

# Quay County and the City of Tucumcari Hazard Mitigation Plan

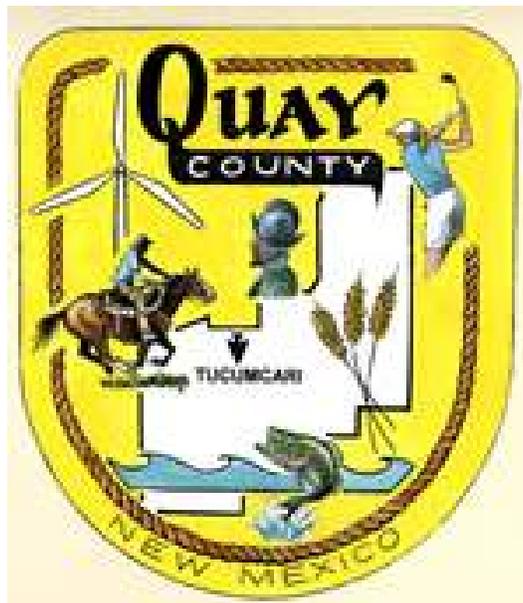
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## June 2018

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Prepared by Quay County Emergency Management and the City of Tucumcari

Technical Assistance provided by AECOM



**Disclaimer:** This report has been specifically prepared for planning purposes only. The figures and information contained herein are not suitable for individual property analyses or budgeting purposes. Mapping and analyses were conducted using data from others and were not technically verified for accuracy.

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Appendix C – Plan Review Tool

## Acronym List

BOR	Bureau of Reclamation
CDBG	Community Development Block Grant
CEDS	Comprehensive Economic Development Strategy
cfs	cubic feet per second
DMA2000	Disaster Mitigation Act 2000
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
GIS	Geographic Information Systems
HazMat	Hazardous Materials Release
HMP	Hazard Mitigation Plan
HMPT	Hazard Mitigation Planning Team
HUD	U.S. Department of Housing and Urban Development
mph	miles per hour
NCDC	National Center for Climatic Data (now known as the National Center for Environmental Information)
NFIP	National Flood Insurance Program
NRCS	Natural Resource Conservation Services
QA/QC	Quality Assurance and Quality Control
SOW	Scope of Work
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
USFS	United States Forest Service
WUI	Wildland Urban Interface

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**FY 2017-2018  
QUAY COUNTY  
RESOLUTION NO. 28**

**PLAN ADOPTION**

**WHEREAS**, Quay County is vulnerable to natural hazards such as flash floods, wildfire, and drought as well as human-caused hazards that can result in property loss, loss of life, economic hardship, and threats to public health and safety,

**WHEREAS**, the Quay County and the City of Tucumcari Hazard Mitigation Plan (hereinafter referred to as the "Plan") has been developed by Quay County Emergency Services and the people of the County,

**WHEREAS**, the Plan recommends mitigation activities that will reduce losses to people and property affected by the natural and human-caused hazards that face the County, and

**WHEREAS**, a series of public meetings were held to develop and review the Plan,

**NOW THEREFORE BE IT RESOLVED** by the Quay County Commissioners that:

The Quay County and the City of Tucumcari Hazard Mitigation Plan is hereby adopted as an official plan.

The Quay County Hazard Mitigation Planning Team or its successor is hereby recognized as the official advisory body for hazard mitigation planning and related activities in the County. The Team members and its Chair shall be appointed by the President of the Quay County Commissioners, subject to the approval of the Quay County Commissioners.

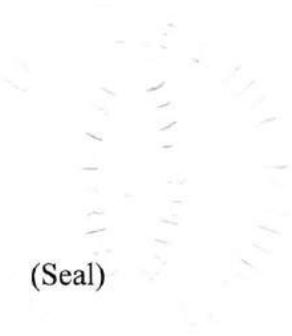
The Quay County Hazard Mitigation Planning Team shall meet as often as necessary, but at least quarterly, to ensure all appropriate activities are targeted toward implementing the Plan. The schedule of meetings shall be posted in appropriate places. All meetings of the Hazard Mitigation Planning Team shall be open to the public.

The respective Quay County officials and agencies identified in Section Five of the Plan, Mitigation Action Plan, are hereby directed to implement the recommended activities assigned to them. By August 31st of each year, the respective Quay County officials and agencies shall report to the Hazard Mitigation Planning Team on the progress of their activities.

By September 30th of each year, the Hazard Mitigation Planning Team shall prepare an annual evaluation report to the Quay County Commissioners and the governing board of each of the communities within the County that have adopted the plan and participated in its implementation. The report shall include an assessment of progress made toward meeting the

goals and objectives and implementing specific actions identified in the Plan. The report shall also include targets for the following year including any appropriate revisions to the Plan.

**ADOPTED** this 14<sup>th</sup> day of MAY, 2018.



*Franklin McCasland*

Franklin McCasland, Commissioner

*Sue Dowell*

Sue Dowell, Commissioner

*Mike Cherry*

Mike Cherry, Commissioner

Attest:

*Ellen White*

Ellen White, County Clerk

**CITY OF TUCUMCARI, QUAY COUNTY, NEW MEXICO  
PLAN ADOPTION RESOLUTION**

**RESOLUTION NO. 2018-13**

**WHEREAS**, The City of Tucumcari is vulnerable to natural hazards such as flash floods, wildfire, and drought as well as human-caused hazards that can result in property loss, loss of life, economic hardship, and threats to public health and safety,

**WHEREAS**, the Quay County and the City of Tucumcari Hazard Mitigation Plan (hereinafter referred to as the "Plan") has been updated by the Tucumcari/Quay County Emergency Management and the people of the County,

**WHEREAS** the Plan recommends mitigation activities that will reduce losses to people and property affected by the natural and human-caused hazards that face the County, and

**WHEREAS** a series of public meetings were held to develop and review the Plan,

**NOW THEREFORE BE IT RESOLVED** by the City Commission of the City of Tucumcari that:

The Quay County and the City of Tucumcari Hazard Mitigation Plan is hereby adopted as an official Plan of the City of Tucumcari.

The Quay County Hazard Mitigation Planning Team or its successor is hereby recognized as the official advisory body for hazard mitigation planning and related activities in the County.

The Tucumcari Fire Chief is hereby recognized as the official representative for the City of Tucumcari to the Hazard Mitigation Planning Team and shall be responsible for coordinating the related actions and programs of the City of Tucumcari accordingly.

By August 31st of next year and every year after, the Tucumcari Fire Chief shall prepare an annual evaluation report first to the City Commission of the City of Tucumcari and subsequently to the Mitigation Planning Team, including an assessment of progress made toward meeting the goals and objectives and implementing specific action identified in the Plan. The report shall include targets for the following year, including recommendation for any appropriate revisions to the Plan.

ADOPTED on this 26<sup>th</sup> day of April, 2018.

ATTEST:

  
Angelica M. Gray, City Clerk

  
Robert C. Lumpkin, Mayor Pro Tem



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## **1 Introduction**

This section provides a general introduction to the Quay County Hazard Mitigation Plan Update. The Quay County Hazard Mitigation Plan was originally developed, adopted and approved in 2006. This document contains the Quay County's Hazard Mitigation Plan Update incorporating a number of revisions and refinements to the original plan content. This Plan analyzes the nine natural hazards presenting the greatest threat to the planning area. Four additional hazards identified in the state plan were reviewed but were excluded from additional consideration as they present little to no risk to the planning area. Quay County and the City of Tucumcari are participating jurisdictions for this plan update. The Villages of House, San Jon, and Logan engaged in the planning process but did not participate to a sufficient level to be considered participating jurisdictions and will not be adopting this version of the plan. The villages are currently working with Quay County to handle mitigation actions through the County; the County intends to conduct further planning with these communities which will be document in annexes to this plan or in the next plan update. The participating jurisdictions reviewed the hazards, independently ranking their relevance to the participating municipality. The Plan Update includes a detailed characterization of relevant natural hazards in Quay County; a risk assessment that describes potential losses to physical assets, people and operations; a set of goals, objectives, and actions that will guide the county and participation jurisdiction's mitigation program in coming years; and a detailed strategy for implementation and monitoring results.

This Hazard Mitigation Plan update focuses on the hazards with the highest potential for causing damage to buildings and other physical assets, injuries and fatalities to the residents of Quay County and disruption of government and business operations in the area. These hazards include flood, wildfire, drought, earthquake, severe winter storms, thunderstorms (including hail and lightning), high wind, tornado, and extreme heat. Other hazards identified in the State of New Mexico Hazard Mitigation Plan were evaluated and discussed but were not considered to pose a significant threat to the planning area.

This section consists of the following subsections:

- Vision and Purpose of the Plan
- Quay County Community Description and Geography
- Scope
- Authority
- Summary of Plan Contents

### **1.1 Vision and Purpose of the Plan**

The primary purpose of hazard mitigation planning is to organize people and resources to produce long-term and recurring benefits that help break the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that the investments made before a hazard event will

significantly reduce the demand for post-event assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Both the localized events that temporarily disrupt normal functioning as well as the larger events that receive Presidential disaster declarations will be addressed. Adopting mitigation practices will enable Quay County to re-establish itself in the wake of a larger disaster event, becoming more resilient with less disruption to services and businesses.

An emphasis was placed on severe winter storms, high wind events, flood, thunderstorms, drought and wildfire as these are considered to pose the greatest threat to the planning area. Three other natural hazards from the 2013 State of New Mexico Hazard Mitigation Plan which are considered to pose a lower risk to the planning area are also profiled in this update.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Related measures emanating from the mitigation plan such as preserving open space,



**From FEMA March 2009 Comprehensive Planning Guide (CPG-101):**

*"Planning has a proven ability to influence events before they occur and is an indispensable contribution to unity of effort."*

protecting vital infrastructure, designing sustainable buildings, maintaining environmental health, and protecting critical facilities meet other important community objectives including public safety, natural resource protection, and business development. It is important that any mitigation planning process be integrated with other local planning efforts, like the comprehensive plans of the County and its municipalities, and any proposed mitigation strategies must take into account other existing goals or initiatives that will help complement or hinder their future implementation. All information in this HMP is for planning and risk management information purposes only.

In summary, the purpose of the Quay County Hazard Mitigation Plan is to:

- Break the cycle of repetitive natural hazards
- Protect life, safety and property by reducing the potential for future damages and economic losses that result from hazards
- Make the county a safer place to work, visit, and live
- Restore and preserve Quay County's natural and recreational resources
- Help the county thrive economically
- Support preservation of hazard prone natural areas
- Reduce future vulnerability by guiding development and redevelopment
- Avoid interruptions caused by hazards
- Qualify for mitigation grant funding in both the pre-disaster and post-disaster environment
- Document coordination efforts with other stakeholders in the hazard mitigation effort
- Speed recovery following disaster events
- Develop broad based community support for hazard mitigation
- Record successful hazard mitigation projects and programs
- Demonstrate a firm commitment to hazard mitigation principles

- Comply with state and federal legislative requirements for hazard mitigation plans

The Quay County Hazard Mitigation Plan is a living document, and as such will be reviewed and updated as necessary in order to evaluate the progress made on the risk reduction actions identified through the planning process. The Plan will also be reviewed when new hazards are identified or when large hazard events occur that may require new mitigation priorities in the planning area.

## **1.2 Quay County Planning Area: History, Demographics, and Geography**

Quay County is a predominately farming and ranching community located in the east-central quadrant of New Mexico and bordering Texas. Quay County has four incorporated communities: the City of Tatum and the Villages of Logan, San Jon, and House. In addition, unincorporated communities that lie within the County include Bard, Glenrio, McAlister, Nara Visa, and Quay.

According to the estimated 2016 U.S. Census, the population of Quay County was 8,365 residents. The 2010 Census recorded a population of 9,041 while the 2000 census shows the population at 10,155. This data indicates a general decline in the County's population.

The City of Tatum, with 5,051 residents (2014 census estimate), is the largest incorporated community in Quay County and accounts for over 59% of the County's total population. Quay County has shown little growth in population over the last four decades and is projected to continue to lose population over the next seven to ten years (U.S. Census).

The composition of employment in Quay County is 22.3% educational, health and social services; 16.8% retail; 11.7% agriculture including forestry, fishing, hunting, and mining; 7.3% public administration; 7.0% construction, 1.7% manufacturing; and the remaining 17.3% in other services. The majority of the commercial/industrial development is within the populated areas of the City of Tatum.

The number of total housing units in the County is 5,545, with 2,999 of them located in Tatum (2010 U.S. Census). Since housing is a function of population, the highest growth in housing units is anticipated within the Tatum area. The largest percentage of homes was constructed between 1940 and 1959 (30.7%) and between 1970 and 1979 (17.9%). The median structure value is \$73,000.

Quay County encompasses approximately 2,883 square miles. Public lands account for 14% of Quay County. Tatum is located in west central Quay County and covers approximately eight square miles. The total privately-owned land areas, which include rural incorporated and unincorporated areas, range land, and farmland are approximately 1,591,871 acres and the remaining 252,249 acres are federal and state open range lands.

All of Quay County is located in the Great Plains Province, which occupies the eastern third of New Mexico. The majority of the County is located in the Upper Pecos Valley Subsection. The Pecos Valley Section includes the terraced valleys of the Pecos and Canadian rivers and flanking piedmont plains and tablelands. Inner river valleys range from reaches with broad floors,

occupied by floodplains and low terraces to relatively shallow canyons. The southern edge of Quay County is in the northwestern part of a broad, nearly level plateau called the Llano Estacada (the staked plain). Situated on the eastern border of New Mexico, Llano Estacada topography includes flatlands, well-incised river basins, and some rock outcroppings. The land slopes gently to the southeast. The average elevation is 4,096 feet, ranging from about 4,700 feet in the northwestern part of the county to about 4,150 feet in the southeastern part (Quay County HMP, 2006).

The Canadian River cuts across the northeast corner of the County and Ute Lake Reservoir covers a large area west of Logan. Seasonal watercourses drain much of the County. Tucumcari sits on the Estrada Aquifer.

Quay County consists of primarily Plains grassland vegetation with buffalo grass and blue grama sharing dominance. Both of these well-marked short-grasses are interspersed with varying amounts of vine-mesquite, tobosa, galleta, and alkali sacaton. Sometimes alkali sacaton occurs in nearly pure stands. Mesquite may sometimes occur in limited amounts, usually in localized populations. In relatively small areas of the County, plains grassland vegetation such as four-wing saltbush and sacaton dominant may appear interspersed with minor grass components (William C. Martin, 1986).

Quay County's climate is semiarid with a median precipitation level of 15.7 inches (Western Regional Climate Center [WRCC], 2003) and an average annual precipitation of 15.42 inches in the Tucumcari area.<sup>1</sup> Elevation is the greatest determining factor for temperature in Quay County. The mean average temperature is 58 °F. Temperatures range from recorded high of 108 F to below 14 °F (Flood Insurance Study, May 2003).

Transportation routes include Interstate 40, which bisects Quay County from east to west, passing through San Jon and Tucumcari. The remaining roads in the County are two lane highways, and county and local roads. U.S. Highway 54 crosses the County from the northeast corner passing through Nara Visa and Logan to Tucumcari and S.R. 209 runs south from Tucumcari and Quay and then turning east at the community of Ragland. In addition, the Union Pacific Railway operates a line through Quay County that runs east and west line paralleling U.S. Highway 54 south to Tucumcari and then turning west to parallel Interstate 40 to Santa Rosa in Guadalupe County. A spur line operated by the Chicago Rock Island and Pacific Railroad enters Quay County from the east at the Texas border near Glenrio and ends near Tucumcari. The Union Pacific Railway east-west line hauls general freight of all descriptions. Between 18 and 21 trains pass through Tucumcari in a 24-hour period on the east-west routes.

Tucumcari Municipal Airport, serving residents within the local area, is located six miles east of Tucumcari. There are two runways: Runway 03/21 is a 7,100 foot long, 100 foot wide asphalt runway; Runway 08/26 is a 4,600 foot long, 60 foot wide asphalt runway. The closest commercial airport is the Amarillo International Airport located 120 miles east of Tucumcari. Thirty-three private aircraft are based at the airport.

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<sup>1</sup> Western Regional Climate Center, <http://www.wrcc.dri.edu>, accessed March 2016

Utility providers for Quay County include the Public Service Company of New Mexico (PNM) for natural gas and Farmers Electric Coop, Inc. and Xcel Energy for electricity. Telephone service is provided by Qwest Communications and ENMR Plateau Telecommunications. The City of Tucumcari owns and operates a municipal water system; the water source is groundwater extracted through a series of wells in the Estrada Aquifer (New Mexico Environment Department [NMED], 2002). Tucumcari also has public wastewater treatment and disposal facilities (NMED, 2002). The Villages of San Jon, Logan, and House each operate a municipal water system. However, only the Villages of San Jon and Logan operate sewer/wastewater utilities. The other Quay County communities are predominantly rural, with major portions of the population obtaining water from on-site domestic wells and disposing of wastewater through individual septic systems.

### 1.3 Plan Scope

The planning process included five major elements, as listed in **Table 1.1**, that were completed over approximately 24 months starting in December 2015. The completion of each of these planning elements contributed to the overall Hazard Mitigation Plan. These elements make up several sections of the Plan as described in detail in **Section 1.5: Summary of Plan Contents**. The overall purpose of mitigation planning is to document the best risk information possible so that it can be used to establish a sustainable on-going process that results in actions to lower the risk. Due to the large scope of mitigating the risk from natural hazards, the Plan helps the county and participating jurisdictions establish both short-term and long-term goals.

**Table 1.1: Hazard Mitigation Planning Phases**

Phase 1:	Planning Process including Pre-Kickoff and Kickoff Meetings
Phase 2:	Hazard Identification, Analysis and Risk Assessment
Phase 3:	Mitigation Strategy including Capability Assessment, Assessment of Alternative Hazard Mitigation Measures, and Implementation Strategy
Phase 4:	Plan Monitoring, Evaluation, and Updating
Phase 5:	Plan Adoption

In developing this plan, AECOM followed the most up-to-date FEMA guidance available, the March 2013 Local Mitigation Planning Handbook, and the most current State Mitigation Plan that was available, the September 2013 State of New Mexico Natural Hazards Mitigation Plan.

## 1.4 Authority

This Plan has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390)
- Local Mitigation Planning requirements found in 44 CFR Part 201.6

This Plan shall be routinely monitored and revised to maintain compliance with the above provisions, rules, and legislation.

## 1.5 Summary of Plan Contents

The remaining contents of this Plan are designed and organized to be reader-friendly and functional. **Section 2: Planning Process** (Phase 1,) provides a complete narrative description of the process used to prepare the Plan. This includes identification of the planning process participants and descriptions of the meetings. Documentation of the process is in **Appendix A** which includes meeting attendance records, meeting minutes and other results of planning meetings.

The Hazards Identification, Analysis, and Risk Assessment phase (Phase 2) is presented in two sections – **Section 3: Hazard Identification** and **Section 4: Hazards Analysis and Risk Assessment**. **Section 3** identifies the natural hazards addressed in this Plan. **Section 4** outlines the County’s risk from these hazards.

The Risk Assessment provides a record of available historical data from past hazard occurrences and detailed hazard profiles which included general probabilities of recurrence, the spatial extent of the hazard, and its potential impact. The risk assessment serves a critical function as the County and participating jurisdictions seek to determine the most appropriate mitigation actions to pursue and implement – enabling them to prioritize and focus efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The **Mitigation Strategy** (Phase 3) consists of two sections – **Section 5: Mitigation Goals, Objectives and Actions**, where mitigation actions to address vulnerabilities identified in **Section 4** are placed, and **Section 6: Implementation Plan** which includes a capability assessment. The capability assessment describes the regulations and policies in the planning area relevant to addressing the identified hazards. The mitigation actions provide specific implementation mechanisms and target completion dates. The actions are prioritized to help focus future efforts. Together, these sections are designed to make the Plan both strategic (through the identification of long-term goals) but also functional through the identification of short-term and immediate actions that will guide day-to-day decision-making and project implementation. In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program, regulatory, and policy mitigation alternatives. These types of

actions can also help achieve other economic, social, and environmental goals. Each action was evaluated for its appropriateness for the planning area.

**Plan Maintenance Procedures** (Phase 4); found in **Section 7**, include the measures that the county and participating jurisdictions will take to ensure the Plan's continuous long-term implementation. These procedures provide a framework to keep the plan current, dynamic, and effective so that over time that becomes integrated into the routine decision making process. The procedures also describe how the Plan will be regularly evaluated and updated to remain a current and meaningful planning document and meet FEMA requirements.

For Phase 5, **Plan Adoption**, copies of the resolutions for adoption of this Plan from each community will be placed right after the Table of Contents once the Plan has been 'approved pending adoption' by FEMA and each participating jurisdiction has passed their resolution.

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## 2 Planning Process

While the hazard mitigation plan update is the final product, it is the planning process, where community resources are organized to best minimize or manage those risks, which is the true legacy of this effort. This section consists of the following subsections:

- Hazard Mitigation Planning Team
- Data Collection
- Meetings
- Public Involvement and Outreach
- The State Hazard Mitigation Plan
- Agency and Organization Coordination
- Future Development Trends

### 2.1 Hazard Mitigation Planning Team (HMPT)

In October 2015, Quay County entered into a contractual agreement with the consulting firm AECOM for assistance in the preparation of the Quay County Hazard Mitigation Plan Update. Initially the participating jurisdictions include Quay County, the City of Tucumcari, the Village of House, the Village of Logan, and the Village of San Jon. As the plan progressed it was determined that the Villages of Logan, San Jon, and House would not be participating. The funds for the contract were from a hazard mitigation planning grant approved by the Federal Emergency Management Agency (FEMA) and the State of New Mexico Department of Homeland Security and Emergency Management (DHSEM). The planning lead from Quay County is Curtis Simpson, Quay County Emergency Manager.

AECOM was led by an experienced professional hazard mitigation planner, Ms. Rhonda Murphy, a Certified Floodplain Manager (CFM); with assistance from experienced professional mitigation planners, Ms. Shubha Shrivastava, CFM; and Mr. Brent Edwards; and was managed by Mr. Jim DeAngelo, an experienced project manager leading the Albuquerque office Hazard Mitigation Team. AECOM and the participating jurisdictions followed the hazard mitigation planning steps, activities and process outlined in 44 CFR Part 201.6 and FEMA’s Local Mitigation Planning Handbook to develop this Plan. The completed Mitigation Plan Review Tool in **Appendix C** provides the location of where each requirement is met within the Plan.

**Table 2.1** provides a list of the HMPT members, representing a wide range of departments and each participating jurisdiction.

**Table 2.1: Quay County HMPT**

Name	Title	Email	Phone
Curtis Simpson	Emergency Management Coordinator	Curtis.simpson@quaycounty-nm.gov	(575) 461-8535
Richard Primrose	Quay County Manager	Richard.primrose@quaycounty-nm.gov	(575) 461-2112

## Hazard Mitigation Plan

June 2018

Name	Title	Email	Phone
Mike Cherry	Quay County Commissioner	mwcherry@hotmail.com	(575) 403-7331
Donald Adams	Quay County Fire Marshal	quaycofm@yahoo.com	(575) 403-7911
Russell Shafer	Quay County Sheriff	Russell.shafer@quaycounty-nm.gov	(575) 461-2720
Robert McClelland	Quay County GIS	Rob.mcclelland@quaycounty-nm.gov	(575) 461-1760
Jared Langenegger	City of Tucumcari Manager	manager@cityoftucumcari.com	(575) 461-3451
Mark Martinez	City of Tucumcari Fire Chief/Project Manager	markm@cityoftucumcari.com	(575) 461-2143
Ralph Lopez	City of Tucumcari Floodplain Coordinator/Project Manager	ralph@cityoftucumcari.com	(575) 461-2143
Rex Stall	Village of Logan Fire Chief	loganfd@plateautel.net	(575) 403-9801
Brenda Bishop	Quay County Extension Program Director	brbishop@nmsu.edu	(575) 461-0562
Jason Lamb	Quay County Extension Agent	jalamb@nmsu.edu	(575) 461-0562
Toni Stoner	Village of San Jon Treasurer	Villageofsanjon@plateautel.net	(575) 576-2922

The HMPT is leading the hazard mitigation effort for the planning area and will continue the planning process past approval into implementation and then a future update.

## 2.2 Data Collection – Existing Plans and Programs

The HMPT and AECOM were diligent in collecting best available and updated data during the 2015-2017 hazard mitigation planning process. The following plans, studies, and reports were evaluated for opportunities to integrate information related to hazard mitigation and incorporated into this planning process where appropriate.

- **2005 Quay County Regional Comprehensive Plan** – The Plan provided a regional overview of resources, land use, infrastructure, and economic development for the county and local jurisdictions. In addition, the plan provided a series of policies designed to implement the plan as well as goals and objectives and implementation actions and timelines.
- **Quay County Regional Comprehensive Plan Update 2010 Addenda** – The Plan provided good information about relevant changes since the 2005 plan, updated demographics, and revised goals, objectives, and policies.
- **2004 City of Tucumcari Comprehensive Plan** – The Plan provided good information about existing resources, land uses and development in the City, as well as goals, objectives, and policies for future development. The plan includes 46 recommended actions for implementation to meet the established goals, many of which were considered for incorporation into this plan.

- **2013 State of New Mexico Natural Hazard Mitigation Plan Update** – A summary of the latest update of the State Mitigation Plan was used to inform this Plan, which is summarized in Section 2.5.
- **2008 Quay County Community Wildfire Protection Plan (CWPP)** – Evaluated plan for wildfire risk assessment background information and mitigation project ideas. Captured appropriate information and project ideas for this plan.
- **2005 Quay County 40 Year Water Plan** – The Plan provided good information about water rights in the County and identified the most urgent needs within the County regarding maintenance and upgrading of local water and sewer infrastructure. The plan includes action summaries and implementation schedules for each jurisdiction.
- **2011 Village of San Jon Comprehensive Plan** – Plan provided background information and information on alternative energy projects and mitigation actions.

### 2.3 Meetings

The members of the HMPT were solicited for their voluntary participation in the development of the plan. An equal opportunity was given to all planning area residents to participate in the process through public announcements/notifications. The public meeting was advertised through the County's website and Facebook page, as well as the local newspaper. HMPT meetings were open to the public and all attendees were encouraged to participate in exercises and discussions. All meeting materials were available online prior to a scheduled meeting. It was the goal of this plan to have a committee that represented a broad spectrum of community stakeholders, including representatives from city government, emergency response organizations, health care, private businessmen, local environmental agencies, and neighboring communities and counties. **Appendix A** includes a list of stakeholders invited by email invitation to participate in plan development and the planning process, including non-participating jurisdictions. During the next planning cycle, Quay County will continue to broaden the scope of stakeholders by inviting additional surrounding counties and communities to participate in the planning process. The approved plan will be made available to the participating local jurisdictions, residents, and neighboring communities on the County's website.

The HMPT met several times during the course of preparing this plan, including several formal meetings as described below. Documentation for these meetings is located in **Appendix A**.

**December 3, 2015, Kickoff Meeting** – The Kickoff Meeting was the first formal planning meeting after Quay County officially contracted with AECOM to prepare the plan. This meeting was facilitated by AECOM (Jim DeAngelo) and attended by 15 members of the HMPT. Mr. DeAngelo opened the meeting with an overview of the purpose as well as introductions. He discussed the overall planning process including the data collection process, hazard identification, risk assessment and the mitigation strategies. Emphasis was given to linking the risk assessment to the mitigation strategy. A Hazard Mitigation Planning Survey was completed by HMPT members during the meeting. Meeting materials and sign in sheets are in **Appendix A**; returned surveys from the meeting are in **Appendix B**.

**April 7, 2016, Risk Assessment Meeting** – The Risk Assessment Meeting was facilitated by AECOM (Jim DeAngelo) and attended by 14 members of the HMPT. Mr. DeAngelo opened the meeting with an overview of the purpose as well as introductions. The team then reviewed each hazard and worked through a CPRI exercise to determine what hazard concerned the community. The mitigation goals were reviewed and the previous mitigation actions were discussed. The meeting continued with a capability discussion and a review of the draft plan. A Hazard Mitigation Baseline Survey was completed by HMPT members during the meeting. Meeting materials and sign in sheets are in **Appendix A**; returned surveys from the meeting are in **Appendix B**.

**September 21, 2017, Final Meeting** – The final meeting was held after the HMPT was provided a copy of the Final Draft plan. The mitigation goals were reviewed and the community's capabilities were discussed. The HMPT also reviewed the Implementation Strategy and Plan Maintenance sections of the plan. A comment collection form was provided to the attendees. Meeting materials and sign in sheets are in **Appendix A**; returned comments from the meeting are in **Appendix B**.

## 2.4 Public Involvement and Outreach

The HMPT pursued a number of avenues for notifying Quay County residents of this planning initiative. The planning team met several times during the course of preparing this plan, as detailed in the previous section. HMPT meetings were open to the public and all attendees were encouraged to participate in exercises and discussions. Meeting invitations were posted on the County's website and are included in **Appendix A**.

A public survey was developed to increase public input. This survey was posted on the County's website and was also distributed at public meetings. Two surveys and one comment collection form were submitted to the planning team throughout the process. The surveys were used to gauge the concerns of the public and to gather potential mitigation action ideas. Items from the surveys were not captured directly but were used as discussion points by the HMPT. Although not very much feedback was received, the feedback that was received was evaluated and incorporated into the plan as applicable. Returned surveys and forms are in **Appendix B**.

The standard process for Quay County to advertise countywide meetings and disseminate information is through the County's website and Facebook page, along with the local newspaper. The general public relies on the website for public announcements. Radio announcements may be considered during the next planning cycle.

## 2.5 The State Hazard Mitigation Plan and Mitigation Program

The 2013 New Mexico State Hazard Mitigation Plan was a critical document to review for this Plan and a valuable resource for risk assessment background information. The 2013 State Plan was reviewed for information on natural hazards and mitigation project ideas so that Quay County's plan was consistent with State information.

The 2013 State Hazard Mitigation Plan states that the goal of mitigation is:

*“...to save lives, reduce injuries, property damage and recovery times. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical facilities, reduce exposure to liability and minimize community disruption. Preparedness, response, and recovery measures support the concept of mitigation and may directly support identified mitigation actions.”*

The Quay County plan addressed nine natural hazards covered in the State Plan. Not all hazards in the State Plan have a significant impact in the planning area; if a hazard has a very low probability of occurring and/or has negligible impact, this is noted in **Section 4**.

The Local Plan Integration section of the State Plan lists four hazards as the most significant in the state:

- Wildfires
- Drought
- Thunderstorms
- High Wind

The State Plan divides New Mexico into six preparedness areas. Quay County is included in Preparedness Area #1, along with Guadalupe, Lincoln, DeBaca, Chavez, Curry, Roosevelt, Eddy, and Lea Counties. In State Preparedness Area #1, four hazards were ranked as the highest priority:

- Drought
- Floods/Flash Floods
- Severe Winter Storms
- Wildfire

The State’s mitigation goals were also reviewed and are closely aligned with Quay County’s goals:

- Reduce the number of injuries due to natural hazards
- Reduce the number of fatalities from natural hazards
- Reduce the amount of property damage, both public and private, from natural hazards
- Reduce the number of necessary evacuations
- Shorten recovery times for both community function and the natural environment after natural hazard events
- Improve communication, collaboration and integration among State, tribal and local emergency management agencies
- Increase awareness and understanding of risk and opportunities for mitigation among the citizens and elected officials of New Mexico

The State Plan was reviewed for mitigation action best practices and types of mitigation actions appropriate for Quay County. The State has been a valuable partner of Quay County and provided technical assistance during the development of this plan.

## **2.6 Agency and Organization Coordination**

From the beginning of the planning process until the final drafting of this plan in December 2017, Quay County has actively coordinated with multiple state and federal agencies to discuss

and evaluate risk reduction activities. Additional outreach efforts have included coordination with DHSEM to discuss risk and mitigation.

## **2.7 Future Development Trends**

The HMPT examined Quay County's existing limits, urban services boundary, and capital improvement program to determine areas of future growth and expansion. The team also examined the Quay County 2005 Regional Comprehensive Plan and 2010 Addenda, which covered all participating jurisdictions, and the 2004 Tatumcari Comprehensive Land Use Plan.

The 2014 Census estimated that the county has a population of 8,501 residents. Between the years 2000 and 2014, the population in Quay County declined by 16.29%. The continued decline in population has led to a decline in development. According to the 2014 census, zero building permits were issued in 2014. Very limited, sporadic development has occurred in the participating jurisdictions since the last plan update with a decline in housing throughout the planning area, so the overall vulnerability is similar or slightly lower in each jurisdiction.

Quay County has not experienced recent large scale population growth since the last planning cycle. The 2016 census numbers estimated a population of 8,365. Small scale development has occurred in the County primarily south of Tatumcari and around Ute Lake. The County and communities recognize the hazards of development in the floodplain and Wildland Urban Interface (WUI) zones.

Quay County and the incorporated communities' economies are driven by the agricultural industry, retail trade industry, public administration, the hospitality industry, and the education/ health and social services industries. There are a small number of manufacturers; however, greater diversification is needed County-wide to increase wages and promote population growth. Quay County has become the focus of wind farm development, which represents an opportunity for future economic growth.

### 3 Hazards Identification

In 2013, the DHSEM updated its State Hazard Mitigation Plan and identified 14 natural hazards which had the greatest impact on the State, as shown in **Table 3.1**.

**Table 3.1 Hazards Identified in State Plan**

Hazard Category	Hazard Type	Hazard Category	Hazard Type
Atmospheric	Extreme Heat High Wind Thunderstorm (Hail/Lightning) Tornado Severe Winter Storms	Geologic	Earthquake Expansive Soils Land Subsidence Volcano Landslide
Hydrologic	Drought Flood	Other	Wildland/Urban Interface Fire Dam Failure

This Plan uses the State’s hazard identification as a basis to analyze the impacts of these 14 natural hazards. The HMPT carefully screened each hazard with the goal of refining the list to reflect the hazards that pose the greatest risk to the jurisdictions represented in this plan. All hazard-specific information and analysis for profiled hazards is provided in **Section 4**. Several hazards listed in the State Hazard Mitigation Plan were excluded from additional consideration as they present little to no risk to the planning area, as follows:

- **Landslide** – There were no previous occurrences of landslide events reported in Quay County. Per the 2013 State Plan and other past research, no records of past landslides have been found for the planning area. Based on historic records Quay County does not appear to be vulnerable to landslide. Any impact would be minor. Therefore the hazard is considered a nuisance and is not addressed in the rest of the plan.
- **Land Subsidence** – Based on historic records Quay County does not appear to be vulnerable to subsidence. Any impact would be minor. Therefore the hazard is considered a nuisance and is not addressed in the rest of the plan.
- **Volcano** – Most volcanism that occurred near Quay County took place more than one million years ago; the youngest volcanic deposits are tens of thousands of years old<sup>2</sup>. The 2013 State Plan indicates that there are no estimates of future occurrence of volcanic activity in New Mexico in the near future. New Mexico’s numerous volcanoes are considered dormant, but not extinct. The State Plan reports an extremely low probability of a volcanic eruption in the next 10 years (.01%); therefore, the probability of volcanic eruption is considered **“Highly Unlikely”**. Given the very low probability of occurring and the lack of previous occurrences, this hazard was not deemed a significant threat to the planning area and is not addressed further in the plan.

<sup>2</sup> Kues, Barry S., and Callender, John, F., 1986, Geologic History, Contribution to New Mexico in Maps, edited by Jerry L. Williams: University of New Mexico Press.)

- **Expansive Soils** – Due the low frequency of this hazard and its minor potential impact, it is considered a nuisance and is not addressed in the rest of the plan.
- **Dam Failure** – No known dam incidents and/or failures involving notable property damage have occurred in Quay County. Conchas Dam, located in San Miguel County and owned by the Bureau of Reclamation, as a federally-owned dam, is required to maintain an Emergency Action Plan (EAP). EAPs include inundation maps as well as lists of critical facilities that may be threatened by the dams. Failure of Conchas Dam would pose little to no threat to Quay County or any municipalities located within Quay County. Likewise, the Ute Dam owned by the New Mexico Interstate Stream Commission (ISC) last prepared an EAP in 1995. Copies of the EAPs are located at the Quay County Emergency Manager's office. There is a low probability of dam failure in Quay County. The Conchas and Ute Dams and Reservoirs are considered to be maintained satisfactorily, and failures during normal operation are unlikely. Therefore, the vulnerability in Quay County due to dam failures is considered to be very low.
- **Hazardous Materials Release (HazMat)** – Is a concern of the communities within Quay County. However, for the scope of this update the HMPT determined that HazMat evaluation, planning, and review would be best approached as part of a Threat and Hazard Identification and Risk Assessment plan. Therefore, HazMat has not been detailed in this plan.

All hazard-specific information and analysis is provided in **Section 4**.

### 3.1 Major and National Emergency Disaster Declarations

Complementing the Hazards Analysis and Risk Assessment section is a review of the past major disaster declarations that impacted Quay County and the participating jurisdictions. Major disasters are declared by the President of the United States when a disaster event is of such severity and magnitude that effective response is beyond the capabilities of the State and the local governments. In these situations, eligible applicants may apply for a wide range of federal disaster assistance that includes funds for public assistance, individual assistance, and hazard mitigation assistance.<sup>3</sup>

Since 1954, Quay County has received one presidential disaster declaration for severe storms and tornadoes as listed in **Table 3.2**. This listing does not include all state or local emergency declarations issued for localized disaster events that did not warrant a presidential declaration.

**Table 3.2: Presidential and Emergency Disaster Declarations in Quay County (1954 –2017)**

Event	Declaration Date	Declaration Number
Severe Storms and Tornadoes	04/02/2007	FEMA-1690-DR

*Source: Federal Emergency Management Agency*

<sup>3</sup>For more information on the disaster declaration process and federal disaster assistance, see <http://www.fema.gov/disasters> Accessed March 2016

## 4 Hazards Analysis and Risk Assessment

In this section of the plan, the HMPT reviewed nine natural hazards identified as posing a threat to the planning area for each hazard's potential to impact the planning area. The nine hazards were selected based on the historical record and expertise of the HMPT members as having the greatest potential for significant impact on Quay County and the participating jurisdictions. For each hazard type, the plan describes the locations that can be affected, the potential severity, and previous occurrences in Quay County. This information is used to estimate the probability of an occurrence of the hazard in any given year. The plan describes the impact of each hazard and the planning area's vulnerability to it. As described in Section 3, several hazards were determined to be insignificant to the planning area, posing little to no threat, and were not addressed further, including Landslide, Volcano, Land Subsidence, Expansive Soils, and Dam Failure.

### 4.1 Methodology

Seven primary sources of data were used to profile, describe, and analyze the hazards.

1. Experience and knowledge from the HMPT as captured in site visits and meetings
2. Existing local plans and data
3. Extensive records from the National Climatic Data Center (NCDC, now known as the National Center for Environmental Information)<sup>4</sup>
4. The September 2013 New Mexico State Hazard Mitigation Plan
5. Studies, data, and reports by USACE and other federal agencies
6. The FEMA 2017 Disaster Declaration database
7. Resources published on the Internet with relevant information. These sources are referenced in footnotes.

Each hazard profile is organized in the following manner:

- *Overview* – General description of the hazard
- *Location and Spatial Extent* – Specific areas in Quay County that may be affected and the extent. Any available maps displaying risk are shown.
- *Previous Occurrences* – List and description of past events where available.
- *Probability and Extent of Future Events* – Establishes the likelihood of the hazard occurring annually and extent of damages if it occurred (severity)
- *Vulnerability and Impact* – The level of impact currently and on future development
- *Conclusions* – Includes summary statements about the hazard, any mitigation accomplishments, and establishes link to Mitigation Actions in Section 5.

In each hazard profile, hazards are assigned varying degrees of risk in five categories (probability, impact, spatial extent, warning time, and duration) as shown in **Table 4.1**.

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<sup>4</sup> National Center for Environmental Information website: <https://www.ncdc.noaa.gov/stormevents/>

**Table 4.1: Degree of Risk**

	Level	Criteria	Index Value	Assigned Weighting Factor
<b>Probability</b>	Highly Unlikely	Probability so remote close to 0% annual probability	0	40%
	Unlikely	Less than 1% annual probability	1	
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 50% annual probability	3	
	Highly Likely	Between 50 to 100% annual probability	4	
<b>Impact</b>	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	20%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
<b>Spatial Extent</b>	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
<b>Warning Time</b>	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
<b>Duration</b>	Less than 6 hours	Self-explanatory	1	10%
	Less than 24 hours	Self-explanatory	2	
	Less than 1 week	Self-explanatory	3	
	More than 1 week	Self-explanatory	4	

At the end of this section is a summary of the vulnerability of Quay County and the participating jurisdictions to the nine identified natural hazards using the evaluation of each hazard with the categories from **Table 4.1**. Each jurisdiction independently evaluated the degree of risk posed by each hazard specific to their community.

## 4.2 Flood

### 4.2.1 Overview

Three types of flooding appear to be of the most concern in the planning area: flash flooding, storm water drainage, and riverine flooding.

**Flash Flood.** A flash flood is a very dynamic event in which a large volume of water moves through an area at high velocity in a very short time. This type of flooding can be very difficult to predict and can occur with little or no warning. In many cases, flash floods can move through an area miles from where rain has occurred, thereby increasing the danger to persons within the flood's path.

Flash floods are created as a result of rainfall. As rainwater runs into small channels, it begins to collect. As these channels merge together, the amount of water increases and picks up speed and force. This collection of water becomes a wall of water that can wash vegetation, structures, and other debris along with it. This debris then increases the amount of force available and increases its destructive power. In addition to the amount of water that creates a flash flood, other factors also affect the dynamics of this type of flood, including slope, width, and vegetation that is in place along the banks of the water course.

The slope that a flash flood traverses has a definite relation to the overall speed in which the water will travel. The steeper the incline, the faster the water will travel. The incline on which the water moves affects the width of the flooding area. Generally, the faster the water moves, the narrower the channel will be created, since the water digs the channel deeper as it flows. When the water flows on a shallower slope, it tends to spread out more, which can decrease its potential to cause mass damage. However, it must still be considered dangerous. Finally, the type of vegetation located along the flood's path can prevent further erosion of the channel banks. A structure that lies along a flood channel that has no surrounding vegetation is at risk of having its foundation undercut, which can cause structural damage, or in some cases, a building's complete collapse.

**Storm Drainage.** As rain falls on any given area, some of the water will be absorbed into the ground. However, the water that is not absorbed or ponded on site will run off. Depending on the area's flatness and the presence of a storm drainage system, this water can create localized flooding. Since the water will flow to the lowest possible location, these areas become temporary holding ponds. The water then evaporates back into the atmosphere, is absorbed back into the earth, or is physically removed using pumps or other equipment.

Depending on the angle of the slope, passing storm waters develop a tremendous amount of force. In such instances these waters can damage structures, push debris in front of them much like a flash flood, and cause soil erosion.

**Riverine Flooding.** The Canadian River runs through Quay County. Though protected by a levee system, deteriorated conditions throughout the system have left many areas of Quay County susceptible to flooding. When it rains, it can cause flooding along its path. The amount of water flowing through a river at any given time determines the river's depth. When a higher than normal amount of water finds its way into a river or stream, the height of the water relative to its path increases. When this occurs, the river will overflow its normal banks and flood the surrounding area to the water's present height. The height of the river's banks determines how far a flood will spread. This type of flooding, like flash flooding, will begin at some point above where the flooding occurs.

The current Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRM) for the incorporated and unincorporated areas of Quay County have an effective date of May 5, 2003.

#### **4.2.2 Location and Spatial Extent**

The population centers of Quay County are the primary areas of concern for flooding. For this mitigation update jurisdictions were asked to identify the primary flooding concern. Not all jurisdictions reported flooding concern and additional data was not available; this data deficiency limited the assessment for this hazard. Available mapping was used to create floodplain maps for west Tucumcari, central Tucumcari, and the Village of San Jon shown in **Figures 4.1a, 4.1b** and **4.2**. There are no mapped flood hazards in the eastern part of Tucumcari.

Although no specific flood mapping exists at this time for the unincorporated areas of Quay County not situated near Tucumcari or San Jon, the county is cross-crossed with ephemeral and seasonal streams and can expect to experience flooding on these streams. However, the impacts of such flooding would generally be limited to erosion and possible livestock or crop losses.

An area of concern for the Village of San Jon exists along San Jon Creek. The creek has a small streambed that is undefined at times. The creek crosses US 39 one mile south of the Village at a low point on the highway with no culvert. The slope of the streambed is approximately 25 feet per mile. This very flat slope, the low capacity of the streambed, and the shallow topographic relief of the floodplain result in widespread flooding moving at a low velocity.

Tucumcari Lake has been the principal flood problem during historical floods for the City of Tucumcari. The lake formed in a natural depression some 60 or 70 feet below the surrounding surface. There is no natural outlet and the lowest point for outside drainage is about 45 feet above the bottom of the depression. Prior to the completion of an irrigation system in 1950, the lake was frequently dry or covered a small surface area between periods of heavy runoff. Since the completion of the irrigation system, seepage, drainage and other flowing water from the irrigation system maintain the lake at several hundred acres of water-surface area.<sup>5</sup>

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<sup>5</sup> Quay County Flood Insurance Study, FEMA, May 2003

Figure 4.1a: Tucumcari Flood Hazards (West)

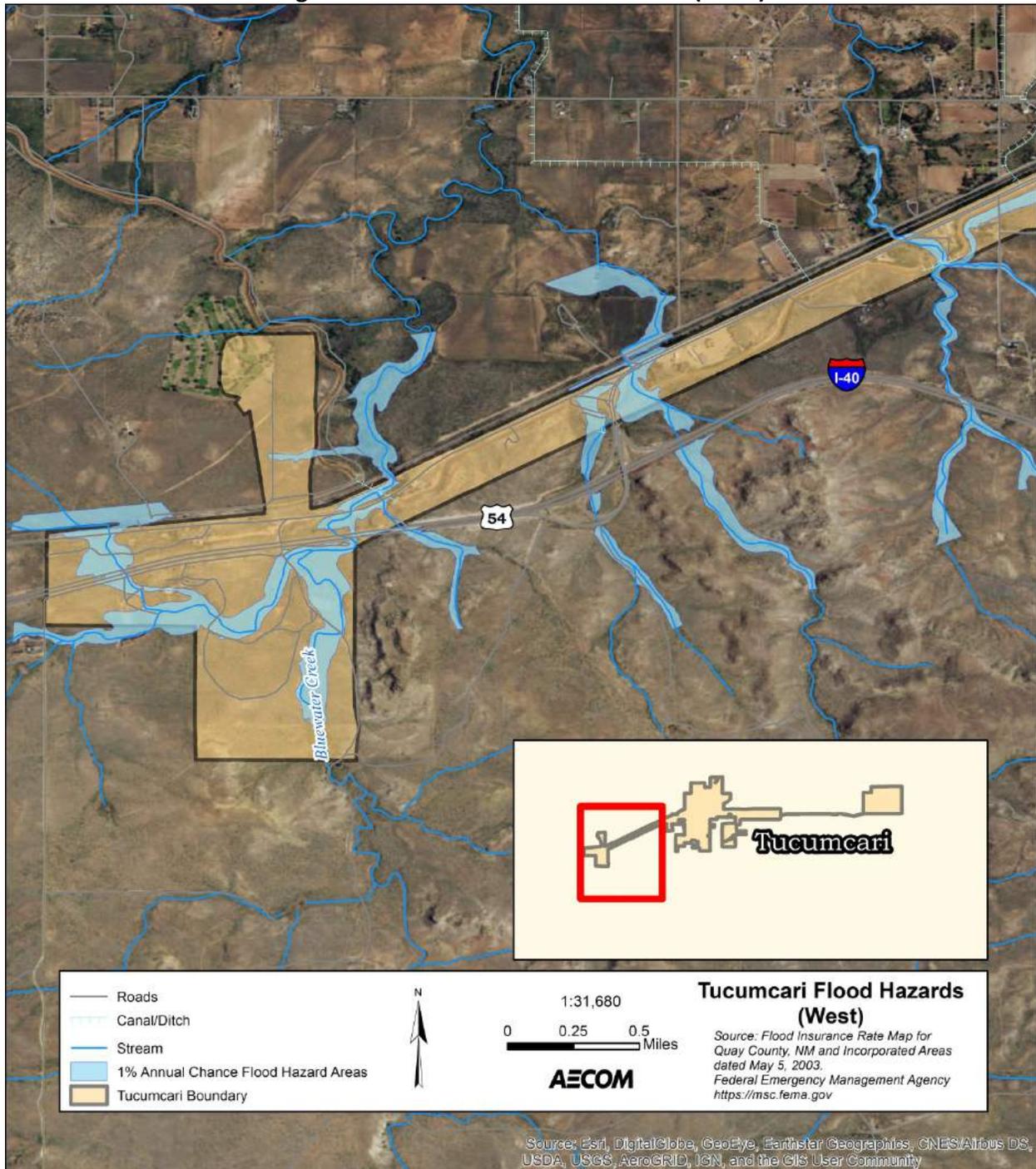


Figure 4.1b: Tucumcari Flood Hazards (Central)

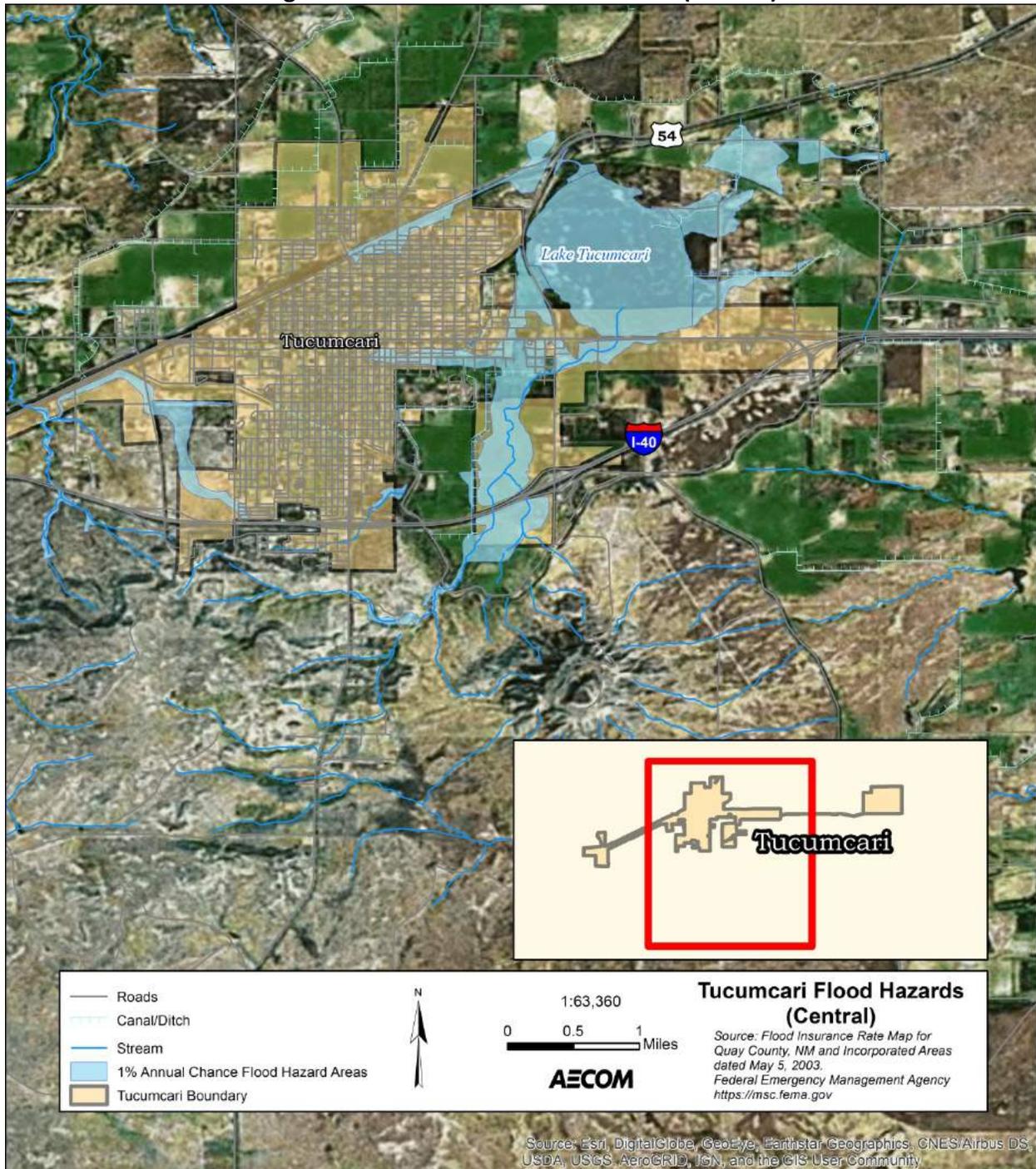
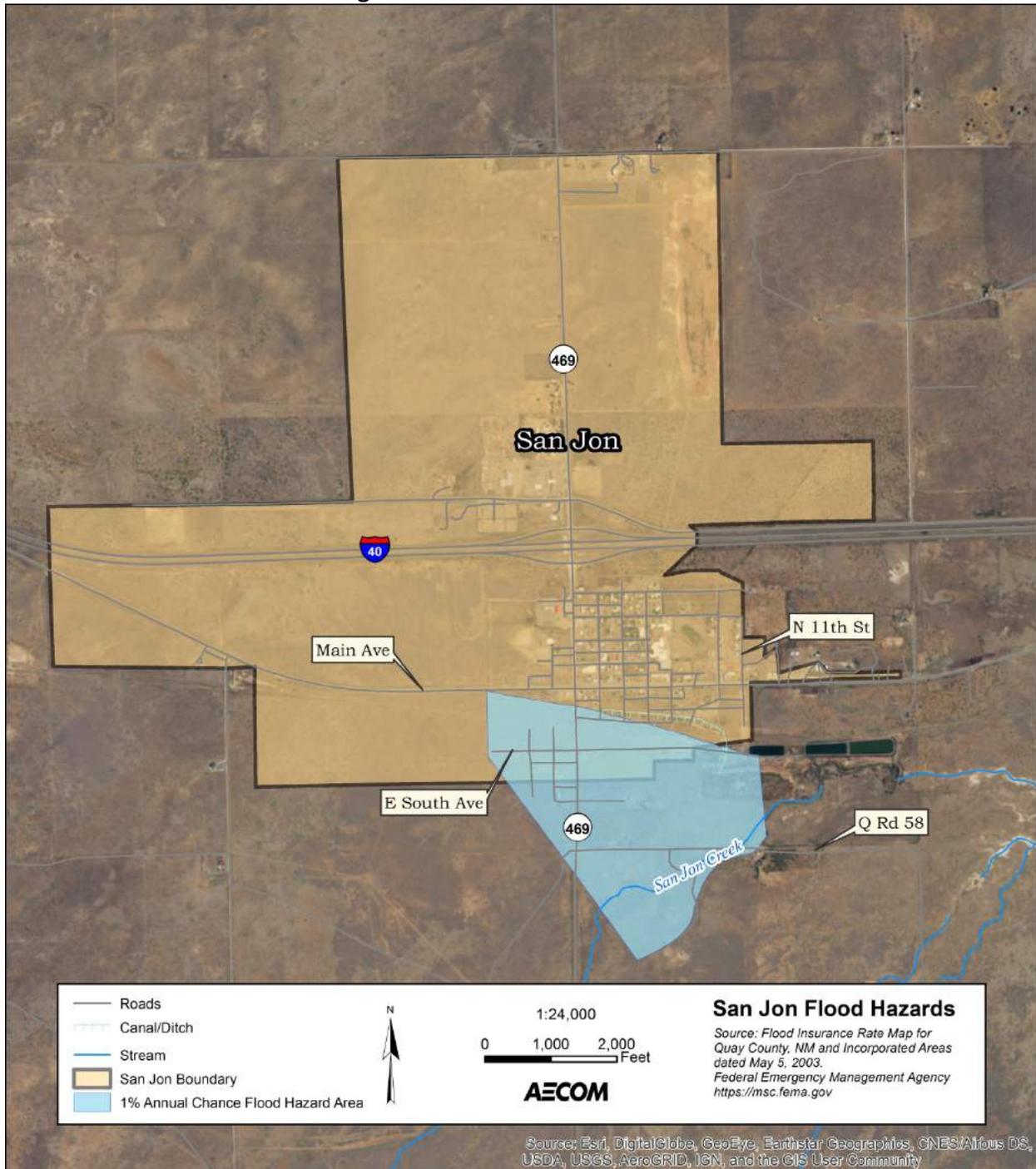


Figure 4.2: San Jon Flood Hazards



### 4.2.3 Previous Occurrences

New Mexico has a long history of flash flooding problems. Many minor flash flood events occur each year during New Mexico's summer monsoon season. Due to the small-scale and localized nature of these events, no consistent records are available. However, Quay County has suffered damage from floods and localized flash flooding almost every year.

According to the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC), there have been 13 reported flash flood events in Quay County from January 1, 1996 (the start date of Storm Events Database) through November 30, 2017. **Table 4.2** lists event locations along with associated damages.

**Table 4.2: Quay County Previous Flood Events**

Location	Date	Event Type	Property Damage
Ragland	8/20/1997	Flash Flood	\$0
San Jon	7/30/1998	Flash Flood	\$1,000
Tucumcari	7/31/1999	Flash Flood	\$0
Tucumcari	6/19/2003	Flash Flood	\$0
San Jon, Glenrio, Tucumcari	8/14/2004	Flash Flood	\$0
Tucumcari	9/1/2005	Flash Flood	\$0
Tucumcari	7/6/2006	Flash Flood	\$100,000
Tucumcari	5/28/2008	Flash Flood	\$15,000
Lesbia	7/9/2008	Flash Flood	\$0
Tucumcari	8/16/2008	Flash Flood	\$25,000
Logan	6/23/2010	Flash Flood	\$0
Quay	8/28/2010	Flash Flood	\$0
Quay, Nara Visa	6/7/2014	Flash Flood	\$0
House	5/31/2016	Flash Flood	\$0

Source: NCDC

According to the FIS for Quay County, New Mexico and Incorporated Areas (May 2003), a major flooding event occurred on July 20, 1972. An article in the Tucumcari News dated July 24-26, 1972, reported that as a result of a flood on San Jon Creek, the south side of the Village, south of US 66 (Interstate 40), appeared to be sitting in a lake. During the night of July 20, several families were forced to leave their homes as floodwater entered the Village. The flood resulted from a rainfall of approximately 7 inches over a 2-day period with depths of 4 to 5 feet reported at some locations along US 39, south of US 66.

According to DHSEM, in December 1996, a flood disaster was declared by the State for Quay County with a total cost of \$74,801. On July 30, 1998, two separate thunderstorms merged over eastern New Mexico producing heavy rain, brief hail and strong wet microbursts over Quay County. Torrential rains of 2-4 inches caused extensive road flooding over southern Quay County from San Jon and Wheatland west to Ragland. As storms bowed northward over the Logan and Ute Lake area of northern Quay County, a large microburst overturned several recreational vehicles and destroyed a number of boat sheds west of Logan.

#### **4.2.4 Probability and Extent of Future Events**

Flooding occurs on a regular basis in the planning area and can be expected to continue, both from rainfalls of just 2-4 inches over a short time period resulting in damaging flash floods, and from monsoonal rains building over days to flood lakes and low-lying areas. While the impact of these events will depend on their location and the specific circumstances existing at the time, both Quay County and Tucumcari can expect to be regularly impacted in the future. Quay County and all participating jurisdictions rank the future probability of floods as **“Highly Likely”**.

#### **4.2.5 Vulnerability and Impact**

The current U.S. Census estimates for 2016 shows that Quay County has 5,545 homes at a median value of \$76,300. Approximately 131 residential structures and 15 businesses are located in a FEMA-designated Special Flood Hazard Area. Planning area assets that are at risk from flooding exceed \$10,658,000 in value.

For this update there was a data deficiency in cataloging and studying the complete expected damages from flooding within Quay County due to lack of detailed data for portions of the County. Future plan updates should consider more study of the flood risk. Flooding will cause an increase in the demands placed on first response capabilities and increase delays in providing normal service to the community.

#### **4.2.6 Conclusions**

Flooding is a significant concern for the County and participating jurisdictions. Heavy rains during the typical monsoon season could result in homes and businesses flooding, damaging the economy of Quay County. Flash flooding and impassable egress routes are primary concerns during flood events.

### **4.3 Wildland Fire/Wildland-Urban Interface (Wildfire)**

#### **4.3.1 Overview**

A wildfire is an uncontrolled fire spreading through vegetative fuels, threatening and possibly consuming structures and other community assets. Wildfires can begin unnoticed in wildland areas and can spread quickly, creating dense smoke that may be seen for miles. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines and similar facilities. A wildland urban interface fire is a wildfire in an area where structures and other human development meet or intermingle with wildland or vegetative fuels.

In New Mexico, periodic prolonged droughts lead to higher wildfire risk. To exacerbate the wildfire risk problem is windblown dry air (typical of New Mexico). This dry wind creates a ‘hairdryer’ effect and further dries out vegetation making it more combustible.

After a fire starts, it can burn as three different burn types: surface, ground, and crown fire, or a combination of all three. A surface burn consumes the ground cover and is limited to the

surface, a ground fire burns roots and plants beneath the soil, and a crown fire burns the tops of trees and vegetation<sup>6</sup>.

The most common catastrophic wildfires are usually in forested areas where the fuel load is high. Potential consequences of wildfires include severe erosion and the silting of streambeds and reservoirs, which causes damage to the watershed and flooding due to a loss of ground cover.

WUI maps for the planning area and the Quay County Fire District Map are shown in **Figures 4.3 to 4.7**. A listing of the Fire District Chiefs serving at the time of this planning process is shown in **Table 4.3**.

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<sup>6</sup> Cohen, Jerry, 2003. *The Impact of Fire on Ecosystem*, University of Texas

Figure 4.3: Tucumcari WUI

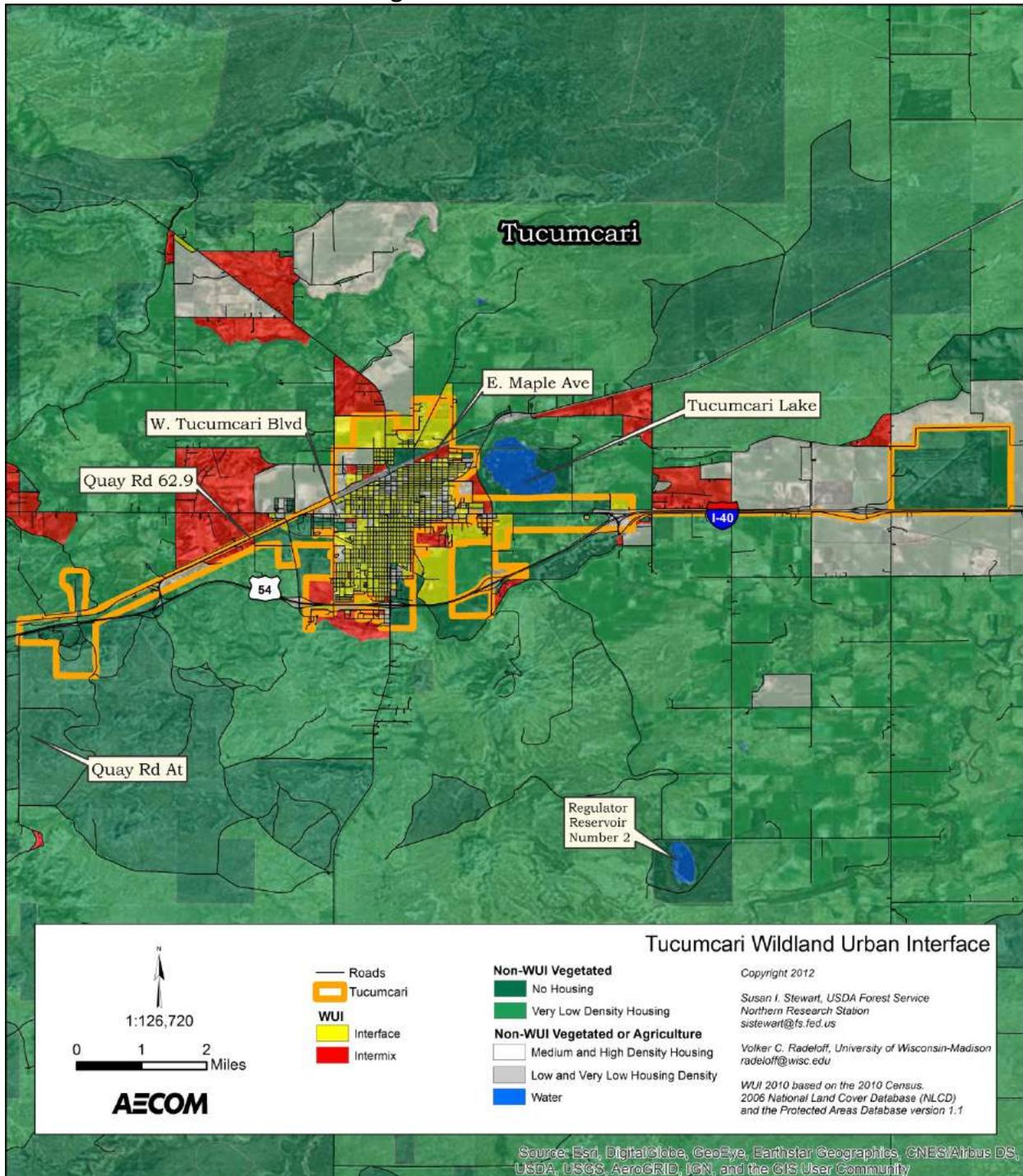


Figure 4.4: House WUI

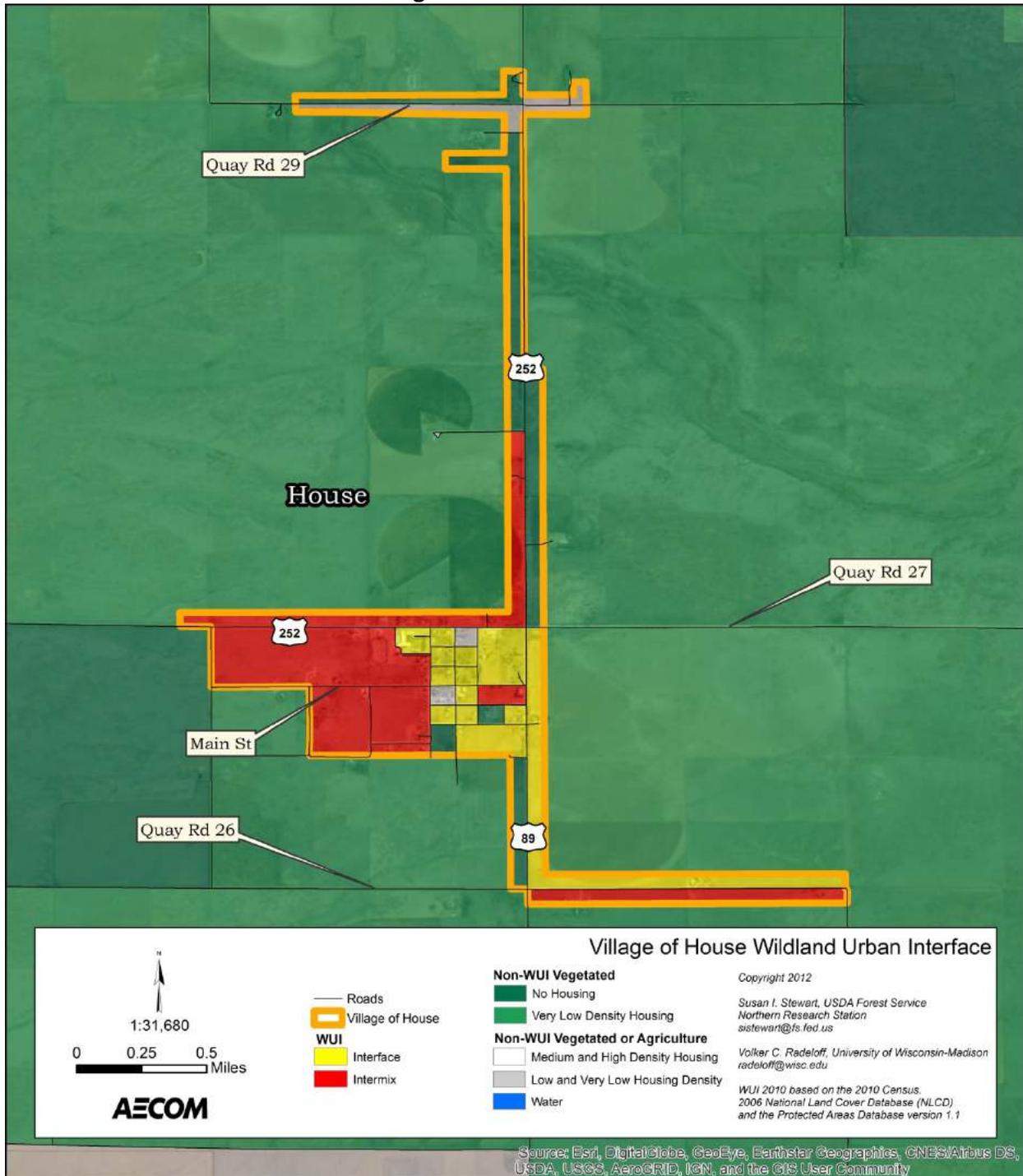


Figure 4.5: Logan WUI

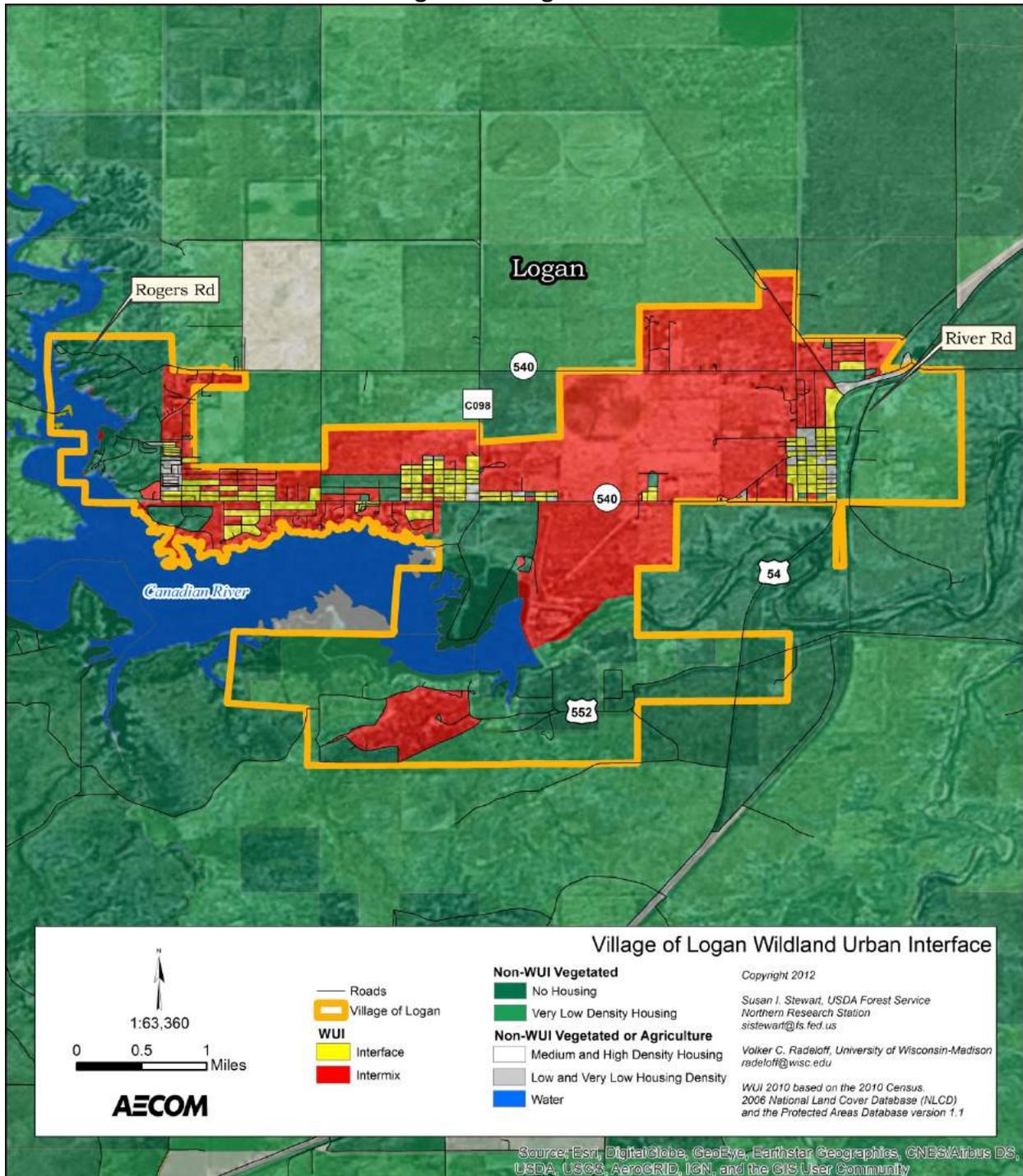


Figure 4.6: San Jon WUI

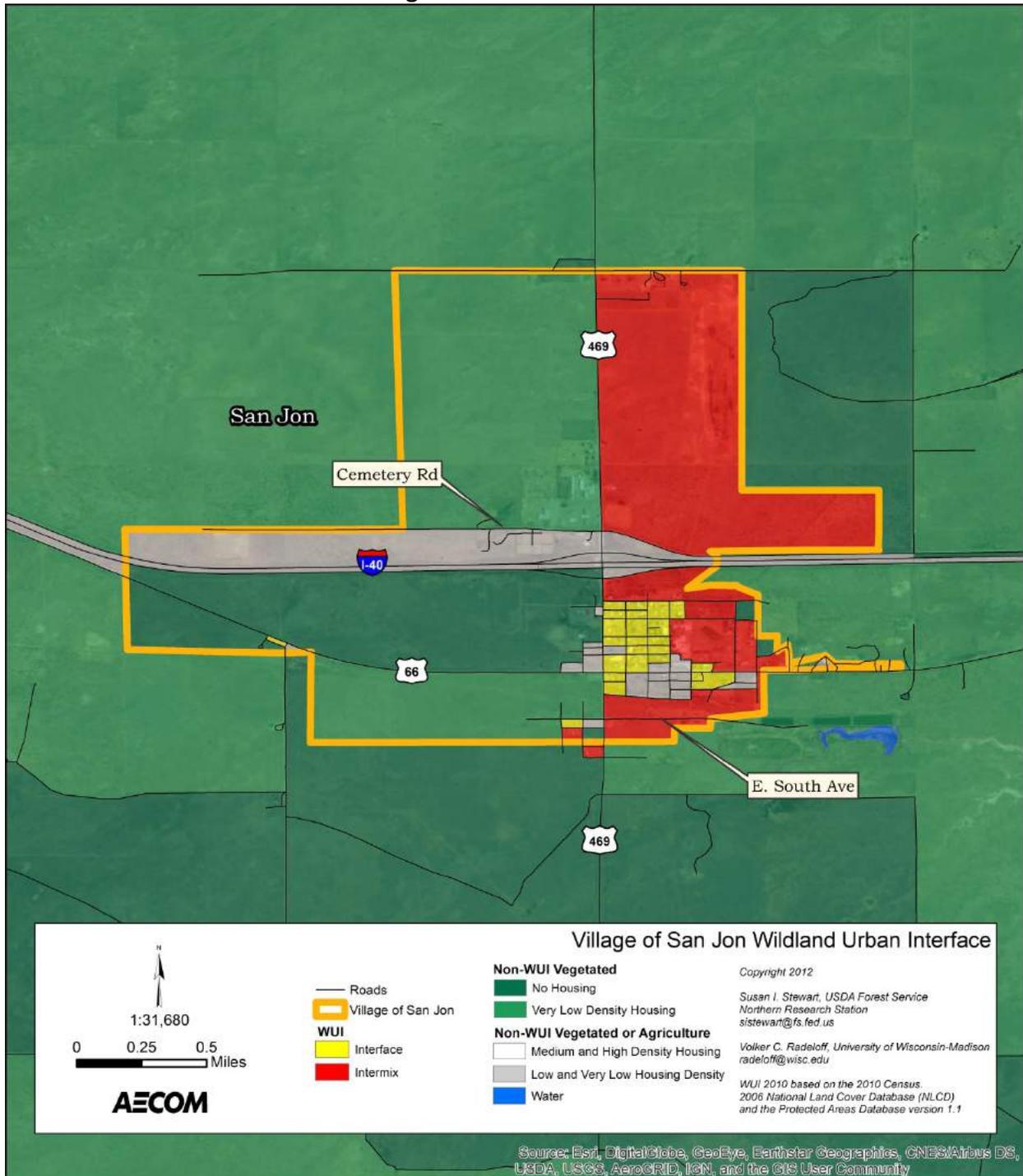
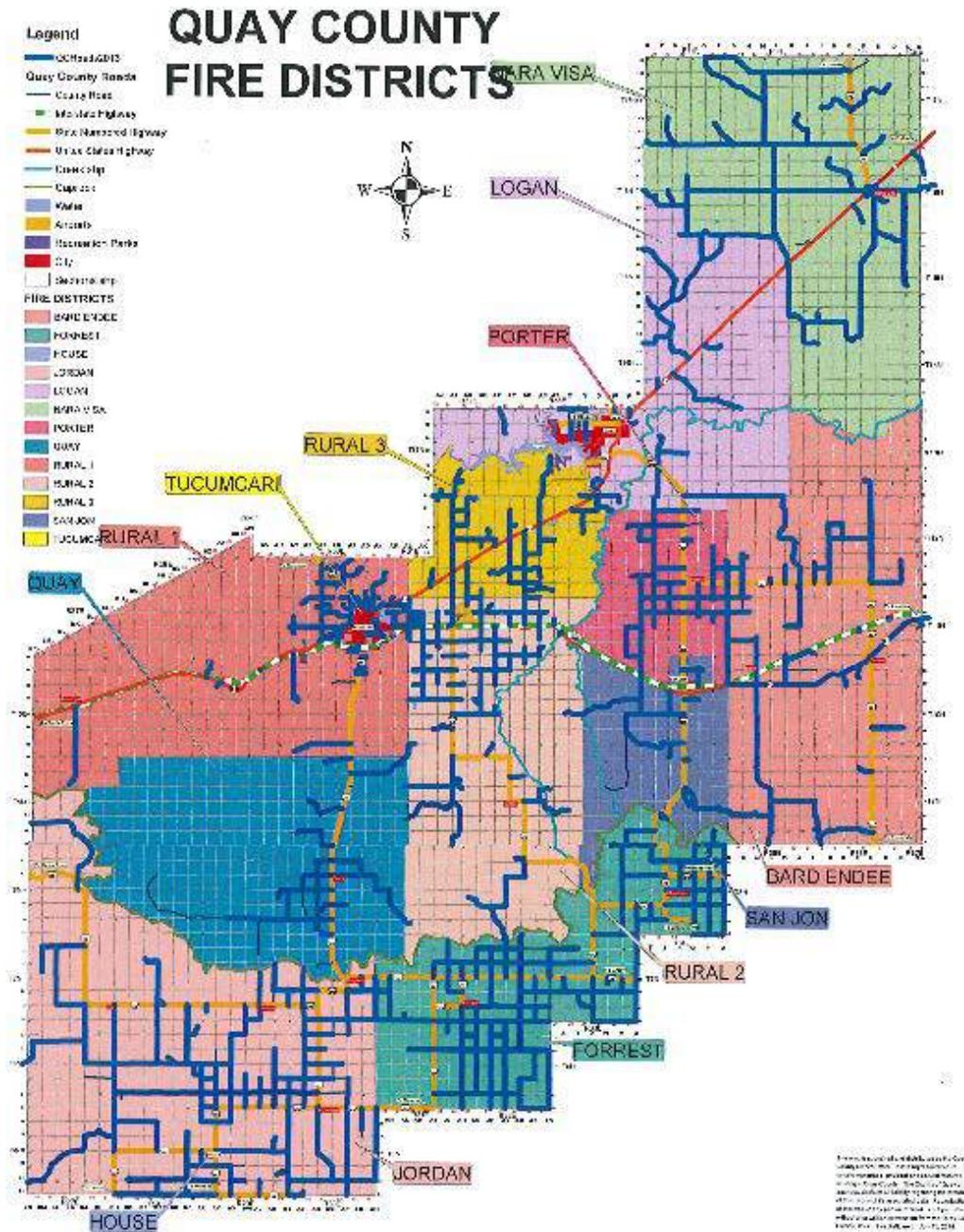


Figure 4.7: Quay County Fire Districts



Source: Quay County

**Table 4.3: Fire District Contacts (2017)**

Quay County Fire Districts	
Department	Chief
Rural District 1	John Hinze
Rural District 2	Danny Wallace
Rural District 3	Del Choate
Quay	Gerald Hight
Bard-Endee	Donald Adams
Porter	Austin Gibson
Nara Visa	Gary Girard
Forrest	Joe Garrett
Jordan	Tedd Tatum
Municipal Fire Departments	
Department	Chief
House	Bill Runyan
Logan	Rex Stall
San Jon	Craig Brashear
Tucumcari	Mark Martinez

#### 4.3.2 Location and Spatial Extent

The Keetch-Bryam Drought Index (KBDI) was developed specifically for fire potential assessment. It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers. It is a continuous index, relating to the flammability of organic material in the ground.

The KBDI attempts to measure the amount of precipitation necessary to return the soil to full field capacity. It is a closed system ranging from zero to 800 units and represents a moisture regime from zero to eight inches of water through the soil layer. At eight inches of water, the KBDI assumes saturation. Zero is the point of no moisture deficiency and 800 is the maximum drought that is possible. At any point along the scale, the index number indicates the amount of net rainfall that is required to reduce the index to zero, or saturation.

The inputs for KBDI are weather station latitude, mean annual precipitation, maximum dry bulb temperature, and the last 24 hours of rainfall. KBDI levels and the relationship to expected fire potential are reflected in **Table 4.4**.

**Table 4.4: Keetch-Byram Drought Index**

<b>0 – 200</b>	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.
<b>200 – 400</b>	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 possible through the night.
<b>400 – 600</b>	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.
<b>600-800</b>	Fires will burn to mineral soils. 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.

Typical conditions in the planning area from September through December usually center on the 200-400 rating while January through August are usually drier months and, depending on fuel and moisture, usually will rate in the 400-600 range. During extreme dry and drought times, typically in the months of May, June, and July the county may be rated at 600-800.

Wildfires in Quay County can occur in fields, grass, and brush as well as in the forested areas. Much of the County consists of irrigated cropland and dry rangeland with occasional stands of junipers. Potential aftermath of wildfires includes severe erosion and the silting of streambeds and reservoirs, resulting in damage to the watershed, and flooding due to a loss of ground cover.

#### 4.3.3 Previous Occurrences

The Forestry Division of the New Mexico Energy, Minerals, and Natural Resources Department lists 87 reports of fires requiring emergency response from 1997 to 2003 in Quay County. During this period, a total of 36,500 acres burned with an estimated expenditure of \$127,041. The most recent wildland grass fires in Quay County burned over 100 acres. There has been an average of 10 wildland grass fires per year over the last three years, totaling approximately 800 acres burned.

The NCDC site details one notable wildfire since 2005 in Quay County. The “Windy Fire” blaze originated three miles east of McAlister. The fire quickly spread under very windy conditions along the Curry and Quay county line. One unoccupied residence was burned along with six outbuildings. In all, 32,143 acres were scorched.

In June of 2017, the Griffith fire consumed 5,120 acres of Quay County near Nara Visa. The fire was extinguished on June 21, 2017. Several fire fighters were injured, with one volunteer firefighter losing his life.

#### 4.3.4 Probability and Extent of Future Events

The potential for wildfire is present throughout Quay County. The location where a wildfire occurs becomes the overriding concern. The severity of a wildfire is relatively low for the rural parts of the county but higher for particular areas near Tucumcari that constitute a wildland-

urban interface. The severity potential is also high along Interstate 40 and the railroad lines due to the combination of a high volume of traffic and the transportation of hazardous materials.

The probability of another wildfire in Quay County is “**Highly Likely**”.

#### 4.3.5 Vulnerability Assessment and Impact

Future wildfires in Quay County could cause substantial loss of property, along with direct and indirect economic effects for residents and community businesses. In Quay County there are more than 2,883 square miles vulnerable to bosque and grassland fires. Due to the recent drought situation in Quay County, virtually all areas of the County could be designated seasonally as high or extreme fire danger. Fire damage to rangeland would result in a short-term economic loss. A greater economic loss would be impacts to the approximately 5,545 housing units in Quay County, with a median value of \$76,300 per structure, occupied by approximately 8,365 people. In addition, an estimated 35 critical facilities within Quay County could be identified as vulnerable to wildfire. Due to security concerns, the names of specific facilities vulnerable to wildfire are not included in this document. However, Quay County maintains the list at its Emergency Operations Office. For this update there was a data deficiency in cataloging and studying the expected damages from wildfire within Quay County. Future plan updates should consider more study of the wildfire risk.

#### 4.3.6 Conclusions

Past experience has proven that wildfires can be a significant threat to the citizens, structures, infrastructure, and natural resources within Quay County. Quay County has been divided into Fire Districts as shown in **Figure 4.7**. Wildfires in Quay County have the potential to impact all 5,545 housing units, with an aggregate value of over \$405 million. Other assets at risk in this hazard area include 35 critical facilities. As a result, the HMPT has identified the wildfire hazard as a priority in the Plan.

### 4.4 Drought

#### 4.4.1 Overview

A drought is a period of prolonged dryness that contributes to depletion of water supplies, both underground and on the surface. Drought is a natural climatic condition caused by an extended period of limited rainfall (less than normal) in a broad geographic area. High temperatures, high winds, and low humidity exacerbate drought conditions. Human demands and actions also exacerbate drought-related impacts.

Droughts are often categorized as meteorologic, hydrologic, agricultural, or socioeconomic:

- A meteorologic drought is defined by a period of less than average or normal precipitation.
- A hydrologic drought occurs when a meteorologic drought begins to affect surface and subsurface water supplies.
- An agricultural drought refers to the effects of a meteorologic or hydrologic drought in terms of soil moisture and its relation to plant life, usually crops.

A socioeconomic drought is when the water shortages affect public health and economic activity including agriculture. The National Weather Service (NWS) and the United States Department of Agriculture (USDA) collaborate with academic institutions to categorize drought. Taking input from these entities and local sources, the National Drought Mitigation Center (NDMC) through the U.S. Drought Monitor website issues a state by state weekly drought severity assessment using these categories shown in increasing intensity from top to bottom:

- **D0** – Abnormally dry
- **D1** – Drought - Moderate
- **D2** – Drought - Severe
- **D3** – Drought - Extreme
- **D4** – Drought - Exceptional

Droughts do the worst damage when they are prolonged and in New Mexico this is possible over multiple years like the droughts of the 1950s and the multi-year drought that ended in December 2013. While drought is a cyclical process, a growing population in New Mexico and an increasing threat from wildfire as a result of dry conditions make it a significant hazard.

#### **4.4.2 Location and Spatial Extent**

Droughts are common in New Mexico and Quay County. Drought is generally a broad geographic hazard that is not tied to site specific topographic and geologic features like flooding. The climate in Quay County is semi-arid with average annual precipitation of about 14 inches. In addition, due to the monsoon effect, most of the precipitation occurs from July to September annually. This normally small and concentrated annual precipitation causes extended periods of low flow in the State's rivers and streams. Any measurable decrease in precipitation rates can create drought conditions in a relatively short time. The entire county is at risk from all levels of drought.

Quay County officials consider any conditions indicating a D2 (severe drought) rating on the drought monitor scale would be a severe threat and appropriate warnings would be issued throughout the planning area. Possible impacts during a D2 drought include crop or pasture losses and water shortages necessitating issuance of water restrictions.

#### **4.4.3 Previous Occurrences**

New Mexico has always known drought which is a product of climate ranges. Archeological records indicate that drought has led to the collapse of early civilizations in New Mexico.

In the last 115 years, New Mexico has suffered four devastating periods of drought; 1900-1910, 1931-1941, 1942-1956, and 1974-1979. Other periods of drought include short-duration droughts in New Mexico in 1996<sup>7</sup> and 2008 (specific to northern New Mexico), and a severe drought that affected the State and the rest of the western U.S. in 2002-2003.

As shown in **Figure 4.8**, as of November 2017, a U.S. Drought Monitor map shows that western counties of New Mexico are experiencing abnormally dry or drought conditions, but the eastern

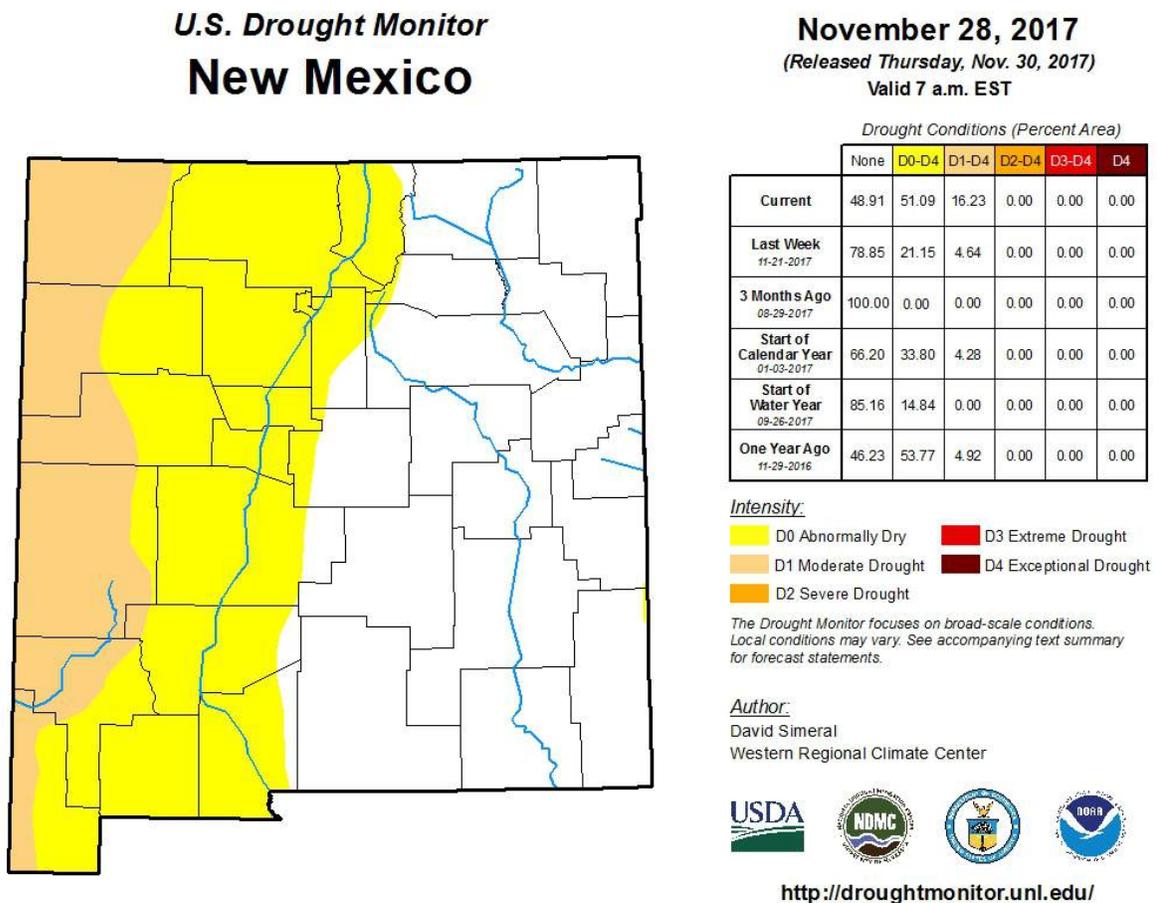
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<sup>7</sup> New Mexico Drought Task Force , May 2002

portion of the state, including Quay County, is not. The drought conditions have dramatically improved since the peak of the most recent drought, in 2013. This drought had also been in effect when the Governor of New Mexico declared a Drought State of Emergency on May 15, 2012. This drought declaration convened the New Mexico Drought Task Force, led by the State Engineer, to determine ways the State can prepare for and mitigate the effects of the drought.

Due to the fact that in May 2013, 44.14% of the state was at the highest level of drought intensity (Exceptional), and 81.68% was either Exceptional or Extreme (the second highest level), the drought that ended in 2013 is considered by some federal meteorologists as the worst one since the 1950's drought<sup>8</sup>.

**Figure 4.8: New Mexico Drought Map (as of November 28, 2017)**



Source: <http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?NM> Accessed December 2017

#### 4.4.4 Probability and Extent of Future Events

In a semi-arid region such as Quay County, the probability of recurring droughts with moderate to exceptional severity is “Likely”. The drought would likely affect the entire county. Droughts

<sup>8</sup> <http://www.abqjournal.com/192344/news/drought-is-worst-since-the-1950s.html> Accessed February 2016

can last from one season to over 40 years and should be expected at any time. The length of the recovery period is a function of the intensity of the drought, its length, and the quantity of precipitation received as the drought ends. There is scientific evidence suggesting that prolonged periods of drought are increasingly likely in the future in the planning area<sup>9</sup>.

#### 4.4.5 Vulnerability and Impact

When severe to exceptional droughts occur, they have significant consequences for water supply (drinking water and agriculture uses), water quality, fighting forest fires, agriculture and navigation and recreation. While the county considers a D2 drought a severe threat, based on experience and anticipated climate conditions, Quay County could experience all levels of drought, some far exceeding D2. When a drought begins, agriculture is usually first to be affected because of its heavy dependence on stored moisture in the soil. Soil moisture can be rapidly depleted during extended dry periods. Dryland farming and ranching are most at risk from drought. The impacts of drought on agriculture and rangeland increase with longer duration droughts and can have a significant long term impact on communities in Quay County. Impact on these activities can also be seen during a short-term drought. Water uses depending on in-stream flows, such as irrigated farms; aquatic, wetland, and riparian environmental communities; and recreational uses are at high risk. Urban and agricultural water users who rely on reservoirs and wells that are not dependent on high rates of aquifer recharge are the last to feel the effects<sup>10</sup>.

Drought affects the entire county and is a hazard that cannot be eliminated. In addition, drought is cyclic and will always be a potential problem. The effect on the county/city/village government infrastructure is the same as for the general public and poses no specific danger to the normal operation of government.

Drought affects the entire community by placing a higher demand on the present water supply systems. Drought also limits the amount of growth that can be expected for the county and its municipalities due to the lack of recharge of the already finite water supply. Additionally, a higher demand on the water system infrastructure can lead to disruption of service due to line breakage.

It is extremely difficult to estimate the amount of dollar damages from a drought because of the slow-moving nature of droughts and the lack of direct immediate impacts. The 2013 State Plan reports on Page 54 that from 2003-2012, the costs of droughts were \$500,000 state-wide. For the planning area, drought impacts cattle-grazing, other agricultural activities, the tourist economy, and reduced charge to the aquifer. Droughts in Quay County leave exposed soils susceptible to erosion and flash flooding. A particularly long spell of drought could mean water restrictions. Using Table 2.18 found in the 2013 State Plan and applying it to the County's assets, **Table 4.5** of this Plan lists specific potential impacts of drought to the County.

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<sup>9</sup> *Long Term Trends and their Implications for Emergency Management* from [http://www.fema.gov/pdf/about/programs/oppa/climate\\_change\\_paper.pdf](http://www.fema.gov/pdf/about/programs/oppa/climate_change_paper.pdf) Accessed December 2015

<sup>10</sup> New Mexico Drought Task Force, 2002

**Table 4.5: Potential Impacts from the Drought**

Subject	Potential Impacts
HEALTH and SAFETY of the PUBLIC	<ul style="list-style-type: none"> <li>• Increased number of wildfires</li> <li>• Health problems related to low water flows and poor water quality</li> <li>• Health problems related to dust</li> </ul>
HEALTH and SAFETY of RESPONDERS	Increased wildfire risk coupled with limited water supply makes it more challenging for responders to fight fires and puts responders at greater risk
ENVIRONMENT	<ul style="list-style-type: none"> <li>• Animal habitat and food supply can dwindle causing species die-off</li> <li>• Poor soil quality</li> <li>• Loss of wetlands</li> <li>• Increased soil erosion</li> <li>• Migration of wildlife</li> </ul>
ECONOMIC CONDITION	<ul style="list-style-type: none"> <li>• Decreased tourism</li> <li>• Crop loss</li> <li>• Decreased land prices</li> <li>• Unemployment from drought-related declines in production</li> <li>• Increased importation of food</li> <li>• Rural population loss</li> </ul>
PUBLIC CONFIDENCE	<ul style="list-style-type: none"> <li>• Reduced incomes</li> <li>• Fewer recreational activities</li> <li>• Increase in food costs due to loss of crops and livestock</li> <li>• Loss of aesthetic values</li> <li>• Loss of cultural sites</li> </ul>

#### 4.4.6 Conclusions

In New Mexico, drought conditions are often the norm rather than the exception. In most cases, the dry weather conditions that cause droughts will need to persist for months or even years before it becomes clear that drought conditions exist. It is also difficult in an arid state like New Mexico to verify when an affected area has actually recovered from a drought. Many drought events are followed by years of average or slightly below average rainfall that do not restore surface water and/or groundwater levels to pre-drought conditions. More accurate monitoring of groundwater levels in critical aquifers would help to establish base conditions and to assess levels of recovery from a drought. There are also data limitations in determining the available quantity and quality of groundwater.

Mitigation management for drought is a proactive process. The best practices include early assessment, public education, and water conservation programs. Identifying the first phases of the drought and reacting with water conservation at the earliest time will help to mitigate drought later in the disaster. At the State level, the Governor’s Drought Task Force Monitoring Working Group monitors the drought situation and can help determine best practices for mitigating the drought effects.

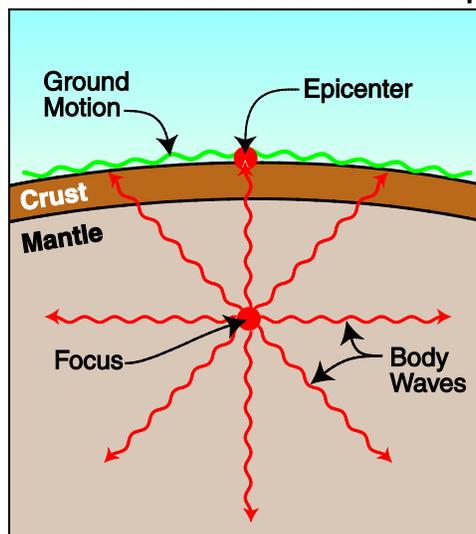
## 4.5 Earthquake

### 4.5.1 Overview

Earthquakes result from sudden ground motion or trembling caused by a release of strain accumulated within or along the edge of the Earth's crustal plates. Earthquakes occur most frequently in the boundaries between the great crustal plates that form the earth's outer shell. As these plates move, stress accumulates. Eventually, when faults along or near plate boundaries slip abruptly, an earthquake occurs.

The severity of an earthquake depends on the amount of energy released from the fault or epicenter of the earthquake. The severity is described in terms of magnitude and intensity. Magnitude characterizes the total energy released, and intensity subjectively describes effects at a particular place. While an earthquake has only one magnitude, its intensity varies throughout the affected region. **Figure 4.9** provides a graphical depiction of an earthquake.

**Figure 4.9: Definition Sketch for Earthquake**



*Source: Understanding Your Risks – FEMA Publication 386-2, page 2-16.*

The Richter scale is a logarithmic magnitude scale that defines magnitude in terms of the motion that would be measured by a standard type of seismograph. On the Richter scale, magnitude is expressed in whole numbers and decimals. For every increase of 1.0 on the Richter scale, the energy released by the earthquake increases 10-fold. In more qualitative terms, an earthquake of 5.0 is a moderate event, 6.0 is a strong event, 7.0 is a major earthquake, and 8.0 or higher is catastrophic. The effect of an earthquake on the Earth's surface is called the intensity. In the U.S., the most commonly used intensity scale is the Modified Mercalli Intensity Scale (MMI).

Another way to express earthquake severity is through peak ground acceleration (PGA) which compares the rate at which the ground surface accelerates due to an earthquake's force with the rate of acceleration experienced by a falling object due to gravity. PGA measures the strength of ground movements in this manner. Although the specific damages caused by different magnitudes of earthquakes are listed in **Table 4.6**, generally when the PGA exceeds

15, significant damage will occur. **Table 4.6** also shows the relationship between PGA, magnitude, and intensity (to get the most accurate picture of risk, locational variables such as the distance from the epicenter and depth of the epicenter would need to be factored in as well).

**Table 4.6: Earthquake Magnitude/Intensity Comparison**

PGA (% g)	Magnitude (Richter)	Intensity (MMI)	Description
<0.17	1.0 - 3.0	I	<b>I.</b> Not felt except by a very few under especially favorable conditions.
0.17 - 1.4	3.0 - 3.9	II - III	<b>II.</b> Felt only by a few persons at rest, especially on upper floors of buildings. <b>III.</b> Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
1.4 - 9.2	4.0 - 4.9	IV - V	<b>IV.</b> Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. <b>V.</b> Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
9.2 - 34	5.0 - 5.9	VI - VII	<b>VI.</b> Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. <b>VII.</b> Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
34 - 124	6.0 - 6.9	VII - IX	<b>VIII.</b> Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. <b>IX.</b> Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
>124	7.0 and higher	<b>VIII</b> or higher	<b>X.</b> Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. <b>XI.</b> Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly <b>XII.</b> Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: Wald, D., et al., 1999, "Relationship between Peak Ground Acceleration, Peak Ground Motion, and Modified Mercalli Intensity in California," *Earthquake Spectra*, v. 15, p. 557 – 564. USGS Magnitude/Intensity Comparison [http://earthquake.usgs.gov/learn/topics/maq\\_vs\\_int.php](http://earthquake.usgs.gov/learn/topics/maq_vs_int.php) Accessed October 2013.

Although earthquakes in the U.S. have caused less economic loss annually than other hazards like flood, they have the potential to cause great and immediate losses, especially near the epicenter. Within one to two minutes, an earthquake can devastate a city through ground shaking, surface-fault ruptures, and ground failures. Seismic hazards often trigger other

devastating events, such as landslides, fires, and damage to dams and levees. Earthquakes can even trigger volcanic eruptions or cause tsunamis in coastal areas.

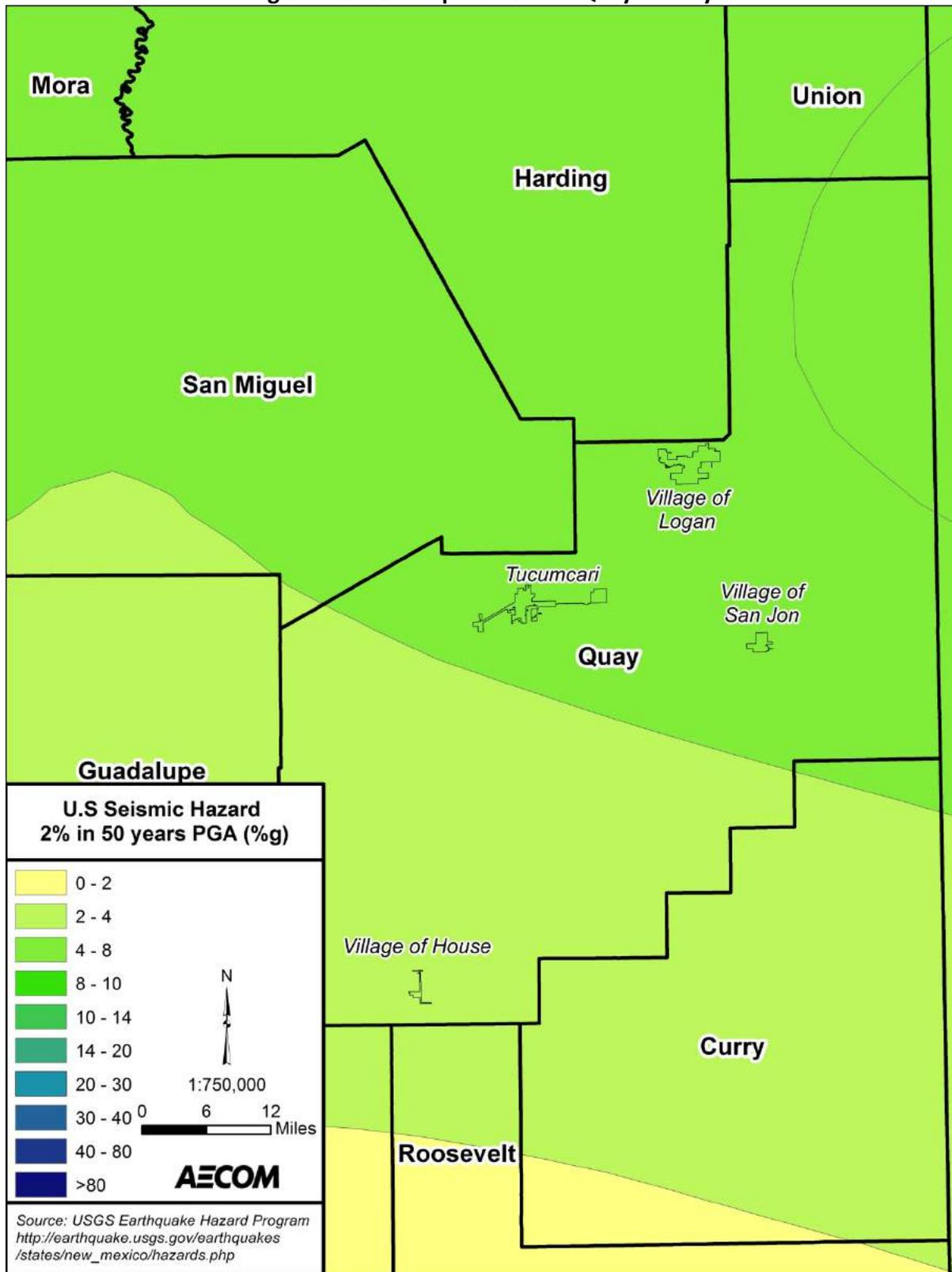
The most significant area of seismic activity in the state is located in the Rio Grande River valley and is centered in Socorro, New Mexico. Eight seismic events have occurred there between 1869 and 1992. The largest recorded seismic event in New Mexico occurred in Socorro in 1906. The effects of this event were felt from El Paso, Texas to Las Vegas, New Mexico; however, little damage was reported and there were no fatalities. This event would not have been felt in Quay County.

Present structural building code requirements in New Mexico do not consider the possibility of seismic events.

#### **4.5.2 Location and Spatial Extent**

Though not nearly as intense or as numerous as in some other parts of the world, earthquakes have occurred in New Mexico. In the last 110 years, New Mexico has experienced earthquakes with an estimated magnitude as high as 6.5 (1906). In 1935 and 1966, earthquakes with a magnitude of 5.5 in 1935 and 1966, causing damage to homes and schools. A seismic event would generally have the same magnitude across the County similarly as the effects are wide-spread. **Figure 4.10** below depicts seismic risk across the planning area. It shows a low risk (green areas on the map) throughout Quay County. These areas have a 2% to 8% chance of experiencing an earthquake that exceeds the 2% predicted maximum quake. The spatial extent of a potential earthquake would be large.

Figure 4.10: Earthquake Risk in Quay County



### 4.5.3 Previous Occurrences

Quay County is vulnerable to low grade earthquakes. Earthquakes in Quay County occurred in at least 10 different locations between 1962 and 1980. The magnitude of these earthquakes ranged from 1.5 to 3.99 on the Richter Scale. No known damages were reported for these events.

The closest large New Mexico earthquakes outside of the county were all located more than 150 miles away, including:

- September 7, 1893 – Belen, Magnitude 5.2
- May 28, 1918 – Los Cerrillos, Magnitude 5.5
- November 6, 1947– Albuquerque, Magnitude 4.5
- August 3, 1955 – Dulce, Magnitude 4.5
- January 23, 1966 – Dulce, Magnitude 4.8

While earthquakes are possible in Quay County, the potential of a damaging event occurring is fairly small. Additionally, of the earthquakes that have occurred in New Mexico since 1869, none have produced significant damage to property or injury to the population. Although there will always be the potential of an earthquake occurring in Quay County, it is not presently anticipated that one of significant magnitude will occur. Historically, no infrastructure of Quay County, or any of the participating jurisdictions have been impacted by earthquakes.

### 4.5.4 Probability and Extent of Future Events

Given the rare past occurrence and moderate risk in magnitude of earthquakes (4.0 to 4.9 on the Richter Scale, as correlated from Table 4.6 and Figure 4.10) to the County and its municipalities, the probability of a future event is “**Unlikely**”. However, earthquakes are nearly impossible to predict and the consequences can be devastating.

### 4.5.5 Vulnerability and Impact

Earthquakes with epicenters in or near Quay County have been detected in the past, although they have been small and damage has been relatively minor. The 2013 State Plan shows that the maximum probable earthquake in Preparedness Area #1, including Quay County, would have a magnitude of 5.5 on the Richter scale and an epicenter in Carlsbad, approximately 220 miles south of the Quay County line. This type of event would cause minor damage in the planning area.

The HMPT would need to study the structures in the planning area—their age, condition, and construction type—to rate their relative vulnerability. Unreinforced masonry and adobe structures built before current building codes are more susceptible to damage than other types of structures built to seismic-resistant codes. For this update there was a data deficiency in cataloging and studying the expected damages from earthquake within Quay County. Future plan updates should consider more study of the earthquake risk.

### 4.5.6 Conclusions

Significant earthquakes with epicenters in or near the County have not been detected. The potential for such a disaster is low. Even the worst earthquake the County might expect would

not inflict significant damage if buildings were built to a code that incorporates seismic resistance. More detailed information on other structures in the County is required to identify vulnerable structures.

Damage from earthquakes can be mitigated for existing buildings through structural retrofits and non-structural retrofits for interior contents that can be damaged by a fall (e.g., computer) or can cause harm by falling (e.g., bookshelves). Structures erected before standard building codes, such as un-reinforced adobe and masonry buildings, are typically vulnerable to earthquake damage. Structural retrofits are generally very expensive whereas non-structural can be relatively inexpensive.

More detailed information on other structures in Quay County is required to identify those that are highly vulnerable. New buildings can be built stronger, according to the most recent seismic design specifications found in contemporary building codes, to minimize their vulnerability to earthquake damage.

## 4.6 Severe Winter Storms

### 4.6.1 Overview

Winter storms in New Mexico generally begin as low-pressure systems that move through the state following the jet stream. These systems are usually generated in the Pacific Ocean and move eastward across California, Nevada, Arizona and Utah before reaching New Mexico, if strong enough. Severe winter storms may bring bursts of heavy snow accumulating three to six inches in short periods or one to two feet in 12 to 24 hours. Blizzard conditions can develop with winds over 35 miles per hour (mph). Freezing rain and drizzle can create a coating of ice that is hazardous to walk or drive on. Unusually heavy ice accumulations can damage trees, power lines and other utilities, and buildings.

**Table 4.7** provides descriptions of the various types and impacts of winter storms that are consistent with NWS approved definitions found in the 2013 State Plan.

**Table 4.7: Types of Winter Storms**

Storm Type	Description
Heavy Snowstorm/ Snowfall	Accumulations of six inches or more in a 12-hour period, or eight inches or more in a 24-hour period. The most common effects are traffic accidents, interruptions in power supply and communications, and the failure of inadequately designed and/or maintained roofing systems.
Sleet/Sleet Storm	Significant accumulations of solid grains or pellets of ice that form from the freezing of raindrops or partially melted snowflakes. While this ice does not cling to surfaces, it causes slippery surfaces, posing hazards to pedestrians and motorists.
Ice Storm	Significant accumulations of rain or drizzle freezing on exposed objects (trees, power lines, roadways), causing slippery surfaces and damage from the weight of ice accumulation.

Storm Type	Description
Blizzard	Wind velocity of 35 mph or more, temperatures below freezing, and considerable blowing snow with visibility frequently below one-quarter mile, prevailing over an extended period of time.
Severe Blizzard	Wind velocity of 45 mph or more, temperatures of 10 degrees Fahrenheit or lower, a high density of blowing snow with visibility frequently measured in inches, prevailing over an extended period of time.
Wind Chill	An apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin
Freezing Drizzle/ Freezing rain	The effect of drizzle or rain freezing upon impact on objects that have a temperature of 32° F or below

The 2013 State Plan lists the likely severe winter storm scenarios for New Mexico:

- 4 or more inches of snowfall below 7,500 feet
- 6 or more inches of snowfall above 7,500 feet in a 12 hour period
- 6 or more inches of snowfall below 7,500 feet
- 9 inches of snowfall above 7,500 feet in a 24-hour period

Winters in New Mexico are generally mild, but occasionally winter storms produce large amounts of snow and below-freezing temperatures. Between 1993 and May 2003, there have been 14 snow and ice events in Quay County. In January 1997, two winter storms within a week of each other produced widespread heavy snow and icy roads. During the first storm, an auto accident near Tucumcari occurred when a van slid off the road and overturned several times killing a passenger in the vehicle. During both storms, sections of Interstate 40 were closed for many hours in each direction. Many of the County's rural roads were impassable for several days. A storm in January 1999 caused roads to be closed in Quay County due to drifts of four to six feet. In November 2015, close to one inch of freezing rain fell followed by snow over a 36-hour period creating treacherous driving conditions. Interstate 40 was closed from Tucumcari to the Texas state line as a result.

Severe winter storms are not of major concern to the citizens of Quay County because they only occur infrequently and do not typically cause significant problems in the planning area. Generally when such a storm hits, it may cause some traffic slow-down, but it rarely causes major transportation routes to be closed for more than a day. This situation creates more of an inconvenience than a hazard. During winter storms, heavy/wet snowfall can create a risk to flat-roofed residential structures, but the damage is generally limited.

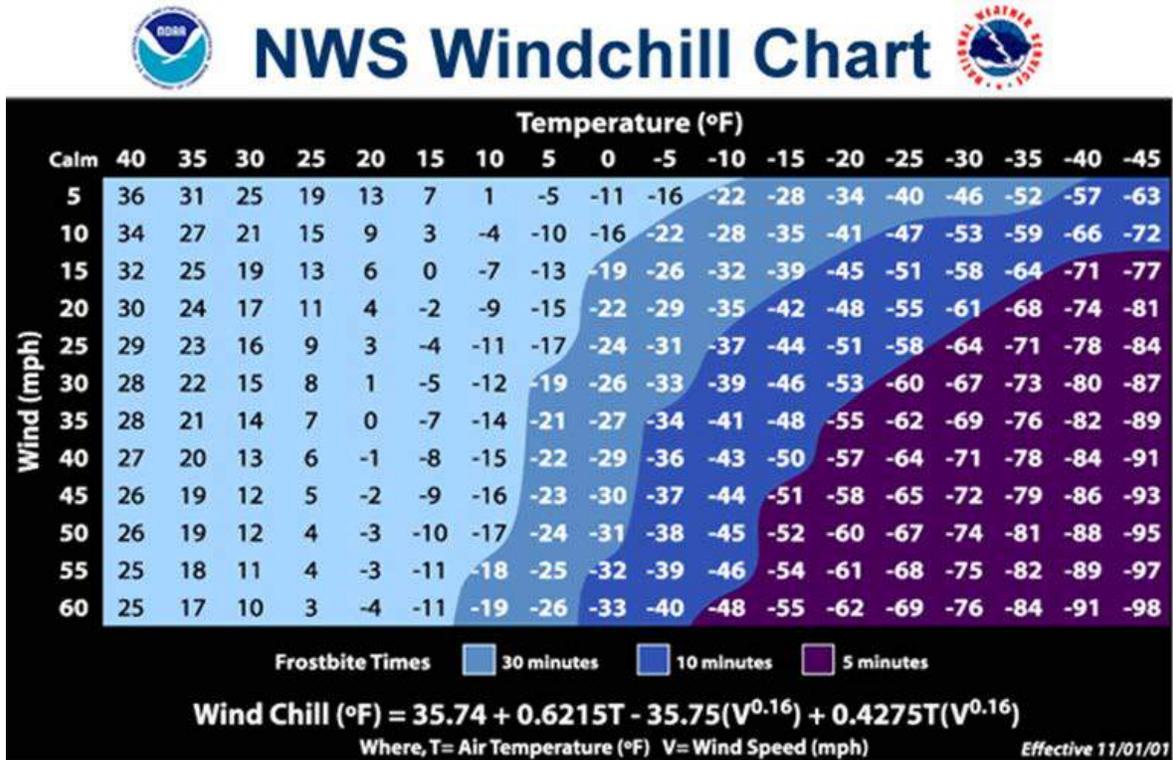
#### 4.6.2 Location and Spatial Extent

The complex terrain of New Mexico, ranging from the eastern plains, to the high mountains across the northern and western regions, to the Rio Grande Valley, creates weather systems that change quickly over relatively short distances. The weather may be relatively mild and sunny along the Rio Grande Valley with near blizzard conditions found across the high plains east of the central mountain chain.

Severe winter storms are generally large enough to affect the entire planning area. Historically, winter storms in the planning area are rare. The most severe conditions would typically include little snowfall (1-2 inches) but would result in extreme wind chills.

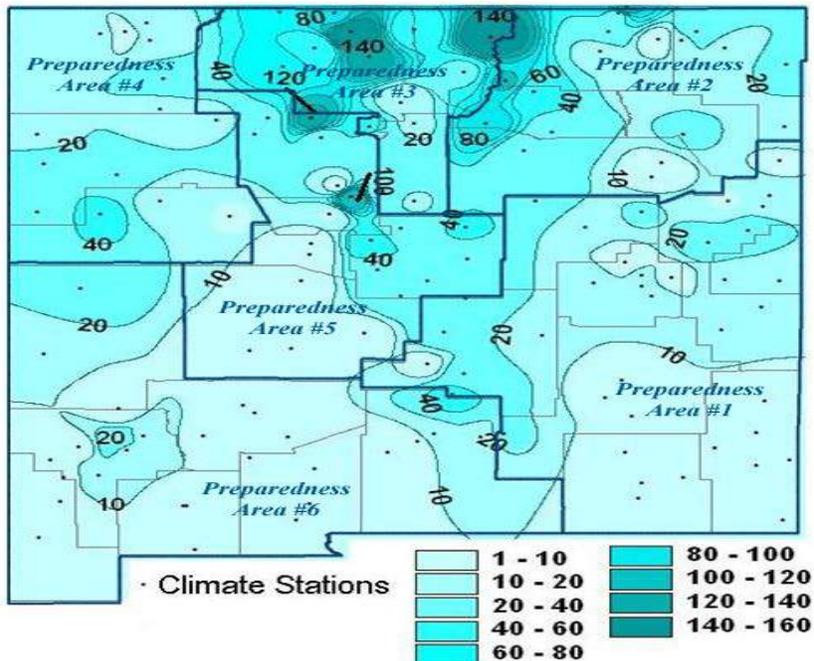
Wind chills play the most significant role in Quay County’s severe winter weather since the welfare of residents is directly related to wind chill. Local officials encourage citizens to heed the warning and take extra precautions. Wind chill is the combination of wind and temperature that serves as an estimate of how cold it actually feels to exposed human skin. Local officials throughout the planning area consider wind chill values below -10 °F to be extremely dangerous to the population although hypothermia can occur at higher temperatures and cause death. **Figure 4.11** gives a range of physical intensities from winter storms along with the potential effect.

**Figure 4.11: National Weather Service Windchill Chart with Impacts**



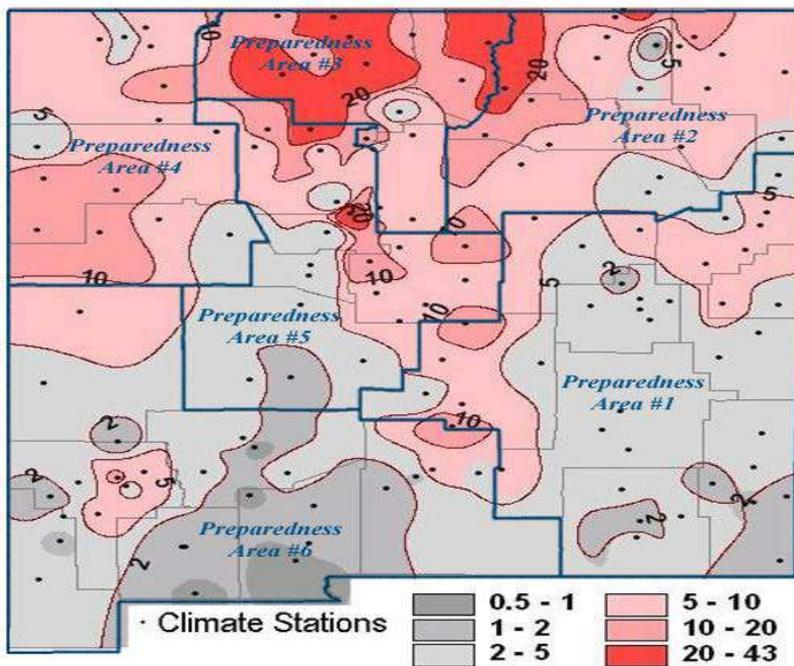
Figures 4.12 and 4.13 from the Southern Region Headquarters of NOAA show annual snowfall amounts across New Mexico<sup>11</sup>.

Figure 4.12: Average Annual Snowfall in New Mexico



Source: NOAA Southern Region Headquarters

Figure 4.13: Average Annual Number of Days with Snowfall in New Mexico



Source: NOAA Southern Region Headquarters

<sup>11</sup> Source: <http://www.srh.noaa.gov/abq/?n=prepwinterwxclimo>

#### 4.6.3 Previous Occurrences

Only two winter storm/ice storm events and one extreme cold/wind chill event was reported for Quay County from January 1, 1996 through December 31, 2015. The following narrative from the NCDC summarizes the events.

- **February 1, 2011** – Low temperatures between 0 and -5 °F combined with northerly winds of 10 to 20 mph with higher gusts resulted in early morning wind chill values from 25 to 35 degrees below zero
- **December 21, 2013** – Observation reports detailed a solid snow band mixed with sleet and freezing rain across eastern Quay County, particularly from San Jon to Amistad and Logan. Snowfall rates averaged near one inch per hour for several hours resulting in up to four inches of new snow. Difficult driving conditions were reported along Highway 54 and Interstate 40 along with significantly reduced visibilities.
- **November 26, 2015** - One half inch to one inch of freezing rain and around one inch of snow fell across Quay County. Treacherous driving conditions were reported along Interstate 40 and many surrounding U.S. highways. Interstate 40 was closed from Tucumcari to the Texas state line due to widespread major impacts to travel into Texas.
- **December 26-28, 2015**- Winter storm impacting almost the entirety of Quay County and a large portion of Eastern New Mexico. Snow reports as high as 12 inches with winds from 40-80 mph causing snow drifts to reach up to 10 feet in some locations in Quay County. All major highways closed causing emergency shelters to be opened in Tucumcari.

The 2013 State Plan shows a total of one Extreme Cold/Wind Chill events for Planning Area #1, with no reported property damage. The State Plan also shows 35 heavy snow events with no reported property damage. However, these events occurred outside of the Quay County planning area in counties with higher elevations.

#### 4.6.4 Probability and Extent of Future Events

Snow and ice can be hazards in two respects: when they fall from the sky, they reduce visibility; and when they accumulate on the surface, they reduce traction and put a strain on power lines, roofs, and other structures. Severe winter storms have been and will continue to be a threat to the economic and social well-being of the County and participating jurisdictions.

Disruptions of emergency and other essential services are the main threats to the people and property. Isolated, rural communities and limited snow removal equipment exacerbate the effects of snow events in the County.

Given this approximate frequency, the probability of a future severe winter storm event to the entire planning area is “**Possible**”.

#### 4.6.5 Vulnerability and Impact

Due to differences in altitude and terrain, the severity of winter storms varies in the different communities. The majority of the population and development in Quay County is in the central portion of the County where winter storm events are usually short-lived and average just a few inches of snowfall. However, these events can cause disruption and damage to the community.

School and business closures, as well as disruptions in transportation systems, electric power, telecommunications, and emergency services, are common occurrences with snow fall as little as two inches.

The entire county is vulnerable to severe winter storms with wind and light snow or ice. The severity of winter storms may vary from mild impacts to an extremely dangerous storm that can bring wind, snow, and ice that can create whiteout conditions, hazards to safety, and impacts to structures and infrastructure. A severe winter storm in Quay County would have the following types of impacts:

- Overwhelm local capabilities to handle disruptions to emergency services, traffic, communications, and electric power when snow and ice-laden branches fall across power lines and interrupt service
- Cause school and business closures, as well as disruptions in transportation systems, electric power, telecommunications, and emergency services
- Residents potentially running out of basic supplies, including food and fuel
- Livestock suffer from severe cold and lack of feed
- In extreme cases, building roof systems fail due to snow loading

Severe Winter Storms have occurred in the past and will occur again in the future. However, given the infrequent recurrence of the extreme cold events and the relatively minor losses associated with this type of event, the overall vulnerability is considered to be low. For this update there was a data deficiency in cataloging and studying the expected damages from Severe Winter Storm within Quay County. Future plan updates should consider more study of the Severe Winter Storm risk.

#### **4.6.6 Conclusions**

Severe winter storms have been and will continue to be a threat to the economic and social well-being of Quay County. Disruptions of emergency and other essential services are the main threats to people and property.

One important part of mitigating severe weather is forecasting and warning so people can prepare. Communities can prepare for winter storms by stocking sand and salt to improve road conditions, advising people to stay home or to use caution if they must go out, and recommending that people stock up on food, water, batteries, and other supplies.

Future development should take into consideration the effects of winter storms, including excessive snow loading on roofs and the potential for freezing of interior piping that is not insulated or protected, which can burst causing damage.

### **4.7 Thunderstorm (including Lightning/Hail)**

#### **4.7.1 Overview**

Thunderstorms are generally produced when dry and cool air converges with warm moist air. Large cold fronts moving through areas of warm moist air can produce long lines of thunderstorm cells. Thunderstorms are responsible for much of the severe weather across New

Mexico, particularly during the North American Monsoon season in the summer. The thunderstorm season in New Mexico is well defined, from early July to September. Thunderstorms are a frequent occurrence in July and August, especially over the northwest and north central mountains of New Mexico.

Thunderstorms are characterized by high winds, heavy rain, hail, lightning, and, on rare occasions, tornados. The National Weather Service defines a severe thunderstorm as a thunderstorm with any of the following attributes: downbursts with winds of 58 miles (50 knots) per hour or greater (often with gusts of 74 miles per hour or greater), hail 0.75 of an inch in diameter or greater, or a tornado. Due the fact that high rainfall impacts are covered in the flood discussions in **Section 4.2** and that both high winds and tornadoes have their own sections in this plan (**Sections 4.8** and **4.9** respectively); this section primarily focuses on hail and lightning.

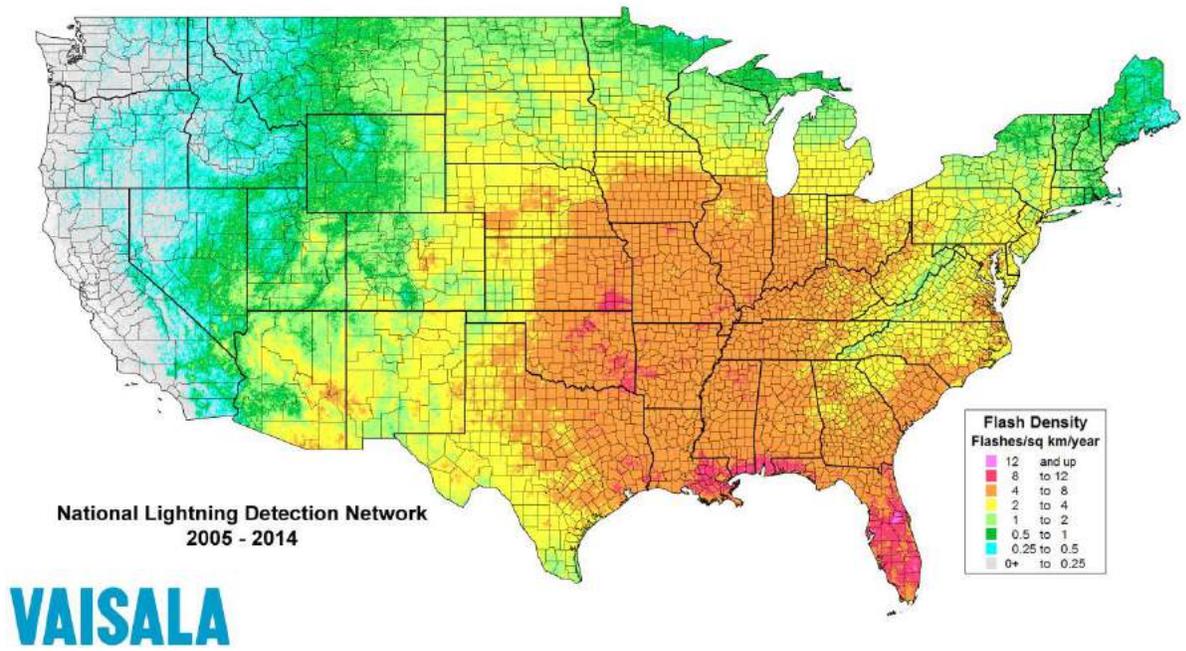
The 2013 State Plan describes lightning as “a sudden and violent discharge of electricity, usually from within a thunderstorm, due to a difference in electrical charges. Lightning is a flow of electrical current from cloud to cloud or cloud to ground.” Hail is described as the movement of water droplets up and down inside the cloud. First, through cold air, where the droplets freeze and then warmer air temperatures, where additional water condenses on the frozen droplet. Layers of ice can be added to the frozen droplets which can become quite large, sometimes round or oval shaped and sometimes irregularly shaped. The frozen droplets of various sizes finally fall to the ground as hail. The failing ice is hard and depending on size can be very dangerous. Hail sizes can range from pea-sized to the size of a softball. The 2013 State Plan states that severe hailstorms most commonly occur in May, followed by June, July and April.

#### **4.7.2 Location and Spatial Extent**

All areas of Quay County are susceptible to thunderstorms (including lightning and hail), although local topography, such as elevation and land contours, plays a significant role in how weather affects a particular area. Thunderstorms can be either localized or widespread so their impact can vary depending on the size, strength, and speed of the storm. At the time of storm occurrence, one neighborhood may experience severe damage while another, located nearby, escapes with minimal impact. Large-scale thunderstorms with multiple lightning strikes, hail, and high wind would create the most impact over a wide area.

The Vaisala Flash Density map shown in **Figure 4.14** shows a lightening flash density of two to four flashes per square kilometer per year for the entire planning area. Specific records are not kept at the local level. Officials of each participating jurisdiction consider all thunderstorm events which contain lightning to be severe events and warrant evasive actions.

**Figure 4.14: Flash Density Map**



Source: Vaisala

The TORRO Hailstorm Intensity Scale in relation to typical damage and hail size is presented in **Figure 4.15**. H0 to H1 hail intensity could typically be expected for the entire Quay County planning area, which is five to 15 millimeters (mm) in size, which could result in slight damage to crops and vegetation.

**Figure 4.15: TORRO Hailstorm Intensity Scale**

Intensity Category		Typical Hail Diameter (mm)*	Probable Kinetic Energy (J-m <sup>2</sup> )	Typical Damage Impacts
<b>H0</b>	Hard Hail	5	0-20	No damage
<b>H1</b>	Potentially Damaging	5-15	>20	Slight general damage to plants, crops
<b>H2</b>	Significant	10-20	>100	Significant damage to fruit, crops, vegetation
<b>H3</b>	Severe	20-30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
<b>H4</b>	Severe	25-40	>500	Widespread glass damage, vehicle bodywork damage
<b>H5</b>	Destructive	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
<b>H6</b>	Destructive	40-60	>800	Bodywork of grounded aircraft dented, brick walls pitted
<b>H7</b>	Destructive	50-75	>800	Severe roof damage, risk of serious injuries
<b>H8</b>	Destructive	60-90	>800	Severe damage to aircraft bodywork
<b>H9</b>	Super Hailstorms	75-100	>800	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
<b>H10</b>	Super Hailstorms	>100	>800	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The complex terrain of New Mexico, ranging from the eastern plains, to the high mountains across the northern and western regions, to the Rio Grande Valley, creates weather regimes that change quickly over relatively short distances. The entire planning area is subject to thunderstorms and hail. A given thunderstorm (including lightning and hail) in Quay County may only directly affect a small portion of the county. The spatial extent of thunderstorms (including lightning and hail) is generally small.

### 4.7.3 Previous Occurrences

The NOAA Southern Region Headquarter’s website shows that May (866 events) and June (960) have had the most hail events in New Mexico from 1955 to 2012<sup>12</sup>. According to NOAA, no damage was reported in Quay County due to lightning events through this same time period.

The New Mexico 2013 State Plan reports that there were 232 hail events in Quay County from 1955 to 2012. By comparison, the counties experiencing the highest number of hail events during this timeframe are Eddy (383) and Lea (369). The 2013 State Plan reports that of the hail events that affected Preparedness Area #1, including Quay County, \$8.8 million of property damage and \$46,500 of crop damage occurred.

As shown in **Table 4.8**, NCDC’s records show a total of 53 additional damaging hail events have occurred in the Quay Count planning area within the period of June 2013 to August 2017, resulting in a total of \$10,500 in property damage and no deaths or injuries.

The National Weather Service reports that a historic rain event occurred in Quay County on September 10-18, 2013. This event had precipitation levels in Quay between 5.74 inches over the 8 days to 2.21 inches. This is a record amount of rain and it caused Revuelto Creek near Logan to peak at 6.98 feet. The record crest at the gage location is 14.3 feet and no flooding was reported.

**Table 4.8: Hail and Lightning Previous Occurrences**

Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
Logan	6/5/2013	Hail	1.75 in.	0/0	\$5,000
Porter	6/5/2013	Hail	1.75 in.	0/0	\$0
Porter	6/5/2013	Hail	0.88 in.	0/0	\$0
Bard	6/5/2013	Hail	0.88 in.	0/0	\$0
Porter	6/5/2013	Hail	1.50 in.	0/0	\$0
Bard	6/5/2013	Hail	0.88 in.	0/0	\$1,000
(Tcc)Tucumcari Arpt	6/5/2013	Hail	0.88 in.	0/0	\$0
Tucumcari	6/17/2013	Hail	0.75 in.	0/0	\$0
Tucumcari	6/19/2013	Hail	2.75 in.	0/0	\$3,000
Tucumcari	6/19/2013	Hail	2.75 in.	0/0	\$1,000
(Tcc)Tucumcari Arpt	6/19/2013	Hail	1.00 in.	0/0	\$0
Tucumcari	6/19/2013	Hail	1.75 in.	0/0	\$0
Porter	6/19/2013	Hail	0.75 in.	0/0	\$0
Porter	6/19/2013	Hail	0.75 in.	0/0	\$0
Montoya	8/8/2013	Hail	0.75 in.	0/0	\$0

<sup>12</sup> <http://www.srh.noaa.gov/abq/?n=prephazards> Accessed December 2015

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Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
Forrest	8/8/2013	Hail	0.88 in.	0/0	\$0
Tucumcari	8/13/2013	Hail	1.00 in.	0/0	\$0
Montoya	5/22/2014	Hail	0.88 in.	0/0	\$0
San Jon	5/22/2014	Hail	1.00 in.	0/0	\$0
San Jon	5/22/2014	Hail	0.88 in.	0/0	\$0
House	6/6/2014	Hail	1.00 in.	0/0	\$0
Tucumcari	6/7/2014	Hail	2.50 in.	0/0	\$0
Tucumcari	6/7/2014	Hail	1.00 in.	0/0	\$0
Tucumcari	6/7/2014	Hail	1.00 in.	0/0	\$0
Tucumcari	6/7/2014	Hail	1.25 in.	0/0	\$0
Tucumcari	6/8/2014	Hail	1.00 in.	0/0	\$0
San Jon	6/8/2014	Hail	1.00 in.	0/0	\$0
Tucumcari	6/8/2014	Hail	1.00 in.	0/0	\$0
Tucumcari	10/9/2014	Hail	0.88 in.	0/0	\$0
Tucumcari	5/4/2015	Hail	1.00 in.	0/0	\$0
(Tcc)Tucumcari Arpt	5/9/2015	Hail	0.75 in.	0/0	\$0
House	5/19/2015	Hail	1.00 in.	0/0	\$500
Palomas	5/29/2015	Hail	0.88 in.	0/0	\$0
San Jon	6/4/2015	Hail	0.75 in.	0/0	\$0
San Jon	6/4/2015	Hail	0.88 in.	0/0	\$0
Porter	7/8/2015	Hail	0.88 in.	0/0	\$0
Tucumcari	8/2/2015	Hail	0.75 in.	0/0	\$0
Logan	8/10/2015	Hail	1.00 in.	0/0	\$0
Nara Visa	8/18/2015	Hail	1.00 in.	0/0	\$0
(Tcc)Tucumcari Arpt	9/23/2015	Hail	1.00 in.	0/0	\$0
San Jon	10/21/2015	Hail	1.00 in.	0/0	\$0
Glenrio	10/21/2015	Hail	1.00 in.	0/0	\$0
Tucumcari	5/21/2016	Hail	1.00 in.	0/0	\$0
Bard	5/29/2016	Hail	1.75 in.	0/0	\$0
San Jon	5/29/2016	Hail	1.00 in.	0/0	\$0
Bard	5/29/2016	Hail	1.75 in.	0/0	\$0
House	5/31/2016	Hail	0.88 in.	0/0	\$0
Logan	7/3/2016	Hail	1.00 in.	0/0	\$0
House	5/8/2017	Hail	1.75 in.	0/0	\$0
Tucumcari	5/9/2017	Hail	1.25 in.	0/0	\$0
House	5/22/2017	Hail	1.00 in.	0/0	\$0
Logan	8/14/2017	Hail	0.75 in.	0/0	\$0
Nara Visa	8/14/2017	Hail	1.25 in.	0/0	\$0

Source: NCDC Storm Events Database, accessed December 2017.

#### 4.7.4 Probability and Extent of Future Events

Quay County experiences thunderstorms with hail and/or lightning on a fairly frequent basis. The 2013 State Plan reports that New Mexico ranks sixth in the nation in lightning fatalities with 0.55 deaths per million people annually. The State ranks 22<sup>nd</sup> in lightning frequency overall. While typical thunderstorms can be expected almost 100% annually, thunderstorms that are capable of producing lightning and hail severe enough to threaten safety and property are considered “Likely”.

#### 4.7.5 Vulnerability and Impact

Vulnerability to the effects of thunderstorms on buildings is dependent on the age of the building (and what building codes were in effect at the time it was built), type of construction, and condition of the structure (how well the structure has been maintained). All of the planning areas critical facilities are vulnerable to potential disruption of services and transportation systems as well as disruptions to emergency communications capabilities. Electric and telephone services are particularly vulnerable to disruption.

For this update there was a data deficiency in cataloging and studying the expected damages from Thunderstorms within Quay County. Future plan updates should consider more study of the Thunderstorm risk. The most probable impact of a thunderstorm in Quay County is lightning. Other impacts of thunderstorms, flood and wildfire ignition, are addressed in **Sections 4.2** and **4.3** respectively. The potential impacts of hail and lightning to Quay County are:

- Local capabilities to handle disruptions to emergency services, traffic, communications, and electric power are overwhelmed
- Hail causes damage to property (particularly crops, roof systems of building, and vehicles)
- Lightning strikes a person or animal causing severe injury or death
- Lightning directly strikes a building causing damage or strikes a tree that falls on a building, person, animal or vehicle
- Lightning strikes ignite a wildfire that threatens the safety of people and destroys property
- Lightning causes a power surge in a building's electrical system that damages the system and/or electronic equipment plugged into the system

#### 4.7.6 Conclusions

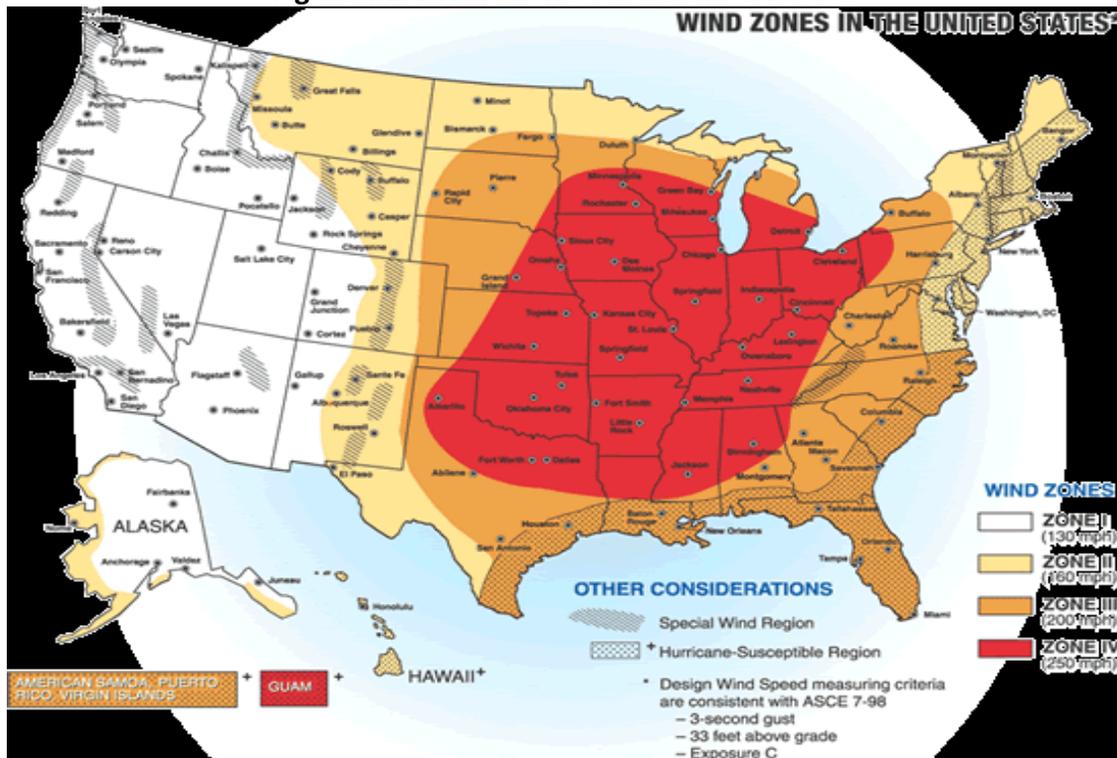
One important part of mitigating severe weather is forecasting and warning so people can prepare. Communities can be notified of approaching severe thunderstorms and take action to seek shelter or get out of the path of the storm. Important community structures and critical facilities should have their electric and roof systems evaluated for vulnerability to hail and lightning. Electronic systems should be unplugged once warning of a thunderstorm has been issued.

### 4.8 High Wind

#### 4.8.1 Overview

High winds that damage property and endanger the safety of people and animals come from a variety of sources. High winds in New Mexico are usually generated by severe thunderstorms and severe winter storms. Quay County is Wind Speed Zone II; experiencing wind speeds up to 160 mph, as shown in **Figure 4.16**.

Figure 4.16: Wind Zones of the United States



Source: 2013 State Plan (originally from ASCE 7-10)

Wind is defined by FEMA’s Multi-Hazard Identification and Risk Assessment as “the motion of air relative to the earth’s surface.” A microburst is a strong, localized thunderstorm downdraft which, when it strikes the surface, produces winds affecting an area less than 2.5 miles across.

A microburst according to the U.S. Weather Service “is a small area of rapidly descending air beneath a thunderstorm. When the descending air hits the ground, it quickly spreads out in all directions, causing very strong, straight-line winds.” A microburst forms “inside a thunderstorm, [when] water vapor condenses into raindrops, which then fall to the ground. When these raindrops fall through the air, they start to evaporate. The evaporation cools the air, causing it to become denser than the air around it. This rain-cooled air, along with the falling raindrops, accelerates downwards; it is this down-rushing air that eventually hits the ground... causing the damaging straight-line winds.”

High winds are considered hazards when the winds cause direct damage to crops, buildings or infrastructure through impacts to the buildings themselves or causing debris or trees to crash into the asset creating damage. Flying debris in high winds can also cause injuries to people and animals.

#### 4.8.2 Location and Spatial Extent

High winds are a hazard that generally has a large geographic impact being caused by larger scale storms, like thunderstorms and winter storms. Quay County’s location in Wind Speed Zone II means a fairly low possibility of extreme wind speeds up to 160 mph.

The Beaufort Wind Scale in **Figure 4.17** shows the specific effects that various wind speed has on land. The entire planning area can experience all 12 Beaufort categories.

**Figure 4.17: Beaufort Scale**

<b>Beaufort number</b>	<b>Mean wind speed (kt / km/h / mph)</b>	<b>Description</b>	<b>Land conditions</b>
<b>0</b>	0 / 0 / 0	<u>Calm</u>	Calm. Smoke rises vertically.
<b>1</b>	2 / 4 / 2	<u>Light air</u>	Wind motion visible in smoke.
<b>2</b>	5 / 9 / 6	Light <u>breeze</u>	Wind felt on exposed skin. Leaves rustle.
<b>3</b>	9 / 17 / 11	Gentle breeze	Leaves and smaller twigs in constant motion.
<b>4</b>	13 / 24 / 15	Moderate breeze	Dust and loose paper raised. Small branches begin to move.
<b>5</b>	19 / 35 / 22	Fresh breeze	Smaller trees sway.
<b>6</b>	24 / 44 / 27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
<b>7</b>	30 / 56 / 35	Near <u>gale</u>	Whole trees in motion. Effort needed to walk against the wind.
<b>8</b>	37 / 68 / 42	Gale	Twigs broken from trees. Cars veer on road.
<b>9</b>	44 / 81 / 50	Strong gale	Light structure damage.
<b>10</b>	52 / 96 / 60	<u>Storm</u>	Trees uprooted. Considerable structural damage.
<b>11</b>	60 / 111 / 69	Violent storm	Widespread structural damage.
<b>12</b>	N/A	<u>Hurricane</u>	Massive and widespread damage to structures

### 4.8.3 Previous Occurrences

Quay County frequently experiences high wind events. Quay County has experienced 96 thunderstorm and high wind events from January 2000 to December 2017, as shown in **Table 4.9**, totaling just under \$100,000 in property damages. These events have occurred over that period of time during any given month. While most of New Mexico experiences high wind events primarily in the months of March, April, and May, Quay County high wind events typically happen between October and May. Quay County winds routinely exceed 40 mph, and 60 mph wind speeds are not uncommon. Additionally, microbursts generate damage similar to a tornado.

**Table 4.9: High Wind and Thunderstorm Winds Previous Occurrences**

Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
Tucumcari	7/23/2001	Thunderstorm Wind		0/0	\$5,000
Tucumcari Arpt	6/14/2002	Thunderstorm Wind	66 Kts. M	0/0	\$0
San Jon	7/1/2002	Thunderstorm Wind	50 Kts. E	0/0	\$0
Forrest	6/4/2003	Thunderstorm Wind	65 Kts. EG	0/0	\$20,000
Tucumcari Arpt	6/5/2003	Thunderstorm Wind	51 Kts. MG	0/0	\$0
San Jon	6/5/2003	Thunderstorm Wind	50 Kts. EG	0/0	\$0
House	6/5/2003	Thunderstorm Wind	50 Kts. EG	0/0	\$0
Logan	7/11/2003	Thunderstorm Wind	61 Kts. EG	0/0	\$0
Tucumcari	7/11/2003	Thunderstorm Wind	51 Kts. EG	0/0	\$0
San Jon	6/27/2004	Thunderstorm Wind	65 Kts. EG	0/0	\$0
Tucumcari Arpt	6/27/2004	Thunderstorm Wind	65 Kts. MG	0/0	\$0
San Jon	8/29/2004	Thunderstorm Wind	53 Kts. EG	0/0	\$0
Tucumcari Arpt	7/4/2005	Thunderstorm Wind	52 Kts. MG	0/0	\$0
Ragland	6/22/2006	Thunderstorm Wind	55 Kts. EG	0/0	\$0
Tucumcari	6/2/2007	Thunderstorm Wind	52 Kts. MG	0/0	\$0
Forrest	6/3/2007	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Quay	6/4/2007	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Tucumcari Arpt	6/26/2007	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Tucumcari Arpt	6/26/2007	Thunderstorm Wind	51 Kts. MG	0/0	\$0
Tucumcari Arpt	8/22/2007	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Adberg	6/23/2008	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Montoya	6/24/2008	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Logan Ute Dam Arpt	8/10/2008	Thunderstorm Wind	52 Kts. EG	0/0	\$0
House	8/10/2008	Thunderstorm Wind	52 Kts. EG	0/0	\$0
House	8/10/2008	Thunderstorm Wind	61 Kts. EG	0/0	\$1,000
Adberg	8/14/2008	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Nara Visa	8/15/2008	Thunderstorm Wind	52 Kts. EG	0/0	\$3,000
Logan Ute Dam Arpt	8/15/2008	Thunderstorm Wind	62 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	7/5/2009	Thunderstorm Wind	50 Kts. MG	0/0	\$0
House	7/5/2009	Thunderstorm Wind	52 Kts. EG	0/0	\$10,000
House	7/5/2009	Thunderstorm Wind	52 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	7/14/2009	Thunderstorm Wind	54 Kts. MG	0/0	\$0
San Jon	7/17/2009	Thunderstorm Wind	50 Kts. EG	0/0	\$0
House	7/29/2009	Thunderstorm Wind	70 Kts. EG	0/0	\$3,000
Logan	7/31/2009	Thunderstorm Wind	52 Kts. MG	0/0	\$0

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Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
(Tcc)Tucumcari Arpt	7/31/2009	Thunderstorm Wind	52 Kts. MG	0/0	\$0
Quay County	8/3/2009		55 Kts. MG	0/0	\$0
Endee	8/14/2009	Thunderstorm Wind	50 Kts. MG	0/0	\$0
House	8/18/2009	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Endee	8/18/2009	Thunderstorm Wind	56 Kts. MG	0/0	\$0
Quay County	12/8/2009	High Wind	56 Kts. MG	0/0	\$0
Quay County	1/22/2010	High Wind	53 Kts. MG	0/0	\$0
Quay County	3/8/2010	High Wind	39 Kts. MS	0/0	\$0
Quay County	4/1/2010	High Wind	58 Kts. MG	0/0	\$0
Quay County	4/6/2010	High Wind	36 Kts. MS	0/0	\$0
Quay County	4/29/2010	High Wind	38 Kts. MS	0/0	\$0
Quay County	5/10/2010	High Wind	62 Kts. MG	0/0	\$2,000
(Tcc)Tucumcari Arpt	6/16/2010	Thunderstorm Wind	57 Kts. MG	0/0	\$0
San Jon	6/16/2010	Thunderstorm Wind	52 Kts. EG	0/0	\$1,000
Logan	7/14/2010	Thunderstorm Wind	55 Kts. EG	0/0	\$2,000
Logan	7/23/2010	Thunderstorm Wind	51 Kts. MG	0/0	\$0
Logan	7/23/2010	Thunderstorm Wind	61 Kts. MG	0/0	\$200
Logan	7/23/2010	Thunderstorm Wind	62 Kts. MG	0/0	\$0
Quay County	10/25/2010	High Wind	50 Kts. MG	0/0	\$0
Quay County	12/31/2010	High Wind	52 Kts. MG	0/0	\$0
Quay County	2/27/2011	High Wind	52 Kts. MG	0/0	\$0
Quay County	4/3/2011	High Wind	50 Kts. MG	0/0	\$0
Quay County	4/9/2011	High Wind	52 Kts. EG	0/0	\$0
Quay County	4/26/2011	High Wind	50 Kts. MG	0/0	\$40,000
Quay County	5/24/2011	High Wind	50 Kts. MG	0/0	\$0
Logan	6/1/2011	Thunderstorm Wind	53 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	6/1/2011	Thunderstorm Wind	64 Kts. MG	0/0	\$0
Logan	6/1/2011	Thunderstorm Wind	52 Kts. EG	0/0	\$0
(Tcc)Tucumcari Arpt	9/3/2011	Thunderstorm Wind	54 Kts. MG	0/0	\$0
Quay County	2/20/2012	High Wind	56 Kts. MG	0/0	\$0
Quay County	2/28/2012	High Wind	51 Kts. MG	0/0	\$0
Quay County	3/18/2012	High Wind	58 Kts. MG	0/0	\$0
Quay County	4/14/2012	High Wind	54 Kts. MG	0/0	\$0
Tucumcari	5/21/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
(Tcc)Tucumcari Arpt	5/21/2012	Thunderstorm Wind	55 Kts. MG	0/0	\$0
Logan	5/21/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
(Tcc)Tucumcari Arpt	6/2/2012	Thunderstorm Wind	65 Kts. MG	0/0	\$0
Tucumcari	6/2/2012	Thunderstorm Wind	61 Kts. EG	0/0	\$2,000
House	6/2/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Logan	6/16/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Logan	6/16/2012	Thunderstorm Wind	61 Kts. EG	0/0	\$0
Nara Visa	6/16/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Nara Visa	6/16/2012	Thunderstorm Wind	61 Kts. EG	0/0	\$0
Logan	8/17/2012	Thunderstorm Wind	52 Kts. MG	0/0	\$0
Porter	10/12/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Forrest	10/12/2012	Thunderstorm Wind	52 Kts. EG	0/0	\$0

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Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
Quay County	11/10/2012	High Wind	65 Kts. EG	0/0	\$0
Quay County	12/19/2012	High Wind	52 Kts. MG	0/0	\$0
Quay County	1/11/2013	High Wind	35 Kts. MS	0/0	\$0
Quay County	2/9/2013	High Wind	58 Kts. MG	0/0	\$0
Quay County	3/23/2013	High Wind	55 Kts. MG	0/0	\$0
Quay County	4/22/2013	High Wind	39 Kts. MS	0/0	\$0
(Tcc)Tucumcari Arpt	6/2/2013	Thunderstorm Wind	55 Kts. MG	0/0	\$0
Jordan	6/3/2013	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Porter	6/5/2013	Thunderstorm Wind	52 Kts. EG	0/0	\$0
(Tcc)Tucumcari Arpt	6/17/2013	Thunderstorm Wind	67 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	6/27/2013	Thunderstorm Wind	51 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	8/13/2013	Thunderstorm Wind	61 Kts. MG	0/0	\$0
Tucumcari	8/13/2013	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Quay County	1/12/2014	High Wind	50 Kts. MG	0/0	\$0
Quay County	1/26/2014	High Wind	51 Kts. MG	0/0	\$0
Quay County	3/15/2014	High Wind	36 Kts. MS	0/0	\$0
Quay County	3/27/2014	High Wind	50 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	4/22/2014	Thunderstorm Wind	53 Kts. MG	0/0	\$0
Quay County	4/26/2014	High Wind	50 Kts. MG	0/0	\$0
Quay County	4/27/2014	High Wind	50 Kts. MG	0/0	\$0
Quay County	4/28/2014	High Wind	58 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	5/7/2014	Thunderstorm Wind	55 Kts. MG	0/0	\$0
Quay County	5/16/2014	High Wind	50 Kts. MG	0/0	\$0
Logan	5/22/2014	Thunderstorm Wind	56 Kts. EG	0/0	\$0
(Tcc)Tucumcari Arpt	6/6/2014	Thunderstorm Wind	55 Kts. MG	0/0	\$0
House	6/13/2014	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Tucumcari	6/13/2014	Thunderstorm Wind	52 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	6/13/2014	Thunderstorm Wind	61 Kts. MG	0/0	\$0
Glenrio	6/13/2014	Thunderstorm Wind	52 Kts. MG	0/0	\$0
Glenrio	9/24/2014	Thunderstorm Wind	52 Kts. EG	0/0	\$0
Quay County	12/14/2014	High Wind	50 Kts. MG	0/0	\$0
Quay County	4/24/2015	High Wind	54 Kts. MG	0/0	\$0
San Jon	7/9/2015	Thunderstorm Wind	56 Kts. EG	0/0	\$0
Porter	7/9/2015	Thunderstorm Wind	56 Kts. EG	0/0	\$0
Quay County	3/23/2016	High Wind	35 Kts. MS	0/0	\$0
Quay County	4/5/2016	High Wind	51 Kts. MG	0/0	\$0
Logan	7/3/2016	Thunderstorm Wind	55 Kts. EG	0/0	\$10,000
(Tcc)Tucumcari Arpt	8/19/2016	Thunderstorm Wind	50 Kts. MG	0/0	\$0
Quay County	11/17/2016	High Wind	51 Kts. MG	0/0	\$0
Quay County	12/16/2016	High Wind	56 Kts. MG	0/0	\$0
Quay County	1/24/2017	High Wind	38 Kts. MS	0/0	\$0
Quay County	2/6/2017	High Wind	56 Kts. MG	0/0	\$0
Quay County	2/23/2017	High Wind	40 Kts. MS	0/0	\$0
Quay County	2/28/2017	High Wind	59 Kts. MG	0/0	\$0
Quay County	3/6/2017	High Wind	53 Kts. MG	0/0	\$0
Quay County	3/23/2017	High Wind	64 Kts. MG	0/0	\$0

Location	Date	Event Type	Magnitude	Deaths/Injuries	Property Damage
San Jon	5/9/2017	Thunderstorm Wind	61 Kts. EG	0/0	\$0
Quay County	5/16/2017	High Wind	50 Kts. MG	0/0	\$0
(Tcc)Tucumcari Arpt	6/20/2017	Thunderstorm Wind	52 Kts. MG	0/0	\$0

Source: NCDC Storm Events Database, accessed December 2017. MG = Measured Gust, EG = Estimated Gust, MS = Measured Sustained, ES = estimated Sustained

#### 4.8.4 Probability and Extent of Future Events

Given the fairly frequent occurrence of high wind in Quay County, the probability of a future event is “Likely”.

#### 4.8.5 Vulnerability and Impact

Quay County experiences high wind frequently, based on seasonal meteorological patterns and local topographical conditions. All areas of the County are vulnerable to high winds, although local topography plays a significant role in how wind affects a particular area. Compared to the hurricane-prone southeastern U.S. coast, the vulnerability is not as high.

For this update there was a data deficiency in cataloging and studying the expected damages from high winds within Quay County. Future plan updates should consider more study of the high wind risk. The likely impacts of high winds in Quay County would be damage to manufactured homes, disruption of power and telephone services, highway closures, and disruptions to emergency communications capabilities. Additional future studies should focus on the vulnerability of key public facilities to high wind.

#### 4.8.6 Conclusions

Mitigation opportunities for high wind in Quay County include adopting updated building codes. For existing residential structures, the most effective mitigation actions focus on the most vulnerable structures, particularly manufactured and mobile homes. These structures can be inspected for adequate tie-downs and retrofitted if necessary. Quay County should examine its critical facilities for wind retrofits first. Subsequent updates to this Plan will explore this further.

### 4.9 Tornado

#### 4.9.1 Overview

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 mph. 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>13</sup>. While tornadoes are most likely to occur during the months of March through May and can occur at any time of day, but are more likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly. 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.

The destruction caused by tornadoes ranges from light to incredible 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). The Enhanced Fujita Scale for Tornadoes was developed to measure tornado strength and associated damages, as shown in **Table 4.10**.

**Table 4.10: Enhanced Fujita Scale for Tornadoes**

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.

Source: NOAA

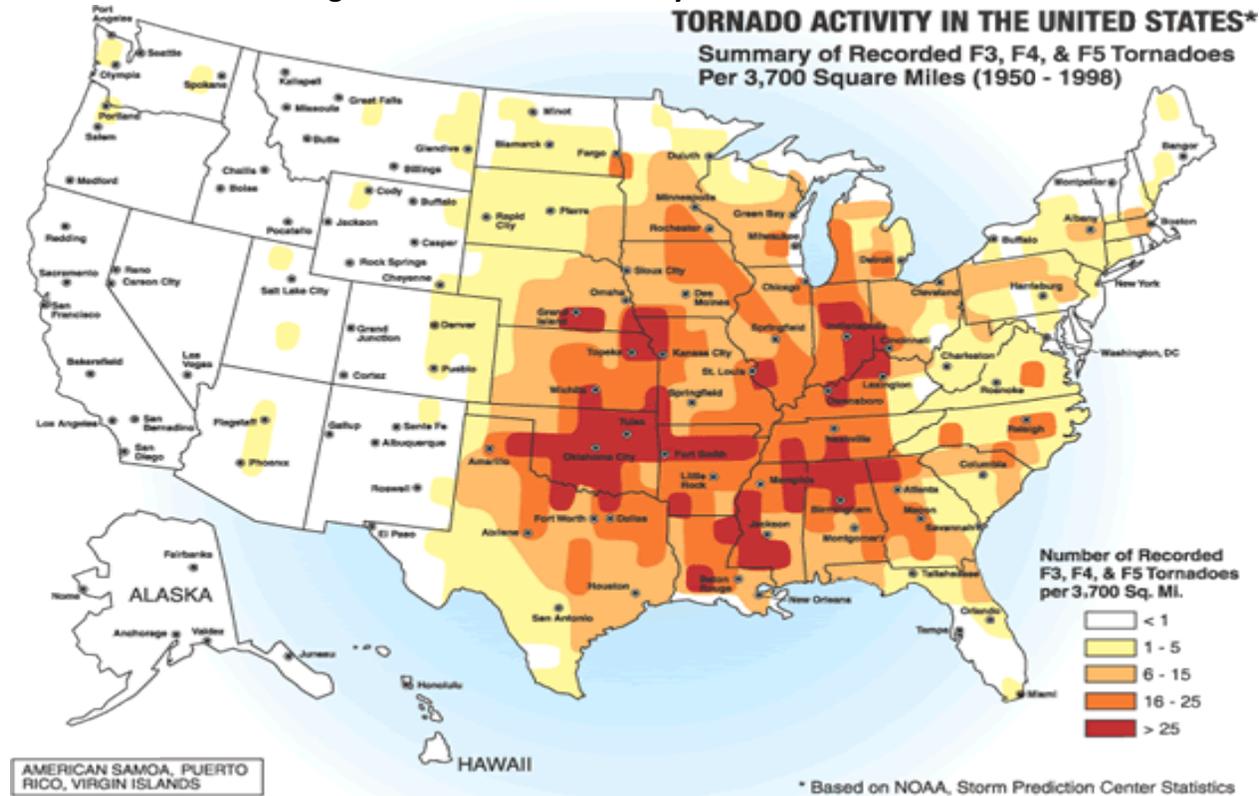
#### 4.9.2 Location and Spatial Extent

According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. The Great

<sup>13</sup> NOAA, 2007 information

Plains region of the Central United States favors the development of the largest and most dangerous tornadoes (earning the designation of “tornado alley”). **Figure 4.18** shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles. Only small parts of eastern New Mexico have more than one tornado reported for 1,000 square miles indicating a low risk for the rest of New Mexico (including Quay County). While the entire planning area is subject to the threat of tornadoes, the planning area’s lower elevations are at a slightly greater risk. The spatial extent of a tornado is small.

**Figure 4.18: Tornado Activity in the United States**



Source: <http://www.fema.gov/safe-rooms/tornado-activity-united-states>

### 4.9.3 Previous Occurrences

There were 10 reports of tornado activity in Quay County from January 1993 through December 2015, according to NOAA, ranging in magnitude from EF0 to EF1. Only one tornado during this period had reported damages. The NCDL narratives detail the severity of the tornado as follows:

- April 23, 2007** – A small and possibly elevated landspout type tornado developed on the far east end of a rear flank outflow that swung south through east over Logan as a storm centered about 5 miles to the west moved north over Ute Lake. Damage along the track as it moved over the west side of Logan was intermittent with damage indicators pointing to winds of general 80 to 90 mph with peak winds near the south and north ends of the track estimated at 105 mph. Average track width was around 100 yards. Logan had no tornado siren system but citizens reported nearly 30 to 50 minutes notice

of an approaching severe thunderstorm. About a dozen injuries were reported with only two transported to Tucumcari for brief treatment in hospital. Heaviest damage was mainly confined to about 50 manufactured homes and recreational vehicles tossed and rolled mainly on the south end of the lake resort community. Damage to site constructed homes and buildings was limited to window, roof, and soffit damage except for one 1910 era frame home that lost its roof.

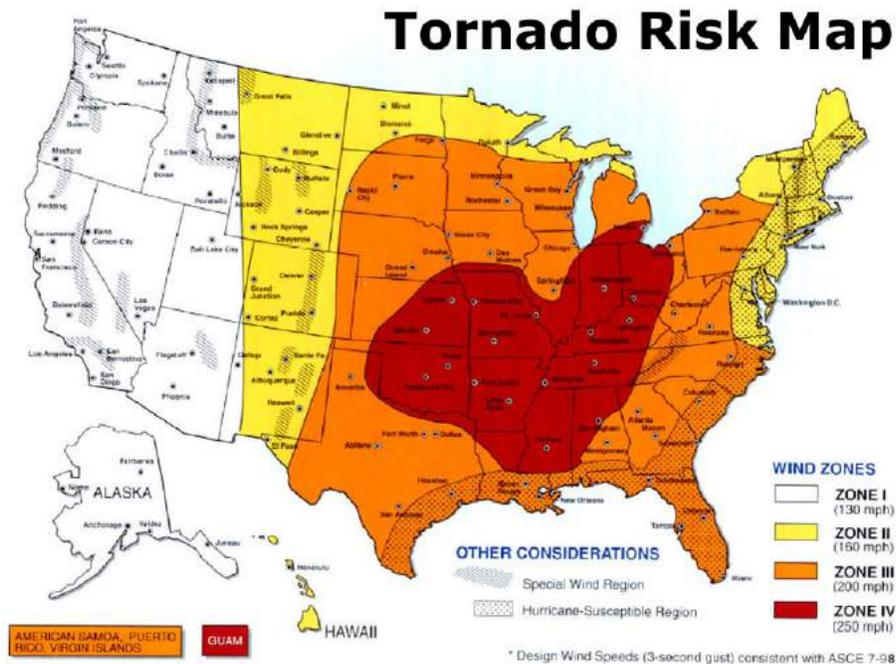
Tornado warnings do occur for Quay County especially during the monsoon season where strong thunderstorms and generate tornado activity. A recent report follows:

- May 5, 2017** – Quay County Sun reported that “a brief tornado touchdown was reported 16 miles southwest of Tucumcari on County Road 43 near Quay. He said the tornado was on the ground for a short period of time but no additional information about the touchdown is available. The storm that produced this tornado also had reports of golf ball-size hail and high wind gust, (Kerry) Jones added”. “Another tornado was reported on the ground 6:15 p.m.-6:30 p.m., six miles northeast of Roy in Harding County. He said a large storm system pulled up deep moisture from the surface from northern Baja, California, and the Gulf of Mexico that resulted in the outbreak of severe thunderstorms yesterday across Eastern New Mexico.”

**4.9.4 Probability and Extent of Future Events**

Given the relatively rare occurrence of tornadoes in Quay County, the probability of a future event is “**Unlikely**”. If a tornado did occur, it will most likely be an EF0 or EF1, the weakest types and unlikely to create significant damage as demonstrated in **Figure 4.19**.

**Figure 4.19: Tornado Risk in the United States**



Source: <http://www.fema.gov/safe-rooms/tornado-activity-united-states>

#### 4.9.5 Vulnerability and Impact

While the magnitude and location of tornadoes are unpredictable, the only tornadoes to have occurred in the area surrounding Quay County in the past 30 years were classified as low intensity (EF0-EF1), typically with no reported damages. However, Quay County would be vulnerable to a direct strike by even a low intensity tornado. For this update there was a data deficiency in cataloging and studying the expected damages from tornado within Quay County. Future plan updates should consider more study of the tornado risk. The impact of a future EF-0 or EF-1 tornado in Quay County would include damage to trees, roofs, chimneys, sign boards, gutters, windows, and siding. Mobile homes may be pushed off foundations or overturned. The entire planning area is equally vulnerable to the impacts of tornadoes. It is possible that Quay County could experience up to an EF3 Tornado which could have a devastating effect on the portion of the county that is impacted. Due to the potential of a stronger tornado, the impact would be considered critical.

#### 4.9.6 Conclusions

The potentially strong winds of a tornado and random location make it a difficult hazard to mitigate. Most tornado mitigation activities across the nation focus on life safety. Safe rooms, both community and individual ones, are common mitigation actions to protect people in a tornado event.

### 4.10 Extreme Heat

#### 4.10.1 Overview, Previous Occurrences, Location, Probability and Severity

Extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and that last for an extended period of time. Humid conditions may also add to the discomfort of high temperatures. Health risks from extreme heat include heat cramps, heat fainting, heat exhaustion, and heat stroke. According to the National Weather Service, heat is one the leading weather-related killers in the United States and kills hundreds of people every year<sup>14</sup>. However, most deaths are attributed to prolonged heat waves in large cities that rarely experience hot weather. It is important to note that while extreme temperatures threaten human health, they typically do not cause significant damage to the built environment. The elderly and the ill are most at-risk, along with those who exercise outdoors in hot, humid weather.

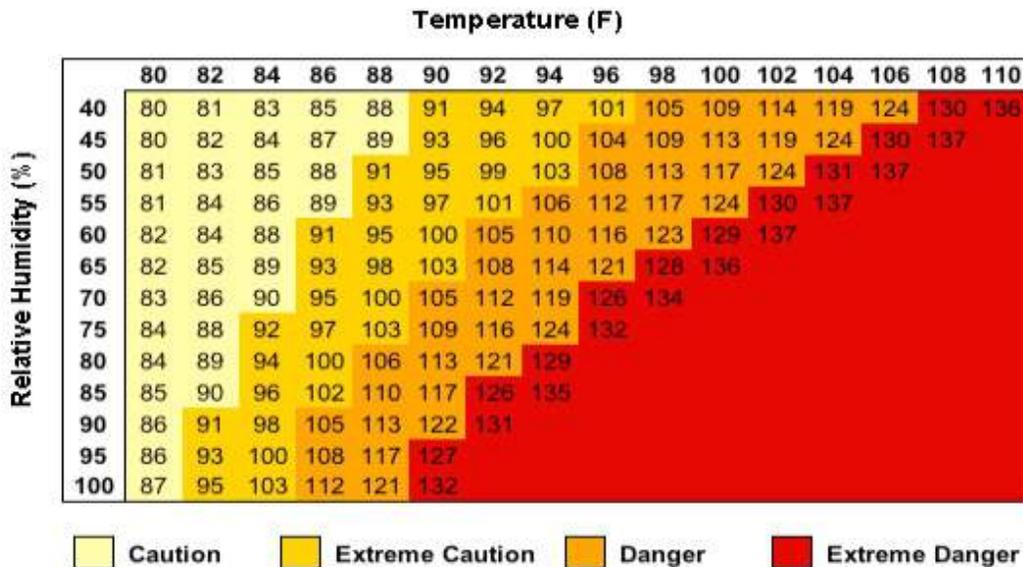
The 2013 State Plan reports that that in New Mexico, at elevations below 5,000 feet, individual day-time temperatures often exceed 100°F during the summer months. However, during July, the warmest month, temperatures range from slightly above 90°F in the lower elevations to 70°F in the higher elevations.

The danger of extreme heat is gauged by using the Extreme Heat Index (below). The Heat Index, as shown in **Figure 4.20**, displays the relative danger in relation to air temperature and relative humidity.

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<sup>14</sup> <http://www.nws.noaa.gov/os/heat/index.shtml#heatindex> Accessed August 2013

Figure 4.20: Extreme Heat Index



Source: [http://www.nc-climate.ncsu.edu/images/climate/heat\\_index.jpg](http://www.nc-climate.ncsu.edu/images/climate/heat_index.jpg)

The 2013 State Plan reports that there have been three extreme heat events that occurred in all Preparedness Areas, including Preparedness Area #1, and can be interpreted to have affected Quay County and its jurisdictions. These events are listed in **Table 4.11**, along with the maximum temperature observed at the Tucumcari Municipal Airport weather station. Dew point, which is needed to estimate relative humidity, is not recorded at that station; thus, the heat index cannot be estimated. There have been no reported deaths as a result of these events.

**Table 4.11: Previous Occurrences of Extreme Heat, with Maximum Recorded Temperature at Tucumcari Airport**

Date	Statewide Impact Description	Max Temperature
June 1998	Conditions had been unusually warm and dry throughout the month, but the heat intensified beginning on the 20 <sup>th</sup> with daily high temperatures climbing well above 100°F, except in mountain communities at elevations above 7,500 feet. Readings in the southeast section of the state peaked at 108 to 113°F as these locations exceeded 10 consecutive days with daily highs above 100°F. New records for duration of 100+ degree-days were set from Carlsbad north to Clovis and Tucumcari. The heat broke records that had lasted 60 to 70 years. By the end of the month a number of locations in the east had observed 16 to 20 days with a daily high over 100°F.	109.4°F (Local Record)
May 24, 2000	New daily high temperature records were set across the state as temperatures soared into the high 90s and 100s all across the east and south. Record highs in the mid and upper 80s were also set in the higher elevation communities of both the south central, central and northern mountains.	103°F (NCEI)
July 2003	Hottest month ever recorded in New Mexico. There were 14 days of highs of 100°F or more, and no cooling at night. A new all-time high low temperature of 78°F is set. 21 days do not go below 70°F. Average temperature of 84.6°F for the entire month shatters 1980 record of 82.7°F.	104°F (July 26, 2003, NCEI)

Source: 2013 State Plan, <https://www.ncdc.noaa.gov/cdo-web/quickdata>, Accessed December 2017.

In Tucumcari, local records indicate the record temperature of 109.4°F was recorded on June 27, 1998. Population centers in Quay County can expect temperatures in excess of 100°F to occur in a typical summer season. Quay County and its jurisdictions consider any extended period with temperatures above 90°F to be hazardous and cause for concern. The entire planning area is equally subject to extreme heat. The probability of extreme heat occurring in the future is “**Possible**”. The spatial extent of the damage is negligible.

#### **4.10.2 Vulnerability and Conclusions**

While extreme heat events will occur again in the future, Quay County’s existing buildings, infrastructure, and critical facilities are not considered vulnerable and therefore any estimated property losses are anticipated to be minimal across the area. For this update there was a data deficiency in cataloging and studying the expected damages from extreme heat within Quay County. Future plan updates should consider more study of the extreme heat risk. Extreme heat does however present a considerable safety risk to Quay County’s vulnerable populations. Heat casualties are usually caused by lack of adequate air conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed, who frequently live on low fixed incomes, and cannot afford to run air-conditioning on a regular basis, may experience power outages, and may be isolated, with no immediate family or friends to look out for their well-being. Young children are also extremely vulnerable to heat, particularly when left unattended in the elements.

During extreme heat episodes, the elderly should seek shelter in air-conditioned spaces. Due to the lack of mitigation options for extreme heat, this hazard is considered a nuisance and will not be addressed in the rest of the plan except for an action to designate a cooling center for Quay County during times of extreme heat and an education program on the dangers of extreme heat and children. If future conditions or events warrant further investigation, a future update to this Plan will address it.

### **4.11 Summary of Vulnerability**

The findings presented in **Section 4** were developed using the best available data and methods that provide an approximation of hazard risk. These approximations should be used to understand relative hazard risk. However, uncertainties are inherent in risk assessment methodology, arising in part from incomplete scientific knowledge concerning specific hazards and their effects on the built environment and from generalities that are necessary to provide a comprehensive analysis and overview of hazard risk for large planning areas.

The preparers of this Plan’s hazard risk assessment relied heavily on historical data, stakeholder input, and professional and experienced judgment regarding projected hazard impacts. The preparers also considered the findings in other relevant plans, studies, and technical reports.

To draw some meaningful planning conclusions on hazard risk for Quay County, the results of the combined risk assessment process were used to generate hazard profiles according to a Priority Risk Index (PRI). The purpose of the PRI, described further below, is to categorize and

prioritize the 10 identified hazards for Quay County and the participating jurisdictions as high, moderate, or low risk (see **Table 4.12**).

#### 4.11.1 Priority Risk Index

The prioritization and categorization of identified hazards for the planning area is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the HMPT in gaining consensus on the determination of those hazards that pose the most significant threat to Quay County based on a variety of factors. The PRI is by no means scientific, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in Quay County based on standardized criteria. The hazard profiles developed earlier in this section allow for the prioritization of high hazard risks for mitigation planning purposes.

The numerical PRI results allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration) which occurred in the **Section 4** hazard profiles. Each degree of risk was assigned a value (1 to 4) and a weighting factor, as summarized in **Table 4.11**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor.

The sum of all five categories is the final PRI value using this example equation:

$$\text{PRI VALUE} = [(\text{PROBABILITY} \times .40) + (\text{IMPACT} \times .20) + (\text{SPATIAL EXTENT} \times .20) + (\text{WARNING TIME} \times .10) + (\text{DURATION} \times .10)]$$

Using the weighting scheme used by Quay County, the highest possible PRI value is 4.0. **Table 4.12** summarizes the degree of risk assigned to each category for all identified hazards. After reviewing the individual PRI score for each hazard for each community, Quay County determined that a single PRI score could be utilized for all jurisdictions. The PRI Score for each hazard is in the last column on the right.

**Table 4.12: Category/Degree of Risk for Quay County and Tucumcari**

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
<b>Flood</b>	Highly Likely	Critical	Moderate	Less than 6 Hours	Less than 24 Hours	<b>2.7</b>
<b>Wildfire</b>	Highly Likely	Limited	Moderate	12 to 24 Hours	Less than 24 Hours	<b>3.8</b>
<b>Drought</b>	Likely	Limited	Large	More than 24 Hours	More than 1 Week	<b>3.3</b>
<b>Earthquake</b>	Unlikely	Critical	Large	6 to 12 Hours	Less than 6 Hours	<b>2.1</b>
<b>Severe Winter Storms</b>	Possible	Minor	Large	More than 24 Hours	Less than 24 Hours	<b>2.4</b>
<b>Thunderstorm</b>	Likely	Minor	Small	More than 24 Hours	Less than 6 Hours	<b>2.9</b>

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Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
High Wind	Likely	Minor	Small	12 to 24 Hours	Less than 6 Hours	2.8
Tornado	Unlikely	Minor	Small	6 to 12 Hours	Less than 6 Hours	2.1
Extreme Heat	Possible	Minor	Moderate	More than 24 Hours	Less than 1 Week	2.5

Table 4.13 shows the nine natural hazards categorized by hazard risk:

- **High** – PRI score over 2.7
- **Moderate** – PRI score between 2.0 and 2.7
- **Low** – PRI score 2.0 or below

**Table 4.13: Hazards Organized by Level of Risk**

Hazard Risk	Hazard Type
High	Wildfire Drought Thunderstorm (includes lightning /hail) High Wind
Moderate	Sever Winter Storm Flood Earthquake Extreme Heat Tornado
Low	None

## 5 Mitigation Goals, Measures, and Actions

The preparation of goal, measures and actions to address the risk defined in **Section 4** is the culmination of the mitigation plan. The implementation of these measures will lead to the fulfillment of risk reduction and ultimately, a higher quality of life for the citizens of Quay County.

### 5.1 Mitigation Measures

#### 5.1.1 Hazard Mitigation Goals

The mitigation goals reflect the aspirations of the Quay County HMPT to provide a safe environment in the planning area while preserving cultural sites, the natural environment and a quality of life. The goals formulation process is linked to the risk and vulnerability findings. The resulting mitigation actions are the specific measures needed to meet the goals. For this update the HMPT reviewed the goals listed in the previous HMP. Those goals were updated to simplify the verbiage while maintaining the intent and to reflect the understanding of the risks faced by the community. The mitigation goals and priorities have not significantly changed for Quay County and Tucumcari as part of this update. The goals listed below are new in the sense they have been reworded but generally mirror the intent of the previous goals.

The mitigation goals of Quay County are:

- I. Make the county and its municipalities safer from natural hazards.
- II. Reduce the damage to cultural sites and natural resources from natural hazards.
- III. Reduce property damages caused by natural hazards.
- IV. Make the county and its municipalities more resilient by shortening the recovery time after a natural hazard event.
- V. Increase the county and its municipalities' capability to mitigate natural hazards.
- VI. Enhance the collaborative process with federal, state and local agencies to mitigate natural hazards in the planning area.
- VII. Increase awareness and understanding of risks and opportunities for mitigation among residents

#### 5.1.2 NFIP Participation and Continued Compliance

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the ravages of flooding. Quay County and Tucumcari are participants in the NFIP and are in good standing. Although not a participating jurisdiction, the Village of San Jon also participates in the NFIP, as does the Village of Logan, although there are no flood hazards defined in Logan and it is shown as non-flood prone on the 2003 FIRM. Although no detailed information regarding the village's

timeline is available as of this plan update, it’s anticipated that the Village of House will investigate the benefits of joining the NFIP during the next planning cycle.

Quay County and Tucumcari will continue to maintain compliance and participation in the NFIP by requiring floodplain permits, reviewing building plans associated with those permits, and meeting the minimum requirements of the NFIP regulations. Both communities employ Certified Floodplain Managers with current accreditations as their Floodplain Administrators.

No NFIP repetitive loss properties are identified in Quay County or Tucumcari. The Village of Logan is non-floodprone according to the 2003 FIRM. The number of NFIP policies in place in Quay County inclusive of other jurisdictions is shown in **Table 5.1**.

**Table 5.1: Number of NFIP Policies by Jurisdiction**

Jurisdiction	No. of Policies
City of Tucumcari	5
Village of San Jon	1
Village of Logan	0
Quay County	1

## 5.2 Previous Mitigation Action Plan Update

**Table 5.2** includes a description and status update of the mitigation actions identified in the last planning cycle. Actions identified for future implementation have been included in the current mitigation actions and projects in **Section 5.3.1**.

**Table 5.2 – Previous Mitigation Actions**

Action #	Action Description	Status
1.A	Coordinate with the City of Tucumcari and the County to assess the condition of critical facilities. Determine relative vulnerability and identify the most immediate needed improvements.	Carry forward
1.B	Identify mobile home structures that would be most impacted by severe storms and target cost-effective measures to secure foundations and reinforce roof structures.	Change to outreach goal
2.A	Reduce fuel loads and create defensible space in the wildland-urban interface in Quay County	Carry forward
2.B	Perform detailed assessments of individual SARA Title III facilities within wildfire hazard areas, including presence or absence of vegetation in close proximity to the buildings, power supply lines and communication lines. In the cases where vegetation is present, follow-on efforts would include an assessment of the available fuel within the forested areas and type of construction materials on the facility (in particular, the roof, siding, and window coverings), to determine more detailed assessments of vulnerability and risk. In cases where vulnerability and risk are considered to be relatively high (high fuel levels, close proximity of vegetation, combustible materials), follow-on efforts should include investigating the extent to which defensible space practices would alleviate the problems in a cost-effective manner.	Review at county level
2.C	Implement defensible space practices around all critical facilities located in wildfire hazard areas	Partially complete, carry forward

## Hazard Mitigation Plan

June 2018

Action #	Action Description	Status
2.D	Hold public meetings for and send flyers to residents to educate them on defensible space and construction in Tucumcari and other fire-prone communities in the County	Carry forward for all communities as an outreach goal
3.A.1	Develop a regional approach for responding to hazardous materials releases	Completed
3.A.2	Work with the State Police to characterize quantities and types of hazardous materials transported by truck along Interstate 40 through Quay County	Completed
3.A.3	Work with Southern Pacific Railroad to strengthen vegetation management program along rail lines near urban areas	Ongoing
3.B.1	Assess need to and ways to harden critical facilities against the effects of human-made hazards, such as the accidental or intentional release of chemical, biological, or radioactive material; the accidental or intentional detonation of explosives; or acts of random violence or terrorism	N/A
3.C.1	Develop a reverse 911 notification system	Carry forward
3.C.2	Upgrade sirens to distinguish between hazardous materials warnings and tornado warnings, each with specific evacuation procedures	Carry forward
3.C.3	Provide backup generators and fuel tanks to provide critical facilities with a redundant system for electrical power	Ongoing
4.A.1	Develop a Quay County Storm Water Management Plan	Carry forward
4.A.2	Provide flood protection while reducing sediment and erosion in the Canadian Watershed	Completed
4.A.3	Build flood control structures as necessary for the four critical facilities that lie in the 100-year floodplain in Tucumcari and Quay County	Carry forward, review critical facilities
4.B.1	Address relatively low participation rate in the NFIP. Promote awareness among property owners in the City, through informational mailings to property owners in the 100-year floodplain; and sponsoring a series of workshops about costs and benefits of acquiring and maintaining flood insurance coverage for property owners in the 100-year floodplain	Carry forward county wide
4.C.1	Complete structure data records in the Quay County GIS to allow future revisions of this Plan to incorporate information about property values, construction types, etc.	Carry forward
4.C.2	Obtain information for all remaining structures in the 100-year floodplain to determine the best property protection methods to promote with individual property owners, including first floor elevations for properties within the 100-year floodplain, market and/or replacement value, and construction type. Techniques for gathering information over time should include developing and implementing a program for integrated information "capture" at key points in normal municipal administrative procedures including applications for building permits at municipal and County offices.	Carry forward for Tucumcari
5.A.1	Line irrigation canals to reduce loss of water	Carry forward
5.A.2	Establish water policies and a water commission for Tucumcari	Ongoing
5.A.3	Launch a pilot program to re-use treated effluent from the Tucumcari wastewater system for use on public landscaping and recreation fields	Some completed, carry forward
5.A.4	Employ zoning, subdivision, and building regulations at the municipal level to promote water conservation. For example, simple provisions in local subdivision ordinances, such as directing storm water runoff to open land as opposed to paved area, can dramatically increase the amount of storm water that infiltrates the ground surface. This water in turn increases groundwater levels that mitigate for loss of function in wells and lessens the impact of low-water periods on base flow in receiving waterways	Carry forward at community level

## Hazard Mitigation Plan

June 2018

Action #	Action Description	Status
5.A.5	Develop a countywide Drought Management Plan. The plan should focus on assessing the County's vulnerability to drought in detail, including impacts to specific agricultural users, municipal and community water utilities, and environmental resources, and explore detailed mitigation actions to minimize impacts during and after a drought	Carry forward
5.B.1	Continue efforts to establish the Ute Water Authority, including hiring an executive director, to make construction of the Ute Pipeline Project possible	Delete
6.A.1	discourage new development within floodplain and floodways add education	Carry forward
6.B.1	Promote adoption of the Wildland-Urban Interface Code by all municipalities and the County	Carry forward
7.A.1	Identify and publicize success stories as part of a consistent public relations program	Delete
7.A.2	Renew and expand commitments to business partner organizations	Delete

### 5.3 Mitigation Action Plan

The mitigation actions and strategies in this section address, to the extent possible, the risk from the hazards described in **Section 4**. The actions and strategies also address areas where additional coordination with other agencies and organizations could benefit Quay County goals to reduce risk. The actions and strategies are the specific measures to help meet the goals of **Section 5.1.1** and include estimated timeframes for completion. Where a specific dollar estimate was not available, a range of costs was used:

- **High** – Over \$500,000
- **Medium** – \$100,000 to \$499,000
- **Low** – \$5,000 to \$100,000
- **Minimal** – Less than \$5,000

The actions were prioritized using a basic format to encourage immediate action, as shown in **Table 5.3**. Flood projects originally receiving a “High” prioritization were also reviewed with STAPLE+E criteria considerations (See **Section 6.2.1**. for criteria). The pass/fail results of the STAPLE+E evaluation for these types of projects are listed in **Section 5.3.1** for projects undergoing the evaluation.

**Table 5.3: Prioritization Categories**

Category	Timeframe	Comments
High	Begin within 1 year from plan adoption	Top organizational priority and is generally a well-detailed project idea. Protects population, resource or property at high risk. Uses feasible methods, techniques or technology.
Medium	2-3 years from plan adoption	A good idea that needs more information or is an action that addresses a moderate hazard.
Low	3-5 years from plan adoption	An idea that needs a lot more information or will take a lot of preliminary action to build support.

Multiple funding sources have been identified (see **Section 6.1.**) for suitability and have been linked as possible to each action. The priority for each action is at the bottom of each action box. When a proposed project mitigates multiple hazards, this is noted.

### 5.3.1 Mitigation Actions and Projects

<b>1. Develop and implement a mass notification system. (Previous Action 3.C.1)</b>	
Project Description/Comments:	Create and implement a mass notification system to inform residents of emergencies and potential evacuation or shelter-in-place notifications.
Jurisdiction:	Quay County
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Quay County Emergency Services, Office of Emergency Management
Estimated Costs:	Medium
Possible Funding Sources:	Local budgets, FEMA
Timeline for Implementation:	Within 2 to 3 years of plan adoption
Cost-Benefit Review	Due to relatively low cost and life safety benefits, the overall benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>2. Move County and City records to GIS. (Previous Actions 4.C.1 and 4.C.2)</b>	
Project Description/Comments:	Move county records to GIS to allow future planning efforts to mine the data and compare special elements and costs. Implement a program to capture new data during the permitting process, property sale and improvement. Update records to account for structure type, elevation and other details.
Jurisdiction:	Quay County, Tukumcari
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Quay County Emergency Services, Office of Emergency Management, City and County Clerk
Estimated Costs:	Medium
Possible Funding Sources:	Local budgets, FEMA
Timeline for Implementation:	Within 1 to 2 years of plan adoption (already underway at County, Tukumcari has obtained needed equipment)
Cost-Benefit Review	Due to relatively low cost and future planning and response benefits, the overall benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>3. Harden Critical Facilities to natural and man-made hazards. (Previous Actions 3.B.1)</b>	
Project Description/Comments:	Access and implement methods to harden critical facilities against the effects of human made hazards such as chemical biological or explosives as well as natural events such as severe storm, earthquakes, and tornados.
Jurisdiction:	Quay County, Tucumcari
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Quay County Emergency Services, Office of Emergency Management, City and County Clerk
Estimated Costs:	High
Possible Funding Sources:	Local budgets, grants
Timeline for Implementation:	Within 2 to 3 years of plan adoption
Cost-Benefit Review	Due to relatively high cost, feasibility studies will be needed to understand the availability of funding and the capacity from a cost benefit perspective. Each project will need to show high benefits. However the total benefit to the community is expected to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>4. Install warning sirens. (Previous Action 3.C.2)</b>	
Project Description/Comments:	Install a fixed outdoor warning siren in various locations throughout Quay County to alert the public of severe weather such as wind, tornado and hail storms. Specific Sirens for HazMat and Tornado will be developed.
Jurisdiction:	Quay County,
Hazard(s) Addressed:	High Wind, Tornado, Thunderstorm (including lightning and hail), Flood
Responsible Organization:	Quay County Emergency Services, Office of Emergency Management
Estimated Costs:	Medium
Possible Funding Sources:	Local budgets, FEMA
Timeline for Implementation:	Within 2 to 3 years of plan adoption
Cost-Benefit Review	Due to relatively low cost and life safety benefits, the overall benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>5. Install generators at Critical Facilities. (Previous Action 3.C.3)</b>	
Project Description/Comments:	This project would allow for fixed diesel powered generators to be installed at critical facilities to ensure continuity of emergency services to the public during high hazard events.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Local Emergency Management Divisions
Estimated Costs:	Medium
Possible Funding Sources:	Local budgets, New Mexico Department of Transportation, FEMA
Timeline for Implementation:	Within 2 to 3 years of plan adoption
Cost-Benefit Review	Life safety benefits expected to outweigh the relatively low costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>6. Multi-hazard Public Education Program (Previous Action 5.B.1)</b>	
Project Description/Comments:	Educate residents on natural hazard threats, impacts, mitigation opportunities, and preparations to make in advance of events. Promote development outside of the floodplain. Print materials will be developed and distributed at local government buildings and public libraries.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Local Emergency Management Divisions
Estimated Costs:	Low
Possible Funding Sources:	Local budgets, FEMA
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Life safety benefits expected to outweigh the low costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>7. Flood Control Structures at Critical Facilities</b>	
Project Description/Comments:	Investigate, design, and build flood control structures to protect the four critical facilities in Tucumcari and Quay County that are in the floodplain. Efforts could include flood wall, levees, floodproofing, or facility relocation.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Flood
Responsible Organization:	Local Emergency Managers , City and County Engineer
Estimated Costs:	High
Possible Funding Sources:	Local municipal funds, Grants
Timeline for Implementation:	3-5 years of adoption
Cost-Benefit Review	Due to high cost, the benefits may outweigh the costs. Feasibility study will focus on fundable efforts that meet cost benefit review.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>8. Well Safety Education Program</b>	
Project Description/Comments:	Local Emergency Managers will work with the New Mexico Department of Health to provide educational information for residents of the County's unincorporated areas on avoiding water well contamination due to flooding. Materials will include methods for well decontamination after flood events.
Jurisdiction:	Quay County
Hazard(s) Addressed:	Flood
Responsible Organization:	Quay County Emergency Management, Quay County Health Department, New Mexico State Engineer's Office
Estimated Costs:	Low
Possible Funding Sources:	Local budgets
Timeline for Implementation:	Within 2 to 3 years of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>9. Flood Insurance Awareness Program (Previous Action 4.B.1)</b>	
Project Description/Comments:	A public awareness program will provide the unprotected property owners throughout the planning area with information concerning their risk and available insurance.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Flood
Responsible Organization:	County and local Floodplain Managers
Estimated Costs:	Low
Possible Funding Sources:	Local budgets
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>10. Multi-Jurisdiction Stormwater Management Plans (Previous Action 4.A.1)</b>	
Project Description/Comments:	Investigate the feasibility and buy-in for a regional stormwater management planning approach. Establish committee and coordinate with neighboring communities to establish better stormwater management planning. Implement a planning team that includes incorporating neighboring jurisdictions and existing plans such as Tucumcari's.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Flood
Responsible Organization:	County and local public works and planning departments
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds, New Mexico State Grants
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+C Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>11. Develop and Implement a Countywide Drought Management Plan (Previous Action 5.A.4 and 5.A.5)</b>	
Project Description/Comments:	Investigate the feasibility and buy-in for countywide drought management plan. Implement a planning team that includes incorporating neighboring jurisdictions. Planning efforts should include construction methods, infiltration, and water use restrictions. Employ regulations such as zoning and building codes to reduce water use. The Plan will detail impacts to water users and providers and the environment.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	County and local public works and planning departments
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds, New Mexico State Grants
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+C Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>12. Water Use Conservation Planning and Regulations (Previous Action 5.A.4)</b>	
Project Description/Comments:	Employ zoning, subdivision, and building regulations at the municipal level to promote water conservation. For example, simple provisions in local subdivision ordinances, such as directing stormwater runoff to open land as opposed to paved areas, can dramatically increase the amount of stormwater that infiltrates the ground surface. This water in turn increases groundwater levels that mitigate for loss of function in wells and lessens the impact of low-water periods on base flow in receiving waterways.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>13. Personal Water Use Reduction Education Program</b>	
Project Description/Comments:	Municipalities will work with the New Mexico State Engineer's Office to provide the citizens of Quay County with methods they can use in reducing their water use. This education will concern the benefits of installing low flow toilets and low flow shower heads in their homes.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>14. Gray Water Education Program and Pilot Program (Previous Action 5.A.2)</b>	
Project Description/Comments:	Information concerning the use of gray water, installation of gray water recovery systems, and the benefits gained will be provided to the general public. Continue to implement uses for treated grey water in Tucumcari and expand the program to neighboring county areas as possible. Grey water reuse on public irrigation such as landscaping and recreation areas.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>15. Mandatory Water Use Restrictions</b>	
Project Description/Comments:	Municipalities will draft a water use restriction program based on a sliding scale with increasingly restrictive measures based on the severity of existing drought conditions.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low
Possible Funding Sources:	Local municipal funds
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>16. Drainage Ditch/Irrigation Canal lining, Improvements, and Maintenance (Previous Action 5.A.1)</b>	
Project Description/Comments:	Clean and repair drainage ditches and culverts to increase or maintain capacity. Develop and implement a maintenance plan.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Flood
Responsible Organization:	Local and county public works departments
Estimated Costs:	Medium
Possible Funding Sources:	FEMA
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to the repetitive losses, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>17. Develop Hazardous Fuels Reduction Program and work with railroad to reduce vegetation near rail lines near urban areas. (Previous Action 3.A.3)</b>	
Project Description/Comments:	Established a program to mow vegetation that can contribute to wildfires. These mowing operations can be implemented by both the property owners and local jurisdictions.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildland Fire
Responsible Organization:	Local emergency managers
Estimated Costs:	Low
Possible Funding Sources:	Municipal Budgets
Timeline for Implementation:	Some planning efforts on-going. Implement within one year of plan adoption.
Cost-Benefit Review	Due to risk of wildfire in the area, and the low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>18. Perform assessment of SARA Title III facilities within wildfire areas. (Previous Action 2.B)</b>	
Project Description/Comments:	Perform detailed assessments of individual SARA Title III facilities within wildfire hazard areas, including presence or absence of vegetation in close proximity to the buildings, power supply lines, and communication lines. Where vegetation is present, follow-on efforts would include an assessment of the available fuel within the forested areas and type of construction materials on the facility (in particular, the roof, siding, and window coverings), to determine more detailed assessments of vulnerability and risk. Where vulnerability and risk are considered to be relatively high (high fuel levels, close proximity of vegetation, combustible materials), follow-on efforts should include investigating the extent to which defensible space practices would alleviate the problems in a cost-effective manner.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildland Fire
Responsible Organization:	Local emergency managers
Estimated Costs:	Low
Possible Funding Sources:	Municipal Budgets, Grants
Timeline for Implementation:	2-3 years from adoption
Cost-Benefit Review	Due to risk of wildfire in the area, and the low cost, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>19. Implement Wildfire Public Education and Outreach Activities (Previous Action 2.D)</b>	
Project Description/Comments:	Develop comprehensive education process that includes fire safety education/prevention and organize community cleanups in high fuel areas. Present the material at public meetings and public gatherings.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildland Fire
Responsible Organization:	Local emergency managers
Estimated Costs:	Low
Possible Funding Sources:	USFS; Municipal Budgets
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost of awareness programs, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>20. Create defensible space in WUI areas and adopt WUI Code. (Previous Actions 2.A and 6.B.1)</b>	
Project Description/Comments:	Reduce fuel loads and increase defensible space in WUI areas by managing vegetation. Adopt Wildland Urban Interface Building codes throughout the County.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildland Fire
Responsible Organization:	Local emergency managers, City and County Managers and Engineers
Estimated Costs:	Low
Possible Funding Sources:	USFS; Municipal Budgets
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost of vegetation management and the high benefit of reduced fire risk, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>21. Create defensible space at critical facilities (Previous Action 2.C)</b>	
Project Description/Comments:	Reduce fuel loads and increase defensible space at critical facilities areas by managing vegetation.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildland Fire
Responsible Organization:	Local emergency managers, City and County Managers and Engineers
Estimated Costs:	Low
Possible Funding Sources:	USFS; Municipal Budgets
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost of vegetation management and the high benefit of reduced fire risk, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>22. Bury Power Lines</b>	
Project Description/Comments:	Bury all power lines in Quay County to reduce the incident of a downed tree hitting a power line.
Jurisdiction:	Quay County, City of Tucumcari, Village of House, Village of San Jon, Village of Logan
Hazard(s) Addressed:	Wildland Fire, Severe Winter Storm, Thunderstorm, High wind, Tornado
Responsible Organization:	Municipal utilities
Estimated Costs:	High
Possible Funding Sources:	Work with utility companies and incorporate into capital improvements plans
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Costs are high; individual Benefit-Cost Analysis would be needed.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>23. Educate Residents on Water Conservation Measures</b>	
Project Description/Comments:	Educate residents on ways to reduce vulnerability, including information about landscaping with indigenous desert plants to reduce the effects of a drought.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local emergency management
Estimated Costs:	Minimal
Possible Funding Sources:	Local Budgets
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost of awareness programs, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>24. Establish Drought Indicator/Early Warning System</b>	
Project Description/Comments:	Establish a system that detects levels of soil moisture and stream/river levels to determine when conditions are trending toward a drought.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Drought
Responsible Organization:	Local emergency management
Estimated Costs:	Low
Possible Funding Sources:	NRCS, USDA
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>25. Conduct Earthquake Safety Awareness Program</b>	
Project Description/Comments:	Provide educational materials (prepared ones where available) to residents to raise awareness of the risk to earthquakes and to learn basic safety techniques during and after an earthquake.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Earthquake
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Minimal
Possible Funding Sources:	FEMA Earthquake Program, Local Budgets
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost of awareness programs, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>26. Adopt Seismic Building Codes</b>	
Project Description/Comments:	Review and adopt seismic building codes for new construction.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Earthquake
Responsible Organization:	Municipal building/permit department or authority
Estimated Costs:	Low
Possible Funding Sources:	Local budgets
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Relative low costs of exploration so the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>27. Explore Feasibility of Seismic Structural and Non-Structural Retrofit to Critical Facilities and Utilities</b>	
Project Description/Comments:	Conduct more detailed risk assessment of earthquake impacts on local critical facilities and utilities. Prepare preliminary analysis of retrofits to critical infrastructure
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Earthquake
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low (non-structural) to High (structural)
Possible Funding Sources:	HUD funds, FEMA
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>28. Prepare Public Education Effort for Winterizing Measures</b>	
Project Description/Comments:	Provide educational information to local residents on insulating pipes to reduce damage from winter storms. Find ready-made brochures to distribute.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Severe Winter Storm
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low
Possible Funding Sources:	HUD if funds are needed
Timeline for Implementation:	Within one year of plan adoption
Cost-Benefit Review	Due to low cost of awareness programs, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>High</b>

<b>29. Implement Tree Trimming to Protect Power Lines</b>	
Project Description/Comments:	Trim trees along roadways to prevent interference with power lines during high winds and winter storms.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Severe Winter Storm, High Winds
Responsible Organization:	Local Forestry Department
Estimated Costs:	Low to Medium
Possible Funding Sources:	Incorporate into capital improvements plans
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to multiple benefits from tree-trimming, benefits expected to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>30. Explore Feasibility of Insulating Water Pipes on Exterior of Public Buildings</b>	
Project Description/Comments:	Insulating the pipes can reduce incidences of pipes bursting and causing interior water damage and loss of water in public buildings.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Severe Winter Storm
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to medium
Possible Funding Sources:	Incorporate into capital improvements plans
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>31. Establish Lightning Safety Program for Quay County Residents</b>	
Project Description/Comments:	Raise awareness among Quay County residents of dangers of lightning and what to do in a lightning storm. Obtain ready-made guides and brochures from sources like FEMA.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Thunderstorms
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Minimal
Possible Funding Sources:	Some staff time needed
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to low cost of awareness programs, the benefits are anticipated to outweigh costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>32. Evaluate Methods for Protecting Public Buildings from Lightning Strike Damage</b>	
Project Description/Comments:	Install a surge protector system for protecting electronic equipment from direct lightning strikes. During severe weather, incorporate plans to take the extra step of disconnecting especially sensitive equipment.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Thunderstorm
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to Medium
Possible Funding Sources:	Incorporate into capital improvement plans
Timeline for Implementation:	Within two to three years of plan adoption
Cost-Benefit Review	Due to high cost of data loss and relative low cost of project, the benefits are anticipated to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>33. Protect Public Buildings from Hail Damage</b>	
Project Description/Comments:	As public buildings are constructed or renovated, use hail-resistant metal roofing.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Thunderstorm
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to Medium
Possible Funding Sources:	Incorporate into capital improvements plans
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>34. Implement Residential Safe Room Rebate Program</b>	
Project Description/Comments:	Implement program to encourage individuals to construct safe rooms at residential homes by implementing a safe room rebate program to reimburse a portion of the construction costs.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Tornados
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to Medium
Possible Funding Sources:	FEMA
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>35. Tornado Warning System</b>	
Project Description/Comments:	Purchase and install a tornado warning system.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Tornados
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to Medium
Possible Funding Sources:	FEMA
Timeline for Implementation:	Within three to five years of plan adoption
Cost-Benefit Review	Benefits relative to costs would have to be explored in greater detail.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>36. Designate/ Set up a Public Cooling Centers</b>	
Project Description/Comments:	Designate and set up cooling centers in well-known, centrally-located public facilities that will serve as a shelter to vulnerable populations (particularly the elderly) during periods of extreme heat.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Extreme Heat
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Low to Medium (cost of generators)
Possible Funding Sources:	HUD, potentially FEMA
Timeline for Implementation:	Within two to three years from plan adoption
Cost-Benefit Review	Due to potential health risks due to extreme heat, the benefits are anticipated to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>37. Conduct fan drive to prepare for periods of extreme heat.</b>	
Project Description/Comments:	Collect and distribute fans to most vulnerable citizens (generally the elderly) during periods of extreme heat. Develop a list of vulnerable citizens ahead of any extreme heat.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Extreme Heat
Responsible Organization:	Local Emergency Managers
Estimated Costs:	Volunteer time and efforts
Possible Funding Sources:	Local donations
Timeline for Implementation:	Within three to five years from plan adoption
Cost-Benefit Review	Due to potential health risks due to extreme heat and voluntary nature of this effort, the benefits are anticipated to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Low</b>

<b>38. Assess condition of Critical Facilities and identify and implement critical improvements. (Previous Action A1.)</b>	
Project Description/Comments:	Review County and City of Tucumcari Critical facilities and assess facilities for needs. Prioritize needs based and complete needed improvements and repairs.
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Wildfire, Drought, Thunderstorm, High Wind, Severe Winter Storm, Flood, Earthquake, Extreme Heat, Tornado
Responsible Organization:	Local Emergency Managers, City County Engineers
Estimated Costs:	Moderate
Possible Funding Sources:	Grants Capital Improvement budgets
Timeline for Implementation:	Within 1-2 years
Cost-Benefit Review	Due to potential risks of failed facilities and the moderate cost, the benefits are anticipated to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

<b>39. Identify at-risk mobile homes and educate owners on cost-effective mitigation actions for foundations. (Previous Action 1B.)</b>	
Project Description/Comments:	Identify mobile homes, and assess the structures with consideration to survivability in severe storms. Target cost effective mitigation action education to the structure owners
Jurisdiction:	Quay County, City of Tucumcari
Hazard(s) Addressed:	Flood, Severe Winter Storm, Tornado
Responsible Organization:	Local Emergency Managers, City County Engineers
Estimated Costs:	Low (Outreach)
Possible Funding Sources:	Grants, Capital Improvement budgets
Timeline for Implementation:	Within 1-2 years
Cost-Benefit Review	Due to the low cost of outreach, and the added long term benefit of outreach to the community as a whole, the benefits are expected to outweigh the costs.
STAPLE+E Review	No concerns raised.
<b>Priority</b>	<b>Medium</b>

## 6 Implementation Strategy

### 6.1 Capability Assessment

Quay County has a large capacity to generate power. This capability is an asset in many response situations. A large wind farm is located in Quay County near the Village of House and a 25 Megawatt solar generation plant is just south of Tucumcari.

As shown in **Table 6.1**, Quay County and the municipalities have the following internal capabilities related to hazard mitigation which serve as a baseline of what they can accomplish with relation to hazard mitigation goals and strategies.

**Table 6.1: Quay County Capabilities**

<b>Regulations</b>	<ul style="list-style-type: none"> <li>• Quay County Planning and Zoning Commission</li> <li>• Quay County Subdivision Regulations</li> </ul>
<b>Emergency Response</b>	<ul style="list-style-type: none"> <li>• Quay County Emergency Management</li> <li>• Quay County Sheriff's Department</li> <li>• Tucumcari/Quay County Regional Emergency Communications Center, located in Tucumcari, operates as central dispatch for the whole of Quay County, Harding County, and Conchas Area Fire Department, and is used by the Forest Service and State Parks.</li> <li>• 14 main stations and 10 sub-stations between the fire departments.</li> <li>• Each fire department has a designated jurisdiction in which they are the first responders. Each fire jurisdiction can request assistance from any other department within the county and municipalities. Groups of fire departments have been designated for different areas of the county that have been identified as the quickest response for assistance. Also agreements have been established with San Miguel, Harding, Curry, and Guadalupe Counties, and the bordering Texas counties in regards for requesting assistance.</li> </ul>
<b>Plans</b>	<ul style="list-style-type: none"> <li>• 2005 Quay County Regional Comprehensive plan (currently under revision)</li> <li>• Quay County CWPP</li> <li>• Tucumcari 2012 Comprehensive Plan</li> <li>• East Central Fire and EMS Association collaborate to plan response actions throughout the County due to fire, including exercises, meetings and needed equipment to improve situational awareness.</li> <li>• 2005 Village of San Jon Comprehensive Plan</li> </ul>
<b>Critical Infrastructure</b>	<ul style="list-style-type: none"> <li>• Interstate 40, Highways 54 and 209</li> <li>• Railroad through Tucumcari and northern Quay County</li> <li>• Quay County's only hospital is in Tucumcari</li> </ul>
<b>Training</b>	<ul style="list-style-type: none"> <li>• Quay County extension from New Mexico State University can provide training for drought, food, water safety, and water conservation.</li> </ul>

Funding sources for hazard mitigation projects that the HMPT will consider for its identified mitigation actions are shown in Table 6.2.

**Table 6.2: Federal, State and Other Funding Sources**

Name of Program	Primary Purpose
FEMA Public Assistance 406 Mitigation	For damaged public structures in a Presidential disaster declaration area that are otherwise eligible to receive Public Assistance funds, mitigation measures to reduce future risk can be considered. See <a href="http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0">http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0</a> for more information.
FEMA Hazard Mitigation Grant Program (HMGP)	Following a Presidential disaster declaration, this program funds mitigation projects and actions that are projected to reduce future losses in excess of the projects' costs. See <a href="http://www.fema.gov/hazard-mitigation-grant-program">http://www.fema.gov/hazard-mitigation-grant-program</a> for more information.
FEMA Pre-Disaster Mitigation Program (PDM)	From an annual Congressional appropriation, this program funds mitigation projects and actions that are projected to reduce future losses in excess of the projects' costs. See <a href="http://www.fema.gov/pre-disaster-mitigation-grant-program">http://www.fema.gov/pre-disaster-mitigation-grant-program</a> for more information.
Natural Resource Conservation Service (NRCS) Emergency Watershed Protection (EWP) Programs <sup>15</sup>	Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events. EWP is an emergency recovery program. All projects undertaken, with the exception of the purchase of floodplain easements, must have a project sponsor. 75% federal/25% non-federal cost-share.
NRCS Watershed and Flood Prevention Operation Program	Assistance may be provided for authorized watershed projects to install conservation practices and project measures (works of improvement) throughout the watershed project area. The planned works of improvement are described in watershed project plans and are normally scheduled to be installed over multiple years.
USDA Rural Development Emergency Community Water Assistance Grants (ECWAG)	USDA can provide grants from \$150,000 to \$500,000 to assist a rural community that has experienced a significant decline in quantity or quality of drinking water due to an emergency, or in which such decline is considered imminent, to obtain or maintain adequate quantities of water that meets the standards set by the Safe Drinking Water Act. This emergency is considered an occurrence of an incident such as drought, earthquake, flood, tornado, hurricane, disease outbreak or chemical spill, leakage or seepage. See <a href="http://www.rurdev.usda.gov/UWEP_HomePage.html">http://www.rurdev.usda.gov/UWEP_HomePage.html</a> for more information.
USACE Section 205 Authority	Provides authority to the U.S. Army Corps of Engineers to plan and construct small flood damage reduction projects (structural and nonstructural) that have not already been specifically authorized by Congress.

<sup>15</sup> See the following website for more information and examples of funded projects:  
[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/ewpp/?cid=nrcs143\\_008263](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/ewpp/?cid=nrcs143_008263)

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Name of Program	Primary Purpose
USACE Section 219 of the Water Resources Development Act of 1992 (WRDA92), Environmental Infrastructure, as amended	Provides assistance to non-federal interests for carrying out water-related environmental infrastructure and resource protection and development projects, including wastewater treatment and related facilities, water supply, storage, treatment, and distribution facilities. Such assistance may be in the form of technical, planning, and design assistance as well as construction assistance for defined projects and locations with specific amounts authorized for each location. A non-federal cost share of not less than 25% is required for all assistance under Section 219.
USFS Collaborative Forest Restoration Program (CFRP)	Assists public or private forest owners with an opportunity to reduce wildfire dangers that threaten the community as a whole. 80% Federally funded
USFS Forestland Enhancement Plan	This program is administered directly to private landowners who have at least 10 acres of forestland. It provides 75% federal funding for the reduction of fuel loading to improve forest health and reduce fire risk. A side benefit is the improvement of wildlife habitat and water quality.
USFS Rural Community Assistance Economic Action Program (RCA-EAP)	The main purpose of the RCA-EAP is to use local forest products to produce value-added materials for resale or for the conversion of biomass materials (waste wood) to energy for heating of public buildings or other uses. It has a multi-objective component as a fuel reduction project in forests thereby mitigation wildfire potential. 80% Federally funded
HUD CDBG Tornado Shelters Act (TSA)	TSA allows local governments to use CDBG funds to create community tornado shelters (“safe rooms”) in manufactured housing communities. No cost-share information is available.
State Fire Assistance – Wildland/Urban Interface (SFA-WUI) Program	This grant program, funded at a 50/50 cost-share by various federal agencies, is administered by the NM Forestry Division of the NM Energy, Minerals, and Natural Resources Department (EMNRD). SFA-WUI seeks to benefit local communities where the Wildland/Urban Interface is a concern through fuel reduction and creation of defensible space. Local governments are the grant recipients, and projects may be done on private land in conjunction with landowners.
State Water Trust Board	The Water Trust Board was created in the Act. Its purpose is to: 1) oversee and administer the Water Trust Fund and Water Project Fund; 2) review and recommend funding for qualifying water projects to the Legislature; and 3) pursue additional funding opportunities. See <a href="http://governor.state.nm.us/Water_Trust_Board.aspx">http://governor.state.nm.us/Water_Trust_Board.aspx</a> for additional information.
New Mexico Community Foundation (NMCF)	NMCF is a statewide endowment-building and grant-making organization that serves and invests in New Mexico’s people, communities and environment. With partners in every county, NMCF promotes philanthropy as a tool for building community assets, relationships and self-reliance. NMCF provides grants in several areas related to hazard mitigation and forest stewardship. See <a href="http://www.nmcf.org">www.nmcf.org</a> for more information.

Opportunities for increased capability:

- **Uniform Building Code (UBC)** – Building codes are important mitigation tools because they are tailored to fit specific hazards present in each region. Consequently, structures that are built to applicable codes are resistant to hazards, such as strong winds, floods, and wildfires, and can help mitigate the effects of these hazards. New Mexico has adopted the 1997 UBC code as a minimum standard for all communities and provides inspection services through the Construction Industry Division of the New Mexico Department of Regulations and Licensing. Individual counties and municipalities are at liberty to adopt the most current UBC.
- **Floodplain Ordinance and Community Rating System (CRS)** – Quay County and all jurisdictions except the Village of House are participants in the NFIP. Those jurisdictions can benefit from adopting higher standards in their floodplain ordinances to ensure additional protection for development in the floodplain or prohibit future development. Quay County and its participating jurisdictions should consider joining the NFIP CRS to receive credit, and potential flood insurance premium discounts for its policyholders, for any adopted higher standards and other enhanced flood risk reduction activities. The Village of House should consider joining the NFIP and adopting higher standards above the minimum requirements of the NFIP.
- **Public Warning System** – Warning systems are needed to ensure timely and accurate information to minimize the effects of disasters in the County
- **Formal Mitigation Function** – For developing and implementing projects as well as maintaining the planning process
- **Firewise Communities/USA** – A project of the National Wildfire Coordinating Group’s Wildland-Urban Interface Working Team, it provides information and guidance for communities in the wildland-urban interface area ([www.firewise.org](http://www.firewise.org)).

## 6.2 Prioritization

As described in Sections 5.2 and 5.3, the HMPT considered identified mitigation goals and activities from the prior plan, evaluated current status, and updated the prioritization of existing mitigation actions. The HMPT updated the prioritization based on the political and financial will and capabilities of the County and participating jurisdictions to implement the selected actions. Since the last planning cycle, local priorities have shifted towards implementation of county-wide solutions supported largely by Quay County’s implementation of a county-wide Emergency Management Program.

### 6.2.1 STAPLE+E Criteria

FEMA developed a comprehensive set of criteria that allows communities to evaluate proposed actions in categories that reflect community values and sound principles for finding appropriate and cost-effective mitigation actions. The HMPT used these criteria, shown in **Table 6.3** and known by the acronym STAPLE+E, to evaluate the potential impact of high priority proposed flood mitigation actions (which are the most actionable ones).

**Table 6.3: STAPLE+E Criteria**

<b>Evaluation Criteria</b>	<b>Considerations</b>
<b>Social</b>	<i>Does the measure treat people fairly?</i> (i.e., Are different social and demographic groups, different generations, different creeds treated equally?)
<b>Technical</b>	<i>Will it work?</i> (i.e., Does it actually solve the problem and is it feasible?)
<b>Administrative</b>	Does the County and/or its municipalities have the capacity to implement and manage the project?
<b>Political</b>	Does support exist from public and political stakeholders?
<b>Legal</b>	Does the County and/or its municipalities have the legal authority to implement and assume any reasonable liability?
<b>Economic</b>	Is it cost-effective? Is there a federal, state or non-profit source for funding? If federal, can the non-federal match bet met locally or through another source? Does it contribute to the local economy?
<b>Environmental</b>	Does it comply with environmental regulations? Will it preserve, protect, or enhance existing natural resources?

The prioritization methodology involved comparing each proposed mitigation measure against the established criteria to determine if the measure would help the County and its municipalities meet the mitigation goals and objectives established for this plan. Then the mitigation measures were compared against each other to determine a priority order.

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## 7 Plan Maintenance

This section discusses how the Quay County Hazard Mitigation Plan will be implemented, evaluated, and enhanced over time.

According to planning guidance, the Plan must be actively monitored. Monitoring means tracking the implementation of the plan over time. To monitor the plan, Quay County and Tucumcari need to observe and check the methods and procedures, identified in the plan, for progress over next five years of approval. The Quay County Emergency Manager and Tucumcari Fire Chief will be responsible for monitoring the plan and reporting to the HMPT on an annual basis as well as leading Plan maintenance, evaluation, and update activities, as described further in the following sections.

The policies and procedures identified in this plan for monitoring are (but are not limited to) the following:

- Plan Evaluation (Section 7.3)
- Plan Update (Section 7.3)
- Continued Public Participation (Section 7.5)
- Enhancement of identified Capabilities (Section 7.3)
- Participation in the NFIP (Section 5.1.2)
- Action Prioritization (Section 6.2)
- Administration of Identified Mitigation Actions (Section 7.3)
- Incorporation into other Planning Mechanisms (Section 7.2)

### 7.1 Implementing the Plan

Quay County and participating jurisdictions will integrate this Plan into existing decision making processes or mechanisms. This includes integrating the requirements of the Plan into other planning documents; processes or mechanisms such as development plans, land use plans, continuity of operations plans, and capital improvement plans, when appropriate. The HMPT will be charged with monitoring, evaluating and implementing the Plan. It will also be responsible for ensuring that the goals and strategies of new and updated planning documents are consistent and do not conflict with the goals and actions of the Plan, and will not contribute to increased hazard risk for the planning area. Opportunities to integrate the requirements of this Plan into other planning mechanisms shall continue to be identified through future meetings of HMPT and through the five-year review process described herein.

### 7.2 Incorporation into Other Planning Mechanisms and Existing Programs

As part of the on-going planning process, the HMPT will continue to identify additional plans and programs that will augment or help support mitigation planning efforts. The HMPT will look to incorporate mitigation into additional existing planning mechanisms including updates to plans and ordinances identified in **Section 2.2** of this plan.

Quay County and participating jurisdictions have reviewed the documents shown in **Section 2.2** and considered each document's planned future updates. When possible this mitigation plan will be used to help guide planning efforts and updates for those plans. At the time this plan was written the status of those actions is as follows:

- **2005 Quay County Regional Comprehensive Plan** – The Plan provided a regional overview of resources, land use, infrastructure, and economic development for the county and local jurisdictions. In addition, the plan provided a series of policies designed to implement the plan as well as goals and objectives and implementation actions and timelines. **Update is in planning process as of 2017.**
- **Quay County Regional Comprehensive Plan Update 2010 Addenda** – The Plan provided good information about relevant changes since the 2005 plan, updated demographics, and revised goals, objectives, and policies. **No updates are planned as of 2017.**
- **2004 City of Tucumcari Comprehensive Plan** – The Plan provided good information about existing resources, land uses and development in the City, as well as goals, objectives, and policies for future development. The plan includes 46 recommended actions for implementation to meet the established goals, many of which were considered for incorporation into this plan. **Updated in 2012. Further updates are being planned for the near future.**
- **2008 Quay County Community Wildfire Protection Plan (CWPP)** – Evaluated plan for wildfire risk assessment background information and mitigation project ideas. Captured appropriate information and project ideas for this plan. **No updates since 2008, no updates being made as of 2017.**
- **2005 Quay County 40 Year Water Plan** – The Plan provided good information about water rights in the County and identified the most urgent needs within the County regarding maintenance and upgrading of local water and sewer infrastructure. The plan includes actions summaries and implementation schedules for each jurisdiction. **Updated October 2015. Digital copy is available at [www.quaycounty-nm.gov](http://www.quaycounty-nm.gov).**
- **2011 Village of San Jon Comprehensive Plan** – Plan provided background information and information on alternative energy projects and mitigation actions. **No updates are planned as of 2017.**

Quay County and the City of Tucumcari acknowledge that it is necessary to ensure that future growth in the County should avoid or control the use of all areas containing known potentially hazardous environments. Further, hazard mitigation will not stop upon completion of each of the specific actions listed in this plan. Therefore, hazard mitigation will become a county-wide, ongoing and coordinated effort. The following areas of consideration will take place as part of this effort.

**Evaluation of declared emergencies and activations of area emergency operations centers.** In the event that an emergency declaration is made within the County or its participating jurisdictions, an evaluation of the events leading to this declaration will be made to identify

possible mitigation actions that can be taken to reduce or eliminate this hazard in the future. In addition, the activation of an Emergency Operations Center within the County will require this same type of evaluation to identify possible mitigation actions that can be taken.

**Incorporation into existing efforts.** Successful efforts at eliminating or reducing the consequences of future hazard events cannot occur without controlling the growth of new development within known hazardous areas. As part of implementing the resolutions of the Quay County Mitigation Plan, all proposed new development must be evaluated against identified hazard-prone areas. Therefore, the building permit approval system will include a review of all newly-proposed development projects to keep them from being built in known hazard-prone areas such as floodplains. If a proposed project falls within such an area, the permit may be disapproved or additional construction requirements may be established to eliminate any dangers that could be caused by the existence of the hazard.

In addition, county and city planning staffs will ensure that all comprehensive plans that are developed based on the community's predicted growth patterns consider both hazard locations and the mitigating action plans to eliminate or reduce them. To accomplish this, the planning staff and the mitigation team will collaborate during the revision and updating of future comprehensive plans. Melding these two efforts will ensure that growth is steered away from identified hazard locations, wherever possible, and avoid increasing the potential damage risk they represent. When the hazard locations cannot be avoided, building codes and zoning codes can be utilized to minimize the danger.

Additional projects may also be developed by the cooperative work of the planning staffs and the mitigation planning team during the revision and updating process of the comprehensive plans. Projects identified in this manner will be included in the revision and updating of the Quay County Hazard Mitigation Plan.

To address the concerns and desires of the general public, efforts will be made to obtain their input. Obtaining this input will be accomplished in the form of questionnaires and advertised public meetings. In addition, the comprehensive plan will be made available through public libraries and the internet. Contact numbers and addresses will be made available to the public so that input can be generated at any time. Questionnaires and public meetings will also be scheduled after the occurrence of a major disaster to provide an avenue for public input.

**Additional Functions.** In addition to incorporating the ideas of hazard mitigation into all planning efforts, other programs routinely take place in Quay County and the participating jurisdictions to provide for the public's general safety. These programs are forms of mitigation. The road departments at each government level, including the state, work to maintain a safe transportation system through such projects as repaving and maintenance of road signs. Crews also maintain street sweeping capability, which removes dangerous debris from road surfaces and aids in keeping storm drains clean, which reduces the potential of flooding.

Municipal, county, and state law enforcement of traffic regulations aids in maintaining safe transportation routes. Laws are in place concerning the illegal dumping of debris and restrictions on open burning. The New Mexico Department of Transportation further monitors

and inspects commercial transports in an effort to ensure that hazardous material movement is conducted in compliance with mandated regulations.

Additionally, emergency operations plans are in place and exercised regularly to ensure that area response agencies coordinate their efforts during emergency situations. The emergency operations plans are reviewed annually and revised as necessary. Training for first responders is an ongoing project and further ensures that police, fire, and emergency medical personnel are kept up-to-date in their respective areas of expertise.

### 7.3 Monitoring, Evaluating, and Updating the Plan

It is critical that the Quay County Hazard Mitigation Plan remains a living document, with the goal of continuing the process of eliminating or reducing potential threats and resulting damage due to existing hazards in the county and participating jurisdictions. The HMP reflects what Quay County will do to protect itself from its unique hazards and threats within its available resources. The general success of the HMP is dependent upon a well-established planning process and well-constructed maintenance process. The formal adoption of the HMP by the Quay County Commission and City Council of each participating jurisdiction is imperative to effectively execute the HMP and the continued planning process.

This HMP will be updated and maintained by Quay County Emergency Management and the HMPT to continually address hazards and risks. The plan will be revised based on local, state, and national guidelines. As laws, government regulations, political, public, and financial changes occur; the HMP should be adjusted if affected by these changes. Additionally, the HMP should be analyzed following applicable disasters to update and add mitigation actions. This will ensure the survivability of the HMP. The HMPT should be informed and approve all changes. Updates requiring resolution will be forwarded to DHSEM upon approval. Agencies, departments, and other partners who complete related mitigation actions are responsible for providing Quay County Emergency Management and the HMPT with a summary of actions undertaken.

The HMPT will hold **an annual public forum** for the continual development and assessment of the HMP. The HMPT will convene **at least annually** to oversee and review updates and revisions to the HMP, to identify completed mitigation projects, and to further evaluate mitigation actions. During those meetings, the HMPT will:

- Report on usefulness of the Plan for each jurisdiction and their progress on mitigation actions
- Report on any input received from the public
- Discuss hazard events and observations
- Report on how the Plan has been incorporated into other planning mechanisms
- Discuss mitigation issues and ideas
- Work to secure funding and identify multi-objective, cost-share, and other opportunities for partnerships
- Discuss how to keep the attention of community leaders and the public on hazard mitigation problems and opportunities

- Discuss new sources for data to improve future updates
- Make recommendations on specific updates to the Plan

The HMPT will also annually assess goals and objectives of the current HMP and appraise the mitigation project's effectiveness to expected conditions using the following criteria:

- Evaluate the resulting benefit of all completed action plans.
- Evaluate the progress of action plans still being implemented.
- Evaluate public input relating to completed projects, ongoing projects, or developing trends or concerns within the mitigation process.
- Determine if new hazard threats have been identified and devise action plans accordingly.
- Revise, if necessary, the schedule of pending mitigation action plans.

Changes to the HMP will be tracked based on the information reported during these annual meetings. A system to track accomplishments and outstanding mitigation actions will be developed and maintained.

#### **7.4 5-Year Plan Effectiveness Review and Update**

The HMP will be **re-evaluated every five years** and forwarded to DHSEM and FEMA for approval as required to remain eligible for Pre-Disaster Mitigation and Hazard Mitigation Grant Program funding. The plan update process shall begin three years into the current planning cycle to ensure the current plan does not expire. This process will determine whether there have been any significant changes that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, the increase or decrease in capability to address hazard risk, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.

The Plan review provides Quay County and participating jurisdiction officials and the HMPT with an opportunity to evaluate those actions that have been successful, and to explore the possibility of 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. The Quay County Emergency Manager will be responsible for reconvening the HMPT and conducting the 5-year plan review.

During the 5-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks or hazards changed?
- Are current human and capital resources appropriate for implementing the Plan?
- Are there plan and mitigation action implementation obstacles such as social, technical, administrative, political, legal, economic, environmental, or coordination issues?

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- Have new issues or needs been identified which are not adequately addressed in the Plan?
- Has there been a change in information, data, or assumptions from those on which the Plan is based?
- Have the outcomes occurred as expected?
- Are there errors, inaccuracies, or omissions made in the identification of issues or needs in the Plan?
- Did the identified agencies, individuals, and/or other partners participate in the plan implementation process as assigned?

Following the 5-year plan review and update, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Plan will be submitted to the entire HMPT for review.

### **7.5 Continued Public Involvement**

Input from the public is vital to an effective HMP. Quay County and the participating jurisdictions will continue their transparent government and all-inclusive public involvement efforts established in the development of this HMP by continuing to include public input in the ongoing hazard mitigation planning processes. The County will continue to ensure adequate public access to the HMP by posting the HMP on the Quay County website. It will also be available from Quay County Emergency Management upon request. An annual public meeting will be held to update residents and stakeholders on the progress of action items within the HMP or to hold workshops for updating the HMP. The annual public meeting will allow for a review process to assess existing goals and mitigation actions and to examine the action plan.

Residents are also welcome to submit comments (by letter or electronically) to the Quay County Emergency Management about the HMP at any time.

# APPENDIX A

## Meeting Documentation

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Mr. Richard Primrose, County Manager  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. Primrose,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

Overall, the Plan update process will:

- a) Identify and profile the community's risk from natural hazards;
- b) Track past mitigation efforts;
- c) Develop goals, objectives, and actions to reduce risk; and
- d) Involve a comprehensive group of stakeholders (where you fit in!) including neighboring jurisdictions, businesses, non-profits, state/federal agencies, and academic institutions.

On behalf of the County, I invite you to the **Hazard Mitigation Plan Kickoff Meeting** on **December 3** at 10 a.m. in the Tucumcari Convention Center – Liberty Room, located at 1500 West Historic Route 66. Your organization is asked to contribute because of participation in other similar planning efforts, and because you offer unique insights and feedback for successful development of this Plan. If participation is more appropriate for someone else in your organization, please forward this letter and notify me via email.

During the meeting, we will overview the planning process, review the schedule and discuss information needed from your organization. The meeting will educate attendees on the process and explain the information needed to determine the most effective ways to support and promote risk reduction.

We understand that this is not part of your normal duties, however the process requires your time and feedback only at critical points in the Plan development, and your input is crucial to safeguard the community. A draft Plan is estimated to be complete in March 2016, at which time we will provide you a copy for review and comments.

If you have any questions, please email me at [Curtis.Simpson@quaycounty-nm.gov](mailto:Curtis.Simpson@quaycounty-nm.gov). Quay County has contracted with AECOM to update the Plan; you may also contact Mr. Jim DeAngelo at [jim.deangelo@aecom.com](mailto:jim.deangelo@aecom.com) or 505-206-1750. We look forward to working with you!

Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Jared Langenegger, Tukumcari City Manager  
City of Tukumcari  
215 E. Center Street  
Tukumcari, NM 88401

Dear Mr. Langenegger,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Larry Moore, Road Superintendent  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. Moore,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Russell Shafer, Sheriff  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. Shafer,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Jason Braziel, Chief of Police  
City of Tucumcari  
206 E. Center Street  
Tucumcari, NM 88401

Dear Mr. Braziel,

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Larry Wallin, Village Administrator  
Village of Logan  
P.O. Box 7  
Logan, NM 88426

Dear Mr. Wallin,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Donald Adams, Fire Marshal  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. Adams,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Shane Warner, Fire Chief  
City of Tucumcari  
205 E. Center Street  
Tucumcari, NM 88401

Dear Mr. Warner,

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Scot Jaynes, Dispatch Director  
Quay County  
206 E. Center Street  
Tucumcari, NM 88401

Dear Mr. Jaynes,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Doug Powers, Asst. City Manager  
City of Tucumcari  
512 S. 8th Street  
Tucumcari, NM 88401

Dear Mr. Powers,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Ms. Vicki Strand, Planning and Zoning Director  
City of Tucumcari  
512 S. 8th Street  
Tucumcari, NM 88401

Dear Ms. Strand,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Ms. Cynthia Lee, Village Administrator  
Village of San Jon  
410 E. Elm Avenue  
San Jon, NM 88434

Dear Ms. Lee,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Ms. Sue Dowell, Commissioner  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Ms. Dowell,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Mike Cherry, Commissioner  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. Cherry,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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We understand that this is not part of your normal duties, however the process requires your time and feedback only at critical points in the Plan development, and your input is crucial to safeguard the community. A draft Plan is estimated to be complete in March 2016, at which time we will provide you a copy for review and comments.

If you have any questions, please email me at [Curtis.Simpson@quaycounty-nm.gov](mailto:Curtis.Simpson@quaycounty-nm.gov). Quay County has contracted with AECOM to update the Plan; you may also contact Mr. Jim DeAngelo at [jim.deangelo@aecom.com](mailto:jim.deangelo@aecom.com) or 505-206-1750. We look forward to working with you!

Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Franklin McCasland, Commissioner  
Quay County  
P.O. Box 1246  
Tucumcari, NM 88401

Dear Mr. McCasland,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

Overall, the Plan update process will:

- a) Identify and profile the community's risk from natural hazards;
- b) Track past mitigation efforts;
- c) Develop goals, objectives, and actions to reduce risk; and
- d) Involve a comprehensive group of stakeholders (where you fit in!) including neighboring jurisdictions, businesses, non-profits, state/federal agencies, and academic institutions.

On behalf of the County, I invite you to the **Hazard Mitigation Plan Kickoff Meeting** on **December 3** at 10 a.m. in the Tucumcari Convention Center – Liberty Room, located at 1500 West Historic Route 66. Your organization is asked to contribute because of participation in other similar planning efforts, and because you offer unique insights and feedback for successful development of this Plan. If participation is more appropriate for someone else in your organization, please forward this letter and notify me via email.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Dr. Aaron Kennedy, Vice President of Student Affairs  
Mesalands  
911 S. 10th Street  
Tucumcari, NM 88401

Dear Dr. Kennedy,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Aaron McKinney, Superintendent  
Tucumcari Public Schools  
700 W Amarosa Avenue  
Tucumcari, NM 88401

Dear Mr. McKinney,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Claude Peterson, Safety Specialist  
Presbyterian  
301 E. Miel de Luna Avenue  
Tucumcari, NM 88401

Dear Mr. Peterson,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager



Mr. Sherman Martin, Mayor  
Village of House  
P.O. Box 682  
House, NM 88121

Dear Mr. Martin,

Quay County is updating its Hazard Mitigation Plan, a plan that strategically aims to help reduce risk from natural hazards in the community. Successful completion of the Plan will also allow for access to FEMA mitigation funding.

Overall, the Plan update process will:

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Sincerely,

Mr. Curtis Simpson, Quay County Emergency Manager

# MEETING SIGN-IN

## ► Quay County Hazard Mitigation Plan, Kickoff

► TIME: December 3, 2015 @ 10:00AM MDT  
 PLACE: Tucumcari Convention Center,  
 Liberty Room,  
 1500 West Historic Route 66

Name	Title	Organization	Phone	Email
Curtis Simpson	Quay Co. Emergency Manager	Quay Co.	5754618535	Curtis.simpson@quaycounty-nm.gov
Jim DeAngelo	AECOM Proj. Manager	AECOM	505.206.1750	Jim.deangelo@aecom.com
Dan Heerding	Clavis/cherry & Co. Inc. / OEM	Director	575 763 9484	dheerding@cityofclavis.org
Paul Nelson	IT Director	City of Clavis	575 763 9690	pnelson@cityofclavis.org
Aaron Kennedy	V.P. Student Affairs	Mesalands	575-461-4413	aaronk@mesalands.edu
Richard Peimrose	Manager	Quay County	575-403-5945	Richard.Peimrose@QuayCounty-NM.gov
Larry S Moore	Quay County Road Dept	Quay County	575-403-7735	larry.moore@quaycounty-nm.gov
MIKE CHERRY	Quay County Commissioner	Quay County	575; 403.7331	mwcherry@hotmail.com
Mark A. Martinez	Project Manager	City of Tucuman	(575)461-2143	markmcityoftucumcari.com
JASON LAMB	Quay Co. AG. EXTENSION AGENT	Quay Co.	575-461-0562	j.lamb@nmsu.edu
JASON BRAZIEL	CHIEF OF POLICE	TUCUMCARI POLICE DEPT.	575-461-6970	jbraziel@cityoftucumcari.com
Claudio Peterson	Safety Specialist HERC DET Hosp	DCI	575-461-7123	cpeterson2@phs.com

# MEETING SIGN-IN

▶ **TIME:** December 3, 2015 @ 10:00AM MDT  
**PLACE:** Tucumcari Convention Center,  
 Liberty Room,  
 1500 West Historic Route 66

## ▶ Quay County Hazard Mitigation Plan, Kickoff

Name	Title	Organization	Phone	Email
Curtis Simpson	Quay Co. Emergency Manager	Quay Co.	5754618535	Curtis.simpson@quaycounty-nm.gov
Jim DeAngelo	AECOM Proj. Manager	AECOM	505.206.1750	Jim.deangelo@aecom.com
Jamie Pender	Assistant Nurse Manager / Health	DCT Hospital	575-461-7092	j.pender@dhs.org
Adella Vargas	Assistant Nurse Manager ED	DCT	575-461-7065	A.VARGAS4@dhs.org
Rex Stall	Fire Chief Wk Dom Controller	Logan FD DE Industrial Safety	575-461-9801 575-403-8233	LoganFD@pntestadl.net Rex.Stall@state-nm.us
Larry Waller	Village of Logan	Logan	575-487-7239	loganville@datacenter.net

# Kickoff Meeting Quay County Hazard Mitigation Plan

Jim DeAngelo

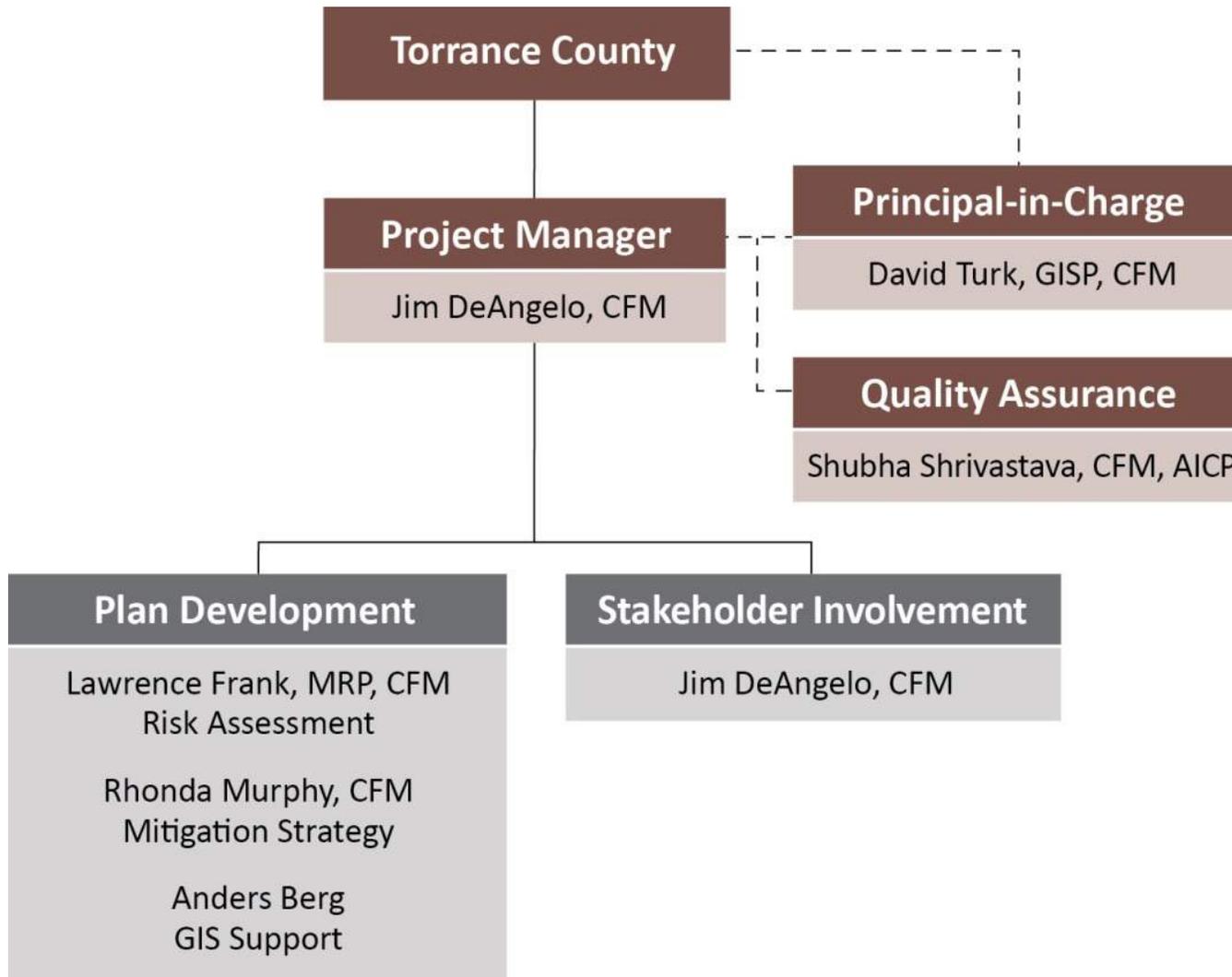
December 3, 2015



# Agenda

- Introductions
- Scope and Objectives of Mitigation Plan
- Quay Co. Hazard Mitigation Plan Team
- Overview of the Hazard Mitigation Planning Process
- Questionnaire
- Action Items and Discussion

# Organization for Project



# Vision and Purpose

– Goal of hazard mitigation planning:

Make communities hazard and disaster resistant

– Purpose

Identify local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards

# Vision and Purpose

- Comprehensive hazard mitigation planning prepares a community to:
  - Protect lives and property
  - Avoid damages and save dollars
  - Reduce or eliminate future damages by guiding new development
  - Speed post-disaster recovery
  - Avoid interruptions caused by hazards



# Mitigation Planning Cycle



# Mitigation Planning Cycle

**Establish a  
Planning Process  
/ Public  
Involvement  
Process**



# The Planning Process

- Identify the plan stakeholders and local champions
- Build on existing Quay County Hazard Mitigation Plan
- Address the 14 natural hazards from the State Plan
- Gather information regarding Quay Co. losses to natural Hazards
- Conduct vulnerability assessment and brainstorm mitigation ideas
- Prioritize mitigation actions

# Data Collection

Hazard Category	Hazard Type
<i>Atmospheric</i>	Extreme Heat High Wind including Dust Storms Thunderstorm (Hail/Lightning) Tornado Severe Winter Storms
<i>Hydrologic</i>	Drought Flood
<i>Geologic</i>	Earthquake Expansive Soils Land Subsidence Volcano Landslide
<i>Other</i>	Wildland/Urban Interface Fire Dam Failure

# Data Collection

## – Drought/ Extreme Weather Events

- Past damages – the extent of the drought, damages and cost to provide water, storm related damages

## – Flood Events

- Past damages – photographs and specific information like what was damaged and how high the water was in buildings
- Will review most recent flood maps

## – Wildfire Events

- Past damages – the extent of the wildfire, what caused it and what did it damage or destroy

# Mitigation Planning Cycle



# Hazard ID, Analysis & Risk Assessment

– Sever Storm Risk

– Storm Types

- Winter Storm
- Thunderstorm
- Wind Storm



# Hazard ID, Analysis & Risk Assessment

– Wildfire Risk

– Wildfire Characteristics

– Influenced by the following:

- Density of vegetation – fuel load
- Topography (steep slopes induce greater spread of fire)
- Weather – wind, dry conditions



# Hazard ID, Analysis & Risk Assessment

## – Flood Characteristics – Quay County

- Three types of flooding: flash flood (particularly in steep sloped areas); riverine flooding and stormwater drainage issues.
- Monsoon season increases flooding incidents

## – Flood Risk

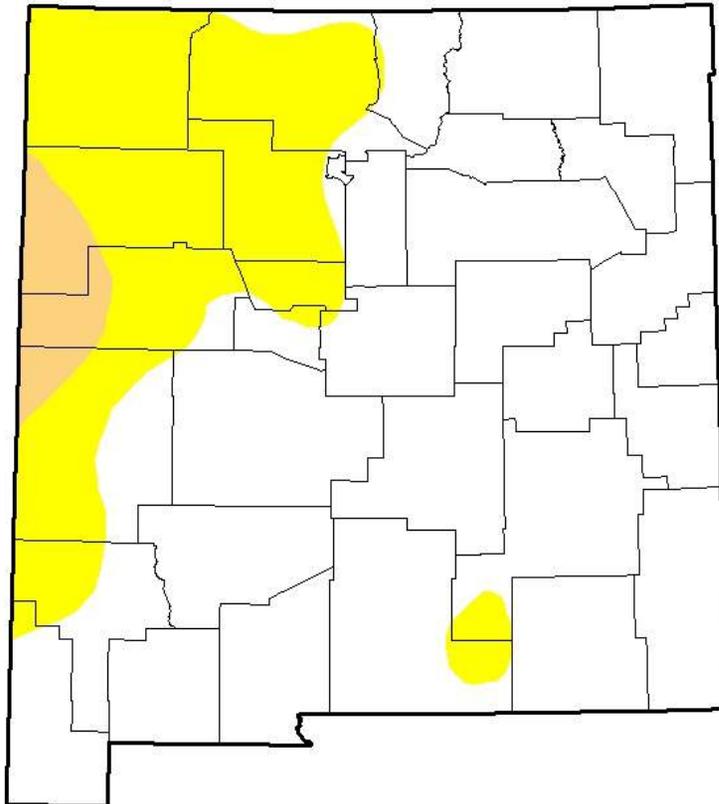
- Flood maps – flood damage may also floodplain
- Flood damage history



# Hazard ID, Analysis & Risk Assessment

## – Drought Conditions

### U.S. Drought Monitor New Mexico



**November 24, 2015**

*(Released Wednesday, Nov. 25, 2015)*

Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	73.76	26.24	3.20	0.00	0.00	0.00
<b>Last Week</b> <i>11/17/2015</i>	73.76	26.24	3.20	0.00	0.00	0.00
<b>3 Months Ago</b> <i>8/25/2015</i>	49.44	50.56	13.08	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>12/30/2014</i>	12.01	87.99	65.38	29.10	3.70	0.00
<b>Start of Water Year</b> <i>8/29/2015</i>	56.70	43.30	7.94	0.00	0.00	0.00
<b>One Year Ago</b> <i>11/25/2014</i>	17.19	82.81	62.53	27.80	1.53	0.00

*Intensity:*



*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**

Richard Heim  
NCEI/NOAA



<http://droughtmonitor.unl.edu/>

# Mitigation Planning Cycle



# Vulnerability Assessment from 2006 HMP

**Table 2: Multi-Jurisdictional Risk Assessment for Quay County, NM**

Jurisdiction	Floods	Wildfire	Drought	Severe Weather	Human Caused Hazards, incl. Hazardous Materials, Nuclear and Terrorism	Earthquakes, landslides, dam failure and volcanoes	Comments
Quay County	Low	Moderate	High	High	Moderate	Low	See Table 1: Summary of Hazard Investigation; p. 9
Tucumcari	Moderate	Low	High	High	Moderate	Low	Risks same as County

# Capability Assessment

- Will evaluate the laws, regulations, policies, and programs related to hazard mitigation and development in hazard-prone areas
- Develop estimated impacts on Mitigation Core Capabilities for the natural hazards of concern
- Will describe funding capabilities for hazard mitigation projects
- Will identify current and potential sources of federal, state, or private funding to implement mitigation activities

# Mitigation Planning Cycle



# Mitigation Strategy

- Addressing the Risk of Existing Development will require Mitigation Project Actions. Some examples:
  - Elevation of structure
  - Acquisition/Demolition of structure in floodplain
  - Stormwater/Drainage Improvement
  - Reroof for wildfire mitigation
  - Planning, Education

# Mitigation Strategy

- Protecting Future Development
  - Development Restrictions (land use planning)
  - Comprehensive Planning/Capital Improvements
  - Building Codes
- For geographic-based hazards like flood and wildfire, location of development is very important
  - e.g., where possible, develop outside of mapped floodplain
  - Develop away from forested areas or the top of ridges

# Mitigation Strategy

- Integration with Comprehensive Plans where there are overlapping objectives
  - Fire Prevention Plans
  - Development Plans
  - Evacuation Plans

# Mitigation Planning Cycle

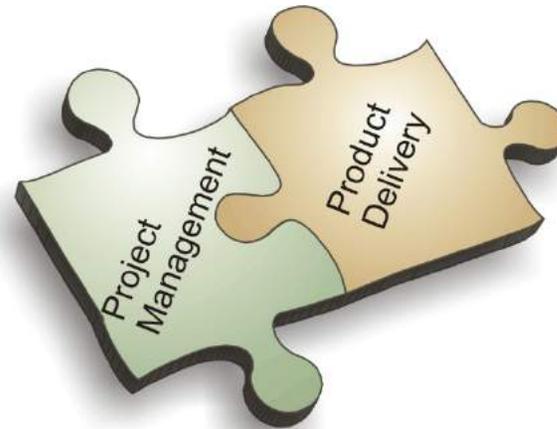


# Plan Monitoring and Evaluation

- Keep the planning process alive
- Evaluating its effectiveness
- How and when to update the plan
- Incorporate into Existing Planning Mechanisms
- Plan Implementation Schedule

# Project Management

- Deliverable Format
- Schedule – Meetings and Deliverables
  - Periodic Phone Calls
  - Risk Assessment Meeting
  - Final Meeting
- Quality Reviews



# Project Management

## Project Schedule

- ❖ Kickoff Meeting December 3, 2015
- ❖ Risk Assessment & Mitigation Action Meeting(s) *February, 2016\**
- ❖ Draft Plan Review Meeting *March, 2015\**
- ❖ Plan to State for Review April 2016\*
- ❖ Plan to FEMA for Approval July 2016\*
- ❖ Plan accepted pending adoption from FEMA September 2016\*

*\*tentative*

# Communication Protocol

- Jim DeAngelo – AECOM PM and will coordinate closely with Plan Lead
- Javier Sanchez, Plan Lead, Quay County Emergency Management

Questions?

Thank You!

[Jim.DeAngelo@aecom.com](mailto:Jim.DeAngelo@aecom.com)

July 28, 2015



**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

*The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!*

Your Name: \_\_\_\_\_

Title: \_\_\_\_\_

Department: \_\_\_\_\_

Contact Phone #: \_\_\_\_\_

Contact Email: \_\_\_\_\_

What does your agency oversee/manage?

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

Project Name:	<i>Quay County HMP Update</i>	
Meeting:	<i>Kickoff Meeting</i>	
Date:	December 3, 2015	Time: 10:00AM to 11:30AM
Place:	Tucumcari Convention Center – Liberty Room, located at 1500 West Historic Route 66, Tucumcari, NM	

**Attendees:**

See Attached Sign In Sheet, Agenda, and Slide Presentation

**1. Greetings and Introductions**

- Curtis Simpson opened the meeting and introduced Jim DeAngelo as a contractor with AECOM to assist Quay County in completion of the plan update.
- J. DeAngelo briefly introduced himself and began the presentation (slides Attached) reviewing the scope of the project the point of the plan update and discussed the AECOM/ Quay County contractors relationship.
- J. DeAngelo continued the presentation by reviewing the vision and purpose of hazard mitigation and introducing the planning cycle
- J. DeAngelo discussed what kind of information the team should be collecting and how it would be used to supplement the available information for the plan update.
- The planning team discussed mitigation measures and began to understand what type of measures would be applicable to the plan.
- J. DeAngelo led a discussion related to who to include in the planning process and what the hazards faced by Quay county are now, compared with several years ago. Several team members offered experiences and suggestions for hazards, mitigation actions, and community inclusion.
- J. DeAngelo continued the presentation by reviewing the project management of the update and discussing the proposed timeline.
- Action Items:
  - AECOM will review r surveys and coordinate with Quay County to receive additional data.
  - AECOM will coordinate with C. Simpson on additional data and setting up the second project meeting.

# AGENDA

Quay County Hazard Mitigation Plan  
Kickoff Meeting  
April 7, 2016 – 10AM-11:30AM

- |   |                                |
|---|--------------------------------|
| 1) Introduction                             | Curtis Simpson                 |
| 2) Review of Hazard Mitigation Process      | Jim DeAngelo                   |
| 3) Discuss Hazards profile                  | Jim DeAngelo, Attendees        |
| 4) Review Goals                             | Jim DeAngelo, Attendees        |
| 5) Review previous Actions/ Add new Actions | Jim DeAngelo, Attendees        |
| 6) Development Trends                       | Attendees                      |
| 7) Capability Assessment                    | Jim DeAngelo, Attendees        |
| 8) Next Steps                               | Jim DeAngelo<br>Curtis Simpson |
| 9) Open Discussion                          | All                            |
| 10) Adjournment                             | Curtis Simpson, Quay County    |

# MEETING SIGN-IN

## ► Quay County Hazard Mitigation Plan, 2<sup>nd</sup> Meeting

► **TIME:** April 7, 2016 @ 10:00AM MDT  
**PLACE:** Tucumcari Convention Center,  
 Liberty Room,  
 1500 West Historic Route 66

Name	Title	Organization	Phone	Email
Curtis Simpson	Quay Co. Emergency Manager	Quay Co.	5754618535	Curtis.simpson@quaycounty-nm.gov
Jim DeAngelo	AECOM Proj. Manager	AECOM	505.206.1750	Jim.deangelo@aecom.com
MIKE CHERRY	Commissioner Quay County	Quay County	575 403 7331	micherry@quaycounty-nm.gov
Rob McClelland	GIS	Quay County	505-250-2032	robert.mcclelland@quaycounty.gov
Aaron Kenney	MCC	MCC	575-461-4113	aaronk@msalmonds.edu
Brenda Bishop	Program Director Quay Extension	Quay Extension	575 461-0562	brbishop@nmsu.edu
Russell Shofer	Sheriff	Quay Co So	575-461-2720	russell.shofer@quaycounty-nm.gov
JASON LAMB	COUNTY AGENT	QUAY EXTENSION	575-461-0562	jalamb@nmsu.edu
DONALD ADAMS	D.C.F.M	QUAY	403-7911	quaycotm@yahoo.com
Rex Stall	Logan Fire District OSE/ISC	Logan FD OSE/ISC	403 9801	Loganfd@plateau.net
SHANE WALZEL	TUCUMCARI FIRE CHIEF	TUCUMCARI FIRE	403-6270	fwalzel@cityoftucumcari.com
JASON BRAZIER	TUCUMCARI POLICE DEPT	CHIEF	461-6370	jbrazier@cityoftucumcari.com

# MEETING SIGN-IN

## ► Quay County Hazard Mitigation Plan, 2<sup>nd</sup> Meeting

► **TIME:** April 7, 2016 @ 10:00AM MDT  
**PLACE:** Tucumcari Convention Center,  
 Liberty Room,  
 1500 West Historic Route 66

Name	Title	Organization	Phone	Email
Curtis Simpson	Quay Co. Emergency Manager	Quay Co.	5754618535	Curtis.simpson@quaycounty-nm.gov
Jim DeAngelo	AECOM Proj. Manager	AECOM	505.206.1750	Jim.deangelo@aecom.com
Mark A. Martinez	Project Manager	City of Tucumcari	(575) 461-2143	markme@cityoftucumcari.com
Jared Langenberger	City Manager	City of Tucumcari	575 461 3451	manager@cityoftucumcari.com
Richard Primrose	County Manager	Quay	403-5945	Richard.Primrose@QuayCounty-NM.gov

Kickoff Meeting  
 Quay County Hazard Mitigation Plan

Jim DeAngelo

April 7, 2016 **AECOM**

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**Agenda**

– See agenda handout

Quay County Hazard Mitigation Plan April 7, 2016 Page 2 **AECOM**

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**Vision and Purpose**

– Goal of hazard mitigation planning:  
 Make communities hazard and disaster resistant

– Purpose  
 Identify local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards

Quay County Hazard Mitigation Plan April 7, 2016 Page 3 **AECOM**

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**Vision and Purpose**

– Comprehensive hazard mitigation planning prepares a community to:

- Protect lives and property
- Avoid damages and save dollars
- Reduce or eliminate future damages by guiding new development
- Speed post-disaster recovery
- Avoid interruptions caused by hazards




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**Mitigation Planning Cycle**




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**Where are we in Process?**

- Initiated Kickoff Meeting
- Identified Planning Team
- Created initial pro-DRAFT plan
- Review Hazards
- Review Goals
- Review Actions
- Discuss Capabilities
- ❖ Provide Specific Comments

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**Hazards**

- Team utilizes matrix and community feedback to rank order hazards.
- Each community may rank order hazards independently
- Lets Review the DRAFT Page 58

April 7, 2016 Page 7 AECOM

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**Goals**

- I. Reduce possibility of damage and loss to existing community assets including structures, critical facilities, and infrastructure due to wildfires.
- II. Reduce possibility of injury and death due to severe weather including tornadoes, high wind, severe winter storms, lightning and hail.
- III. Reduce possibility of damage and loss due to drought.
- IV. Reduce possibility of damage and loss to existing community assets including structures, critical facilities, and infrastructure due to flooding.

April 7, 2016 Page 8 AECOM

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**Goals**

- V. Reduce possibility of damage and loss to existing community assets including structures, critical facilities, and infrastructure due to earthquakes.
- VI. Promote disaster-resistant future development.
- VII. Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population.

April 7, 2016 Page 9 AECOM

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**Actions**

- Review previous Actions
- ? Was action Completed? (yes/no)
- ? Why was action not completed? (not relevant/ no funding)
- ?Should Action be carried forward? (yes/ no/ yes w/ Mod)
- ? What is needed to complete Action?

New Actions: Title, and detail

Lets Look At The DRAFT Page 63

April 7, 2016 Page 10 AECOM

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**Development Trends/ Community Description**

- Review text.
- Add updated for your community
- Interested in trends in growth, changes in demographics
- Review and comment specifically, text includes what AECOM has so far be able to determine

April 7, 2016 Page 11 AECOM

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**Capability Assessment**

- List of Capabilities includes:
  - Regulations
  - Emergency Response
  - Programs
  - Plans
  - Infrastructure

Lets review the DRAFT Page 78

Presentation Title August 25, 2015 Page 12 AECOM

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**Next Steps**

- Receive Digital copy of Proto DRAFT Plan
- Review plan for your community, and the county as a whole.
- Provide detailed changes/ comments  
– [Send to: Curtis Simpson](#)
- Comments Incorporated by AECOM
- DRAFT Produced for final review
- Plan routed through state and federal agencies

Presentation Title      April 7, 2016      Page 13      **AECOM**

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**Project Management**

Project Schedule

❖ Kickoff Meeting	December 3, 2015
❖ Risk Assessment & Mitigation Action Meeting	<i>April 7, 2016</i>
❖ Draft Plan Review Meeting	June 2016*
❖ Plan to State for Review	July 2016*
❖ Plan to FEMA for Approval	August 2016*
❖ Plan accepted pending adoption from FEMA	September 2016*

*\*tentative*

Quay County Hazard Mitigation Plan      April 7, 2016      Page 14      **AECOM**

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Questions?

Thank You!

[Jim.DeAngelo@aecom.com](mailto:Jim.DeAngelo@aecom.com) 505.206.1750

April 7, 2016      **AECOM**

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Project Name:	<i>Quay County HMP Update</i>		
Meeting:	<i>2<sup>nd</sup> Mitigation Meeting</i>		
Date:	April 7, 2016	Time:	10AM-12:00PM
Place:	Tucumcari Convention Center, Liberty Room, 1500 West Historic 66		

**Attendees:**

See Attached Sign In Sheet, Agenda, and Slide Presentation

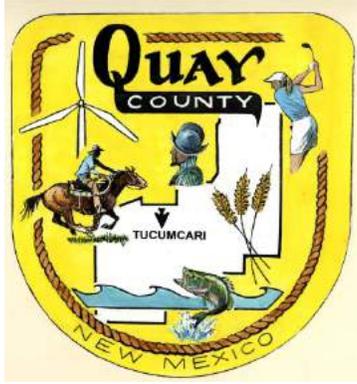
**1. Greetings and Introductions**

- Curtis Simpson opened the meeting and introduced Jim DeAngelo. J. DeAngelo briefly reviewed the agenda began the presentation. The presentation focused on reviewing the goals hazards and items from the effective mitigation plan. (slides Attached).
- J. DeAngelo continued the presentation by reviewing the vision and purpose of hazard mitigation and introducing the planning cycle
- J. DeAngelo opened a DRAFT version of the new plan and presented it to the audience.
- The audience and team worked through previous mitigation actions to determine which to carry forward, and also to identify new actions. Team members commented and the draft was annotated.
- J. DeAngelo reviewed the steps moving ahead and reminded the team that participation was key. J. DeAngelo reminded the team that the draft plan would be posted and that specific comments and annotations should be made. So items unable to be determined in the meeting were highlighted for further consideration by the team.
- J. DeAngelo continued the presentation by reviewing the project management of the update and discussing the proposed timeline.
- Action Items:
  - comment. Simpson will provide a digital copy of the plan to participants for their comments
  - C. Simpson will send J. DeAngelo any comments and surveys in addition to the sign in sheets and invites
  - J. DeAngelo and C. Simpson will coordinate on the timeline for the final meeting and final draft review.

# AGENDA

## Quay County Hazard Mitigation Plan 3<sup>rd</sup> and Final Meeting September 21, 2017 2PM

- |  |                                |
|--|--------------------------------|
| 1) Introduction                                | Curtis Simpson                 |
| 2) Review of Hazard Mitigation Process to Date | Jim DeAngelo                   |
| 3) Quay Hazards                                | Jim DeAngelo, Attendees        |
| 4) HMP Goals                                   | Jim DeAngelo, Attendees        |
| 5) Mitigation Actions                          | Jim DeAngelo, Attendees        |
| 6) Capabilities                                | Jim DeAngelo, Attendees        |
| 7) Plan Maintenance                            | Attendees                      |
| 8) Next Steps                                  | Jim DeAngelo<br>Curtis Simpson |
| 9) Open Discussion                             | All                            |
| 10) Adjournment                                | Curtis Simpson, Quay County    |



## QUAY COUNTY GOVERNMENT

300 South Third Street

P.O. Box 1246

Tucumcari, NM 88401

Phone: (575) 461-2112

### PUBLIC HEARING NOTICE

This notice is to inform the public of a Public Meeting on Thursday, September 21, 2017 at 2:00 p.m. held at the Tucumcari Convention Center, 1500 West Rt. 66, Tucumcari, NM. The Public Meeting will be regarding the Tucumcari/Quay County Hazard Mitigation Plan.

Quay County Residents will be given the opportunity to address any concerns at the Public Meeting. Beginning on Wednesday, September 13, 2017, physical copies of the plan will be available for review at the following locations:

- Quay County Clerk's office, 300 S. 3<sup>rd</sup> St., 1<sup>st</sup> floor, Tucumcari, NM 88401.
- Tucumcari Public Library, 602 S. 2<sup>nd</sup> St., Tucumcari, NM 88401
- Tucumcari Community Development Department Office, 512 S. 8<sup>th</sup> St., Tucumcari, NM 88401.

To be published in the Quay County Sun:

September 13, 2017

September 20, 2017

# Newspaper Publication of Public Hearing Notice:

## LOCAL ROUNDUP

### Meeting slated for DRAFT plan

A public meeting will be held 2 p.m. today at the Tucumcari Convention Center for the public to comment on the DRAFT Hazard Mitigation Plan for Tucumcari and Quay County.

Quay County residents will be given the opportunity to comment on the draft plan at the Public Meeting.

Physical copies of the plan will be available for review at the following locations:

■ Quay County Clerk's office, 300 S. Third St.

■ Tucumcari Public Library, 602 S. Second St.

■ Tucumcari Community Development Department Office, 512 S. Eighth St.

Comments can also be submitted to Curtis Simpson via email at [curtis.simpson@quaycounty-nm.gov](mailto:curtis.simpson@quaycounty-nm.gov) through Oct. 13.

### Dinosaur Museum free on Saturday

The Mesalands Community College's Dinosaur Museum and Natural Sciences Laboratory

## Meetings watch

### Tucumcari City Commission

The Tucumcari City Commission Thursday took the following actions in its regular session:

■ Decided to sign a new lease to replace a leased dozer for the Tucumcari landfill. Under the lease, the city will pay about \$5,400 a month in an agreement that includes full service on a new dozer. City Manager Jared Langenegger said. District 1 Commissioner Ralph Moya voted against a new lease, saying the city should have exercised its option to purchase the machine that will be replaced. Langenegger said that if the paid \$48,000 to purchase the dozer, it would then have had to put about \$60,000 in repairs on the device. Moya, however, said diesel machinery is built to last, and that the city should buy the machine.

■ Approved donation of a non-functioning ambulance to Mesalands Community College to be used for Mesalands' new emergency medical technician education program.

■ Approved a contract for about \$22,000 for engineering services to

will open its doors free to the community on Saturday taking part in the Smithsonian's Annual Museum Day Live.

The move is part of a nationwide event where participating museums and cultural institutions offer free admission.

### Novice 4-H team wins at State Fair

A Novice Quay County 4-H team won first place in the inaugural New Mexico 4-H Food Challenge Saturday at the New Mexico State Fair.

"There were four novice teams and as each was announced our excitement grew," said Brenda Bishop, FCS Extension Agent.

Bishop said the team of Brooke Smith, Aimee Ross, and Mikayla Klinger placed first out of four teams that competed in the contest. She said the girls received special 4-H Food Challenge aprons and first-place medals.

Bishop said the teams started the contest with a bag of secret ingredients donated by the New Mexico Department of Agriculture. The novice teams received



Courtesy photo

The winning 4-H team at the state fair, from left, are Steve Beck, State 4-H Program Leader, Aimee Ross, Mikayla Klinger, and Brooke Smith.

pecans, honey and Tucumcari Mountain Feta Cheese.

Bishop said using the equipment in their tote and pantry ingredients the three had to prepare a dish using all three ingredients, clean their work space and prepare a speech in 40 minutes. She said Quay County's team made a tortilla roll-up with a side of sweetened pecans for dessert. While they were cooking judges circulated

around the room watching how the kids worked together.

Bishop said the speech had to include information on MyPlate and the required servings for their age group, how their food fit into MyPlate, the nutrients present in their food, food safety that they practiced while preparing their dish, the cost per serving of their dish.

— Compiled by QCS staff

## SEPTEMBER 1949

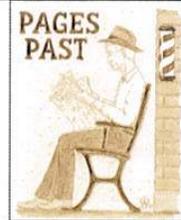
■ The Federal Bureau of Investigation aided in the search for a robbery suspect who allegedly inspected a federal liquor inspector.

The male suspect apparently stole \$1,700 from a San Jon liquor store. The suspect would later be captured in Lubbock.

■ Quay County's booth displayed at the New Mexico State Fair won top prize.

■ Tucumcari was selected as the new site set to hold the trial of Dona Ana Sheriff A.L. Apodaca. Apodaca was indicted on various moral offenses and misconduct counts in his office.

■ New Mexico Republican State chairman



John W. Knorr visited Tucumcari as part of a statewide financial reform platform.

■ Tucumcari General Hospital superintendent C.H. Ferguson was presented a new baby incubator from the Veterans of Foreign War Auxiliary.

— Compiled by QCS Staff

## Menus

The following are the menus for the Tucumcari and Logan senior centers and schools in Quay County for today through Sept. 27.

### Senior centers

Coffee, tea and milk served daily

### Logan

**Thursday:** Burrito supreme, Spanish rice, salad with dressing, apricots

**Friday:** Kraut dog, California vegetables, French fries, strawberries and bananas

**Monday:** Spaghetti, spinach, garlic bread, salad with dressing, cherry cobbler

**Tuesday:** Frito pie, mixed vegetables, lemon crisp cookie

**Wednesday:** Baked pork chop, carrot, zucchini, tomato, whole wheat roll, margarine, scalloped apple

### Tucumcari

**Thursday:** Chicken breast, baked potato, sour cream, margarine, stuffing, peas and carrots, applesauce cake

**Friday:** Sausage, wild rice, steamed broccoli, margarine, whole wheat roll, apricots

**Monday:** Ham and beans, macaroni and cheese, fried okra, cornbread, watermelon

**Tuesday:** Chicken pot pie, green beans with mushrooms, salad, dinner roll, tropical fruit

**Wednesday:** Sweet and sour pork, white rice, carrots, whole wheat bread, margarine, mandarin orange

### Quay County Schools

#### Logan

##### Thursday

Breakfast: Biscuits with gravy, cereal, milk, juice  
Lunch: Enchiladas, beans, rice, salad, fruit, milk

##### Monday

Breakfast: Frudels, cereal, milk, juice  
Lunch: Steak fingers, mashed potatoes with gravy, corn, salad, fruit, milk

##### Tuesday

Breakfast: Pancake on a stick, cereal, milk, juice  
Lunch: Deli sandwich, chips, salad, fruit, milk

##### Wednesday

Breakfast: Cinnamon biscuit, cereal, milk, juice  
Lunch: Tacos, beans, rice, salad, fruit, milk

#### San Jon

##### Thursday

Breakfast: Toast, cereal, milk, juice  
Lunch: Sloppy Joes, corn, pinto beans, salad, fruit, milk

##### Monday

Breakfast: French toast sticks, cereal, milk, juice  
Lunch: Chicken crisps, carrots, pinto beans, crackers, salad, fruit, milk

##### Tuesday

Breakfast: Sausage biscuit, cereal, milk, juice  
Lunch: Chicken tacos, salad, fruit, milk

##### Wednesday

Breakfast: Yogurt, breakfast bar, cereal, milk, juice  
Lunch: Steak fingers, mashed potatoes with gravy, rolls, cauliflower, salad, fruit, milk

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## Facebook Publication of Public Hearing Notice:

**Quay County Government** September 7 at 5:05pm · 🌐 ...

**PUBLIC HEARING NOTICE**

This is a public notice to invite the interested public to comment on the DRAFT Hazard Mitigation Plan for Tukumcari and Quay County. The Public Meeting will be held Thursday, September 21, 2017 at 2:00 p.m. at the Tukumcari Convention Center, 1500 West Rt. 66, Tukumcari, NM.

Quay County Residents will be given the opportunity to comment on the draft plan at the Public Meeting. Beginning on Wednesday, September 13, 2017, physical copies of the plan will be available for review at the following locations:

- Quay County Clerk's office, 300 S. 3rd St., 1st floor, Tukumcari, NM 88401.
- Tukumcari Public Library, 602 S. 2nd St., Tukumcari, NM 88401
- Tukumcari Community Development Department Office, 512 S. 8th St., Tukumcari, NM 88401.

Comments can also be submitted to Curtis Simpson via email at [curtis.simpson@quaycounty-nm.gov](mailto:curtis.simpson@quaycounty-nm.gov) through October 13, 2017.

To be published in the Quay County Sun:  
September 13, 2017  
September 20, 2017

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164 people reached Boost Post

 Like  Comment  Share 

 Daniel Garcia, Elizabeth Morris and Ce Ce Arias Haddon

 Write a comment...    

Press Enter to post.

# Website Links to Public Notice and Draft Plan:

The screenshot shows the Quay County website with a navigation menu on the left and a main content area. A red circle highlights a link in the main content area.

**Navigation Menu:**

- Home
- County Administration
- County Departments
- County Commission
- County Assessor
- County Clerk
- County Sheriff
- County Treasurer
- Probate Judge
- County Extension
- District Attorney
- District Court
- Emergency Mgmt.
- Job Opportunities
- Public Documents
- Pictures
- Links

**Main Content Area:**

**Hazard Mitigation Plan Public Hearing notice**  
Quay County Hazard Mitigation Draft Plan

Quay County (pronounced "kway") is a county located in Eastern New Mexico. As of the 2000 census, the population is 10,115. The county seat is Tucumcari. Quay County was named for Pennsylvania senator ~~stratton~~ **Quay**, who supported New Mexico statehood.



**QUAY COUNTY COURTHOUSE**

**Statistics**

Founded	February 28, 1903
Seat	Tucumcari
Largest City	Tucumcari

**Area**

Total	2,882 sq mi (7,464 km)
Water	7 sq mi (18 km), 0.24%

**Population**

(2010)	9,041
Density	3/sq mi (1/km)

**Localities**

City	Tucumcari
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## Draft Plan on Website:

The image shows a web browser window with a red circle around the address bar. The address bar contains the URL: [www.quaycounty-nm.gov/documents/1709QuayHMPdraft.pdf](http://www.quaycounty-nm.gov/documents/1709QuayHMPdraft.pdf). The browser's page number is 1 of 206, and the zoom level is 90%. The main content area displays the cover page of a document titled "Quay County and the City of Tucumcari Hazard Mitigation Plan". The document is a "DRAFT PLAN" dated "September 2017". It was prepared by Quay County Emergency Management and the City of Tucumcari, with technical assistance provided by AECOM of Albuquerque, NM & Germantown, MD. The cover page features the official seal of Quay County, New Mexico, which includes a yellow shield with a blue border. The shield contains a central figure holding a staff, a plow, and a sheaf of wheat, with the words "QUAY COUNTY" at the top and "NEW MEXICO" at the bottom.

# Water authority talks pipeline details at meeting

By Eamon Scarbrough  
EASTERN NEW MEXICO NEWS  
escarbrough@thenews.email

PORTALES — The Eastern New Mexico Water Utility Authority learned at its Thursday meeting that securing an easement for a pipeline from Cannon Air Force Base to Portales may prove costly. CAFB Water Quality Project Manager John Rebman told members in the public input portion of the meeting that three parcels of land where the pipeline from Ute Lake is set to be constructed require an undetermined cost for the 5,400 feet of land.

"It's not gonna be an in-kind consideration like it was on the northern portion of the pipeline running from Cannon to Clovis, but it's gonna be deemed a non in-kind consideration, in which the Air Force is gonna have to charge for that easement," he said.

The cost, which will be determined by an appraisal of the parcels, wasn't the only news Rebman brought — he said the Air Force also requires an "environmental baseline survey" for the easement.

"Basically, Cannon doesn't have the money to have that

environmental baseline prepared, and it doesn't look like our headquarters is gonna be able to support that either," he said.

Based on past surveys, Rebman estimated a cost of \$35,000.

In response to a question by ENMWUA Executive Director Justin Howalt, Rebman said the authority could conduct its own survey.

Chairman David Lausford noted that the survey should be included as an action item on a future agenda to develop a scope of work.

Also at Thursday's meeting: Authority members voted to advertise the position of ENMWUA executive director in trade publications for the American Water Works Association and the American Society of Civil Engineers, as well as continue advertising the position on online job sites. Office Director Maggie Chapman reported the authority had received 11 applicants for the position.

Members agreed to review applications at the authority's Oct. 26 meeting at 1 p.m. in Grady.

Howalt, the outgoing director, will resign from the position effective Oct. 1.

## LOCAL ROUNDUP

### Public comments sought for hazard plan

A public meeting regarding the Quay County/City of Tucumcari Draft Hazard Mitigation Plan took place on Sept. 21 at the Tucumcari Convention Center.

A previous notice incorrectly stated the meeting would be Sept. 20.

Comments from the public will continue to be accepted through Oct. 13, with the digital copy of the plan available on the Quay County website homepage at the following web address: [www.quaycounty-nm.gov](http://www.quaycounty-nm.gov).

Hard copies of the plan will be available at the following locations:

- Quay County Clerk's office, 300 South Third Street
- Tucumcari Public Library, 602 South Second Street
- Tucumcari Community Development Department Office, 512 S. Eighth St.

Comments can also be submitted to Curtis Simpson via email at [curtis.simpson@quaycounty-nm.gov](mailto:curtis.simpson@quaycounty-nm.gov) through Oct. 13.

### Fairground restroom renovation approved

A revised cost proposal for the cost of restroom renovation at the Quay County Fairgrounds was approved to the tune of more than \$59,000 by commissioners.

"These proposed renovations will bring the fairground restrooms at the county fair barn into compliance with the Americans with Disabilities Act," said Richard Primrose, county manager.

Primrose said the scope of work that would be covered does not include possible increases due to additional construction or repairs that could arise during the renovations. He said the renovations will result in the loss of one stall

per bathroom.

Mike Cherry, District commissioner, asked if the loss of one stall would violate New Mexico building code requirements.

Primrose said he would check with the building codes.

In other business before the commission:

■ Quay County Extension Service Program Director Brenda Bishop presented the commission with a quarterly report.

■ The commission approved the continuation of Judy Ross as the county's library board member.

■ Larry Moore, Quay County Road Superintendent gave a report on the updates on county road projects, repairs.

■ Held an executive session for threatened or pending litigation. No action was taken.

— Staff reports

# Quay, House officials talk bond split

By Thomas Garcia  
QCS SENIOR WRITER  
[tgarcia@qcsunonline.com](mailto:tgarcia@qcsunonline.com)

House School officials and Quay County Commissioners came to a preliminary agreement on the split from money generated from the Industrial Revenue Bonds of the proposed Casa Mesa Pilot wind farm.

"The request from an increased share of this new project is due to the need for more money for House Schools," said Bonnie Lightfoot, superintendent.

Lightfoot made the request for an increased split to the commissioners during Monday's regular meeting at the Quay County courthouse in Tucumcari. She said the schools are OK with the existing split, of 79 percent (Quay County) and 21 percent (House Schools) for the current New Mexico Wind Energy Center. However, it

is in House Schools best interest that the split that would come from the IRBs of NextEra Energy Resources' proposed wind farm made up of 19, 2.5 megawatt turbines and two 1.75 megawatt turbines be re-negotiated, Lightfoot added.

"House Schools needs the additional revenue to avoid cutting staff or services that will impact the students education," Lightfoot said.

Lightfoot said the school with a total enrollment of 70 students has been operating on emergency funding from the New Mexico Public Education Department. She said as a result, a large portion of the operational budget goes towards cost rather than improvements or increased services.

"I am a firm believer that the students if rural schools deserve all of the advancements, services and education of urban students,"

Lightfoot said.

Lightfoot said in order to provide the best education possible, without having to cut services or staff a split of 65/35, with Quay County getting the larger portion, would best serve the school district.

Commission Chairman Franklin McCasland said there is a concern of the cost to the county for the cost generated from the upkeep of infrastructure (county roads, including bus routes) from the expansion of the New Mexico Wind Energy Center and construction of the Casa Mesa Pilot wind farm.

McCasland said another issue is if there was a renegotiated rate and House School closes the money would then be lost to the county if the school was absorbed by an out of county district. He said a 65/35 split was just not feasible.

"As a former educator I can see the need for an increased split for the sake of the students," said Sue Dowell, District 1 commissioner.

Dowell said House schools do not reach out often for assistance from the

county, their students are vital to the county.

Dowell motioned for a split of 70/30 that died due to a lack of a second.

"What if we met in the middle?" asked District 2 Commissioner Mike Cherry.

Cherry said he acknowledges the need for an increased motioning for a 73.5/26.5 split, that died due to a lack of a second.

McCasland motioned for a 72.5/27.5 split that was seconded by Cherry. Dowell voted against the split.

"I voted against the split hoping that it would be possible for a 70/30 increased split instead," Dowell said.

Lightfoot said she originally wanted the 65/35 split but is happy that the commission agreed to a preliminary 72.5/27.5 split. She said the increase will help the schools with the operational cost and provide revenue for the improvement of the technology, services and quality of education at House Schools.

This agreement still has to be voted on by the House School Board of Education before any further advancement of the issuing of IRB for the proposed projects.

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Follow up Facebook Publication, Draft Plan available for comment:

**Quay County Government** September 25 at 1:33pm · 🌐

If you missed the public meeting regarding the Quay County/ City of Tucumcari Hazard Mitigation Draft Plan be aware that comments on the draft plan from the public will be accepted until October 13, 2017.

A link to the digital copy of the draft plan can be found on the Quay County website at the following web address: [www.quaycounty-nm.gov](http://www.quaycounty-nm.gov).

Hard copies of the plan are still available at the following locations:

- Quay County Clerk's office, 300 S. 3rd St., 1st floor, Tucumcari, NM 88401.
- Tucumcari Public Library, 602 S. 2nd St., Tucumcari, NM 88401
- Tucumcari Community Development Department Office, 512 S. 8th St., Tucumcari, NM 88401.

Comments can be submitted to Curtis Simpson via email at [curtis.simpson@quaycounty-nm.gov](mailto:curtis.simpson@quaycounty-nm.gov) through October 13, 2017.

**Quay County**  
Quay County Government's Web Site  
[QUAYCOUNTY-NM.GOV](http://QUAYCOUNTY-NM.GOV)

330 people reached Boost Post

👍 Like    💬 Comment    ➦ Share    🌐

👍 Daniel Garcia and Donald D. Best

 Write a comment... 😊 📷 GIF 🗨️

Press Enter to post.

# MEETING SIGN-IN

► TIME: September 21, 2017 @ 2:00 PM MDT  
 PLACE: Tucumcari Convention Center,  
 Liberty Room,  
 1500 West Historic Route 66

## ► Quay County Hazard Mitigation Plan, 3<sup>rd</sup> and Final Meeting

Name	Title	Organization	Phone	Email
Curtis Simpson	Quay Co. Emergency Manager	Quay Co.	5754618535	Curtis.simpson@quaycounty-nm.gov
Jim DeAngelo	AECOM Proj. Manager	AECOM	505.206.1750	Jim.deangelo@aecom.com
Kyle Mann	DHSEM M. Righter	Specialist	505 280 3081	Kyle.mann@state.nm.us
Gabriel J. Holguin	LPC	DHSEM	505-690-2007	gabriel.holguin2@state.nm.us
AARON KENNEDY	V.P.S.A MCC	MCC	575-461-4413	aaronk@mesalands.edu
MIKE CHERRY	COMMISSIONER	Quay County	575-403-7331	mwcherry@hotmail.com
Travis Thompson	City Manager	Logan	575-403-7132	Loganville@plateau.net
Arita Allen	City Treas.	House	575-279-7372	uah@plateau.net
Robert McClelland	GIS	Quay	505-230-2032	robert.mcclelland@quaycounty-nm
Daniel Zamora	GIS Tech	Quay	575 403 4708	daniel.zamora@quaycounty-nm
Doug Hagen	Fire Chief	Tuc. FD	575-461-4400	firechief@cityoftucumcari.com
Richard Primrose	Quay Manager	Quay	575-403-5945	richard.primrose@quaycounty-nm.gov
RALPH LOPEZ	CITY OF TUCUMCARI PROJECT ADMIN		575-461-2143	ralph@cityoftucumcari.com

# Final Meeting Quay County Hazard Mitigation Plan

Jim DeAngelo

September 21, 2017



# Agenda

– See agenda handout

# Vision and Purpose

– Goal of hazard mitigation planning:

Make communities hazard and disaster resistant

– Purpose

Identify local policies and actions that can be implemented over the long term to reduce risk and future losses from hazards

# Vision and Purpose

- Comprehensive hazard mitigation planning prepares a community to:
  - Protect lives and property
  - Avoid damages and save dollars
  - Reduce or eliminate future damages by guiding new development
  - Speed post-disaster recovery
  - Avoid interruptions caused by hazards



# Mitigation Planning Cycle



# Where are we in Process?

- Initiated Kickoff Meeting
- Identified Planning Team
- Created initial pro-DRAFT plan
- Created Final Draft Plan
- Plan Review
- Collect Incorporate Comments
- State and FEMA Plan Review
- ❖ Adopt/ Utilize/ Maintain Final Plan

# Draft HMP

- DRAFT HMP was produced using the previous HMP and was updated based on received information, comments and in close coordination with C. Simpson
- Plan partners are Quay County and City of Tucumcari
- Villages of Logan, House, and San Jon will be able to seek mitigation funding through Quay County

# Hazards

- Hazard Section Begins on Page 13 of the DRAFT HMP
- Profiled Hazards
  - Flood
  - Wildfire
  - Drought
  - Earthquake
  - Sever Winter Storm
  - Thunderstorm/ Lightning
  - High Wind
  - Tornado
  - Extreme Heat

# Hazards

- Hazards Not Profiled
  - Landslide
  - Land Subsidence
  - Volcano
  - Expansive Soils
  - Dam Failure

## **Updated Goals: Begin on Page 58 of the DRAFT HMP**

- I. Make the county and its municipalities safer from natural hazards
- II. Reduce the damage to cultural sites and natural resources from natural hazards
- III. Reduce property damages caused by natural hazards
- IV. Make the county and its municipalities more resilient by shortening the recovery time after a natural hazard event

# Goals

- V. Increase the county and its municipalities' capability to mitigate natural hazards
  
- VI. Enhance the collaborative process with federal, state and local agencies to mitigate natural hazards in the planning area
  
- VII. Increase awareness and understanding of risks and opportunities for mitigation among residents

# Previous Mitigation Actions

- Begin on Page 60 of the DRAFT HMP
- Actions were pulled from the previous plan and reviewed at the last meeting.
- Actions were determined to be completed or Incomplete
- Incomplete Actions were reviewed and if determined to be valid, updated and carried forward into this plan update.

# New/ Updated/ Mitigation Actions

- Begin on Page 64 of the DRAFT HMP
- Previous Actions updated and reformatted
- New Actions added based on provided information and HMPT feedback.
- Actions reviewed for STAPLE + E

Social, Technical, Administrative, Political, Legal, Economic, and Environmental

# Capabilities

- Current Systems, Assets and regulations were reviewed for Quay County.
- Opportunities for increased capability, See Page 88 in the Draft HMP
  - Adopt most current Unified Building Code
  - Join NFIP CRS
  - Deploy Public Warning System
  - Utilize a Formal Mitigation function in all project implementation
  - Utilize Firewise

# Plan Maintenance

- Page 90 of Draft HMP
- Utilize Mitigation plan and actions as part of update to other planning actions such as Comprehensive plans, CWPP's, and CIP's
- Meet annually to review and update the plan
- Re evaluate the plan every 5 years
- Include the Public

## Next Steps

- Review Draft Plan
- Provide specific detailed comments to C. Simpson by 10.2.17
- Comments Incorporated by AECOM
- Final DRAFT HMPT submitted to NMDHSEM
- Comments Incorporated by AECOM
- Plan Submitted to FEMA R6
- Comments Incorporated by AECOM
- Final Plan adopted

Questions?

Thank You!

Project Name:	<i>Quay County HMP Update</i>		
Meeting:	<i>3<sup>rd</sup> and Final Mitigation Meeting</i>		
Date:	September 21, 2017	Time:	2:00 PM
Place:	Tucumcari Convention Center, Liberty Room, 1500 West Historic 66		

**Attendees:**

See Attached Sign In Sheet, Agenda, and Slide Presentation

**1. Greetings and Introductions**

- Curtis Simpson opened the meeting and introduced Jim DeAngelo. J. DeAngelo briefly reviewed the agenda began the presentation. The presentation focused on reviewing what had occurred thus far in the planning process and discussing specific sections in the plan for HMPT review. Those sections included Hazards, HMP Goals, Mitigation actions, Capabilities, and Plan Maintenance (slides Attached).
- There was a general discussion on the status of San Jon, Logan and House. These communities were initially part of the plan, but were pulled under the county to facilitate the plan creation. C. Simpson indicated that once the current plan was effective, he would work with each community to amend the HMP to include the villages as separate amendments or annexes. Until that time each community could work with the county to seek and manage mitigation grants and projects.
- A general discussion of HMP grants and how/ if grants could be used for fire mitigation and what could be used for the matching funds occurred. C. Simpson indicated matching funds could not be Federal, and K. Mason from NMDHSEM indicated that NMDHSEM would be able to provide better guidance on the grants as needed.
- J. DeAngelo reviewed the steps moving ahead and reminded the team that participation was key. J. DeAngelo reminded the team that the draft plan was posted and that specific comments and annotations should be made. Comments should be forwarded to C. Simpson by October 13, 2017
- J. DeAngelo completed the presentation by reviewing the next steps of the plan and the timeline of actions.
- Action Items:
  - C. Simpson will provide J. DeAngelo PDF's of the newspaper invites, web notification screen shots.
  - C. Simpson will send J. DeAngelo any comments for the Draft HMP.
  - J. DeAngelo and C. Simpson will coordinate to update the plan for comments and prepare the DRAFT HMP for review by NMDHSEM.

# APPENDIX B

## Survey

---

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: JASON LAMB

Title: QUAY Co. AGRICULTURE EXTENSION AGENT

Department: CEIS

Contact Phone #: 575-461-0562

Contact Email: jalamb@nmsu.edu

What does your agency oversee/manage?

*Agriculture/Education*

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

*Assist in Agriculture*

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

*Drought -*

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Adella Vargas

Title: RN Assistant Manager ED-DCT

Department: Emergency Dept. - DCT

Contact Phone #: 575-461-7065

Contact Email: avargas4@phs.org

What does your agency oversee/manage?

The emergency room at our local hospital.

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

I am not sure.

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

winter storm last week

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

No

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Jamie Pender

Title: Assistant Nurse Manager Med/Surg

Department: Med/Surg / Peds / SNF

Contact Phone #: 575-461-7092

Contact Email: j.pender@phs.org

What does your agency oversee/manage?

DCH Hospital - Emergency & acute medical care

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Severe Thunderstorms and winter storms  
Severe Drought & Heat

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES /  NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: JASON BRAZIEL

Title: CHIEF OF POLICE

Department: TUCUMCARI POLICE DEPT.

Contact Phone #: 575-461-6370

Contact Email: tpdchief@cityoftucumcari.com

What does your agency oversee/manage?

LAW ENFORCEMENT / PUBLIC SAFETY IN TUCUMCARI

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

YES  
TOO MANY TO LIST

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES  NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

TORNADO - EMERGENCY WARNING  
WILDFIRE  
SEVERE WEATHER

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: AARON KOWARDY

Title: V.P. Student Affairs / Mesalands

Department: Student Affairs / MESALANDS

Contact Phone #: 575-461-4413 ext 104

Contact Email: aaronk@mesalands.edu

What does your agency oversee/manage?

Mesalands Community College

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

YES, risk mgmt + property protection for the College.

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

NONE

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

An emergency response plan + team.

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Dan Heerding

Title: Director

Department: Clavis/Curry County OEM

Contact Phone #: 575-763-9485

Contact Email: dheerding@cityofclavis.org

What does your agency oversee/manage?

EM Responsibilities for city of clavis & all of curry county

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Terrorism -

flood / drought

Severe weather - wind, T-storm, winter weather, tornado

fire -

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

Curry county - Yes

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

- upgrade outdoor warning sirens
- upgrade critical infrastructure - generators (COOP)
- bury power lines
- outreach/education
- drainage ditches - roads
- Community Alerting

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Larry J Moore

Title: Superintendent

Department: Road

Contact Phone #: 575-403-7735

Contact Email: Larry.Moore@quaycounty-nm.gov

What does your agency oversee/manage? County Roads

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities: Maintaining & Repairing County Roads

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred): Flooding - September (2013-2014) (2014-2015) June-August Washed Roads Out + 1 road that Caved In

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm): ?

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Richard Primrose

Title: County manager

Department: ADM

Contact Phone #: 575-403-5945

Contact Email: Richard.Primrose@QuayCounty-NM.gov

What does your agency oversee/manage?

County

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

County Roads, Flood, Fire, EMS

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Floods, Fire, Snow storms, Tornado

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

Education, Training, Equipment

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Larry Wallin

Title: Village Administrator

Department: Water, Sewer, Fire, EMS, Solid Waste

Contact Phone #: 575-487-2239

Contact Email: lwallin@plateau.net

What does your agency oversee/manage?

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Flood, TORNADES

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

Flood

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Rex Stall

Title: Fire Chief / Ute Dam caretaker <sup>OSE</sup> ISC

Department: Logan Fire Rescue

Contact Phone #: 575 403 8233 / 9801  
Personal Dept cell

Contact Email: loganfd@plateaufel.net

What does your agency oversee/manage? Emergency Services for Logan Fire District

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities: Fire protection, Rescue operations.

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO possibly?

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Claude Peterson

Title: Safety Specialist

Department: Dr. Dan C. Trigg Memorial Hospital

Contact Phone #: 575-461-7123

Contact Email: cpeterson2@phs.org

What does your agency oversee/manage?

Hospital. Also have ambulatory care

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

N/A

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Lightening, recently, caused fire to an electrical pole near the hospital and put us into blackout and caused our alarms to go off.

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

Will think on it.

**Quay County Multi-Jurisdictional Hazard Mitigation Plan Survey**

The information you provide for this survey will help URS gather the information needed to prepare the hazard mitigation plan. Thank you for your participation!!

Your Name: Mark A. Martinez

Title: Project Manager

Department: Community Development Dept. (City of Tucumcari)

Contact Phone #: (575) 461-2143

Contact Email: markm@cityoftucumcari.com

What does your agency oversee/manage?

Permits, Planning & Zoning, Plan review, Project management, city maps, grants

Does your agency have any risk management or property protection responsibilities? If yes, please describe these responsibilities:

Planning & Zoning, Municipal Code

Please name any hazard events (e.g., flood, wildfire, dust storm) that you are familiar with in the last five years (provide approximate date and any information on what occurred):

Do you have pictures of any of these events that could be used in the hazard mitigation plan? (if yes, we will contact you later) YES / NO

What types of projects might help reduce risk to the major hazards in Quay County (e.g. flood, wildfire, drought, dust storm):

2016 County Hazard Mitigation Plan (HMP)  
Baseline Survey



Name: ARON KENNEDY

Organization: Morland's Community College

**NATURAL HAZARDS**

Natural hazards are **naturally occurring events** that will have an effect on people, facilities, operations/business and/or the environment.

Q1. Circle four natural hazards that you believe are **MOST LIKELY** to occur in your community, Please specify your community here: \_\_\_\_\_.

- |                  |                               |
|------------------|-------------------------------|
| <u>Drought</u>   | <u>Severe Winter Storm</u>    |
| Earthquake       | Thunderstorm (Hail/Lightning) |
| Extreme Heat     | <u>Tornado</u>                |
| Flood            | <u>Wildfire</u>               |
| <u>High Wind</u> |                               |

Q2. Circle four natural hazards that you believe are **LEAST LIKELY** to occur in your community..

- |                   |                                      |
|-------------------|--------------------------------------|
| <u>Drought</u>    | <u>Severe Winter Storm</u>           |
| <u>Earthquake</u> | <u>Thunderstorm (Hail/Lightning)</u> |
| Extreme Heat      | Tornado                              |
| Flood             | Wildfire                             |
| High Wind         |                                      |

Q3. Circle four natural hazards that, if they did occur, would have a **HIGH IMPACT** county-wide.

- |                  |                               |
|------------------|-------------------------------|
| <u>Drought</u>   | <u>Severe Winter Storm</u>    |
| Earthquake       | Thunderstorm (Hail/Lightning) |
| Extreme Heat     | <u>Tornado</u>                |
| Flood            | <u>Wildfire</u>               |
| <u>High Wind</u> |                               |

Q4. Circle four natural hazards that, if they did occur, would have the **LEAST IMPACT** county-wide.

- |                   |                                      |
|-------------------|--------------------------------------|
| <u>Drought</u>    | <u>Severe Winter Storm</u>           |
| <u>Earthquake</u> | <u>Thunderstorm (Hail/Lightning)</u> |
| Extreme Heat      | Tornado                              |
| Flood             | Wildfire                             |
| High Wind         |                                      |

Q5. Please describe an area that is a reoccurring risk or on going threat in the face of a natural hazard in your community. For example: a culvert that often floods or a stretch of road susceptible to snow.

Highway 209

Q6. Please describe an potential mitigation action that could make your community more resilient to Natural Disasters.

designated shelters w/ kitchens  
mowing weeds / land management

Use the space below to add more information as you like.

develop / expand communication plans  
health plans / e.g. avian flu  
animal diseases  
hazardous material plan

2016 County Hazard Mitigation Plan (HMP)  
Baseline Survey



Name: Brenda Bishop

Organization: Extension Office

**NATURAL HAZARDS**

Natural hazards are **naturally occurring events** that will have an effect on people, facilities, operations/business and/or the environment.

Q1. Circle four natural hazards that you believe are **MOST LIKELY** to occur in your community, Please specify your community here: Quay County.

- |                  |                               |
|------------------|-------------------------------|
| <u>Drought</u>   | <u>Severe Winter Storm</u>    |
| Earthquake       | Thunderstorm (Hail/Lightning) |
| Extreme Heat     | Tornado                       |
| Flood            | <u>Wildfire</u>               |
| <u>High Wind</u> |                               |

Q2. Circle four natural hazards that you believe are **LEAST LIKELY** to occur in your community..

- |                     |                               |
|---------------------|-------------------------------|
| Drought             | Severe Winter Storm           |
| <u>Earthquake</u>   | Thunderstorm (Hail/Lightning) |
| <u>Extreme Heat</u> | <u>Tornado</u>                |
| <u>Flood</u>        | <u>Wildfire</u>               |
| High Wind           |                               |

Q3. Circle four natural hazards that, if they did occur, would have a **HIGH IMPACT** county-wide.

- |                   |                               |
|-------------------|-------------------------------|
| Drought           | <u>Severe Winter Storm</u>    |
| <u>Earthquake</u> | Thunderstorm (Hail/Lightning) |
| Extreme Heat      | <u>Tornado</u>                |
| Flood             | <u>Wildfire</u>               |
| High Wind         |                               |

Q4. Circle four natural hazards that, if they did occur, would have the **LEAST IMPACT** county-wide.

- |                     |                                      |
|---------------------|--------------------------------------|
| Drought             | <u>Severe Winter Storm</u>           |
| <u>Earthquake</u>   | <u>Thunderstorm (Hail/Lightning)</u> |
| <u>Extreme Heat</u> | Tornado                              |
| <u>Flood</u>        | Wildfire                             |
| <u>High Wind</u>    |                                      |

Q5. Please describe an area that is a reoccurring risk or on going threat in the face of a natural hazard in your community. For example: a culvert that often floods or a stretch of road susceptible to snow.

Road just North of House NM Floods  
QR AR + Cedar Break Floods  
Snow Drifts in the Southern part of County

Q6. Please describe an potential mitigation action that could make your community more resilient to Natural Disasters.

Food Supplies if roads closed due to  
Snow

Use the space below to add more information as you like.

Agricultural Disasters - livestock diseases  
Fire recovery  
Drought recovery

2016 County Hazard Mitigation Plan (HMP)  
Baseline Survey



Name: JASON LAMB

Organization: QUAY Co. EXTENSION

**NATURAL HAZARDS**

Natural hazards are naturally occurring events that will have an effect on people, facilities, operations/business and/or the environment.

Q1. Circle four natural hazards that you believe are **MOST LIKELY** to occur in your community, Please specify your community here: \_\_\_\_\_.

- |              |                               |
|--------------|-------------------------------|
| Drought      |                               |
| Earthquake   | <u>Severe Winter Storm</u>    |
| Extreme Heat | Thunderstorm (Hail/Lightning) |
| <u>Flood</u> | <u>Tornado</u>                |
| High Wind    | <u>Wildfire</u>               |

Q2. Circle four natural hazards that you believe are **LEAST LIKELY** to occur in your community..

- |                     |                               |
|---------------------|-------------------------------|
| <u>Drought</u>      |                               |
| <u>Earthquake</u>   | Severe Winter Storm           |
| <u>Extreme Heat</u> | Thunderstorm (Hail/Lightning) |
| Flood               | Tornado                       |
| High Wind           | Wildfire                      |

Q3. Circle four natural hazards that, if they did occur, would have a **HIGH IMPACT** county-wide.

- |                   |                               |
|-------------------|-------------------------------|
| <u>Drought</u>    |                               |
| <u>Earthquake</u> | <u>Severe Winter Storm</u>    |
| Extreme Heat      | Thunderstorm (Hail/Lightning) |
| <u>Flood</u>      | Tornado                       |
| High Wind         | Wildfire                      |

Q4. Circle four natural hazards that, if they did occur, would have the **LEAST IMPACT** county-wide.

- |                  |                                      |
|------------------|--------------------------------------|
| Drought          |                                      |
| Earthquake       | Severe Winter Storm                  |
| Extreme Heat     | <u>Thunderstorm (Hail/Lightning)</u> |
| Flood            | Tornado                              |
| <u>High Wind</u> | Wildfire                             |

Q5. Please describe an area that is a reoccurring risk or on going threat in the face of a natural hazard in your community. For example: a culvert that often floods or a stretch of road susceptible to snow.

Q6. Please describe an potential mitigation action that could make your community more resilient to Natural Disasters.

Use the space below to add more information as you like.

2016 County Hazard Mitigation Plan (HMP)  
Baseline Survey



Name:

Russell Shafer

Organization:

Way County Sheriff's Office

**NATURAL HAZARDS**

Natural hazards are naturally occurring events that will have an effect on people, facilities, operations/business and/or the environment.

Q1. Circle four natural hazards that you believe are **MOST LIKELY** to occur in your community. Please specify your community here: Way County.

- |                      |                               |
|----------------------|-------------------------------|
| <u>Drought</u>       | <u>Severe Winter Storm</u>    |
| Earthquake           | Thunderstorm (Hail/Lightning) |
| Extreme Heat         | <u>Tornado</u>                |
| Flood                | <u>Wildfire</u>               |
| <del>High Wind</del> |                               |

Q2. Circle four natural hazards that you believe are **LEAST LIKELY** to occur in your community..

- |                   |                                      |
|-------------------|--------------------------------------|
| <u>Drought</u>    | <u>Severe Winter Storm</u>           |
| <u>Earthquake</u> | <u>Thunderstorm (Hail/Lightning)</u> |
| Extreme Heat      | Tornado                              |
| <u>Flood</u>      | Wildfire                             |
| <u>High Wind</u>  |                                      |

Q3. Circle four natural hazards that, if they did occur, would have a **HIGH IMPACT** county-wide.

- |                   |                               |
|-------------------|-------------------------------|
| <u>Drought</u>    | <u>Severe Winter Storm</u>    |
| <u>Earthquake</u> | Thunderstorm (Hail/Lightning) |
| Extreme Heat      | <u>Tornado</u>                |
| Flood             | <u>Wildfire</u>               |
| High Wind         |                               |

Q4. Circle four natural hazards that, if they did occur, would have the **LEAST IMPACT** county-wide.

- |                     |                                      |
|---------------------|--------------------------------------|
| <u>Drought</u>      | <u>Severe Winter Storm</u>           |
| <u>Earthquake</u>   | <u>Thunderstorm (Hail/Lightning)</u> |
| <u>Extreme Heat</u> | Tornado                              |
| Flood               | Wildfire                             |
| <u>High Wind</u>    |                                      |

Q5. Please describe an area that is a reoccurring risk or on going threat in the face of a natural hazard in your community. For example: a culvert that often floods or a stretch of road susceptible to snow.

Q6. Please describe an potential mitigation action that could make your community more resilient to Natural Disasters.

Use the space below to add more information as you like.



# APPENDIX C

## Plan Review Tool

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## LOCAL MITIGATION PLAN REVIEW TOOL

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

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

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

<b>Jurisdiction:</b> Quay County	<b>Title of Plan:</b> Quay County and the City of Tucumcari Hazard Mitigation Plan	<b>Date of Plan:</b> December 2017
<b>Local Point of Contact:</b> Curtis Simpson	<b>Address:</b> 300 S. Third Street PO Box 1246 Tucumcari, NM 88401	
<b>Title:</b> Emergency Manager		
<b>Agency:</b> Quay County Emergency Management		
<b>Phone Number:</b> O: 575-461-8535 C: 575-403-9103	<b>E-Mail:</b> Curtis.Simpson@quaycounty-nm.gov	

<b>State Reviewer:</b> Kyle Mason	<b>Title:</b> Mitigation Specialist	<b>Date:</b> 12/27/17
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<b>FEMA Reviewer:</b> Ben Buchanan Shanene Thomas	<b>Title:</b> HM Community Planner	<b>Date:</b> 1/10/2018 2/10/18, 2/21/18
<b>Date Received in FEMA Region (insert #)</b>	January 3, 2018	
<b>Plan Not Approved</b>		
<b>Plan Approvable Pending Adoption</b>	February 21, 2018	
<b>Plan Approved</b>		

**SECTION 1:**

**REGULATION CHECKLIST**

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

1. REGULATION CHECKLIST	Location in Plan		Not
Regulation (44 CFR 201.6 Local Mitigation Plans)	(section	Met	Met
<b>ELEMENT A. PLANNING PROCESS</b>			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 2, beginning on page 8	X	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 2.3, page 10; Appendix A	X	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 2.4, page 11	X	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 2.2, page 9	X	
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 7.3, page 99	X	
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 7.3, page 99, 101	X	
<b>ELEMENT A: REQUIRED REVISIONS</b>			

<b>ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT</b>			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4, beginning on page 16	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4, beginning on page 16	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 4, beginning on page 16	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been <b>repetitively damaged</b> by floods? (Requirement §201.6(c)(2)(ii))	Section 5, pg 71	X	
<b>ELEMENT B: REQUIRED REVISIONS</b>			
<b>ELEMENT C. MITIGATION STRATEGY</b>			
C1. Does the plan document each jurisdiction's <b>existing</b> authorities, policies, programs and resources and its ability to <b>expand on and improve</b> these existing policies and programs? (Requirement §201.6(c)(3))	Section 6.1, page 92 Table 6.1 Page 95	X	
C2. Does the Plan address each jurisdiction's participation in the <b>NFIP</b> and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 5.1.2, page 68-9	X	
C3. Does the Plan include <b>goals</b> to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 5.1.1, page 67	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation <b>actions</b> and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 5.3.1, page 71	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be <b>prioritized</b> (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 6.2, page 95, 96 Page 71	X	
C6. Does the Plan describe a <b>process</b> by which local governments will <b>integrate</b> the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 7.2, page 98, 99, 100	X	
<b>ELEMENT C: REQUIRED REVISIONS</b>			

<b>ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION</b> (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 2.7, page 13	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	Section 5.2, pages 69-71; Table 5.2	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4.1.1; 5.1.1, page 66-7, Section 6.2, page 95	X	
<b><u>ELEMENT D: REQUIRED REVISIONS</u></b>			
<b>ELEMENT E. PLAN ADOPTION</b>			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))			X
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			X
<b><u>ELEMENT E: REQUIRED REVISIONS</u></b>			
E1 or E2 will be met once the plan is approved pending adoption by FEMA and the plan's participating jurisdictions submit formal adoption resolutions to FEMA.			
<b>ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)</b>			
F1.			
F2.			
<b><u>ELEMENT F: REQUIRED REVISIONS</u></b>			

## SECTION 2: PLAN ASSESSMENT

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

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

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

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

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

## A. Plan Strengths and Opportunities for Improvement

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

### Element A: Planning Process

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

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

### Element B: Hazard Identification and Risk Assessment

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

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

*How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:*

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

### Element C: Mitigation Strategy

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

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

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

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

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

## B. Resources for Implementing Your Approved Plan

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

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

**SECTION 3:**  
**MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)**

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

MULTI-JURISDICTION SUMMARY SHEET												
#	Jurisdiction Name	Jurisdiction Type	Plan POC	Mailing Address	Email	Phone	Requirements Met (Y/N)					
							A. Planning Processes	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Quay County	County	Curtis Simpson	PO Box 1246 Tucumcari, NM 88401	Curtis.Simpson@quaycounty-nm.gov	575-461-8535	Y	N	Y	Y	N	
2	Tucumcari	City	Jared Lange	PO Box 1188 Tucumcari, NM 88401	manager@cityoftucumcari.com	575-461-3451	Y	N	Y	Y	N	