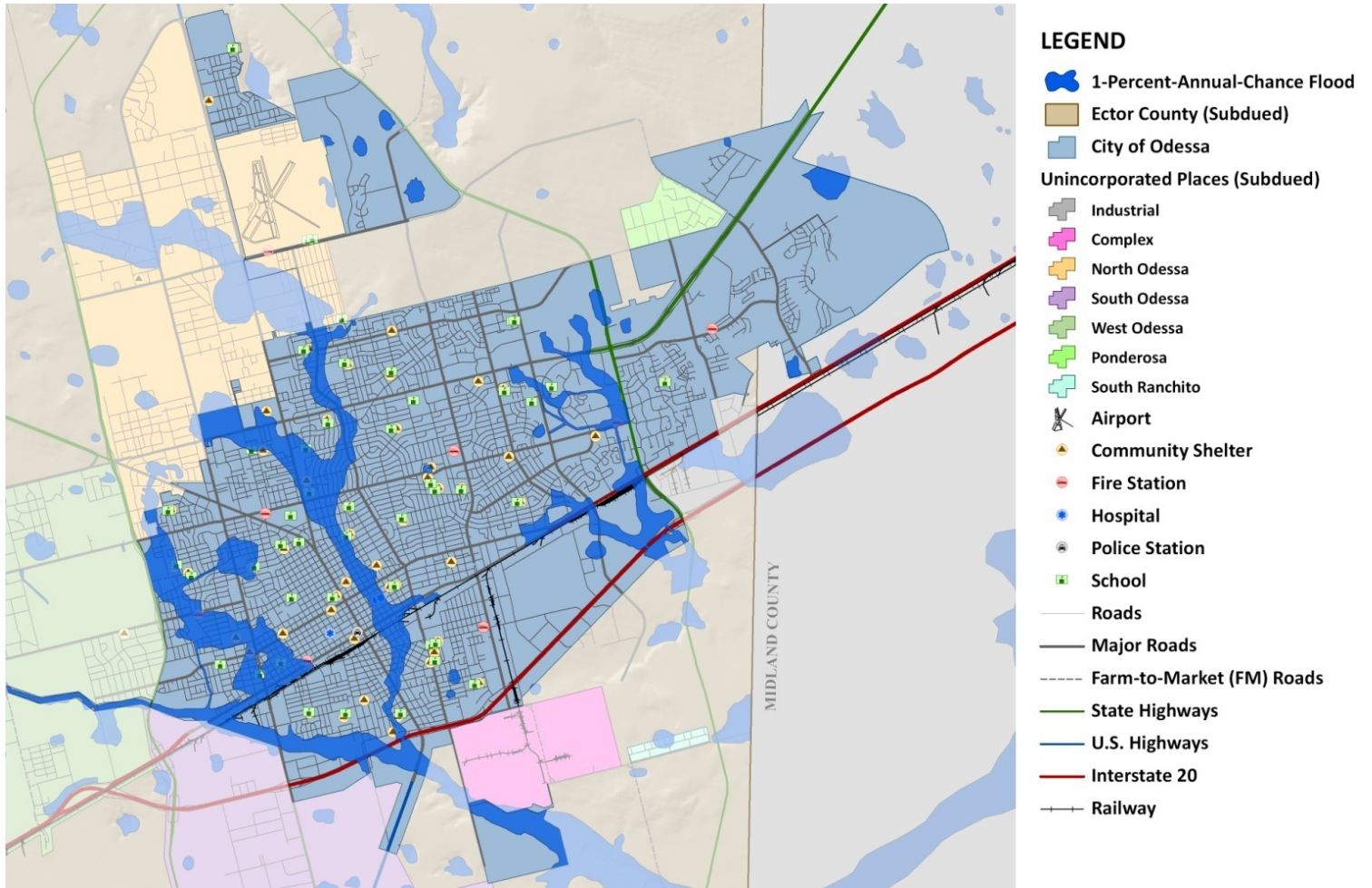
**Figure 5-12. Flood Zones in Ector County**



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**Figure 5-13. Flood Zones in the City of Odessa**

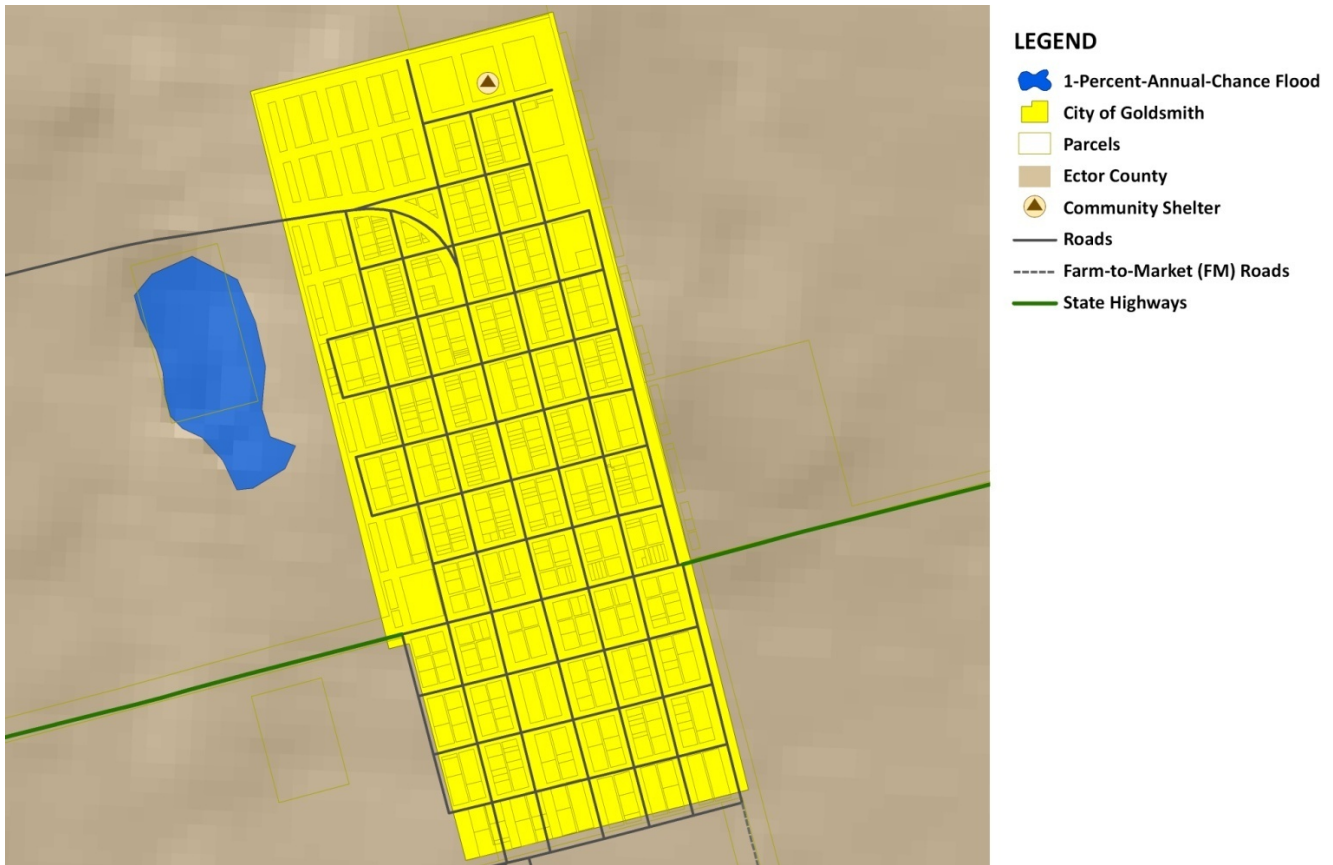




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**Figure 5-14. Flood Zones in the City of Goldsmith**



## Extent

The extent of flood risk is measured by flood zones as determined on Flood Insurance Rate Maps (FIRM). The magnitude or intensity of risk is divided into four categories: high risk; moderate-to-low risk; low risk; and undetermined risk. High risk areas have at least a one percent annual chance of flooding, which means over the life of a 30-year mortgage for a residence, there is a 26 percent chance of flooding. These high risk areas are called Special Flood Hazard Areas (SFHA) and are designated on FIRMs as zone A or V. Areas of moderate and low risk are outside of the one percent annual flooding. Although there is still a risk it is greatly reduced. These zones are identified as B, C and X (shaded and non-shaded) zones. Areas of undetermined risk are labeled as D zones. Even though these are areas of undetermined risk they should be treated with as much caution as high-risk zones. Table 5-20 below describes flood zones in further detail.

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**Table 5-20. Extent Scale – Flood Zones<sup>16</sup>**

Flood Zones	Description		Level of Risk
<b>Zone A</b>	The 100-year or Base Floodplain. There are six types of A zones:		<b>High</b>
	<b>A</b>	The base floodplain mapped by approximate methods, i.e., BFEs are not determined. This is often called an unnumbered A zone or an approximate A zone.	
	<b>A1-30</b>	These are known as numbered A zones (e.g., A7 or A14). This is the base floodplain where the firm shows a BFE (old format).	
	<b>AE</b>	The base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.	
	<b>AO</b>	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.	
	<b>AH</b>	Shallow flooding base floodplain. BFE's are provided.	
	<b>A99</b>	Area to be protected from base flood by levees or Federal flood protection systems under construction. BFEs are not determined.	
<b>AR</b>	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection		
<b>Zone V and VE</b>	<b>V</b>	The coastal area subject to velocity hazard (wave action) where BFEs are not determined on the FIRM.	<b>High</b>
	<b>VE</b>	The coastal area subject to velocity hazard (wave action) where BFEs are provided on the FIRM.	
<b>Zone B and Zone X (shaded)</b>	Area of moderate flood hazard, usually the area between the limits of the 100-year and the 500-year floods. B zones are also used to designate base floodplains or lesser hazards, such as areas protected by levees from the 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.		<b>Moderate to Low</b>
<b>Zone C and Zone X (non-shaded)</b>	Area of minimal flood hazard, usually depiction FIRMs as exceeding the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood.		<b>Low</b>
<b>Zone D</b>	Area of undetermined but possible flood hazards.		<b>Undetermined</b>

Detailed GIS maps were created showing the one percent annual flood risk for the County, the City of Odessa and the City of Goldsmith at Figures 5-12, 5-13 and 5-14, respectively.

<sup>16</sup> Source: Understanding Your Risks, identifying hazards and estimating losses, FEMA 386-2

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**Table 5-21. Extent Scale – Water Depth (Mean Sea Level, MSL)**

LEVEL OF RISK	ECTOR COUNTY	ODESSA	GOLDSMITH
LOW	0 - 13 feet*	1 - 9 feet	0 - 13 feet*
MODERATE	14 - 19 feet	10 - 16 feet*	14 - 19 feet
HIGH	20 - 27 feet	17 - 24 feet	20 - 27 feet

\* Expected extent to mitigate

The water depths depicted in Table 5-21 are an approximation based on elevation data (above sea level rather than above ground) and stream gauge data provided by the National Weather Service. This level of risk is determined by the levels of area streams and rivers. According to Table 5-21, the expected extent to mitigate for Ector County and Goldsmith is from zero to 13 feet and between 10 and 16 feet for Odessa.

In a flash flood event, a low risk for Odessa, Goldsmith and Ector County would be on average lower than one foot. A moderate risk for a flash flood event for all communities would be between one and two feet on average, whereas a high risk would be over two feet. In a flash flood event, two feet of water can wash out low sections of roads or cause vehicles to be swept away.

Reading the maps at Figures 5-12 through 5-14 in conjunction with the extent scales at Table 5-20 and 5-21, indicates that the intensity of a flood event for the County ranges from low to high risk. The risk varies within the City of Odessa, as some areas are located within a zone of high intensity and within the one percent annual flood, while other areas are completely outside of the high risk zone. While flooding may be more prevalent in Odessa, the City of Goldsmith has no mapped SFHAs. Streams and rivers do not flow through the City of Goldsmith, and as it is a more rural area of Ector County, it is generally an area of low risk, affected by shallow flooding and ponding due to the predominant flat terrain.

## Previous Occurrences

Table 5-22 lists historical flood occurrences for the County and participating jurisdictions.

**Table 5-22. Historical Flood Occurrences (NCDC 1993–2009)**

LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
Goldsmith	05/23/1993	6:45 PM	Flash Flood	0	0	\$0



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LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
Odessa	08/25/1993	1:34 AM	Flash Flood	0	0	\$0
Odessa	08/30/1993	7:15 PM	Flash Flood	0	0	\$0
Ector County	06/11/1994	11:00 PM	Flash Flood	0	0	\$0
Odessa	07/13/1994	9:45 PM	Flash Flood	0	0	\$0
Odessa	08/28/1996	6:00 PM	Flash Flood	0	0	\$7,148
Odessa	06/08/1997	1:40 PM	Flash Flood	0	0	\$0
Odessa	07/09/1997	7:43 PM	Flash Flood	0	0	\$0
Odessa	07/10/1997	9:20 PM	Flash Flood	0	0	\$0
Odessa	08/18/1997	7:30 PM	Flash Flood	0	0	\$0
Pleasant Farms	10/06/1997	6:00 PM	Flash Flood	0	0	\$0
Ector County	06/19/1999	7:30 PM	Flash Flood	0	0	\$0
Odessa	09/05/1999	7:00 PM	Flash Flood	0	0	\$6,720
Odessa	09/12/1999	5:30 PM	Flash Flood	0	0	\$40,317
Gardendale	03/22/2000	3:00 AM	Flash Flood	0	0	\$0
Odessa	10/17/2000	6:45 AM	Flash Flood	0	0	\$0
Countywide	10/24/2000	5:10 PM	Flash Flood	0	0	\$0
Odessa	08/31/2001	3:05 PM	Flash Flood	0	0	\$12,668
Penwell	03/29/2002	5:40 PM	Urban/Small Stream Flood	0	0	\$0
Penwell	05/25/2002	7:00 PM	Flash Flood	0	0	\$0
Odessa	05/25/2002	8:00 PM	Flash Flood	0	0	\$0
Penwell	05/25/2002	8:30 PM	Flash Flood	0	0	\$0
Pleasant Farms	05/25/2002	9:00 PM	Flash Flood	0	0	\$0
Odessa	09/13/2002	6:40 PM	Urban/Small Stream Flood	0	0	\$6,149
Odessa	10/06/2002	8:30 PM	Flash Flood	0	0	\$12,299
Odessa	10/18/2002	6:25 PM	Flash Flood	0	0	\$0
Odessa	10/18/2002	6:45 PM	Flash Flood	0	0	\$24,597
Odessa	10/18/2002	7:08 PM	Flash Flood	0	0	\$0
Odessa	10/28/2002	11:30 AM	Flash Flood	0	0	\$0
Odessa	05/24/2003	7:25 PM	Flash Flood	1	0	\$358,216
Odessa	06/03/2003	4:59 PM	Flash Flood	0	0	\$0
Odessa	06/05/2003	11:25 PM	Flash Flood	0	0	\$0
Odessa	08/30/2003	8:25 PM	Flash Flood	0	0	\$23,881
Odessa	10/05/2003	8:48 PM	Flash Flood	0	0	\$35,822
Odessa	04/04/2004	12:43 PM	Flash Flood	0	0	\$0
Goldsmith	06/24/2004	6:42 PM	Flash Flood	0	0	\$0
Odessa	06/29/2004	6:48 PM	Flash Flood	0	0	\$0
Odessa	07/25/2004	8:47 AM	Flash Flood	0	0	\$11,593

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LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
Odessa	09/01/2004	2:50 PM	Flash Flood	0	0	\$0
Gardendale	09/01/2004	5:20 PM	Flash Flood	0	0	\$0
Odessa	09/25/2004	9:10 AM	Flash Flood	0	0	\$34,778
Odessa	09/26/2004	4:50 PM	Flash Flood	0	0	\$0
West Odessa	09/27/2004	7:25 PM	Flash Flood	0	0	\$2,318,548
Ector County	09/28/2004	3:00 PM	Flood	0	0	\$289,819
Odessa	10/04/2004	8:37 AM	Flash Flood	0	0	\$23,185
Odessa	10/05/2004	11:55 PM	Flash Flood	0	0	\$86,946
West Odessa	10/07/2004	7:25 PM	Flash Flood	0	0	\$0
Odessa	11/14/2004	7:15 PM	Flash Flood	0	0	\$17,389
Odessa	11/15/2004	10:00 AM	Flash Flood	0	0	\$34,778
Odessa	05/15/2005	5:50 AM	Flash Flood	0	0	\$281,377
Odessa	05/15/2005	12:00 PM	Flash Flood	0	0	\$0
Odessa	05/26/2005	6:48 AM	Flash Flood	0	0	\$0
Odessa	05/28/2005	2:28 PM	Flash Flood	0	0	\$84,413
Odessa	06/03/2005	3:03 AM	Flash Flood	0	0	\$0
Odessa	07/13/2005	4:30 PM	Flash Flood	0	0	\$0
Odessa	08/14/2005	1:30 PM	Flash Flood	0	0	\$5,628
Odessa	10/09/2005	5:00 PM	Flash Flood	0	0	\$0
Odessa	10/13/2005	6:30 AM	Flash Flood	0	0	\$22,510
Odessa	10/13/2005	7:30 AM	Flash Flood	0	0	\$11,255
Odessa	03/28/2006	11:29 PM	Flash Flood	0	0	\$5,464
Odessa	08/13/2006	9:05 PM	Flash Flood	0	0	\$54,636
Odessa	08/15/2006	3:00 AM	Flash Flood	0	0	\$0
Odessa	08/15/2006	7:15 PM	Flash Flood	0	0	\$0
Odessa	08/16/2006	8:15 AM	Flash Flood	0	0	\$0
Odessa	08/25/2006	6:45 PM	Flash Flood	0	0	\$5,464
Odessa	08/28/2006	2:34 PM	Flash Flood	0	0	\$0
Goldsmith	08/31/2006	6:15 PM	Flash Flood	0	0	\$0
Odessa	03/25/2007	11:21 PM	Flash Flood	0	0	\$21,218
Odessa	04/29/2007	3:11 PM	Flash Flood	0	0	\$0
Odessa	05/02/2007	8:30 AM	Flash Flood	0	0	\$530,450
West Odessa	05/08/2007	12:13 PM	Flash Flood	0	0	\$0
Odessa	05/09/2007	4:09 AM	Flash Flood	0	0	\$10,609
Odessa	06/26/2007	11:23 PM	Flash Flood	0	0	\$0
Odessa	07/21/2007	1:58 PM	Flash Flood	0	0	\$0
Odessa	08/02/2007	1:10 AM	Flash Flood	0	0	\$53,045

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LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
Odessa	08/02/2007	5:11 AM	Flash Flood	0	0	\$0
West Odessa	08/30/2007	8:30 PM	Flash Flood	0	0	\$0
Odessa	09/10/2007	5:57 PM	Flash Flood	0	0	\$15,914
Greenfield Acres	10/11/2007	4:24 PM	Flash Flood	0	0	\$10,609
Odessa	10/11/2007	5:11 PM	Flash Flood	0	0	\$10,609
Westover	06/28/2008	5:05 PM	Flash Flood	0	0	\$0
Odessa	10/05/2008	6:20 PM	Flash Flood	0	0	\$0
Westover	04/11/2009	7:20 PM	Flash Flood	0	0	\$0
<b>TOTALS</b>	-	-	-	<b>1</b>	<b>0</b>	<b>\$4,468,054</b>

## May 24, 2003 Event

A significant flash flood event impacted the City of Odessa during the evening hours of May 24, 2003. Numerous reports of flash flooding, including water in homes and stalled vehicles, were recorded. Several swift water rescues were conducted by the Odessa Fire Department across the city. An 18-year-old female was killed when she was swept away by raging floodwaters while trying to evacuate her stalled pickup truck. Two passengers were successfully rescued from the vehicle. High water resulted in dangerous conditions for motorists throughout the city. A few of the most significant reports were received from the area around Ratliff Stadium (where a high school graduation was scheduled to occur) and along University Street. Over \$350,000 in property damages were reported.

## September 27, 2004 Event

Very intense rainfall fell over Monahans Draw near West Odessa on September 27, 2004. The first reports of flash flooding indicated that high water rendered Farm-to-Market (FM) Road 866, State Highway 302 and Interstate 20 impassable. Up to 6 feet of water was reported crossing low lying areas of FM Road 866 just north of the I-20 junction. Several vehicles stalled in high water flowing across the Interstate, resulting in high water rescues of stranded motorists. By late evening the swollen Monahans Draw, usually a dry depression, inundated residential areas in West Odessa. The hardest hit areas were near Third and Damascus streets. The most extensive damage occurred to several trailer parks in the Westcliff, Knox Village and Manor subdivisions. Rescue crews from three fire departments worked to remove distressed residents from homes and vehicles that were threatened by high water. One fire engine stalled in the floodwaters. Many families were displaced to

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emergency shelters in other portions of the City of Odessa and West Odessa. More than 40 homes suffered serious damage. Four trailer homes and two permanent homes were destroyed. Another 15 single family homes experienced major damage from the floodwaters. Local emergency management officials continued to report major flash flooding resulting from runoff along Monahans Draw through the night. During the pre-dawn hours of September 28, another band of showers and thunderstorms moved north across Ector County. Brief heavy rainfall from this activity aggravated the flash flood situation. By 6:35 a.m., local officials were again at work to evacuate residents near the intersections of Tripp and Twenty-Third streets and Tenth and Redondo streets. Between 2 and 3 feet of water was reported rushing through those streets threatening numerous homes. At least three high water rescues were also conducted to save stranded motorists. Significant runoff and associated flash flooding of low lying areas prevented access to much of West Odessa through the early afternoon hours. Scattered thunderstorms developed and produced locally heavy rainfall over the western parts of the West Texas Permian Basin during the late afternoon and evening of the 27th. Many West Odessa residents were displaced from their homes during the late evening hours when flash flooding along Monahans Draw devastated parts of the city. No casualties were reported, but at least 20 families were left homeless and over \$2,300,000 in property damages were reported.

## May 15, 2005 Event

The Odessa Fire Department conducted 35 high water rescues as flash flooding of city streets stranded motorists in 2 to 4 feet of flowing floodwaters on May 15, 2005. The Odessa American reported that the worst flooding occurred along Dixie Boulevard, Eighth Street, 42nd Street and Muskingum Street. A complex of showers and thunderstorms propagated over the Permian Basin of West Texas during the morning hours of the 15th. No injuries were reported but over \$280,000 in property damages were recorded.

## May 2, 2007 Event

Widespread flooding occurred in the City of Odessa on May 2, 2007, resulting in damage to at least 100 homes. The number of homes affected, vehicles stranded in high water and county buildings damaged by flooding prompted the Ector County judge to declare a state of emergency in the county the following day. Damage to homes ranged from minimal wind and rain damage to up to 2 feet of water inside homes. Several vehicles were stranded in 2 to 4 feet of water. Eleven inches of water pooled in the basement of the Ector County Library and 2 to 3 inches of water was observed in the Ector County Health Department. On the following day, newspapers reported that 25 to 40 families sought assistance from the

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American Red Cross. Ector County Road, Bridge and Traffic Department employees worked overtime to pump water out of flooded streets on subsequent days. During the storm, high schools closed their campuses to off-campus travel, prompting a need for food to be delivered to the campuses to feed all the students who normally travel off-campus for lunch. Odessa firefighters and EMS personnel responded to 95 calls for high water rescues. Over \$530,000 in property damages were reported.

## Probability of Future Events

The probability of future occurrences of flood events is highly probable, with more than a 75 percent chance of a flood event occurring in any given year.

## Earthquake

An earthquake is the motion or trembling of the ground produced by a sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles; cause damage to property measured in the tens of billions of dollars; result in loss of life and injury to hundreds of thousands of persons; and cause major social and economic disruptions.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake's size, distance from the fault, and site and regional geology. Other damaging effects include landslides, or the down-slope movement of soil and rock, and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's ten tectonic plates. These plate borders generally follow the outlines of the continents, with the North American plate following the continental border with the Pacific Ocean in the west, and the mid-Atlantic trench in the east. As earthquakes occurring in the mid-Atlantic trench usually pose little danger to humans, the greatest earthquake threat in North America is along the Pacific Coast.

The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite

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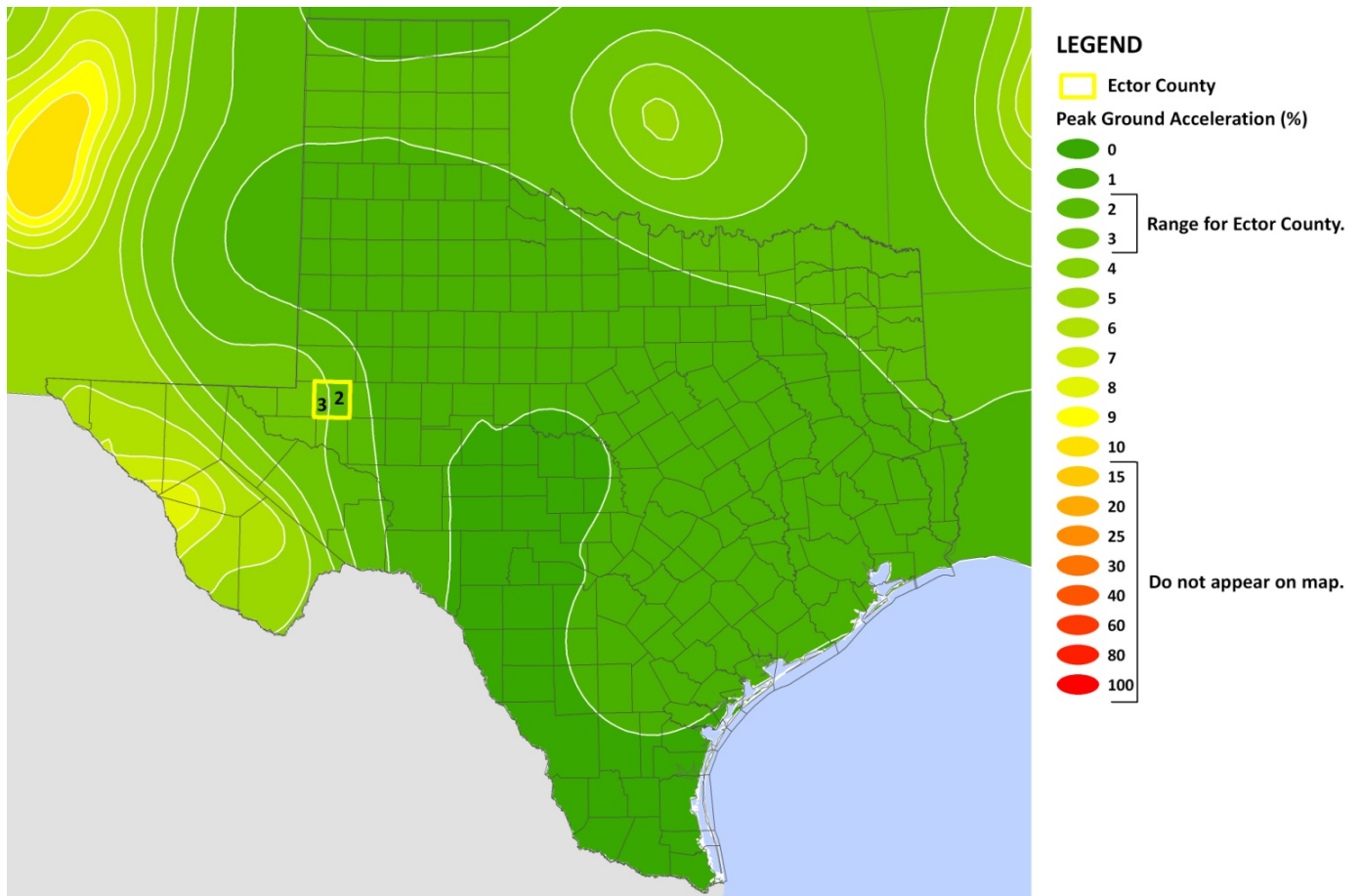
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directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the buildup of stored energy. When the built-up stress exceeds the rocks' strength, a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

## Location

Figure 5-15 shows peak ground acceleration (PGA) values for the State of Texas based upon data from the U.S. Geological Survey (USGS), with Ector County location and information highlighted. Figure 5-16 illustrates the amount of damage expected.

**Figure 5-15. Regional Map Showing Peak Ground Acceleration for the State of Texas**

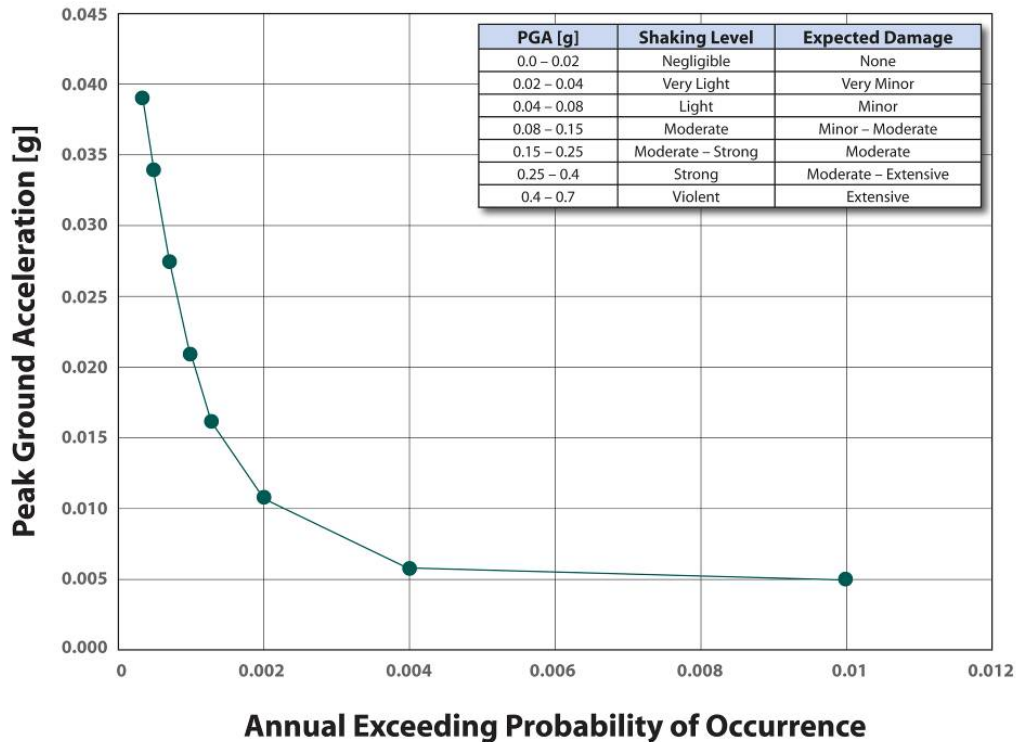




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**Figure 5-16. Peak Ground Acceleration Profile as a Representative Parameter of the Earthquake Hazard Profile**



## Extent

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (see Table 5-23). Each unit increase in magnitude on the Richter Scale corresponds to a ten-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, with a I corresponding to imperceptible (instrumental) events, IV corresponding to moderate (felt by people awake) event, and XII, representing a catastrophic (total destruction) event. A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is provided in Table 5-24.



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**Table 5-23. Richter Scale**

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
LESS THAN 3.5	Generally not felt, but recorded.
3.5 TO 5.4	Often felt, but rarely causes damage.
UNDER 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 TO 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 TO 7.9	Major earthquake. Can cause serious damage over larger areas.
8 OR GREATER	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

**Table 5-24. Modified Mercalli Intensity (MMI) Scale**

SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
I	INSTRUMENTAL	Detected only on seismographs.	
II	FEEBLE	Some people feel it.	< 4.2
III	SLIGHT	Felt by people resting; like a truck rumbling by.	
IV	MODERATE	Felt by people walking.	
V	SLIGHTLY STRONG	Sleepers awake; church bells ring.	< 4.8
VI	STRONG	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	VERY STRONG	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	DESTRUCTIVE	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	RUINOUS	Some houses collapse; ground cracks; pipes break open.	< 6.9

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SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
X	DISASTROUS	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	VERY DISASTROUS	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	CATASTROPHIC	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Taking into consideration the possible extent of an earthquake for the area, by reviewing Tables 5-23 and 5-24 in conjunction with previous occurrences as depicted in Table 5-25, the Ector County area could experience anywhere from a 4.1 to 6.4 Richter Scale or Level IV or moderate impact based on the Modified Mercalli Intensity scale.

## Previous Occurrences

According to the National Geophysical Data Center (NGDC), there are no “significant” earthquakes on record for the state of Texas from 2150 B.C. to the 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 Ector County and its jurisdictions. However, according to the NGDC Earthquake Intensity Database, there are 585 seismic occurrences on record for the state of Texas between 1882 and 1985, with some events equating to a VII on the MMI Scale. Table 5-25 shows events associated with the Ector County study area based on NGDC records.

**Table 5-25. Historical Earthquake Occurrences (NGDC 1993–2009)**

LOCATION	DATE	TIME	MAGNITUDE		DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
			Richter Scale	MMI			
Odessa	08/16/1931	11:40 AM	6.4	IV	0	0	Unknown
Notrees	01/25/1976	4:48 AM	4.1	IV	0	0	Unknown

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LOCATION	DATE	TIME	MAGNITUDE		DEATHS	INJURIES	PROPERTY DAMAGE (IN 2009 DOLLARS)
			Richter Scale	MMI			
TOTALS	-	-	-	-	0	0	Unknown

## Probability of Future Events

Based on the extremely limited previous occurrences for earthquake, any probability for future occurrences would be unlikely, meaning that an event is possible within the next ten years. Regardless, the earthquake hazard was addressed due to the potential for impact.

## Wildfire

Texas has seen a huge increase in the number of wildfires in the past 30 years. More and more people are siting their homes in woodland settings in or near forests, rural areas, or remote mountain sites. Many of these homes are nestled along ridgelines, cliff-edges, and other classic fire-interface hazard zones. There, homeowners enjoy the beauty of the environment but they also face the very real danger of wildfire. Years of fire suppression have significantly disturbed natural fire occurrences—nature’s renewal process. The result has been the gradual accumulation of understory and canopy fuels to levels of density that can feed high-energy, intense wildfires and further increase the hazards from and exposure to interface problems.



A grassfire in south Ector County on 2/1/09 burned with smoke visible for miles. *Midland-Reporter Telegram*

## Location

GIS data depicting the Federal Register definition of the wildland-urban interface in Texas based on the integration of U.S. Census and USGS National Land Cover Data was used to identify the following areas of possible concern:

- High Density Interface

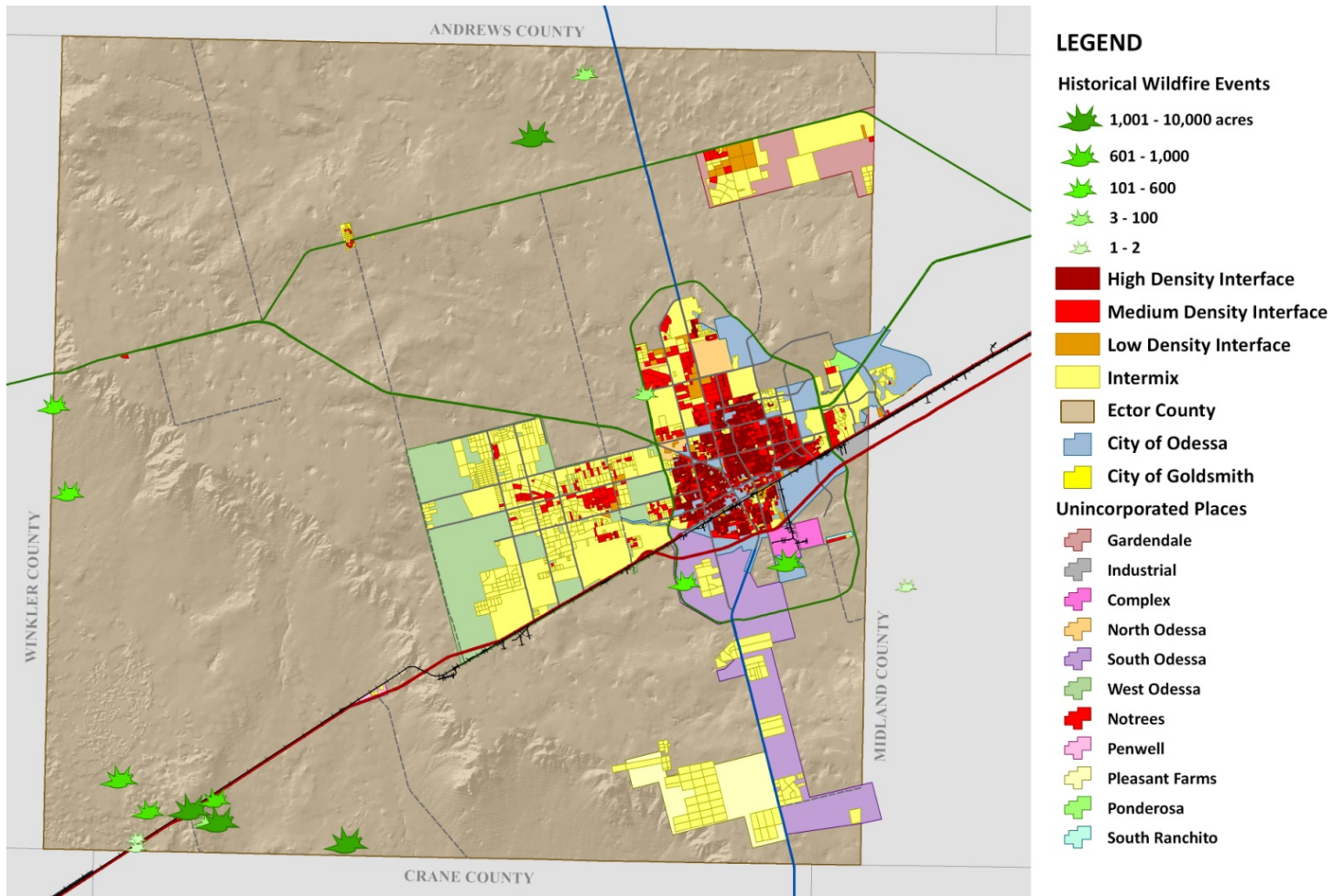
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- Medium Density Interface
- Low Density Interface
- Intermix

Figure 5-17 graphically illustrates the potential wildfire hazard areas listed above and provides an indication of where there is potential for damage to property and loss of life in Ector County. Known historical wildfire occurrences are also shown in Figure 5-17 (based upon information shown in Table 5-26). Figure 5-18 and Figure 5-19 show potential wildfire hazard areas in the City of Odessa and the City of Goldsmith.

**Figure 5-17. Wildland Urban Interface (WUI) Areas and Known Historical Events (2008-2009)**

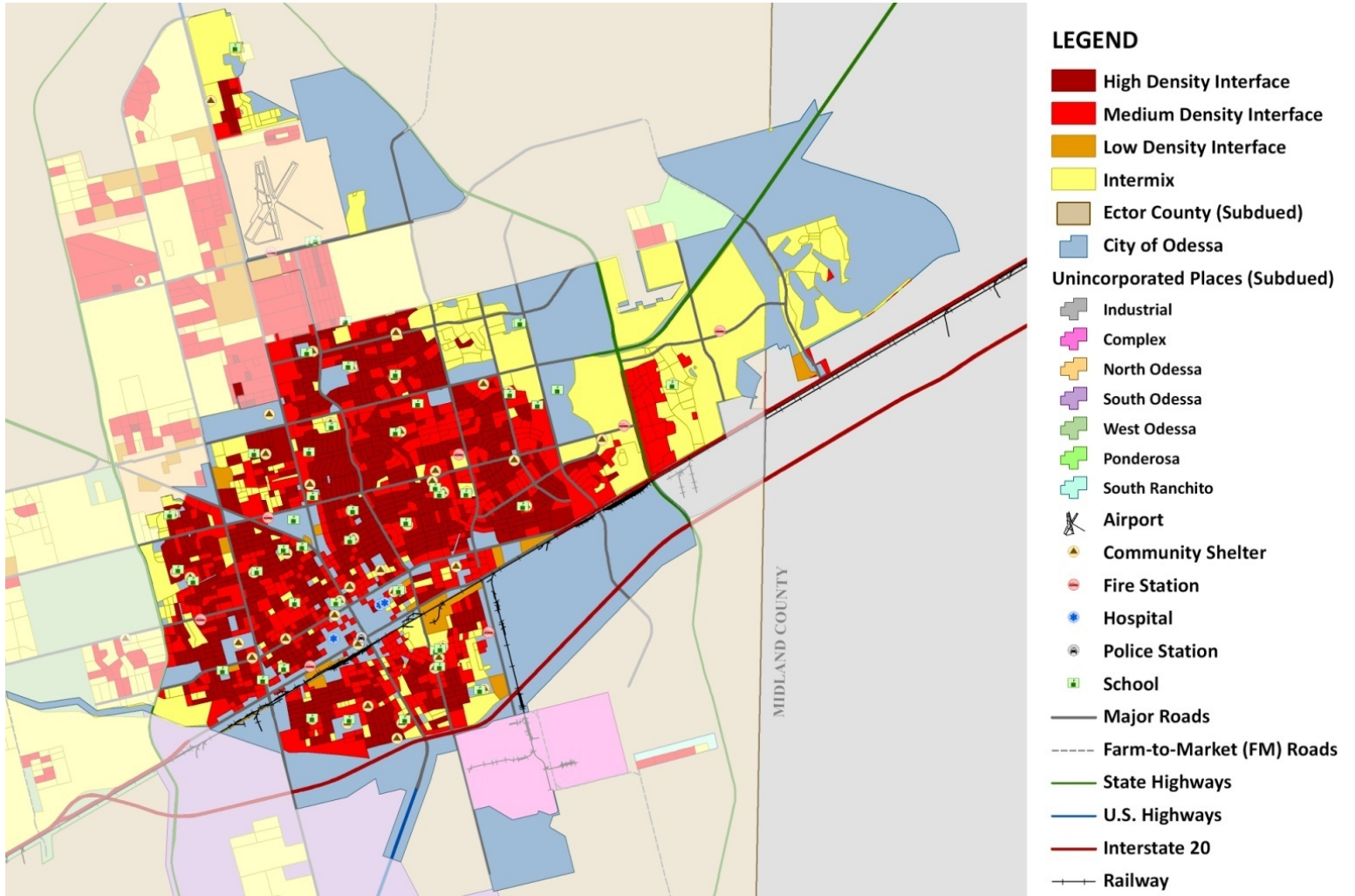




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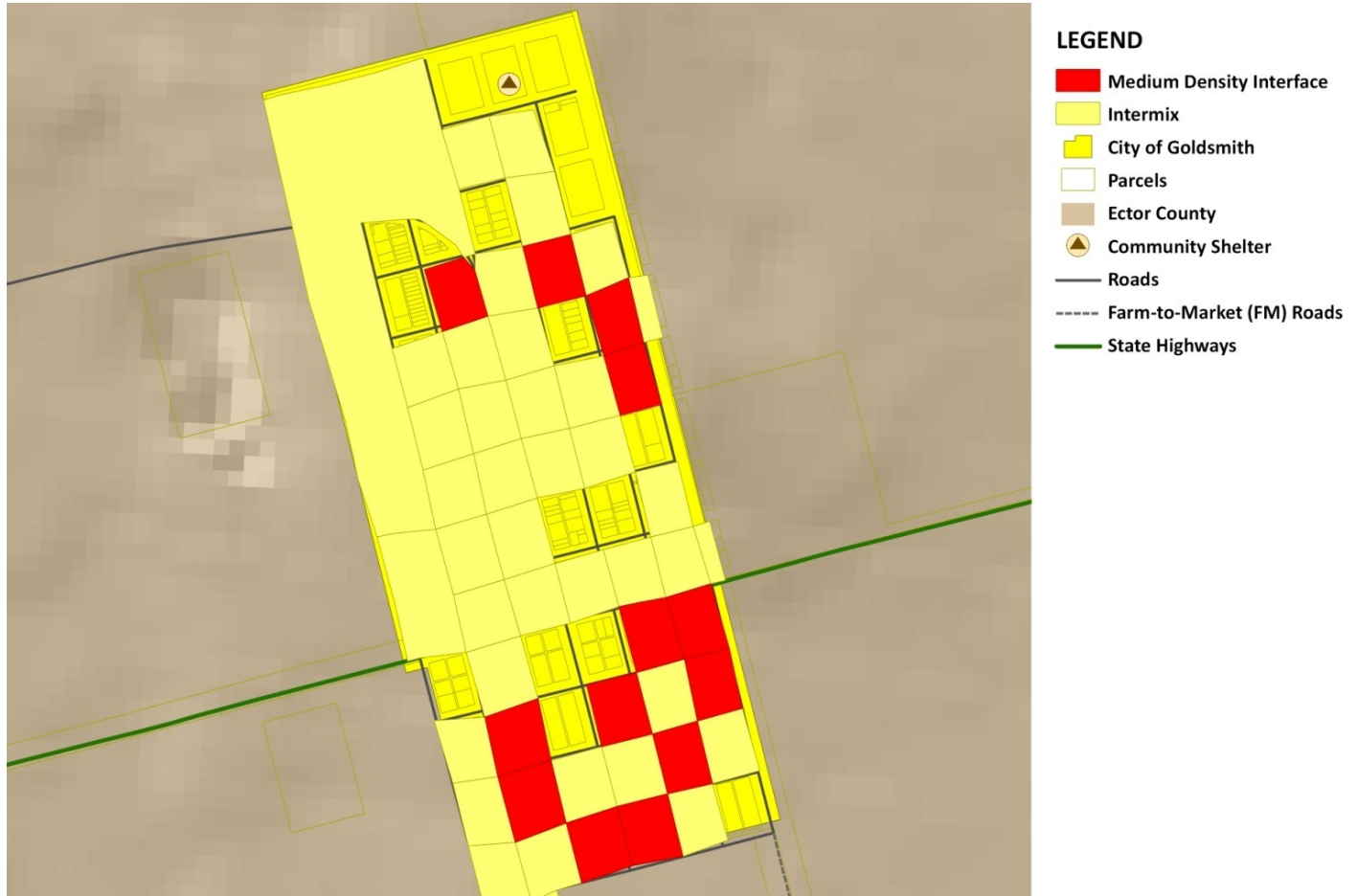
**Figure 5-18. Wildland Urban Interface (WUI) Areas (City of Odessa)**



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**Figure 5-19. Wildland Urban Interface (WUI) Areas (City of Goldsmith)**



## Extent

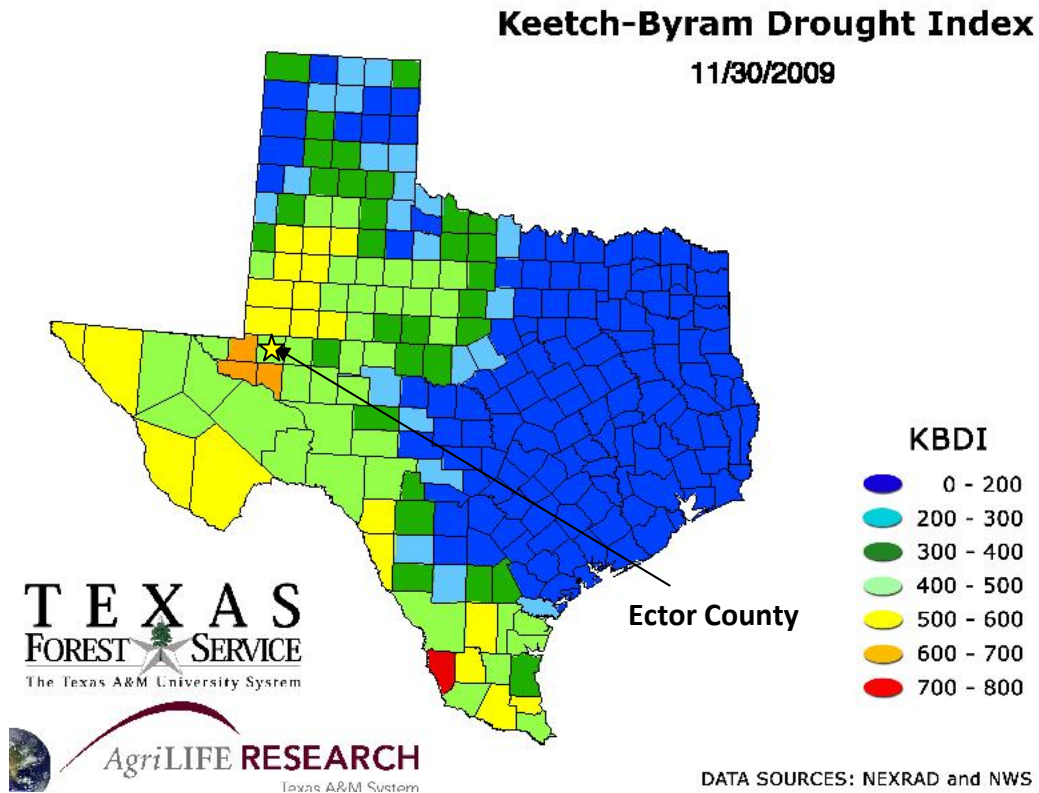
Fire risk is measured in terms of magnitude and intensity using the Keetch-Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior.

The KBDI determines forest fire potential and is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

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Figure 5-20. KBDI County Averages – November 2009



Each color on the map represents the drought index at that location. The drought index ranges from 0 to 800, where a drought index of 0 represents no moisture depletion, and an index of 800 represents absolutely dry conditions.

These numbers correlate with potential fire behavior as follows:

- **0 - 200** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
- **200 - 400** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.



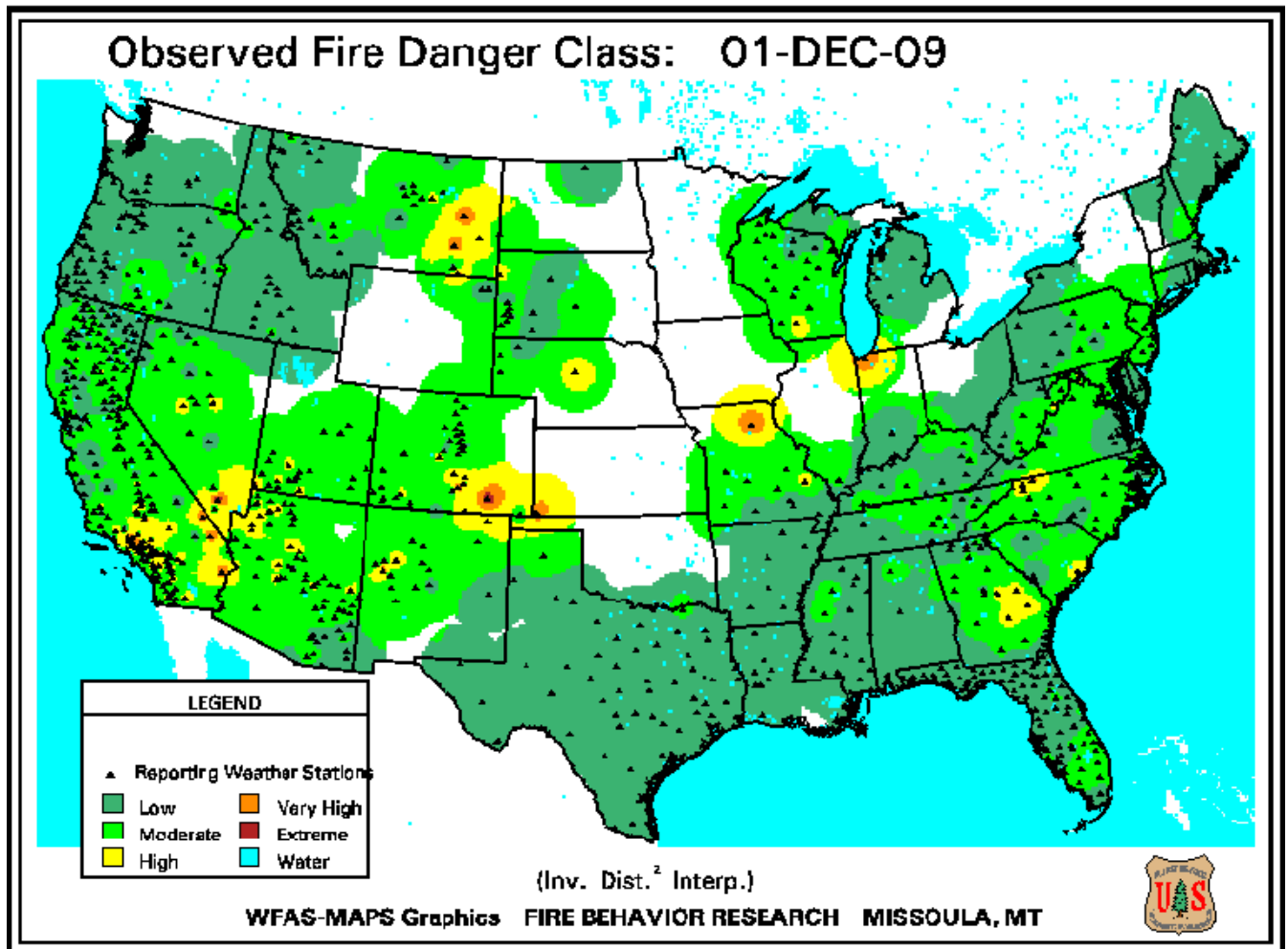
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- **400 - 600** Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
- **600 - 800** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Using the KBDI index is a good measure of the readiness of fuels for wildland fire. Caution should be exercised in dryer, hotter conditions, and the KBDI should be referenced as the area experiences changes in precipitation and soil moisture.

**Figure 5-21. Fire Danger Class**



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Ector County is currently at a Class 1 as indicated by Figure 5-21 on the previous page. The Fire Danger Rating System is established by NOAA that characterizes fire danger by evaluating the approximate upper limit of fire behavior in a fire danger rating area during a 24-hour period. The calculation is based on fuels, topography and weather.

**Table 5-26. Fire Danger Rating (NOAA)**

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

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National Fire Danger Rating System		
Rating	Basic Description	Detailed Description
		develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.

Ector County is currently at a low risk based on the extent scales in Figures 5-20 to 5-21. As the magnitude of an event can change based on the weather, it's important to maintain awareness of the Fire Danger Class, KBDI and Regional Fire Risk Levels to mitigate against future occurrences of wildfire.

## Previous Occurrences

A total of 27,619 acres of land are reported to have burned in 2008 and 2009 as a result of 14 wildfire events greater than 10 acres each (Table 5-27).

**Table 5-27. Historical Wildfire Events Within Ector County Greater Than 10 Acres (2008–2009)<sup>17</sup>**

FIRE DEPARTMENT	EVENT NAME	START DATE	INJURIES	FATALITIES	RESIDENCES LOST	ACRES BURNED
Fort Stockton	Odessa 338	02/25/2008	0	0	0	400
Monahans	Anderson Ranch	03/16/2008	Unknown	Unknown	Unknown	10,000
Wickett VFD	1053 Fire	03/16/2008	Unknown	Unknown	Unknown	10,000
Monahans	95 MM	04/09/2008	Unknown	Unknown	Unknown	100
Canyon	1053	04/10/2008	0	0	0	2,500
Abilene	Goldsmith Fire	04/10/2008	0	0	0	1,500
Monahans	93 MM	04/10/2008	Unknown	Unknown	Unknown	400
Abilene	North Goldsmith	04/10/2008	0	0	0	50

<sup>17</sup> Source: Texas Forest Service and Volunteer Fire Stations

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FIRE DEPARTMENT	EVENT NAME	START DATE	INJURIES	FATALITIES	RESIDENCES LOST	ACRES BURNED
Fort Stockton	Yukon Road	04/17/2008	0	0	0	25
West Odessa VFD	South Dixie Fire	01/25/2009	Unknown	Unknown	Unknown	1,000
Fort Stockton	1053 Fire	03/05/2009	0	0	0	640
Wickett VFD	278	03/05/2009	Unknown	Unknown	Unknown	600
San Angelo	Hell Bound	05/29/2009	0	0	0	199
San Angelo	Ector Co. 307	06/02/2009	0	0	0	205
<b>TOTALS</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>27,619</b>

## Probability of Future Events

Wildfires can occur at any time of the year, an occurrence for Ector County is highly likely. 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 these types of fires. The intensity of fires and the rate at which they spread are directly related to wind speed, temperature, and relative humidity.

## Hazardous Material Release

In a hazardous materials incident, solid, liquid and/or gaseous contaminants are released from fixed or mobile containers, although this profile focuses on fixed sites. Weather conditions will directly affect how the hazard develops.

The Toxics Release Inventory (TRI) is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemical releases and other waste management activities reported annually by certain covered industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to the EPA and to their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities;

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RCRA Subtitle C treatment, storage, and disposal (TSD) facilities; and solvent recovery services.

- Has 10 or more full-time employee equivalents.
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative and toxic (PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds or 0.1 grams depending on the chemical.

Tier 2 data is a publicly available database from the Texas Department of State Health Services Tier 2 Chemical Reporting Program. Under the community right-to-know program laws upheld at the state and federal level, all facilities that store significant quantities of hazardous chemicals must share this information with state and local emergency responders and planners. Facilities in Texas share this information by filing annual hazardous chemical inventories with the state, with Local Emergency Planning Committees (LEPCs), and with local fire departments. The Texas Tier 2 Reports contain facility identification information and detailed chemical data about hazardous chemicals stored at a facility.

A facility must report if it meets the following criteria:

- Any company using chemicals that could present a physical or health hazard must report them, according to Tier 2 requirements.
- If an industry has an OSHA deemed hazardous chemical that exceeds the appropriate threshold at a certain point in time, then the chemical must be reported. These chemicals may be on the list of 356 Extremely Hazardous Substances (EHS) or could be one of the 650,000 reportable hazardous substances (not on the EHS list). This reporting format is for a "snapshot in time". EHS chemicals have to be reported if the quantity is either greater than 500 pounds, or if the Threshold Planning Quantity (TPQ) amount is less than 500 pounds.

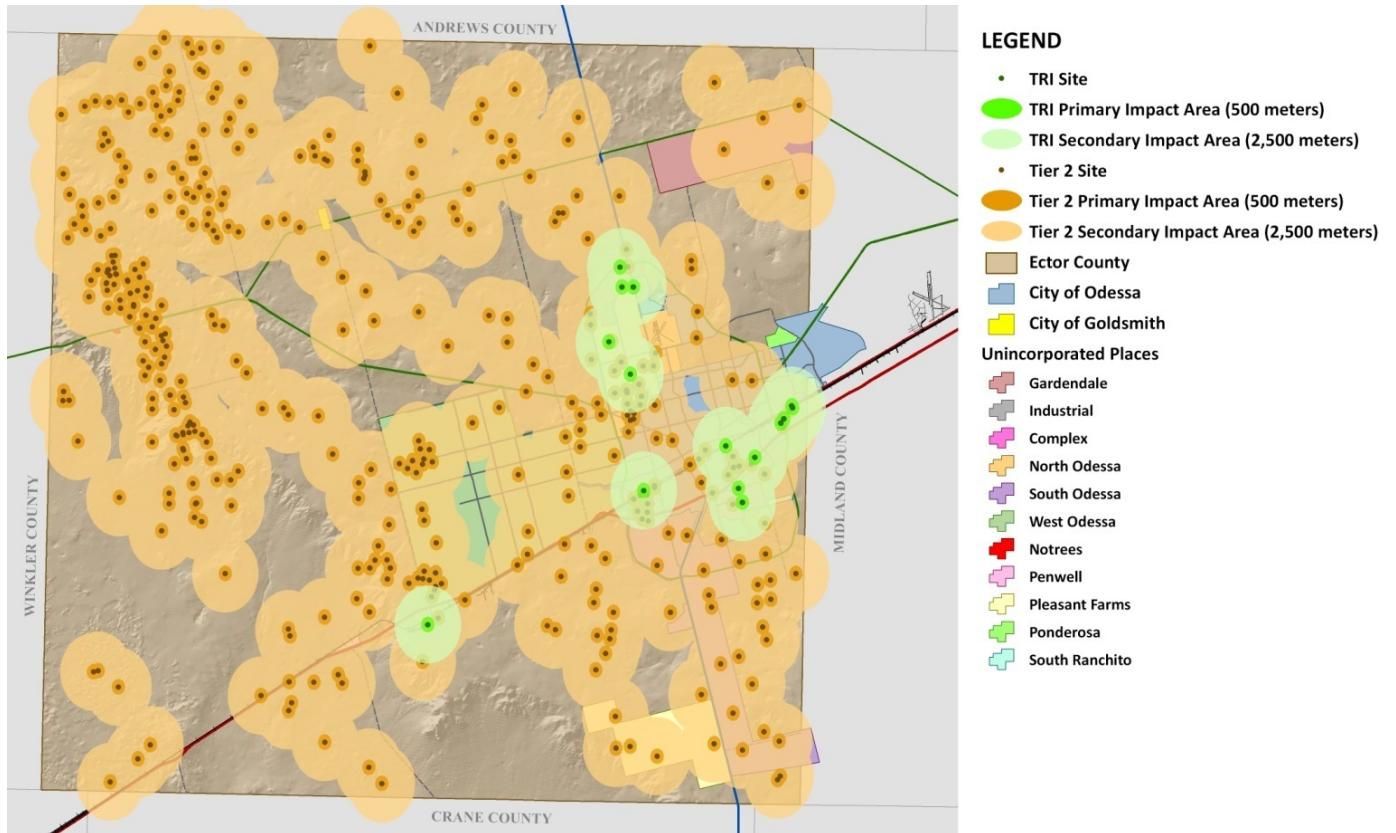
## Location

Figure 5-22 shows the locations of available georeferenced TRI and Tier 2 listed toxic sites in the Ector County study area. Figures 5-23 and 24 show the toxic site locations in the Cities of Odessa and Goldsmith, respectively. For fixed site analysis, only toxic sites that have georeferenced data available were analyzed and the circle buffers are drawn around each hazardous material site. Two sizes of buffers, 500 and 2,500 meters are assumed in respect to the different levels of impact—immediate (primary) and secondary. Figure 5-25 illustrates the 500-meter and 2,500-meter buffers for the two infrastructure elements that comprise the mobile toxic release hazard: highway and rail.

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**Figure 5-22. Fixed HAZMAT Analysis Locations and Buffers (Ector County)**

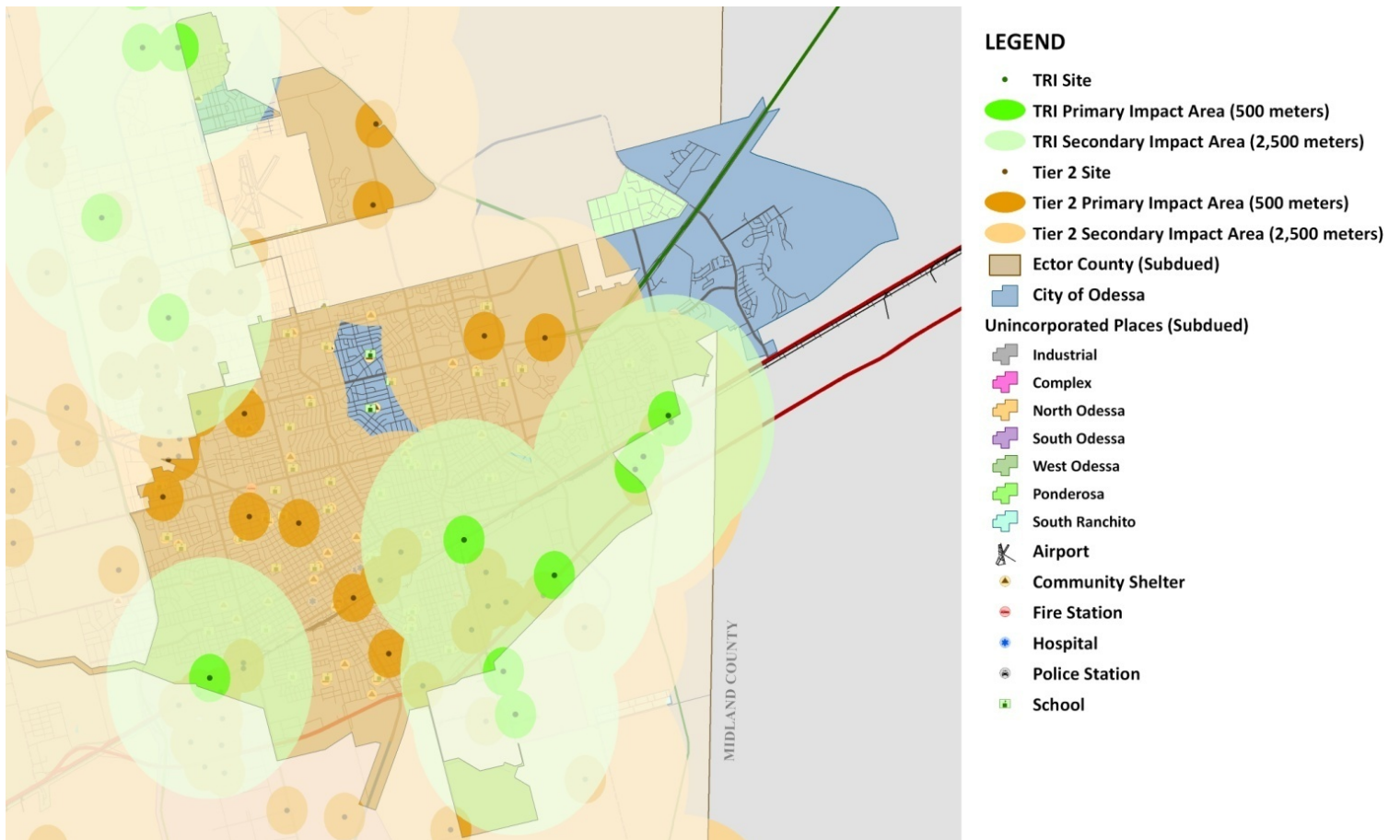




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**Figure 5-23. Fixed HAZMAT Analysis Locations and Buffers (City of Odessa)**

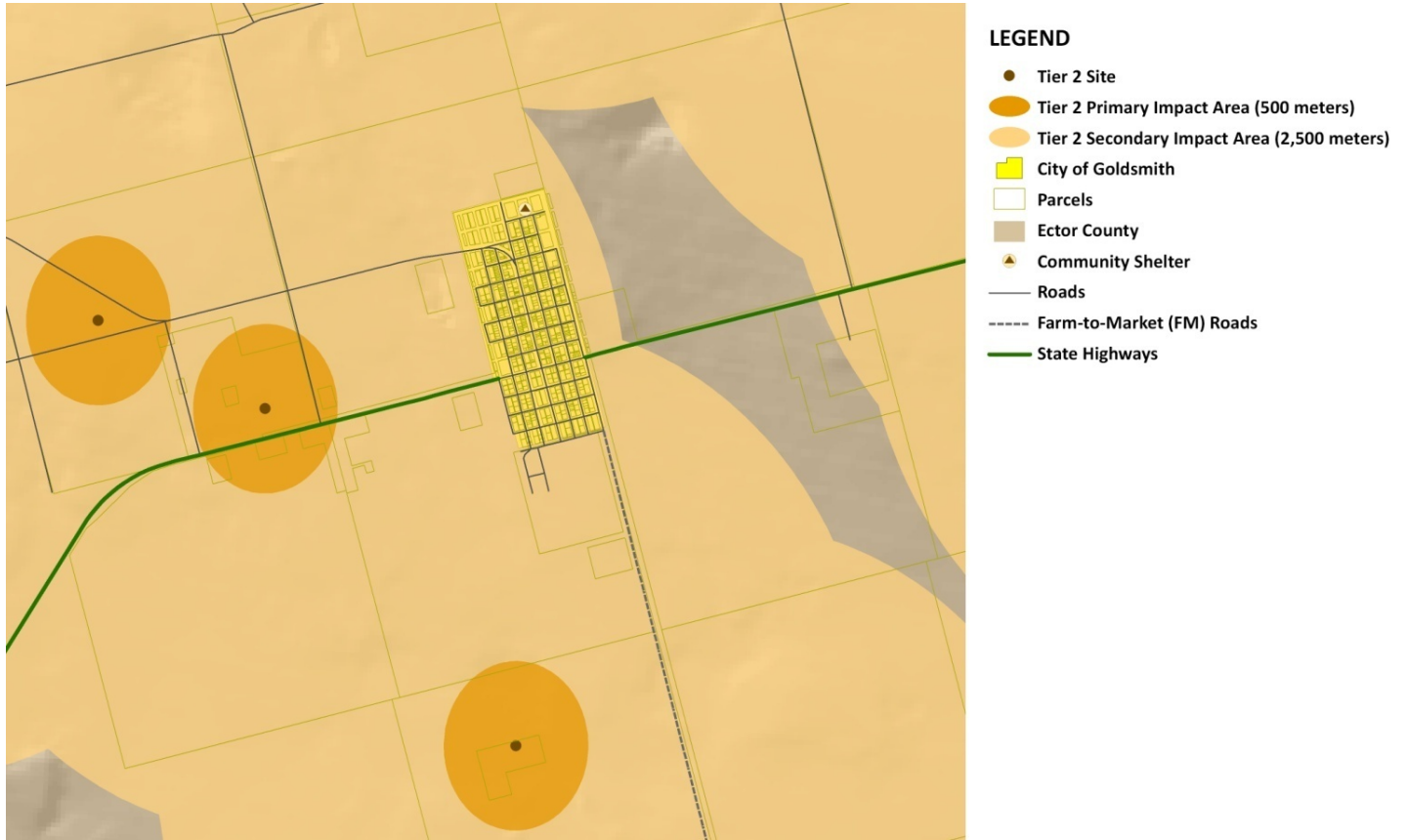




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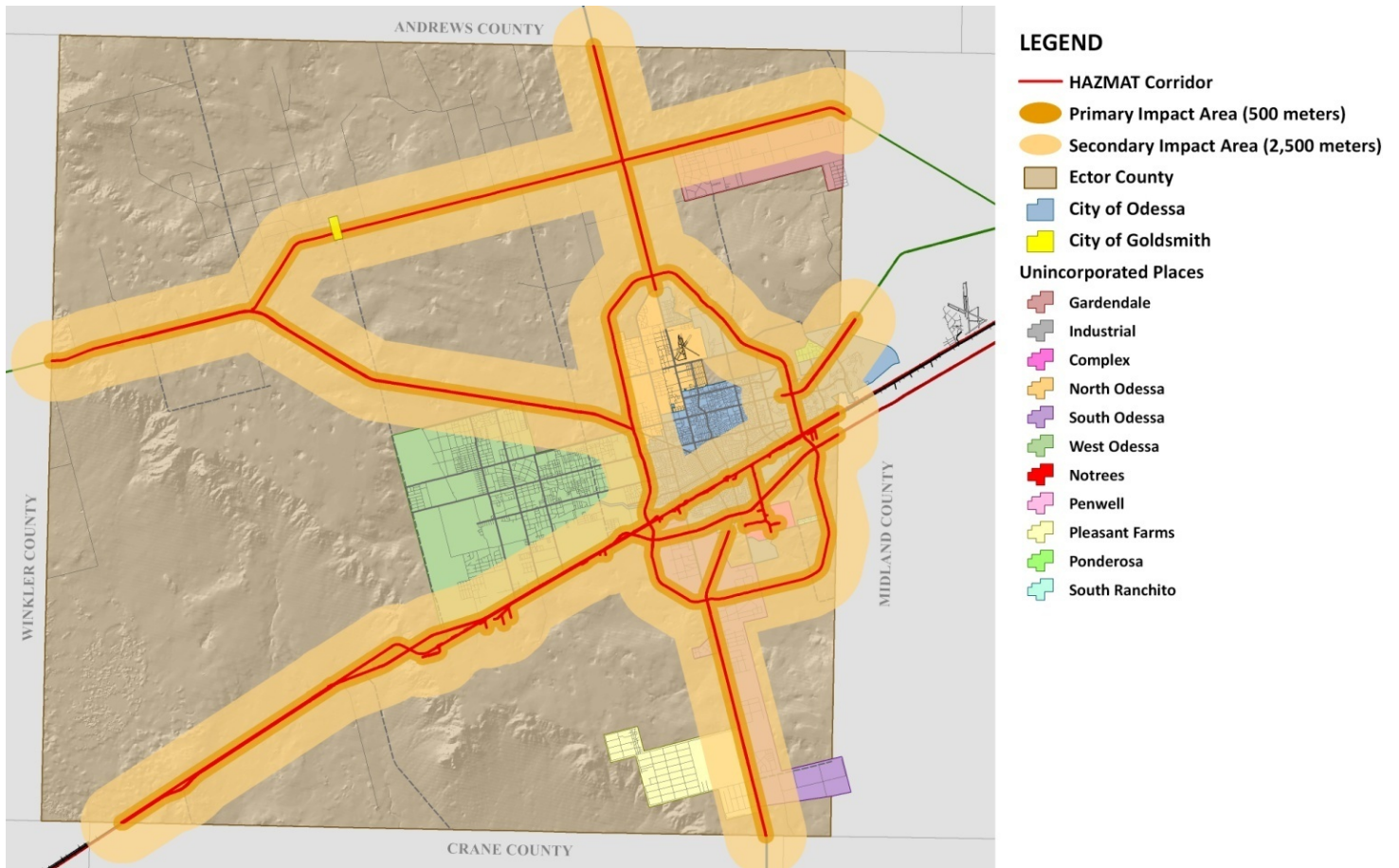
**Figure 5-24. Fixed HAZMAT Analysis Locations and Buffers (City of Goldsmith)**



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**Figure 5-25. Mobile HAZMAT Analysis Corridors and Buffers**



## Extent

In a hazardous materials incident, solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. The micro-meteorological effects of the buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering-in-place can protect people and property from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time for hazardous materials incidents is minimal to none.

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## Probability of Future Events

Based on the location of mobile and fixed hazardous material sites, a spill is likely for Ector County, with the potential of having a substantial impact.

## Pipeline Failure

Fuel pipeline breach or pipeline failure addresses the rare, but serious hazard of an oil or natural gas pipeline. An estimated 2.2 million miles of pipelines in the United States carry hazardous materials. Natural gas pipelines transport natural gas, and oil or liquid petroleum pipelines transport crude oil and refined products from crude oils, such as gasoline, home heating oil, jet fuel and kerosene in addition to liquefied propane, ethylene, butane and some petrochemical products. Sometimes oil pipelines are also used to transport liquefied gases, such as carbon dioxide.



Pipeline failure is a rare occurrence, but has the potential to cause extensive property damage and loss of life. Pipelines have caused fires and explosions that killed more than 200 people and injured more than 1,000 people nationwide and 50 people in Texas in the last decade.

## Location

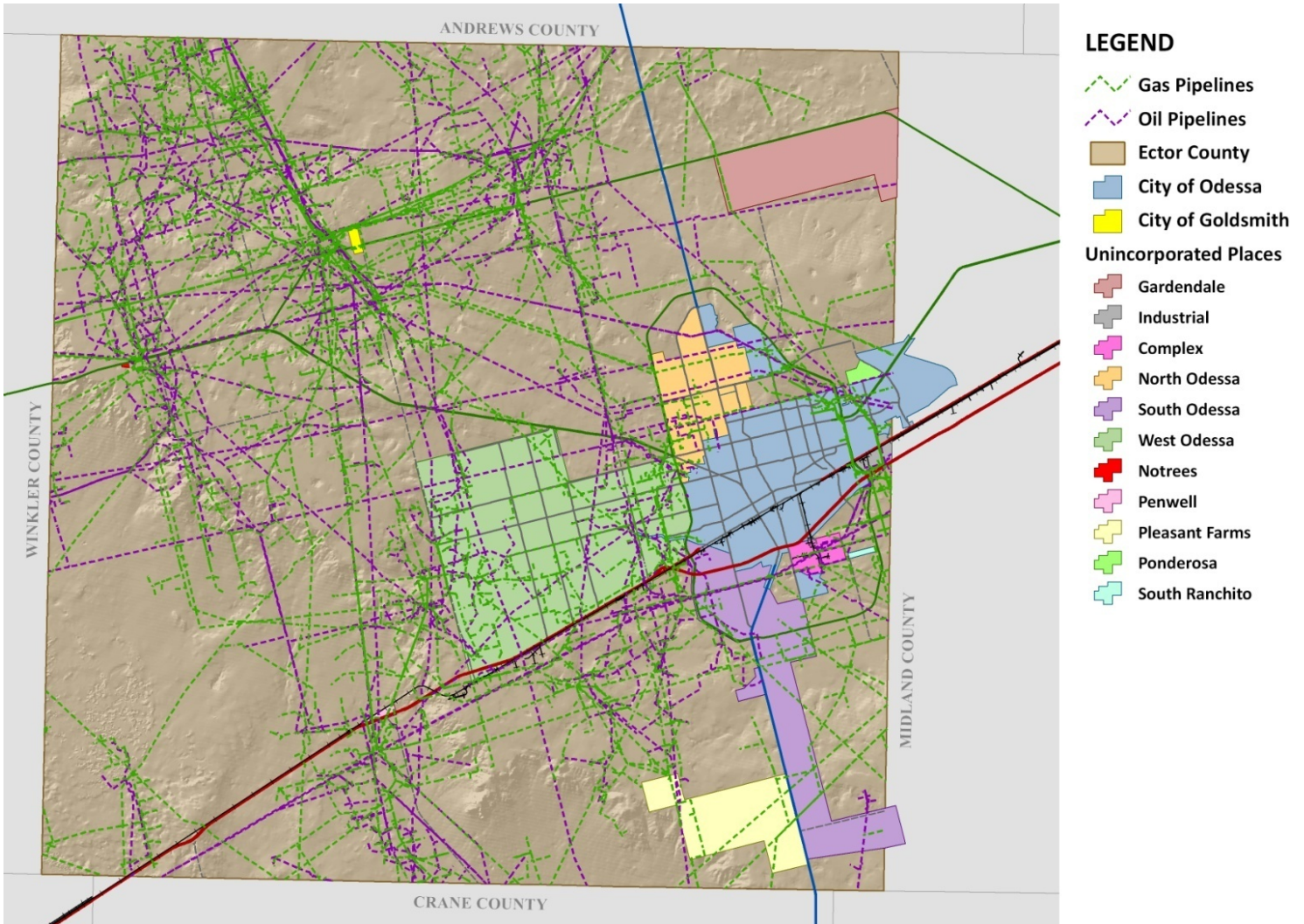
Figure 5-26 shows the location of energy pipelines (gas and oil) in Ector County. If any of these energy pipelines, gas or oil, were to rupture, such an event could endanger property and lives in the immediate area (up to 500 meters for immediate [primary] impact and up to 2,500 meters for secondary impact).



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Figure 5-26. Gas and Oil Pipelines



## Extent

While many of the historical accidents presented in Table 5-28 are relatively small in terms of the amount of property damage that was reported, and while some may not meet the conventional idea of a “pipeline failure,” it is valuable to consider these events as part of the vulnerability assessment as they do provide some indication of the types of issues related to gas and oil in the county and the preventable nature of many of these occurrences. For

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example, several of the incidents reported to the Railroad Commission of Texas were the result of drivers hitting presumably unprotected facilities with their vehicles. Several incidents appeared to be the result of miscommunication or lack of communication regarding locates prior to digging. Maintenance and possibly homeowner education could have been a contributing factor in two of the events.

## Previous Occurrences

Table 5-28 summarizes the incident log of historical pipeline accidents (gas and oil combined) reported by the Railroad Commission of Texas for Ector County.

**Table 5-28. Historical Pipeline Accidents (Gas and Oil Combined) (2003-2008)**

AREA	INCIDENT DATE	OPERATOR	DESCRIPTION OF EVENT AND CAUSE	INJURIES	DEATHS	PROPERTY DAMAGE (IN 2009 DOLLARS)
Odessa	11/04/03	Mobil Pipeline Co.	N/A	N/A	N/A	< \$5,970
Odessa	02/16/04	Trojan Pipeline	N/A	N/A	N/A	< \$5,800
Odessa	09/30/04	Atmos Energy Corp. <sup>18</sup>	Vehicle struck a natural gas meter setting where no meter guard was in place; no fire	0	0	< \$5,800
Odessa	10/14/04	Chevron Texaco	A casing vent released hydrocarbon condensate; reported cause was related to corrosion	N/A	N/A	\$17,412
Odessa	11/17/04	Atmos Energy Corp.	Possible natural gas leak in residential piping may have caused a fire that destroyed a “trailer house” attached to the original portion of a house	0	0	> \$5,800
Odessa	12/27/04	Atmos Energy Corp.	A natural gas riser and meter were hit by a car	N/A	N/A	< \$5,800
Odessa	04/12/05	Atmos Energy Corp.	An 8-inch steel natural gas line was hit by a contractor due to the line being reportedly mislocated	N/A	N/A	< \$5,600
Odessa	04/21/05	Atmos Energy Corp.	A private contractor installing electrical conduit underground cut a 12-inch diameter distribution natural gas main resulting in escaping gas; no	0	0	< \$5,600

<sup>18</sup> Atmos Energy is the largest natural-gas-only distributor in the United States and operates one of the largest intrastate natural gas pipelines in Texas.

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AREA	INCIDENT DATE	OPERATOR	DESCRIPTION OF EVENT AND CAUSE	INJURIES	DEATHS	PROPERTY DAMAGE (IN 2009 DOLLARS)
			fire			
Odessa	04/24/05	Longhorn Pipeline	A chemical relief drain valve was left open and spilled into sump which overfilled 2 BBLs of diesel onto soil	N/A	N/A	N/A
Goldsmith	05/04/05	Unknown	A pipeline was ruptured by a worker digging with a backhoe	N/A	N/A	\$0
Odessa	04/01/06	Atmos Energy Corp.	An auger used to install an electric pole damaged a 3-inch steel natural gas main line resulting in the isolation of 150 feet of damaged main; no fire. The reported cause of the situation was that the locating contractor failed to communicate with the excavator the extent of excavation.	0	0	< \$5,500
Odessa	04/20/06	Atmos Energy Corp.	A lightning strike ignited a fire that melted a regulator on a residential meter; natural gas escaped and ignited	0	0	< \$5,500
Odessa	09/10/06	Atmos Energy Corp.	A natural gas meter was hit by a passing car; no fire. (The driver abandoned the car and fled the scene on foot.)	0	0	< \$5,500
Odessa	11/26/06	Atmos Energy Corp.	A natural gas line was hit during electric pole replacement; no fire	0	0	< \$5,500
Odessa	01/10/07	Tyl Propane, Inc.	Propane water heater explosion; fire damaged interior of residential property	N/A	N/A	> \$5,300
Odessa	04/03/07	Plains Pipeline L.P.	Damage caused by outside force	N/A	N/A	\$10,609
Odessa	04/25/07	Plains Pipeline L.P.	A pipeline was punctured by a landowner using a grading blade to clear garbage, brush, etc. The pipeline was marked and the landowner still hit the line accidentally.	N/A	N/A	\$9,548
Odessa	06/12/07	Plains Pipeline L.P.	Crude oil spill over 5 gallons; no fire	0	0	\$42,118
Odessa	07/09/07	Unknown	Flow line leak	N/A	N/A	N/A
Odessa	07/25/07	Onoek Westex Transmission	A 24-inch natural gas pipeline was cut by a trencher resulting in blowing gas;	0	0	\$467,008

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AREA	INCIDENT DATE	OPERATOR	DESCRIPTION OF EVENT AND CAUSE	INJURIES	DEATHS	PROPERTY DAMAGE (IN 2009 DOLLARS)
			no fire. The right-of-way area was overgrown and no signs were posted in the area. The line was located with paint and flags but there was some confusion over the execution of the locate request.			
Odessa	08/02/07	Plains Pipeline L.P.	Large amount of liquid spilled; no fire	0	0	\$98,876
Odessa	01/04/08	Plains Pipeline L.P.	A roadside valve was hit by a truck and a spill occurred; no fire. The spill occurred in a "high consequence area" due to population in the area.	0	0	< \$51,500
Odessa	06/23/08	Atmos Energy Corp.	A contractor cut a 4-inch steel natural gas main interrupting service to customers; no fire. The contractor had an expired locate and there was additional confusion regarding the locate area.	0	0	> \$5,150
Odessa	01/31/09	Atmos Energy Corp.	A fire resulted from a damaged natural gas meter. An intoxicated driver hit a pole that caused a transformer to hit the gas meter resulting in ignition.	0	0	< \$5,000

## Probability of Future Events

According to the historical incident data, a pipeline incident for the county is highly likely, with an event averaging once per year.

## Infectious Disease

An infectious disease is defined as a clinically evident disease resulting from the presence of pathogenic microbial agents. According to FEMA, infectious diseases are a major threat around the world, killing millions globally each year. Transmission of an infectious disease may occur through one or more means including physical contact with infected individuals.



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These infecting agents may also be transmitted through liquids, food, bodily fluids, contaminated objects, airborne inhalation or through vector-borne dissemination.

Three terms are commonly used to classify disease impacts: endemic, epidemic and pandemic. An endemic is present at all times at a low frequency (e.g., chicken pox in the United States). An epidemic is a sudden severe outbreak of disease (e.g., the bubonic plague during Medieval times) and a pandemic is an epidemic that becomes very widespread and affects a whole region, a continent, or the world (e.g., the 1957 flu pandemic caused at least 70,000 deaths in the United States and 1-2 million deaths worldwide). Fears of pandemic have risen in recent years as our globalized economy and growing population fosters large scale international travel and trade. Also, growing populations increase the vulnerability of all areas to disease as it can travel more quickly and creates difficulty in preventing the spread of infection.

The top 11 infectious diseases according to the World Health Organization based upon number of deaths are presented in Table 5-28 along with known cases of each in Ector County since 1937.

**Table 5-29. Worldwide Mortality Due to Infectious Disease**

RANK	CAUSE OF DEATH	APPROXIMATE WORLDWIDE DEATHS IN 2002	PERCENTAGE OF ALL DEATHS WORLDWIDE	KNOWN CASES IN ECTOR COUNTY SINCE 1937 (BASED ON TABLE X)
1	Lower Respiratory Infections	3.9 million	6.9%	17,711*
2	HIV/AIDS	2.8 million	4.9%	39
3	Diarrheal diseases	1.8 million	3.2%	929**
4	Tuberculosis (TB)	1.6 million	2.7%	251
5	Malaria	1.3 million	2.2%	18
6	Measles	600,000	1.1%	3,650
7	Pertussis	290,000	0.5%	26
8	Tetanus	210,000	0.4%	Unknown
9	Meningitis	170,000	0.3%	75
10	Syphilis	160,000	0.3%	439

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RANK	CAUSE OF DEATH	APPROXIMATE WORLDWIDE DEATHS IN 2002	PERCENTAGE OF ALL DEATHS WORLDWIDE	KNOWN CASES IN ECTOR COUNTY SINCE 1937 (BASED ON TABLE X)
11	Hepatitis B	100,000	0.2%	855***

\* Includes influenza and pneumonia

\*\* This reflects cases of dysentery, campylobacter, salmonellae, shigella and shigellosis

\*\*\* Includes multiple types of hepatitis, not just hepatitis B

## Location

Pandemics are random, with a few happening every century. Wherever and whenever it starts, the disease impacts all areas of the world, and all areas are vulnerable. Third world countries have fewer resources to fight disease and may be more vulnerable than more industrialized nations. In the United States, the public health system works at the Federal, state and local levels to monitor diseases, plan and prepare for outbreaks and prevent epidemics where possible. But, in the age of air travel and worldwide shipping, it is becoming increasingly difficult to contain localized outbreaks as infected or exposed people travel and work, sending the disease across the globe in a matter of hours.

## Extent

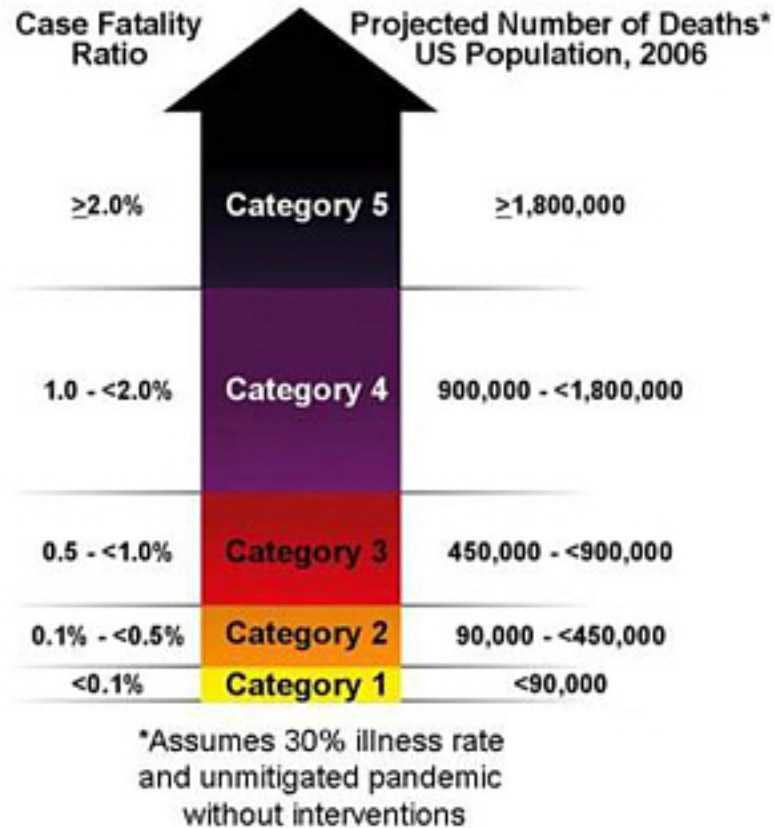
The severity of a pandemic virus can be evaluated from two perspectives: that of the individual who has been infected and from the population level – that is, how many complications and deaths might be expected as a whole. Measuring severity from either perspective in real time is a major challenge. The most common measure of severity is the case-fatality rate (CFR) as depicted in Figure 5-27

The magnitude of a pandemic event is also evaluated from the population level in terms of warnings. Figure 5-28 illustrates the various warning levels for pandemic. Dr. Margaret Chan, Director General of the World Health Organization (WHO) announced in June of 2009 that H1N1 had reached Phase 6, Pandemic.

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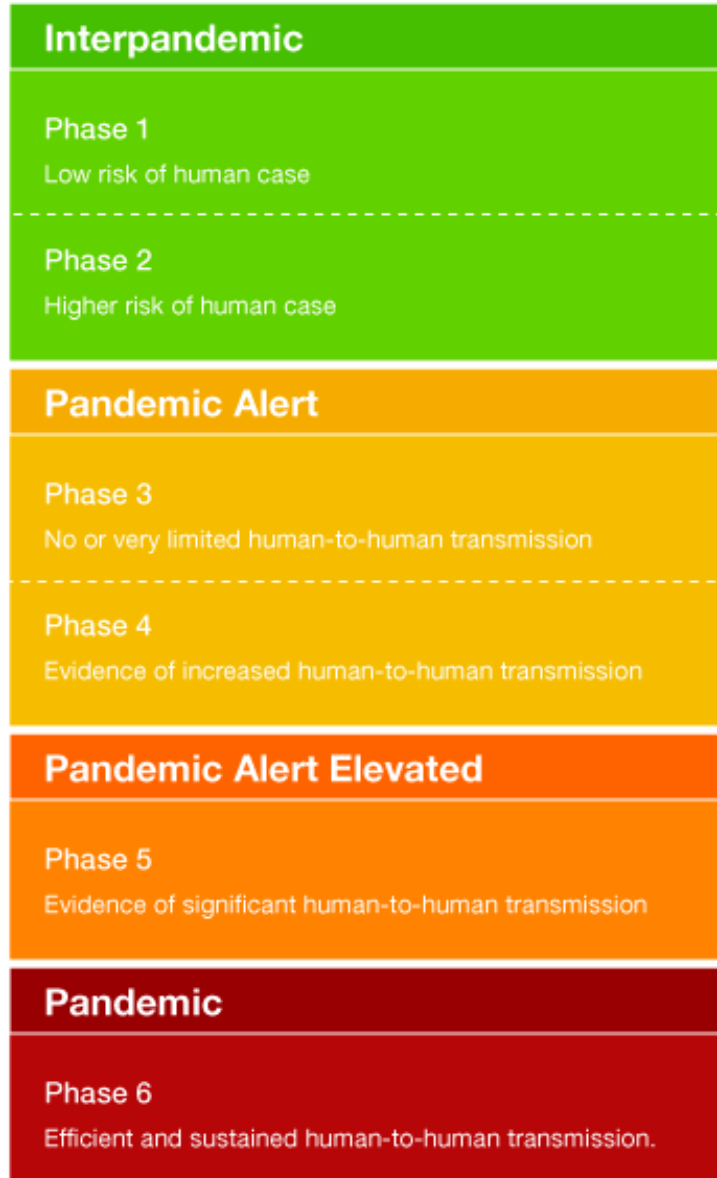
**Figure 5-27. Intensity Scale – Infectious Disease**



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**Figure 5-28. Risk levels for Pandemic (World Health Organization)**



## Previous Occurrences

Based upon historical infectious disease data ranging from 1937 to 2006 (available from the Texas Department of State Health Services), Ector County has had reported cases of at least 40 categories of infectious diseases, some of which can be broken down into as many as four

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subcategories. The total number of cases for these diseases range from one reported case to as many as 16,527 reported cases during the timeframe studied.

**Table 5-30. Historical Infectious Disease Cases for Ector County (Texas DSHS 1937–2009)**

REPORTABLE COMMUNICABLE DISEASE	TOTAL REPORTED CASES	PERCENT OF TOTAL COUNTY POPULATION*
Amebiasis	31	0.03%
Campylobacter	29	0.02%
Chicken Pox	4,570	3.77%
Chlamydia	3,890	3.21%
Coccidioidomycosis	5	0.00%
Cryptosporidiosis	3	0.00%
Diphtheria	71	0.06%
Dysentery	471	0.39%
Encephalitis	1	0.00%
Gonorrhea	2,909	2.40%
Hepatitis	855	0.71%
HIV/AIDS	39	0.03%
Influenza	16,527	13.64%
Legionellosis	1	0.00%
Listeriosis	1	0.00%
Malaria	18	0.01%
Measles	3,650	3.01%
Meningitis	75	0.06%
Mumps	1,248	1.03%
Paratyphoid	1	0.00%
Pellagra	5	0.00%
Pertussis	26	0.02%
Plague	1	0.00%
Pneumonia	1,184	0.98%
Poliomyelitis	68	0.06%
Rubella	1	0.00%
Salmonella	363	0.30%
Scarlet Fever	181	0.15%
Shigella	66	0.05%
Shigellosis	392	0.32%

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REPORTABLE COMMUNICABLE DISEASE	TOTAL REPORTED CASES	PERCENT OF TOTAL COUNTY POPULATION*
Small Pox	1	0.00%
Streptococcus	5	0.00%
Syphilis	439	0.36%
Tuberculosis	251	0.21%
Tularemia	1	0.00%
Typhoid Fever	27	0.02%
Typhus Fever	12	0.01%
Undulant Fever	6	0.00%
Venereal	485	0.40%
Whooping Cough	2,099	1.73%

\* Based on 2000 Census population

## H1N1

In March of 2009, a novel strain of Influenza A (H1N1 or “Swine Flu”) virus was detected in Mexico and the United States. The virus has since spread worldwide. As of September 27, 2009, more than 340,000 cases of Swine Flu have been confirmed worldwide and approximately 4,100 deaths have been reported<sup>19</sup>.

The most commonly reported symptoms include cough, fever, sore throat and gastrointestinal symptoms such as vomiting and diarrhea. Most cases with H1N1 did not require hospitalization and had symptoms that lasted four days<sup>20</sup>.

Since June 9, 2009, the Center for Disease Control (CDC) has reported antigenic characterization results from 25 novel influenza A (H1N1) viruses and 1 seasonal influenza A (H1N1) virus received from the Texas Department of State Health Services (DSHS) Laboratory since April 26, 2009.

Figure 5-29 illustrates the percentage of visits to Texas hospitals for influenza-like symptoms. Figure 5-30 displays nationwide influenza activity.

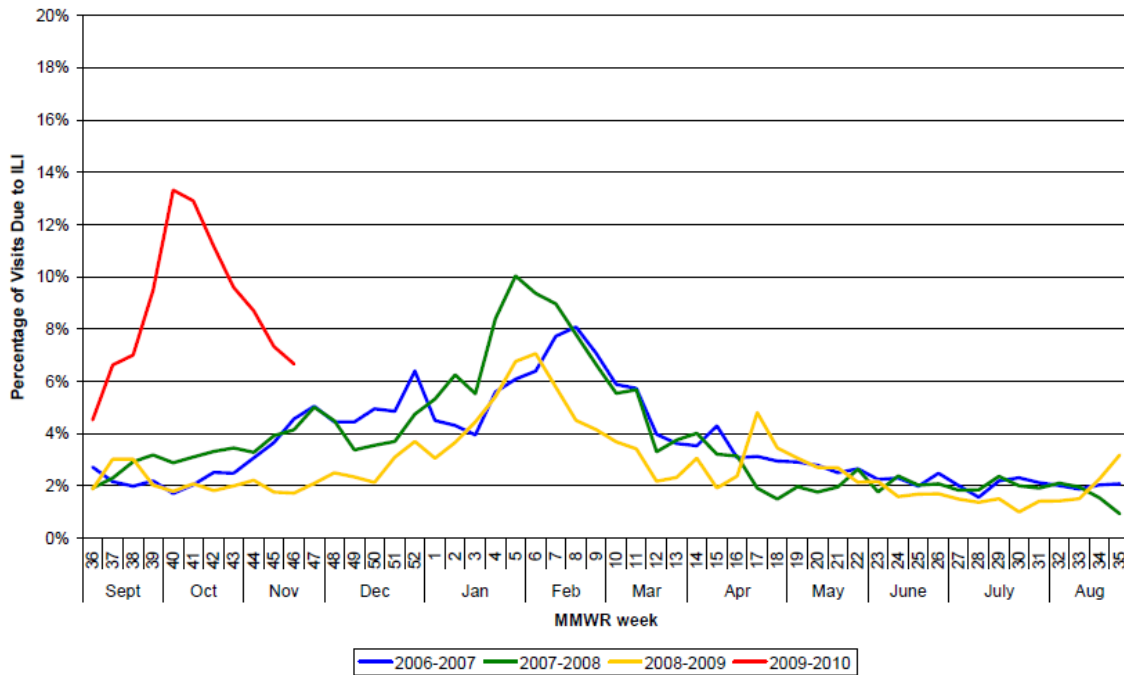
<sup>19</sup> World Health Organization

<sup>20</sup> Carrat, F. et al. Timelines of Infection and Disease in Human Influenza: A Review of Volunteer Challenge Studies. American Journal of Epidemiology, 2008, 167: 775–785.

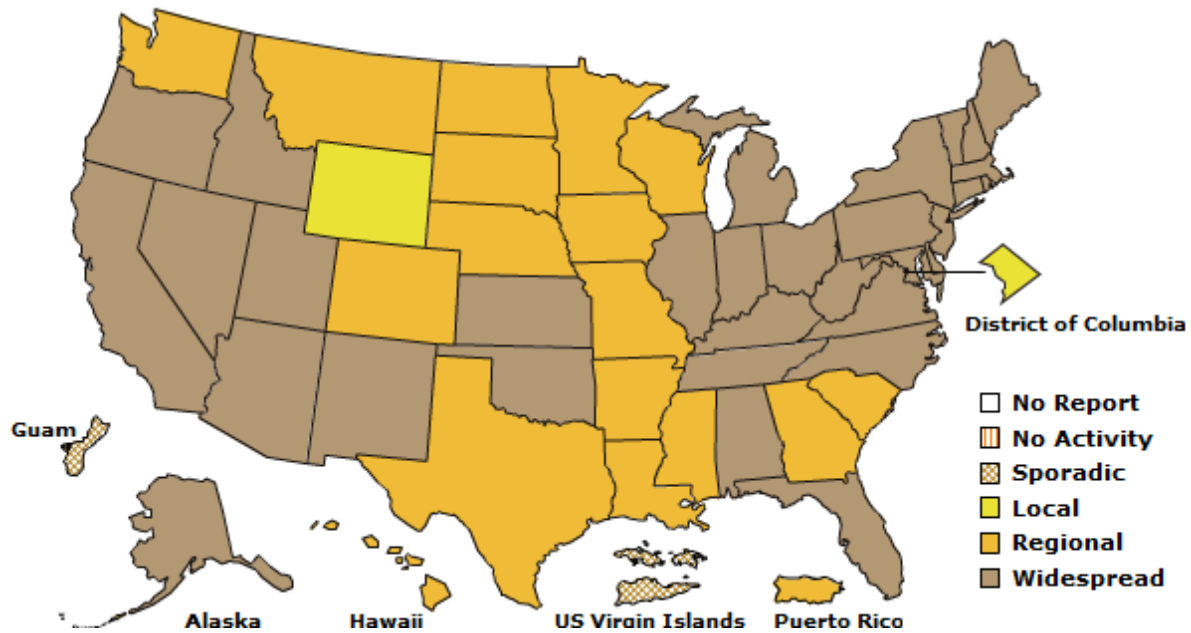
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**Figure 5-29. Percentage of Visits Due – Flu-Like Illness, Texas (2006-2010 Seasons)**



**Figure 5-30. Influenza Summary by State – Activity Estimates, Nov. 2009**





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## Probability of Future Events

Disease impacts all areas of the world and all areas are vulnerable. Third world countries have fewer resources to fight disease and may be more vulnerable than more industrialized nations. In the United States, the public health system works at the Federal, state and local levels to monitor diseases, plan and prepare for outbreaks and prevent epidemics where possible. But, in the age of air travel and worldwide shipping, it is becoming increasingly difficult to contain localized outbreaks as infected or exposed people travel and work, sending the disease across the globe in a matter of hours.

## Terrorism

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types—domestic terrorism or international terrorism. Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend their national boundaries.



A terrorist attack can take several forms, depending on the technological means available to the terrorist, the nature of issue motivating the attack, and the points of weakness of the terrorist's target. Bombings are the most frequently used terrorist method in the United States. A terrorist using a chemical or biological weapon is of particular concern to officials. Special training and equipment is needed in order to safely manage a WMD incident.

Biological agents are infectious microbes or toxins used to produce illness or death in people, animals or plants. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water as they are extremely difficult to detect.

Chemical agents kill or incapacitate people, destroy livestock, or ravage crops. Some chemical agents are odorless and tasteless and are therefore difficult to detect. They can

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have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

The Department of Defense estimates that as many as 26 nations may possess chemical agents and/or weapons and an additional 12 may be seeking to develop them. The Central Intelligence Agency reports that at least ten countries are believed to possess or to be conducting research on biological agents for weaponization.

Terrorist incidents – as with other natural and technological disasters – involve the application of one or more modes of harmful force to the built environment. These modes include contamination (as in the case of chemical, biological radiological or nuclear hazards), energy (explosives, arson, and even electromagnetic waves), or denial of service (sabotage, infrastructure breakdown, and transportation service disruption).

## Location

There is no distinct geographic boundary to the threat of terrorism. An event is possible throughout the county.

## Extent

The Homeland Security Advisory System, issued by the U.S. Department of Homeland Security, is a color-coded terrorism warning system that sets out five threat levels. Terrorism Warning Threat Levels are described in Table 5-31.

**Table 5-31. Terrorism Warning System Threat Levels<sup>21</sup>**

Color	Threat Level <sup>22</sup>	Governmental actions to be taken
Green	Low: Low risk of attacks.	Requires “protective measures” such as regularly assessing facilities for weaknesses and finding ways to reduce them, and making sure State and local government employees are trained to handle terrorism situations.
Blue	Guarded:	Requires government agencies to review and update emergency response procedures and

<sup>21</sup> Department of Homeland Security

<sup>22</sup> Current threat levels can be found at:

[http://www.dhs.gov/xinfo/share/programs/Copy\\_of\\_press\\_release\\_0046.shtm](http://www.dhs.gov/xinfo/share/programs/Copy_of_press_release_0046.shtm).

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Color	Threat Level <sup>22</sup>	Governmental actions to be taken
	General risk of attacks.	communications systems, as well as provide the public with necessary information.
Yellow	Elevated: Significant risk of attacks.	Includes increasing surveillance of critical locations, coordinating emergency plans with nearby jurisdictions and implementing contingency and emergency response plans.
Orange	High: High risk of attacks.	Requires coordinating necessary security efforts with armed forces or law enforcement agencies, taking additional precautions at public events, preparing to work at an alternative site or with a dispersed workforce and restricting access to essential personnel.
Red	Severe: Severe risk of attacks.	Includes assigning emergency response personnel and setting up specially trained teams; monitoring, redirecting, or constraining transportation systems; closing public and government facilities; and increasing or redirecting personnel to address emergency needs.

The Red Cross also issues Advisory System Recommendations for individuals, families, neighborhoods, schools and businesses for each alert level. These may be found at: [www.redcross.org](http://www.redcross.org).

There are heightened periods for terrorism risk based on intelligence and other information. A potential terrorist event could devastate the community physically, economically and psychologically for many years to come. Warning time for terrorism is minimal to none.

## Previous Occurrences

The history of terrorism on United States soil includes the attacks of September 11, 2001, on the World Trade Center in New York and the Pentagon in Washington, D.C. and the ensuing anthrax attacks; the 1995 bombing of the Murrah Federal Building in Oklahoma City; and earlier bombing of the World Trade Center in 1993.

Ector County has not experienced a terrorist act. While complete prevention of an attack may not be attainable, the county can lessen the likelihood and/or the potential effects of an incident. The county continues to improve its readiness to respond to a terrorist incident

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through participation in state and federal programs that provide training and equipment for agencies that would respond to a local terrorist incident, and in exercises that help to improve agency coordination and test local response plans.

## **Probability of Future Events**

The types, frequencies, and locations of many natural hazards are identifiable and, even in some cases, predictable. The laws of physics and nature govern them. Malevolence, however, cannot be forecast with any accuracy. There is, therefore, some potential for most, if not all, types of intentional terrorist acts to occur anywhere and at any time.

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## Overview

This section builds upon the information provided in Section 5 by identifying and characterizing an inventory of assets for the unincorporated areas Ector County, and the Cities of Odessa and Goldsmith, and then assessing the potential impact and amount of damages that can be expected to be caused by each identified hazard event. The primary objective of the vulnerability assessment is to quantify exposure and potential loss estimates for each hazard. In so doing, the County and its planning partners better understand their

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unique risks to identified hazards, which helps when evaluating and prioritizing mitigation actions.

This section begins with an explanation of the methodology applied to complete the hazard vulnerability assessment, followed by a summary description of the asset inventory as compiled for the participating jurisdictions<sup>1</sup>. The remainder of this section focuses on the results of the vulnerability assessment, and is organized by hazard as listed below.

- Atmospheric
  - Extreme Heat
  - Hail
  - High Wind
  - Lightning
  - Thunderstorm
  - Tornado
  - Winter Storm
- Hydrologic
  - Drought
  - Flood
- Other Natural Hazards
  - Earthquake
  - Wildfire
- Technological / Man-Caused
  - Hazardous Materials Release
  - Pipeline Failure
  - Infectious Disease
  - Terrorism

## Methodology

This risk assessment was conducted using two distinct methodologies: utilizing GIS-based analysis and statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information.

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<sup>1</sup> Toxic Sites and Critical Facilities found in Appendix C and D are not repeated in this Section for privacy concerns.



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A GIS-based analysis was conducted for four hazards:

- Flood
- Pipeline Failure
- Hazardous Materials Release
- Wildfire

HAZUS-MH loss estimations were prepared for three hazards:

- Flood<sup>2</sup>
- Earthquake
- High Wind

A statistical risk assessment approach was used to analyze seven hazards:

- Hail
- Severe Thunderstorm
- Drought
- Tornado
- Extreme Heat
- Lightning
- Severe Winter Storm

An analysis of historical data was used to analyze two hazards:

- Infectious Disease (Pandemic)
- Terrorism

## GIS-Based Analysis

For the GIS-based assessment, geospatial data was collected from local, state and national sources, with local data being used to the maximum extent possible. ESRI® ArcGIS™ 9.2 was used to assess risk utilizing digital data such as local tax records for individual parcels and georeferenced point locations for critical facilities. Using these types of data layers, exposure and associated risk was approximated by estimating the assessed building value associated with developed parcels determined to be located in identified hazard areas. HAZUS-MH MR4 (August 2009) was also used to model the riverine flood, earthquake, and high wind hazards and estimate potential losses for these types of events. Census 2000

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<sup>2</sup> Flooding was analyzed using GIS where geospatial data was available. Where unavailable, HAZUS-MH MR4 was used for modeling.

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data (at the census block level) were derived from HAZUS-MH and used to estimate potentially exposed populations in hazard areas.

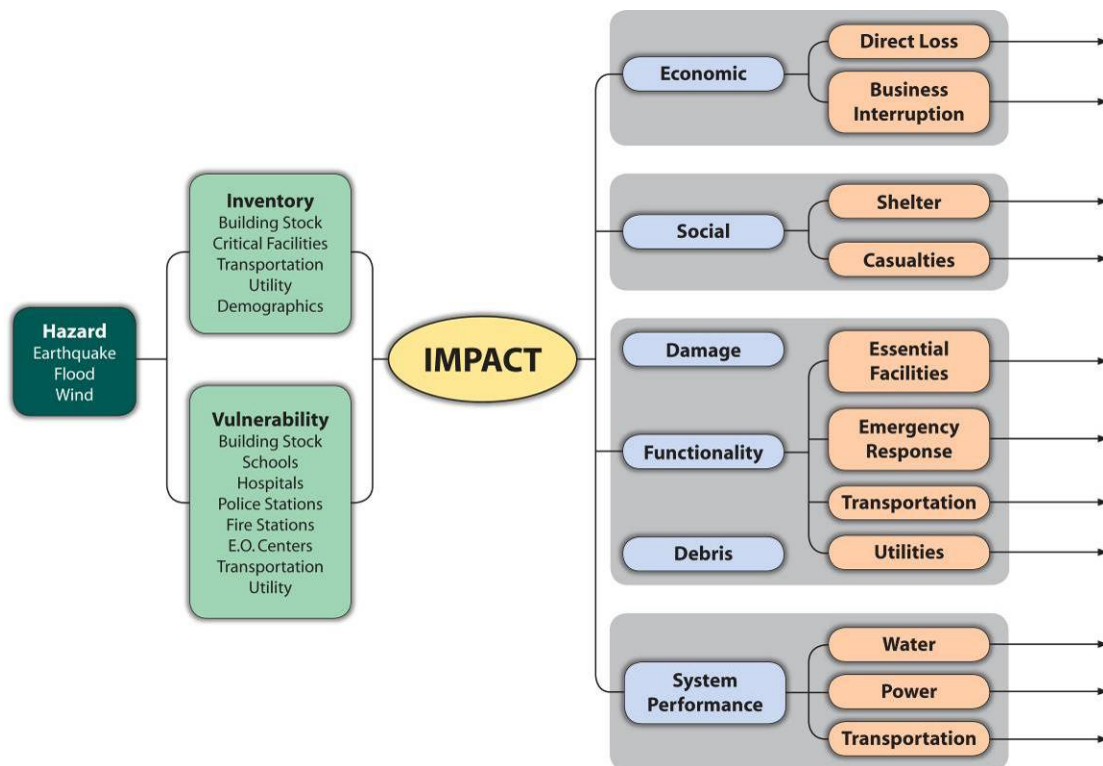
The objective of the GIS-based analysis was to determine the estimated vulnerability of people, buildings, and critical facilities to the identified hazards using best available data. In so doing, local databases, such as local tax assessor records, parcel boundaries, building footprints, and critical facilities data, were used (where available) in combination with digital hazard data. The results of the analysis provided an estimated number of people, as well as the numbers and values of buildings and critical facilities determined to be potentially at risk to those hazards with delineable geographic hazard boundaries. These hazards include the flood, wildland fire and technological hazards. A more specific description of the GIS-based analysis for each particular hazard is provided in the discussion of each individual hazard.

HAZUS-MH is FEMA's standardized loss estimation methodology built upon an integrated GIS platform (Figure 6-1) to conduct analysis at a regional level, rather than a structure-by-structure basis. The HAZUS-MH risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (i.e., damages and losses) on the built environment. This risk assessment applied HAZUS-MH to produce a countywide profile and estimate losses for two hazards at the jurisdictional level (earthquake, flood, and high wind). The results of the HAZUS-MH model analysis includes annualized loss estimates. HAZUS-MH MR4 uses Census 2000 for population; Census 2000 and Dun & Bradstreet 2002 for building count; 2006 RS Means for building valuation; and 2006 Dun and Bradstreet for commercial data.

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**Figure 6-1. Conceptual Model of HAZUS-MH Methodology**



## Statistical Risk Assessment Methodology

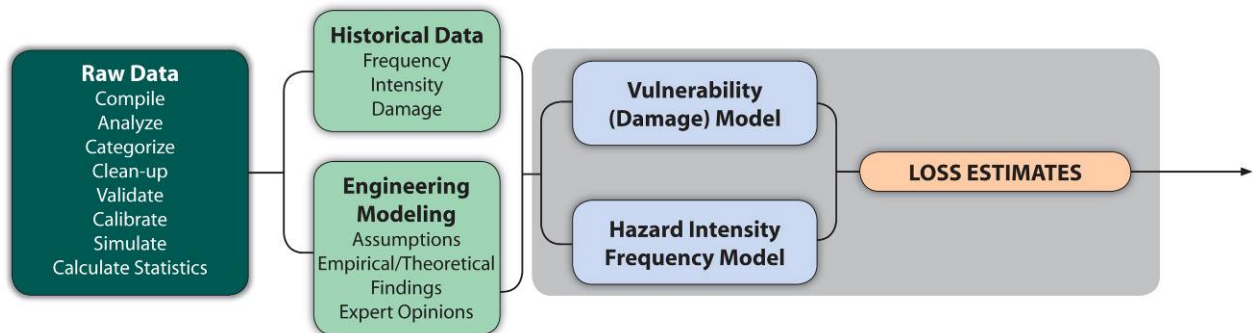
The statistical risk assessment methodology was applied to analyze hazards of concern that were outside the scope of HAZUS-MH and the GIS-based risk assessment. This methodology uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historical damage information. This methodology was used to assess risk to the drought, extreme heat, hail, lightning, severe thunderstorm, severe winter storm and tornado hazards. Available historical data for each hazard was used and statistical evaluations were performed using manual calculations. The general steps used in the statistical risk assessment methodology are summarized below:

- Compile data from local, state and national sources, as well as literature.
- Clean up data, including removal of duplicate records and update losses to account for inflation.
- Identify patterns in frequency, intensity, vulnerability and loss.
- Statistically and probabilistically extrapolate the patterns.
- Produce meaningful results, including the development of annualized loss estimates.

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**Figure 6-2. Conceptual Model of the Statistical Risk Assessment Methodology**



A significant portion of the historical data used in this risk assessment comes from the National Climatic Data Center (NCDC), a division of the National Oceanic and Atmospheric Administration (NOAA). NCDC is the world's largest active archive of climate data.

The economic loss results are presented here using two interrelated risk indicators:

- The Annualized Loss (AL), which is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (i.e., county).
- The Annualized Loss Ratio (ALR), which expresses estimated annualized loss normalized by property replacement value.

The impact for each hazard is presented in terms of annualized losses, whenever possible. For other hazards where the statistical approach was used, the computations are based primarily on the observed historical losses.

In general, presenting results in the annualized form is useful on three fronts:

- Contribution of potential losses from all future disasters is accounted for with this approach.
- Results in this form from different hazards are readily comparable and hence easier to rank.
- When evaluating mitigation alternatives, use of annualized losses is the most objective approach for this purpose.

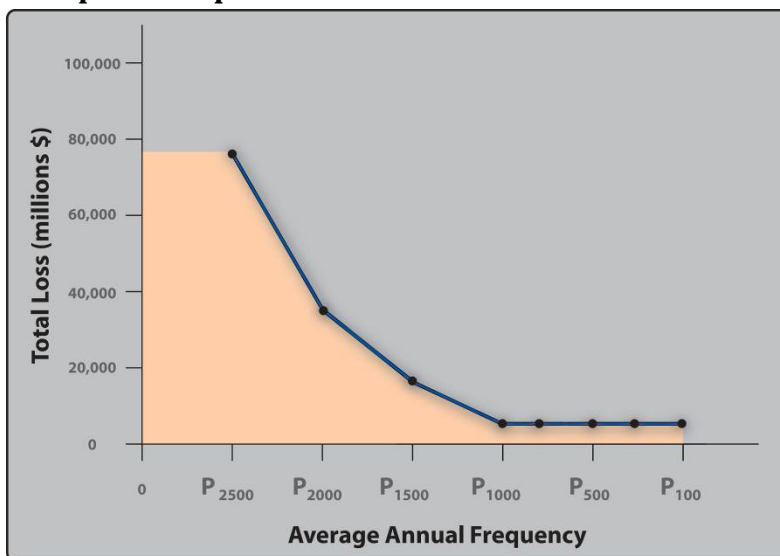
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Annualized losses (for the hazards where the parametric approach is utilized) are computed in a three-step process (see Figure 6-3):

1. Compute / estimate losses for a number of scenario events with different return periods [e.g., 10-year, 100-year, 200-year, 500-year, etc...].
2. Approximate the Probability versus Loss Curve through curve fitting.
3. Calculate the area under the fitted curve to obtain annualized losses.

**Figure 6-3. Graphical Representation of the Annualized Loss Methodology**



The estimated Annualized Loss (AL) addresses the key idea of risk: the probability of the loss occurring in the study area (largely a function of building construction type and quality). By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk. The Annualized Loss Ratio (ALR) represents the AL as a fraction of the replacement value of the local inventory. This ratio is calculated using the following formula:

$$\text{ALR} = \text{Annualized Losses} / \text{Total Exposure}$$

The annualized loss ratio gauges the relationship between average annualized loss and replacement value. This ratio can be used as a measure of vulnerability in the areas and, since it is normalized by replacement value, it can be directly compared across different geographic units such as metropolitan areas or counties.

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## Study Area and Asset Inventory

Hazard identification consists of (1) defining the study area in terms of scale and coverage; and (2) collecting and compiling a list of prevalent hazards in the study area to help narrow the focus of the analysis.

### Study Area

The study area is all of the participating communities, which consist of the City of Odessa, the City of Goldsmith and unincorporated areas of Ector County. All areas of Ector County are covered in this risk assessment, including small portions of the City of Odessa and the community of South Odessa that extend into neighboring Midland County. Named places within unincorporated Ector County that are discussed in this risk assessment and shown on the map illustrations include: Gardendale, Complex, Industrial, North Odessa, Notrees, Penwell, Pleasant Farms, Ponderosa, South Odessa, South Ranchito and West Odessa. Other named places that are referenced in the hazards history data presented in this risk assessment include: Greenfield Acres, North Cowden and Westover.<sup>3</sup>

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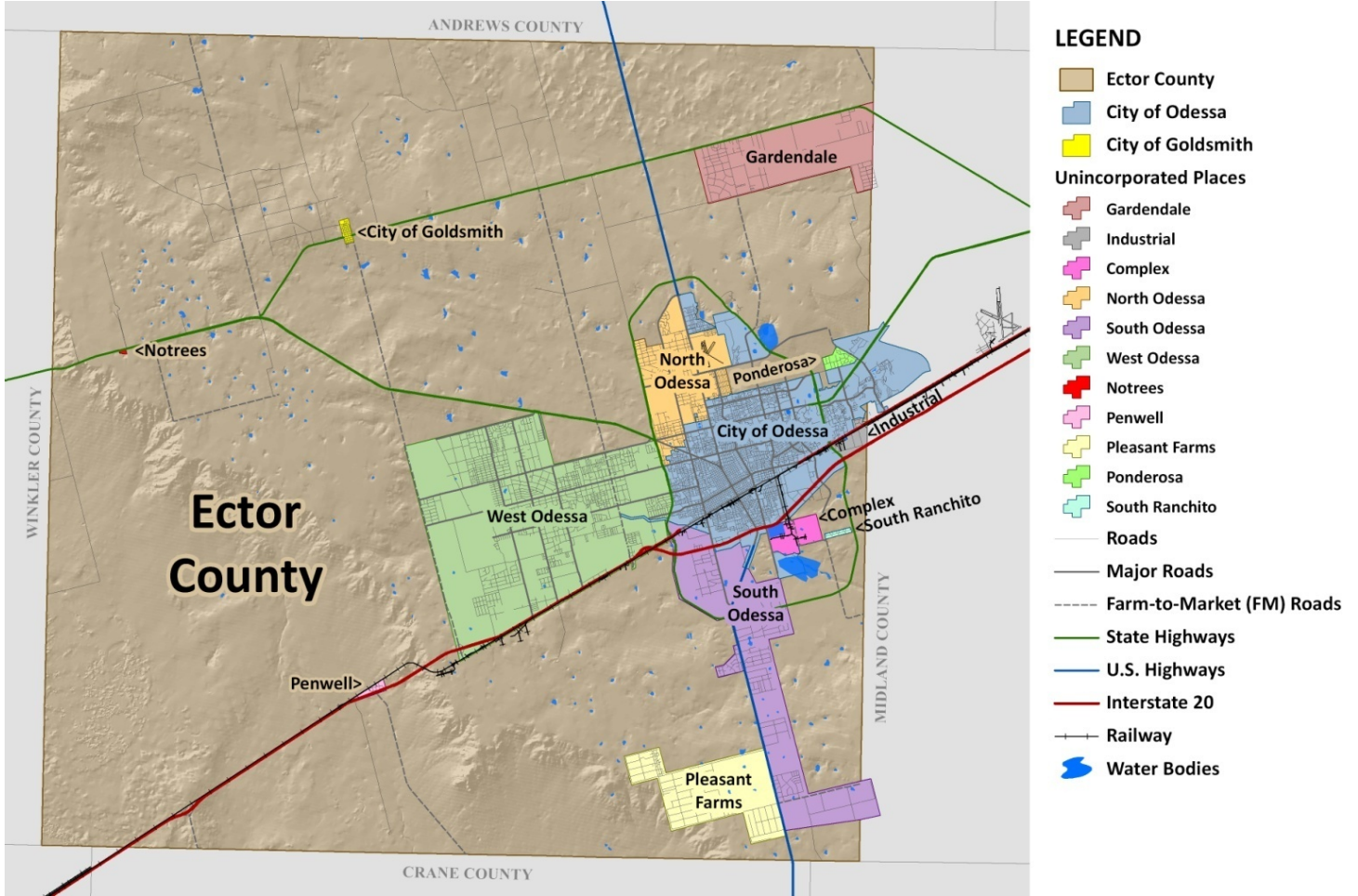
<sup>3</sup> Colors used to represent individual cities and areas in the map illustrations are also used in various tables throughout the risk assessment for ease of reference.



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**Figure 6-4. Community Profile**



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## Asset Inventory

Table 6-1 provides parcel data available for Ector County, which includes data for the cities of Odessa and Goldsmith, contains key pieces of information needed for portions of this risk assessment. These key attributes include location (street address and spatial coordinates), improved value of the parcel, total value of the parcel, and year built. This data is further introduced and explained within the discussion of individual hazards, such as flood and wildfire. It is important to note that some discrepancies may exist in portions of the analyses in that some parcels may intersect two different jurisdictional boundaries or may intersect more than one hazard boundary. For example, a parcel may intersect with the mapped boundary for the City of Goldsmith and may also be partially located in unincorporated Ector County. Or, portions of a parcel may intersect more than one flood zone if multiple flood zones are analyzed. For the purposes of this risk assessment, any such parcels are generally associated with the municipality and are not also counted in the county results. As stated previously, the intent is to use this data to produce relative approximations and estimations of risk and is not necessarily expected to be 100 percent accurate when compared with real-world conditions.

**Table 6-1. Countywide Parcel Information**

LOCATION	TOTAL ESTIMATED NUMBER OF PARCELS	TOTAL ESTIMATED VALUE OF PARCELS	TOTAL ESTIMATED NUMBER OF PARCELS WITH IMPROVED VALUES	TOTAL ESTIMATED IMPROVED VALUE OF PARCELS
City of Odessa	36,646	\$4,855,794,748	30,762	\$4,152,876,653
City of Goldsmith	571	\$9,622,869	183	\$9,205,163
Unincorporated Ector County	26,697	\$1,708,661,557	12,336	\$1,085,950,400
<b>TOTALS</b>	<b>63,914</b>	<b>\$6,574,079,174</b>	<b>43,281</b>	<b>\$5,248,032,216</b>

Source: Ector County Tax Assessor's Office

## General Building Stock and Exposure Values

Table 6-2 provides a listing of estimates generated by HAZUS-MH MR4 for seven different occupancy types comprising the general building stock used by HAZUS for loss estimation purposes. The breakdown shows the estimated number of buildings per occupancy type and the total estimated dollar exposure values for each group for loss estimation purposes. The values reflected in this table differ slightly from the countywide parcel information presented

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in the preceding section. The primary reason for this is that HAZUS accounts for additional factors for loss estimation purposes beyond the improved value of the property, such as estimated building contents values.

**Table 6-2. General Building Stock (Type, Number, and Total Estimated Dollar Exposure)  
Used for Loss Estimation**

TYPE OF BUILDING	ESTIMATED NUMBER OF BUILDINGS	TOTAL ESTIMATED DOLLAR EXPOSURE
<b>CITY OF ODESSA</b>		
Residential	34,085	\$4,065,371,000
Commercial	1,997	\$980,408,000
Industrial	448	\$187,240,000
Agricultural	52	\$6,465,000
Religious	203	\$190,683,000
Government	53	\$37,127,000
Educational	62	\$138,081,000
<b>SUBTOTALS</b>	<b>36,900</b>	<b>\$5,605,375,000</b>
<b>CITY OF GOLDSMITH</b>		
Residential	117	\$11,580,000
Commercial	11	\$3,439,000
Industrial	4	\$2,509,000
Agricultural	1	\$50,000
Religious	0	\$0
Government	2	\$529,000
Educational	0	\$0
<b>SUBTOTALS</b>	<b>135</b>	<b>\$18,107,000</b>
<b>UNINCORPORATED ECTOR COUNTY</b>		
Residential	13,150	\$1,065,543,000
Commercial	776	\$272,704,000
Industrial	378	\$208,712,000
Agricultural	36	\$4,489,000
Religious	49	\$24,822,000
Government	13	\$4,293,000
Educational	6	\$4,768,000
<b>SUBTOTALS</b>	<b>14,408</b>	<b>\$1,585,331,000</b>
<b>TOTALS</b>	<b>51,443</b>	<b>\$7,208,813,000</b>

Source: HAZUS-MH MR4

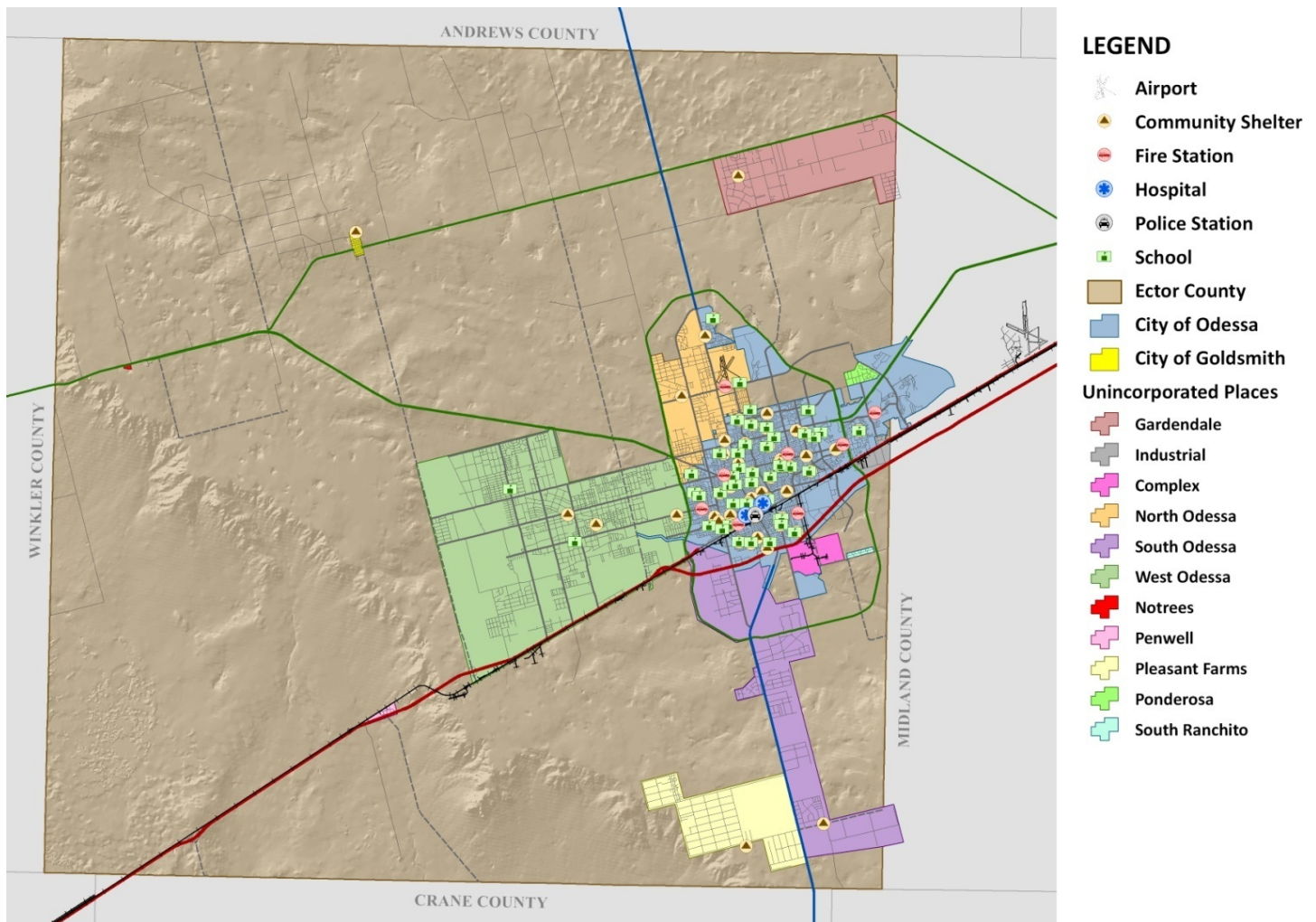
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## Critical Facilities

Figure 6-5 shows a map of critical facilities these assets indicating their approximate locations within the study area. It is important to note that Level 1 essential facilities data from HAZUS-MH MR4 was used for the HAZUS-based analyses for hurricane wind, earthquake, and flood and may vary somewhat from data provided by the City of Odessa.<sup>4</sup>

**Figure 6-5. Critical Facilities (General Locations)**



<sup>4</sup> There are essentially two reasons for this. First, the default inventory used by HAZUS may not be as current, complete, or accurate as data available locally. Second, the analyses for hurricane wind, earthquake, and flood were conducted at the census block levels and the aggregation of the data at these levels may lead to minor discrepancies in building counts and exposure values within the study region.



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## Infrastructure, Lifelines and Hazardous Materials

Table 6-3 includes the amount (in kilometers) of oil and gas pipelines, highways and railways, and the number of hazardous materials sites (i.e., includes georeferenced TRI and Tier II sites) in the study area.

**Table 6-3. Infrastructure, Lifelines, and Hazardous Materials<sup>5</sup>**

JURISDICTION	ESTIMATED INFRASTRUCTURE AND LIFELINES					HAZARDOUS MATERIALS FACILITIES
	Oil Pipe (km)*	Gas Pipe (km)*	Roads <sup>6</sup> (km)**	Highways Only <sup>7</sup> (km)**	Railroad (km)**	Number of Sites***
<b>GENERAL INVENTORY</b>						
City of Odessa	32.1	115.7	895.2	53.5	39.6	28
City of Goldsmith	0.0	1.6	13.7	0.0	0.0	0
Unincorporated Ector County	2,200.1	3,292.8	1,808.0	331.0	73.4	423
<b>TOTALS</b>	<b>2,232.2</b>	<b>3,410.1</b>	<b>2,716.9</b>	<b>384.5</b>	<b>113.0</b>	<b>451</b>
<b>INTERSECTING FLOODPLAIN</b>						
City of Odessa	4.3	17.9	128.2	7.4	5.9	7
City of Goldsmith	0.0	0.0	0.0	0.0	0.0	0
Unincorporated Ector County	119.4	129.7	124.3	12.5	1.4	20
<b>TOTALS</b>	<b>123.7</b>	<b>147.6</b>	<b>252.5</b>	<b>19.9</b>	<b>7.3</b>	<b>27</b>
<b>INTERSECTING WILDLAND URBAN INTERFACE</b>						
City of Odessa	13.6	44.4	646.4	7.2	7.0	10
City of Goldsmith	0.0	0.8	9.5	0.0	0.0	0
Unincorporated Ector County	105.4	172.6	758.5	26.4	0.0	29
<b>TOTALS</b>	<b>119.0</b>	<b>217.8</b>	<b>1,414.4</b>	<b>33.6</b>	<b>7.0</b>	<b>39</b>

\*Source: Railroad Commission of Texas

\*\*Source: City of Odessa

\*\*\*Source: TRI and Tier II lists

<sup>5</sup> Sources: Railroad Commission of Texas; TRI/Tier II lists

<sup>6</sup> Roads, for the purposes of this analysis, includes U.S. Interstates, U.S. highways, State highways, loops, Farm-to-Market (FM) roads, major roads (as identified by the City of Odessa), and minor roads.

<sup>7</sup> Highways for the purposes of this analysis include U.S. Interstates, U.S. highways, State highways, and loops.

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## Impact

For each of the following hazards, a description of the warning time or potential speed of onset of the hazard is included, along with County’s overall vulnerability to that hazard based on impact. Impact statements are defined in the Table 6-4.

**Table 6-4. 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/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

### Extreme Heat

Because extreme heat events are not confined to specific geographic boundaries, all existing and future buildings, facilities, and populations are considered to be exposed to this hazard and could potentially be impacted.

One heat wave is on record for Ector County. NCDC reports it occurred in June 1994. Given that only 1 incident was reported and limited likelihood for structural losses resulting from extreme heat occurrences in the planning area, annualizing potential structural losses over a long period of time would most likely yield a negligible annualized loss estimate for the city.



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Typically more than twelve hours of warning time would be given before the onset of an extreme heat event. Only minor property damage would result. The potential impact of excessive summer heat is considered “minor” as injuries and/or illnesses do not result in permanent disability.

In terms of vulnerability to structures, the impact from extreme heat would be negligible. It is possible that critical facilities and infrastructure could be shut down for 24 hours if cooling units are run constantly, leading to a temporary power outage. Less than 10 percent of residential and commercial property could be damaged if extreme heat events lead to structure fires.

## Hail

Because hail events are not confined to specific geographic boundaries, all existing and future buildings, facilities, and populations are considered to be exposed to this hazard and could potentially be impacted. The NCDC reports 215 hail events since 1958. It is important to note that only reported hail events have been factored into this vulnerability assessment<sup>8</sup> and only events with georeferenced point data have been included in the point locations map.



To estimate losses due to hail, NCDC historical hail loss data was used to develop a hail stochastic model. In this model:

- Losses were scaled to account for inflation.
- Expected annualized losses were calculated through a non-linear regression of historical data.

Table 6-5 shows potential annualized losses for the study area.

**Table 6-5. Potential Annualized Losses (Hail)**

TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
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<sup>8</sup> It is possible that additional hail events may have occurred since 1950 that were not reported to NCDC and are not accounted for in this analysis.

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TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	\$1,934,956	0.03%

Warning time for a hailstorm is generally 0-3 hours or minimal. The severity of a hailstorm impact is considered to be “limited” since they generally result in injuries treatable with first aid, shut down critical facilities and services for 24 hours or less, and less than ten percent of affected properties are destroyed or suffer major damage.

## High Wind

HAZUS-MH wind speed data, inventory and damage functions, and methodology were used to determine the annual expected loss at the county level<sup>9</sup>. Because the analysis was conducted at the census tract level, some margin of error can be expected as some census tracts only partially intersect the core study area. Table 6-6 shows potential annualized property losses by occupancy type and Table 6-7 shows the annualized percent loss ratio.

**Table 6-6. Potential Annualized Losses (High Wind)**

OCCUPANCY TYPE	TOTAL	BUILDING	CONTENTS
Residential	\$7,600	\$6,400	\$342,700
Commercial	Negligible	Negligible	\$68,300
Industrial	Negligible	Negligible	\$32,700
Agricultural	Negligible	Negligible	\$4,800
Religious/Non-Profit	Negligible	Negligible	\$3,900
Government	Negligible	Negligible	3,900
Education	Negligible	Negligible	\$21,000
<b>TOTALS</b>	<b>\$7,600</b>	<b>\$6,400</b>	<b>\$477,300</b>

Source: HAZUS-MH MR4

\*Negligible is less than \$5,000

<sup>9</sup> The Wind model in HAZUS-MH is generally run at the county level due to the regional nature of the hazard and the widespread impacts of this type of wind event.

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**Table 6-7. Annualized Percent Loss Ratio (High Wind)**

TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	\$7,600	0.00%

Table 6-8 shows potential loss of use (in number of days) and damage state probabilities related to critical facilities for varying return periods ranging from a 50-year event to a 1,000-year event.

Based on the loss estimates and potential damage to critical facilities from a high wind event, the impact would be “limited”, with no damage to residential, commercial and industrial property.

**Table 6-8. Critical Facility Loss of Use and Damage State Probabilities (High Wind)**

FACILITY TYPE	LOSS OF USE (DAYS)	MINOR DAMAGE	MODERATE DAMAGE	SEVERE DAMAGE	COMPLETE DAMAGE
<b>50-YEAR RETURN PERIOD</b>					
Fire Stations	0	0	0	0	0
Medical Care Facilities	0	0	0	0	0
Police Stations	0	0	0	0	0
Schools	0	0	0	0	0
<b>100-YEAR RETURN PERIOD</b>					
Fire Stations	0	0	0	0	0
Medical Care Facilities	0	0	0	0	0
Police Stations	0	0	0	0	0
Schools	0	0	0	0	0
<b>200-YEAR RETURN PERIOD</b>					
Fire Stations	0	0	0	0	0
Medical Care Facilities	0	0	0	0	0
Police Stations	0	0	0	0	0
Schools	0	0	0	0	0
<b>500-YEAR RETURN PERIOD</b>					
Fire Stations	0	0	0	0	0
Medical Care Facilities	0	0	0	0	0
Police Stations	0	0	0	0	0

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FACILITY TYPE	LOSS OF USE (DAYS)	MINOR DAMAGE	MODERATE DAMAGE	SEVERE DAMAGE	COMPLETE DAMAGE
Schools	0	0	0	0	0
<b>1,000-YEAR RETURN PERIOD</b>					
Fire Stations	0	0	0	0	0
Medical Care Facilities	0	0	0	0	0
Police Stations	0	0	0	0	0
Schools	0	0	0	0	0

Source: HAZUS-MH MR3

## Lightning

If lightning directly hits an unprotected structure it can cause electrical damage and even fire. Occasionally, explosive damage will occur if lightning attaches to a chimney or other porous structural component. Typically, an attachment will be to a roof or protrusion, and arcing within the structure, will cause ignition of structural materials. Once it attaches to a structure, lightning will often flow to the electrical system and thence to earth, causing severe damage to the wiring.

While lightning striking a person can result in that person’s death, the impact is more commonly “limited” since power outages and small fires are more common. Injuries and/or illnesses are treatable with first aid. Critical facilities can shutdown services for 24 hours or less. Less than 10 percent of property destroyed or with major damage. Potential annualize losses are summarized in Table 6-9 below.

**Table 6-9. Potential Annualized Losses (Lightning)**

TOTAL EXPOSURE	POTENTIAL ANNUALIZED LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	\$19,785	0.00%

## Severe Thunderstorm

Because thunderstorm events are not confined to specific geographic boundaries, all existing and future buildings, facilities and populations are considered to be exposed to this hazard and could potentially be impacted. The designation “severe” is assigned by NOAA and is based on wind magnitude and other factors. It is important to note that only reported thunderstorms have been factored into this vulnerability assessment. Table 6-10 shows the

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results in terms of potential annualized property losses for the study area from a severe thunderstorm event.

**Table 6-10. Potential Annualized Losses (Severe Thunderstorm)**

TOTAL EXPOSURE*	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	\$92,867	0.00%

As with lightning, the impact of thunderstorms is limited. Injuries and/or illnesses are treatable with first aid, minor quality of life lost, shutdown of critical facilities and services can continue for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

## Tornado

As with other atmospheric hazards, tornado events are not confined to specific geographic boundaries. Because all new and existing buildings could be exposed, a stochastic model was used to determine losses based on those reported to the NCDC. Table 6-11 shows potential annualized property losses that the study area could sustain from a tornado.

**Table 6-11. Potential Annualized Losses (Tornado)**

TOTAL EXPOSURE*	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	\$24,352	0.00%

Warning time for the onset of a tornado is generally minimal, meaning 3 hours or less. The impact of tornadoes can be “substantial”. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.



## Severe Winter Storm

A non-linear regression of historical data was also used to estimate losses for winter storms (Table 6-12). Like tornadoes,



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thunderstorms and hail events, a winter storm is not confined to any specific geographic location.

**Table 6-12. Potential Annualized Losses (Winter Storm)**

TOTAL EXPOSURE*	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	NEGLIGIBLE	0.00%

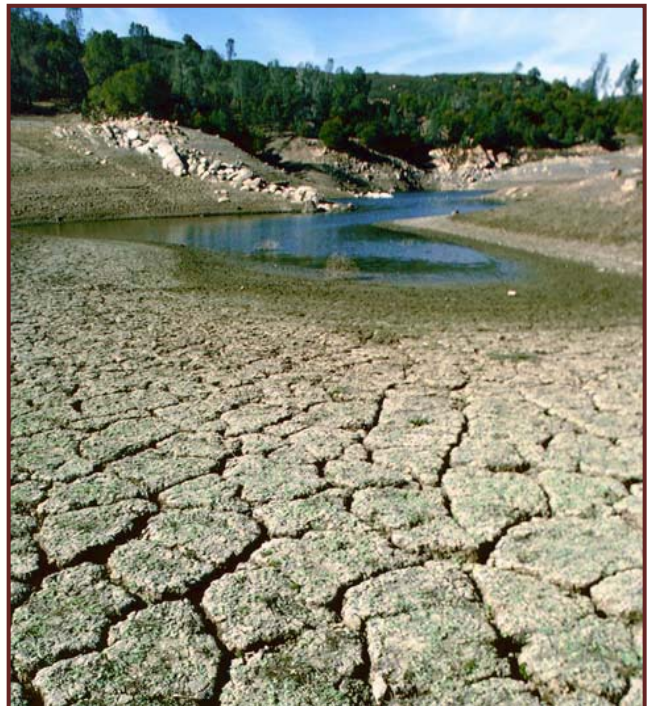
Warning time for winter storms is generally 6 to 12 hours. The severity of impact of winter storms is generally “minor”. Winter storms can cause deaths, injuries, power outages, major car accidents, and road closures.

## Drought

Sixteen drought events were recorded by National Climatic Data Center (NCDC) in the years 1996-2006. Ten years of statistical data from the National Climatic Data Center (NCDC) and 2007 USDA agriculture data (for non-irrigated agriculture products) was used to analyze drought hazard risk and estimate potential losses at the county level. This analysis is based upon a total agricultural products exposure of \$3,775,743 yielding an annualized loss estimate (in dollars) of \$410,168 and a percent loss ratio of 10.86 percent for the study area.

It is important to mention that many historical drought occurrences are recorded at a regional level as droughts typically impact large geographic areas. This adds another layer of difficulty in isolating specific figures for a municipal-level study. Therefore, while the annualized loss estimate and ratio presented above are valid for Ector County as a whole, drought vulnerability for the Cities of Odessa and Goldsmith would be lower.

Droughts are slow onset hazards. Warning time for drought is long, since drought events take place over long periods of time. Drought warnings are issued by the State Drought





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Preparedness Council, as directed by H.B. 2660, based upon input from NOAA, the Office of the State Climatologist, the U.S. Geological Service, the Texas Water Development Board, Texas Commission on Environmental Quality and the Texas Agricultural Statistics Service. Warnings utilize five “levels of concern” and take into account assessments of climatology, agriculture, and water availability.

The potential impact of drought is “minor” resulting in few, if any, injuries. There is only minor property damage and minimal disruption to the quality of life. Any shutdown of facilities is temporary.

## Flood

In order to assess exposure to the flood hazard using best available local data, digital flood hazard data was compared with census block data and parcel information provided by Ector County to determine the total estimated population, total estimated number of parcels and total improved value of parcels intersecting the flood hazard area. One flood hazard area exists in Ector County; the 1-percent-annual-chance flood hazard. Table 6-15 shows the results of the analysis.

**Table 6-15. Estimated Exposure of People and Parcels (Flooding)**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
<b>1-PERCENT-ANNUAL-CHANCE FLOOD HAZARD</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	26,459	4,720	\$585,430,963
City of Goldsmith <sup>10</sup>	253	183	\$9,205,163	0	0	\$0
Unincorporated	29,927	12,336	\$1,085,950,400	14,290	1,833	\$158,127,772
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>40,749</b>	<b>6,553</b>	<b>\$743,558,735</b>

\* With improved values.

<sup>10</sup> The City of Goldsmith has no mapped flood hazard areas.

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The HAZUS analysis conducted for the flood hazard (which applies to the following tables) was performed at the census block level. The HAZUS-MH loss estimation analysis conducted for essential facilities produced no results indicating no potential economic impacts to essential facilities in the study area. This should not be used to assume that damages or interruption of operation is not possible during an actual flood event, merely which the HAZUS-MH estimations indicated no potential monetary losses based on the scenarios run. These losses are summarized in Table 6-16.

**Table 6-16. Annualized Losses (Flooding)**

TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES	ANNUALIZED PERCENT LOSS RATIO
\$7,208,813,000	\$21,311,000	0.30%

Table 6-17 shows countywide damage probabilities for residential, commercial, industrial, government, education, and agriculture occupancy types for the 1-percent-annual-chance flood event and the 0.2-percent-annual-chance flood event. For this analysis, residential building stock is further broken down into the categories of pre-FIRM and post-FIRM. This level of analysis compliments the exposure values presented in the preceding tables by estimating the number of structures that are likely to actually sustain varying degrees of damage as opposed to simply being exposed to potential floodwaters. A pre-FIRM structure is one that was built prior to the effective date of the first Flood Insurance Rate Map (FIRM) for a community and is therefore considered to be more likely to be vulnerable to the flood hazard (assuming that the structure would have been built prior to the community enacting comprehensive floodplain management regulations through the National Flood Insurance Program<sup>11</sup>).

**Table 6-17. Damaged Building Counts by General Occupancy (Flooding)**

OCCUPANCY TYPE	TOTAL IN COUNTY IMPACTED	NUMBER OF BUILDINGS IN EACH DAMAGE PERCENTAGE RANGE						TOTAL DAMAGED PER TYPE
		1 TO 10%	11 TO 20%	21 TO 30%	31 TO 40%	41 TO 50%	51 TO 100% (SUBSTANTIAL DAMAGE)	
<b>1-PERCENT-ANNUAL-CHANCE FLOOD HAZARD</b>								
Residential (Pre-FIRM)	45,464	6	577	2,216	127	90	271	<b>3,287</b>
Residential (Post-FIRM)		0	0	10	0	0	3	<b>13</b>

<sup>11</sup> The City of Goldsmith does not currently participate in the NFIP and has no mapped flood hazard areas.

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OCCUPANCY TYPE	TOTAL IN COUNTY IMPACTED	NUMBER OF BUILDINGS IN EACH DAMAGE PERCENTAGE RANGE						TOTAL DAMAGED PER TYPE
		1 TO 10%	11 TO 20%	21 TO 30%	31 TO 40%	41 TO 50%	51 TO 100% (SUBSTANTIAL DAMAGE)	
Commercial	2,605	13	61	0	1	0	0	75
Industrial	761	0	4	0	2	0	0	6
Government	62	1	0	0	0	0	0	1
Education	64	1	0	0	0	0	0	1
Agriculture	82	0	1	0	0	0	0	1
<b>TOTAL BUILDINGS</b>	<b>49,038</b>	<b>21</b>	<b>643</b>	<b>2,226</b>	<b>130</b>	<b>90</b>	<b>274</b>	<b>3,384</b>
<b>0.2-PERCENT-ANNUAL-CHANCE FLOOD HAZARD</b>								
Residential (Pre-FIRM)	45,464	6	649	2,814	405	171	418	4,463
Residential (Post-FIRM)		0	0	11	3	0	11	25
Commercial	2,605	13	67	8	1	0	0	89
Industrial	761	0	8	1	0	1	0	10
Government	62	1	0	0	0	0	0	1
Education	64	1	0	0	0	0	0	1
Agriculture	82	0	1	0	0	0	0	1
<b>TOTAL BUILDINGS</b>	<b>49,038</b>	<b>21</b>	<b>725</b>	<b>2,834</b>	<b>409</b>	<b>172</b>	<b>429</b>	<b>4,590</b>

Source: HAZUS-MH MR4

The HAZUS-MH loss estimation analysis conducted for essential facilities produced no results indicating no potential economic impacts to essential facilities in the study area. This should not be used to assume that damages or interruption of operation is not possible during an actual flood event, merely which the HAZUS-MH estimations indicated no potential monetary losses based on the scenarios run.

Based on the loss estimations, flooding and flash flooding events would have the potential for a “major” impact as floods could potential damage more than 25 percent of property and cause serious injuries or death.

## Repetitive Loss Properties

Another consideration for the flood assessment is the existence of repetitive loss properties associated with the study area. A repetitive loss property, as defined and tracked by the NFIP and FEMA, is any insurable building for which two or more claims of more than \$1,000 were paid by the NFIP within any rolling 10-year period, since 1978.

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A repetitive loss property may or may not be currently insured by the NFIP. According to Texas Water Development Board (TWDB) records, there are five repetitive loss properties within the City of Odessa and Ector County, none of which have been mitigated. There are no repetitive properties for City of Goldsmith as of November 2009. For a detailed description of repetitive loss properties and NFIP compliance, please see Section 7.

## Earthquake

According to the NGDC Earthquake Intensity Database, there are 585 seismic occurrences on record for the state of Texas between 1882 and 1985, with some events equating to a VII on the Modified Mercalli Intensity (MMI) Scale though none were known to have impacted Ector County and its jurisdictions.

In terms of economic losses, the model estimates total economic losses at \$120,000, 31 percent of which were related to the business interruption of the region. Business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Table 6-18 shows annualized losses for the study area.

**Table 6-18. Annualized Losses and Annualized Loss Ratio (Earthquake)**

TOTAL EXPOSURE	POTENTIAL ANNUALIZED LOSSES	ANNUALIZED LOSS RATIO
\$7,208,813,000	NEGLIGIBLE	0.00%

## Wildfire

Table 6-19 shows the number of parcels with improved values exposed to the wildfire hazard and an estimate of those values.

**Table 6-19. Estimated Exposure of People and Parcels (Wild fire)**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of Households Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
City of Odessa	90,943	30,762	\$4,152,876,653	33,973	29,371	\$3,307,905,966

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LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of Households Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
City of Goldsmith	253	183	\$9,205,163	104	171	\$8,887,018
Unincorporated	29,927	12,336	\$1,085,950,400	11,477	10,726	\$719,870,347
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>45,554</b>	<b>40,268</b>	<b>\$4,036,663,331</b>

\* With improved values.

As described in Section 5, risk of wildfire varies considerably by month. Warning time for wildfire events is often minimal or none.

The severity of impact of major wildfire events can be “substantial”. Such events can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.



No residential properties are known to have been destroyed as a result of the historical wildfire events presented in Table 6-19 and no other property or crop damages are available. Therefore, sufficient data is not available to prepare a meaningful annualized loss estimate for this hazard.

## Hazardous Materials Incident

Table 6-20 uses census block data to estimate toxic release exposure of people and parcels by jurisdiction for fixed sites. Primary and secondary impact distances were selected based on guidance from FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* and engineering judgment. Because many sites containing hazardous materials are located in densely populated areas, there are population and structures that could be susceptible to a release from more than one site.

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**Table 6-20. Estimated Exposure of People and Parcels (Fixed Site Toxic Release)**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
<b>PRIMARY IMPACT AREA (500-METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	16,764	3,791	\$776,556,857
City of Goldsmith	253	183	\$9,205,163	0	0	0
Unincorporated	29,927	12,336	\$1,085,950,400	12,051	2,380	\$617,928,929
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>28,815</b>	<b>6,171</b>	<b>\$1,394,485,786</b>
<b>SECONDARY IMPACT AREA (2,500-METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	74,817	26,473	\$3,272,251,212
City of Goldsmith	253	183	\$9,205,163	253	183	\$9,205,163
Unincorporated	29,927	12,336	\$1,085,950,400	21,408	9,196	\$687,837,199
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>96,478</b>	<b>35,852</b>	<b>\$3,969,293,574</b>
<b>TOTAL IMPACT**</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	91,581	30,264	\$4,048,808,069
City of Goldsmith	253	183	\$9,205,163	253	183	\$9,205,163
Unincorporated	29,927	12,336	\$1,085,950,400	33,459	11,576	\$1,305,766,128
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>125,293</b>	<b>42,023</b>	<b>\$5,363,779,360</b>

Source: GIS Analysis

\* With improved values only.

\*\*Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Table 6-21 shows the estimated exposure of people and parcels to the mobile toxic release hazard.

**Table 6-21. Estimated Exposure of People and Parcels (Mobile Toxic Release—Highway and Rail)**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
<b>PRIMARY IMPACT AREA (500-METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	21,059	4,911	\$1,147,370,471



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LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
City of Goldsmith	253	183	\$9,205,163	220	149	\$6,467,393
Unincorporated	29,927	12,336	\$1,085,950,400	7,801	1,442	\$597,943,943
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>29,080</b>	<b>6,502</b>	<b>\$1,751,781,807</b>
<b>SECONDARY IMPACT AREA (2,500-METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	49,032	17,958	\$2,219,470,445
City of Goldsmith	253	183	\$9,205,163	40	34	\$2,737,770
Unincorporated	29,927	12,336	\$1,085,950,400	12,025	5,027	\$418,420,976
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>61,097</b>	<b>23,019</b>	<b>\$2,640,629,191</b>
<b>TOTAL IMPACT**</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	70,091	22,869	\$3,366,840,916
City of Goldsmith	253	183	\$9,205,163	253	183	\$9,205,163
Unincorporated	29,927	12,336	\$1,085,950,400	19,826	6,469	\$1,016,364,919
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>90,170</b>	<b>29,521</b>	<b>\$4,392,410,998</b>

Source: GIS Analysis

\* With improved values.

\*\*Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Hazardous materials or toxic releases can have a “substantial” impact. Such events can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

## Pipeline Failure

Tables 6-22 and 6-23 show total numbers of population and parcels at risk from gas and oil pipeline accidents, respectively. The analysis for gas pipelines consists of liquid petroleum gas and natural gas. The analysis for oil pipelines consists of crude oil and natural gas liquids. The immediate (primary) area of impact for both types of pipeline accidents is a 500-meter buffer. The secondary area of impact for both types of pipeline accidents is a 2,500-meter buffer.

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**Table 6-22. Potential Impact Due to Gas Pipeline Accidents**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS*	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
<b>PRIMARY IMPACT AREA (500 METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	18,209	3,828	\$1,161,105,234
City of Goldsmith	253	183	\$9,205,163	253	182	\$9,168,032
Unincorporated	29,927	12,336	\$1,085,950,400	26,761	7,929	\$1,009,991,587
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>45,223</b>	<b>11,939</b>	<b>\$2,180,264,853</b>
<b>SECONDARY IMPACT AREA (500 TO 2,500 METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	57,438	19,642	\$2,193,920,293
City of Goldsmith	253	183	\$9,205,163	253	1	\$37,131
Unincorporated	29,927	12,336	\$1,085,950,400	3,166	4,101	\$359,628,483
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>60,857</b>	<b>23,744</b>	<b>\$2,553,585,907</b>
<b>TOTAL IMPACT**</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	75,647	23,470	\$3,355,025,527
City of Goldsmith	253	183	\$9,205,163	253	183	\$9,205,163
Unincorporated	29,927	12,336	\$1,085,950,400	29,927	12,030	1,369,620,070
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>105,827</b>	<b>35,683</b>	<b>\$4,733,850,760</b>

Source: GIS Analysis

\* With improved values.

\*\*Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

**Table 6-23. Potential Impact Due to Oil Pipeline Accidents**

LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
<b>PRIMARY IMPACT AREA (500-METERS)</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	15,297	3,908	\$723,012,038
City of Goldsmith	253	183	\$9,205,163	72	31	\$2,950,106
Unincorporated	29,927	12,336	\$1,085,950,400	23,832	6,655	\$965,722,931
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>39,201</b>	<b>10,594</b>	<b>\$1,691,685,075</b>
<b>SECONDARY IMPACT AREA (500 TO 2,500-METERS)</b>						

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LOCATION	TOTAL ESTIMATED POPULATION	TOTAL ESTIMATED NUMBER OF PARCELS	TOTAL IMPROVED VALUE OF PARCELS	EXPOSURE		
				Number of People Potentially At Risk	Number of Parcels At Risk*	Value of Parcels At Risk
City of Odessa	90,943	30,762	\$4,152,876,653	55,785	17,650	\$2,372,871,439
City of Goldsmith	253	183	\$9,205,163	181	152	\$6,255,057
Unincorporated	29,927	12,336	\$1,085,950,400	6,095	5,127	\$390,592,657
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>62,061</b>	<b>22,929</b>	<b>\$2,769,719,153</b>
<b>TOTAL IMPACT**</b>						
City of Odessa	90,943	30,762	\$4,152,876,653	71,082	21,558	\$3,095,883,477
City of Goldsmith	253	183	\$9,205,163	253	183	\$9,205,163
Unincorporated	29,927	12,336	\$1,085,950,400	29,927	11,782	\$1,356,315,588
<b>TOTALS</b>	<b>121,123</b>	<b>43,281</b>	<b>\$5,248,032,216</b>	<b>101,262</b>	<b>33,523</b>	<b>\$4,461,404,228</b>

Source: GIS Analysis

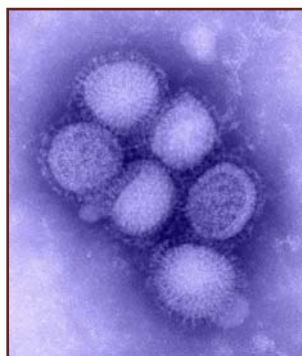
\* With improved values.

\*\*Includes 500-meter and 2,500-meter impact areas.

This analysis assumes no climate impacts or changes in terrain.

Pipeline failure can have a “substantial” impact. Such events can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

## Infectious Disease / Pandemic



Estimated potential losses are difficult to calculate because infectious disease causes little damage to the built environment and damages generally are experienced through public health response and medical costs as well as lost wages by patients.

Therefore, it is assumed that all buildings and facilities are exposed to disease but would experience negligible damage in the occurrence of an outbreak. For example, upkeep and maintenance of buildings and facilities would fall behind due to the high absenteeism of employees or the closing of facilities. The costs to the public health sector, however, in terms of responding to an outbreak as well as impact to health as a whole, may be “substantial”.

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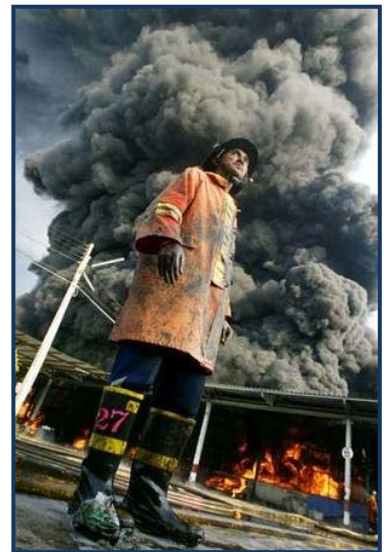
Even though a pandemic event would affect mainly people, critical infrastructure services, such as emergency services, utility services, water services and telecommunications can be limited by an event. With the 2009 H1N1 pandemic, most of the people affected will have mild illness and not require hospitalization. People at the highest risk for developing complications from H1N1 include children younger than 5, adults 65 year of age and older and pregnant women. People who have medical conditions such as: asthma, heart disease; chronic lung disease; blood, endocrine, kidney, liver or metabolic disorders; or a weakened immune system, can experience a worsening of existing conditions if they contract the H1N1 virus.

It is still yet to be determined how the 2009 H1N1 pandemic will impact not only Ector County, but also the state and nation. Each community is facing the challenge of limited vaccines, antiviral supplies and managing the demands of health-care resources.

## Terrorism

There is no defined geographic boundary for a terrorist event. All of the population, buildings, critical facilities, infrastructure and lifelines and hazardous materials facilities are considered exposed to the hazards of terrorism and could potentially be affected.

Terrorist events can have a “substantial” severity of impact. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.



## Development Trends

According to the City of Odessa Planning Department, proposed development for the City of Odessa is a relatively fluid situation, changing frequently from one week to the next. Proposed developments for Odessa as of late September 2009 include a shopping center, a medical facility, a four story hotel, and two apartment developments. These include:

- Chimney Rock Shopping Center at the northeast corner of the intersection of Highway 191 and East Loop 338
- MCH Ambulatory Care Center east of the intersection of Highway 191 and Faudree Road

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- Four-story, 94-room hotel development southeast of the intersection of Highway 191 and Faudree Road
- Two multi-family residential apartment developments
  - One 352-unit development west of the intersection of Faudree Road and Dorado Drive
  - One 312-unit development west of the intersection of Highway 191 and Faudree Road

## Building Permits

Building permits indicate what types and uses of buildings are being constructed. Table 6-24 provides the number of building permits that have been granted for residential buildings and units during 1980 to 2008, and the associated construction costs.

The construction costs are to show the potential increase of vulnerability of structures to the various hazards assessed in this risk assessment. The increase in vulnerability can be attributed to the higher construction costs that would be factored into repairing or replacing a structure using current market value.

**Table 6-24. Number of Building Permits**

ECTOR COUNTY RESIDENTIAL BUILDING PERMITS			
Year	Buildings	Units	Construction Cost
1990	45	45	5,436,900
1991	61	61	7,752,928
1992	113	113	15,275,321
1993	104	105	12,760,706
1994	104	106	13,441,827
1995	102	103	13,730,357
1996	71	71	9,561,053
1997	125	126	12,438,112
1998	147	147	14,840,606
1999	101	101	11,935,052
2000	106	238	20,621,071
2001	100	101	14,957,101
2002	131	200	25,892,133
2003	173	173	25,924,124

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ECTOR COUNTY RESIDENTIAL BUILDING PERMITS			
Year	Buildings	Units	Construction Cost
2004	194	194	30,282,732
2005	157	255	33,185,274
2006	261	261	45,893,063
2007	225	439	62,533,474
2008	275	716	84,297,936

Source: U.S. Census Bureau

## Hazard Ranking

Economic loss results are presented in Table 6-25 using Annualized Loss (AL) estimates (the estimated long-term value of losses to the general building stock in any single year in a specified geographic area) and Annualized Loss Ratios (ALRs) (which represent the AL as a fraction of the replacement value of the local inventory). The AL addresses the two key components of risk: the probability of the hazard occurring in the study area and the consequences of the hazard, largely a function of building construction type and quality, and of the intensity of the hazard event. By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk. The ALR gauges the relationship between average annualized loss and replacement value.

**Table 6-25. Summary of Annualized Loss Estimates and Annualized Loss Ratios**

HAZARD	ANNUALIZED LOSS ESTIMATE	ANNUALIZED LOSS RATIOS
Drought	\$410,168	10.86%
Hail	\$1,934,956	0.03%
Flood	\$21,311,000	0.30%
Thunderstorm	\$92,867	0.00%
Tornado	\$24,352	0.00%
Lightning	\$19,785	0.00%
Hurricane Wind	\$7,600	0.00%
Earthquake	NEGLIGIBLE	0.00%
Winter Storm	NEGLIGIBLE	0.00%



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Hazard ranking depends on the severity, area of impact and probability of occurrence (return period). Table 6-26 provides the hazard ranking for each hazard. Each hazard was given a rating of high (H), moderate (M), low (L), very low (VL), or not applicable (N/A) based on how vulnerable Ector County is to that hazard or how probable that hazard is to impact the area. The rating of N/A was used if the results for loss or potential impacts were zero. The rating is based on a combination of factors such as population and building exposure, or annualized loss (or ALRs) when available.

The ranking of hazards was based on a review of historical incidents, existing plans and risk assessment results. ALRs were considered in the development of the ratings for drought, earthquake, flood, hail, hurricane wind, lightning, severe thunderstorm, tornado and severe winter storm hazards. Without historic events, an ALR was not able to be determined for terrorism. Potential impacts were considered in the development of ratings for extreme heat, fuel pipeline failure, HAZMAT release, infectious disease/pandemic and wildfire.

**Table 6-26. Hazard Risk Ranking - ALR**

HAZARD	RANKING
Flood*	H
Wildfire**	H
Hail*	M
HAZMAT Release**	M
High Wind*	VL
Drought*	H
Pipeline Failure**	M
Severe Thunderstorm*	L
Tornado*	L
Severe Winter Storm**	VL
Earthquake*	VL
Infectious Disease/Pandemic**	L
Extreme Heat**	VL

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HAZARD	RANKING
Lightning*	L

\* ALR considered for ranking.

\*\* Potential impact considered for ranking.

Table 6-27 portrays the results of the planning team’s self assessment for hazard ranking based on the preliminary results of the risk assessment as presented at the Risk Assessment Workshop in November, 2009. This table also takes into account local knowledge regarding previous occurrences and impact. Because Table 6-27 is not limited to loss results, the additional hazard of Terrorism is included in the ranking.

**Table 6-27. Hazard Risk Ranking – Planning Team Assessment**

Hazard	Very Low (VL)	Low (L)	Moderate (M)	High (H)
Drought			E G	O
Earthquake	E O G			
Extreme Heat			E G	O
Flooding			G	E O
Hail			E G	O
Hazardous Materials Incident			O G	E
High Wind			E G	O
Lightning				E O G
Pandemic		E	O G	
Pipeline Failure			G	E O
Severe Thunderstorm			E	O G
Severe Winter Storm		E O G		
Terrorism		O	E G	
Tornado			E O G	
Wildland Fire				E O G

\* Ector County (E) City of Odessa (O) City of Goldsmith (G)

# CAPABILITY ASSESSMENT

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## Description

A capability assessment is an analysis tool distributed to each community in the form of a survey, the results of which are used to:

- Inventory a jurisdiction’s relevant plans, programs and ordinances;
- Identify shortfalls or weaknesses that could hinder mitigation actions;
- Implement a comprehensive mitigation strategy;
- Identify opportunities for establishing or enhancing mitigation policies, programs or projects; and
- Establish goals based on an understanding of the organizational capacity and technical capability of a community.

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In addition to providing an inventory of each jurisdiction’s programs and plans in place, the capability assessment also helped communities to prioritize actions through the STAPLEE criteria by determining if mitigation actions are practical and likely to be implemented over time given the local planning and regulatory framework, level of administrative and technical support, amount of fiscal resources and current political climate. Further, the capability assessment highlighted the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

When combined with the Risk Assessment, the Capability Assessment helped planning team members to specify mitigation actions and ensure that those actions are achievable given current capabilities and limitations.

## Process

During the Kickoff Workshop, a detailed Capability Assessment Survey was distributed to planning team members. The survey requested information regarding existing local plans, policies, programs or ordinances that contribute to and/or hinder the ability to implement hazard mitigation actions. Other indicators included information related to each jurisdiction’s fiscal, administrative and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. Survey respondents were also asked to comment on the current political climate with respect to hazard mitigation.

The results of the survey provide an inventory of existing plans and ordinances for Ector County, the City of Odessa and the City of Goldsmith. In addition planning team members ranked their jurisdiction’s capabilities in a self-assessment, which is shown at Table 7-4. This allowed for the identification of any gaps or weaknesses.

## Assessment Findings

The findings of the capability assessment are summarized in this Plan to provide insight into the relevant capacity of Ector County and the Cities of Odessa and Goldsmith to implement hazard mitigation activities. While the participating jurisdictions have some plans and planning mechanisms in place, the focus for this survey is to identify those areas where mitigation activities could be incorporated, or where other planning mechanisms and goals can be integrated into the Plan. All information is based upon the input provided by planning team members through the Capability Assessment Survey.

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## Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate each a jurisdiction's commitment to guiding and managing growth and development in a responsible manner, while maintaining the general welfare of the community. It includes emergency response and mitigation planning and comprehensive land use planning as well as plans to protect environmental, historic and cultural resources in the community. These planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision making process.

## Hazard Mitigation Action Plan (HMAP)

A Hazard Mitigation Action Plan (HMAP) represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy. Ector County, Odessa, and Goldsmith are creating a mitigation plan for the first time.

## Disaster Recovery Plan

A Disaster Recovery Plan serves to guide the physical, social, environmental and economic recovery of a community, including the physical reconstruction process following a disaster. Ector County and the City of Odessa have developed a disaster recovery plans. The City of Goldsmith indicated that they do not have a disaster recovery plan in place or under development.

## Emergency Management or Operations Plan

An Emergency Management Plan outlines the responsibilities of those responding to an emergency or disaster and the means by which resources are deployed. The City of Odessa is the only participant having an evacuation plan in place as either a stand-alone plan or part of their Emergency Operations Plan.

## Continuity of Operations Plan (COOP)

A Continuity of Operations Plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster. Of the three jurisdictions participating in the Plan, only one, the City of Odessa, has a Continuity of Operation Plan.

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## Comprehensive Plan

A Comprehensive Plan establishes the overall vision for a community and helps to guide municipal decision making. Survey results indicate that Odessa alone has a comprehensive plan in place.

## Capital Improvements Plan

A Capital Improvement Plan guides the scheduling of spending on public improvements. A capital improvement plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments. Survey results indicate that the City of Odessa has a Capital Improvements Plan, Goldsmith does not, and the County is developing one.

## Historic Preservation Plan

A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.<sup>1</sup> This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of a hazard-prone area. The City of Odessa has a historic preservation plan

## Floodplain Management Capability

Flooding represents one of the high hazards facing the City of Odessa and the County but not Goldsmith. The City of Odessa has a Floodplain Management Plan and a Floodplain Ordinance, which provide a framework for corrective and preventative actions to reduce related impacts. It is the only participant with these tools in place.



## Stormwater Management Program

Stormwater management is typically focused on design and construction measures that are intended to reduce the impact of more frequently

<sup>1</sup> See Protecting the Past from Natural Disasters. 1989. Nelson, Carl. National Trust for Historic Preservation: Washington, D.C.



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occurring minor urban flooding. Ector County and the City of Odessa follow a Stormwater Management Program that provides for the planning and design of drainage improvements to provide flood protection.

## National Flood Insurance and Community Rating System

Ector County and the City of Odessa participate in the National Flood Insurance Program (NFIP)<sup>2</sup> to allow citizens to purchase flood insurance. As an additional indicator of floodplain management responsibility, Odessa participates in FEMA’s Community Rating System (CRS) but the County and City of Goldsmith do not. This is an incentive-based program that allows communities to undertake flood mitigation activities that go beyond NFIP requirements. CRS mitigation activities are given a range of point values. As communities complete these activities they are given a rating from 10 to 1, which results in a reduction of flood insurance (See Table 7-1). The city’s current rating is 7, which allows citizens up to a 15 percent reduction in flood insurance costs.

**Table 7-1. CRS Premium Discounts**

CRS Rating	Premium Deduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0

The County does not participate in the CRS as they do not have ordinance-making capabilities under State law. The City of Goldsmith does not participate in the NFIP due to the low risk of flood for the area. As noted in Section 5, flood zones for Goldsmith are outside of the city limits. In addition the City has not experienced any losses to structures or even extensive damage to property during flood events.

<sup>2</sup> For mitigation actions regarding the NFIP, see Section 9.

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## Repetitive Loss

The Severe Repetitive Loss (SRL) 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 severe repetitive loss residential structures insured under the National Flood Insurance Program (NFIP). The Texas Water Development Board (TWDB) administers the SRL grant program for the State of Texas.

Severe Repetitive Loss properties are defined as residential properties that are:

- covered under the NFIP and have at least four (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
- for which at least two (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 two (2) of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart<sup>3</sup>. Table 7-2 shows repetitive loss properties for Ector County. There are no severe repetitive loss properties for Ector County.

**Table 7-2. Repetitive Loss and Severe Repetitive Loss Properties**

Community Name	Comm. No.	Prop Locator	Insured?	Date of Loss	Building Type	Flood Zone	Losses	Total Paid	Average Pay
ECTOR COUNTY*	480796	0169966	YES	05/02/2007	SINGLE FMLY	AE	2	40,399.28	20,199.64
CITY OF ODESSA	480206	0172117	NO	05/02/2007	SINGLE FMLY	AE	2	20,361.27	10,180.64
CITY OF ODESSA	480206	0172646	YES	08/02/2007	SINGLE FMLY	AE	2	13,401.72	6,700.86
CITY OF ODESSA	480206	0037472	NO	04/18/1979	SINGLE FMLY	EMG	2	21,412.04	10,706.02
CITY OF ODESSA	480206	0172276	NO	05/02/2007	SINGLE FMLY	X	2	95,552.33	47,776.17

Even though only the City of Odessa participates in CRS, the county also developed mitigation actions that related to either NFIP maintenance or compliance. Table 7-3 provides the community, description of action, and page where located in Section 9.

<sup>3</sup> Source: Texas Water Development Board

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**Table 7-3 NFIP Maintenance and Compliance Actions**

<b>Participating Jurisdiction</b>	<b>Mitigation Action<sup>4</sup></b>	<b>Action Number</b>	<b>Location in Section 9 (Page No.)</b>
Ector County	Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.	02	10
Ector County	Flood proof public buildings in flood prone areas	26	34
Odessa	Develop a land acquisition program in flood hazard areas.	27	75
Odessa	Annually distribute flood protection/NFIP pamphlets to owners of flood-prone properties.	28	76
Odessa	Conduct workshops for local lending agencies, insurance agents, surveyors and title companies to promote availability of and understanding of flood insurance.	29	77
Odessa	Prepare Comprehensive Flood Plain and Drainage Study for the City of Odessa, determine BFE in currently identified "A" zones.	31	79

## Growth Management and Protection Plans

Ector County and the City of Odessa have developed protection programs and plans, which provide solutions for protecting land and resources for growing communities.

## Open Space Management Plan

Open Space Management Plan describes a process and recommend strategies and solutions for handling open space issues for outdoor recreational or open habitat areas of land. The City of Odessa has developed an Open Space Management Plan in order to balance the valuable natural resources, local heritage, and recreation of open space.



<sup>4</sup> Mitigation Actions include those regarding NFIP compliance. Please see Section 9 for the full action.

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## Conclusions on Capability

The success of future mitigation efforts in a community can be gauged to some extent by its previous and continual planning efforts. The City of Odessa and Ector County have implemented programs and plans to maintain safety and sustainability. Despite the widespread mechanisms in place to further hazard mitigation measures, planning team members still see room to grow as indicated in the Self Assessment.

## Self Assessment

In addition to the inventory and analysis of specific local capabilities, the Capability Assessment Survey required planning team members to conduct their own self assessment of capability to implement hazard mitigation activities by considering barriers to implementing mitigation strategies or mechanisms that could enhance mitigation strategies. Team members ranked each level of capability, by marking it as “limited”, “moderate” or “high.” Table 7-4 below, summaries the results from each returned questionnaire.

**Table 7-4. Self-Assessment for Capability**

Participating Jurisdiction	Planning / Regulatory	Technical Capability	Fiscal Capability	Political Capability	Overall Capability
Ector County	L	L	L	L	L
Goldsmith	L	L	L	L	L
Odessa	H	H	M	H	H

# MITIGATION STRATEGY

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Goal 3 .....	2
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Goal 5 .....	3
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## Mitigation Goals

Based on the results of the risk and capability assessments, the planning team was able to develop and prioritize the mitigation strategy. At the Mitigation Workshop in December of 2009, planning team members refined the mitigation strategy for the Plan, with the overall goal of reducing and eliminating the long-term risk of loss of life and property damage from the full range of disasters.

### Goal 1

Protect public health and safety.

#### Objective 1.1

Maintain critical facilities.

#### Objective 1.2

Maximize the 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

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## Objective 1.4

Protect critical facilities and services.

## Goal 2

Protect new and existing properties.



## Objective 2.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

## Objective 2.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

## Objective 2.3

Enact and enforce regulatory measures to ensure that development will not put people in harm's way or increase threats to existing properties.

## Goal 3

Increase public understanding, support and demand for hazard mitigation.

## Objective 3.1

Heighten public awareness of the full range of natural and man-made hazards they 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.

## Objective 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.



## Goal 4

Build and support local capacity and commitment to



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continuously become less vulnerable to hazards.

## Objective 4.1

Build and support local partnerships to continuously become less vulnerable to hazards.

## Objective 4.2

Build a cadre of committed volunteers to safeguard the community before, during and after a disaster.

## Objective 4.3

Build hazard mitigation concerns into City and County planning and budgeting processes.

## Goal 5

Promote growth in a sustainable manner.

## Objective 5.1

Incorporate hazard mitigation into the long-range planning and development activities.

## Objective 5.2

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

## Objective 5.3

Utilize regulatory approaches to prevent creation of future hazards to life and property.



## Goal 6

Maximize the resources for investment in hazard mitigation.

## Objective 6.1

Maximize the use of outside sources of funding.

# MITIGATION STRATEGY

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## Objective 6.2

Maximize participation of property owners in protecting their properties.

## Objective 6.3

Maximize insurance coverage to provide financial protection against hazard event.

## Objective 6.4

Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.

# MITIGATION ACTIONS

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## Mitigation Actions

As discussed in Section 2, at the mitigation workshop, the planning team and stakeholders met to develop mitigation actions. Each of the actions in this section were prioritized based on FEMA’s STAPLE+E criteria, which includes considering the social, technical, administrative, political, legal, economic and environmental factors necessary for the implementation of each action. As a result of this exercise, an overall priority was assigned to each mitigation action.

Taking into account STAPLE+E considerations, plus cost, time for implementation and needs of the community, each action was identified by team members 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. Note that these priorities are subject to change as the plan is updated, and as funding becomes available to Ector County and the jurisdictions within.

All actions are presented in this section, beginning with Ector County, followed by the City of Odessa and finally, the City of Goldsmith. Tables 9-1, 9-2 and 9-3 summarize actions per hazard for the County and cities, respectively. In the individual actions that follow the tables, more than one hazard is sometimes listed for an action if appropriate.

# MITIGATION ACTIONS

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**Table 9-1. Ector County Actions per Hazard**

Action Number	Page Number	Hazard	Action
01	9	Drought	Educate the public on extreme heat/drought safety and health issues.
14	22	Drought	Provide water conservation education for low-flow plumbing and toilets, efficient washers, rain harvesting.
13	21	Drought	Make flyers available at county offices and post information on county web-site describing xeriscape planting resources and benefits.
27	35	Earthquake	Implement a County wide mass notification phone calling system
20	28	Earthquake	Provide additional means of access into single-entry neighborhoods.
33	41	Earthquake	Develop a public awareness campaign to educate county residents about safety during an earthquake event.
34	42	Earthquake	Harden County facilities by adding bracing and vital equipment and elevating generators.
30	38	Extreme Heat	Increase tree planting in public right of ways to reduce urban heat levels
01	9	Extreme Heat	Educate the public on extreme heat/drought safety and health issues
02	10	Flood	Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.
26	34	Flood	Flood proof public buildings in flood prone areas
28	36	Hail	Construct a barn to house County equipment and vehicles
29	37	Hail	Introduce County residents to and enlist volunteers in CoCoRAHS
35	43	Hail	Educate the public about activities to mitigate the effects of hail.
36	44	Hail	Retrofit County buildings by acquiring roofing products that bear the UL 2218 hail-resistant product listing.
08	16	High Wind	Secure traffic lights and traffic controls from high wind damage.
07	15	High Wind	Post safety notices for severe weather action plans and designated tornado shelter areas for employees and visitors at Ector County facilities to follow during severe weather events.
31	39	Infectious Disease	Assess needs for the county's emergency response services/work with County hospital to ensure supplies, such as anti-viral medications, are

# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
			stocked
32	40	Infectious Disease	Make PSA announcements reminding the public of basic preventative measures to preserve health
21	29	Lightning	Add minimal residential street width criteria to accommodate sizeable rescue vehicle.
22	30	Lightning	Erect lightning rods on the roof tops of critical facilities to prevent power outages
03	11	Pipeline Failure	Provide safety procedures to builders and developers for building and operating near hazardous pipelines
04	12	Pipeline Failure	Educate the public about hazardous materials: safety risks, detecting an accident, responding to an accident, evacuation, and shelter-in-place training via public announcements on local media outlets, brochures and county website.
05	13	Terrorism	Harden critical Ector County facilities, install vehicle barrier systems.
06	14	Terrorism	Increase security for Ector County government computer system to prevent cyber-terrorism resulting in loss of critical data and operational capabilities.
23	31	Thunderstorm	Achieve certification by the National Weather Service as a "StormReady" community
16	24	Thunderstorm	Remove downed trees and fire fuels that increase fire risk in easements and right-of ways.
37	45	Thunderstorm	Purchase NOAA radios for in the event of a power outage due to a thunderstorm.
38	46	Thunderstorm	Install critical facility back-up generators.
24	32	Tornado	Run PSAs to remind public the need for a tornado evacuation plan or shelter in place plan
25	33	Tornado	Provide construction specifications to builders, developers and the public for construction of concrete tornado safe rooms in populated areas of County
18	26	Wildfire	Install fire danger rating / burn ban signs
17	25	Wildfire	Provide information on how to select and maintain the appropriate type of fire extinguisher for all homes and businesses.
09	17	Wildfire	Conduct public education program on fire risks and wildland fire mitigation, with the Texas Forest Service.

# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
10	18	Wildfire	Evaluate access and road conditions in unincorporated areas of Ector County for response vehicles and formulate options to improve access.
11	19	Wildfire	Identify need and suggest to developer additional means of access into single-entry neighborhoods and gated communities in order to prevent residents from becoming trapped in a hazardous area.
15	23	Wildfire	Discourage vegetation growth and encourage fire-resistant landscaping in easements
12	20	Winter Storm	Coordinate, prepare and release public education materials on winter storm safety with American Red Cross, Salvation Army, Cities of Odessa and Goldsmith, and Ector County ISD for facility closing and shelter openings.
19	27	Winter Storm	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way.
39	47	Winter Storm	Develop plan to coordinate with TxDOT for the installation of warning signs on roadways.
40	48	Winter Storm	Retrofit critical facilities with storm shutters and hazard-resistant materials for severe winter storm

**Table 9-2. City of Odessa Actions per Hazard**

Action Number	Page Number	Hazard	Action
04	52	Drought	Identify new sources of water
23	71	Drought	Issue public awareness conservation methods within businesses & residential areas
22	70	Drought	Develop and enforce ordinance for water conservation usage rate
18	66	Earthquake	Install back-up generators for the wastewater treatment plant
05	53	Earthquake	Improve outdated emergency center of operations technological capabilities for monitoring, recording, and responding to disasters
34	82	Extreme Heat	Increase tree planting in public right of ways to reduce urban heat levels
35	83	Extreme Heat	Insert flyers in residential and business water bills



# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
			describing xeriscape planting resources and benefits
27	75	Flood	Develop a land acquisition program in flood hazard areas.
28	76	Flood	Annually distribute flood protection/NFIP pamphlets to owners of flood-prone properties.
21	69	Flood	Provide man hole inserts for low lying areas to prevent in-flow during rainfall events.
29	77	Flood	Conduct workshops for local lending agencies, insurance agents, surveyors and title companies to promote availability of and understanding of flood insurance.
30	78	Flood	Increase capacity of drainage channels in areas prone to flooding or with drainage problems.
31	79	Flood	Prepare Comprehensive Flood Plain and Drainage Study for the City of Odessa, determine BFE in currently identified "A" zones.
32	88	Flood	Install rain gauges at eight (8) locations around city to collect data and improve warning system.
09	57	Hail	Purchase "All Hazards" radios for early warning and post event information. Place them in area schools, businesses, and critical facilities.
38	85	Hail	Evaluate need for metal shed or barn to protect maintenance vehicles from hail
01	49	Infectious Disease	Conduct a study to determine pollutant levels in County areas nearby sewer system for level of contaminants before and after a flood event
02	50	Hazardous Materials Release	Implement a leak detection system for the rail switch yard to detect a hazardous material release.
08	56	Hazardous Materials Release	Convert the use of chlorine gas to non-hazardous disinfectant at water treatment plant
26	74	Hazardous Materials Release	Establish a hazardous cargo route
33	81	High Wind	Implement a tree trimming program
36	84	High Wind	Secure traffic lights and traffic controls from high wind damage.
16	64	Lightning	Implement lightning meters at public parks, gatherings, and schools
14	62	Lightning	Develop a Disaster Recovery Plan

# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
12	60	Pipeline Failure	Establish a program for students to partner with oil and gas to explore new technologies and possible re-use
13	61	Pipeline Failure	Assess needs for the city's emergency response services
20	68	Pipeline Failure	Create GIS map showing the locations of hazardous material sites & pipelines. Make sure the map is provided to builders, homeowners, and lenders.
11	59	Terrorism	Launch Public Awareness campaign that will provide emergency preparedness information, activities, and kits to prepare for potential terrorist attacks.
24	72	Terrorism	Harden critical facilities for terrorism by installing vehicle barrier systems
17	65	Thunderstorm	Update public community facilities to include Severe weather actions plan and designated tornado shelter
19	67	Thunderstorm	Implement or expand rainfall observer program using volunteers (Community Collaborative Rain Hail and Snow Network (CoCoRaHS) through NOAA
10	58	Tornado	Provide proper design criteria (to public?) for tornado safe rooms
06	54	Tornado	Implement and enhance an area wide telephone emergency notification system "code red"
03	51	Wildfire	Implement ordinance to require low vegetation for open areas within 500 yards of structures.
25	73	Wildfire	Create an evacuation plan of areas within City Limits that are surrounded by 50 acres or more
07	55	Winter Storm	Implement National Weather Chat for stakeholders and emergency management coordinators during weather critical events
15	63	Winter Storm	Obtain certification of communities by the national weather service as "Storm Ready" communities

**Table 9-2. City of Goldsmith Actions per Hazard**

Action Number	Page Number	Hazard	Action
06	91	Drought	Update drought contingency plan

# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
07	92	Drought	Insert flyers in water bills provide Xeriscape landscaping info resources
05	90	Earthquake	Purchase and install five back-up generators on drinking water station, Storm shelters, and City Hall.
18	103	Earthquake	Implement a back-up plan for storing public records and digital copies offsite in a non-hazard area
08	93	Extreme Heat	Advertise the availability of crop insurance
09	94	Extreme Heat	Develop a water/power/supplies crisis response plan
16	101	Flood	Promote "Turn Around Don't Drown"
17	102	Flood	Debris and street clean up streets in town after severe flood
19	104	Hail	Recommend to the public the use of roofing products that bear the UL 2218 hail-resistant product listing
20	105	Hail	Achieve certification by the National Weather Service as a "StormReady" community
10	95	High Wind	Implement a tree trimming program to remove limbs from right of way
11	96	High Wind	Educate public and builders of effect of high wind incidents on new construction by inserting informative flyers in utility bills.
12	97	Lightning	Insert flyers w/ utility bills for the City of Goldsmith that offers info of how residents can reduce hazardous effects of lightning (and all other hazards).
13	98	Lightning	Place lightning rods on roof tops of critical facilities / structures
01	86	Pipeline Failure	Conduct a pipeline awareness campaign
14	99	Thunderstorm	Install quick-connect emergency generator hook-ups for critical facilities
22	107	Thunderstorm	Participate in CoCoRaHS
15	100	Tornado	Purchase and install a radio activated siren system for mass notification
04	89	Tornado	Construct two concrete safety shelters for residents of City of Goldsmith
23	108	Tornado	Purchase NOAA weather radios and notify public of availability
24	109	Wildfire	Work with the County to create a Wildfire Contingency Plan
02	87	Wildfire	Maintain mowing on vacant lots, maintain mowed swaths on each side of fence where possible.

# MITIGATION ACTIONS

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Action Number	Page Number	Hazard	Action
03	88	Wildfire	New pumper truck for Volunteer Fire Dept.
21	106	Winter Storm	Create a plan to communicate with TxDOT to install warning signs on roadways as soon as the signs are foreseen to be needed

# MITIGATION ACTIONS

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## Ector County

<b>COUNTY - 01</b>	
<b>Proposed Action:</b>	Educate the public on extreme heat/drought safety and health issues.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County website, media PSAs
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought/Extreme Heat
<b>Effect on new/existing buildings:</b>	Water conservation, more efficient use of cooling systems
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Minimal – staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Emergency Management, PIO and Ector County Information Technology
<b>Implementation Schedule:</b>	Summer 2010

<b>COMMENTS</b>
This action will help ensure that residents are aware of the simple steps they can take to be better prepared for excessive heat waves. The goal is to help individuals learn how to take care of themselves and their families and look out for neighbors that may be at high risk.

# MITIGATION ACTIONS

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**COUNTY - 02**

<b>Proposed Action:</b>	Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Unincorporated areas of Ector County
<b>History of Damages:</b>	Examples of repetitive flooding in area of 61 <sup>st</sup> Street and Benefield, Florida in north western area of county

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Minimize or eliminate flooding
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be developed
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works and Emergency Management
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
Moving the property out of harm's way will allow water to safely convey downstream and reduce injuries and damages.



# MITIGATION ACTIONS

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<b>COUNTY -03</b>	
<b>Proposed Action:</b>	<b>Provide safety procedures to builders and developers for building and operating near hazardous pipelines</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Unincorporated areas of Ector County
<b>History of Damages:</b>	Pipeline damage, explosion and fire due to improper excavation

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release/Pipeline Failure
<b>Effect on new/existing buildings:</b>	Prevention of explosion and fire
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 initial cost
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	EC Public Works and Pipeline Group
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>
This action will ensure that builders and excavators are aware of the dangers as digging occurs on property as it is developed.

# MITIGATION ACTIONS

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**COUNTY -04**

<b>Proposed Action:</b>	Educate the public about hazardous materials: safety risks, detecting an accident, responding to an accident, evacuation, and shelter-in-place training via public announcements on local media outlets, brochures and county website.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County website and offices and media PSAs
<b>History of Damages:</b>	Various hazardous materials incidents in past with minor consequences; major consequences with Champion Technologies explosion; would be a preventative measure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Material Release/Pipeline Failure
<b>Effect on new/existing buildings:</b>	Reduce or eliminate contamination, safer sheltering-in-place
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000 initial for brochures
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Emergency Management, PIO and Ector County Information Technology
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

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**COUNTY -05**

<b>Proposed Action:</b>	<b>Harden critical Ector County facilities, install vehicle barrier systems.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Various county-owned buildings, such as Courthouse, Law Enforcement Center, Youth Center, Health Department, Courthouse Administration Building
<b>History of Damages:</b>	Preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	Prevention of damage or destruction
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$200,000
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	EC Building Maintenance and Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

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**COUNTY -06**

<b>Proposed Action:</b>	Increase security for Ector County government computer system to prevent cyber-terrorism resulting in loss of critical data and operational capabilities.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	All Ector County departments and facilities
<b>History of Damages:</b>	This would be a preventative measure. Our internet provider has been attacked by hackers in the past.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	Protects infiltration of computer system
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$200,000
<b>Potential Funding Sources:</b>	Local, State and Federal grants
<b>Lead Agency/Department Responsible:</b>	Ector County Information Technology
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

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**COUNTY -07**

<b>Proposed Action:</b>	Post safety notices for severe weather action plans and designated tornado shelter areas for employees and visitors at Ector County facilities to follow during severe weather events.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Lobby areas of each Ector County facility
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado/High Wind
<b>Effect on new/existing buildings:</b>	Directs employees and public where to go within the buildings during severe weather event
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$7,000
<b>Potential Funding Sources:</b>	Local, State and Federal grants
<b>Lead Agency/Department Responsible:</b>	Ector County Sign Shop, Building Maintenance
<b>Implementation Schedule</b>	2012

<b>COMMENTS</b>
<p>This would be to offer the best safety option for employees and public visiting County buildings during working hours should a severe weather event occur. It would not be to designate the buildings as tornado shelters to draw the public either during or after business hours.</p>

# MITIGATION ACTIONS

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**COUNTY -08**

<b>Proposed Action:</b>	<b>Secure traffic lights and traffic controls from high wind damage.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Highways and streets in unincorporated areas of Ector County
<b>History of Damages:</b>	Various high wind events in past caused localized damage, but this would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado/High Wind
<b>Effect on new/existing buildings:</b>	Preventative measure to ensure public safety in transportation areas
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$50,000
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works/ Sign Shop
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

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**COUNTY-09**

<b>Proposed Action:</b>	<b>Conduct public education program on fire risks and wildland fire mitigation, with the Texas Forest Service.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Commissioners Courtroom, Ector County website and news media PSAs
<b>History of Damages:</b>	This would be an educational, preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Prevent and mitigate losses to homes and other structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,000 cost of copying brochure materials
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Emergency Management, PIO and Texas Forest Service
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
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## COUNTY-10

<b>Proposed Action:</b>	Evaluate access and road conditions in unincorporated areas of Ector County for response vehicles and formulate options to improve access.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County unincorporated areas: housing developments, subdivisions
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Prevention and mitigation of fire damage to structures, livestock and other property
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-11

<b>Proposed Action:</b>	Identify need and suggest to developer additional means of access into single-entry neighborhoods and gated communities in order to prevent residents from becoming trapped in a hazardous area.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County unincorporated areas: housing developments, subdivisions
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Prevention and mitigation of fire-related deaths or injuries, rather than structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Minimal – staff time for evaluation of locations
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-12

<b>Proposed Action:</b>	Coordinate, prepare and release public education materials on winter storm safety with American Red Cross, Salvation Army, Cities of Odessa and Goldsmith, and Ector County ISD for facility closing and shelter openings.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Odessa/Goldsmith/Ector County community-wide effort with ECISD on jurisdictional websites, media PSAs, brochures
<b>History of Damages:</b>	This would be a preventative measure to reduce accidents and increase safety.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms
<b>Effect on new/existing buildings:</b>	Preventative for pipe damage and improve heating safety
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$5,000 brochure copies
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Emergency Management, PIO
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

<b>COUNTY-13</b>	
<b>Proposed Action:</b>	<b>Make flyers available at county offices and post information on county web-site describing xeriscape planting resources and benefits.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County Offices, web-site.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought/ Extreme Heat
<b>Effect on new/existing buildings:</b>	Water Conservation
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management and Information Technology
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-14**

	<b>Proposed Action:</b>	<b>Provide water conservation education for low- flow plumbing and toilets, efficient washers, rain harvesting.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Ector County Offices, web-site.
	<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	low
<b>Estimated Cost:</b>	TBD
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	Ector County
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-15**

	<b>Proposed Action:</b>	Discourage vegetation growth and encourage fire-resistant landscaping in easements.
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Throughout Ector County.
	<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Reduce wildfire hazards
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-16**

	<b>Proposed Action:</b>	<b>Remove downed trees and fire fuels that increase fire risk in easements and right-of ways.</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Throughout Ector County
	<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire, Flooding, Severe Thunderstorm
<b>Effect on new/existing buildings:</b>	Reduce risks to buildings
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-17**

<b>Proposed Action:</b>	Provide information on how to select and maintain the appropriate type of fire extinguishers for all homes and businesses.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	County offices and web-site.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management, Information Technology
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-18**

<b>Proposed Action:</b>	Install fire danger rating/ burn ban signs.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	All major roads entering Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Traffic/ Sign Shop
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-19**

	<b>Proposed Action:</b>	Implement a tree trimming program that routinely clears tree limbs hanging in right-of- way.
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Throughout Ector County.
	<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms, Wildfire
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	Low/ High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-20**

<b>Proposed Action:</b>	<b>Provide additional means of access into single-entry neighborhoods.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	New subdivisions in Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2010

<b>COMMENTS</b>
This can be accomplished during the subdivision review process.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-21

<b>Proposed Action:</b>	<b>Add minimal residential street width criteria to accommodate sizeable rescue vehicle.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	New subdivisions in Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2010

<b>COMMENTS</b>
This can be accomplished during the subdivision review process.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-22**

<b>Proposed Action:</b>	Erect lightning rods on the roof tops of critical facilities to prevent power outages.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County's various facilities.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning
<b>Effect on new/existing buildings:</b>	Prevent damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management, Building Maintenance
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-23**

<b>Proposed Action:</b>	Achieve certification by the National Weather Service as a "StormReady" community
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm
<b>Effect on new/existing buildings:</b>	Prevent damage to structures
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-24**

<b>Proposed Action:</b>	<b>Run PSAs to remind public the need for a tornado evacuation plan or shelter in place plan</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout Ector County on local news media, County website.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado
<b>Effect on new/existing buildings:</b>	Reduce bodily harm to residents
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Minimal – staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-25**

<b>Proposed Action:</b>	<b>Provide construction specifications to builders, developers and the public for construction of concrete tornado safe rooms in populated areas of County</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	To be determined by preference of builders, developers or individual members of public within unincorporated areas of Ector County
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado
<b>Effect on new/existing buildings:</b>	Enhance survivability of citizens in new or retrofitted buildings
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined – brochure printing
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Emergency Management and Public Works
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-26**

<b>Proposed Action:</b>	<b>Flood proof public buildings in flood prone areas</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Ector County's various facilities.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Prevent damage to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State and Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Building Maintenance
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-27**

<b>Proposed Action:</b>	Implement a County-wide mass notification system.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Effect on new/existing buildings:</b>	Reduce damage to structures
<b>Priority (High, Moderate, Low):</b>	Very Low
<b>Estimated Cost:</b>	To be determined.
<b>Potential Funding Sources:</b>	Local, state and federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-28**

<b>Proposed Action:</b>	<b>Construct a barn to house County equipment and vehicles</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout Ector County, but especially at Highways and Streets yard.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	Prevent damage to equipment and vehicles
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works, Building Maintenance
<b>Implementation Schedule:</b>	2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-29**

<b>Proposed Action:</b>	Introduce County residents to and enlist volunteers in CoCoRAHS
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout unincorporated areas of Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Negligible
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management
<b>Implementation Schedule:</b>	To begin after Plan approval

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-30**

<b>Proposed Action:</b>	Increase tree planting in public right of ways to reduce urban heat levels
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout unincorporated parts of Ector County
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	Prevent damage to structures
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works, Building Maintenance
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-31

<b>Proposed Action:</b>	Assess needs for the county's emergency response services /work with County hospital and Health Department to ensure supplies, such as anti-viral medications, are stocked
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout unincorporated areas of Ector County.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Infectious Disease
<b>Effect on new/existing buildings:</b>	Reduce bodily harm to residents
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management, Health Department
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-32**

<b>Proposed Action:</b>	<b>Make PSA announcements reminding the public of basic preventative measures to preserve health</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout Ector County on local media and Ector County's website.
<b>History of Damages:</b>	This would be a preventative measure.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Infectious Disease
<b>Effect on new/existing buildings:</b>	Reduce bodily harm to residents
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Ector County Emergency Management, Health Department, Information Technology and PIO
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-33

<b>Proposed Action:</b>	Develop a public awareness campaign to educate county residents about safety during an earthquake event.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	There have been a limited number of events over the past 50 years, and for those events the intensity has been moderate or less.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Effect on new/existing buildings:</b>	Not applicable as this is a public awareness action
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-34**

<b>Proposed Action:</b>	Harden County facilities by adding bracing and vital equipment and elevating generators.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	County-owned buildings
<b>History of Damages:</b>	There has not been an occurrence of an earthquake in Ector county.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Effect on new/existing buildings:</b>	Existing public buildings will be secured in the event of an earthquake to prevent collapse and permanent damage.
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$500,000
<b>Potential Funding Sources:</b>	DHS, HMGP grants
<b>Lead Agency/Department Responsible:</b>	EMC, Building maintenance
<b>Implementation Schedule:</b>	2012, as funding is available

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-35**

<b>Proposed Action:</b>	Educate the public about activities to mitigate the effects of hail. Make plans available for residents.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	The County experiences high wind and hail storm events and currently does not have information available to residents for activities such as sheltering in place.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	Not applicable as this is a public awareness action
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,000
<b>Potential Funding Sources:</b>	Local funding and State grants
<b>Lead Agency/Department Responsible:</b>	Building Maintenance, Sign Shop, EMC
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

<b>COUNTY-36</b>	
<b>Proposed Action:</b>	<b>Retrofit County buildings by acquiring roofing products that bear the UL 2218 hail-resistant product listing.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	The County experiences high wind and hail storm events, which can cause significant damage to roofing.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	This action would protect existing county facilities by preventing significant property damage in the event of a hailstorm. It could also mitigate the effects on new buildings if used in the development of new facilities.
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$25,000
<b>Potential Funding Sources:</b>	Local funds and Federal grants
<b>Lead Agency/Department Responsible:</b>	Building Maintenance, EMC
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-37**

<b>Proposed Action:</b>	Purchase NOAA radios for in the event of a power outage due to a thunderstorm.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	Thunderstorms often disrupt power. This action will keep citizens informed to help mitigate the loss of lives in a thunderstorm event.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	\$10,000
<b>Potential Funding Sources:</b>	Federal Grants
<b>Lead Agency/Department Responsible:</b>	EMC
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**COUNTY-38**

<b>Proposed Action:</b>	<b>Install critical facility back-up generators</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	The critical facilities to be strengthened include: County Jail, Juvenile Detention, Sheriff Patrol and Dispatch, as well as fueling facilities for County vehicles.
<b>History of Damages:</b>	Thunderstorms cause severe damage to buildings and loss of power, meaning a loss of critical services to the public.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm
<b>Effect on new/existing buildings:</b>	Hardening critical facilities will allow for the continual operation of buildings during and after a storm event.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	Federal Grants
<b>Lead Agency/Department Responsible:</b>	Building Maintenance, Engineering
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-39

<b>Proposed Action:</b>	Develop plan to coordinate with TxDOT to install warning signs on roadways in the event of a severe winter storm.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	Severe winter storms have caused serious traffic accidents, injuries and damage to property due to ice on roads.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Minimal- staff time only
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	Ector County Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## COUNTY-40

<b>Proposed Action:</b>	<b>Retrofit critical facilities with storm shutters and hazard-resistant materials for severe winter storm.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Countywide
<b>History of Damages:</b>	Severe winter storms have in the past caused broken windows and damage to critical public facilities.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storms
<b>Effect on new/existing buildings:</b>	This action would reduce damage to critical facilities during storm by retrofitting windows and shutters on existing facilities.
<b>Priority (High, Moderate, Low):</b>	Medium
<b>Estimated Cost:</b>	\$300,000
<b>Potential Funding Sources:</b>	Federal grants
<b>Lead Agency/Department Responsible:</b>	Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## City of Odessa

<b>ODESSA-01</b>	
<b>Proposed Action:</b>	<b>Conduct a study to determine pollutant levels in County areas nearby sewer system for level of contaminants before and after a flood event</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Near areas that flood
<b>History of Damages:</b>	Flooding occurs seasonally in the areas to be studied. E.coli has been reported in these flood waters.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Infectious Disease/Flood
<b>Effect on new/existing buildings:</b>	Protects public health
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Federal and State programs (TCEQ, TWDB, EPA)
<b>Lead Agency/Department Responsible:</b>	Odessa College
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>
A similar study has been conducted by UTEP with the Houston Health Science Center branch at El Paso.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-02**

<p><b>Proposed Action:</b></p>	<p>Implement a leak detection system for the rail switch yard to detect a hazardous material release.</p>
<p><b>BACKGROUND INFORMATION</b></p>	
<p><b>Site and Location:</b></p>	<p>Rail switch yard &amp; spurs south of Highway 80</p>
<p><b>History of Damages:</b></p>	<p>Railcars are stopped within ½ mile of Odessa city limits, and small leaks have occurred several times in the rail switch yard.</p>

MITIGATION ACTION DETAILS	
<p><b>Hazard(s) Addressed:</b></p>	<p>Hazardous Materials Release</p>
<p><b>Effect on new/existing buildings:</b></p>	<p>None to building</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>Moderate</p>
<p><b>Estimated Cost:</b></p>	<p>\$100,000</p>
<p><b>Potential Funding Sources:</b></p>	<p>Local, State, Federal</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>Odessa Fire Dept.</p>
<p><b>Implementation Schedule:</b></p>	<p>2012</p>

COMMENTS
<p> </p>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-03**

<b>Proposed Action:</b>	<b>Implement ordinance to require low vegetation for open areas within 500 yards of structures.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	There is a regular occurrence of wildfires in this area.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	Structures will be protected by the new setback requirements
<b>Priority (High, Moderate, Low):</b>	high
<b>Estimated Cost:</b>	\$20,000
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Legal Dept. of City of Odessa
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-04**

<b>Proposed Action:</b>	Identify new sources of water
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Colorado River Municipal Water District (CRMWD)
<b>History of Damages:</b>	Local lakes are at less than $\frac{3}{4}$ capacity.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$50 million
<b>Potential Funding Sources:</b>	Federal and State
<b>Lead Agency/Department Responsible:</b>	CRMWD
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-05**

<b>Proposed Action:</b>	<b>Improve outdated emergency center of operations technological capabilities for monitoring, recording, and responding to disasters</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	To be determined
<b>History of Damages:</b>	Flooding damages in the City of Odessa occur annually.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials, High Wind, Lightning, Pandemic, Pipeline Failure, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	Improving emergency response time is reducing the threat of a hazard to structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$4 million
<b>Potential Funding Sources:</b>	Federal grants
<b>Lead Agency/Department Responsible:</b>	City of Odessa
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-06**

<b>Proposed Action:</b>	<b>Implement and enhance an area wide telephone emergency notification system “code red”</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Public Safety Commission
<b>History of Damages:</b>	Damages have resulted from area residents being unaware of an incident leaving no time to take proactive measures

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials, High Wind, Lightning, Pandemic, Pipeline Failure, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	Early warnings sent to occupants will allow for buildings to be secured in the face of a threat.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	State, Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa, Public Safety Commission
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-07**

<b>Proposed Action:</b>	<b>Implement National Weather Chat for stakeholders and emergency management coordinators during weather critical events</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	The County and Ector County Independent School District
<b>History of Damages:</b>	Previous

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Extreme Heat, Flood, Hail, High Wind, Lightning, Thunderstorm, Winter Storm, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Negligible
<b>Potential Funding Sources:</b>	Local
<b>Lead Agency/Department Responsible:</b>	National Weather Service
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
IT Constraints such as a firewall issue may need to be resolved before implementation.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-08**

<b>Proposed Action:</b>	<b>Convert the use of chlorine gas to non-hazardous disinfectant at water treatment plant</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City water treatment plants in Odessa
<b>History of Damages:</b>	The potential for terrorist incident is high, this action reduces that risk.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Materials Release, Terrorism
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$1.5 million
<b>Potential Funding Sources:</b>	Local, state, federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa utilities
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-09**

<p><b>Proposed Action:</b></p>	<p><b>Purchase “All Hazards” radios for early warning and post event information. Place them in area schools, businesses, and critical facilities.</b></p>
<p><b>BACKGROUND INFORMATION</b></p>	
<p><b>Site and Location:</b></p>	<p>Various locations identified on the Critical Facilities list</p>
<p><b>History of Damages:</b></p>	<p>Previous damage has made for unreliable communications with the community.</p>

<p><b>MITIGATION ACTION DETAILS</b></p>	
<p><b>Hazard(s) Addressed:</b></p>	<p>Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials, High Wind, Lightning, Pandemic, Pipeline Failure, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire</p>
<p><b>Effect on new/existing buildings:</b></p>	<p>Increased warning time and communication will allow people to better protect existing buildings when possible.</p>
<p><b>Priority (High, Moderate, Low):</b></p>	<p>High</p>
<p><b>Estimated Cost:</b></p>	<p>\$50,000</p>
<p><b>Potential Funding Sources:</b></p>	<p>Local, federal, and private</p>
<p><b>Lead Agency/Department Responsible:</b></p>	<p>National Weather Service of Odessa</p>
<p><b>Implementation Schedule:</b></p>	<p>2011-2012</p>

<p><b>COMMENTS</b></p>
<p> </p>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-10**

<b>Proposed Action:</b>	<b>Provide proper design criteria to the public for tornado safe rooms</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City wide
<b>History of Damages:</b>	Improperly designed and make shift safe rooms have left residents in harm's way.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	High Wind/Tornado
<b>Effect on new/existing buildings:</b>	Proper construction will insure a building is resistant to high winds and tornados
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa – PIO Plans
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## ODESSA-11

<b>Proposed Action:</b>	Launch Public Awareness campaign that will provide emergency preparedness information, activities, and kits to prepare for potential terrorist attacks.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City wide
<b>History of Damages:</b>	Historical damages are very minimal but the potential is great

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	A public that is more aware will prevent all (structural) damages possible.
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$50,000- \$100,000
<b>Potential Funding Sources:</b>	Local business partners / federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa & Ector County
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>
Community Awareness will be raised by partnering with local businesses to develop emergency kits and preparedness measures community members can take to better protect themselves and their families.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-12**

<b>Proposed Action:</b>	Establish a program for students to partner with oil and gas to explore new technologies and possible re-use
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Odessa College
<b>History of Damages:</b>	City experiences minor and major hazardous materials spills and pipeline incidents. Both hazards are high for the area.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Materials Release/Pipeline Failure
<b>Effect on new/existing buildings:</b>	Potential for energy efficiency and savings in both existing and future development
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	To be determined
<b>Potential Funding Sources:</b>	Federal education grants, NSF
<b>Lead Agency/Department Responsible:</b>	Odessa College
<b>Implementation Schedule:</b>	Continuous if successful, upon implementation

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-13**

<b>Proposed Action:</b>	Assess needs for the city's emergency response services
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Lives and property can always be better protected. Emergency services need to grow with the populations they protect.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Materials Release/Pipeline Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$2million - \$3 million
<b>Potential Funding Sources:</b>	Local, Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa Dept. of Public Safety
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-14**

<b>Proposed Action:</b>	<b>Develop a Disaster Recovery Plan</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials, High Wind, Lightning, Pandemic, Pipeline Failure, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$50K
<b>Potential Funding Sources:</b>	Local Match, Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa, Emergency Management
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>
This plan will be incorporated into the existing Emergency Management Plan.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-15**

	<b>Proposed Action:</b>	Obtain certification of communities by the national weather service as “Storm Ready” communities
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	City of Odessa
	<b>History of Damages:</b>	

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flooding, Hail, High Wind, Lightning, Thunderstorm, Winter Storm, Tornado
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,000
<b>Potential Funding Sources:</b>	Local, State
<b>Lead Agency/Department Responsible:</b>	National Weather Service, City of Odessa
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-16**

<b>Proposed Action:</b>	<b>Implement lightning meters at public parks, gatherings, and schools</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout the City
<b>History of Damages:</b>	Previous Lightning Strikes

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning/Thunderstorm
<b>Effect on new/existing buildings:</b>	This will help mitigate against potential damage to existing structures as lightning can at the very least cause a power outage, but also lead to structure fire.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$15,000
<b>Potential Funding Sources:</b>	Local, State, and Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa Parks Department
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>
This project would require personnel training on equipment.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-17**

<b>Proposed Action:</b>	Update public community facilities to include Severe weather actions plan and designated tornado shelter
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	The City experiences high wind events with thunderstorms and tornadoes as well as separate windstorm events. Currently a designated shelter is not available.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail, High Wind, Thunderstorm, Winter Storm, Tornado
<b>Effect on new/existing buildings:</b>	This action will directly impact people, rather than property
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,000
<b>Potential Funding Sources:</b>	Local, State
<b>Lead Agency/Department Responsible:</b>	City of Odessa
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-18**

<b>Proposed Action:</b>	Install back-up generators for the wastewater treatment plant
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Power outages cause the system to stop treatment process and sewage back up into homes can occur.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake, Flooding, Hail, High Wind, Lightning, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	Backup generators will prevent the loss of power during a hazard event. Keeping power to existing structures will protect against additional damages to this critical facility and also prevent sewage backup to personal property.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$500,000
<b>Potential Funding Sources:</b>	Federal, State, Local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Utilities
<b>Implementation Schedule:</b>	2012-2013

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-19**

<b>Proposed Action:</b>	Implement or expand rainfall observer program using volunteers (Community Collaborative Rain Hail and Snow Network (CoCoRaHS) through NOAA
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	NOAA relies on reports of weather events and by implementing a CoCoRaHS program, the City can help to more accurately report hazard occurrences.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood/Thunderstorm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Local, State
<b>Potential Funding Sources:</b>	\$4,000
<b>Lead Agency/Department Responsible:</b>	City of Odessa and NWS
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-20**

<b>Proposed Action:</b>	Create GIS map showing the locations of hazardous material sites & pipelines. Make sure the map is provided to builders, homeowners, and lenders.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Fatal accidents and useless investments have resulted from builders, homeowners, and lenders not being aware of a pipeline's location in relation to their project site.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Pipeline Failure
<b>Effect on new/existing buildings:</b>	Knowing exact locations of type of certain pipelines will prevent damages to existing buildings undergoing repairs or renovations. It will also prevent incidents resulting from new construction projects.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$70,000
<b>Potential Funding Sources:</b>	Local, State
<b>Lead Agency/Department Responsible:</b>	City of Odessa GIS Department
<b>Implementation Schedule:</b>	2011-2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-21**

<b>Proposed Action:</b>	<b>Provide man hole inserts for low lying areas to prevent inflow during rainfall events.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	The sewer system cannot accommodate a deluge of flood water. Inserts will prevent running the WWTP from exceeding capacity.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	This action will prevent the existing critical facility, Wastewater Treatment Plant, from exceeding capacity.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	State, Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa Utilities
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>
Limits inflow to wastewater facilities

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-22**

<b>Proposed Action:</b>	<b>Develop and enforce ordinance for water conservation usage rate</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Water conservation is increasingly important as droughts become more severe. The City experiences moderate to severe drought during the summer months.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	Utilities
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
<p>This would require consent and approval from City Council.</p> <p>Costs associated with starting up and maintaining can be expected.</p>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-23**

<b>Proposed Action:</b>	Issue public awareness conservation methods within businesses & residential areas
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Increasing public awareness about the importance of conservation will help to plan for future droughts.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$20,000
<b>Potential Funding Sources:</b>	Local, State
<b>Lead Agency/Department Responsible:</b>	City of Odessa Utilities
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-24**

<b>Proposed Action:</b>	<b>Harden critical facilities for terrorism by installing vehicle barrier systems</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	All critical facilities with the city where needed
<b>History of Damages:</b>	History is minimal but potential is great

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Terrorism
<b>Effect on new/existing buildings:</b>	Critical protection of new and existing critical facilities
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$50,000-\$100,000
<b>Potential Funding Sources:</b>	Local, Federal
<b>Lead Agency/Department Responsible:</b>	Local vendors
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-25**

	<b>Proposed Action:</b>	Create an evacuation plan of areas within City Limits that are surrounded by 50 acres or more
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	Borders of City Limits
	<b>History of Damages:</b>	Regular occurrence of wildfire outside of the City threatens the City

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	A protective buffer can prevent buildings from catching on fire.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$25,000
<b>Potential Funding Sources:</b>	Local, State, Federal
<b>Lead Agency/Department Responsible:</b>	City of Odessa Fire Department
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-26**

<b>Proposed Action:</b>	Establish a hazardous cargo route
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	There is a history of minor and major hazardous materials incidents within the last 15 years

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hazardous Materials Release
<b>Effect on new/existing buildings:</b>	Routing this traffic away from existing buildings will reduce the threat of that hazard to the structures and occupants
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$25,000
<b>Potential Funding Sources:</b>	Federal and Local
<b>Lead Agency/Department Responsible:</b>	TxDOT
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
Establish marking system to route truck drivers through the community that are transporting hazardous materials.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-27**

<b>Proposed Action:</b>	Develop a land acquisition program in flood hazard areas.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Muskingum Draw flood plain between 8 <sup>th</sup> Street and University Boulevard
<b>History of Damages:</b>	Numerous houses and small businesses are subject to damage from water, some 400 potential properties.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Eliminate damage for existing structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$3.2 M
<b>Potential Funding Sources:</b>	Federal and local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-28**

<b>Proposed Action:</b>	Annually distribute flood protection/NFIP pamphlets to owners of flood-prone properties.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout flood plains in Odessa
<b>History of Damages:</b>	Numerous houses and businesses are subject to flood water damage.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Educate owners on how to reduce losses due to flooding
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$9,000/year
<b>Potential Funding Sources:</b>	Federal and local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-29**

<b>Proposed Action:</b>	<b>Conduct workshops for local lending agencies, insurance agents, surveyors and title companies to promote availability of and understanding of flood insurance.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Odessa, community-wide
<b>History of Damages:</b>	Damages in flood plain areas in Odessa.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Increase insurance coverage on new/existing structures
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000
<b>Potential Funding Sources:</b>	Federal and local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-30**

<b>Proposed Action:</b>	Increase capacity of drainage channels in areas prone to flooding or with drainage problems.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	<ol style="list-style-type: none"> <li>1. In Odessa, Eastside Channel from east of Pagewood Avenue, at confluence, to Pueblo Avenue culvert</li> <li>2. In Odessa, East Channel Drainage Basin improvements in vicinity of Spur 588 (Faudree Rd.) and BI-20</li> </ol>
<b>History of Damages:</b>	Numerous homes and apartments are subject to flooding if channel overflows. Flood prone area identified in 1977 Drainage Study subject to increasing floods due to developed areas.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Reduce potential for flooding structures in flood plains
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$8.1 M
<b>Potential Funding Sources:</b>	Federal and local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-31**

<b>Proposed Action:</b>	<b>Prepare Comprehensive Flood Plain and Drainage Study for the City of Odessa, determine BFE in currently identified "A" zones.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City-wide study
<b>History of Damages:</b>	Addressing all current flood plains and development areas to reduce potential for damages.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Prevent future flooding damages
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$750,000
<b>Potential Funding Sources:</b>	Federal, local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-32**

<b>Proposed Action:</b>	<b>Install rain gauges at eight (8) locations around city to collect data and improve warning system.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Eight (8) at City of Odessa Fire Stations
<b>History of Damages:</b>	Community-wide response to flood prone areas.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	Reduce potential for damages and to prepare warnings
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,200
<b>Potential Funding Sources:</b>	Federal and local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works
<b>Implementation Schedule:</b>	2010

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-33**

<b>Proposed Action:</b>	<b>Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	Throughout the City of Odessa
<b>History of Damages:</b>	During thunderstorms and high wind events trees and tree limbs fall in the streets causing safety problems for traffic

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	High Wind/Thunderstorms
<b>Effect on new/existing buildings:</b>	Reduce damage from falling branches and provide clear access for emergency vehicles to homes and businesses
<b>Priority (High, Moderate, Low):</b>	M
<b>Estimated Cost:</b>	\$40,000
<b>Potential Funding Sources:</b>	Federal and or Local
<b>Lead Agency/Department Responsible:</b>	City of Odessa Public Works Dept.
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-34**

<b>Proposed Action:</b>	Increase tree planting in public right of ways to reduce urban heat levels
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Area has received heat waves in the past. On record events occurred on June 25, 1994 and June 30, 1994. High temperatures in most areas reached between 105 and 110 degrees daily. All-time records were set on June 27, 1994.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	No affect
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$750k
<b>Potential Funding Sources:</b>	Federal Funding
<b>Lead Agency/Department Responsible:</b>	Parks Department
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-35**

<b>Proposed Action:</b>	<b>Insert flyers in residential and business water bills describing xeriscape planting resources and benefits</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Area has received heat waves in the past. On record events occurred on June 25, 1994 and June 30, 1994. High temperatures in most areas reached between 105 and 110 degrees daily. All-time records were set on June 27, 1994.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	No affect
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$5k
<b>Potential Funding Sources:</b>	State/Federal Funding
<b>Lead Agency/Department Responsible:</b>	Emergency Management
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-36**

<b>Proposed Action:</b>	<b>Secure traffic lights and traffic controls from high wind damage. Install a system-wide communications system (Wireless Access Points) for maintenance or problems association from high wind.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa
<b>History of Damages:</b>	Previous “Derecho Event” on June 27, 2007. Straight-line winds occurred throughout the Permian Basin. Wind speeds reached 93mph.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	High Wind
<b>Effect on new/existing buildings:</b>	No Affect
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$2.5 Million
<b>Potential Funding Sources:</b>	Federal Funding
<b>Lead Agency/Department Responsible:</b>	Traffic Engineering
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>
This project would allow other city department the ability to communicate during events of severe weather.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**ODESSA-38**

<b>Proposed Action:</b>	Evaluate need for metal shed or barn to protect maintenance vehicles from hail
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Odessa Facilities
<b>History of Damages:</b>	215 historical hail events. Most notably in storms on May 26, 1999, May 2, 2007 caused 2,500 claims and April 9, 2008.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	New construction
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$1 Million
<b>Potential Funding Sources:</b>	Federal Funding
<b>Lead Agency/Department Responsible:</b>	Building Services
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## City of Goldsmith

GS-01	
<b>Proposed Action:</b>	<b>Conduct a pipeline awareness campaign</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Multiple fatalities over the years due to unawareness, neglecting to call is fatal. Several pipelines cross in Goldsmith, booster stations and pump stations in Goldsmith support this need as well.

MITIGATION ACTION DETAILS	
<b>Hazard(s) Addressed:</b>	Pipeline Failure
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$5,000
<b>Potential Funding Sources:</b>	DigTess
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Upon funding

COMMENTS
DigTess will present to school

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

<b>GS-02</b>	
<b>Proposed Action:</b>	<b>Maintain mowing on vacant lots, maintain mowed swaths on each side of fence where possible,</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	May 1, 1993 City experienced 75 MPH winds that caused power lines to go down and fires started. Damages included lost livestock, downed power lines, and power outages.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	A protective buffer will reduce the threat of wildland fires to existing and new buildings.
<b>Priority (High, Moderate, Low):</b>	low
<b>Estimated Cost:</b>	\$1,500
<b>Potential Funding Sources:</b>	State, Local, Federal
<b>Lead Agency/Department Responsible:</b>	City
<b>Implementation Schedule:</b>	

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-03**

<b>Proposed Action:</b>	<b>Purchase pumper truck for Volunteer Fire Dept.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Grass fires have been caused by lightning strikes and tank batteries fires. One pumper truck currently delivers water to the two fire trucks. There have been times when this is insufficient.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning, Wildfire, Hazardous Materials Release, Terrorism, High Wind
<b>Effect on new/existing buildings:</b>	Increasing capability to extinguish fires will prevent damage to new and existing structures
<b>Priority (High, Moderate, Low):</b>	high
<b>Estimated Cost:</b>	\$400,000
<b>Potential Funding Sources:</b>	Federal and Local
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Upon funding

<b>COMMENTS</b>
Two Army 1962 and 1967 model pump trucks, and a 1981 water truck to deliver water to the pump truck. Trucks have trouble getting through fields to major fires, need 4 wheel drive.



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-04**

<b>Proposed Action:</b>	<b>Construct two concrete safety shelters for residents of the City of Goldsmith</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Previously, a local school served as storm shelter. The school has closed and now there is no shelter for residents.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire, Thunderstorm, Terrorism, Hail, Tornado, Infectious Disease, High Wind,
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	TBD
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Complete within 2 years of funding

<b>COMMENTS</b>
A shelter on the north side of town and one of the south side of town will provide residents with immediate shelter when needed.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-05**

<b>Proposed Action:</b>	<b>Purchase five back up generators for drinking water station, proposed storm shelters, and City Hall.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	High winds have knocked power lines down, lift stations

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Earthquake, Extreme Heat, Flood, Hail, Hazardous Materials Release, High Wind, Lightning, Pandemic, Pipeline Failure, Thunderstorm, Winter Storm, Terrorism, Tornado, Wildfire
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	Unknown at this time
<b>Potential Funding Sources:</b>	Federal and State grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Complete within 6 months of funding

<b>COMMENTS</b>
Generators allow for the continuous operation of these essential services.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-06**

<b>Proposed Action:</b>	<b>Update drought contingency plan</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	The City of Goldsmith owns its own utility system and has a drought contingency plan in place though it is in need of being updated.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	n/a
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000
<b>Potential Funding Sources:</b>	Federal
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Annually, upon funding

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-07**

<b>Proposed Action:</b>	<b>Insert flyers in water bills providing Xeriscape landscaping information resources</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Extreme drought 2009 left area ground cover dead and unable to hold soil down leaving it subject to entering the sewer system.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	moderate
<b>Estimated Cost:</b>	\$500
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-08**

<b>Proposed Action:</b>	<b>Advertise the availability of crop insurance</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Annual crop loss was significant after the extreme drought conditions of 2009.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Unknown at this time
<b>Potential Funding Sources:</b>	Grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith, Ector County Agrilife Extension Service
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-09**

<b>Proposed Action:</b>	<b>Develop a water/power/supplies crisis response plan.</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Extreme heat is a risk to the area each summer. It is important to conserve water and have a response plan.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme heat
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$25,000 + Staff time
<b>Potential Funding Sources:</b>	ORCA grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith,
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>
<p>This action will ensure that residents have an adequate water supply during an extreme heat event.</p>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-10**

<b>Proposed Action:</b>	Implement a tree trimming program to remove limbs from right of way
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Tree limbs can get into power lines and cause power outages.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	High Wind
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	low
<b>Estimated Cost:</b>	\$5,000
<b>Potential Funding Sources:</b>	City of Goldsmith
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-11**

<b>Proposed Action:</b>	Educate public and builders of effect of high wind incidents on new construction by inserting informative flyers in utility bills.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	High winds have caused damages to metal roofs.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	High Wind
<b>Effect on new/existing buildings:</b>	Providing information will increase awareness that stronger roof materials are necessary in order to prevent damage to buildings.
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$500
<b>Potential Funding Sources:</b>	City funding
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	

<b>COMMENTS</b>



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-12**

<b>Proposed Action:</b>	Insert flyers w/ utility bills for the City of Goldsmith that offers info of how residents can reduce hazardous effects of lightning (and all other hazards).
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Lightning striking buildings has caused severe damage to buildings and homes.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning
<b>Effect on new/existing buildings:</b>	Information properly used can prevent damage to buildings
<b>Priority (High, Moderate, Low):</b>	low
<b>Estimated Cost:</b>	\$500
<b>Potential Funding Sources:</b>	City of Goldsmith
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	

<b>COMMENTS</b>
It is necessary to provide information to residents that will better equip them to reduce the effects from this hazard.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-13**

<b>Proposed Action:</b>	Place lightning rods on roof tops of City Hall
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith City Hall 206 West Gulf Goldsmith, Texas 79741
<b>History of Damages:</b>	Potential exists for the critical facility to be damaged from lightning.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Lightning
<b>Effect on new/existing buildings:</b>	Prevents the building from catching on fire, reduces damages from lightning event
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$500
<b>Potential Funding Sources:</b>	City of Goldsmith
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
There are lightning rods at other critical facilities in Goldsmith. Once City Hall is protected all critical facilities will be protected.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-14**

<b>Proposed Action:</b>	Install quick-connect emergency generator hook-ups for critical facilities
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith City Hall 206 West Gulf Goldsmith, Texas 79741
<b>History of Damages:</b>	Frequent power outages occur from thunderstorms. Encore (provider) has had outages over 24 hours.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm
<b>Effect on new/existing buildings:</b>	This will prevent damage to structures.
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$20,000
<b>Potential Funding Sources:</b>	ORCA, TCEQ, TWDB, FEMA Grants
<b>Lead Agency/Department Responsible:</b>	City
<b>Implementation Schedule:</b>	Upon funding

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-15**

<b>Proposed Action:</b>	<b>Purchase and install a radio activated siren system for mass notification</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	The existing system requires personnel to climb the siren's tower to turn on siren and that is a hazard.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$20,000 each siren, cost of system is TBD
<b>Potential Funding Sources:</b>	State and Federal grants
<b>Lead Agency/Department Responsible:</b>	volunteer fire dept
<b>Implementation Schedule:</b>	w/in 1 yr of receipt of funding

<b>COMMENTS</b>
The current system needs to be updated as it places personnel at risk. The whole system will cost more than \$20,000 so the cost of the whole system is TBD. Furthermore, the current siren is run by phone line but during an event that would be disconnected leaving no way to turn the siren off.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-16**

<b>Proposed Action:</b>	<b>Promote Turn Around Don't Drown (TADD)</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	In 2007 Goldsmith received 3 inches of rain in 30 minutes. Streets turned into rivers from flash flooding.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	This action will protect people.
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Staff time (materials are free)
<b>Potential Funding Sources:</b>	City of Goldsmith
<b>Lead Agency/Department Responsible:</b>	TFMA Stakeholder group
<b>Implementation Schedule:</b>	2012

<b>COMMENTS</b>
Visit schools to give turn around don't drown talk. Distribute materials to students.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-17**

<b>Proposed Action:</b>	<b>Debris and street clean up streets in town after severe flood</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Flood waters although rare can cover curbs and leave debris in streets and sidewalks

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on new/existing buildings:</b>	This addresses a street issue
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Negligible
<b>Potential Funding Sources:</b>	TxDOT
<b>Lead Agency/Department Responsible:</b>	TxDOT
<b>Implementation Schedule:</b>	As needed after flood events

<b>COMMENTS</b>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-18**

<b>Proposed Action:</b>	<b>Implement a back-up plan for storing public records and digital copies offsite in a non-hazard area</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Currently records are mostly hard copies and vulnerable to being damaged or lost in a hazardous event.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Earthquake
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$2,000 in staff time and equipment
<b>Potential Funding Sources:</b>	FEMA or State grants
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	Within 6 months of funding

<b>COMMENTS</b>
The cost includes software, scanner, and off site FTP service.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-19**

<b>Proposed Action:</b>	Recommend to the public the use of roofing products that bear the UL 2218 hail-resistant product listing.
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Frequent damage has occurred to roofs from hail

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	Prevents roof damage
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	Staff time
<b>Potential Funding Sources:</b>	City Goldsmith
<b>Lead Agency/Department Responsible:</b>	City Goldsmith
<b>Implementation Schedule:</b>	As needed

<b>COMMENTS</b>
Provide information to homeowners as needed



# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-20**

<b>Proposed Action:</b>	Achieve certification by the National Weather Service as a "StormReady" community
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Area communities have been impacted by hail events

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Hail
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Negligible
<b>Potential Funding Sources:</b>	National weather service provides materials
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
<p>Weather service and City currently offer tornado spotting classes. Storm Ready status would complement existing programs and increase community awareness of the need to be prepared for potential natural hazard events.</p>

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-21**

<b>Proposed Action:</b>	<b>Create a plan to communicate with TxDOT to install warning signs on roadways as soon as the signs are foreseen to be needed</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Occasionally ice develops on roads

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	low
<b>Estimated Cost:</b>	Staff time
<b>Potential Funding Sources:</b>	TxDOT
<b>Lead Agency/Department Responsible:</b>	TxDOT
<b>Implementation Schedule:</b>	As needed

<b>COMMENTS</b>
Winter storm is a rare occurrence ranked very low from risk assessment.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

GS-22

<b>Proposed Action:</b>	Participate in CoCoRaHS
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	With no monitoring program in place, weather event details remain unknown.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm
<b>Effect on new/existing buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	Negligible
<b>Potential Funding Sources:</b>	NOAA
<b>Lead Agency/Department Responsible:</b>	NOAA
<b>Implementation Schedule:</b>	2011

<b>COMMENTS</b>
Reporting capabilities for rural areas will improve with on site data collection in these areas.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-23**

<b>Proposed Action:</b>	<b>Purchase NOAA weather radios and notify public of availability</b>
<b>BACKGROUND INFORMATION</b>	
<b>Site and Location:</b>	City of Goldsmith
<b>History of Damages:</b>	Currently, if a tornado knocks out power, the existing danger is not able to be communicated to people.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Tornado
<b>Effect on new/existing buildings:</b>	N/A, just warning people
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$20 per unit
<b>Potential Funding Sources:</b>	City funds or grant funds
<b>Lead Agency/Department Responsible:</b>	City of Goldsmith
<b>Implementation Schedule:</b>	within 6 months of funding

<b>COMMENTS</b>
Units will be available at City hall for residents and businesses.

# MITIGATION ACTIONS

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**GS-24**

	<b>Proposed Action:</b>	<b>Work with the County to Create a Wildfire Contingency Plan</b>
<b>BACKGROUND INFORMATION</b>		
	<b>Site and Location:</b>	City of Goldsmith
	<b>History of Damages:</b>	Wildfires frequently threaten the City and outlying areas.

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Wildfire
<b>Effect on new/existing buildings:</b>	New buildings will have increased protection from developed prevention measures.
<b>Priority (High, Moderate, Low):</b>	See county priority
<b>Estimated Cost:</b>	Staff time
<b>Potential Funding Sources:</b>	City of Goldsmith
<b>Lead Agency/Department Responsible:</b>	Ector County
<b>Implementation Schedule:</b>	When County initiates planning process

<b>COMMENTS</b>

# PLAN MAINTENANCE

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Monitoring.....	1
Evaluation .....	1
Updating.....	2
Plan Amendments.....	2
Five (5) Year Review.....	3
Implementation/Incorporation .....	3
Continued Public Involvement.....	4

## Overview

Periodic revisions of the Plan are required to ensure that the goals, objectives, and mitigation action plans are kept current. More important, revisions may be necessary to ensure that the Plan is in full compliance with federal regulations and state statutes. This portion outlines the procedures for completing such revisions and updates.

## Monitoring

Designated Hazard Mitigation Planning Team Members (see Appendix A) are responsible for biannual monitoring of components of the hazard mitigation plan that pertain to their respective department or organization within the city. The Planning Team will be responsible for monitoring the plan by providing biannual updates to City Council and the County Commissioner’s Court regarding the implementation of any mitigation actions or any meetings held to discuss the Plan. A written summary of meeting notes will report the status of particulars involved in turning an action into a project.

## Evaluation

As part of the evaluation process, team members will assess any changes in risk, determine whether implementation of mitigation actions is on schedule or if there are any

# PLAN MAINTENANCE

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

implementation problems (such as technical, political, legal or coordination issues), and reflect changes in land development or programs that affect mitigation priorities in their respective department or organization.

On an annual basis, the planning team will meet to identify any needed changes in the plan based upon their evaluation activities. This yearly evaluation process will help determine if any changes are necessary.

## Updating

### Plan Amendments

At any time, minor technical changes may be made to the plan to keep it updated. However, any material changes to the 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 respective jurisdictions. Any amendment to the plan must undergo an open public process. The jurisdiction will seek public input on any material change to the plan during a formal review and comment period of not less than 30 days.

At the end of the comment period, the proposed amendment and all comments will be forwarded to the jurisdictions' respective governing body. If no comments are received from the reviewing parties within the specified review period, this will also be noted. The governing body will then review the proposed amendment and comments received and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to the Texas Division of Emergency Management (TDEM).

In determining whether to recommend approval or denial of a plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the preparation of the plan;
- New issues or needs that were not adequately addressed in the plan; and
- Changes in information, data, or assumptions from those on which the plan was based.

# PLAN MAINTENANCE

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## 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 any significant changes in the area that may necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the plan.

The plan review provides the Ector County jurisdictions with an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. It is recommended that the planning team meet to review the plan at the end of three years, as grant funds may be necessary for the development of a five-year update. Due to the timelines for grant cycles, it is wise planning to begin the review process in advance of the five-year deadline.

Following the review, any revisions deemed necessary will be summarized and utilized according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised plan will be submitted to the TDEM for final review and approval in coordination with FEMA.

## Implementation/Incorporation

Each participating city or county department or team member will be responsible for further development and/or implementation of mitigation action plans. Each action has been assigned to a jurisdiction or a specific department within each jurisdiction.

The potential funding sources listed for each identified action may be used when the planning team member begins to seek 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.

Team members will integrate implementation of their mitigation action plans with other existing plans for the city, such as the emergency management plan. Existing plans for the city will be reviewed in light of the Plan and will incorporate any mitigation policies and



# PLAN MAINTENANCE

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actions into these plans, as appropriate. Team members will ensure that the actions in the mitigation plans are reflected in other planning efforts.

Upon formal adoption of the Plan, team members will work to integrate the hazard mitigation strategies into other plans as they are developed. Participating team members will conduct periodic reviews of plans and policies and analyze the need for amendments in light of the approved Plan. Planning team members from the City of Odessa will ensure that future planning of capital improvements, disaster recovery, historic preservation, and flood response plans will be consistent with the goals of this hazard mitigation plan to reduce the long-term risk to life and property from all hazards by annually reviewing these active plans for consistency. Ector County planning team members will ensure consistency during annual reviews of existing capital improvements, emergency operations, and pandemic operating procedures plans. The City of Goldsmith has created a mitigation action to work with Ector County to create a Wildfire Contingency Plan.

The Plan will also be discussed at each jurisdictions' meeting for annual budget planning and approval processes, so that proposed funding sources for mitigation actions are taken into consideration.

## Continued Public Involvement

Input from the public was an integral part of the preparation of this plan and will continue to be essential as the plan grows and changes. As noted above, a significant change to this Plan will require opportunities for the public to make its views known.

This Plan will be posted on the Odessa and Ector County websites where officials and the public will be invited to provide ongoing feedback. Copies of the Plan also will be kept for public review at the County office.

If necessary, the Planning Team may also designate voluntary citizens or willing members of the private sectors as members of the planning team as well as utilize local media to notify the public of any maintenance or periodic review activities taking place.

# APPENDIX A

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Planning Team Members..... 1  
 Stakeholders..... 2

## Planning Team Members

As discussed in Section 2, the Plan was organized using a direct representative model. At the beginning of the process key Planning Team Members sent notices to all City and County departments asking for input and participation in the process. The following organizations<sup>1</sup> responded to the request and participated throughout the planning process.

**Table A-1 - Planning Team Members - Organization and Title**

Organization	Department Representative
Ector County	<ul style="list-style-type: none"> <li>• Human Resources Director</li> <li>• Sheriff’s Office</li> <li>• Public Works</li> <li>• Health Department</li> </ul>
Ector County Independent School District	<ul style="list-style-type: none"> <li>• Emergency Management Coordinator</li> <li>• Benefits Risk Management Director</li> </ul>
City of Odessa	<ul style="list-style-type: none"> <li>• Fire Chief</li> <li>• Assistant Fire Chief</li> <li>• GIS</li> <li>• Safety Coordinator</li> </ul>

<sup>1</sup> Titles are given rather than names as the person holding the title in the respective organization will be responsible for continual maintenance of the Update, regardless of whether that same person initially held that role in 2009.

# APPENDIX A

ECTOR COUNTY, TEXAS  
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Organization	Department Representative
	<ul style="list-style-type: none"> <li>• Public Works &amp; Utilities</li> <li>• Risk Management</li> <li>• Engineering</li> <li>• Police</li> <li>• Planning &amp; Zoning</li> <li>• Building Inspection</li> <li>• Public Information</li> </ul>
LEPC	Treasurer
City of Goldsmith	Public Utilities

## Stakeholders

The following groups were invited to stakeholder meetings, public meetings and workshops throughout the planning process and include: City and County departments and groups; non-profit organizations; private businesses; hospitals; and educational groups. For a list of attendance at meetings, please see Appendix E<sup>2</sup>.

**Table A-2. Stakeholder Groups**

University of Texas Permian Basin
Odessa Community College
Medical Center Hospital
Odessa Regional Medical Center
Southwest Texas Red Cross
Permian Basin Regional Planning Commission
Magellan Midstream Partners, L.P.

<sup>2</sup> Information contained in Appendix E is exempt from public release under the Freedom of Information Act (FOIA).

# APPENDIX B

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Overview .....	1
Survey Results.....	3

## Overview

Ector County and the Cities of Odessa and Goldsmith prepared public surveys that asked a wide range of questions concerning the opinions of the public regarding natural and man-caused hazards. This fifteen-question survey was made available on the websites of the City of Odessa, Ector County, Medical Center Hospital, local Red Cross, and the Odessa Regional Medical Center. This survey was also distributed in hard copy format at public meetings and stakeholder events throughout the planning process.

A total of 303 surveys were collected, the results of which are analyzed in this Appendix. The purpose of the surveys was twofold: 1) to solicit public input during the planning process and 2) to help the city to identify any potential actions or problem areas.

Survey results are depicted on the following pages, showing the percentage of responses for each answer.

# APPENDIX B

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



**PUBLIC PARTICIPATION SURVEY  
FOR HAZARD MITIGATION PLANNING**

**We need your help!**

Ector County and the City of Odessa are currently engaged in a planning process in order to become less vulnerable to natural disasters, and your participation is important to us!

The collaboration is working to prepare a multi-jurisdictional *Hazard Mitigation Action Plan*. The purpose of this Plan is to identify and assess our community's natural hazard risks and determine how to best minimize or manage those risks. A comprehensive Hazard Mitigation Action Plan will result from this effort.

This survey questionnaire provides an opportunity for you to share your opinions and participate in the mitigation planning process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impact of future hazard events.

**Please help us by completing this survey and returning it to:**

Erin Capps  
H2O Partners, Inc.  
P.O. Box 160130  
Austin, TX 78716  
512-329-6612 (FAX)  
[ecapps@h2opartnersusa.com](mailto:ecapps@h2opartnersusa.com)

If you have any questions regarding this survey or would like to learn about more ways you can participate in the development of the Ector County / City of Odessa Hazard Mitigation Action Plan Update, please contact Erin Capps, H2O Partners, (512) 769-5483, [ecapps@h2opartnersusa.com](mailto:ecapps@h2opartnersusa.com).

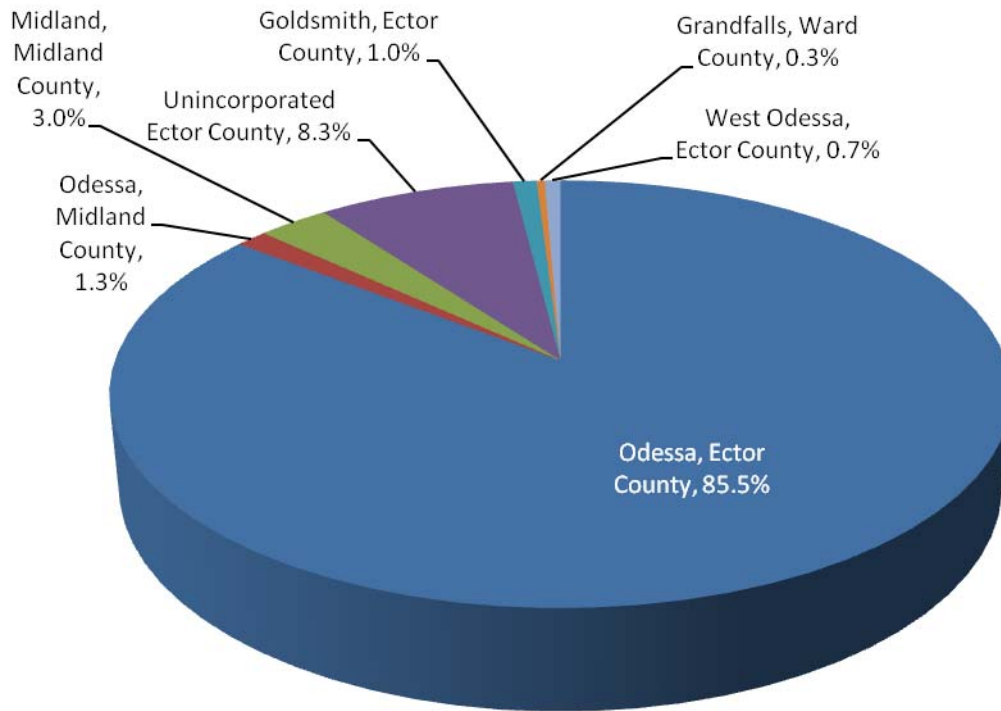
For questions that did not provide a multiple choice answer, or that required an explanation, comments are included as they were entered on the survey itself and are not in any particular ranking order.

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ECTOR COUNTY, TEXAS  
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## Survey Results

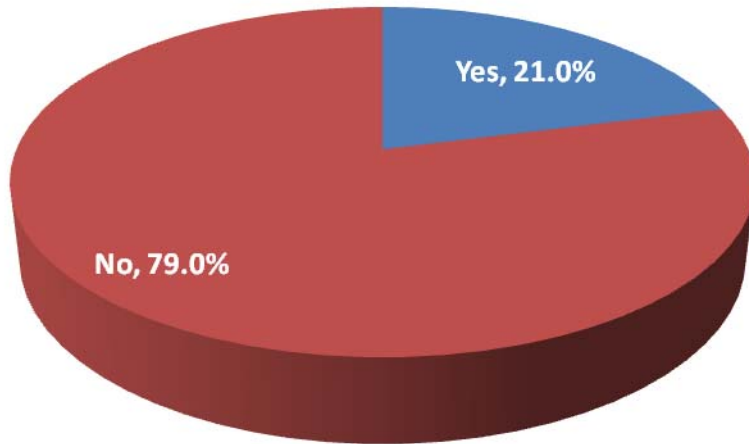
1. Please state the jurisdiction (city and county) where you reside.



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MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2. Have you ever experienced or been impacted by a disaster?



If “yes”, what hazard have you endured<sup>1</sup>?

- Drought
- Lightning
- High Winds
- Wildfire
- Hail
- Tornado
- Flood
- Hazardous Materials Release

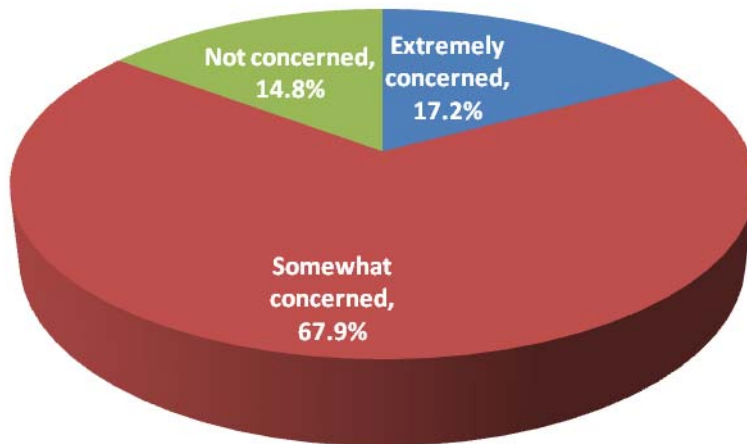
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<sup>1</sup> Responses entered may not be specific to Ector County as some survey participants could have endured a hazard in another location.

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3. How concerned are you about the possibility of your community being impacted by a disaster?

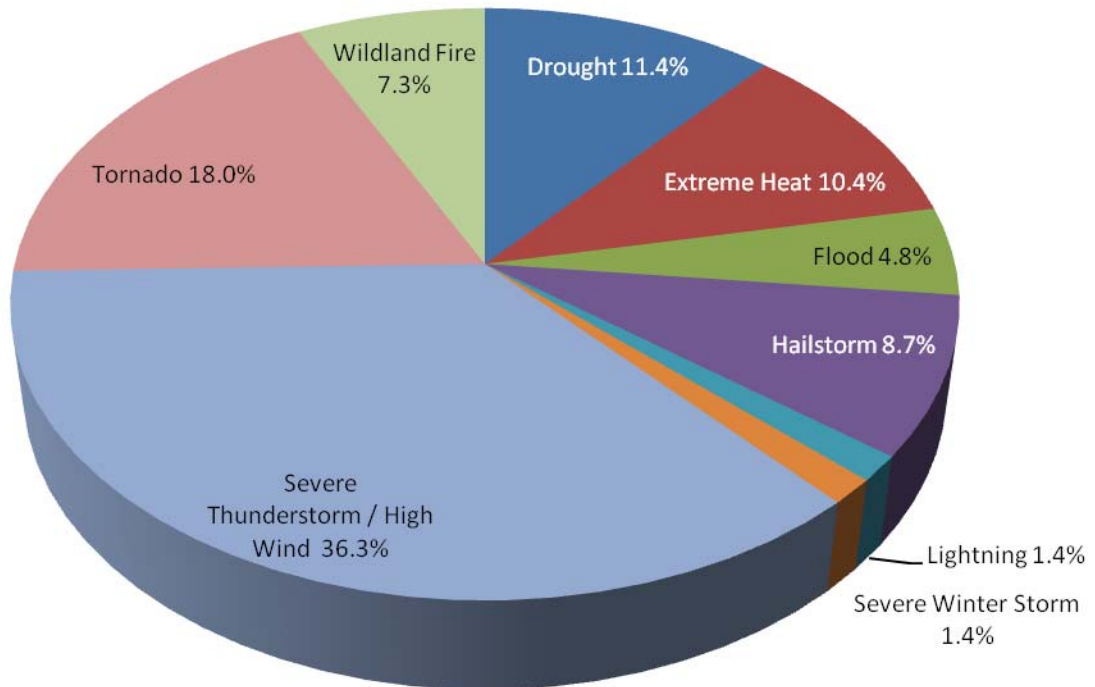




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ECTOR COUNTY, TEXAS  
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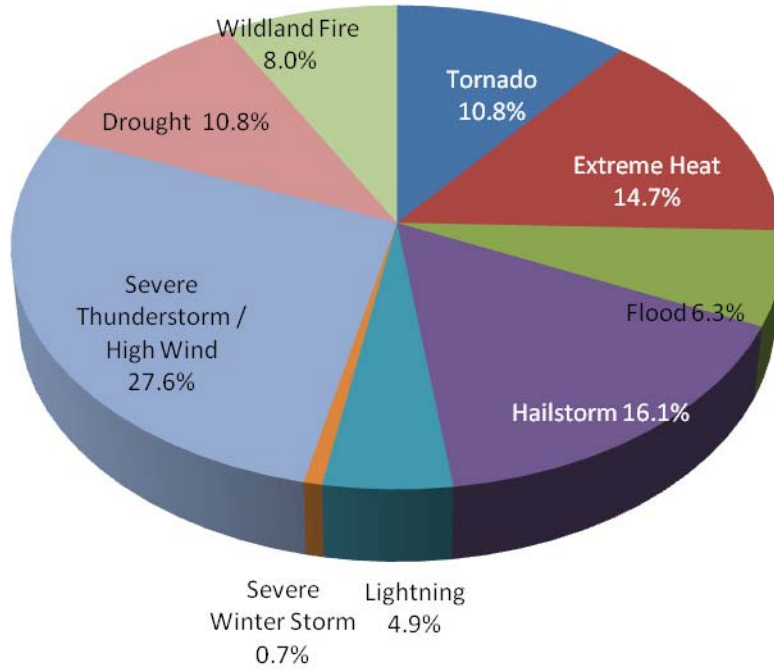
4 Please select the one hazard you think is the highest threat to your neighborhood:



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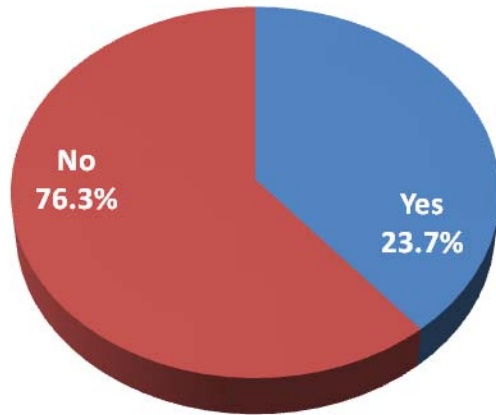
5. Please select the one hazard you think is the second highest threat to your neighborhood:



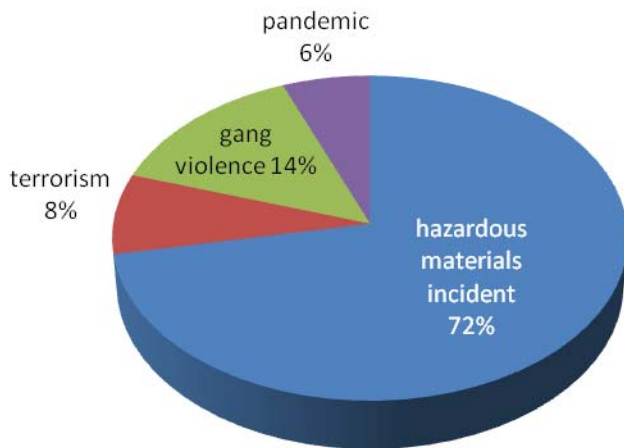
# APPENDIX B

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6. Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?



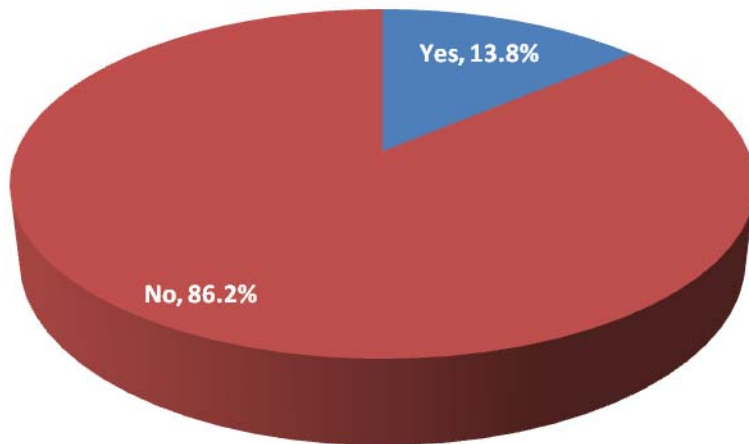
If “yes”, please explain what hazards you think are a wide-scale threat that are not listed?



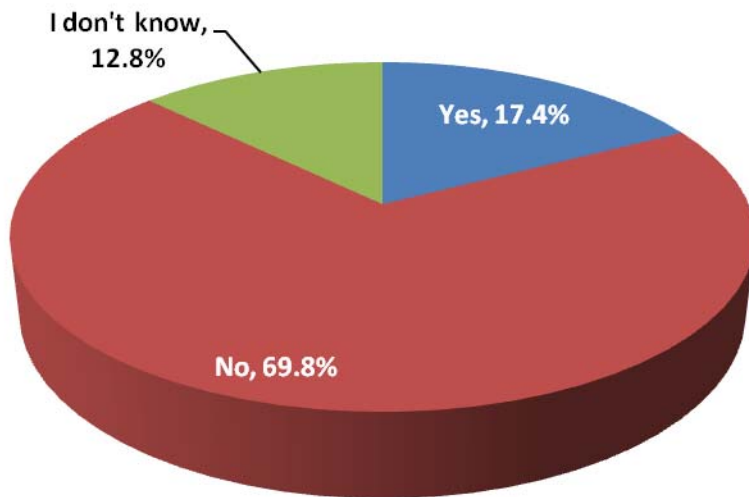
# APPENDIX B

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7. Is your home located in a floodplain?



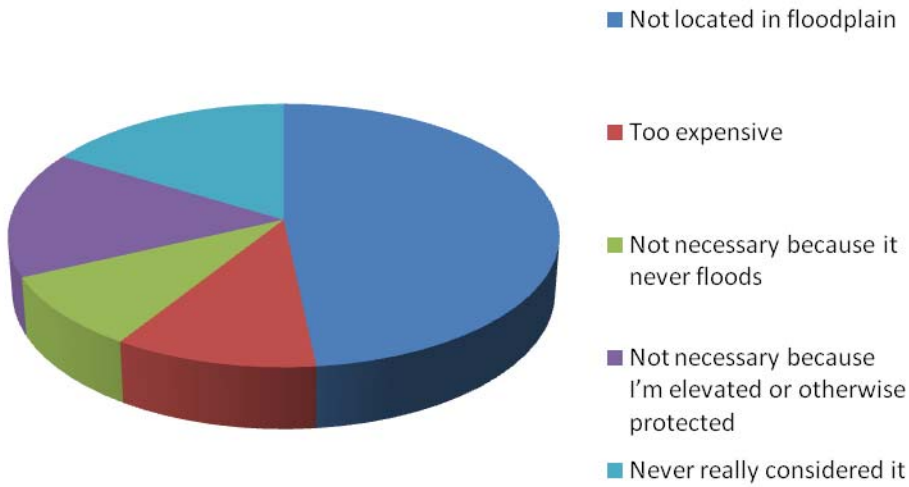
8. Do you have flood insurance?



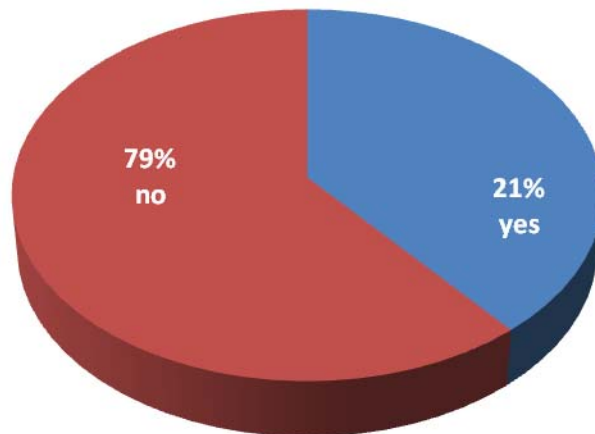
# APPENDIX B

ECTOR COUNTY, TEXAS  
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## 9. If you don't have flood insurance, why not?



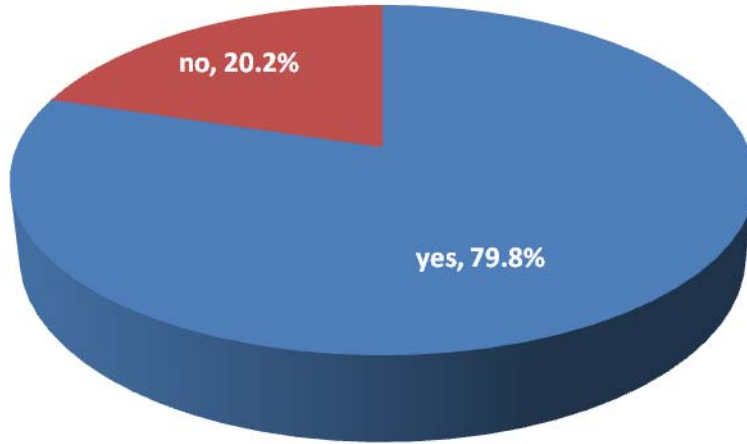
## 10. Have you taken any actions to make your home or neighborhood more resistant to hazards?



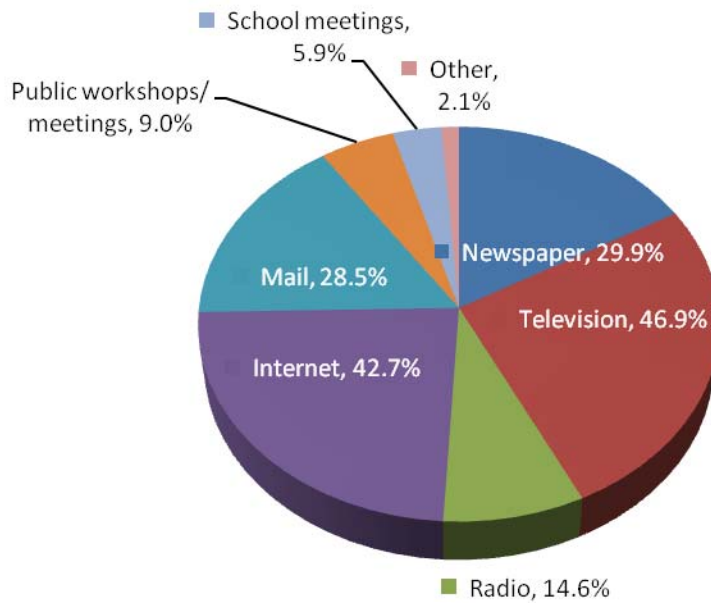
# APPENDIX B

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11. Are you interested in making your home or neighborhood more resistant to hazards?



12. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards<sup>2</sup>?



<sup>2</sup> Results total more than 100 percent as participants selected more than one type of communication.

# APPENDIX B

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13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood<sup>3</sup>?

- Develop a plan of action in the event of a hazardous disaster
- Tornado (warning) systems installed throughout the city
- Enforce building codes
- Education
- Make known where the flood plains are
- Proper funding of the Volunteer fire departments in the County. Provide funding for training of VFD's and EMS service within the VFD's
- Public Awareness about regional hazards & Seminars open to the public for informational preparedness and planned responses.
- More police on patrol. I never see police patrolling the residential areas.
- For the County to improve and have more drainage for the water when it rains to keep the streets from flooding when it rains. The City to install more drainage for flooding.
- A city wide hazard alarm
- Possible series of public meetings to discuss future problems
- Public awareness of threats in the area
- Education of the public in the area of disaster preparedness and actions to take in the event of a hazard damages or disaster.
- Improved early warning systems
- Planning
- Make sure buildings are up to par.
- Enforce fire bans
- Provide training to allow the general public to aid in recovery.

14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

- Air and water pollution management. Establish a County inspection system of building codes and enforcement control. Make it mandatory to have a trash pickup throughout the county, no more burning.
- Adequate equipment for all personnel that would be involved in hazard

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<sup>3</sup> Answers for questions 13 and 14 are entered as they appeared in the survey.

# APPENDIX B

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

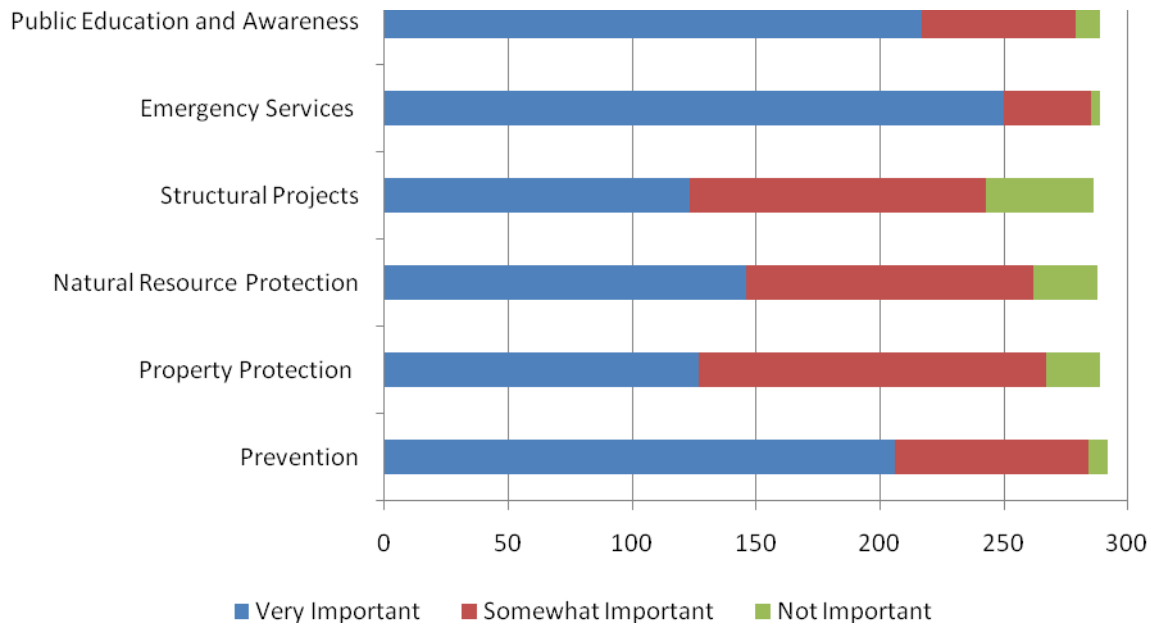
- Public warning system is needed
- Lack of education by local, state and federal agencies
- Regulation for the new and existing developments from making the flooding when it rains worsen.
- For the City and County to have designated areas in neighborhoods for the public to get information and news if a large disaster happens and there is no communications or utilities and will be an extended period of time and have these designated areas published and have postings in the designated places so the public knows where to go for information if a large scale disaster was ever to happen in Ector County
- Emergency Preparedness for the City Employees
- I'd like to see storm shelter type places in case of tornadoes, plus a advanced warning system if one doesn't exist.
- The city and county need to have a plan in place for sheltering residents if a number of people were to be displaced from their homes.
- Education of what potential hazards we have
- Improve street drainage
- Water is provided from a single facility. This puts the supply at risk to single failure.
- appropriate zoning



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15. 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.



## PUBLIC EDUCATION AND AWARENESS

Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include: outreach projects, school education programs, library materials and demonstration events.

## 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 emergency facilities or systems.

## 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 modifications, retaining walls and storm sewers.

## NATURAL RESOURCE PROTECTION

# APPENDIX B

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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.

## 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, evaluation, structural retrofits, and storm shutters.

## PREVENTION

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.

# APPENDIX C

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

## Toxic Sites

### Listing of Geo-referenced Toxic Sites Used in HAZMAT Analysis for Ector County and the Cities of Odessa and Goldsmith

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	CEMEX CEMENT OF TEXAS LP	16501 W MURPHY RD	TRI SITE
ODESSA	FLINT HILLS RESOURCES LP	2505 S GRANDVIEW	TRI SITE
ODESSA	PERMIAN TANK & MANUFACTURING INC MAIN FACILITY	2701 W I-20	TRI SITE
ODESSA	COASTAL CHEMICAL CO. LLC	2222 S GRANDVIEW	TRI SITE
ODESSA	REEF SERVICES LLC	2559 W I-20	TRI SITE
ODESSA	CONTINENTAL PRODUCTS OF TEXAS	100 INDUSTRIAL AVE	TRI SITE
ODESSA	UNIVAR USA INC ODESSA	311 LARK AVE	TRI SITE
ODESSA	CHAMPION TECHNOLOGIES INC.	115 PROCTOR	TRI SITE
ODESSA	UNIVAR USA INC ODESSA PRONTO	105 PRONTO	TRI SITE
ODESSA	PENATEK INDUSTRIES LTD	6830 E BUSINESS LOOP 20	TRI SITE
ODESSA	ODESSA BABBITT BEARING CO	6112 W COUNTY RD	TRI SITE
ODESSA	CAMERON INTERNATIONAL CORP	2500 STEVEN RD	TRI SITE
ODESSA	DUOLINE TECHNOLOGIES LP	9019 N COUNTY RD W	TRI SITE
ODESSA	UNITED FUEL & ENERGY CORP	9421 N ANDREWS HWY	TRI SITE
ODESSA	PERMIAN TANK & MANUFACTURING INC FIBERGLASS FACILITY	8800 NW LOOP 388	TRI SITE
ODESSA	FLINT HILLS RESOURCES LP	2505 S GRANDVIEW	TRI SITE
ODESSA	PERMIAN TANK & MANUFACTURING INC MAIN FACILITY	2701 W I-20	TRI SITE
ODESSA	COASTAL CHEMICAL CO. LLC	2222 S GRANDVIEW	TRI SITE
ECTOR COUNTY	HARPER FIELD	2.5 MILES WEST & 3 MILES NORTH FROM DOURO; OFF FM 86	TIER 2 SITE
ECTOR COUNTY	CENTURION PIPELINE LP, - ECTOR STATION	FROM INTERSECTION FM 1936 TO HWY 158, GO NORTH 1/5 MILES TO ECTOR STATION	TIER 2 SITE
ECTOR COUNTY	EAST COWDEN UNIT MAIN BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	A.E. THOMAS "B" TANK BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	ALMA 1	SL: SECTION 42, BLOCK 45, T&P RR, A-1279 - 667 FSL 2004 FWL OF TEXAS SECTION	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ECTOR COUNTY	ALMA 10	SL: SEC 6, BLK 45, T&P RR, A-1275 - 2100 FNL 760 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 11	SL: SEC 42, BLK 45, T&P RR, A-1279 - 710 FSL 618 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 12	SL: SEC 42, BLK 45, T&P RR, A-1279 - 2028 FSL 540 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 13	SL: SEC 6, BLK 45, T&P RR, A-1275 - 560 FNL 560 FEL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 3	SL: SEC 6, BLK 45, T&P RR, A-1275 - 665 FNL 667.5 FEL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 4	SL: SEC 42, BLK 45, T&P RR, A-1279 - 661 FNL 2011 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 6	SL: SEC 42, BLK 45, T&P RR, A-1279 - 1982.5 FSL 667.5 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 7	SL: SECTION 42, BLOCK 45, T&P RR, A-1279 - 1983 FSL 2005.2 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 8	SL: SEC 42, BLK 45, T&P RR, A-1279 - 1983 FNL 2006.2 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ALMA 9	SL: SEC 42, BLK 45, T&P RR, A-1279 - 760 FSL 1880 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	ANDERSON	N/A	TIER 2 SITE
ECTOR COUNTY	ANDERSON A	N/A	TIER 2 SITE
ECTOR COUNTY	BACO: GOLDSMITH (5600') CLEARFORK FIELD	8 MILES SOUTH OF ECTOR COUNTY (HWY 302)	TIER 2 SITE
ECTOR COUNTY	COWDEN 1-1 TANK BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	CUSHING LEASE TANK BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	ECTOR COUNTY FACILITY 3	4 MI NORTH OF ECTOR COUNTY	TIER 2 SITE
ECTOR COUNTY	ECTOR COUNTY PRODUCTION WELLS	RURAL	TIER 2 SITE
ECTOR COUNTY	ECTOR COUNTY PRODUCTION WELLS	RURAL	TIER 2 SITE
ECTOR COUNTY	ECTOR COUNTY PRODUCTION WELLS	RURAL	TIER 2 SITE
ECTOR COUNTY	ECTOR -G- FEE BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	ECTOR -T- & -AR- FEE BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	J. E. PARKER -A- BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	J. E. PARKER -B- BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	JUDKINS TRUCK PMTX	1 MILES W. OF ECTOR COUNTY ON S. SERVICE RD. - SOUTH 1 MILE	TIER 2 SITE
ECTOR COUNTY	MILLARD B LEASE	1 MILE WEST OF ECTOR COUNTY, TX	TIER 2 SITE
ECTOR COUNTY	MILLARD C LEASE	2.5 MILES WEST OF ECTOR COUNTY, TX	TIER 2 SITE
ECTOR COUNTY	MILLARD D LEASE	1.5 MILES WEST OF ECTOR COUNTY, TX	TIER 2 SITE
ECTOR COUNTY	NORTH ECTOR COUNTY UNIT LEASE	1.5 MILES WEST OF ECTOR COUNTY, TX	TIER 2 SITE
ECTOR COUNTY	PARKER "B" #10-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ECTOR COUNTY	PARKER "B" #11-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE
ECTOR COUNTY	PARKER "B" #12-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE
ECTOR COUNTY	PARKER "B" #13-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE
ECTOR COUNTY	PARKER "B" #14-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE
ECTOR COUNTY	PARKER "B" #9-SA	1 MILE E OF ECTOR COUNTY HWY 302, TURN S 5 MILES ON FM 2019	TIER 2 SITE
ECTOR COUNTY	PARKER BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	PETSCH 1L	SL: SEC 16, BLK 45, T&P RR, A-797 - 1981 FSL 1980 FEL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	SLAT 11	SL: SEC 16, BLK 45, T&P RR, - 667 FSL 2650 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	T-X-L "G" LEASE TANK BATTERY	31.8810 N; 102.7898 W	TIER 2 SITE
ECTOR COUNTY	TXL A 12	SL: SEC 21, BLK 45, T&P RR, A-367 - 726 FNL 660 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	TXL B 8	SL: SEC 43, BLK 45, T&P RR, A-355 - 1320 FSL 2640 FEL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	TXL B 9	SL: SEC 43, BLK 45, T&P RR, A-355 - 661 FSL 668 FWL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	TXL Q 2	SL: SEC 21, BLK 45, T&P RR, A-344 - 1980 FNL 1980 FEL OF TEXAS SECTION	TIER 2 SITE
ECTOR COUNTY	TXL WW LEASE	HWY 866	TIER 2 SITE
ECTOR COUNTY	VEST AF #1	31.720638889;102.762333333	TIER 2 SITE
ECTOR COUNTY	VEST BCD #2W	OUTSIDE OF ECTOR COUNTY, TX	TIER 2 SITE
ECTOR COUNTY	WOOTTON LEASE	2 MILES EAST OF ECTOR COUNTY; OFF HWY 80	TIER 2 SITE
ECTOR COUNTY	ECTOR COUNTY FLD OFS- YARBROUGH/ALLEN (SOLD 6/08)	6 MI E OF ECTOR COUNTY	TIER 2 SITE
ECTOR COUNTY	CATALYST OILFIELD SERVICES	11999 HWY 158	TIER 2 SITE
ECTOR COUNTY	GREATER GARDENDALE WATER SUPPLY CORPORATION	6600 E. GOLDENROD	TIER 2 SITE
GOLDSMITH	ABELL LEASE	4.5 MILES N, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	ANDECTOR BOOSTER	4 MILES N OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	ANDREWS -- HAJ SOUTH SATELLITE	N/A	TIER 2 SITE
GOLDSMITH	BLAKENEY 29	4 MILES EAST OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	BLAKENEY 32	4 MILES EAST OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	BLAKENEY E LEASE	2 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	BLAKENEY G	N/A	TIER 2 SITE
GOLDSMITH	CLYDE B LEASE	4 MILES W. OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	COWDEN C LEASE	1 MILE SW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	CUMMINS "11"	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
GOLDSMITH	CUMMINS "A"	N/A	TIER 2 SITE
GOLDSMITH	CUMMINS "B"	N/A	TIER 2 SITE
GOLDSMITH	CUMMINS "C"	N/A	TIER 2 SITE
GOLDSMITH	EMBAR 2&6	N/A	TIER 2 SITE
GOLDSMITH	EMBAR 3&4	N/A	TIER 2 SITE
GOLDSMITH	FRANK A LEASE	3 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	FRANK B LEASE	4 MILES N, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	G. C. FRASER	4 MILES SOUTHWEST OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	GBCU	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- CUMMINS A BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- CUMMINS B CTB	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- CUMMINS C BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- CUMMINS J BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- CUMMINS K BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU CENTRAL TANK BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #1	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #10	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #11	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #12	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #2	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #3	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #4	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #5	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #6	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #6B	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #7	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SATELLITE #9	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU SOUTH INJECTION SITE	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- GCDU WEST WATER TRANSFER STATION	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- J.D. SLATOR BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- LAREN BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- TXL L BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GCDU -- TXL P BATTERY	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ADOBE UNIT FACILITIES	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 01	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 08	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 19	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 21	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 25	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 26	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 31	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 33	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 34	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 36	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH ANDECTOR UNIT 37	N/A	TIER 2 SITE
GOLDSMITH	GOLDSMITH GAS PLANT	1 MILE W OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	GOLDSMITH TRUCK PMTX	2 MILES S. OF GOLDSMITH ON FM 866 - W. .5 TO STA.	TIER 2 SITE
GOLDSMITH	HARPER TRUCKS	HWY 20 / HWY 866	TIER 2 SITE
GOLDSMITH	HORACE LEASE	4 MILES WEST & 4 MILES NORTH FROM GOLDSMITH	TIER 2 SITE
GOLDSMITH	J. M. WILLIAMSON "A"	N/A	TIER 2 SITE
GOLDSMITH	JESSIE "B" #1 LEASE	HIGHWAY 866	TIER 2 SITE
GOLDSMITH	JESSIE MAY WILLIAMSON	N/A	TIER 2 SITE
GOLDSMITH	JOHNSON	7 MI SE OF	TIER 2 SITE
GOLDSMITH	JOHNSON UNIT / RHODES COWDEN	N/A	TIER 2 SITE
GOLDSMITH	LIMPIA LEASE	4.5 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	MCENTIRE LEASE	3 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	MINS DD LEASE	3.5 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	MINS LEASE	3 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	NOBLES LEASE	4.5 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	NORTH COWDEN	N/A	TIER 2 SITE
GOLDSMITH	ODESSA CRUDE PUMP STATION	HWY 866	TIER 2 SITE
GOLDSMITH	ODESSA TRUCKS	HWY. 866	TIER 2 SITE
GOLDSMITH	PARKER MINERALS LEASE FACILITIES	N/A	TIER 2 SITE
GOLDSMITH	RANT LEASE	4.5 MILES NORTH, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	RELIANT PROCESSING, LTD.	7501 E. HIGHWAY 158	TIER 2 SITE
GOLDSMITH	RICKSON TANK BATTERY	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- ECTOR C FEE	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- ECTOR E FEE NCT-1,NCT 2	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- ECTOR E FEE UNIT 2	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- ECTOR H-3 SWD	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- TXI G FEE	N/A	TIER 2 SITE
GOLDSMITH	SANDHILLS -- WHEELER, R.A.	N/A	TIER 2 SITE
GOLDSMITH	SHOE BAR RANCH "F" #1 SWD	SEE GPS DATA	TIER 2 SITE
GOLDSMITH	SLATOR	N/A	TIER 2 SITE
GOLDSMITH	SOUTH FAULT BLOCK UNIT LEASE	2.5 MILES N, NW OF GOLDSMITH, TX	TIER 2 SITE
GOLDSMITH	TARA TREATER	1 MILE NW OF GOLDSMITH	TIER 2 SITE
GOLDSMITH	TXL -- D BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- E BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- L A-C #2 BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- M BATTERY	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
GOLDSMITH	TXL -- N CTB 2	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH CENTRAL BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH K BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH O BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 1	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 10	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 2	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 3	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 4	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 5	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 6	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 7	N/A	TIER 2 SITE
GOLDSMITH	TXL -- NORTH SATELLITE 9	N/A	TIER 2 SITE
GOLDSMITH	TXL -- PRODUCED WATER BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- QQ TB	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SLATOR A, B & E BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SLATOR, JD C BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 11	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 12	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 14	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 15	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 20	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 23	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 27	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 28	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 35	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 38	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 42	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 51	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 56	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 6	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 63	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 67	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 70	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SOUTH SATELLITE 75	N/A	TIER 2 SITE
GOLDSMITH	TXL -- SU OIL BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- THOMAS A BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- THOMAS B BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- THOMAS C, D & E BATTERY	N/A	TIER 2 SITE
GOLDSMITH	TXL -- WATER INJECTION STATION	N/A	TIER 2 SITE
GOLDSMITH	TXL "19"	N/A	TIER 2 SITE
GOLDSMITH	W. GOLDSMITH FIELD	N/A	TIER 2 SITE



# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
GOLDSMITH	WALLACE C 4Q	N/A	TIER 2 SITE
GOLDSMITH	WEST #28 LEASE	HIGHWAY 302	TIER 2 SITE
GOLDSMITH	WIGHT -A- LEASE	N/A	TIER 2 SITE
GOLDSMITH	WORKER BEE/QUEEN BEE LEASE	N/A	TIER 2 SITE
MIDLAND	HOLT FACILITY	4000 N BIG SPRING	TIER 2 SITE
N/A	BARROW BATTERY	N/A	TIER 2 SITE
N/A	CORA LONGBOTHAM AB	N/A	TIER 2 SITE
N/A	DEPCO - STATOR #24	N/A	TIER 2 SITE
N/A	EF COWDEN D #1	N/A	TIER 2 SITE
N/A	EF COWDEN D #4	N/A	TIER 2 SITE
N/A	FOREST - SLATOR #26	N/A	TIER 2 SITE
N/A	PAUL MOSS D BATTERY	N/A	TIER 2 SITE
N/A	PHILLIPS - SLATOR #24	N/A	TIER 2 SITE
N/A	PHILLIPS - SLATOR #26	N/A	TIER 2 SITE
N/A	PHILLIPS TXL #23	N/A	TIER 2 SITE
N/A	SLATOR BATTERY	N/A	TIER 2 SITE
N/A	WE COWDEN ACD BATTERY	N/A	TIER 2 SITE
N/A	WE COWDEN B BATTERY	N/A	TIER 2 SITE
ECTOR COUNTY	SWINNEY TRUCKS	HWY 302	TIER 2 SITE
ODESSA	0090 ODESSA, TX USA	6155 W. MURPHY ST.	TIER 2 SITE
ODESSA	ALLTEL-GRANDVIEW	0.1 MILE N OF LOOP S338 & IS-20	TIER 2 SITE
ODESSA	AMERIPRIDE LINEN & APPAREL SERVICES	1201 S JACKSON	TIER 2 SITE
ODESSA	ARGO-MOSS	N/A	TIER 2 SITE
ODESSA	ARGO-MOSS 'B'	N/A	TIER 2 SITE
ODESSA	ARGO-MOSS HARPER SWD	N/A	TIER 2 SITE
ODESSA	AVERITT	N/A	TIER 2 SITE
ODESSA	BENJAMIN B BATTERY	N/A	TIER 2 SITE
ODESSA	BENJAMIN BATTERY	N/A	TIER 2 SITE
ODESSA	BLAKENEY BATTERY	N/A	TIER 2 SITE
ODESSA	BLAKNEY, B. H. "A" (GOLDSMITH, E. PENN)	BLK 44, T-1-S, T&P	TIER 2 SITE
ODESSA	BLAKNEY, B. H. "V" (GOLDSMITH, E. GLORIETA)	BLK 44, T-1-N, T&P	TIER 2 SITE
ODESSA	BLAKNEY, B. H. -J- (GOLDSMITH, E. GLORIETA)	BLK 44, T-1-N, T&P	TIER 2 SITE
ODESSA	CAPROCK STATION	CORNER OF FM 1936 AND 16TH STREET	TIER 2 SITE
ODESSA	CASTLEMAN 11 TANK BATTERY	N/A	TIER 2 SITE
ODESSA	CEMEX CEMENT OF TEXAS, LP - ODESSA CEMENT PLAN	16501 WEST MURPHY STREET	TIER 2 SITE
ODESSA	CHAPEL HILL BOOSTER	7 MILES ENE OF GOLDSMITH	TIER 2 SITE
ODESSA	CHARLOTTE	N/A	TIER 2 SITE
ODESSA	CITY OF ODESSA - WAREHOUSE	1100 W. 42ND STREET	TIER 2 SITE
ODESSA	CITY OF ODESSA - STREET DEPARTMENT	801 E. POOL ROAD	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	CITY OF ODESSA - TRAFFIC ENGINEERING	801 E. POOL ROAD	TIER 2 SITE
ODESSA	CITY OF ODESSA - WATER TREATMENT PLANT	811 W. 42ND STREET	TIER 2 SITE
ODESSA	CITY OF ODESSA - YUKON PUMP STATION	201 E YUKON	TIER 2 SITE
ODESSA	CLEARWATER INTERNATIONAL LLC D/B/A REACTION CHEMICAL ENTERPRISES INC.	2263 W. BELL ST.	TIER 2 SITE
ODESSA	COLE RANCH TXL TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COMMERCIAL METALS COMPANY DBA CMC RECYCLING (ODESSA W)	3303 W 2ND STREET	TIER 2 SITE
ODESSA	COMMERCIAL METALS COMPANY DBA CMC RECYCLING (ODESSA)	3501 W 2ND STREET	TIER 2 SITE
ODESSA	CONNELL "C" TANK BATTERY	N/A	TIER 2 SITE
ODESSA	CONNELL ESTATE C BATTERY	SEC. 3; BLK. B16; PSL SURVEY	TIER 2 SITE
ODESSA	CONNELL, W. E.	SEC. 4; BLK. B16; PSL SURVEY; ABS. 980.	TIER 2 SITE
ODESSA	CORRIGAN COWDEN	N/A	TIER 2 SITE
ODESSA	COURTNEY	N/A	TIER 2 SITE
ODESSA	COWDEN "B" LEASE	W. MURPHY STREET	TIER 2 SITE
ODESSA	COWDEN 11G TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COWDEN 12-1TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COWDEN 13-1 TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COWDEN 13G TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COWDEN 14G TANK BATTERY	N/A	TIER 2 SITE
ODESSA	COWDEN AA #1	N/A	TIER 2 SITE
ODESSA	COWDEN BOOSTER	4 MILES SW OF ODESSA	TIER 2 SITE
ODESSA	COWDEN D & F	N/A	TIER 2 SITE
ODESSA	COWDEN I	N/A	TIER 2 SITE
ODESSA	COWDEN U	N/A	TIER 2 SITE
ODESSA	CRAN #1	N/A	TIER 2 SITE
ODESSA	CUMMINS "C" TANK BATTERY	N/A	TIER 2 SITE
ODESSA	CUMMINS "N"	N/A	TIER 2 SITE
ODESSA	CUMMINS, H. E. "A"	SEC. 32-BLK 4 T1N-T&P RR CO SURVEY - A-751	TIER 2 SITE
ODESSA	DKM #2	N/A	TIER 2 SITE
ODESSA	E F COWDEN TANK BATTERY	N/A	TIER 2 SITE
ODESSA	E.K. COLBERT	N/A	TIER 2 SITE
ODESSA	EAST COWDEN TACT 1 BATTERY	N/A	TIER 2 SITE
ODESSA	EAST COWDEN TACT 2 BATTERY	N/A	TIER 2 SITE
ODESSA	EAST GOLDSMITH HOLT BATTERY NO. 1 (GOLDSMITH, EAST HOLT)	SEC 23, BLK 44, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH HOLT BATTERY NO. 2 (GOLDSMITH, EAST HOLT)	SEC 25, BLK 44, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH HOLT UNIT BATTERY NO. 3 (GOLDSMITH, EAST HOLT)	SEC 30, BLK 43, T-1-N, T&P	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	EAST GOLDSMITH HOLT UNIT BATTERY NO. 4 (GOLDSMITH, EAST HOLT)	SEC 31, BLK 43, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH HOLT UNIT BATTERY NO. 5 (GOLDSMITH, EAST HOLT)	SEC 6, BLK 43, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH SAN ANDRES BATTERY NO. 2 (GOLDSMITH, EAST SAN ANDRES)	SEC 25, BLK 44, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH SAN ANDRES UNIT BATTERY NO. 3 (GOLDSMITH, EAST SAN ANDRES)	SEC 30, BLK 43, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH SAN ANDRES UNIT BATTERY NO. 4 (GOLDSMITH, EAST SAN ANDRES)	SEC 31, BLK 43, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST GOLDSMITH SAN ANDRES UNIT BATTERY NO. 5 (GOLDSMITH, EAST SAN ANDRES)	SEC 6, BLK 43, T-1-N, T&P	TIER 2 SITE
ODESSA	EAST HARPER UNIT TANK BATTERY	N/A	TIER 2 SITE
ODESSA	ECTOR 'AB' FEE	N/A	TIER 2 SITE
ODESSA	ECTOR 'AI' FEE	N/A	TIER 2 SITE
ODESSA	ECTOR AS FEE	SEC. 15-BLK 43-T&P RR SVY	TIER 2 SITE
ODESSA	ECTOR AZ FEE	SEC. 35-BLK 43-T&P SVY	TIER 2 SITE
ODESSA	ECTOR BB FEE #1	N/A	TIER 2 SITE
ODESSA	ECTOR FEE 'AO'	N/A	TIER 2 SITE
ODESSA	ECTOR FEE UNIT	N/A	TIER 2 SITE
ODESSA	ECTOR FEE UNIT NO. 5	N/A	TIER 2 SITE
ODESSA	ECTOR FEE UNIT NO. 8	N/A	TIER 2 SITE
ODESSA	ECTOR 'Q' FEE	N/A	TIER 2 SITE
ODESSA	EDWARDS E LEASE	9 MILES SOUTH, SOUTHWEST OF ODESSA, TX	TIER 2 SITE
ODESSA	EDWARDS LEASE	WEST LIME STREET	TIER 2 SITE
ODESSA	EMMONS UNIT LEASE	4 MILES SOUTH OF ODESSA, TX	TIER 2 SITE
ODESSA	ERICA	N/A	TIER 2 SITE
ODESSA	EXXON BARROW	6 MILES NORTH OF ODESSA	TIER 2 SITE
ODESSA	FASKEN ESTATE (CIRCLE BAR, EAST; ATOKA)	SEC. 31, BLK 41, T-1-N; G&MMB&A	TIER 2 SITE
ODESSA	FAY HOLT	SEE GPS DATA	TIER 2 SITE
ODESSA	FEE "AH" (COWDEN, NORTH)	SEC 31, BLK 42, T-1-N, G&MMB&A	TIER 2 SITE
ODESSA	FINISHMASTER, INC. #76	505 N. DIXIE BLVD.	TIER 2 SITE
ODESSA	FLINT HILLS RESOURCES, LP	2505 S. GRANDVIEW AVE.	TIER 2 SITE
ODESSA	FORTUNE 500 TANK BATTERY	N/A	TIER 2 SITE
ODESSA	FOSTER	N/A	TIER 2 SITE
ODESSA	FOSTER -B- LEASE	N/A	TIER 2 SITE
ODESSA	FOSTER 'C' BATTERY	N/A	TIER 2 SITE
ODESSA	FOSTER 'D' BATTERY	N/A	TIER 2 SITE
ODESSA	FOSTER 'F' LEASE	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	FOSTER GBSA UNIT BATTERY	N/A	TIER 2 SITE
ODESSA	FOSTER J LEASE	1/2 MILE WEST OF ODESSA, TX	TIER 2 SITE
ODESSA	FOSTER JOHNSON BATTERY NO. 17	N/A	TIER 2 SITE
ODESSA	FOSTER JOHNSON BATTERY NO. 2	N/A	TIER 2 SITE
ODESSA	FOSTER JOHNSON BATTERY NO. 3	N/A	TIER 2 SITE
ODESSA	FOSTER JOHNSON BATTERY NO.1	N/A	TIER 2 SITE
ODESSA	FOSTER LEASE	N/A	TIER 2 SITE
ODESSA	FOSTER 'SEC. 8 WF STATION	N/A	TIER 2 SITE
ODESSA	FOSTER STATION (L) PPTX	FROM LOOP 338 & HWY. 302 WEST 2.2 MILES TURN RIGHT ON FM 193 FOR 2 MILES	TIER 2 SITE
ODESSA	FOSTER, H.S. A-E /TXL 13 BATTERY	N/A	TIER 2 SITE
ODESSA	FOSTER, H.S. BATTERY	N/A	TIER 2 SITE
ODESSA	FRAC TECH SERVICES, LTD. - ODESSA, TX	986 S. MAURICE STREET.	TIER 2 SITE
ODESSA	G&RG, INC.	800 S. MEADOW AVE.	TIER 2 SITE
ODESSA	GIST 'A' BATTERY	N/A	TIER 2 SITE
ODESSA	GIST 'B' BATTERY	N/A	TIER 2 SITE
ODESSA	GIST 'C' BATTERY	N/A	TIER 2 SITE
ODESSA	GIST ET AL	N/A	TIER 2 SITE
ODESSA	GIST UNIT	N/A	TIER 2 SITE
ODESSA	GRAYBURG-KLOH	SEC. 5, BLOCK 43, T1S T&P SURVEY	TIER 2 SITE
ODESSA	H E CUMMINS TANK BATTERY	N/A	TIER 2 SITE
ODESSA	H.E. CUMMINS	N/A	TIER 2 SITE
ODESSA	H.E. CUMMINS 'B'	N/A	TIER 2 SITE
ODESSA	HARPER BOOSTER	11 MILES W OF ODESSA	TIER 2 SITE
ODESSA	HARPER DEVONIAN UNIT	N/A	TIER 2 SITE
ODESSA	HC FOSTER	N/A	TIER 2 SITE
ODESSA	HEADLEE NORTH	N/A	TIER 2 SITE
ODESSA	HERB MILLER	N/A	TIER 2 SITE
ODESSA	HILLTOP	N/A	TIER 2 SITE
ODESSA	INTERCHEM, INC.	3801 MANKINS AVE.	TIER 2 SITE
ODESSA	J.D. SLATOR	N/A	TIER 2 SITE
ODESSA	J.D. SLATOR 'B'	N/A	TIER 2 SITE
ODESSA	J.E. PARKER	N/A	TIER 2 SITE
ODESSA	J.T. CROSS	N/A	TIER 2 SITE
ODESSA	J.T. CROSS 'B'	N/A	TIER 2 SITE
ODESSA	JANICE	N/A	TIER 2 SITE
ODESSA	JE BAGLEY	N/A	TIER 2 SITE
ODESSA	JOHN J	N/A	TIER 2 SITE
ODESSA	JOHNSON 'D', 'P' AND MARCUS GIST BATTERY	N/A	TIER 2 SITE
ODESSA	JOHNSON J.L.	N/A	TIER 2 SITE
ODESSA	JONES BROS. SMALL PIT	701 INDUSTRIAL	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	JORDAN UNIVERSITY TANK BATTERY	N/A	TIER 2 SITE
ODESSA	JUDKINS BOOSTER	19 MILES W OF ODESSA	TIER 2 SITE
ODESSA	JUNE SANDERS	.7 MILES W & 1/4 MILE N OF HWY 1787 & 1492 INTER.	TIER 2 SITE
ODESSA	KAYLEIGH	N/A	TIER 2 SITE
ODESSA	KEY ENERGY SERVICES - 428	5347 WEST 42ND	TIER 2 SITE
ODESSA	KLOH 'A'	N/A	TIER 2 SITE
ODESSA	KLOH 'B-5' ELLENBURGER	N/A	TIER 2 SITE
ODESSA	KLOH 'B-5' SAN ANDRES	N/A	TIER 2 SITE
ODESSA	KLOH 'B-7'	N/A	TIER 2 SITE
ODESSA	KLOH 'C-21'	N/A	TIER 2 SITE
ODESSA	L.E. WIGHT B	N/A	TIER 2 SITE
ODESSA	LYDA MAE JOHNSON	N/A	TIER 2 SITE
ODESSA	MARTIN RESOURCES LLC (ODESSA-ARCADE) 301102	7589 WEST MURPHY ROAD	TIER 2 SITE
ODESSA	MARTIN RESOURCES LLC (ODESSA-DOURO) 301101	14001 W. MURPHY	TIER 2 SITE
ODESSA	MARY ELLEN	N/A	TIER 2 SITE
ODESSA	MCAFFEE STATION (L) PPTX	SOUTH ON HWY. 385 TO FM 1787 & EAST 1 MI. & SOUTH 1.5 MI.	TIER 2 SITE
ODESSA	METEOR CRATER	N/A	TIER 2 SITE
ODESSA	MILDAND FARMS	N/A	TIER 2 SITE
ODESSA	MOSS GBSA UNIT BATTERY	N/A	TIER 2 SITE
ODESSA	MRS. L E WIGHT #A-9	NE SEC. 9, BLK. 43, T-1S T&P RY	TIER 2 SITE
ODESSA	NAKEISHA	N/A	TIER 2 SITE
ODESSA	ECTOR COUNTY BOOSTER	1 MILE NE OF ECTOR COUNTY	TIER 2 SITE
ODESSA	NOV MOBILE RIGS ODESSA	5561 W UNIVERSITY	TIER 2 SITE
ODESSA	NOV TUBOSCOPE ODESSA FULTON ROAD	2269 SOUTH FULTON ROAD	TIER 2 SITE
ODESSA	NOV TUBOSCOPE ODESSA LINER PLANT	2400 STEVEN ROAD	TIER 2 SITE
ODESSA	NOV TUBOSCOPE RODCO ODESSA	100 EAST 61ST STREET	TIER 2 SITE
ODESSA	OCCIDENTAL CHEMICAL CORPORATION - ODESSA TEXAS TERMINAL	101 SANDY STREET	TIER 2 SITE
ODESSA	OPIE	N/A	TIER 2 SITE
ODESSA	PARKER J.E. BATTERY	N/A	TIER 2 SITE
ODESSA	PAUL MOSS	N/A	TIER 2 SITE
ODESSA	PAUL MOSS 'C'	N/A	TIER 2 SITE
ODESSA	PAUL MOSS 'PE-38'	N/A	TIER 2 SITE
ODESSA	PERMIAN TANK & MANUFACTURING, INC.	2701 W. I-20	TIER 2 SITE
ODESSA	PERMIAN TANK & MANUFACTURING, INC.	8800 NW LOOP 338	TIER 2 SITE
ODESSA	QUAIL RUN ENERGY CENTER	2950 E INTERSTATE 20	TIER 2 SITE
ODESSA	RATLIFF "C"	N/A	TIER 2 SITE
ODESSA	RATLIFF "F"	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	RATLIFF SWD STATION	N/A	TIER 2 SITE
ODESSA	RATLIFF TANK BATTERY	N/A	TIER 2 SITE
ODESSA	RHODES 1 & 2	NORTH OF ODESSA	TIER 2 SITE
ODESSA	R-J 5 / GIST	N/A	TIER 2 SITE
ODESSA	ROSE MARIE	N/A	TIER 2 SITE
ODESSA	SABINE #1	N/A	TIER 2 SITE
ODESSA	SALLIE 11 BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE 13 BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE 2 BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE 23 BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE A BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE B BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE C BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE D BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE E BATTERY	N/A	TIER 2 SITE
ODESSA	SALLIE F BATTERY	N/A	TIER 2 SITE
ODESSA	SAM'S CLUB #6439	4230 JOHN BEN SHEPPARD PKWY B	TIER 2 SITE
ODESSA	SCHAR "A"	N/A	TIER 2 SITE
ODESSA	SCHARBAUER B TANK BATTERY	N/A	TIER 2 SITE
ODESSA	SHERRY	N/A	TIER 2 SITE
ODESSA	SHOEBAR '27'	N/A	TIER 2 SITE
ODESSA	SLATOR LEASE	N/A	TIER 2 SITE
ODESSA	SMITH #1	N/A	TIER 2 SITE
ODESSA	SOUTH COWDEN CANYON UNIT BATTERY	N/A	TIER 2 SITE
ODESSA	SOUTH COWDEN UNIT LEASE	4.5 MILES SOUTH OF ODESSA, TX	TIER 2 SITE
ODESSA	SOUTH FOSTER GBSA UNIT BATTERY	N/A	TIER 2 SITE
ODESSA	SOUTH MOJO BOOSTER	W 42ND AND HWY 302	TIER 2 SITE
ODESSA	SUNBELT RENTALS PC #511	2708 E. I-20	TIER 2 SITE
ODESSA	T.P. LAND TRUST 'D'	N/A	TIER 2 SITE
ODESSA	TATIA	N/A	TIER 2 SITE
ODESSA	THE HOME DEPOT STORE 0562	5181 E 42ND ST	TIER 2 SITE
ODESSA	THERMO FLUID, INC	1501 WALTHER	TIER 2 SITE
ODESSA	THOMAS A NCT-1	N/A	TIER 2 SITE
ODESSA	THOMAS A NCT-2	N/A	TIER 2 SITE
ODESSA	TXL "O"	N/A	TIER 2 SITE
ODESSA	TXL "O" (GOLDSMITH CLEARFORK)	BLK 43, T-1-S, T&P	TIER 2 SITE
ODESSA	TXL "P"	N/A	TIER 2 SITE
ODESSA	TXL "W"	N/A	TIER 2 SITE
ODESSA	TXL D TANK BATTERY	N/A	TIER 2 SITE
ODESSA	TXL E TANK BATTERY	N/A	TIER 2 SITE
ODESSA	TXL N LEASE	N/A	TIER 2 SITE

# APPENDIX C

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

JURISDICTION	FACILITY NAME	FACILITY ADDRESS	FACILITY TYPE
ODESSA	TXL P TANK BATTERY	N/A	TIER 2 SITE
ODESSA	TXL-B	8 MILES NS OF GOLDSMITH	TIER 2 SITE
ODESSA	TXL-TEXAS	N/A	TIER 2 SITE
ODESSA	ULTRA PREMIUM OILFIELD SERVICES, LTD.	3424 RASCO AVENUE	TIER 2 SITE
ODESSA	ULTRA PREMIUM OILFIELD SERVICES, LTD.	4000 N. RASCO AVENUE	TIER 2 SITE
ODESSA	UNIMIN ODESSA TERMINAL	800 S. MEADOW	TIER 2 SITE
ODESSA	UNITED RENTALS NORTHWEST, INC.	1220 S. GRANDVIEW AVENUE	TIER 2 SITE
ODESSA	UNIVAR ODESSA BRANCH	311 S. LARK	TIER 2 SITE
ODESSA	UNIVAR USA INC. PRONTO, ST.	105 PRONTO	TIER 2 SITE
ODESSA	UNIVERSITY D TANK BATTERY	N/A	TIER 2 SITE
ODESSA	UPTON COUNTY FACILITY 6	13 MILES SOUTH OF ODESSA	TIER 2 SITE
ODESSA	VICTAULIC-ODESSA DISTRIBUTION CENTER	2628 REMINGTON ROAD	TIER 2 SITE
ODESSA	VINA BAGLEY	LAT 31.87508 LONG 102.40404	TIER 2 SITE
ODESSA	WARREN EQUIPMENT COMPANY	2301 PRODUCTION LANE	TIER 2 SITE
ODESSA	WEATHERFORD ARTIFICIAL LIFT SYSTEMS	905 S. GRANDVIEW	TIER 2 SITE
ODESSA	WEATHERFORD FRACTURING TECHNOLOGIES	8866 W LOOP 338 N	TIER 2 SITE
ODESSA	WEATHERFORD U.S., L.P.	8870 W. LOOP 338 N.	TIER 2 SITE
ODESSA	WESTAIR GAS & EQUIPMENT	114 S. TEXAS AVE	TIER 2 SITE
ODESSA	WESTERN TANK COMPANY OF ODESSA	211 WILLIAMS AVENUE	TIER 2 SITE
ODESSA	WIGHT GAS UNIT #6	E/2 SEC. 6, BLK. 43, 1-1S T&P RY	TIER 2 SITE
ODESSA	WIGHT UNIT #8-12	NW/4 SEC 8, BLK 43, T1S, T&P RR CO SURVEY A-882	TIER 2 SITE
ODESSA	WIGHT UNIT PHASE II	S/2 SW, NE/SW, SEC. 4, BLK 43 T1S	TIER 2 SITE
ODESSA	WRIGHT 14G TANK BATTERY	N/A	TIER 2 SITE

# APPENDIX D

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

## Critical Facilities in Ector County and the Cities of Odessa and Goldsmith Generated by HAZUS-MH

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
<b>CITY OF ODESSA</b>			
<b>Community Shelters</b>			
Austin Elementary School (Capacity: 80)	\$4,224,606		
Belmont Baptist Church (Capacity: 300)	\$889,134		■
Blackshear Elementary School (Capacity: 80)	\$6,979,020		
Blanton Elementary School (Capacity: 80)	\$2,566,256		■
Bonham Junior High School (Capacity: 200)	\$5,376,502		■
Bowie Junior High School (Capacity: 200)	\$2,882,313		
Burleson Elementary School (Capacity: 80)	\$1,703,908	■	■
Burnett Elementary School (Capacity: 80)	\$2,902,132		■
Cameron Elementary School (Capacity: 80)	\$3,061,244	■	■
Carver Early Education School (Capacity: 80)	\$6,979,020		
Central Baptist Church (Capacity: 200)	N/A		
Chapel Hill Baptist Church (Capacity: 150)	\$558,345		■
Christian Faith Center (Capacity: 100)	\$1,245,253		■
Crescent Park Baptist Church (Capacity: 500)	\$3,900,776		■
Crockett Junior High School (Capacity: 200)	\$6,188,794	■	■
Dowling Elementary School (Capacity: 80)	\$4,149,967		■
Ector County Coliseum (Capacity: 200)	\$15,696,173		

<sup>1</sup> The estimated value of the critical facilities presented in this table are based upon an intersection of the critical facility point locations provided by the City of Odessa and the parcel data (containing improved building values) provided by the Ector County Tax Assessor's office. Some parcels were noted to contain more than one facility. At this time, the total improved value of these parcels has been divided equally by the number of facilities located upon it. Also, it was not possible in all cases to match a point location for the facility with the corresponding parcel data. These facilities currently reflect a value of "N/A."



# APPENDIX D

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
Ector Junior High (Capacity: 200)	\$16,627,077		
Floyd Gwin Community Center (Capacity: 95)	\$1,681,909	■	
Freedom Missionary Baptist Church (Capacity: 100)	\$270,353		■
Friendship Baptist Church (Capacity: 100)	N/A	■	■
Gale Pond/Alamo Elementary School (Capacity: 80)	\$1,704,229		■
Gonzales Elementary School (Capacity: 80)	\$3,350,097		■
Hays Magnet School (Capacity: 80)	\$2,710,585		
Hood Junior High School (Capacity: 200)	\$4,442,606		■
Immanuel Baptist Church (Capacity: 300)	\$3,193,507		■
Ireland Elementary School (Capacity: 140)	\$3,516,179		■
Jerusalem Baptist Church (Capacity: 100)	\$336,997		■
Johnson Elementary School (Capacity: 300)	\$3,961,433		■
Jordan Elementary School (Capacity: 300)	\$3,237,125		■
Kingston Avenue Baptist (Capacity: 100)	\$501,720		■
Lamar Elementary School (Capacity: 50)	\$4,164,283		
Milam Elementary School (Capacity: 80)	\$6,979,020		■
Noel Elementary School (Capacity: 145)	\$4,022,415		
Odessa First Baptist Church (Capacity: 750)	\$3,530,719		
Odessa YMCA (Capacity: 200)	\$515,871	■	■
Pease Elementary School (Capacity: 80)	\$2,747,691		■
Primera Iglesia Baptist Church (Capacity: 75)	N/A		■
Reagan Elementary School (Capacity: 80)	\$2,833,724		■
Ross Elementary School (Capacity: 80)	\$2,123,951		
Royalty Heights Baptist Church (Capacity: 75)	\$108,603		■
Salinis Community Center (Capacity: 61)	\$76,331		■
Salvation Army (Capacity: 60)	\$842,019		
Sam Houston Elementary School (Capacity: 80)	\$2,195,533	■	■
San Jacinto Elementary School (Capacity: 80)	\$2,743,392	■	
Second Baptist Church (Capacity: 700)	\$1,514,135		■
Travis Elementary School (Capacity: 80)	\$4,088,426		■
UTPB University (Capacity: 300)	\$1,880,264		■
Woodson Community Center (Capacity: 60)	\$4,747		■
Zavala Elementary School (Capacity: 80)	\$66,430		■
<b>TOTAL NUMBER: 50</b>	<b>\$155,274,814</b>	<b>8 (\$18,090,651)</b>	<b>35 (\$83,598,051)</b>
<b>Fire Stations</b>			
Central	\$76,500		
Station 2	\$72,629		
Station 3	\$1,880,264	■	■

# APPENDIX D

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
Station 4	\$340,907		
Station 5	\$233,656		■
Station 6	\$254,948		■
Station 7	\$404,821	■	■
<b>TOTAL NUMBER: 7</b>	<b>\$3,263,725</b>	<b>2 (\$2,285,085)</b>	<b>4 (\$2,773,689)</b>
<b>Hospitals</b>			
Medical Center Hospital	\$93,887,120		
ORMC West Campus	N/A	■	
ORMC East Campus	N/A	■	■
<b>TOTAL NUMBER: 3</b>	<b>\$93,887,120</b>	<b>2 (N/A)</b>	<b>1 (N/A)</b>
<b>Law Enforcement</b>			
Courthouse Jail	N/A		
Ector County Jail	N/A		
Ector County Sheriff Office	N/A		
Police Department	\$2,517,138		
<b>TOTAL NUMBER: 4</b>	<b>\$2,517,138</b>	<b>0 (\$0)</b>	<b>0 (\$0)</b>
<b>Schools</b>			
Academic Acceleration Academy High School	\$1,258,779	■	
Aim High School	\$843,797		
Austin Elementary	\$4,224,606		
Blackshear Elementary	\$6,979,020		
Blanton Elementary	\$2,566,256		■
Bonham Junior High	\$5,376,502		■
Bowie Junior High	\$2,882,313		
Burleson Elementary	\$1,703,908	■	■
Burnet Elementary	\$2,902,132		■
Cameron Elementary	\$3,061,244	■	
Career Center High School	\$8,496,046	■	■
Carver Early Education	\$6,979,020		
Christ Lutheran Church	\$431,323		■
Crockett Junior High	\$6,188,794	■	■
Dowling Elementary	\$4,149,967		■
Ector Junior High	\$16,627,077		
Gale Pond/Alamo Elementary	\$1,704,229		■
Goliad Elementary	\$1,981,398		
Gonzales Elementary	\$3,350,097		■
Hays Elementary	\$2,710,585		
Hood Junior High	\$4,442,606		■

# APPENDIX D

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
Ireland Elementary	\$3,516,179		■
Johnson Elementary	\$3,961,433		■
Jordan Elementary	\$3,237,125		■
Lamar Early Education	\$4,164,283		
Milam Elementary	\$6,979,020		■
Nimitz Junior High	\$5,763,911		■
Noel Elementary	\$4,022,415		
Odessa Christian Church	\$2,065,641		■
Odessa Junior College	\$42,854,299		
Odessa High School	\$12,504,105		
Pease Elementary	\$2,747,691		■
Permian High School	\$2,487,640		■
Reagan Elementary	\$2,833,724		■
Ross Elementary	\$2,123,951		
Sam Houston Elementary	\$2,195,533	■	■
San Jacinto Elementary	\$2,743,392	■	
Sherwood Christian Church	\$107,204		■
St. John's Episcopal Church	\$2,217,117	■	
St. Mary's Catholic Church	\$1,233,133		■
Teen Parent Center High School	\$843,797		
Travis Elementary	\$4,088,426		■
UTPB University	\$1,880,264		■
Zavala Elementary	\$66,430		■
<b>TOTAL NUMBER: 44</b>	<b>\$203,496,412</b>	<b>8 (\$27,864,813)</b>	<b>26 (\$84,475,214)</b>
<b>Other</b>			
Odessa/Ector County Emergency Management	N/A		■
Big Three Industries, Inc.	N/A		
City of Odessa Utilities Dist. Site	N/A		
City of Odessa Utilities Lab	N/A		
Continental Products	N/A		
County Health Dept.	N/A		
Courthouse Admin. Annex	N/A		
Dawn Water Tower	\$104,804		■
Ector County Coliseum and Exhibit Buildings/Arena	N/A		
Ector County Courthouse	N/A		
Martin Resources, Inc.	N/A		
Medical Examiner Office	N/A		
Municipal Plaza	N/A		

# APPENDIX D

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
Music City Mall	N/A		■
Oakwood Water Tower	N/A		■
Phillips Pipeline Company	N/A		
Rainbow Water Tower	N/A		■
Reaction Chemical Enterprises, Inc.	N/A		
Recon Oil, Inc.	N/A		
Ref Chem L.P.	N/A		
Tomco Coating and Painting	\$171,107		■
Union Pacific Railroad	N/A		
UTPB	N/A		■
Vulcan Chemicals	N/A	■	
<b>TOTAL NUMBER: 24</b>	<b>\$275,911</b>	<b>1 (N/A)</b>	<b>7 (\$275,911)</b>
<b>CITY OF GOLDSMITH</b>			
<b>Community Shelters</b>			
Goldsmith Community Center (Capacity: 40)	\$33,150		
<b>TOTAL NUMBER: 1</b>	<b>\$33,150</b>	<b>0 (\$0)</b>	<b>0 (\$0)</b>
<b>UNINCORPORATED ECTOR COUNTY</b>			
<b>Airports</b>			
Schlemeyer Field Airport	\$1,053,833		
<b>TOTAL NUMBER: 1</b>	<b>\$1,053,833</b>	<b>0 (\$0)</b>	<b>0 (\$0)</b>
<b>Community Shelters</b>			
Caprock Baptist Church (Capacity: 75)	\$129,073		
Cavazos Elementary School (Capacity: 300)	\$3,958,382		■
Gardendale Community Center (Capacity: 31)	\$63,646	■	■
Greater St. Luke Baptist Church (Capacity: 200)	\$180,076		■
Greenfield Acres Church (Capacity: 50)	\$420,064		■
Kellis Turner Community Center (Capacity: 29)	\$57,294	■	■
Pleasant Farms Community Center (Capacity: 22)	\$61,001		
<b>TOTAL NUMBER: 7</b>	<b>\$4,869,536</b>	<b>2 (\$120,940)</b>	<b>5 (\$4,679,462)</b>
<b>Fire Station</b>			
Station 8	\$71,820		
Gardendale VFD	N/A		■
Pleasant Farms/South Ector Co VFD	\$89,396		■
West Odessa VFD	\$52,424		
<b>TOTAL NUMBER: 4</b>	<b>\$213,640</b>	<b>0 (\$0)</b>	<b>2 (\$89,396)</b>
<b>Law Enforcement</b>			
Juvenile Detention Center	N/A		

# APPENDIX D

## ECTOR COUNTY, TEXAS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

FACILITY	TOTAL ESTIMATED VALUE <sup>1</sup>	LOCATED IN FLOODPLAIN	LOCATED IN WILDLAND URBAN INTERFACE
<b>TOTAL NUMBER: 1</b>	<b>N/A</b>	<b>0 (\$0)</b>	<b>0 (\$0)</b>
<b>Schools</b>			
Alternative Education High School	\$684,419		
Cavazos Elementary School	\$3,958,382		■
Fly Elementary School	\$3,671,993		
Youth Center High School	\$684,419		
<b>TOTAL NUMBER: 4</b>	<b>\$8,999,213</b>	<b>0 (\$0)</b>	<b>1 (\$3,958,382)</b>
<b>Other</b>			
Champion Technologies Odessa Plant	N/A		
Continental Sulfur and Chemical Company (Martin Resources)	N/A		
Cottons Inspection	N/A	■	
CRMWD Open Water Reservoir	N/A		
Desert Industrial X-Ray	N/A		■
Eddins Walcher Fuels	N/A		■
Family Dollar Distribution Center	N/A		
Frank Fuels	\$48,027		
Huntsman Polymers Corporation	\$177,735		
I-Chem, Inc.	N/A		■
Meister Industries	N/A		
Oilfield Mud & Chemical	\$76,646		
Pro Inspection, Inc.	N/A		
Quaker Petroleum Chemicals	N/A		
REXtac, LLC	\$16,382,290		
Russ Chemical Co., Inc.	N/A		
Team Industrial	N/A		
Texas Independent Energy	N/A		
Trigas Industrial Gases	N/A		
Truckload Fireworks Warehouse	N/A		
Water Treatment Plant	N/A		
Yukon Pump Station	N/A		■
<b>TOTAL NUMBER: 22</b>	<b>\$16,684,698</b>	<b>1 (N/A)</b>	<b>4 (N/A)</b>

Source: City of Odessa – GIS Department

# APPENDIX E: MEETING DOCUMENTATION



Ector County & City of Odessa Hazard Mitigation Plan  
 Kickoff Meeting  
 March 30, 2009

SIGN-IN SHEET

Name	Organization & Title	Phone/Fax	Email
Traer Drake	Odessa Fire/Asst Chief	432-335-4654	t Drake@ci.odessa.tx.us
Sallie Connor	Ector Co. Health Dept. Program Mgr.	432-617-8426	econnor@ecclm.texas.gov
Danna Ziriax	ECISO Benefits/Pers. Mgt. Div.	432-334-1176	danna.ZIRIAX@ecclm.texas.gov
Barry Wooten	City of Odessa Safety Coordinator	335-4694	bwooten@ci.odessa.tx.us
Pete Frankson	Ector Co. Fire Dept. E.H. Mgt.	432-770-4603	Peter.Frankson@ectorcounty.org
FRED CRAWFORD	Ector Co Public Works	498-4041	CRAWFFJ@CO.ECTOR.TX.US
Luey Griffith	Odessa College	432-335-6854	lgriffith@odessa.edu
Chuck Mead	Odessa Police	432-967-3190	cmead@ci.odessa.tx.us
Darrell Wells	Risk Mgt City	432-335-4697	dewells@ci.odessa.tx.us
Debbie McReynolds	City of Odessa Utilities	335-4625 (Fax)	dmcroyno@ci.odessa.tx.us
JOHN ALVAREZ	CITY OF ODESSA FIRE	432-335-4655	jalvarez@ci.odessa.tx.us
Red Hannessy	" " PSIS	432-335-3250	rhannessy@odessa-tx.gov
Sharon Lloyd	MCA	432-640-1120	slloyd@echd.org
Andrea Frankson	City Public Works	432-335-4806	afrankson@ci.odessa.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



## Ector County & City of Odessa Hazard Mitigation Plan

Kickoff Meeting

March 30, 2009

### SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
Matt Squires	City of Odessa Public Works	432.335.3244	msquires@ci.odessa.tx.us
Ajay Shakyaver	" " " Engineering Div. City Eng.	432-335-3292	ashakyaver@ci.odessa.tx.us
Barney Welch	PBRPC, Dir., Homeland Sec.	432-563-1061	bwelch@pbrpc.org
Pat Patton	Ector Co. EME	432-498-4025	pattonp@co.ector.tx.us
Roger Boyd	City of Odessa, Fire	(432)335-4664	rboyd@ci.odessa.tx.us
Greg Bittick	City of Odessa/Fire/GIS	432.335.3831	gbittick@ci.odessa.tx.us
Pam Castellano	DRMC	432 582 8855	pcastellano@Tasis.healthcare.us

### LOCATIONS FOR POSTING OF PUBLIC MEETING NOTICE MARCH 30, 2009

ODESSA CITY HALL	411 W. 8 <sup>TH</sup> STREET, ODESSA, TEXAS
CITY OF ODESSA WEBSITE	<a href="http://www.odessa-tx.gov">www.odessa-tx.gov</a>
ECTOR COUNTY COURTHOUSE	300 N. GRANT STREET, ODESSA, TEXAS
ECTOR COUNTY ANNEX	1010 E. 8 <sup>TH</sup> STREET, ODESSA, TEXAS
ECTOR COUNTY LIBRARY	321 W. 5 <sup>TH</sup> STREET, ODESSA, TEXAS
ECTOR COUNTY WEBSITE	<a href="http://www.co.ector.tx.us">www.co.ector.tx.us</a>
ODESSA AMERICAN NEWSPAPER	MARCH 25 & 29, 2009



# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

## The Public is Invited to Participate in Hazard Mitigation Planning for the City of Odessa and Ector County

3-29-09

Ector County and the City of Odessa will hold a public meeting as part of a collaborative effort to create a Hazard Mitigation Action Plan. The public meeting information is as follows:

**Monday, March 30, 2009 6:00 – 7:00 pm**

**Odessa City Council Chambers  
5<sup>th</sup> floor of City Hall  
411 W. 8th Street  
Odessa, TX 79760**

The purpose of the open meeting is to inform the community on the development of the plan and to solicit information that can help the project team in identifying and analyzing hazards affecting residents, as well as recommending possible actions that can be taken to reduce the impact of those hazards. **The public is invited and encouraged to attend the meeting.**

Ector County and Odessa are undertaking the development of a comprehensive hazard mitigation plan for unincorporated areas of Ector County and the City of Odessa, which have experienced the disastrous effects of natural and manmade hazard events. The resulting Hazard Mitigation Plan will comply with the hazard mitigation planning standards and criteria of the State of Texas and the Federal Emergency Management Agency (FEMA).

The goal of this Hazard Mitigation Action Plan is to minimize or eliminate the long-term risk to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. *Mitigation is defined by FEMA as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.*

The purpose of the Plan is to minimize disruption to residents following a disaster; streamline disaster recovery by defining actions to be taken before a disaster strikes to reduce or eliminate future damage; to serve as a basis for future funding that may become available through grant and technical assistance programs offered by state or Federal agencies; and to ensure that Ector County and Odessa maintain its eligibility for the full range of future Federal disaster relief. Certain forms of Federal hazard mitigation assistance for projects are made available only to local governments that have a FEMA-approved Hazard Mitigation Action Plan in place.

At the public meeting a briefing will be provided on the planning process. An opportunity will be provided for the public to offer thoughts on their hazards of concern and recommended ways to reduce future risk.

Questions about the Hazard Mitigation Plan should be addressed to H<sub>2</sub>O Partners, planning consultants for Ector County and the City of Odessa. You may reach Erin Capps at (512) 769-5483 or by email at [ecapps@h2opartnersusa.com](mailto:ecapps@h2opartnersusa.com) or Anne Williams at (361) 815-6041 or [anne@h2opartnersusa.com](mailto:anne@h2opartnersusa.com).





# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



Ector County & City of Odessa Hazard Mitigation Plan  
Public Meeting, Odessa City Council Chambers  
March 30, 2009

## SIGN-IN SHEET

Name	Phone	Fax	Email
Armando S. Rodriguez	333-6222	498-4005	rodias@co.ector.tx.us
JOHN ALVAREZ	335-4655		
Pat Patton	498-4025	498-4097	patp@co.ector.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Risk Assessment Workshop  
Nov. 12, 2009

SIGN-IN SHEET

Name	Organization & Title	Phone/Fax	Email
Roy Staggis	City of Odessa	432-335-4625	rstaggis@ci.odessa.tx.us
Andrea Gannon	City of Odessa	335-4800/4811	agannon@ci.odessa.tx.us
Barry Wooten	City of Odessa	335-4694	bwooten@ci.odessa.tx.us
Michael Marrero	City of Odessa	335-4107	mmarrero@ci.odessa.tx.us
Sharon Lloyd	MOH	6401120	slloyd@ehd.org
Taner Drake	BFD	257-0506	tdrake@ci.odessa.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Risk Assessment Workshop  
Nov. 12, 2009

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
GARY FITTICK	FIRE/GIS/GAS COORDINATOR	432.335.3831	fittick@ci.odessa.tx.us
Bennie Cope	Utility Manager	432-829-3404	
RALPH MCCAIG	BUILDING OFFICIAL	335 3214	rmccaig@ci.odessa.tx.us
JOHN ALVARAZ	ODESSA FIRE DEPT.	432-257-0512	j.alvarez@odessa-tx.gov
David Peck	Ector County Project Mgr	498-4036	dpeck@ec.co.ector.tx.us
MATT RUINI	CLERK/UTILITIES ASSISTANT	335-4686	m.ruini@ci.odessa.tx.us
Debbie McReynolds	Utilities - Odessa	335-4634	dmcreyn@ci.odessa.tx.us
Pete Frankson	Ector Cty. ISD	432-770-4603	Peter.Frankson@ectorcountyisd.org
Detra White	Odessa F.D	432-335-4656	dwhite@ci.odessa.tx.us
Pat Patton	Ector County	432-498-4025	pattp@ec.co.ector.tx.us
Chuck Moed	Odessa PD	432-335-3354	cmoad@ci.odessa.tx.us
Roger Boyd	Fire	(432) 335-4657	rboyd@ci.odessa.tx.us
Matthew Squires	Odessa Public Works	335 3299	msquires@ci.odessa.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**LEGAL NOTICE**  
To be published in the Odessa American  
on Tuesday, November 10, 2009 and  
Wednesday, November 11, 2009.

**PUBLIC MEETING**  
To create a Hazard  
Action Plan for Ector  
County and the Cities of  
Odessa and Goldsmith

Thursday, November 12, 2009  
6 to 7 pm  
Odessa City  
Council Chambers  
5th Floor City Hall  
411 West 8th Street  
Odessa, Texas 79762  
#1113



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Public Meeting, Odessa City Council Chambers  
Nov. 12, 2009

## SIGN-IN SHEET

Name	Phone	Fax	Email
JOHN ALVAREZ	432-257-0507	432-257-0512	jalvarez@odessa-tx.gov
Pat Patton	432-498-4025	432-498-4097	patp@ec.co.ector.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Mitigation Workshop  
Dec. 10, 2009

SIGN-IN SHEET

Name	Organization & Title	Phone/Fax	Email
GARY BITTICK	CITY OF ODESSA CFO/AS	432-335-3831	gbittick@ci.odessa.tx.us
PETE FRANKLSON	Ector County ISD	432-770-4603	Petev.Franklson@ectorcountyisd.org
Bennie Cope	City of Goldsmith/Utility Manager	(432)829-3404	
Gene Baker	Magellan Pipeline COM	432 940-7227	gene.baker@magellanlp.com
FRED CHAMBERS	Ector Co Public Works	432-3526518	cccham@co.ector.tx.us
David Peck	Ector Co. Public Works	432-498-4036	peckda@co.ector.tx.us
Debbie McReynolds	City of Odessa Dir of Utilities	432-335-4698	dmreyno@ci.odessa.tx.us
STAN STUNNY	City of Odessa Fire Dept	432-257-0509	stunny@ci.odessa.tx.us
TANER DRAKE	Odessa Fire - Asst Chief	257-0506	tdrake@ci.odessa.tx.us
Liz Adams	Ector County Health Dept	617-8427	adamslp@co.ector.tx.us
Selsa Lerma	Odessa College	335-6539	slerma@odessa.edu
Barry Wooten	City of Odessa	335-4694	bwooten@ci.odessa.tx.us
Chuck Maul	Odessa Police	335-3354	cmaul@ci.odessa.tx.us
MATT RUIZ	CO UTILITIES	335-4686	mruiz@ci.odessa.tx.us

# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Mitigation Workshop  
Dec. 10 2009

SIGN-IN SHEET

Name	Department & Title	Phone/Fax	Email
DAVID GLEATON	LIEUTENANT SPECIAL SERVICES ECTOR COUNTY SHERIFF'S OFFICE	432-386-3085	davidgleaton@ectorcountysheriff.com
Pat Patton	Ector County EMC	432-498-4025	patp@ecor.co.ector.tx.us
PAT VESPER	NATIONAL WEATHER SERVICE	432-563-5901/2003	Pat.Vesper@noaa.gov
RANDY BRINLEY	PLANNING DEPT/PLANNER	432-335-3211 / 335-4176	
Lail Grant	WIPB Env. Health & Safety	432-552-2778	grant.l@wipb.edu
Matt Squawles	City of Odessa Public Works	335 3214	msquawles@ci.oda.tx.us



# APPENDIX E

ECTOR COUNTY, TEXAS  
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**LEGAL NOTICE**  
To be published in the Odessa American  
on Tuesday, December 8, 2009 and  
Wednesday, December 9, 2009.

**PUBLIC MEETING**  
To create a Hazard  
Action Plan for Ector  
County and the Cities of  
Odessa and Goldsmith

Thursday, December 10, 2009  
6 to 7 pm  
Odessa City  
Council Chambers  
5th Floor City Hall  
411 West 8th Street  
Odessa, Texas 79762  
#1208



Ector County Multi-Jurisdictional Hazard Mitigation Plan  
Public Meeting, Odessa City Council Chambers  
Dec. 10, 2009

## SIGN-IN SHEET

Name	Phone	Fax	Email
MIKE LULLOFF	432-272-0668		michlull@psande.com.net
DONALD M ANDERSON	432-653-0303		dman1520@yahoo.com
Ron Whitaker	432-272-5709		ron.whitaker@ectorcountyisd.org
Pat Patton	432-498-4025		pattpj@co.ector.tx.us
JOHN ALVAREZ	432-257-0507		j.alvarez@ci.odessa.tx.us