May 2025

Torrance County, New Mexico
Local Hazard Mitigation Plan Update

Encompassing:

- **Torrance County, New Mexico**
- **Village of Encino**
- **Town of Estancia**
- **City of Moriarty**
- **Town of Mountainair**
- **Village of Willard**
- **Central Tri-County Soil and Water Conservation District**
- **Claunch-Pinto Soil and Water Conservation District**
- **East Torrance Soil and Water Conservation District**

Prepared By:
Blue Umbrella Solutions

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List of Appendices

A Participating Jurisdiction Adoption Documentation and FEMA Region VI Approval Documentation
B Community Feedback

List of Commonly Used Acronyms

Acronym	Meaning
EAL	Expected Annual Loss
CRS	Community Rating System
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
LHMP	Local Hazard Mitigation Plan
MPC	Mitigation Planning Committee
NCEI	National Centers for Environmental Information
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRI	National Risk Index
NWS	National Weather Service
NMDHSEM	New Mexico Department of Homeland Security and Emergency Management
RAPT	Resilience Analysis and Planning Tool
SWCD	Soil and Water Conservation District
TCOEM	Torrance County Office of Emergency Management
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geologic Survey
WUI	Wildland/Urban Interface

Section 1 – Introduction, Assurances, Incorporation, and Adoption

1.1 Introduction

Hazard mitigation is commonly defined as sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects. Hazard mitigation planning provides communities with a roadmap to aid in the creation and revision of policies and procedures, and the use of available resources, to provide long-term, tangible benefits to the community. A well-designed hazard mitigation plan provides communities with realistic actions that can be taken to reduce potential vulnerability and exposure to identified hazards.

This Local Hazard Mitigation Plan (LHMP) was prepared to provide sustained actions to eliminate or reduce risk to people and property from the effects of natural and man-made hazards. This plan documents Torrance County and its participating jurisdictions planning process and identifies applicable hazards, vulnerabilities, and hazard mitigation strategies. This plan will serve to direct available community and regional resources towards creating policies and actions that provide long-term benefits to the community. Local and regional officials can refer to the plan when making decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives.

Specifically, this hazard mitigation plan was developed to:

- Update the 2017 LHMP
- Build for a safer future for all citizens
- Foster cooperation for planning and resiliency
- Identify, prioritize, and mitigate hazards
- Assist with sensible and effective planning and budgeting
- Educate citizens about hazards, mitigation, and preparedness
- Comply with relevant federal requirements

This plan has been designed to be a living document, a document that will evolve to reflect changes, correct any omissions, and constantly strive to ensure the safety of all citizens.

1.2 Assurances

In an effort to reduce natural disaster losses, the United States Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). DMA 2000 amended the Stafford Act by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). Section 322 of the DMA makes the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for Federal mitigation grant funds. This LHMP was prepared to meet the requirements of the DMA 2000, as defined in regulations set forth by the Interim Final Rule (44 Code of Federal Regulations (CFR) Part 201.6 and CFR Part 201.7).

All adopting jurisdictions certify that they will comply with all applicable Federal statutes and regulations during the periods for which they receive grant funding, in compliance with 44 CFR 13.11(c), and will amend this plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

This hazard mitigation plan was prepared to comply with all relevant requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by the Disaster Mitigation Act of 2000. This plan complies with all the relevant requirements of:

- Code of Federal Regulations (44 CFR) pertaining to hazard mitigation planning
- Federal Emergency Management Agency (FEMA) planning directives and guidelines
- Interim final, and final rules pertaining to hazard mitigation planning and grant funding
- Relevant presidential directives
- Office of Management and Budget circulars
- Any additional and relevant federal government documents, guidelines, and rules.

Additionally, this LHMP has been completed to address all State of New Mexico recommendations and requirements concerning hazard mitigation planning and the requirements of FEMA's Local Mitigation Planning Policy Guide that went into effect April 11, 2025.

1.3 Authorities

The LHMP relies on the authorities given to participating jurisdictions by its citizens and encoded in local and state law. This plan is intended to be consistent with all policies and procedures that govern activities related to the mitigation programing and planning. In all cases of primacy, State of New Mexico and local laws, statutes, and policies will supersede the provisions of the plan.

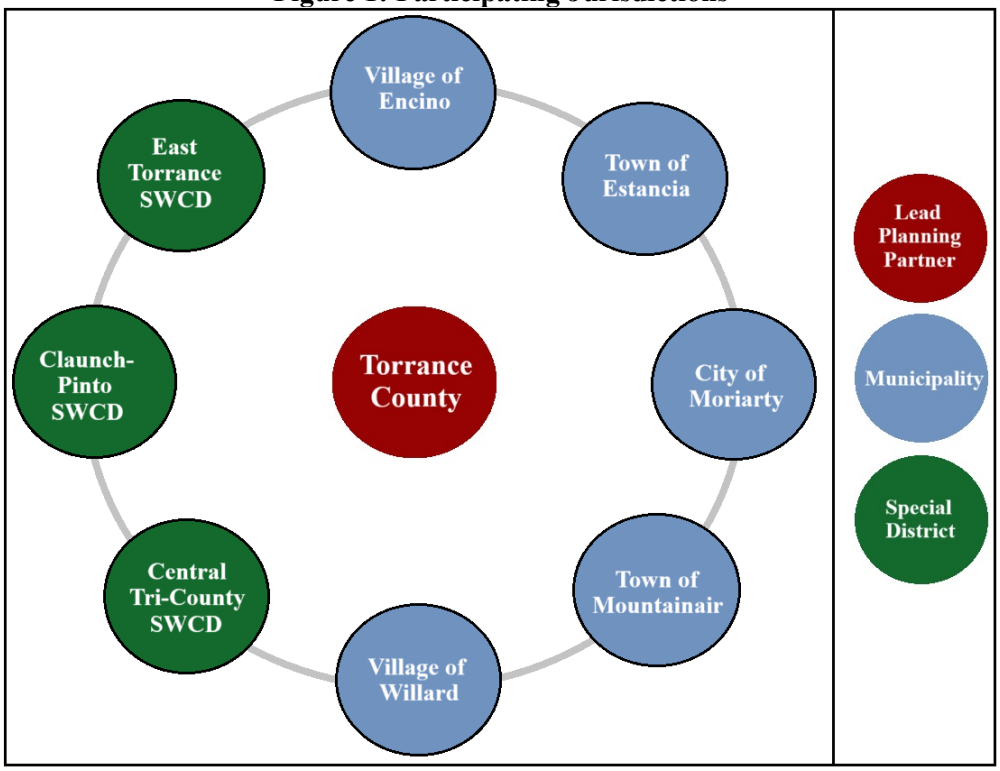
1.4 Participating Jurisdictions

In order to have an approved hazard mitigation plan, DMA 2000 requires that each jurisdiction participate in the planning process. Each jurisdiction choosing to participate in the development of the plan was required to meet detailed participation requirements, which included the following:

- Participation in planning meetings
- Provision of information to support the plan development
- Identification of relevant mitigation actions
- Review and comment on plan drafts
- Fostering the public input process
- Formal adoption of the plan

Based on the above criteria, the following jurisdictions participated in the planning process, and will adopt the approved hazard mitigation plan:

Figure 1: Participating Jurisdictions



1.5 Hazard Mitigation Plan Incorporation and Integration

This hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various county and local codes, plans, reports, and studies. The integration of these can provide the following community benefits:

- Align community goals, objectives, and prime concerns

- Avoid lost opportunities
- Eliminate duplication of effort

Torrance County and participating jurisdictions will continue to actively work on incorporating elements of this hazard mitigation plan into any relevant plan, code, or ordinance creation or revision. Whenever possible, Torrance County and participating jurisdiction will use existing plans, policies, procedures, and programs to aid in the implementation of identified hazard mitigation actions.

On a local level, hazard mitigation plans can be integrated into various planning documents and initiatives to ensure a comprehensive and coordinated approach to reducing the impact of hazards. Local level plans where hazard mitigation strategies have and will be integrated include:

- **Codes and Ordinances:** A hazard mitigation plan can be a powerful tool for updating local codes and ordinances by providing data-driven insights and risk assessments that support stronger, more resilient community standards.
- **Community Wildfire Protection Plan:** A locally developed, collaborative plan that identifies wildfire risks and outlines strategies to reduce hazards and protect people, property, and natural resources from wildfires.
- **Comprehensive Plan:** Helps guide long term community development to ensure future resilience against identified hazards.
- **Emergency Operations Plan:** Contributes to detailing specific actions to be taken before, during, and after disasters to reduce vulnerability and enhance community resilience.
- **Floodplain Management Plan:** A community-based strategy that identifies flood risks and outlines policies, actions, and regulations to reduce flood damage, protect public safety, and promote sustainable land use in flood-prone areas.
- **Land-Use/Zoning Plan:** Helps guide the development and zoning decisions in a way that minimizes vulnerability to hazards. This includes avoiding construction in high-risk areas and encouraging resilient building practices.

Specifically, the following table details where the previous Torrance County LHMP was utilized for jurisdictional plans:

Table 1: LHMP Jurisdictional Plan Integration

Jurisdiction	Codes and Ordinances	Community Wildfire Protection Plan	Comprehensive Plan	Emergency Operation Plan	Floodplain Management Plan	Land Use and Zoning Plan
Torrance County	x	x		x		x
Encino	x	x	x	x		
Estancia	x	x		x		x
Moriarty	x	x	x	x	x	x
Mountainair	x	x	x	x		x
Willard	x	x		x		
Central Tri-County SWCD		x	x			x
Claunch-Pinto SWCD		x	x			x
East Torrance SWCD		x	x			x

Integrating hazard mitigation with FEMA programs and initiatives provides many benefits to Torrance County and participating jurisdictions. These benefits include a streamlined planning and funding process for hazard mitigation projects, enhanced community resilience from the leveraging of federal programs to create a holistic approach to resilience, broad based data sharing allowing for an improved understating of community risk, and enhanced funding

opportunities where jurisdictions can leverage multiple sources of federal funding to implement hazard mitigation actions. Programs currently being integrated into the LHMP include:

National Flood Insurance Program (NFIP):

- NFIP: The NFIP is a federal program, managed by FEMA, which exists to provide flood insurance for property owners in participating communities, to improve floodplain management practices, and to develop maps of flood hazard areas.
- Community Rating System (CRS): NFIP's CRS incentivizes communities to go beyond minimum floodplain management standards to reduce flood risk. Communities earn CRS points for implementing flood hazard mitigation activities, which can result in lower flood insurance premiums for residents. Hazard mitigation planning can guide communities in adopting flood-specific measures that qualify for CRS points.
- Building Standards: NFIP policies encourage communities to adopt and enforce building standards to minimize flood damage. By integrating hazard mitigation planning, communities can identify and prioritize infrastructure improvements that meet or exceed NFIP standards, especially in areas vulnerable to flooding.
- Floodplain Management Plans: Developing comprehensive floodplain management plans as part of hazard mitigation planning can support NFIP compliance while addressing risks specific to community needs.

Hazard Mitigation Assistance (HMA) Grants

- Planning Support: FEMA's HMA grant programs provide funding for hazard mitigation plans. These plans can help identify, prioritize, and implement mitigation projects that reduce risk and align with FEMA's overall resilience goals.
- Eligible Project Types: HMA grants fund a variety of projects (e.g., retrofitting infrastructure, elevating buildings, property acquisitions) that can align with community-specific hazard mitigation goals. By aligning local hazard mitigation strategies with HMA-eligible project types, communities can maximize available funding to address critical risks.
- Funding Integration with Local Mitigation Projects: Communities can leverage HMA grants to implement local mitigation projects that align with broader hazard mitigation goals. For example, using FMA funds to reduce flood risk in NFIP-insured properties or leveraging funds for innovative infrastructure resilience projects.

Threat and Hazard Identification and Risk Assessment (THIRA)

- Comprehensive Risk Identification: THIRA provides a structured approach for communities to identify and prioritize their risks based on a full spectrum of hazards, including natural and human-caused events. Integrating hazard mitigation planning with THIRA enables communities to address multi-hazard risks with targeted mitigation strategies.
- Capability Targets Alignment: THIRA also helps communities identify capability gaps and set targets for resilience. Hazard mitigation plans can use these targets to outline mitigation actions that align with capability-building priorities, such as improving emergency response infrastructure or fortifying lifeline systems.
- Unified Risk and Capability Assessments: By integrating hazard mitigation planning with the THIRA process, communities can develop a more cohesive picture of their risk and capability needs, allowing for more focused and impactful use of FEMA resources across initiatives.

Integration of hazard mitigation into these various plans ensures that resilience efforts are embedded in the broader fabric of community development. Coordination and collaboration among different sectors and stakeholders are essential for the successful implementation of hazard mitigation strategies on the local level. Plan incorporation and integration is crucial for creating a cohesive and coordinated approach to address various aspects of hazard mitigation. All participating jurisdictions utilize similar internal procedures for plan incorporation and integration. The following represent utilized methods:

- **Cross-Referencing:** Identify and cross-reference relevant sections of different plans and policies. This involves explicitly noting connections between the goals, strategies, and actions outlined in one plan with those in others.

- **Consistency Checks:** Conduct consistency checks to ensure that the language, objectives, and strategies in different plans and policies align with each other.
- **Joint Planning Committees:** Establish joint planning committees or task forces that involve representatives from different departments or agencies responsible for various plans (for example, the MPC). These committees facilitate communication, collaboration, and the coordination of planning efforts across sectors.
- **Collaborative Workshops and Meetings:** Organize collaborative workshops and meetings to bring together stakeholders involved in different planning processes (as seen in the planning meetings for the LHMP). These forums provide an opportunity for stakeholders to share information and discuss common goals.
- **Alignment with State and Regional Plans:** Ensure that local plans align with broader regional and state plans. This involves considering regional and state priorities and incorporating them into local planning efforts to create a harmonized approach to development.
- **Data Sharing and Analysis:** Share relevant data among planning efforts and conduct joint data analysis. This helps in creating a common understanding of the challenges and opportunities, facilitating evidence-based decision-making across different plans.
- **Unified Implementation Strategies:** This involves identifying common actions and initiatives that contribute to the achievement of multiple goals outlined in various plans.

1.6 Plan Adoption

This plan was submitted to New Mexico Department of Homeland Security and Emergency Management (NMDHSEM) and FEMA Region VI prior to adoption (approval pending adoption protocol). This methodology allows for a single plan adoption by participating jurisdictions in the event of plan revisions during the review and approval process. Upon review and approved pending adoption status by FEMA Region VI, adoption resolutions will be signed by the participating jurisdictions. FEMA approval documentation and jurisdictional adoption resolutions may be found in Appendix A.

Administration and oversight of the hazard mitigation program is the responsibility of the Torrance County Office of Emergency Management (TCOEM). The plan will be reviewed annually and will be updated every five years, or as required by changing hazard mitigation regulations or guidelines.

Section 2 – Documentation of the Planning Process

2.1 Guiding Principle

The guiding principle for the creation and utilization of this LHMP is as follows:

- Through partnerships among all local jurisdictions, identify and reduce the vulnerability to natural hazards to protect the health, safety, quality of life, environment and economy of the diverse communities within Torrance County.

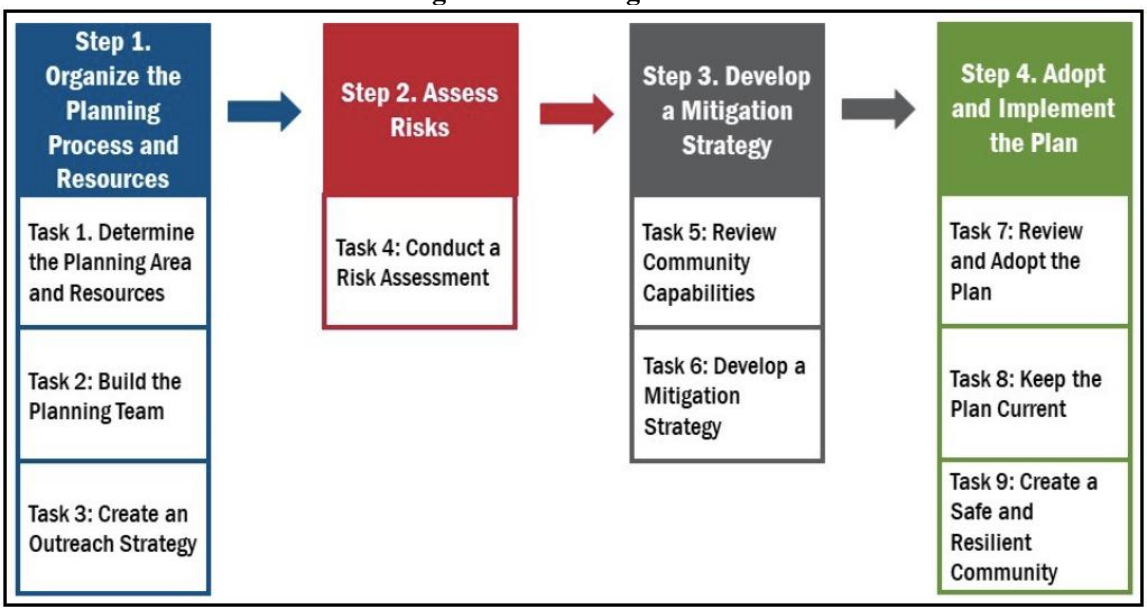
2.2 Planning Process

The process established for this planning effort is based on the Disaster Mitigation Act of 2000 planning and update requirements and the FEMA associated guidance for local hazard mitigation plans (Local Mitigation Planning Policy Guide (FP 206-21-0002), effective April 11, 2025). To accomplish this, the following planning process methodology was followed:

- Inform, invite, and involve other mitigation plan stakeholders throughout the state, including federal agencies, state agencies, regional groups, businesses, non-profits, underserved communities, and local emergency management organizations.
- Creation of a Mitigation Planning Committee (MPC) to codify and guide the planning process.
- Develop the planning and project management process, including methodology, review procedures, details about plan development changes, interagency coordination, planning integration, and the organization and contribution of stakeholders.
- Creation of a multi-pronged outreach strategy to engage stakeholders.
- Conduct a thorough review of all relevant current and historic planning efforts.
- Conduct a review of all related and relevant state and local plans for integration and incorporation.
- Collect data on all related state plans and initiatives, local plans' hazard risk, local plans' mitigation strategies and actions, critical facilities and community lifelines, flood plains, Repetitive Loss/Severe Repetitive Loss properties, hazard events, on-going and completed mitigation actions, and mitigation program changes since the development of the previous plan.
- Complete a risk and vulnerability assessment using data from the FEMA and other federal and state agency resources. Analyses were conducted at the state level, county by county, of state-owned facilities, and county by county drawing on local assessments.
- Develop and update the capability assessment of Torrance County and all participating jurisdictions.
- Develop a comprehensive mitigation strategy effectively addressing Torrance County's hazards and mitigation program objectives. This included reviewing pre and post disaster policies and programs, identifying objectives and goals, identifying mitigation actions and projects, and assessing mitigation actions and projects.
- Determination and implementation of a plan maintenance cycle, including a timeline for plan upgrades and improvements.

The following figure summarizes these steps:

Figure 2: Planning Process

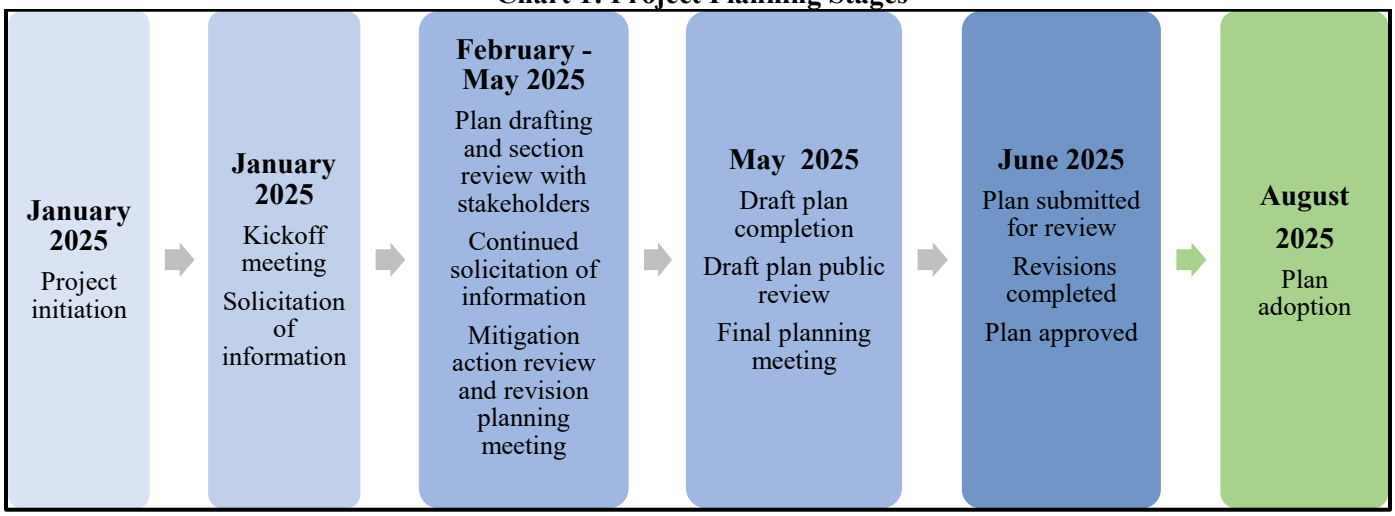


Source: FEMA

2.3 Project Timeline

The Torrance County LHMP review and revision process began in June 2024, with the first public meeting held in June 2024. The following chart indicates the planning stages completed as part of this process:

Chart 1: Project Planning Stages



2.4 Plan Organization

This LHMP is both a reference document and an action plan. It has information and resources to educate readers and decision-makers about hazard events and related issues and a comprehensive strategy that participating jurisdictions, stakeholders, and community members can follow to improve resilience. This LHMP is composed of the following sections:

- **Section 1 - Introduction, Assurances, Incorporation, and Adoption:** Details the regulatory framework for plan development, participating jurisdictions, how the plan will be incorporated into other planning mechanisms, and adoption requirements.
- **Section 2 – Planning Process:** Outlines the steps taken to complete this LHMP, the people involved in its creation, strategies to invite public participation, and technical and planning resources utilized in completing this plan.

- **Section 3 - Regional Profile and Development Trends:** Details demographic information, vulnerable populations, critical facility and infrastructure information, and agricultural data.
- **Section 4 – Capability Assessment:** Provides a comprehensive evaluation of existing abilities to effectively mitigate hazards and manage disaster risks. This assessment involves analyzing the community's current resources, policies, programs, and systems to determine how well it can implement mitigation strategies.
- **Section 5 - Hazard Identification and Risk Assessment:** Describes the hazards that can impact the planning area, including extent, previous occurrences, changing conditions, and vulnerabilities.
- **Section 6 - Mitigation Strategy:** Outlines the specific actions, policies, and projects designed to reduce or eliminate the risks and impacts of hazards on a community. These strategies are developed based on the findings from the hazard identification and risk assessment phases and are tailored to address the unique vulnerabilities and capabilities of the community.
- **Section 7 - Plan Maintenance:** Summarizes plan maintenance responsibilities, monitoring and update requirements, and opportunities for continued public involvement.
- **Appendices:** Provides supplementary detailed information and supporting documents. The appendices serve to enhance the main content by offering further clarification, data, and documentation that support the planning process and implementation.

2.5 2025 Plan Update

In undertaking this planning effort, Torrance County determined that wide variances in planning format and data do not allow for effective continuous planning. To provide planning continuity every effort was made during this plan update to adhere as closely as possible to elements of the previous LHMP. As such, the level of analysis and detail included in this risk assessment is cumulative, allowing participating jurisdictions to have a robust base to further mold and improve their mitigation strategies over the next five years.

As part of this planning effort, each section of the previous mitigation plan was reviewed based on current and available data. The plan was reviewed against the following elements:

- Compliance with the current regulatory environment
- Completeness of data
- Correctness of data
- Capability differentials
- Current regional environment

Based on the above criteria, each section of the previous LHMP was revised as required. In addition to data revisions, the format and sequencing of the previous plan was updated for ease of use and plan clarity. Key updated elements from the previous LHMP include:

- Expanded definition and discussion of underserved communities and vulnerable populations.
- Updated goals and objectives, including a new goal and objectives.
- Updated critical facilities and community lifelines list.
- Expanded detailing of historic hazard event occurrences.
- Updated mapping using newly available data.
- Updated county and jurisdictional capabilities assessment
- Updated mitigation actions, including progress on previous actions

Participating jurisdictions hazard mitigation priorities have remained consistent for all participating jurisdictions since the last plan update. These priorities include a continued focus on reducing vulnerabilities, enhancing resilience, and addressing risks associated with natural hazards. Stakeholders remain committed to strengthening community preparedness, protecting critical infrastructure, and minimizing potential losses through collaborative strategies and long-term planning.

2.6 Mitigation Planning Committee

Project initiation began with the selection of a Mitigation Planning Committee (MPC), consisting of the Torrance County Emergency Manager and representative staff from both Torrance County and participating jurisdictions. From project inception to completion, the MPC was notified at each major plan development milestone through a combination of meetings and electronic communication.

In general, all MPC members were asked to participate in the following ways:

- Attend and participate in meetings
- Help establish project operating procedures and timelines
- Review planning elements and drafts
- Shepherd the plan adoption process

Members of the MPC were also asked to assist with the following:

- **Providing Localized Risk Assessment Data:** Contribute specific data and information about local hazards, vulnerabilities, and risks that are unique to their jurisdiction.
- **Identifying Mitigation Actions:** Help identify and prioritize mitigation actions that are most relevant to their jurisdiction.
- **Coordinating with Stakeholders:** Act as liaisons between the MPC and their respective stakeholders, including vulnerable communities, community members, local businesses, and other governmental agencies. This ensures that the plan reflects the concerns and needs of all relevant parties.
- **Ensuring Compliance and Integration:** Ensure that the mitigation strategies and actions proposed in the LHMP align with existing local plans, ordinances, and regulations. This integration helps to streamline implementation and ensures that the LHMP supports broader community goals.
- **Securing Resources and Funding:** Help identify potential resources, including funding opportunities, that can support the implementation of mitigation actions.
- **Reviewing and Updating the Plan:** After the initial development of the LHMP, MPC members are typically involved in regular reviews of the plan. This includes monitoring progress on mitigation actions, evaluating the effectiveness of strategies, and making necessary adjustments based on new data or changing conditions.
- **Public Engagement and Education:** Play a crucial role in engaging the public and educating community members about the LHMP and its importance.

By fulfilling these roles, MPC members help ensure that the LHMP is well-rounded, locally relevant, and effectively implemented across the entire planning area. Their involvement is key to the plan's success in reducing risks and enhancing community resilience to hazards. The following table represents members of the MPC:

Table 2: MPC Members

Jurisdiction	Name	Title
Torrance County	Samantha O'Dell	Emergency Manager
Encino	Lawrence Gallegos	Maintenance Supervisor
Encino	Angel Sanchez	Planning and Zoning Officer
Estancia	William Teaney	Director of Security
Moriarty	Todd Hart	Fire Chief
Moriarty	Adan Urbina	Police Chief
Mountainair	Josh Lewis	EMS Chief
Willard	David Dean	Mayor
Central Tri-County SWCD	Brenda Smythe	District Manager
Claunch-Pinto SWCD	Dierdre Tarr	District Manager
Claunch-Pinto SWCD	Tom Carroll	Board Member
East Torrance SWCD	Leonard Howell	District Manager

2.7 Participating Stakeholders

Torrance County acknowledges that effective hazard mitigation planning should involve a diverse group of stakeholders, including government agencies, private sector entities, private non-profit organizations, quasi-governmental authorities, and special districts. The coordination and cooperation of these stakeholders assists with all aspects of plan development, including:

- Data collection
- Hazard and risk analysis
- Capability assessment
- Mitigation action review, revision, and development
- Plan implementation

These participating stakeholders were contacted directly by TCOEM via phone and email during the entirety of the planning process concerning plan progress and meeting information (including remote meeting login information and in person meeting address and time when applicable), and included:

- Local and regional agencies involved in hazard mitigation activities (HAZ).
- Agencies that have the authority to regulate development (DEV).
- National Flood Insurance Program coordinators.
- Neighboring communities (NC).
- Representatives of business, academia, and other private organizations. (BAP)
- Non-profit and community-based organizations who work to provide support to socially vulnerable and underserved communities (NP).

The following table details our participating stakeholders:

Table 3: Participating Stakeholders

Name	Title	Jurisdiction or Agency	Type
Gary Smith	Fire Chief	Torrance County Fire Department	HAZ
Don Goen	Planning & Zoning Director	Torrance County Planning & Zoning	DEV
Leonard Lujan	Road Superintendent	Torrance County Road Department	HAZ
J. Jordan Barela	County Manager	Torrance County	HAZ
Chris Wolonsky	Fire Chief	Estancia	HAZ
William Teaney	Zoning Officer	Estancia	DEV
Nathan Dial	Mayor	Estancia	HAZ
Tom Carter	Chief of Police	Estancia	HAZ
Brandon S. Webb	Mayor	Moriarty	HAZ
Maria N. Martinez	Planning & Zoning Administrator	Moriarty	DEV
Jeff Tapia	Public Works Director	Moriarty	HAZ
Peter Nieto	Mayor	Mountainair	HAZ
Joshua Archuleta	Fire Chief	Mountainair	HAZ
Jesse Davidson	Planning & Zoning Chair	Mountainair	DEV
Carl Archuleta	Public Works Supervisor	Mountainair	HAZ
Shawn Penman	Technical Partner Coordinator	Earth Data Analysis Center, UNM	BAP
Victoria Sedillo	Admin Contractor	Claunch-Pinto SWCD	HAZ
Lainey Fastnacht	Admin. Assistant	Claunch-Pinto SWCD	HAZ

Emphasis was placed on inviting and engaging local building departments (Section 4.3) and local level departments with potential mitigation roles (Section 4.2) who played a critical role in creating and reviewing this LHMP. Their expertise was used to help identify local vulnerabilities and develop building-related mitigation measures. Additionally, jurisdictional NFIP coordinators played a key role in mitigation planning at the community level (Section 4.8). These coordinators were actively engaged and for their expertise on flood risk, mitigation strategies, and NFIP compliance. Outreach to these stakeholders was also carried out through MPC members to ensure compliance with planning requirements.

2.8 Coordinating Stakeholders

Public Comment: *The Mountainair Ranger District will support Torrance County in any way possible.*

The Torrance County MPC provided the opportunity for a wide variety of coordinating stakeholders to participate in the planning process. Coordinating stakeholders have information and resources that are important to the planning process, but do not participate fully in the planning process. While not all of these organizations attended meetings, each was actively courted to provide information, data, and feedback as necessary and as related to their areas of expertise.

The following provides a list of all coordinating stakeholders involved in the development of this LHMP:

- New Mexico Department of Agriculture
- New Mexico Department of Game and Fish
- New Mexico Department of Health
- New Mexico Department of Homeland Security and Emergency Management
- New Mexico Department of Transportation
- New Mexico of Energy, Minerals and Natural Resources Department
- New Mexico Indian Affairs Department
- New Mexico General Building Bureau, Construction Industries Division
- Bernalillo County Emergency Management (Tom Walmsley, Emergency Manager)
- Guadalupe County Emergency Management (Emergency Manager)
- Lincoln County Emergency Management (Arron Griewahn, Emergency Services Director)
- San Miguel County Emergency Management (Dennis Esquibel, Emergency Manager)
- Santa Fe County Office of Emergency Management (Brad Call, Emergency Manager)
- Socorro County Emergency Management (Gail Rogers-Tripp, Emergency Manager)
- Valenica County Emergency Management (Sarah Gillen, Emergency Manager)
- Mid-Region Council of Governments
- Mountainair Ranger District
- National Oceanic and Atmospheric Administration (NOAA)
- National Weather Service (NWS)
- United States Army Corps of Engineers
- United States Department of Agriculture (USDA)
- United States Geological Survey (USGS)
- United States Census Bureau
- University of Wisconsin SILVIS Labs

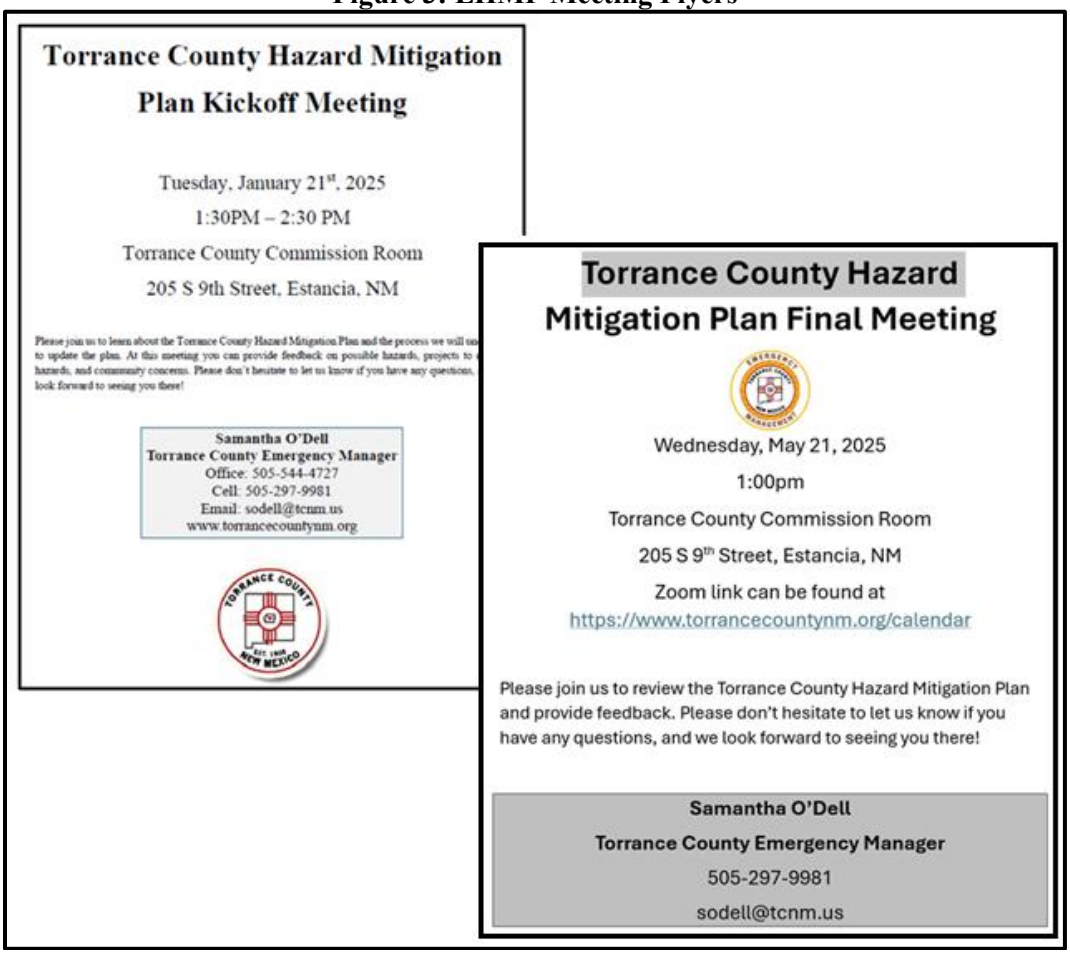
2.9 Community Outreach

All participating jurisdictions undertook a joint strategy to notify and include the public in the LHMP process. Members of the community (the public) were provided with numerous opportunities to contribute and comment on the creation and adoption of the plan. For participating jurisdictions, the public was defined as any person with an interest in the resilience and welfare of Torrance County. These opportunities included:

- TCOEM webpage updates concerning all hazard mitigation activities, survey links, and meeting information.
- Flyers to post to advertised meeting locations and details.
- Online and paper surveys.
- Comment period, along with an online survey, upon completion of draft plan .

All open public meetings were held at easily accessible community locations. As many participating jurisdictions and citizens have limited communications capabilities, meeting notices were placed in high visibility locations and our MPC was asked to conduct a word-of-mouth campaign concerning the planning process to include as many participants as possible.

Figure 3: LHMP Meeting Flyers



Along with public meetings, and to help generate community interest and participation, a parallel online outreach strategy was undertaken. Because Torrance County encompasses many rural communities, an online strategy was enacted. This allowed remote and underserved communities to participate fully in the process without having to travel long distances. Information concerning the hazard mitigation planning process, along with links to public surveys, links to meeting presentations, and recorded copies of meetings were provided through the TCOEM website.

Figure 4: TCOEM Webpage Featuring Hazard Mitigation Updates

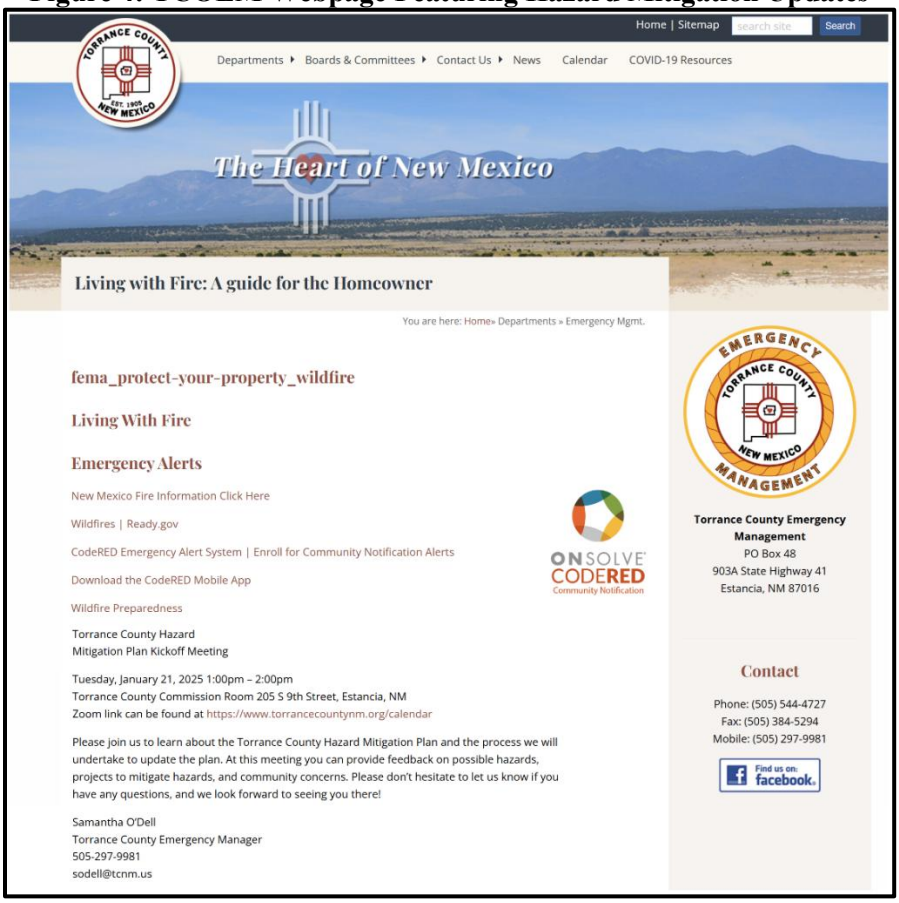
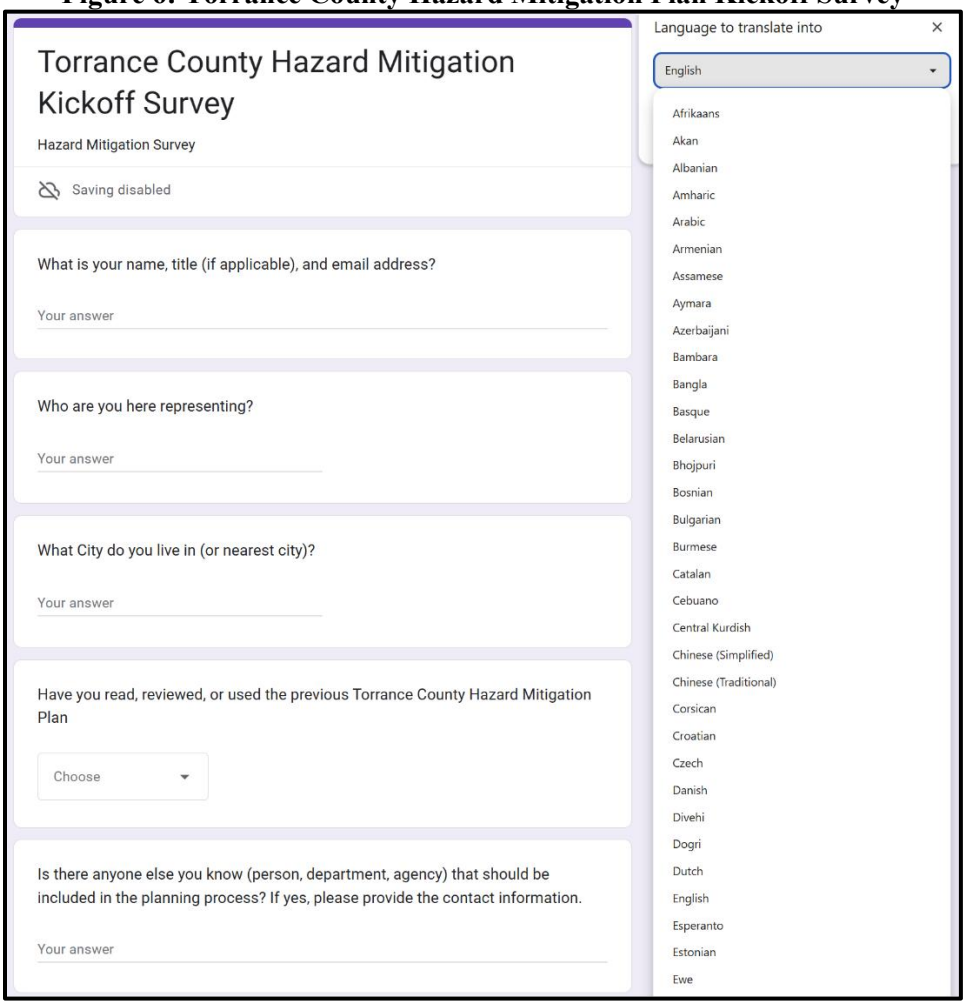


Figure 5: TCOEM Facebook Page



Additionally, throughout the planning process numerous public surveys were released to allow community members to provide feedback and input on the LHMP update using a series of guided questions and open comment fields. The surveys used Google's auto translate feature to provide a host of languages to complete the forms.

Figure 6: Torrance County Hazard Mitigation Plan Kickoff Survey



Input from the general public provided the MPC with a clearer understanding of local concerns, helped confirm identified hazards, helped shape proposed mitigation actions, and provided elected officials with a guide and tool to set local, regional, and ordinances and regulations. This public outreach effort was also an opportunity for adjacent jurisdictions and entities to be involved in the planning process. Additionally, as citizens were made more aware of potential hazards and the local process to mitigate against their impacts, it was believed that they would take a stronger role in making their homes, neighborhoods, schools, and businesses safer from the potential effects of natural hazards. Comments and feedback from the surveys are both incorporated in this LHMP and are included in Appendix B.

Public Comment: *Thank you for including our community.*

2.10 Planning Meetings

Numerous in-person meetings were conducted for the 2025 LHMP update. All of the meetings were held in a publicly accessible location and advertised as open to the public. These meeting were conducted to discuss the mitigation planning process as well as gain public support and input for the plan update. The following is a brief synopsis of those meetings.

- **LHMP Update Kick-Off and Public Information Meeting – January 25, 2025:** Torrance County hosted a kick-off meeting for the MPC, stakeholders, and the public. The meeting was used to present the general

structure and timeline for the LHMP process, discuss jurisdictional participation requirements, present data concerning changing demographics and development, review and discuss identified hazards that could impact the region, and present next steps. During the meeting, MPC members, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, MPC members were tasked with collecting contact information, and advised of future data collection requirements such as hazard history, facility information, and other pertinent information from participating jurisdictions.

- **LHMP Capability Review, and Mitigation Strategy Review Meeting – April 8, 2025:** Torrance County had a virtual planning meeting for the MPC. Attendees reviewed and revised, as necessary, the hazards list and vulnerability assessment. MPC members also reviewed the mitigation strategy to ensure it was in-line with the current planning environment.
- **LHMP Update Final Review Meeting – May 21, 2025:** Torrance County hosted a public final plan review meeting for the MPC, stakeholders, and the public. At the meeting, MPC members, jurisdictional representatives, plan stakeholders, and the public were invited to voice any concerns, ask questions, and provide input on the mitigation plan update. Additionally, members of the public were invited to review a draft copy of the LHMP update posted to jurisdictional and county websites for two weeks prior to the final meeting, and prior to its submission to FEMA Region VI.

Formal meetings were supplemented with planning calls and frequent email communications

2.11 Planning Document Resources

The hazard mitigation plan is an overarching document that is both comprised of, and contributes to, various other jurisdictional plans. In creating this plan, all the planning documents identified below were consulted and reviewed, often extensively. In turn, when each of these other plans is updated, they will be measured against the contents of the hazard mitigation plan.

Below is a list of the various planning efforts, sole or jointly administered programs, and documents reviewed and included in this hazard mitigation plan. While each plan can stand alone, their review and functional understanding was pivotal in the development of this plan and further strengthens and improves a jurisdiction's resilience to disasters.

- **2017 Torrance County Hazard Mitigation Plan:** The previous LHMP has been reviewed and is incorporated throughout this plan per FEMA requirements.
- **2023 New Mexico State Hazard Mitigation Plan:** Completed by the NMDHSEM, this plan was utilized to provide the framework for hazard mitigation. This plan set a baseline for standards and practices for hazard mitigation planning and was used as a resource for information and data.
- **Torrance County Comprehensive Plan:** Provides long-term framework for future growth and development. All specific plans, subdivisions, public works projects, and zoning decisions must be consistent with the general plan. These plans provided background information on the county and jurisdictions, information on risk and vulnerabilities, and a review of existing policies related to hazards and mitigation.
- **2020 Encino Comprehensive Plan:** Provides long-term framework for future growth and development. All specific plans, subdivisions, public works projects, and zoning decisions must be consistent with the general plan. These plans provided background information on the county and jurisdictions, information on risk and vulnerabilities, and a review of existing policies related to hazards and mitigation.
- **2011 Village of Willard Comprehensive Plan:** Provides long-term framework for future growth and development. All specific plans, subdivisions, public works projects, and zoning decisions must be consistent with the general plan. These plans provided background information on the county and jurisdictions, information on risk and vulnerabilities, and a review of existing policies related to hazards and mitigation.
- **2024 Torrance County Community Wildfire Protection Plan:** Created in collaboration with local governments, fire departments, and relevant stakeholders to address the risk of wildfire in the county. The primary goals are to enhance wildfire preparedness, reduce the risk of wildfire to life, property, and critical infrastructure, and improve community resilience.

- **2024 Claunch-Pinto Soil and Water Conservation District Community Wildfire Protection Plan:** Created in collaboration with local governments, fire departments, and relevant stakeholders to address the risk of wildfire in the county. The primary goals are to enhance wildfire preparedness, reduce the risk of wildfire to life, property, and critical infrastructure, and improve community resilience.
- **2016 Claunch-Pinto Soil and Water Conservation District Land Use Plan:** This plan identifies and applies goals, objectives, and policies to the state and federal regulatory framework that governs the management of private, state, and federal land and the rangeland, soil, water, and wildlife resources. The plan guides the County, private, state, and federal decision makers in addressing federal and state natural resource management issues.
- **2024 Torrance County Emergency Operations Plans:** This plan is used to develop procedures for the protection of personnel, equipment, and critical records to help determine existing established policies that ensure the continuity of government and essential services during and after disasters.
- **2020 Southern Torrance County Economic Development Plan:** Addresses how culture, history, geography, natural resources, and infrastructure create unique economic opportunities and challenges for the region.
- **Planning and Zoning Documents and Ordinances:** Planning and zoning ordinances are tools used by local governments to regulate land use and development within their jurisdictions. These ordinances are essential for implementing a community's land development plan and ensuring orderly growth and development. These documents were reviewed, assessed, and cataloged to compile each participating jurisdiction's capabilities.

2.12 Technical Resources

A variety of technical resources during plan development. These technical resources were instrumental in completing an accurate vulnerability and risk assessment, and include:

- **FEMA Digital Flood Insurance Rate Maps**: FEMA's National Flood Hazard Layer data was instrumental in mapping floodplain locations and estimating potential flood impacts and loss estimates.
- **FEMA National Risk Index (NRI):** An online mapping application that identifies communities most at risk to natural hazards. The mapping service visualizes natural hazard risk metrics and includes data about expected annual losses from natural hazards, social vulnerability, and community resilience. The NRI's interactive web maps are at the county and Census tract level and made available via GIS services for custom analyses.
- **FEMA Resilience Analysis and Planning Tool (RAPT):** FEMA and Argonne National Laboratory created RAPT to support state, local, tribal, territorial analysis in identifying focus areas for building resilience, response, and recovery capabilities. RAPT is a geographic information system web map tool with clickable layers of community resilience indicators, infrastructure locations, and hazard data.
- **Homeland Infrastructure Foundation-Level Data (HIFLD)**
  A program managed by the U.S. Department of Homeland Security (DHS) that provides authoritative geospatial data for use by government agencies, emergency responders, and other authorized users involved in homeland security, emergency management, and critical infrastructure protection. The primary goal of HIFLD is to support homeland defense, security, and emergency preparedness missions by offering high-quality, reliable geospatial information.
- **National Oceanic and Atmospheric Administration (NOAA)/National Centers for Environmental Information (NCEI):** Provided weather data and historical events occurrence data.
- **U.S. Army Corps of Engineers (USACE):** Provided dam and flood control data.
- **U.S. Department of Agriculture (USDA):** Provided drought and agricultural data.
- **U.S. Geological Survey:** Provided geologic hazard occurrence and probability data.
- **National Weather Service (NWS):** Provided meteorological and storm event occurrence and probability data.
- **U.S. Drought Monitor:** Provided drought occurrence and intensity data.
- **New Mexico Geological Society:** Provided data about Torrance County's geology and seismology.
- **FEMA Map Service Center:** The official public source for flood hazard information produced in support of the National Flood Insurance Program (NFIP).
- **United States Census Bureau:** Data concerning populations, socially vulnerable populations, and housing.
- **NMDHSEM:** LHMP planning guidance and technical support.

Section 3 – Regional Profile and Development Trends

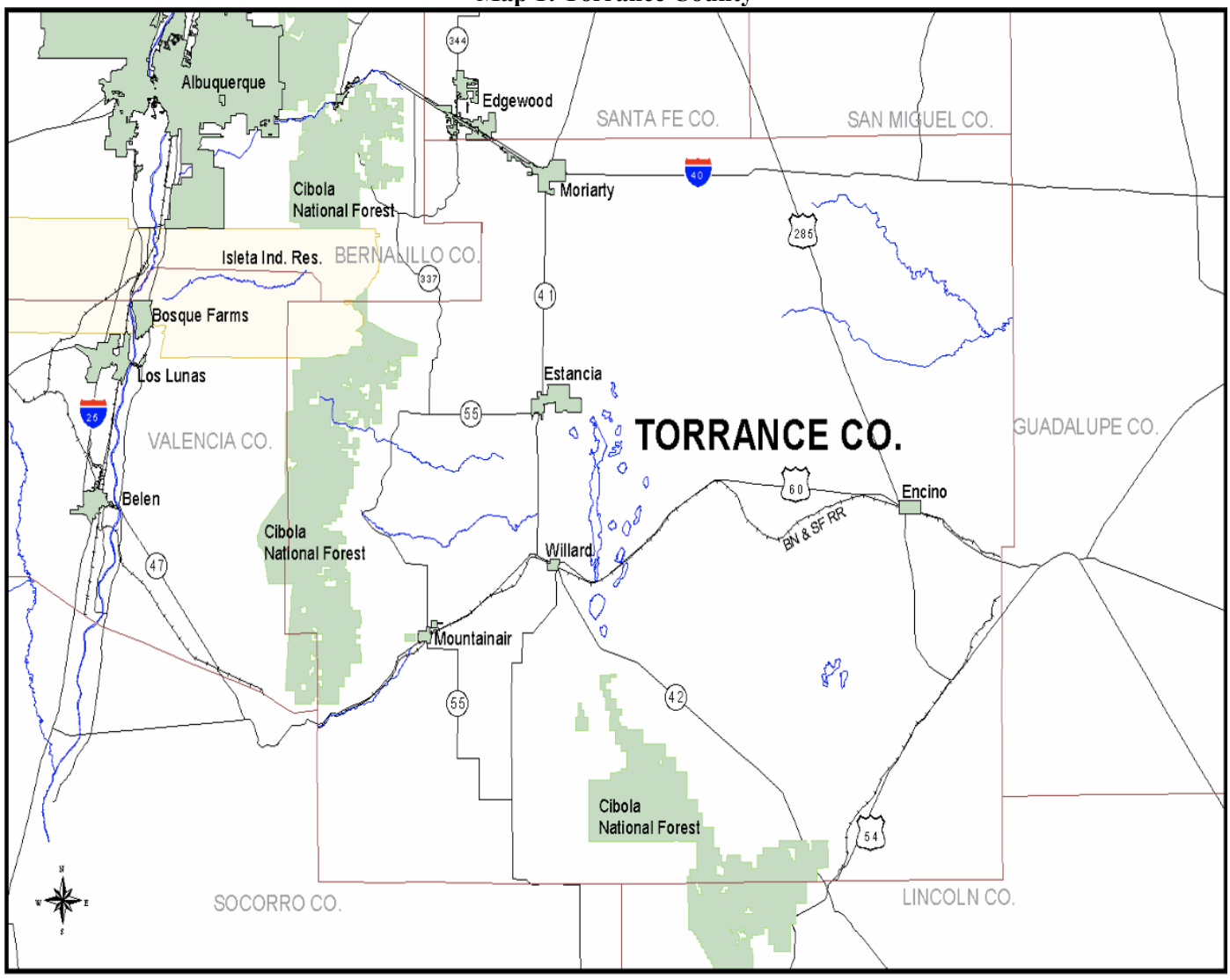
3.1 Introduction

Data concerning development trends and conditions is of great importance in determining regional and local risk and vulnerability to identified hazards, especially in locations which are susceptible to identified hazards. In general, any increase in population or development in hazard susceptible areas tends to increase both the risk and the vulnerability to that hazard. As such, the information presented in this chapter details relevant population and building statistics for Torrance County. This data will then be used to determine and refine potential hazard vulnerability in succeeding sections.

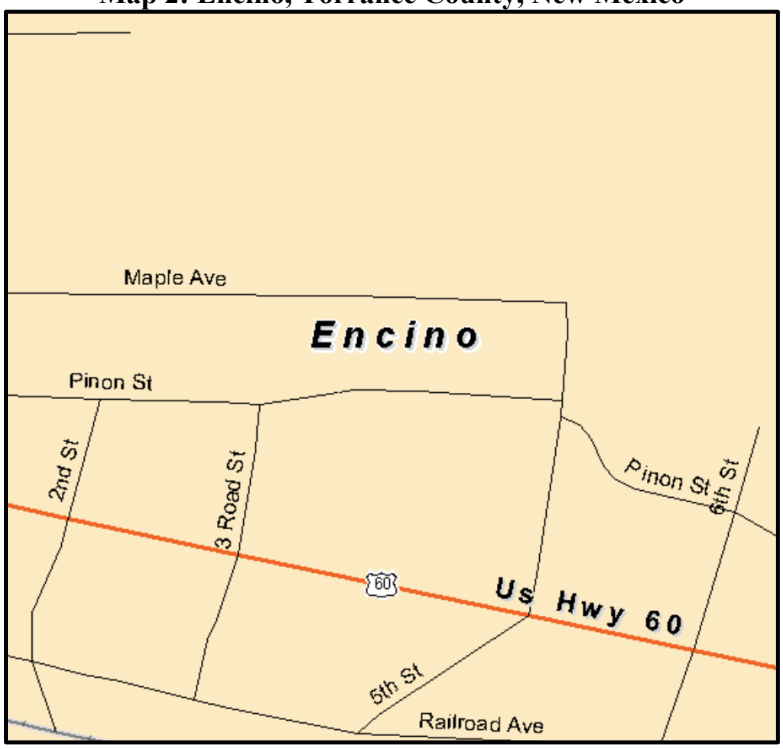
3.2 Jurisdictional Maps

The following map details the locations of Torrance County and participating jurisdictions:

Map 1: Torrance County

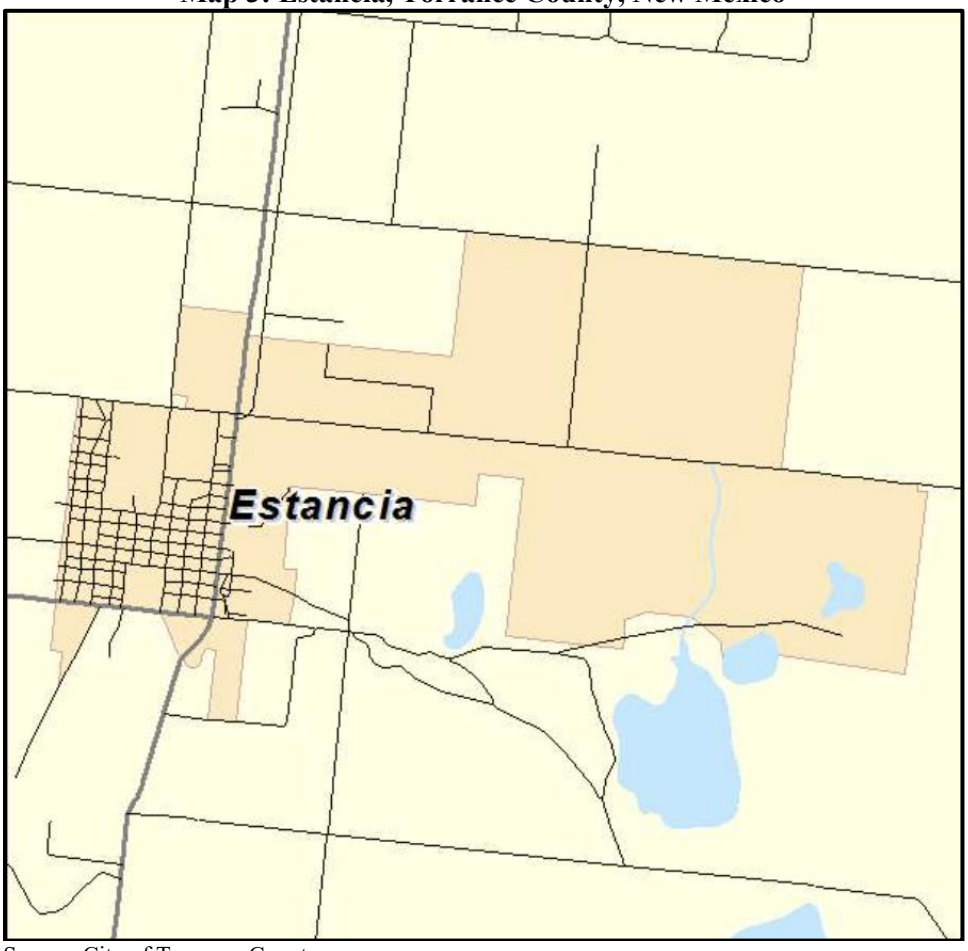


Map 2: Encino, Torrance County, New Mexico



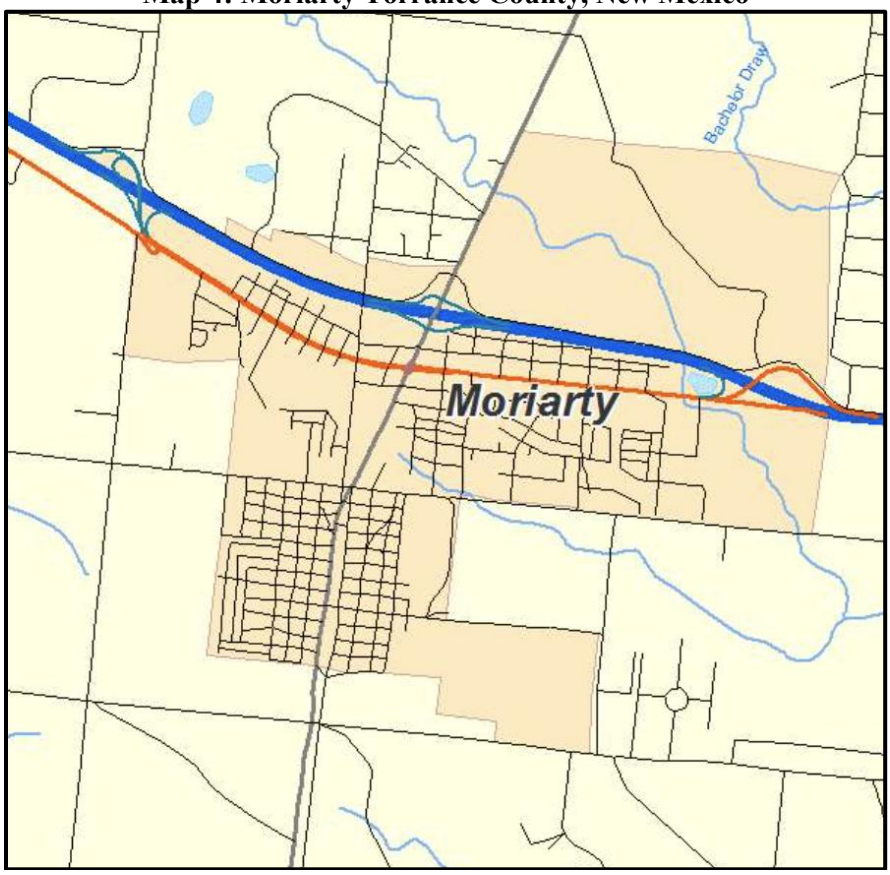
Source: Torrance County

Map 3: Estancia, Torrance County, New Mexico



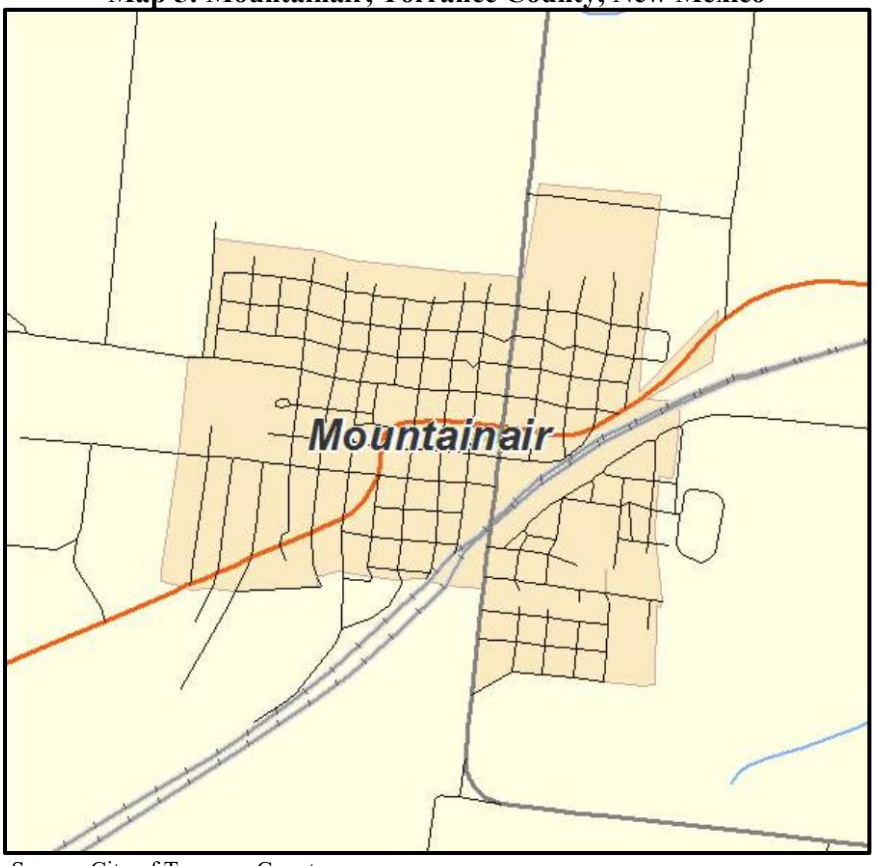
Source: City of Torrance County

Map 4: Moriarty Torrance County, New Mexico



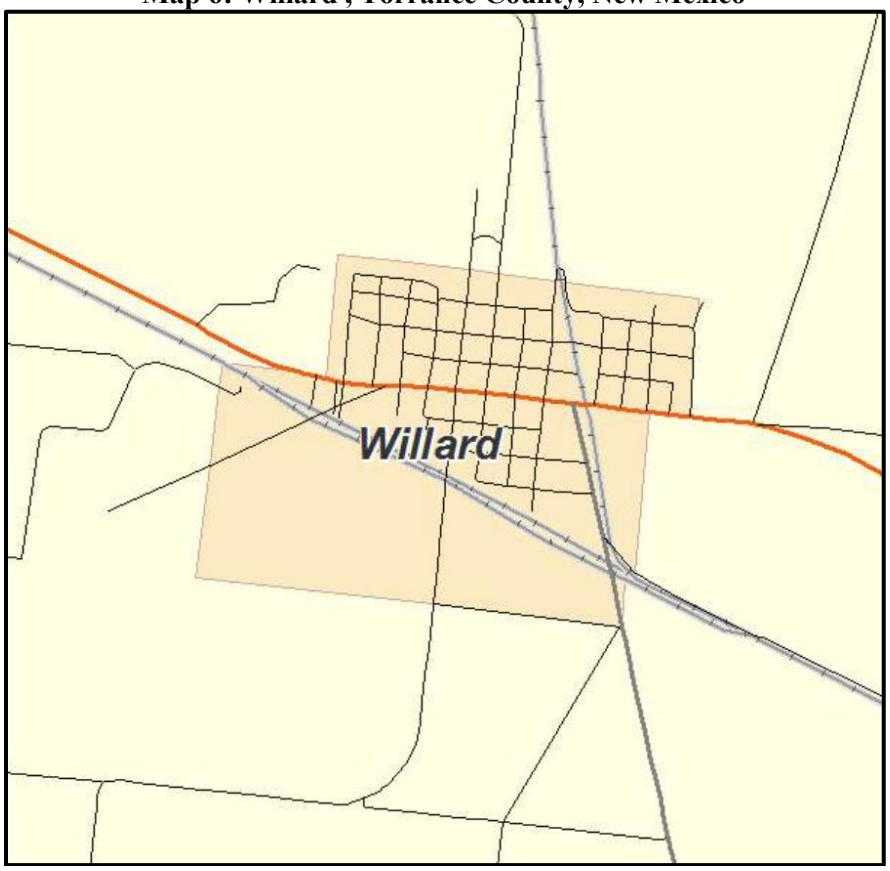
Source: City of Torrance County

Map 5: Mountainair, Torrance County, New Mexico



Source: City of Torrance County

Map 6: Willard , Torrance County, New Mexico



Source: City of Torrance County

3.3 Population Data

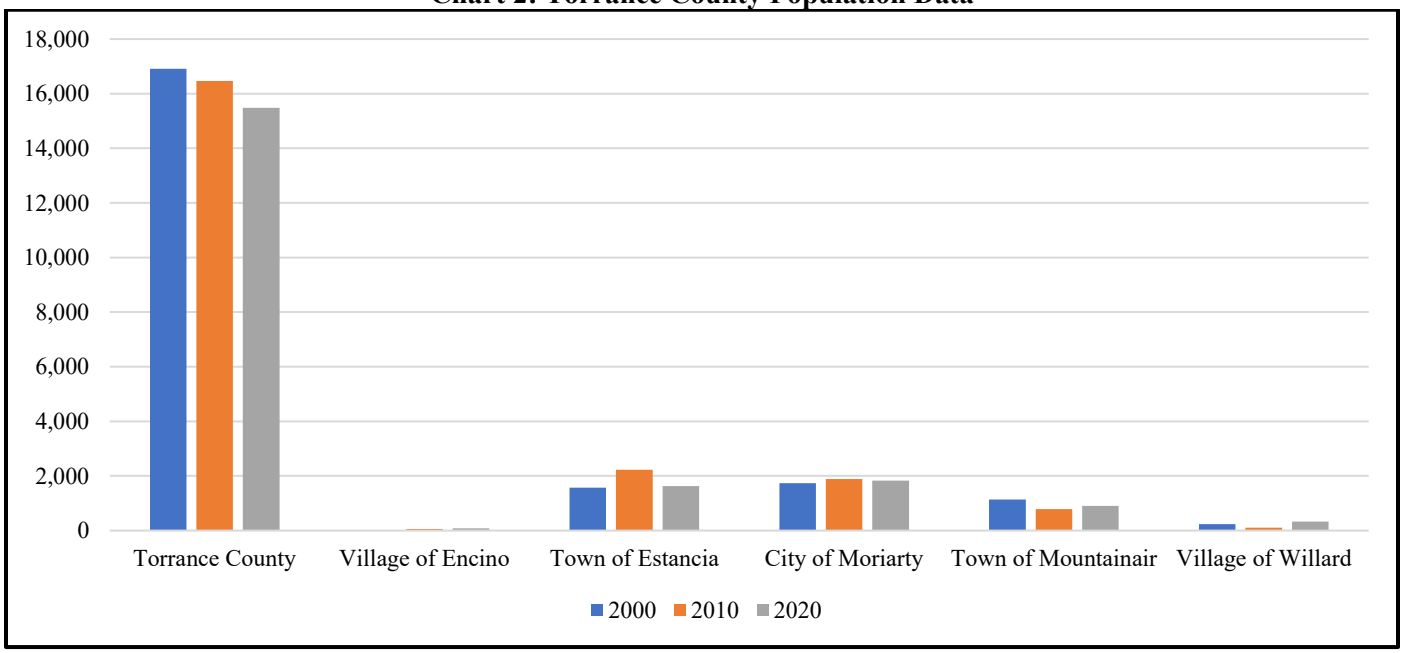
The following table, and associated charts, present population data for Torrance County and participating jurisdictions:

Table 4: Torrance County Population Data

Jurisdiction	Population			Percentage Population Change 2000-2020	Total Land Area (Sq. Mi.)	Population Density
	2000	2010	2020			
Torrance County	16,911	16,467	15,477	-8.5%	3,345.0	5
Encino	NA	64	84	31.3%	2.0	42
Estancia	1,572	2,226	1,635	4.0%	5.7	287
Moriarty	1,738	1,891	1,835	5.6%	4.8	382
Mountainair	1,136	788	903	-20.5%	1.1	844
Willard	239	109	327	36.8%	0.8	409

Source: US Census Bureau
-: No data

Chart 2: Torrance County Population Data



Source: US Census Bureau

3.4 Socially Vulnerable and At-Risk Populations

As a subset of the population data, Torrance County has socially vulnerable and at-risk populations, populations that may have difficulty with medical issues, poverty, extremes in age, and communications due to language barriers. Several principles may be considered when discussing potentially at-risk populations, including:

- Not all people who are considered at risk are at risk
- Outward appearance does not necessarily mark a person as at risk
- The hazard event will, in many cases, affect at risk population in differing ways

The National Response Framework defines at risk populations as "populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining independence, communication, transportation, supervision, and medical care."

Public Comment: *I have concerns about protecting the elderly in our community.*

Identifying socially vulnerable populations is a cornerstone of effective hazard mitigation planning because it helps ensure that all community members are protected. Socially vulnerable groups often face heightened challenges in preparing for, responding to, and recovering from disasters. By recognizing these populations, future mitigation efforts can design targeted interventions, such as accessible evacuation routes, culturally appropriate communication strategies, and prioritized resource distribution, to reduce risks and improve outcomes.

The following tables presents information on potential at risk populations within Torrance County and participating jurisdictions using 2020 census data:

Table 5: Torrance County Vulnerable Population Data

Jurisdiction	Population 5 and Under	Population 65+	Speaking Language Other Than English	Living Below Poverty Level	Disability, Under the Age of 65
Torrance County	746	3,193	3,606	3,730	3,776
Encino	0	22	50	1	14
Estancia	58	314	659	180	463
Moriarty	113	324	492	717	607
Mountainair	16	274	270	258	156

Table 5: Torrance County Vulnerable Population Data

Jurisdiction	Population 5 and Under	Population 65+	Speaking Language Other Than English	Living Below Poverty Level	Disability, Under the Age of 65
Willard	6	27	35	125	55

Source: US Census Bureau
-: No data

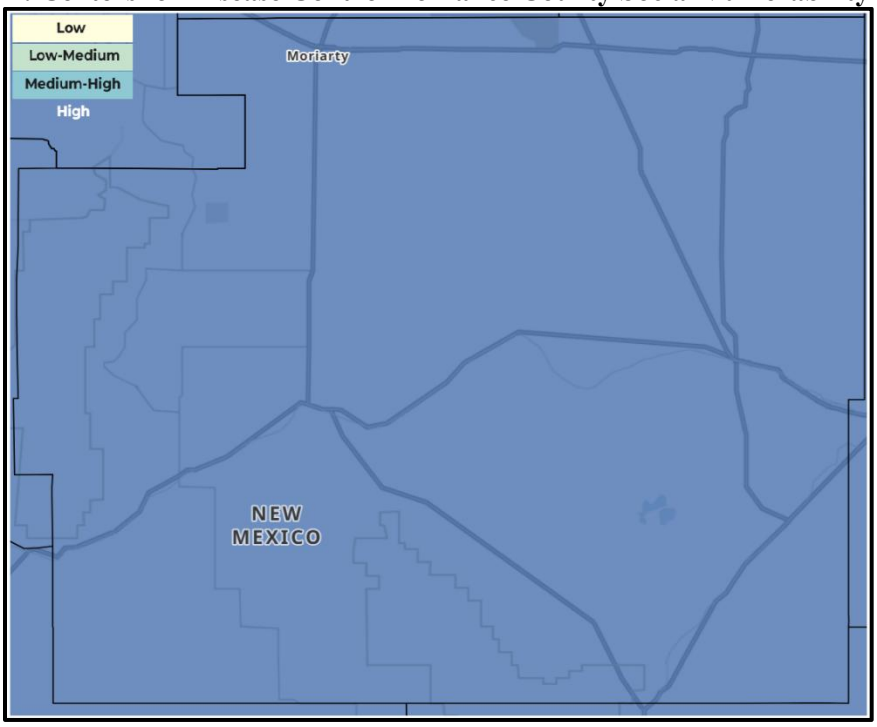
Table 6: Torrance County Socially Vulnerable and At-Risk Populations as Percentage of Total Population

Jurisdiction	Percentage of Population Age Five and Under	Percentage of Population Age 65+	Percentage of Population Speaking Language Other Than English	Percentage of Population Living Below Poverty Level	Percentage of Persons with a Disability, Under the Age of 65
Torrance County	4.8%	20.6%	23.3%	24.1%	24.4%
Encino	0.0%	26.2%	59.5%	2.7%	16.7%
Estancia	3.5%	19.2%	40.3%	11.0%	28.3%
Moriarty	6.2%	17.7%	26.8%	39.1%	33.1%
Mountainair	1.8%	30.3%	29.9%	28.6%	17.3%
Willard	1.8%	8.3%	10.7%	38.2%	16.8%

Source: US Census Bureau
-: Data unavailable

The Centers for Disease Control's Social Vulnerability Index Map shows the relative social vulnerability of communities based on factors such as socioeconomic status, household composition, disability, minority status, language, housing type, and transportation access. This map highlights areas where populations may have increased difficulty preparing for, responding to, and recovering from the impacts of hazard events. The following map helps identify vulnerable populations that may require additional resources and targeted support during mitigation planning and response efforts. By integrating this data, participating jurisdictions can prioritize investments, tailor outreach strategies, and ensure equitable distribution of resources to reduce disaster impacts on those most at risk.

Map 7: Centers for Disease Control Torrance County Social Vulnerability Map



Source: CDC

A Community Disaster Resilience Zone is a designated area that has been identified as particularly vulnerable to natural disasters and other hazards. The goal of establishing such zones is to focus resources, planning efforts, and mitigation strategies on areas that need the most support to improve their resilience to disasters. These zones are typically selected based on factors such as the frequency and severity of past disasters, the level of community vulnerability, and the potential impact of future events. Communities designated as Community Disaster Resilience Zone can receive increased financial and technical assistance to plan and implement resilience projects. As of this plan, no communities within Torrance County have received this designation.

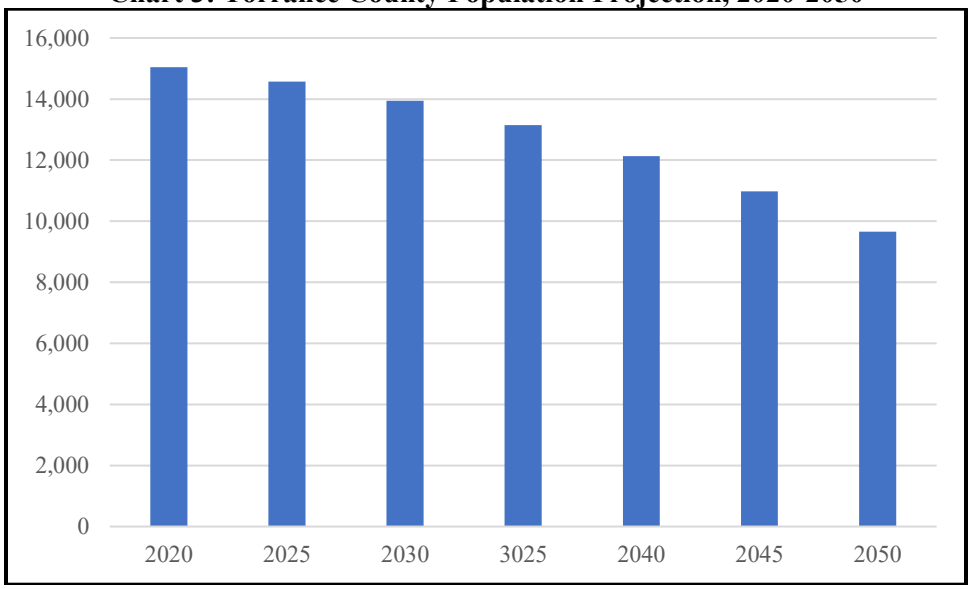
3.5 Regional Population Migration

Torrance County is experiencing consistent population decline as people increasingly migrate from rural areas to urban centers. This transformation reflects broader demographic trends witnessed across the United States. Demographic research indicates that this migration is occurring due to the following factors:

- **Economic Opportunity:** A primary driver of the population movement from rural to urban areas is the quest for better economic prospects. Urban centers, such as Albuquerque, offer a diverse range of employment opportunities in sectors like manufacturing, healthcare, finance, and technology. These opportunities often come with higher wages and better access to educational and healthcare facilities compared to rural areas.
- **Access to Education and Training:** Urban centers are often home to educational institutions, including colleges, universities, and vocational schools. Young people from rural areas often migrate to these urban settings to pursue higher education and vocational training.

The rural-to-urban population movement has significant implications for Torrance County. Communities may experience declining populations, school closures, and reduced economic activity. The following chart, using data from the University of New Mexico Geospatial and Population Studies, indicates a decreasing population for Torrance County through 2050:

Chart 3: Torrance County Population Projection, 2020-2050



Source: University of New Mexico Geospatial and Population Studies

3.6 Housing Data

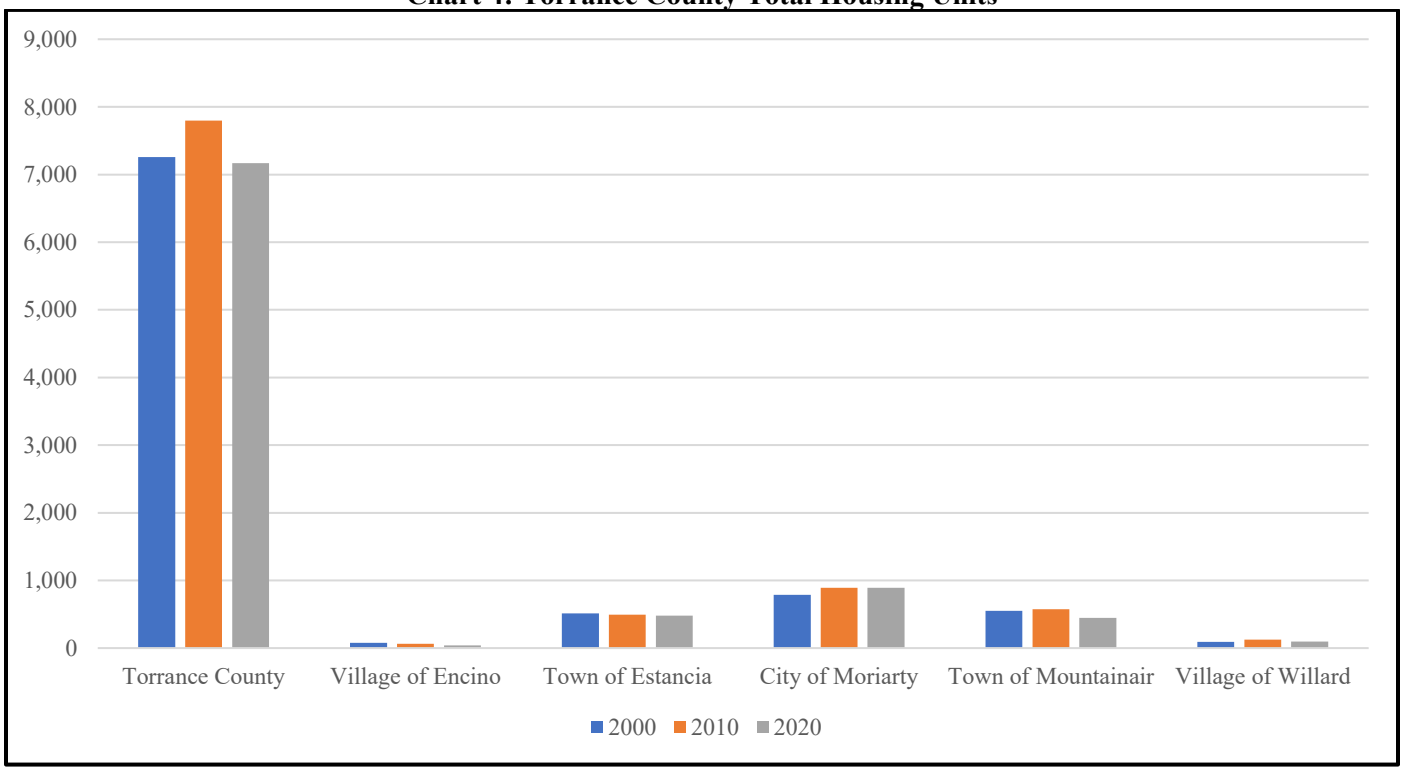
Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. The following table and associated charts, using data from the U.S. Census, present occupied housing unit information for Torrance County.

Table 7: Torrance County Housing Data

Jurisdiction	2000		2010		2020		2000 - 2020	
	Total	Occupied	Total	Occupied	Total	Occupied	Numeric Change	Percent Change
Torrance County	7,257	6,024	7,798	6,264	7,169	5,953	-88	-1.2%
Encino	77	41	62	45	41	36	-36	-46.8%
Estancia	512	400	492	410	481	398	-31	-6.1%
Moriarty	786	668	892	750	890	789	104	13.2%
Mountainair	553	461	574	418	447	384	-106	-19.2%
Willard	94	94	124	97	99	81	5	5.3%

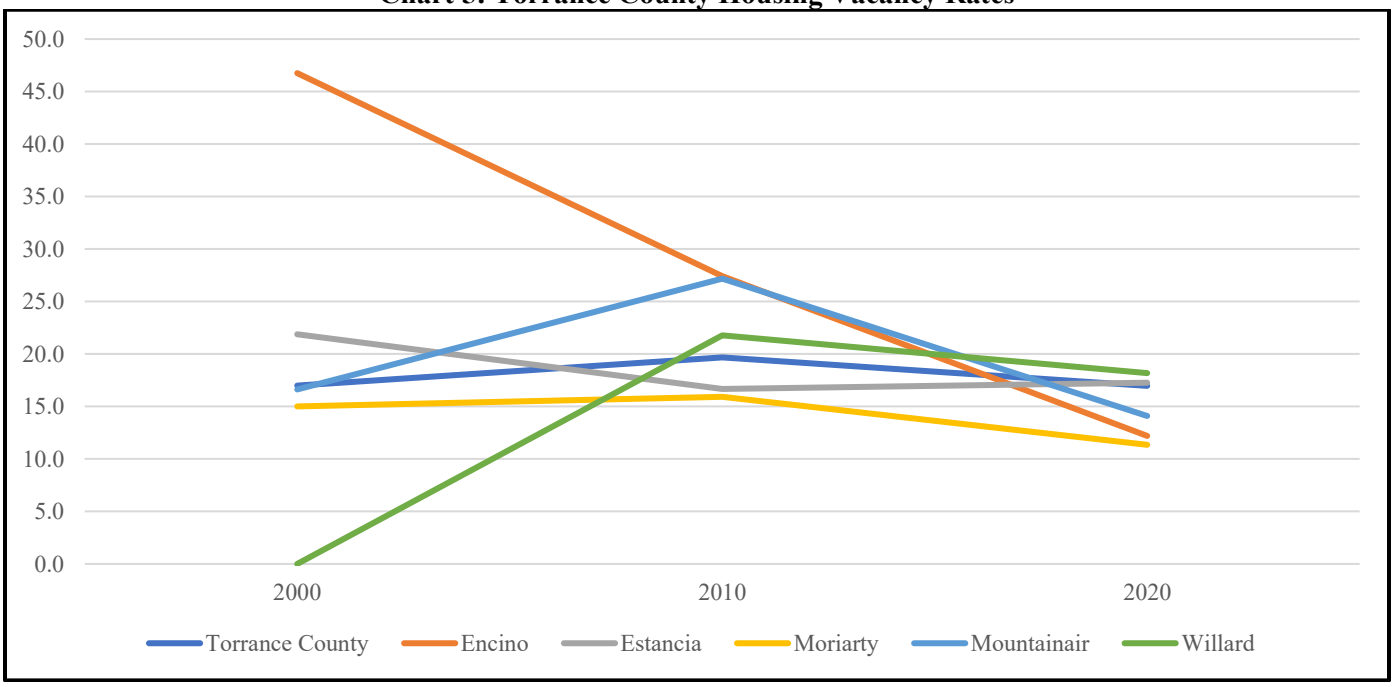
Source: US Census Bureau
-: No data

Chart 4: Torrance County Total Housing Units



Source: US Census Bureau

Chart 5: Torrance County Housing Vacancy Rates



Source: US Census Bureau

Of particular concern when considering housing data is mobile home residences. Data from the NOAA National Severe Storms Laboratory reports that people living in mobile homes are especially at risk for injury and death as even anchored mobile homes can be seriously damaged when winds gust over 80 miles per hour. Additionally, study data from Michigan State University reported that the two biggest factors related to wind event fatalities were housing quality (measured by mobile homes as a proportion of housing units) and income level. When a tornadic wind strikes, a county with double the number of mobile homes as a proportion of all homes will experience 62% more fatalities than a county with fewer mobile homes, according to the study data. The following indicates the percentage of mobile homes for each Torrance County participating jurisdiction:

Table 8: Torrance County Mobile Home Data

Jurisdiction	2000		2010		2020		2000 - 2020
	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Total	Percentage of Total Housing Units	Numeric Change
Torrance County	3,222	44.4%	2,679	34.4%	2,508	35.0%	-714
Encino	22	28.6%	5	8.1%	26	63.4%	4
Estancia	157	30.7%	146	29.7%	210	43.7%	53
Moriarty	263	33.5%	186	20.9%	201	22.6%	-62
Mountainair	123	22.2%	103	17.9%	110	24.6%	-13
Willard	46	48.9%	24	19.4%	56	56.6%	10

Source: US Census Bureau
-: No data

3.7 Valuation Data

The Torrance County Assessor's Office was contacted to determine if a valuation of properties was available for participating jurisdictions. It was determined that, due to the reporting format of available data, determining valuations for each jurisdiction was not feasible. As such, data on building valuation for participating jurisdictions was sourced from the FEMA NRI by both county and Census tract, presented in the following table:

Table 9: Participating Jurisdiction Building Valuation

Jurisdiction	Census Tract	Building Valuation
Torrance County	All	$3,379,000,000
-	35057963201	$672,976,948
Moriarty	35057963202	$794,398,417
Estancia	35057963601	$1,290,590,342
Encino, Mountainair and Willard	35057963700	$609,405,012
-	35057980000	$13,127,360

Source: FEMA NRI

3.8 School District Data

Children are among the most vulnerable populations during disasters, requiring special consideration in preparedness and response efforts. A community with high school enrollment typically has a significant portion of its population dependent on schools for safety, education, and emergency support during crises. Additionally, disruptions to education during disasters can have long-term impacts on children's well-being and development. Communities with higher school enrollment may face increased challenges in ensuring the safety and continuity of education during hazard events, making it essential to prioritize schools in mitigation planning and resource allocation.

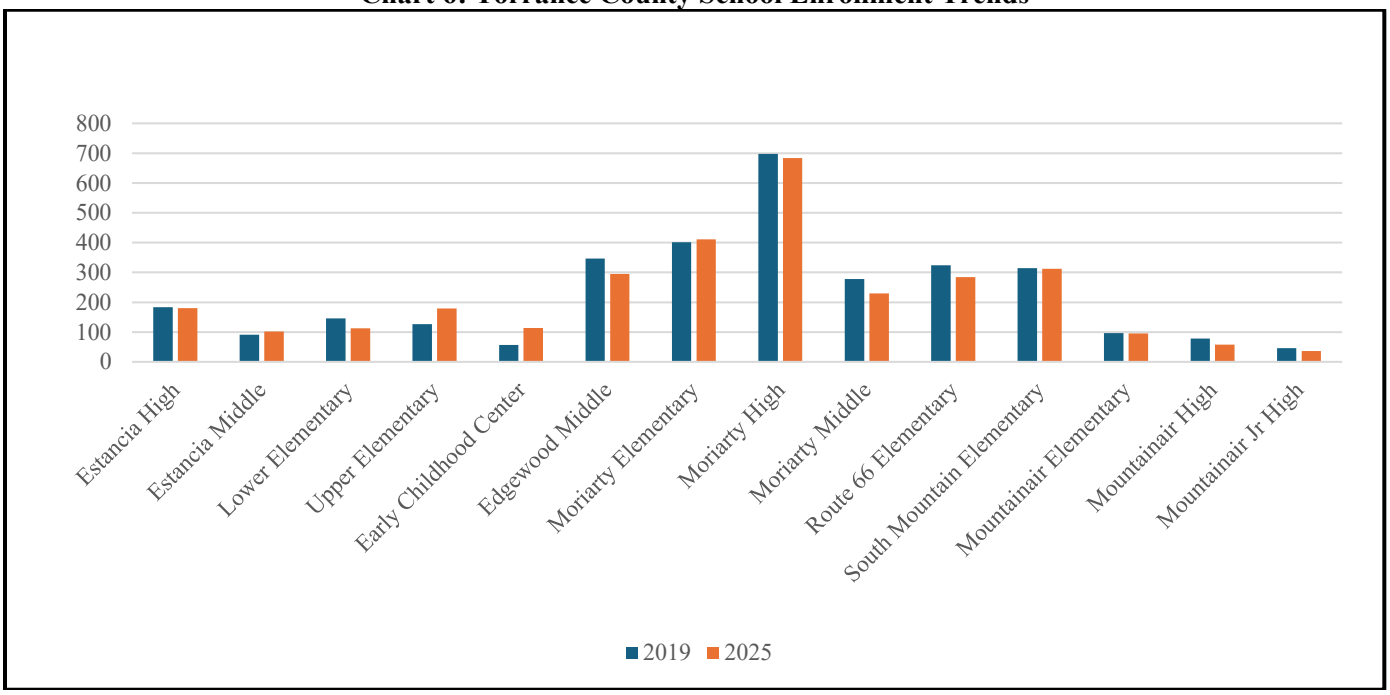
The following table presents school enrollment information from the New Mexico Public Education Department for school years 2018-2019 and 2024-2025:

Table 10: Torrance County School Enrollment Information

Jurisdiction	School Name	2018-2019 Enrollment	2024-2025 Enrollment	Change, 2019 - 2024
Estancia	Estancia High	183	180	-3
	Estancia Middle	91	102	11
	Lower Elementary	146	113	-33
	Upper Elementary	126	179	53
Moriarty-Edgewood	Early Childhood Center	57	114	57
	Edgewood Middle	346	295	-51
	Moriarty Elementary	401	411	10
	Moriarty High	697	684	-13
	Moriarty Middle	278	229	-49
	Route 66 Elementary	324	284	-40
	South Mountain Elementary	314	312	-2
Mountainair	Mountainair Elementary	96	95	-1
	Mountainair High	78	58	-20
	Mountainair Jr High	46	36	-10

Source: New Mexico Public Education Department

Chart 6: Torrance County School Enrollment Trends



Source: New Mexico Public Education Department

3.9 Critical Facilities and Infrastructure

Critical facilities have a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These locations help maintain order, public health, education, and help the economy function. Additionally, components are integral to disaster response and recovery operations. The following is a list of considered critical facilities:

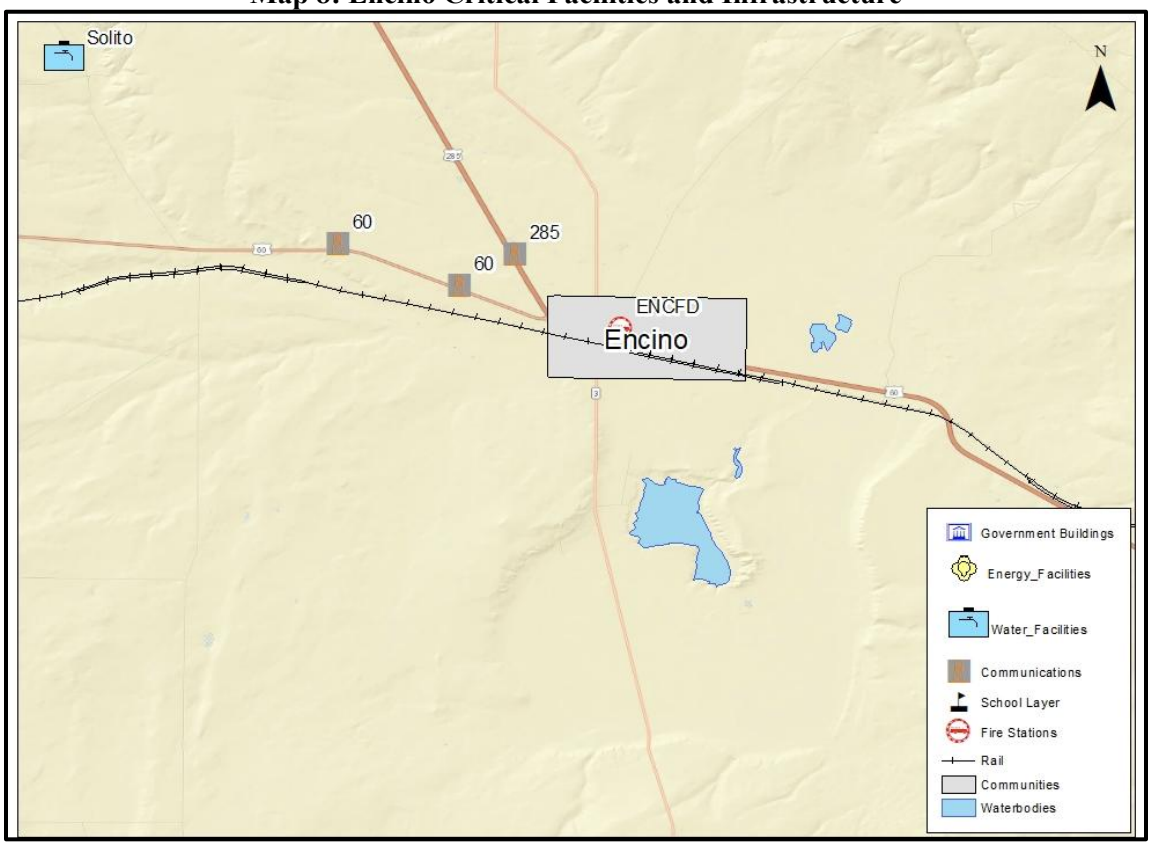
- Fire facilities
- Government facilities
- Law enforcement facilities
- Medical facilities
- Schools

Critical infrastructure refers to the essential systems, assets, and services that are vital for the functioning of society and the economy. These infrastructures are necessary for public safety, economic stability, and quality of life. If disrupted or destroyed, the impacts could be severe, affecting the community's ability to function. The following is a list of considered critical infrastructure:

- Transportation Infrastructure
- Communications
- Energy generation and regulation
- Roads
- Water and wastewater treatment

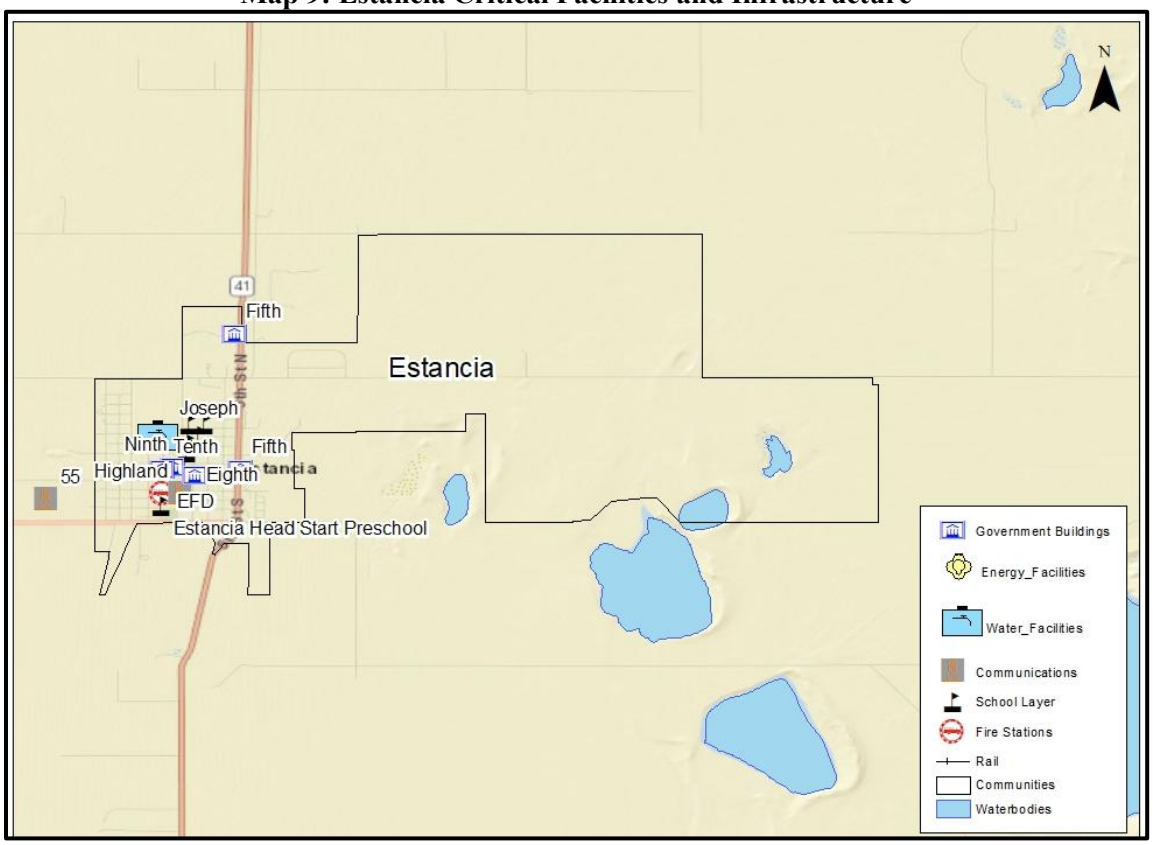
Jurisdictional GIS data was very limited concerning the location of critical facilities. The following maps break down community critical facilities and infrastructure by jurisdiction using available data:

Map 8: Encino Critical Facilities and Infrastructure



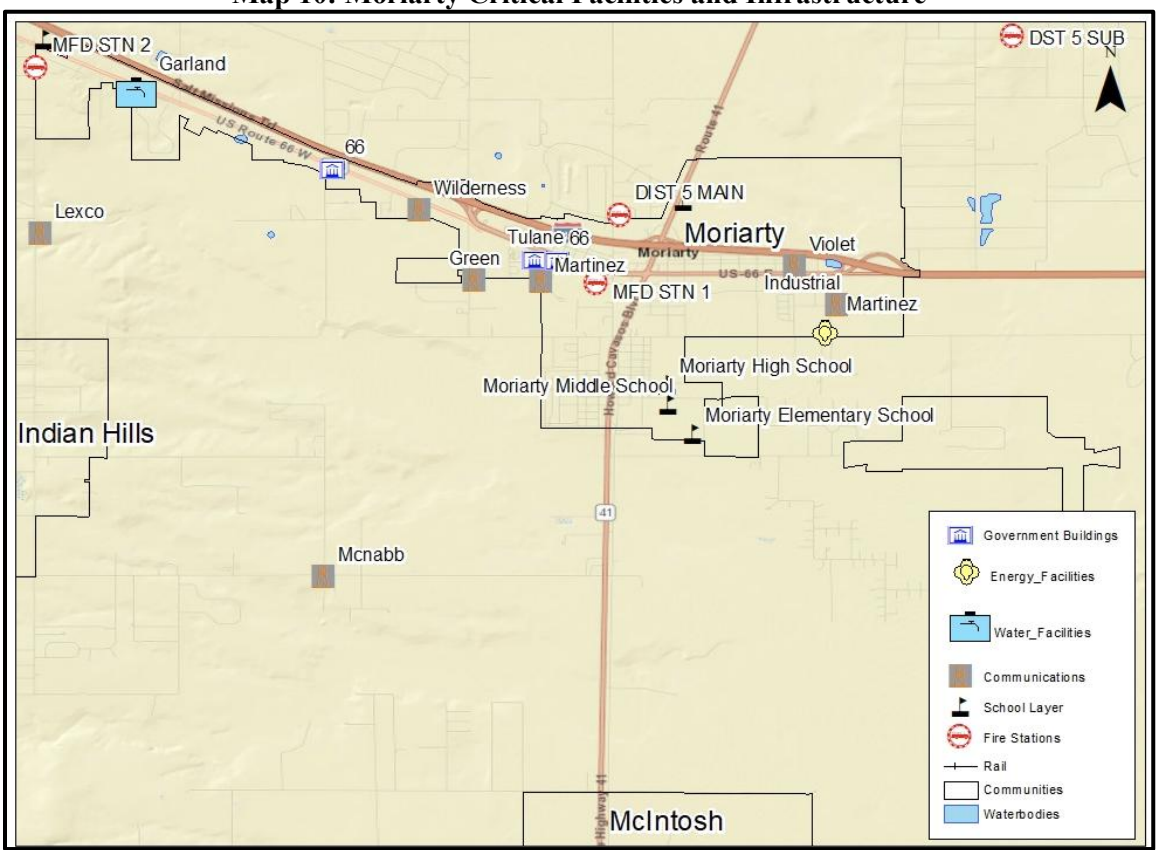
Source: Janey Camp, GIS data

Map 9: Estancia Critical Facilities and Infrastructure



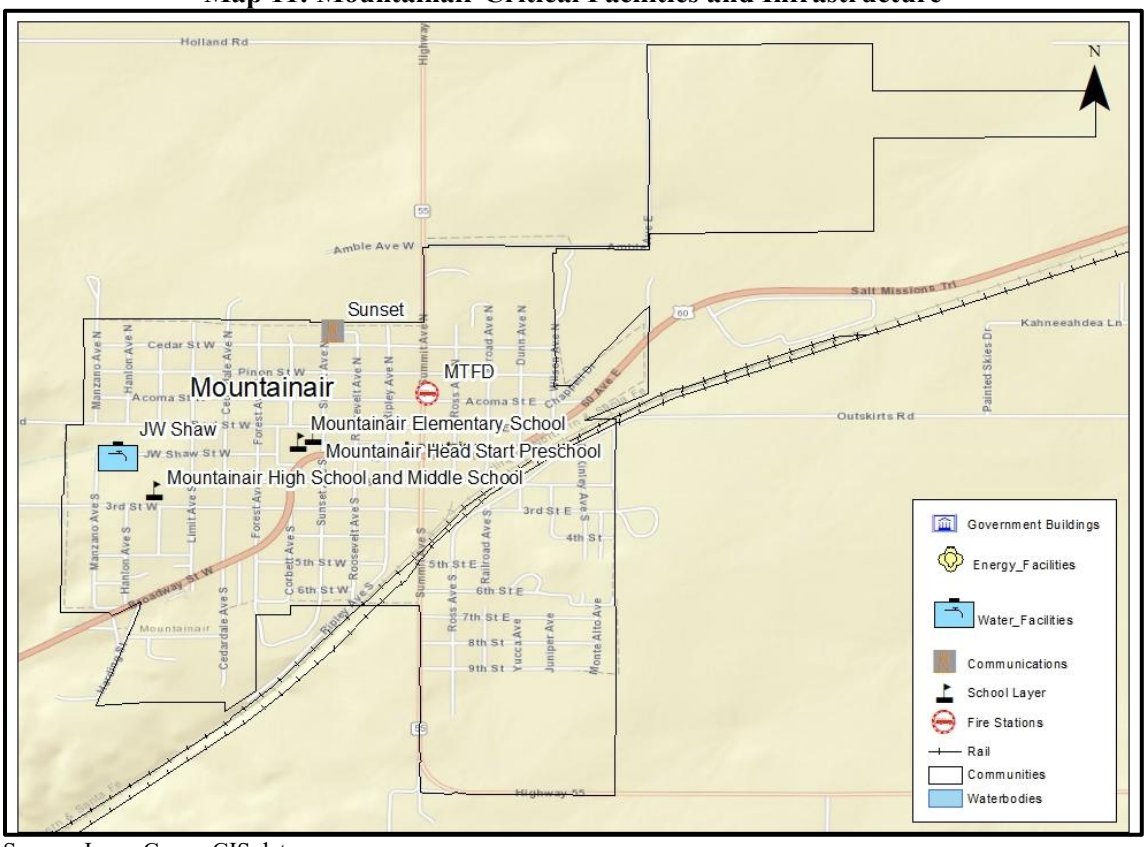
Source: Janey Camp, GIS data

Map 10: Moriarty Critical Facilities and Infrastructure



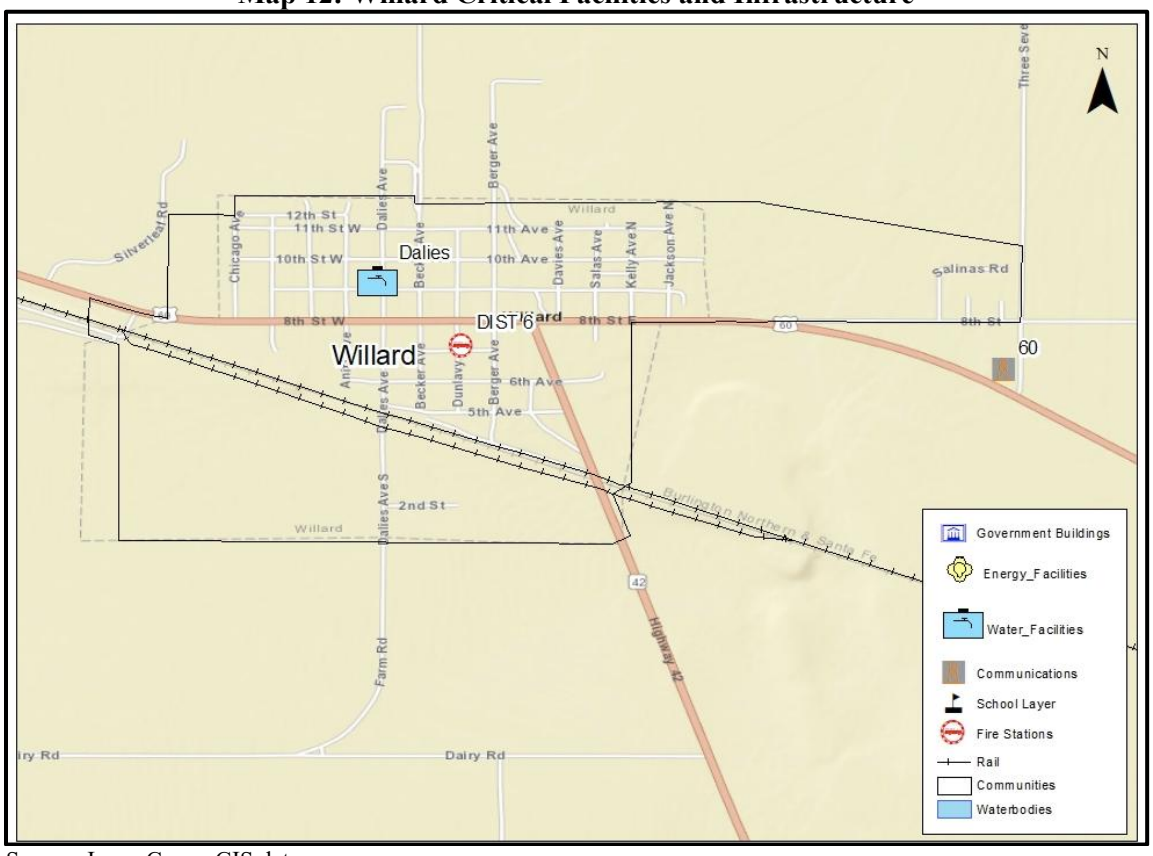
Source: Janey Camp, GIS data

Map 11: Mountainair Critical Facilities and Infrastructure



Source: Janey Camp, GIS data

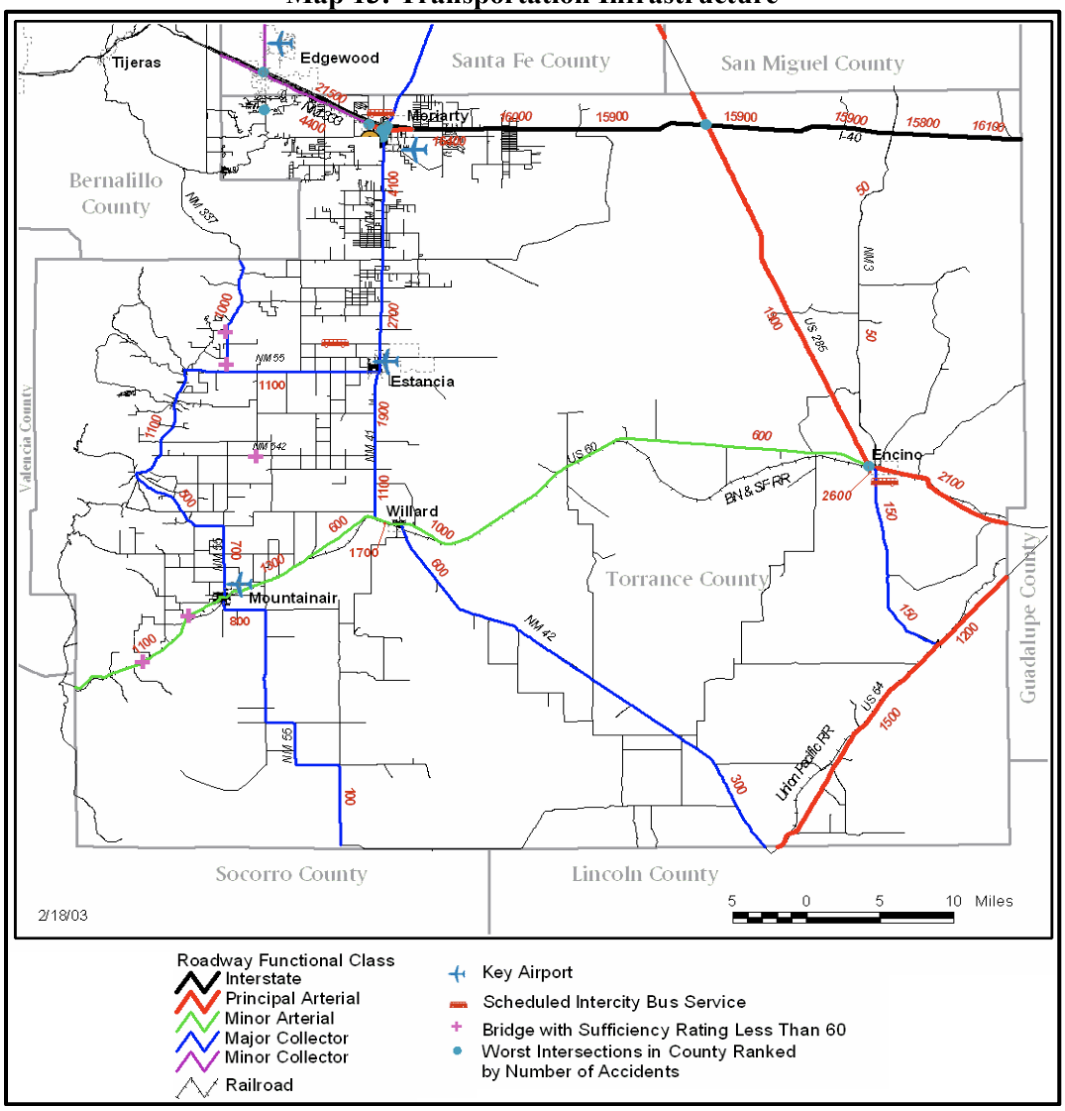
Map 12: Willard Critical Facilities and Infrastructure



Source: Janey Camp, GIS data

Transportation infrastructure is essential in supporting emergency response, evacuation, and the delivery of critical supplies during disasters. Well-maintained roads, bridges, and transit systems enable first responders to access affected areas quickly and help residents evacuate safely. Identifying and reinforcing vulnerable transportation routes reduces the risk of isolation, delays, and infrastructure failure during events like floods and severe storms. The following map details major transportation infrastructure within Torrance County:

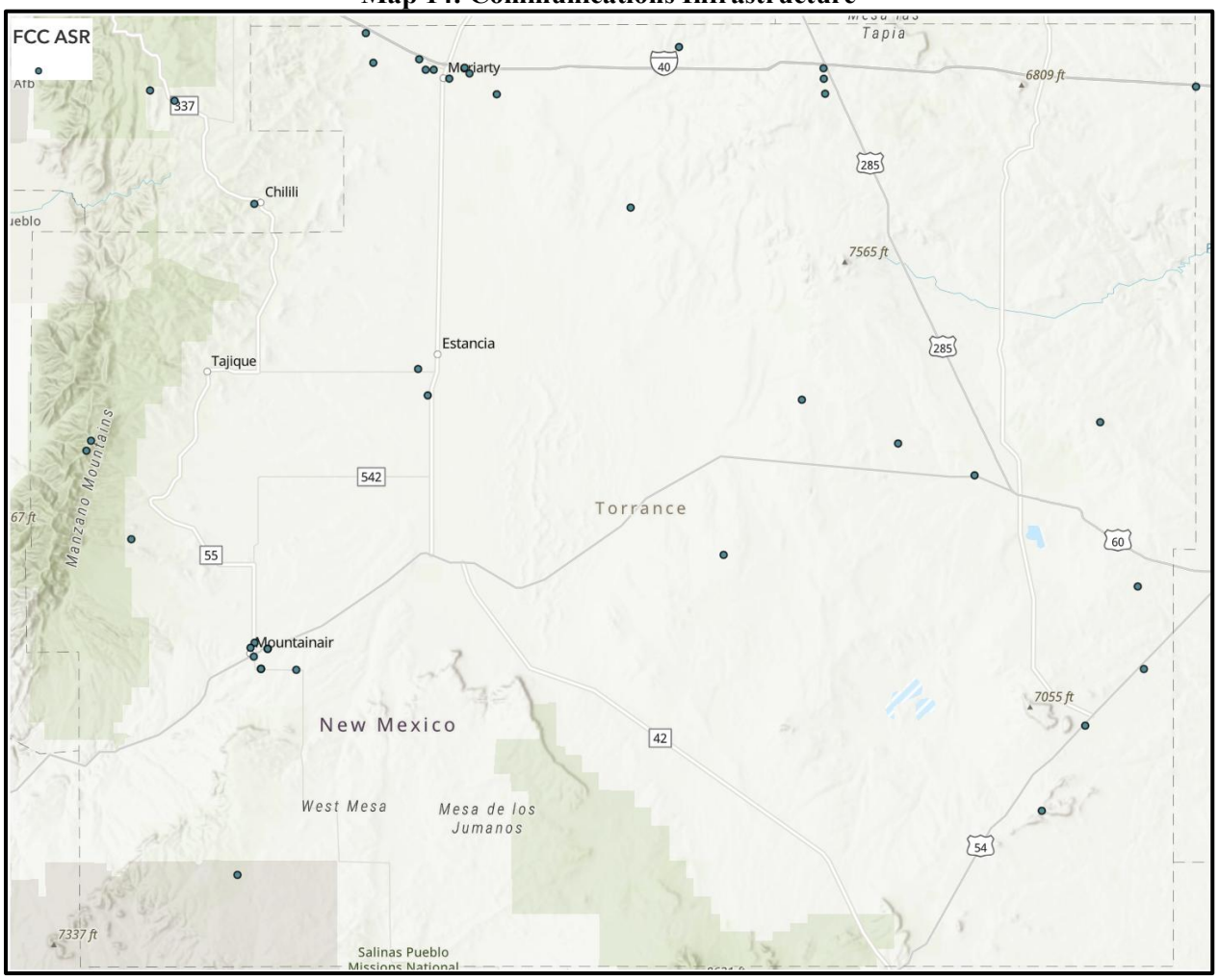
Map 13: Transportation Infrastructure



Source: Torrance County

Communication tower infrastructure ensures reliable, real-time communication before, during, and after emergencies. These towers support cellular networks, emergency alerts, public warning systems, and coordination among first responders. In disaster situations such as severe storms, floods, or power outages, communication towers enable critical information to reach residents, emergency services, and government agencies quickly and efficiently. Incorporating the protection, backup power, and strategic placement of communication towers into hazard mitigation plans helps reduce response times, improve situational awareness, and enhance overall community resilience during crises. The following map details the location of communications tower, including commercial cellular towers, within Torrance County:

Map 14: Communications Infrastructure

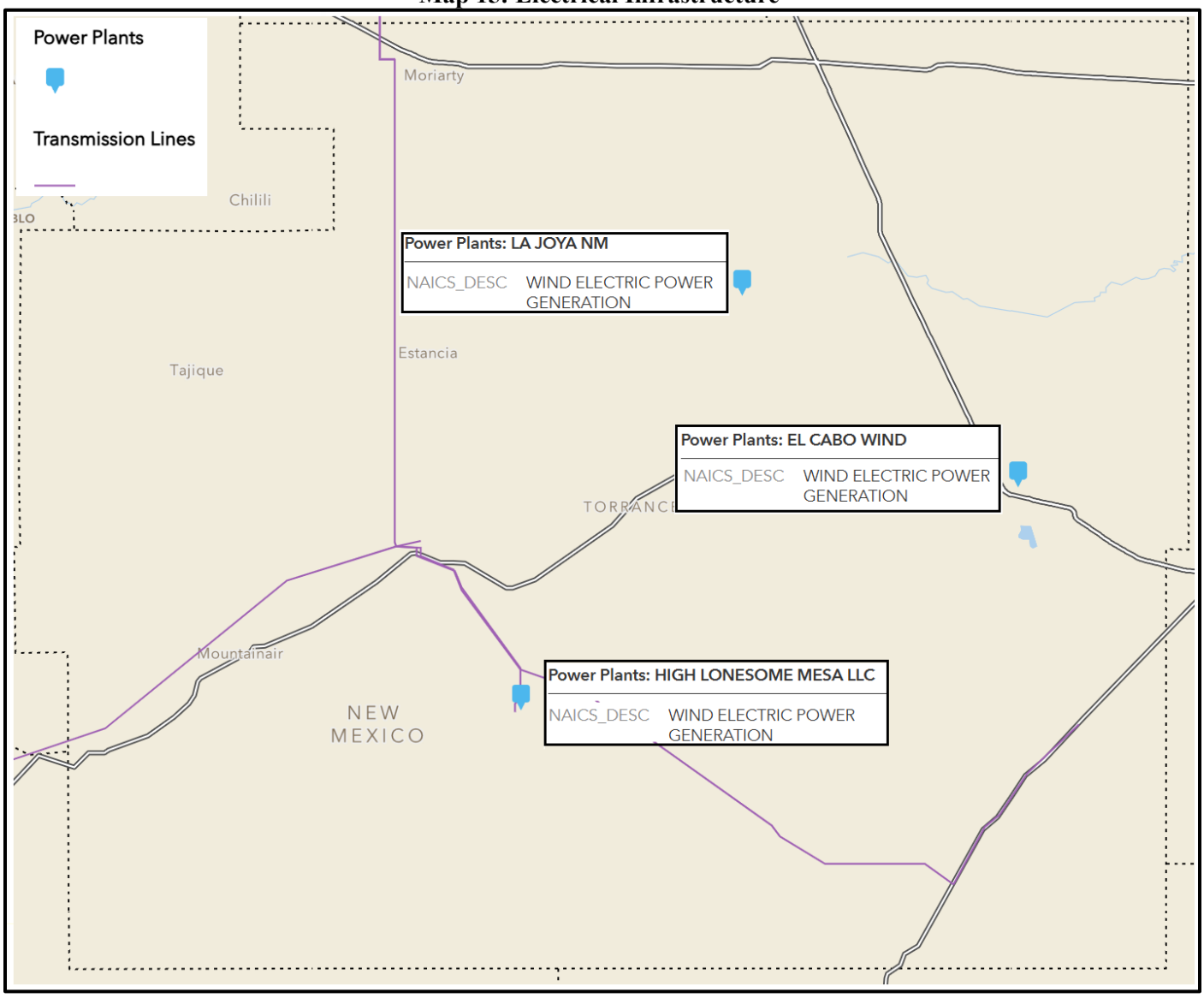


Source: Federal Communications Commission

Electrical utilities are essential to hazard mitigation because they provide the power needed to operate critical infrastructure, emergency response systems, healthcare facilities, and communication networks during disasters. A reliable electrical grid reduces the risk of service interruptions that can endanger lives, delay emergency operations, or compromise public safety. By ensuring continuity of power, electrical utilities play a foundational role in maintaining stability and protecting lives before, during, and after emergencies.

In Torrance County, the primary provider of electricity is the Central New Mexico Electric Cooperative .

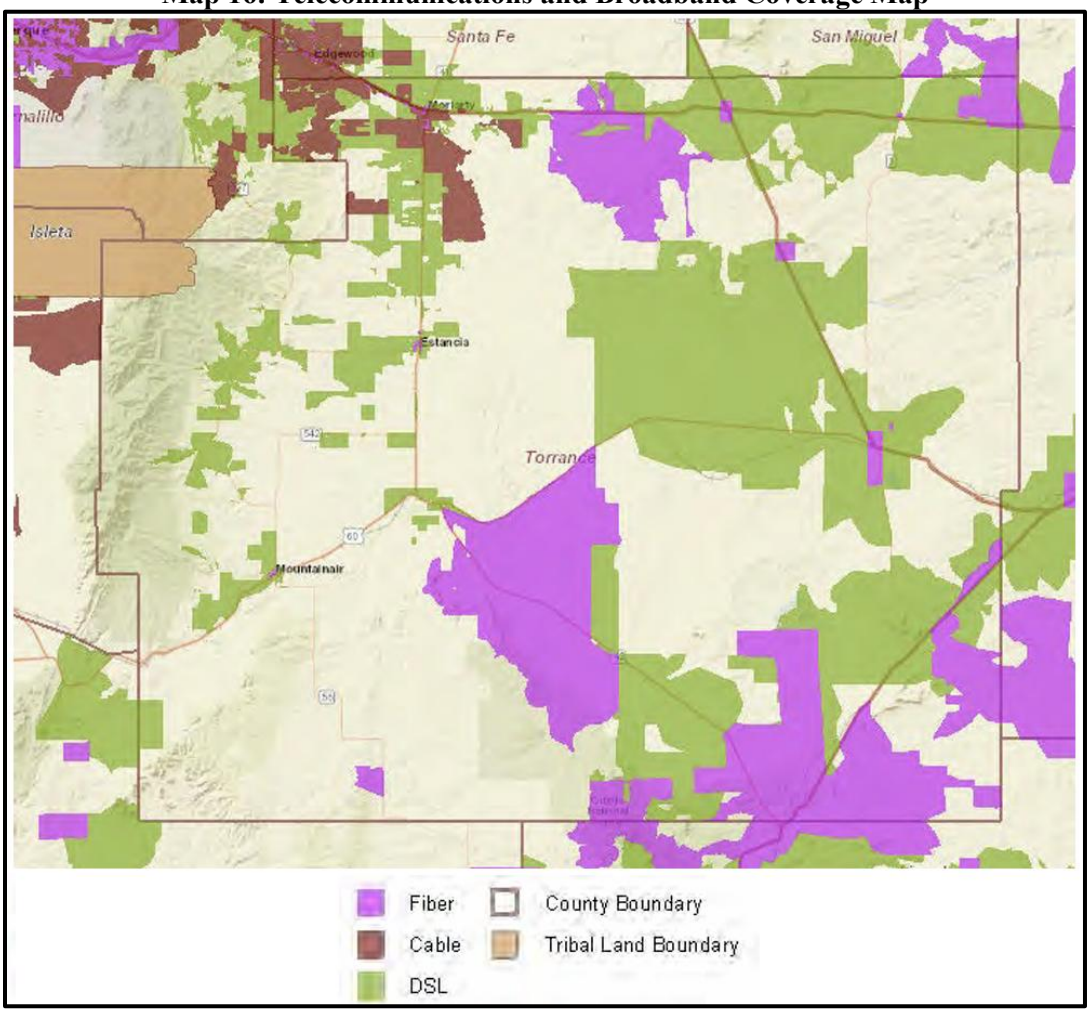
Map 15: Electrical Infrastructure



Source: FEMA RAPT

Communications infrastructure is critically important to hazard mitigation because it enables the timely exchange of information before, during, and after disasters. Reliable communication systems support emergency alerts, coordination between response agencies, and public access to life-saving instructions. Disruptions to phone, radio, internet, or emergency networks can delay evacuations, hinder resource deployment, and isolate vulnerable populations. Strengthening communications infrastructure through redundancy, backup systems, and hardened technology enhances a community's ability to respond effectively to hazards such as severe weather, wildfires, earthquakes, and cyberattacks. In essence, robust communications are a backbone of emergency preparedness and community resilience.

Map 16: Telecommunications and Broadband Coverage Map



Source: New Mexico Department of Technology

3.10 Historic Places

Historic buildings are generally more vulnerable to natural hazards due to their age, materials, and construction methods. These structures were often built before modern building codes and may lack the structural reinforcements required to withstand hazards. Additionally, the materials used in historic buildings, like old brick, wood, or mortar, may have deteriorated over time, further reducing their resilience. However, the MPC has determined that, in general, these locations are no more or less vulnerable to the identified hazards within this plan.

Preserving historic buildings poses unique challenges in hazard mitigation because retrofitting or upgrading them to meet modern safety standards must balance maintaining their historical integrity. This vulnerability underscores the importance of integrating historic preservation with hazard mitigation planning, ensuring that these culturally significant structures are protected while minimizing risks to public safety. For cultural and historic locations within Torrance County the following resources were consulted:

- **National Register of Historic Places**: The official list of the United States' historic properties deemed worthy of preservation for their significance in American history, architecture, archaeology, engineering, or culture. Administered by the National Park Service under the Department of the Interior, it includes districts, sites, buildings, structures, and objects. Established by the National Historic Preservation Act of 1966, the register seeks to recognize and protect cultural heritage. While listing does not impose restrictions on private property, it provides eligibility for preservation incentives.
- **New Mexico State Register of Cultural Properties:** An official listing of sites, buildings, structures, objects, and districts deemed significant to the history, culture, architecture, or archaeology of New Mexico. Administered by the New Mexico Historic Preservation Division, the register aims to recognize and protect the

state's rich heritage. Properties listed in the register are evaluated based on their historical importance, architectural merit, and cultural contributions. Inclusion in the register not only acknowledges a property's significance but also provides opportunities for preservation grants, technical assistance, and tax incentives. It also ensures that state-funded projects consider the impact on these cultural assets, promoting stewardship and sustainable preservation efforts.

The following table details properties and locations in Torrance County and participating jurisdictions listed on these registers.

Table 11: Torrance County Historic Places

Location	Jurisdiction	National Register	New Mexico Register
Abo Mission Ruin NR & NHL	Torrance County	x	
Pueblo Colorado (South)	Progresso		x
Tabira Ruin (Pueblo Blanco South)	Progresso		x
Quarai Ruin NHL	Punta de Agua	x	x
Atchison, Topeka & Santa Fe Rwy Depot	Mountainair		x
Berkshire Hotel	Estancia		x
Rancho Bonito	Mountainair	x	x
Shaffer Hotel	Mountainair	x	x
Eclipse Windmill, Moriarty	Moriarty	x	x
Mountainair Municipal Auditorium	Mountainair	x	x
Evans, Greene, Garage	Moriarty	x	x
Encino School	Encino		x
Willard Mercantile Company	Mountainair	x	x
Duran Historic District	Duran	x	x

Source: National Register of Historic Places, New Mexico State Register of Cultural Properties

3.11 Economic Conditions

As of current U.S. Census Bureau data, approximately 15,542 civilian residents were in the workforce in 2022, as shown in the following table:

Table 12: Jobs Held by Torrance County Residents, by Type of Industry, 2022

Industry Type	Number Employed
Agriculture, forestry, fishing and hunting, and mining	309
Construction	511
Manufacturing	284
Wholesale trade	86
Retail trade	620
Transportation and warehousing, and utilities	348
Information	27
Finance and insurance, and real estate and rental and leasing	208
Professional, scientific, management, and administrative and waste management services	587
Educational services, and health care and social assistance	1,098
Arts, entertainment, and recreation, and accommodation and food services	631
Other services, except public administration	138
Public administration	621

Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

U.S. Census data provides key insights into the working-age population actively participating in the economy. This data helps measure the labor force participation rate, a critical economic indicator reflecting the proportion of the eligible population contributing to the workforce. It excludes certain groups, such as retirees, students, or those not seeking employment, giving a clearer picture of economic engagement and workforce trends.

Table 13: Population in Labor Force

Jurisdiction	Population over 16	In Labor Force	Employed	Unemployed
Torrance County	12,616	6,189	5,468	721
Encino	31	17	17	0
Estancia	1203	585	336	249
Moriarty	1583	812	679	133
Mountainair	985	445	396	49
Willard	226	120	101	19

Source: U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

Community activities of value are initiatives that promote engagement, collaboration, and well-being within a community. These activities may include volunteer programs, cultural festivals, educational workshops, and recreational events that foster connections among residents and enhance the quality of life. They often address local needs, celebrate diversity, and build a sense of shared identity and purpose, contributing to a more resilient and vibrant community. The following is a brief list of notable activities of value throughout the county:

- **Torrance County Fair:** Held annually in early August, the Torrance County Fair is a family-oriented event where community members showcase agricultural products and livestock. The fair features various entertainment options, including livestock shows, indoor exhibits, and commercial booths. In 2024, the fair is scheduled from August 4th to August 9th.
- **Old Timer's Day:** Celebrated in July, Old Timer's Day is a cherished tradition in Estancia, featuring a parade at 10 a.m. and a car show at 11 a.m. The event brings together residents and visitors to honor the town's history and community spirit.
- **Estancia Alumni Block Party:** Celebrated in July, the Estancia Alumni Main Street Block Party offers a lively gathering for former students and community members. The event takes place on Main Street, fostering connections and reminiscing about shared experiences.
- **Pinto Bean Fiesta:** Held in Moriarty in October.
- **Punkin Chunkin:** Held in Estancia in October.
- **Mile Long Yard Sale:** Held in Estancia in June.

3.12 Physical Setting and Land Cover

Torrance County, located in central New Mexico, encompasses a diverse physical landscape. Situated within the Basin and Range Province, Torrance County's terrain primarily consists of rolling plains interspersed with ridges, hills, and mesas. The western portion of the county includes the Manzano Mountains, with Manzano Peak reaching an elevation of 10,098 feet. This mountainous area offers significant topographic relief compared to the predominantly gentle slopes of the eastern plains. The county also encompasses the expansive Estancia Basin, a long and wide valley that plays a crucial role in the region's hydrology.

While Torrance County lacks significant perennial surface water sources, it features several notable hydrological characteristics including the Estancia Basin. Historically, this basin was occupied by Lake Estancia during the last Ice Age, covering approximately 300 square miles. Today, the remnants of this ancient lake are evident in the form of playas and seasonal salt lakes, such as Laguna del Perro, which is about 12 miles long and a mile wide but typically only a few inches deep. These features are central to the county's unique landscape and have been sources of salt for indigenous peoples and early settlers.

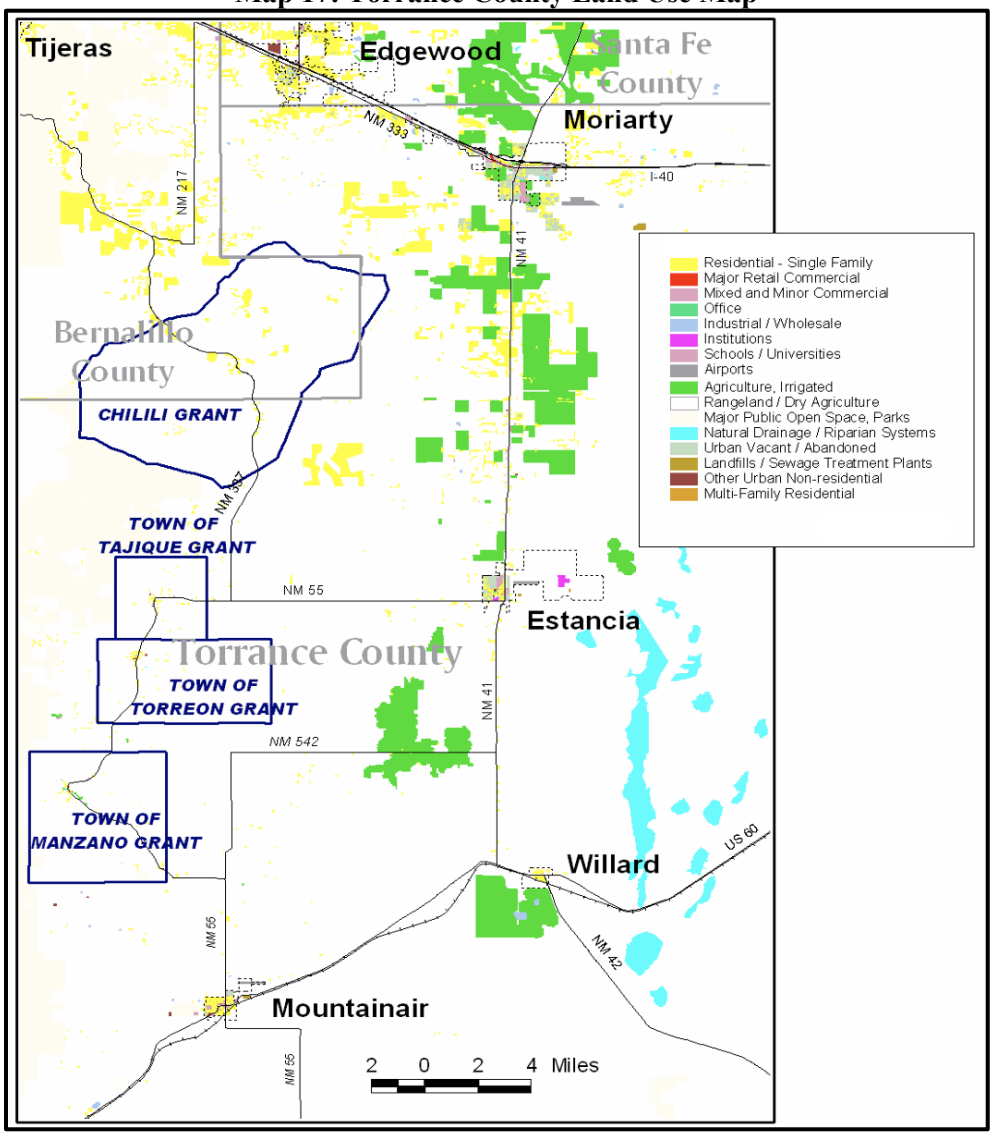
Due to the scarcity of surface water, residents and agricultural operations rely heavily on groundwater extracted from the Valley Fill Aquifer within the Estancia Basin. This aquifer is the primary source of drinking and irrigation water, making its conservation vital for the county's sustainability.

Land use in a region has a profound and lasting impact on future development. The way land is allocated and utilized can shape the economic, social, and environmental aspects of a region for decades, and can impact:

- **Economic Development:** Land use decisions influence the location and type of economic activities in a region. Zoning regulations that encourage the development of industrial zones can attract manufacturing businesses, while zoning for commercial and residential areas can promote retail and housing development. These decisions can have long-term implications for job creation, revenue generation, and overall economic health.
- **Transportation and Infrastructure:** Land use planning is closely tied to transportation infrastructure. The location of roads and other transportation facilities is determined in part by land use decisions. Well-planned land use can lead to efficient transportation networks, reducing congestion, and improving mobility. Poorly planned land use, on the other hand, can result in traffic congestion and increased infrastructure costs.
- **Housing and Urbanization:** Land use policies influence the availability and affordability of housing in a region. Zoning regulations, for example, can determine the density of residential areas and the types of housing permitted. Inadequate or restrictive land use policies can lead to housing shortages and higher costs, while well-planned policies can support diverse housing options and affordability.
- **Long-Term Costs:** Land use decisions can affect the long-term costs of development. Efficient land use planning can reduce the need for costly infrastructure extensions and maintenance, while inefficient or sprawling development can strain municipal budgets.

As indicated by the following map, land use consists largely of rangeland and dry agriculture areas:

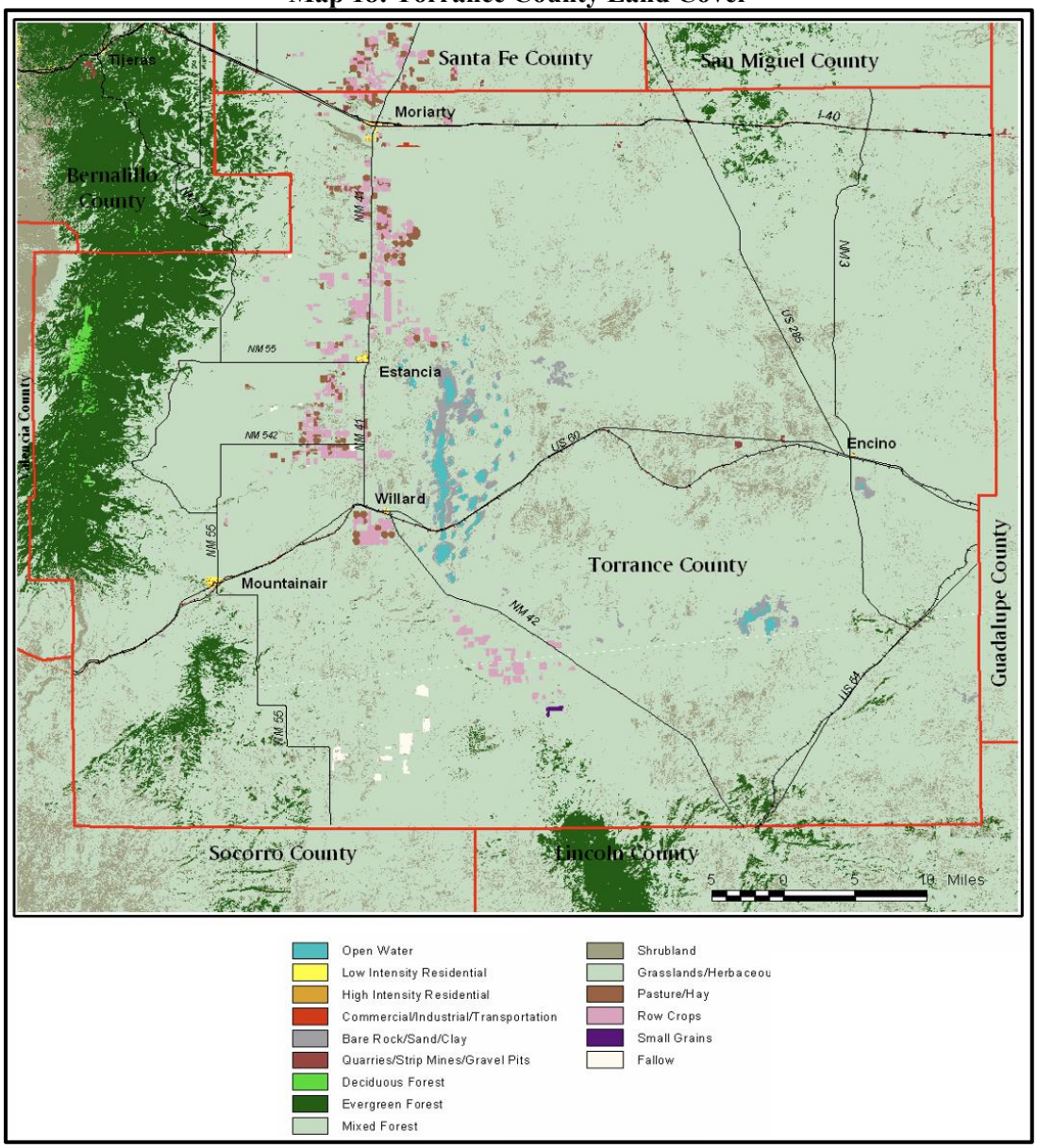
Map 17: Torrance County Land Use Map



Source: Torrance County Land Use Plan

The land cover in Torrance County reflects its semi-arid climate and varied topography. The rolling plains are primarily covered by grasslands, which support cattle ranching, a significant component of the local economy. In the higher elevations of the Manzano Mountains, vegetation transitions to forests dominated by ponderosa pine, aspen, and spruce-fir species. These forested areas are part of the Cibola National Forest and include the Manzano Mountain Wilderness, which provides habitat for diverse wildlife and opportunities for recreation. As indicated by the following map from the Torrance County, land cover consists largely of grasslands:

Map 18: Torrance County Land Cover



Source: Torrance County Land Use Plan

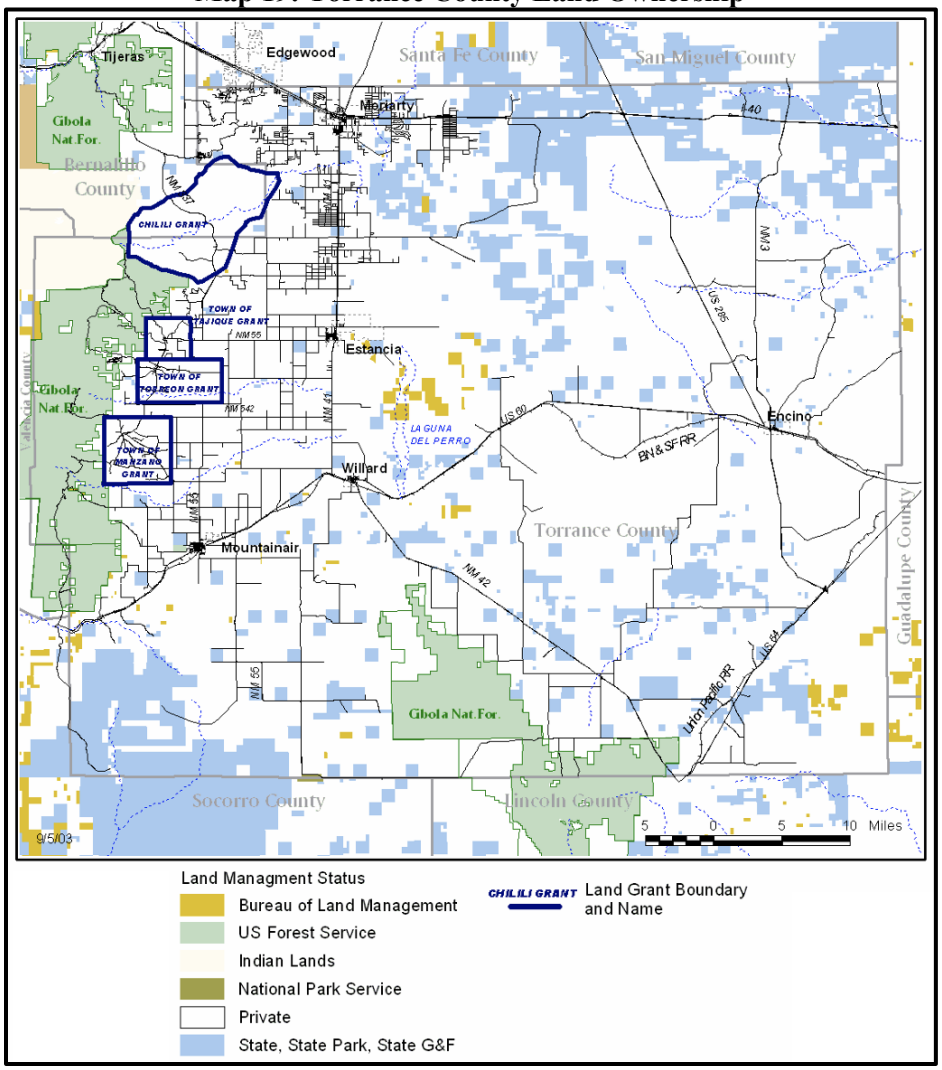
Rural areas tend to retain their rural nature over time, but there are several factors that can influence the evolution of these areas, including:

- **Economic Conditions:** The economic viability of agriculture can vary significantly over time due to factors like crop prices, weather patterns, and changes in agricultural technology. Economic challenges may lead some farmers to sell their land for non-agricultural uses, potentially affecting the rural landscape.
- **Urbanization and Development:** In some cases, rural areas may experience suburbanization or the expansion of nearby urban centers. This can result in residential and commercial development encroaching on agricultural land. However, the extent of this development depends on local zoning and land use regulations.

- **Infrastructure Development:** The construction of new transportation infrastructure, such as highways or railroads, can influence land use patterns. Improved infrastructure may make it easier to transport agricultural products to markets or to access rural areas for development.
- **Government Policies:** Government policies, including agricultural subsidies, land use regulations, and conservation programs, can impact the way rural and agricultural land is used. For example, conservation programs may encourage farmers to preserve land for wildlife habitat rather than development.
- **Local Planning and Zoning:** Local governments play a key role in land use planning and zoning regulations. These policies can determine whether agricultural land can be converted to non-agricultural uses, such as residential or commercial development. Some areas may have strict zoning that preserves agricultural character, while others may allow more flexibility.
- **Population Trends:** Demographic trends, including population growth or decline, can influence the demand for land in rural areas. If there is an influx of new residents seeking a rural lifestyle, it can drive demand for residential development in formerly agricultural areas.

The majority of lands within Torrance County are privately owned or state owned. The following map details landownership throughout the county:

Map 19: Torrance County Land Ownership



Source: Torrance County

Based on the available data, it is likely that Torrance County and all participating jurisdictions will retain their mostly rural character during the life of this plan.

3.13 Infrastructure Development

Infrastructure repair can have a significant impact on regional development, both positive and negative. The specific effects depend on the scale of the repair projects, the quality of the infrastructure, and the overall economic and social context of the region, and may include:

- **Improved Connectivity:** Repairing and upgrading infrastructure, such as roads, bridges, and ports, can enhance connectivity within and between regions. This improved connectivity can reduce transportation costs, facilitate the movement of goods and people, and attract businesses and investments to the region.
- **Economic Growth:** Functional infrastructure supports economic activities. When infrastructure is repaired, it can create jobs directly in the construction and maintenance sectors. Additionally, it can indirectly stimulate economic growth by providing a reliable foundation for businesses to operate and expand, leading to increased production and trade.
- **Enhanced Productivity:** Well-maintained infrastructure can increase productivity by reducing downtime and transportation delays. This, in turn, can make regional industries more competitive and efficient.
- **Attracting Investment:** Regions with modern and well-maintained infrastructure are often more attractive to investors. Businesses are more likely to invest in regions with reliable transportation, utilities, and communication networks, as it reduces operational risks and costs.
- **Quality of Life:** Infrastructure repair can enhance the quality of life for residents by providing access to essential services such as clean water, sanitation, healthcare, and education. This can contribute to improved human development indicators and overall well-being.
- **Resilience and Disaster Mitigation:** Infrastructure repair can include upgrades to make infrastructure more resilient to natural disasters. This can help protect communities and assets and reduce the long-term costs of recovery and reconstruction.

However, it is important to note that there can be negative impacts as well, including:

- **Disruption During Construction:** Repair projects can disrupt communities and businesses during the construction phase, leading to short-term challenges.
- **Costs and Budget Constraints:** Large-scale infrastructure repair projects can be costly, and they may strain regional budgets or lead to increased taxes or debt.
- **Environmental Concerns:** If not done carefully, infrastructure repair projects can have adverse environmental impacts, such as habitat disruption or water pollution.

Discussions with MPC members indicate that as of this plan there are no major construction, infrastructure, or housing projects taking place in the county.

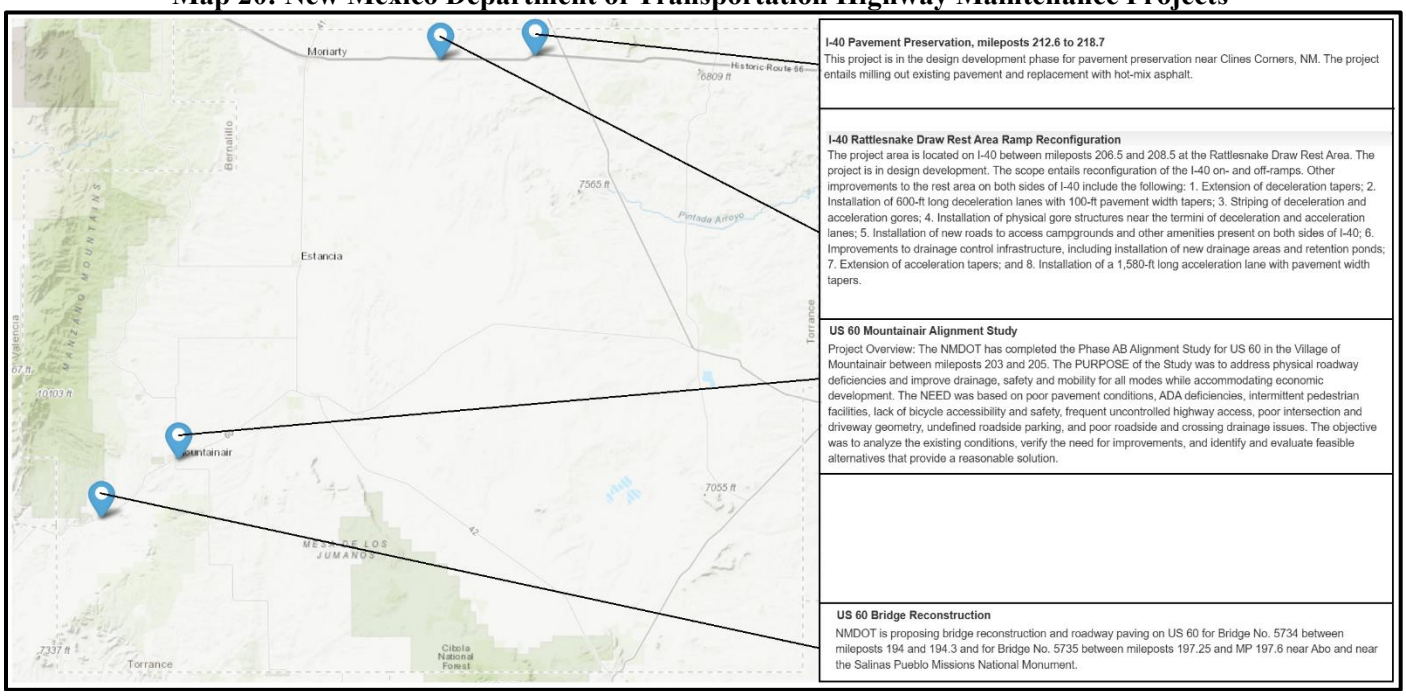
Road maintenance projects play a critical role in hazard mitigation by improving the resilience and functionality of transportation infrastructure. Consistent repair and maintenance can help mitigate hazards by:

- **Reduced Flooding Risk:** Regular maintenance, such as cleaning and repairing drainage systems, helps prevent flooding on roadways. Properly maintained culverts, ditches, and stormwater systems ensure that water can flow away from roads, reducing the risk of water damage and road erosion.
- **Strengthening Infrastructure:** Road maintenance projects often include reinforcing bridges, overpasses, and retaining walls to withstand seismic activity, heavy rains, and other hazards.
- **Slope Stabilization:** Road maintenance projects often include measures to stabilize slopes and prevent landslides that can block roads and isolate communities. This includes planting vegetation, installing retaining walls, and improving drainage.
- **Erosion Control:** Implementing erosion control measures such as riprap, geotextiles, and retaining structures helps protect roadways from erosion caused by heavy rains and flooding.

- **Resilient Design:** Maintenance projects can incorporate resilient design features that account for increased precipitation, higher temperatures, and more frequent extreme weather events. This includes elevating roadways, improving drainage systems, and using materials that can withstand changing conditions.
- **Monitoring and Adaptation:** Ongoing maintenance allows for continuous monitoring and adaptation of road infrastructure to changing environmental conditions, ensuring long-term resilience.

The following map indicates current and future New Mexico Department of Transportation maintenance projects:

Map 20: New Mexico Department of Transportation Highway Maintenance Projects



Source: New Mexico Department of Transportation

Based on the available data, it is likely that Torrance County and all participating jurisdictions will retain a mostly rural character during the life of this plan. Additionally, no near future development charges are anticipated to increase jurisdictional vulnerability to identified hazards. Rather, the noted demographic decrease is expected to potentially reduce across the board vulnerability to identified hazards.

3.14 Agricultural Data

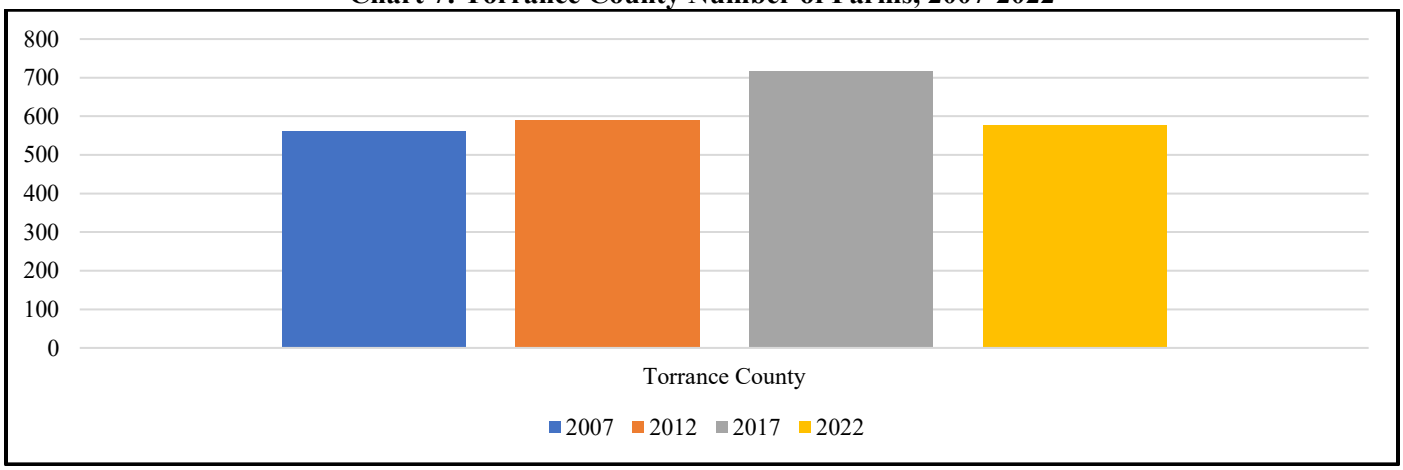
Agriculture forms a large part of both the economic and social fabric of Torrance County. USDA National Agricultural Statistics Service data from 2007, 2012, 2017, and 2022 (the latest available data) was used to develop an understanding of the agricultural footprint within the county, as detailed in the following table and charts:

Table 14: Torrance County Regional Agricultural Data

Year	2007	2012	2017	2022
Number of Farms	561	589	716	577
Total Farm Acreage	1,796,048	1,864,589	1,561,057	1,692,413
Market Value of Products Sold	$40,438,000	$58,520,000	$45,893,000	$45,619,000
Value of Machinery and Equipment*	$67,957	$79,518	$55,855	$74,343
Value of Lands and Buildings*	$1,059,220	$1,151,192	$1,038,912	$2,299,610

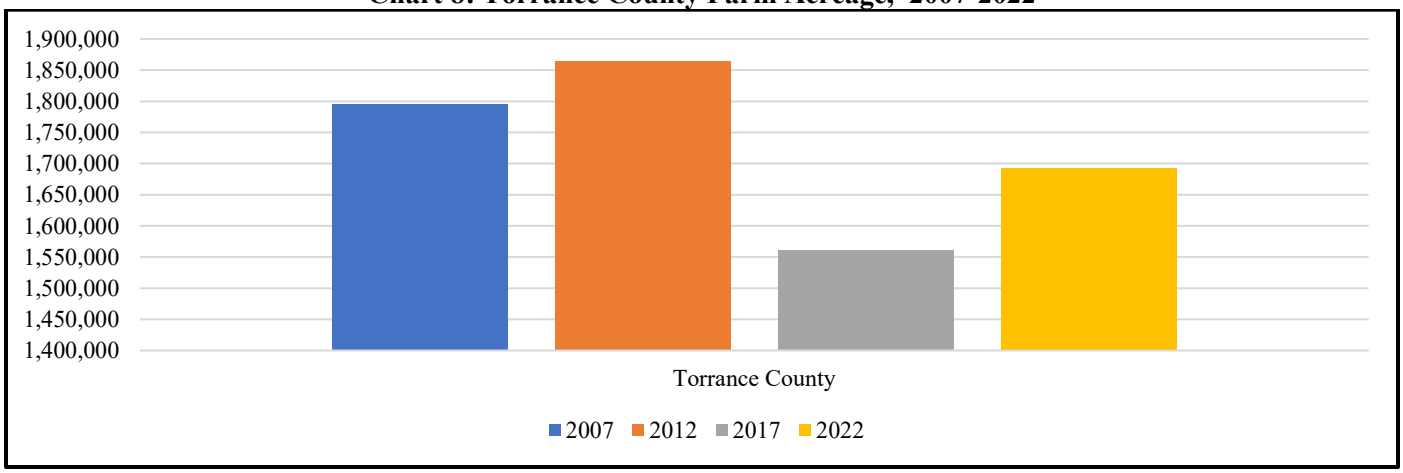
Source: USDA National Agricultural Statistics Service
*: Average per farm

Chart 7: Torrance County Number of Farms, 2007-2022



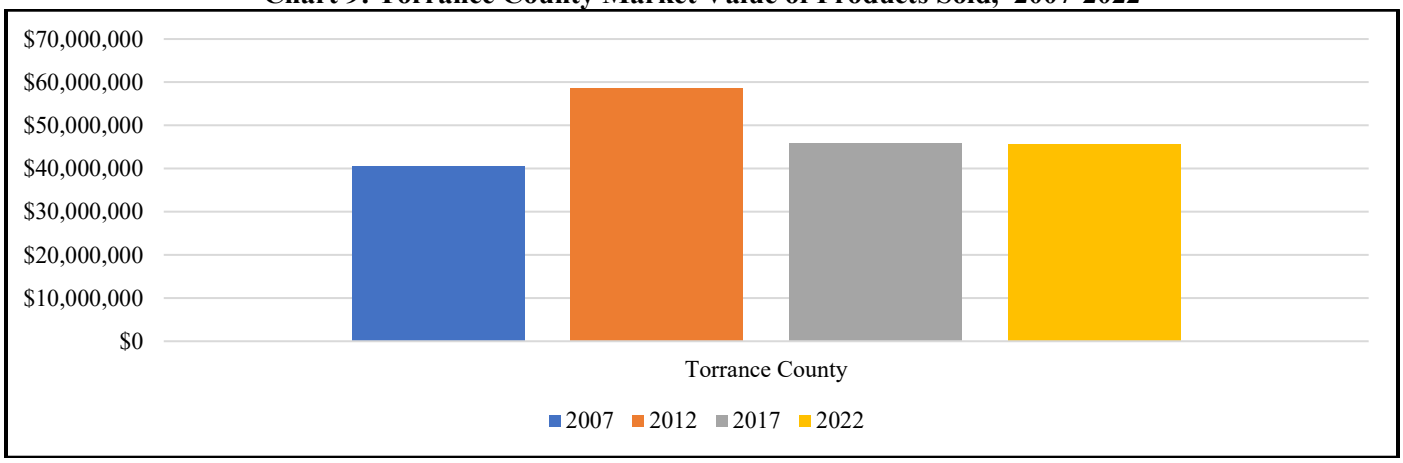
Source: USDA National Agricultural Statistics Service

Chart 8: Torrance County Farm Acreage, 2007-2022



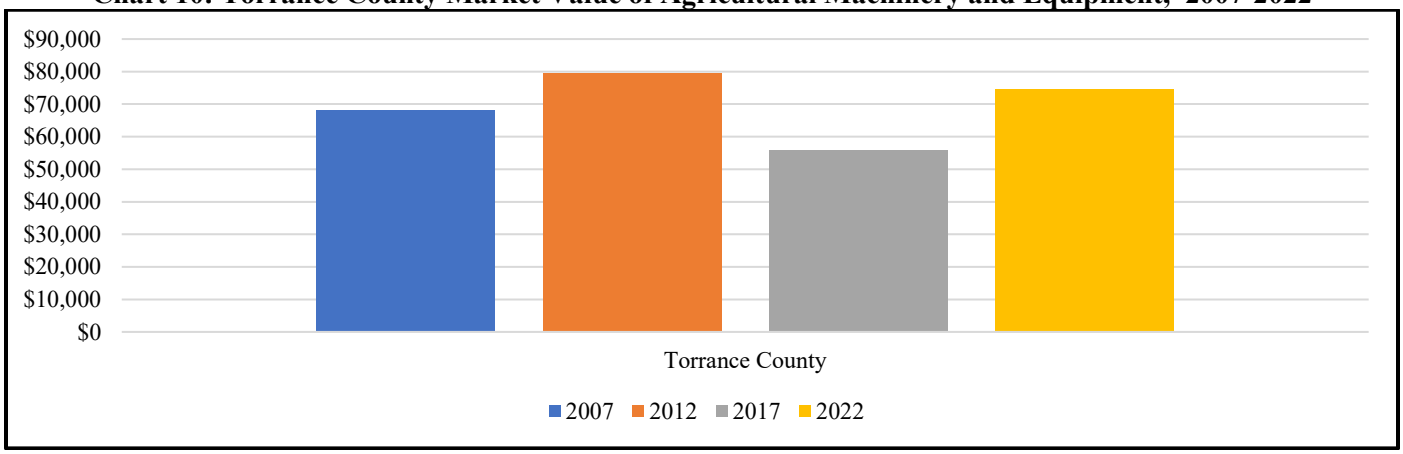
Source: USDA National Agricultural Statistics Service

Chart 9: Torrance County Market Value of Products Sold, 2007-2022



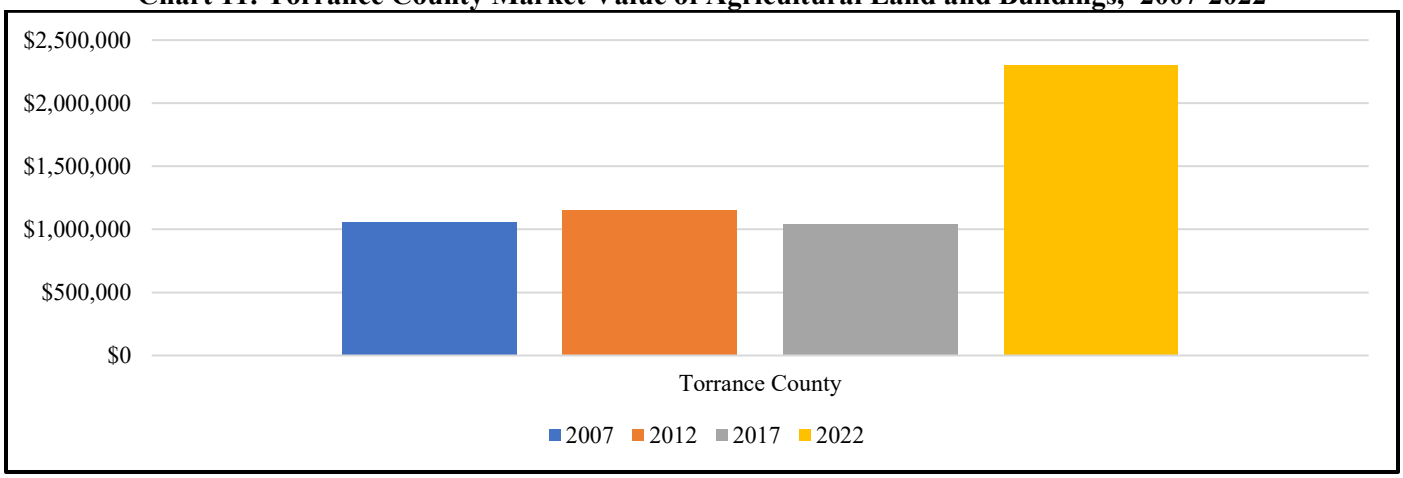
Source: USDA National Agricultural Statistics Service

Chart 10: Torrance County Market Value of Agricultural Machinery and Equipment, 2007-2022



Source: USDA National Agricultural Statistics Service

Chart 11: Torrance County Market Value of Agricultural Land and Buildings, 2007-2022



Source: USDA National Agricultural Statistics Service

3.15 Regional Climate

Torrance County, located in central New Mexico, experiences a semi-arid climate characterized by distinct seasonal variations in temperature and precipitation. Understanding the county's climatic patterns is essential for agriculture, water resource management, and daily life.

The county exhibits a wide range of temperatures throughout the year. Summers are typically warm to hot, with July high temperatures averaging around 87 degrees Fahrenheit. During this period, residents can expect approximately 23 days annually with temperatures exceeding 90 degrees Fahrenheit. In contrast, winters are cold, with January low temperatures averaging 16.8 degrees Fahrenheit. The region experiences about 167 days per year with temperatures dropping below freezing, and approximately 3.5 days annually when temperatures fall below zero degrees Fahrenheit.

Annual precipitation in Torrance County averages 14.4 inches, which is relatively low compared to national averages, reflecting its semi-arid conditions. August stands out as the wettest month, receiving about 2.6 inches of rainfall, while February is the driest, with only 0.5 inches. The county experiences precipitation on approximately 60.5 days per year, encompassing rain, snow, sleet, or hail.

Snowfall is a notable feature during the winter months, with an annual average of 22.9 inches. December typically records the highest snowfall, averaging 6.5 inches. Snow contributes to the region's water resources, albeit modestly, and influences local agricultural practices and transportation.

High winds are prevalent due to the county's location in the Central Great Plains region of New Mexico, which can impact daily life and agricultural operations.

Section 4 –Capability Assessment

4.1 Introduction

This capability overview for Torrance County and participating jurisdictions documents programs, policies, and funding mechanisms for participating jurisdictions. All listed capabilities documented in the previous LHMP were reviewed for relevance and updated to reflect the current environment, as necessary. Additionally, any programs, policies, or funding mechanisms that are no longer applicable, are outdated, or are no longer in existence have been removed. As part of this process, updated jurisdictional capability profiles were sent for review and, if necessary, further revision.

This section of the plan discusses the current capacity of regional communities to mitigate the effects of identified hazards. A capability assessment is conducted to determine the ability of a jurisdiction to execute a comprehensive mitigation strategy, and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs or projects.

A capability assessment helps to determine which mitigation actions are practical based on a jurisdiction's fiscal, staffing and political resources, and consists of:

- An inventory of relevant plans, ordinances, or programs already in place
- An analysis of the capacity to carry them out.

A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit current or proposed mitigation activities, or potentially aggravate a jurisdiction's vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that should continue to receive support.

4.2 Administrative and Technical Capabilities

The administrative and technical functions of Torrance County and participating jurisdictions are critical in the effective implementation of hazard mitigation strategies. These functions ensure that the jurisdiction is prepared to reduce risks associated with natural and human-made hazards and can efficiently identify, integrate, and manage mitigation projects.

Torrance County has a dedicated staff across multiple departments for hazard mitigation roles including planning and mapping. Additionally, the county has numerous communication channels available, including websites and social media platforms, and a dedicated Public Information Officer and general staff to disseminate hazard mitigation information to all stakeholders and the public. The staffing capabilities of participating jurisdictions vary, with many having small, but dedicated teams.

The following table details Torrance County and participating jurisdiction departments and positions and their roles in supporting hazard mitigation planning:

Table 15: Torrance County and Participating Jurisdictions Departments Supporting Mitigation Planning

Department or Position	Hazard Mitigation Roles
Governing Board or Chief Executive	• Provides adoption resolution for LHMP. • Approves ordinances and bylaws and facilitates capital improvements budget.
Building Department and/or Planning and Zoning	• Enforces building codes that enhance structural resilience to hazards. • Conducts inspections and issues permits ensuring compliance. • Establishes limits on construction in hazard areas.
Emergency Management Department*	• Develops, implements, and updates the LHMP. • Coordinates between various departments, agencies, and external stakeholders to ensure a cohesive approach to hazard mitigation. • Provides public education on matters concerning hazard mitigation. • Coordinates hazard grant application process.

Table 15: Torrance County and Participating Jurisdictions Departments Supporting Mitigation Planning

Department or Position	Hazard Mitigation Roles
	• Involving local businesses, non-profits, and residents in the planning process to foster a collaborative approach to mitigation. • Supports the planning and implementation of mitigation projects.
Finance Department	• Allocates funding for hazard mitigation projects. • Manages grants and other financial resources to support mitigation efforts.
Fire Department	• Wildfire mitigation through controlled burns and fuel management. • Outreach programs to educate the public on fire safety, such as how to prevent home fires, create defensible spaces around properties. • Community planning to create defensible spaces and ensure buildings are more fire-resistant
Geographic Information System (GIS)	• Provides critical data and mapping services for hazard identification and risk assessments. • Utilizes advanced modeling techniques to predict the impact of various hazards on the community. • Supports the planning and implementation of mitigation projects.
Health Department	• Addresses public health risks associated with identified hazards. • Plans for emergency medical response and disease control measures. • Monitors environmental hazards (e.g., water contamination, hazardous materials).
Parks Department	• Manage open space and wetlands for flood control. • Manage vegetation in parks to reduce fire hazards. • Provision of green spaces to help mitigate the urban heat island effect by cooling surrounding areas through shade and evapotranspiration
Planning Department	• Enforces zoning and land-use policies to minimize hazard risks. • Integrates hazard mitigation into comprehensive and capital improvement plans.
Public Works Department / Road Department	• Manages infrastructure resilience projects (e.g., road improvements, drainage systems).

Note: * Role may be taken by local fire or police department, and not dedicated emergency management department

The following table indicates if a participating jurisdiction has the above noted departments:

Table 16: Participating Jurisdiction Departments

Jurisdiction	Board or Exec	Building	Emergency Management	Financial	Fire	GIS	Health	Parks	Planning	Public Works
Torrance County	x	x	x	x	x	x			x	x
Encino	x			x	x					
Estancia	x	x		x	x				x	x
Moriarty	x	x		x	x				x	x
Mountainair	x	x		x	x				x	x
Willard	x			x						
Central Tri-County SWCD	x			x						
Claunch-Pinto SWCD	x			x						
East Torrance SWCD	x			x						

4.3 Regulation of Development

The regulation of development plays a crucial role in helping a community become more resilient in the face of various hazards. Effective regulation of development contributes to community resilience through:

- **Risk Reduction:** Regulations guide land use and construction practices, ensuring that they provide strong protection against hazards.
- **Public Safety:** Building codes and land-use regulations establish minimum safety standards for construction, including structural integrity, fire resistance, and the use of resilient materials.
- **Infrastructure Resilience:** Regulations may require infrastructure improvements, such as the construction of resilient roads, bridges, utility systems, and drainage systems. This strengthens a community's ability to withstand hazards, ensures the continued operation of critical services, and aids in recovery.
- **Floodplain Management:** Regulations in flood-prone areas can mandate elevation requirements for new construction, ensuring that structures are built above the base flood elevation. This minimizes flood damage, reduces the need for costly post-disaster repairs, and protects property values.
- **Land Use Planning:** Effective land-use planning helps communities avoid inappropriate development in areas at high risk of hazards.
- **Community Awareness:** Public education and outreach can be incorporated into regulations, requiring communities to inform residents about local hazards, evacuation routes, and preparedness. Informed residents are more likely to take protective measures and respond effectively to disasters.

The following sections provide further detail on building codes, zoning ordinances, and floodplain management.

Building Codes

In New Mexico, the authority for enacting and enforcing building codes lies with New Mexico Construction Industry Division, in conjunction with local planning and zoning departments. Building codes establish general minimum construction standards and are enforced through authorized local building inspection agencies and inspectors. Building codes provide for:

- **Life Safety:** Building codes include provisions for fire safety, emergency egress, and the use of fire-resistant materials.
- **Accessibility and Life Support:** Building codes incorporate accessibility standards, ensuring that buildings are designed to accommodate all individuals. This is crucial during and after disasters when people with mobility issues may require assistance. Accessible features also benefit emergency responders and support recovery efforts.
- **Retrofitting Existing Buildings:** Building codes may require the retrofitting of older structures to meet modern safety standards.
- **Public Awareness:** Building codes promote public awareness of hazards and the importance of resilient construction. This can lead to informed decision-making by property owners, builders, and developers, resulting in safer structures.

Key hazard resistant building code provisions found in current building codes include:

- **Structural Design Requirements:** Provides requirements for the structural design of buildings to ensure their resistance to various hazards, including earthquakes, high winds, and snow loads. These requirements are aimed at enhancing the overall structural integrity and safety of buildings.
- **Wind Design Requirements:** Provides specific provisions for wind design, considering the geographical location of the structure. Wind loads are calculated based on factors such as wind speed, exposure, and building height.
- **Seismic Design Requirements:** Incorporates seismic design provisions to address earthquake hazards. The code includes seismic design categories and requirements for the design and construction of buildings in seismic-prone regions.

- **Flood-Resistant Design Requirements:** Includes provisions related to flood-resistant design, particularly in areas prone to flooding. It may specify elevation requirements, construction materials, and other considerations to reduce the risk of flood damage. The vast majority of the regulations required by the NFIP are included within the International Building Code and the International Residential Code.
- **Fire-Resistant Construction Requirements:** Requirements for fire-resistant construction are included to mitigate the risk of fire hazards. This includes specifications for fire-resistant materials, assemblies, and building features.
- **Material and Construction Standard Requirements:** Establishes standards for building materials and construction methods to ensure the durability and safety of structures, considering various hazards.

In Torrance County building codes are enforced in accordance with the New Mexico state codes, which include various regulations for construction, electrical work, plumbing, mechanical systems, and energy conservation. These codes are supplemented by local ordinances that address specific issues such as flood damage prevention, signage, and land use. Current Codes enforced include:

- 2021 New Mexico Residential Energy Conservation Code NMAC 14.7.6 (effective 7.30.24)
- 2021 New Mexico Commercial Energy Code NMAC 14.7.9 (effective 7.30.2024)
- 2021 New Mexico Commercial Building Code NMAC 14.7.2
- 2021 New Mexico Residential Building Code NMAC 14.7.3
- 2021 New Mexico Earthen Building Materials Construction Code (Phase III) NMAC 14.7.4
- 2009 New Mexico Non-Load Bearing Baled Straw Construction Building Code (Phase III) NMAC 14.7.5
- 2018 New Mexico Residential Energy Conservation Code NMAC 14.7.6
- 2021 New Mexico Existing Building Code NMAC 14.7.7
- 2021 New Mexico Historic Earthen Buildings NMAC 14.7.8
- 2018 New Mexico Commercial Energy Conservation Code NMAC 14.7.9
- 2021 New Mexico Plumbing Code NMAC 14.8.2
- 2012 New Mexico Swimming Pool, Spa, and Hot Tub Code NMAC 14.8.3
- 2021 New Mexico Mechanical Code NMAC 14.9.2
- Boilers NMAC 14.9.4
- Medical Gas Installation and Certification NMAC 14.9.5
- 2012 New Mexico Solar Energy Code NMAC 14.9.6
- 2020 New Mexico Electrical Code NMAC 14.10.4
- 2012 New Mexico Electrical Safety Code NMAC 14.10.5

In general, Torrance County and all participating jurisdictions require building permits for the following activities:

- Construction
- Manufactured home placement
- New Utility service/meter relocation/service upgrade
- Grading-Solar panels
- Accessory structures
- Additions
- Roofs
- Wells
- Demolition

Zoning Ordinances

Zoning ordinances in Torrance County govern land use, development, and building requirements and are overseen by the Planning and Zoning Departments. Zoning ordinances work by dividing the land into different zoning districts and

establishing rules and guidelines for land use, building placement, density, and setback within the zoning districts. In general, zoning ordinances establish:

- **Zoning districts:** Areas designated for specific types of land use, such as residential, commercial, industrial, agricultural, mixed-use, or special districts.
- **Land usage within a zoning district:** Specifications as to which activities, buildings, and operations are permitted in each zoning district.
- **Enforcement:** Zoning ordinances are enforced by the local building department or zoning enforcement officers.

Zoning is the traditional, and most common, tool available to local jurisdictions to control the use of land. Zoning is used to promote health, safety, and the general welfare of the community. Zoning is used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population.

Zoning ordinances play a significant role in enhancing hazard resilience for communities and can help reduce vulnerability to various natural and man-made hazards by regulating land use and development practices. In Torrance County, locally instituted and enforced zoning ordinances provide for:

- **Land Use Planning:** Zoning ordinances designate land use zones within a community, ensuring that certain areas are reserved for particular uses. This can prevent the construction of critical infrastructure, homes, or businesses in high-risk zones, such as floodplains or wildfire-prone areas.
- **Setback Requirements:** Zoning ordinances often mandate specific setbacks, which are distances between structures and property lines or natural features. These setbacks can help prevent buildings from being too close to potential hazards, potentially reducing the risk of damage.
- **Building Height and Design Standards:** Zoning codes can establish building height limits to reduce exposure to certain hazards. Design standards, including materials and construction methods, can be specified to make structures more resilient.
- **Floodplain Management:** Many zoning ordinances incorporate floodplain regulations, which dictate where and how buildings can be constructed within flood-prone areas. These regulations may require buildings to be elevated, use flood-resistant materials, or include openings to allow floodwaters to pass through.
- **Wildfire Mitigation Zones:** In regions susceptible to wildfires, zoning ordinances can establish wildfire mitigation zones with specific requirements for defensible space, fire-resistant landscaping, and building materials to reduce the risk of wildfires spreading to structures.

Properly applied, zoning restriction is one of the most effective hazard mitigation tools available.

As part of this planning effort, personnel charged with regulating or overseeing development and zoning were given the opportunity to review and comment of the elements of this plan. The following personnel were identified:

Table 17: Torrance County Building and Zoning Stakeholders

Name	Title	Jurisdiction or Agency
Don Goen	Planning & Zoning Director	Torrance County Planning & Zoning
William Teaney	Zoning Officer	Estancia
Maria N. Martinez	Planning & Zoning Administrator	Moriarty
Jesse Davidson	Planning & Zoning Chair	Mountainair

Floodplain Management Ordinances

Floodplain ordinances and management are one of the most effective hazard mitigation tools available against flooding. Local floodplain ordinances, required for NFIP participants, are often used to prevent inappropriate development in floodplains and to reduce flood hazards. In general, they allow the jurisdiction to:

- Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage.
- Prevent and minimize loss of life, injuries, and property damage in flood hazard areas.
- Promote the public health, safety and welfare of citizens in flood hazard areas.
- Manage planned growth.
- Grant permits for use in development within special flood hazard areas that are consistent with the community ordinance and the NFIP under 44 CFR 60.3.

The NFIP floodplain management regulations work alongside local building codes by providing specific flood-related requirements that must be met in addition to general building code standards. In NFIP communities, when constructing or substantially improving a structure in a Special Flood Hazard Area (SFHA), the structure must be elevated to or above the Base Flood Elevation (BFE), which is a requirement imposed by the NFIP's regulations.

Code and Ordinance Summary
The following table indicates, with an x, if the participating jurisdiction has the above enumerated codes and ordinances. Please note that none of the participating SWWCDs have coded or ordinances.

Table 18: Jurisdictional Codes and Ordinances

Jurisdiction	Building Code	Zoning Ordinance	Floodplain Ordinance
Torrance County		x	x
Encino			
Estancia		x	x
Moriarty		x	x
Mountainair		x	
Willard			

Note: Blank indicates no code or ordinance

4.4 Jurisdictional Plans

Planning plays a critical role in hazard mitigation by helping communities identify, assess, and reduce risks associated with natural and man-made hazards. Effective planning involves a proactive, strategic, and comprehensive approach to minimize the impact of disasters and enhance community resilience. Jurisdictions were asked if they had completed the following plans:

- **Capital Improvement Plan:** Allocates funding for infrastructure projects, including those that enhance resilience, such as stormwater management systems and seismic retrofits.
- **Community Wildfire Protection Plan**: Focused on reducing wildfire risks, this plan involves community input and includes strategies for fuel reduction, public education, and emergency response improvements.
- **Comprehensive Plan:** A comprehensive plan establishes the overall vision for a jurisdiction and serves as a guide to decision making, and generally contains information on demographics, land use, transportation, and facilities. As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.
- **Emergency Operations Plan:** An emergency operations plan outlines the responsibility and means and methods by which resources are deployed during and following an emergency or disaster. In Torrance County, the overarching county provides emergency operation planning for jurisdictions within its borders.
- **Floodplain Management Plan:** This plan aims to manage flood risks through zoning, building codes, and public education, often in coordination with FEMA’s NFIP.
- **Land Use and Zoning Plan:** These plans regulate development to minimize exposure to hazards, such as restricting construction in flood-prone or wildfire-prone areas. Specifically, for the Claunch-Pinto SWCD, a land-use plan gives a clear roadmap for steering limited conservation funds to the most vulnerable soils and waterways, coordinating with local development decisions, and proving evidence-based priorities in grant proposals.

The following table indicates, with an x, if the participating jurisdiction has the above enumerated plans. Please note that some of these are umbrella plans from Torrance County providing coverage to the community:

Table 19: Jurisdictional Plans

Jurisdiction	Capital Improve	Community Wildfire Protection*	Comprehensive	Emergency Operations*	Floodplain Management	Land Use and Zoning
Torrance County	x	x		x		x
Encino	x	x	x	x		
Estancia	x	x		x		x
Moriarty		x	x	x	x	x
Mountainair	x	x	x	x		x
Willard		x		x		
Central Tri-County SWCD	x	x		x		
Claunch-Pinto SWCD	x	x	x	x		x (land use)
East Torrance SWCD	x	x		x		

Note: Blank indicates no plan
Note: * May be under county plan

4.5 Financial Capabilities

Torrance County and all participating jurisdictions can raise revenue through the application of a tax, an assessment, or a fee, each approved by a statutory authority. The differences between a tax, assessment, and fee are primarily related to their purpose and how they are imposed:

- **Tax:** A mandatory financial charge imposed by a government on individuals or entities to generate revenue for public services, such as schools, roads, and public safety. Taxes are broad and general in nature.
- **Assessment:** A charge levied on property owners to fund specific local improvements that benefit their property, like road paving or sewer systems. It is usually proportional to the benefit received.
- **Fee:** A charge for a specific service provided by the government, such as a building permit, park entry, or utility connection. Fees are usually voluntary and paid directly by the user of the service.

Additionally, Torrance County and all participating jurisdictions can borrow money in a number of different ways, generally used as a means of financing large projects such as infrastructure and buildings. Major methods include:

- **General Obligation Bonds:** General obligation bonds have been the traditional form of financing for capital projects such as land acquisition, park development, and transportation projects that are owned and operated by the county. In general, repayment is guaranteed by both tax revenue and operating revenue.
- **Revenue Bonds:** Generally used to finance water and wastewater projects, airports, and stormwater systems. Payment for debt service on revenue bonds comes from user fees generated by the capital facility that is being built.
- **Local Improvement District Bonds:** When a capital project is going to primarily benefit a subset of the population, a Local Improvement District can be formed. Local Improvement Districts are commonly used for projects such as street improvements, water and sewer systems, and the burying of power lines. Bond payment is through an assessment to property owners in the improvement district.

Concerning hazard mitigation, Torrance County and all participating jurisdictions have numerous avenues to fund potential projects, including:

- **Grants:** Participating jurisdictions can apply for state and federal grants for hazard mitigation projects through myriad programs.

- **Bond Issuance:** Participating jurisdictions can issue bonds to finance large-scale mitigation projects, such as infrastructure upgrades.
- **Public-Private Partnerships:** Participating jurisdictions can collaborate with private entities to fund and implement mitigation measures.
- **Reserves and General Fund:** Participating jurisdictions may allocate funds from their general budget or reserves for mitigation activities.

Participating Stakeholder Financial Capability Summary
The following table indicates, with an x, if the participating jurisdiction has the above enumerated financial capabilities:

Table 20: Participating Jurisdiction Financial Capabilities

Jurisdiction	Tax	Assessment	Fee	Grant Application	Public-Private Partnership	Reserves and General Fund
Torrance County	x	x	x	x	x	x
Encino	x	x	x	x	x	x
Estancia	x	x	x	x	x	x
Moriarty	x	x	x	x	x	x
Mountainair	x	x	x	x	x	x
Willard	x	x	x	x	x	x
Central Tri-County SWCD				x	x	x
Claunch-Pinto SWCD				x	x	x
East Torrance SWCD				x	x	x

4.6 Community-Based Classifications

Torrance County currently participates in the following community-based classifications, which attest to the continued investment in community resilience.

Public Protection Classification
An Insurance Services Office (ISO) fire rating, officially known as the Public Protection Classification (PPC) rating, is a score given to evaluate the fire protection capabilities of a community. This rating assesses how well-equipped a local fire department is to respond to fires, which can impact insurance premiums for homeowners and businesses within that community. Key Components of the ISO Fire Rating include:

- Emergency Communications: This evaluates the community's emergency call center and dispatch system. The speed and efficiency of handling emergency calls are critical factors.
- Fire Department: The number, training, and equipment of the firefighters are assessed. This includes the department's ability to handle fires, the number of engines, and the availability of water supply.
- Water Supply: The availability and reliability of water sources, such as hydrants and water mains, are evaluated. This also includes the volume of water available for firefighting.
- Community Risk Reduction: This includes fire prevention efforts, public fire safety education, and building code enforcement. Effective risk reduction programs can positively impact the ISO rating.

The ISO rating is given on a scale from 1 to 10, with a Class 1 rating representing the best public protection and superior fire protection services and a Class 10 rating indicating that the community's fire protection does not meet ISO's minimum standards. A better (lower) ISO rating can lead to lower insurance premiums for property owners because it indicates a lower risk of fire damage. The following table details ISO ratings for program participants:

Table 21: Torrance County ISO Ratings

Name	ISO Rating
Torrance County Fire – District 1 (Duran)	9
Torrance County Fire – District 2 (Indian Hills)	6
Torrance County Fire – District 3 (McIntosh)	6

Table 21: Torrance County ISO Ratings

Name	ISO Rating
Torrance County Fire – District 4 (Torreon)	9
Torrance County Fire – District 5	6
Torrance County Fire – District 6 (Willard)	7
Encino Fire	5
Estancia Fire	5
Moriarty Fire	3
Mountainair Fire	6

Source: Insurance Services Office

Firewise USA Program

The Firewise USA program is a national initiative designed to help communities at risk from wildfires take proactive steps to reduce their vulnerability. Managed by the National Fire Protection Association (NFPA), the program encourages local solutions for wildfire safety by involving homeowners, community leaders, and other stakeholders in reducing fire risks. Key Elements of the program include:

- **Community Engagement:** The program focuses on encouraging communities to work together to develop and implement plans that reduce the risk of wildfire damage. This includes organizing community events, educational workshops, and fire preparedness activities.
- **Risk Assessment:** The program helps communities assess their wildfire risk by identifying vulnerable areas, such as overgrown vegetation or homes with flammable roofing materials. Communities then create a plan to address these risks.
- **Mitigation Actions:** The program encourages property owners to take specific actions to make their homes and surroundings more fire-resistant. These actions might include clearing brush and dead trees, using fire-resistant building materials, and creating defensible space around homes.
- **Education and Resources:** The program provides educational materials and resources to help communities understand wildfire risks and the steps they can take to mitigate them. This includes guidelines for homeowners, tips for creating fire-resistant landscapes, and strategies for community preparedness.
- **Community Cohesion:** The program fosters a sense of shared responsibility and cooperation among community members, which can enhance overall preparedness and resilience.
- **Potential Insurance Discounts:** Some insurance companies offer discounts to homeowners in recognized Firewise communities, reflecting the reduced risk of wildfire damage.

As of this plan, no Torrance County jurisdictions are registered in the Firewise USA program.

StormReady Community

The StormReady program is a community preparedness initiative developed by the NWS to enhance the ability to prepare for and respond to severe weather events. The goal of StormReady is to help communities develop comprehensive weather safety plans that save lives and protect property. Key Components of the program include:

- **Establishing Warning Systems:** Communities must have multiple ways to receive severe weather warnings and alert the public. This can include NOAA Weather Radios, emergency alert systems, and local broadcast media.
- **Emergency Operations Center:** A designated location where emergency managers and public officials can monitor weather conditions and coordinate responses.
- **Public Education Programs:** Communities in this program must promote weather safety and preparedness through public outreach, including safety fairs, school programs, and distributing weather information materials.
- **Training:** Community leaders and emergency managers undergo training on how to prepare for, respond to, and recover from severe weather.

- **Advanced Monitoring Systems:** Communities are required to monitor local weather conditions in real-time, often using local spotters, weather stations, and other technology to keep track of changing weather patterns.
- **Formal Emergency Plans:** Communities must develop and maintain formal plans for responding to various types of severe weather, including hurricanes, tornadoes, floods, and winter storms. These plans should detail evacuation routes, shelter locations, and post-disaster recovery strategies.
- **Collaboration with the NWS:** Communities work closely with their local NWS office to ensure they have the latest information and resources for weather preparedness and response.
- **Potential Insurance Benefits:** Some insurance providers may offer benefits or discounts to communities that are StormReady certified, reflecting the reduced risk of weather-related damage.

Neither Torrance County nor any participating jurisdictions are StormReady communities.

4.7 Special Districts Mitigation Capabilities

Special districts, which are independent government units created for specific purposes, have several mitigation capabilities:

- **Infrastructure Development and Maintenance:** They can build and maintain infrastructure like levees, drainage systems, or firebreaks to reduce the impact of natural hazards.
- **Emergency Services:** Some districts manage fire protection, flood control, or emergency medical services, which are critical in disaster response and mitigation.
- **Land Use and Zoning:** They can enforce zoning regulations that limit development in high-risk areas.
- **Public Education and Outreach:** Special districts often provide information and resources to help communities prepare for and respond to hazards.
- **Collaboration:** They often work with local, state, and federal agencies to coordinate mitigation efforts and share resources.

These capabilities allow special districts to play a crucial role in reducing risks and enhancing community resilience against natural hazards.

Fire districts mitigation capabilities include:

- **Fire Prevention Programs:** They conduct inspections, enforce fire codes, and promote fire-safe practices within communities.
- **Hazardous Fuels Management:** Fire districts manage vegetation to reduce fuel loads, including controlled burns and clearing brush, to prevent the spread of wildfires.
- **Emergency Response Planning:** They develop and implement response plans for wildfires, floods, and other emergencies, ensuring quick and effective action.
- **Public Education:** Fire districts educate residents on fire safety, evacuation procedures, and emergency preparedness.
- **Infrastructure Protection:** They work to protect critical infrastructure and buildings by ensuring compliance with building codes and fire-resistant construction practices.

School districts mitigation capabilities include:

- **Building Safety:** They enforce building codes and design schools to withstand hazards like earthquakes, floods, and tornadoes.
- **Emergency Preparedness Plans:** School districts develop and regularly update emergency response plans, including evacuation routes, shelter-in-place procedures, and communication strategies.
- **Drills and Training:** They conduct regular safety drills and provide training for students, teachers, and staff on how to respond during emergencies.

- **Community Coordination:** School districts collaborate with local emergency services, law enforcement, and public health agencies to ensure a coordinated response to hazards.
- **Resilience Education:** They integrate disaster preparedness into the curriculum, teaching students about hazard awareness and safety practices.

As participating jurisdictions, soil and water conservation districts (Central-Tri County, Claunch-Pinto, and East Torrance) have the following mitigation capabilities:

- **Flood Control:** They manage reservoirs, levees, and drainage systems to prevent or reduce flooding.
- **Water Supply Management:** Water districts ensure the stability and reliability of water supplies during droughts or emergencies by implementing conservation measures and diversifying water sources.
- **Infrastructure Resilience:** They maintain and upgrade water infrastructure to withstand hazards.
- **Emergency Response:** Water districts develop and implement emergency response plans to quickly address disruptions in water services due to natural hazards.
- **Public Education:** They educate the community on soil and water conservation, hazard preparedness, and response strategies.

The above enumerated capabilities allow special districts to play a crucial role in reducing risks and enhancing community resilience against natural hazards.

The following table list relevant special districts, along with a representative, within Torrance County:

Table 22: Torrance County Special Districts

District Type	Special District Name	Representative	Title
Fire	Torrance County Fire – Districts 1 - 6	Gary Smith	Fire Chief
School District	Estancia	Cindy Sims	Superintendent
School District	Moriarty-Edgewood	Todd Bibiano	Superintendent
School District	Mountainair	Dr. Pedro Vallejos	Superintendent
SWCD	Central Tri-County SWCD	Brenda Smythe	District Manager
SWCD	Claunch-Pinto SWCD	Dierdre Tarr	District Manager
SWCD	East Torrance SWCD	Leonard Howell	District Manager

4.8 Jurisdictional Compliance with NFIP

Torrance County NFIP participating communities are committed to continued involvement and compliance. To help facilitate compliance, NFIP participating communities:

- Meet the minimum standards set forth in the program.
- Adopted floodplain regulations through local ordinance.
- Enforce floodplain ordinances through building restrictions.
- Regulate new construction in Special Flood Hazard Areas as outlined in their floodplain ordinance.
- Utilize FEMA DFIRMs, where available.
- Monitor floodplain activities.

A community's NFIP coordinator plays a crucial role in managing and implementing floodplain management activities to reduce flood risk. Their responsibilities typically include:

- **Administering Floodplain Regulations:** Ensuring the community complies with NFIP standards by enforcing local ordinances and building codes in designated flood-prone areas.
- **Assisting Property Owners:** Providing guidance on flood insurance requirements, helping residents understand their flood risk, and facilitating access to NFIP insurance.

- **Maintaining Flood Maps:** Keeping and updating FIRMs to reflect current flood risks and communicating changes to stakeholders.
- **Coordinating Flood Risk Reduction Efforts:** Collaborating with federal, state, and local agencies to implement flood mitigation strategies and projects.
- **Community Outreach:** Educating the public about flood hazards, mitigation measures, and the importance of flood insurance coverage.

By fulfilling these duties, NFIP coordinators help reduce flood damage and promote community resilience. The following represent NFIP coordinators for each participating community within Torrance County (please note that SWCDs cannot participate in the NFIP). All eligible jurisdictions participate:

Table 23: Torrance County Jurisdictional NFIP Coordinators

Jurisdiction or Agency	Name	Title
Torrance County	Don Goen	Planning & Zoning Director
Estancia	William Teaney	Zoning Officer
Moriarty	Maria N. Martinez	Planning & Zoning Administrator

Participation in the NFIP is based on an agreement between the municipality and the federal government. If a municipality agrees to adopt and enforce a floodplain ordinance designed to reduce future flood risks, all citizens in the participating municipality can purchase flood insurance.

As part of NFIP participation, communities must:

- Use current NFIP flood maps in adopting floodplain management regulations.
- Require permits for all development in SFHAs
- Ensure that development does not increase the flood hazard on other properties.
- Meet current elevation standards. Ensuring the lowest occupied floor is elevated to or above the base flood elevation indicated on the NFIP flood map.

While most floodplain requirements have been incorporated into the current Building Codes, some additional provisions and regulations may be required by a community. Communities participating in the NFIP are required to adopt, enforce and maintain a local floodplain ordinance as a stipulation of compliance with the program. The purpose of this ordinance is to ensure public safety, minimize impact to persons and property from flooding, protect watercourses from encroachment, and maintain the capability of floodplains to retain and carry off floodwaters. The local floodplain administrator is typically the municipal official responsible for overseeing the enforcement and update of the document.

Each participating jurisdiction in the NFIP has their own NFIP Coordinator to ensure base flood elevation certificates are completed for all new construction in the planning area, ensure any development in a flood plain is accompanied by a Flood Hazard Development Certificate, and further develops the NFIP program in the planning area to mitigate flood risk to its population. Both certificates are required prior to construction and to be completed by a licensed surveyor.

Torrance County jurisdictional floodplain ordinances are typically enforced by law enforcement departments and/or code enforcement offices. For all Torrance County NFIP participating communities the enforcement process works as follows:

- **Identification of Violations:** Violations are often identified through various means, such as citizen complaints, routine inspections, or observations by enforcement officers.
- **Notification:** Once a violation is identified, the responsible party is typically notified of the violation. This notification may come in the form of a written citation, warning letter, or verbal communication depending on the severity of the violation and local procedures.

- **Correction Notice:** In many cases, the responsible party is given a certain amount of time to correct the violation. They may be required to remedy the situation, obtain necessary permits, or comply with specific regulations.
- **Follow-up Inspections:** After the designated correction period, enforcement officers may conduct follow-up inspections to ensure that the violation has been addressed satisfactorily.
- **Penalties and Fines:** If the responsible party fails to comply with the ordinance or correct the violation within the specified timeframe, they may face penalties or fines. These penalties can vary depending on the nature and severity of the violation and may escalate for repeated offenses.
- **Legal Action:** In cases of persistent non-compliance or serious violations, local authorities may initiate legal proceedings against the responsible party. This can involve court appearances, injunctions, or other legal measures to compel compliance.

Additionally, FEMA has specific requirements NFIP communities must follow both before (pre-disaster) and after (post-disaster) a flood event. These requirements are designed to mitigate flood risks, promote sustainable development, and ensure eligibility for federal disaster assistance and flood insurance benefits. The following figure represents both pre- and post-disaster NFIP community requirements:

Figure 7: Pre- and Post-Disaster Community NFIP requirements



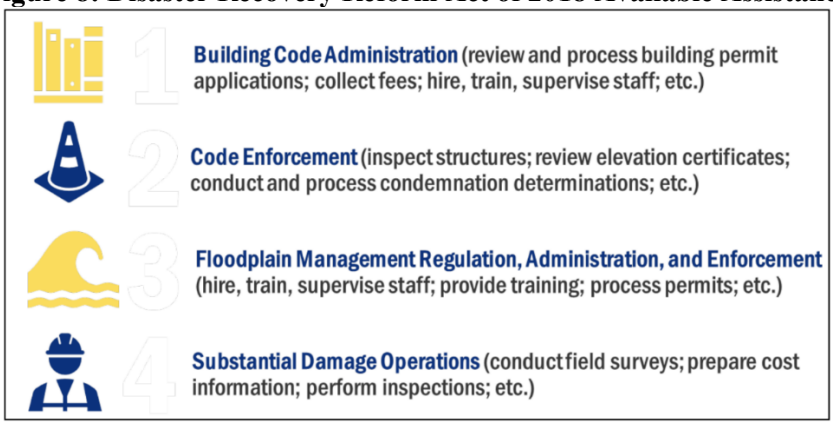
Source: FEMA

When structures located in the SFHAs are substantially modified (more than 50% damaged or improved) they are required to be brought into compliance with current NFIP standards and local building codes. In cases of repairs being conducted as a result of damage, jurisdictional NFIP Coordinators are responsible for substantial damage and improvement determinations. These determinations are required for compliance in the NFIP and must be completed before residents begin repairs or permits are issued.

However, the May 2020 Report to Congressional Committees on the National Flood Insurance Program by the United States Government Accountability indicates "FEMA generally does not collect or analyze the results of these assessments, limiting its ability to ensure the process operates as intended. Furthermore, FEMA has not clarified how communities can access NFIP claims data. Such data would help communities target substantial damage assessments after a flood." This has been found to be true in Torrance County, with submitted information and data underutilized and some FEMA available data unshared and/or unadvertised.

Section 1206 of the Disaster Recovery Reform Act of 2018 authorizes the FEMA to provide communities with the resources to administer and enforce building code and floodplain management ordinances following a major disaster declaration through FEMA's Public Assistance Program. To be eligible for reimbursement under the Public Assistance Program, including for the Disaster Recovery Reform Act of 2018 Section 1206, communities must be designated for Public Assistance permanent work under a major disaster declaration and be legally responsible to administer and enforce building codes or floodplain management regulations. Communities must also be in good standing with the NFIP. Available assistance includes:

Figure 8: Disaster Recovery Reform Act of 2018 Available Assistance



Source: FEMA

It is worth noting that this assistance is available for a variety of hazards occurrence types, not just flooding.

Key to achieving across the board reduction in flood damages is a robust community assistance, education, and awareness program. As such, NFIP participating jurisdictions will continue to develop both electronic (including social media) and in person outreach activities.

4.9 Challenges and Opportunities for Capability Improvement

As always, challenges exist for all participating jurisdictions due to the day-to-day demands of the working environment including staffing issues, budget restrictions, and staffing turnover. These issues can, and do, impact the utilization and incorporation of the LHMP and the completion of identified hazard mitigation projects.

As part of this planning process, the MPC worked to identify gaps and deficiencies identified in the completion of this LHMP. Resulting from this assessment is a series of problem statements, concise descriptions of issues or challenges that need to be addressed. These problem statements were determined to be applicable to all participating jurisdictions:

- Available funding for the completion of hazard mitigation projects is at a premium, with all participating jurisdiction seeing minimal room in the budget for any required project match.
- The difficulties in applying for and managing hazard mitigation grants is a challenge for all participating jurisdictions
- Staffing at all levels is stretched thin, with many personnel wearing multiple hats, compromising mitigation capabilities.

Improving capabilities can lead to enhanced performance, increased efficiency, and better outcomes in hazard mitigation planning and implementation. The following identify recommended improvements for all jurisdictions, with some recommendations being applicable to all jurisdictions, and others being specific to identified jurisdictions:

- Participating jurisdictions that do not have climate studies and plans should conduct them.
- All participating jurisdictions should conduct more extensive educational outreach to all communities, especially vulnerable and underserved communities, on mitigation actions and methodologies.
- Participating NFIP communities should apply for membership in the CRS to allow citizens to receive discounts off their federally backed flood insurance policies.
- Participating jurisdictions who are not current participants should apply for membership in the Firewise USA program.
- Continued instruction should be solicited from NMDHSEM and FEMA Region VI on grant application and grant management strategies to reflect changing requirements.
- Participating jurisdictions not in the NFIP should apply for membership.
- Torrance County and participating jurisdictions should engage in public-private planning partnerships to allow for the infusion of additional funding and expertise to help complete mitigation projects.

- Participating jurisdictions who are not current participants should apply for membership in the StormReady program.
- Participating jurisdictions that do not have wildfire specific codes or ordinances should draft and adopt them.

Table 24: Participating Jurisdiction Opportunities for Improvement

	Torrance County	Encino	Estancia	Moriarty	Mountainair	Willard	SWCDs
Climate Plan	x	x	x	x	x	x	x
Community Outreach	x	x	x	x	x	x	x
CRS Application	x	x	x	x	x	x	
Firewise Application	x	x	x	x	x	x	x
Grant Education	x	x	x	x	x	x	x
NFIP Application			x		x	x	
Public-Private Partnership	x	x	x	x	x	x	x
StormReady Application	x	x	x	x	x	x	
Wildfire Ordinance	x	x	x	x	x	x	

To help overcome many of these identified challenges, participating jurisdictions will work collaboratively using the following strategies, as appropriate:

- **Innovation and Adaptation:** Foster a culture of innovation and adaptability. Encourage employees to think creatively, embrace change, and explore new ways of doing things to overcome challenges.
- **Training and Development:** Invest in training and development to enhance skills and knowledge.
- **Communication Improvement:** Enhance communications and provide clear and transparent communication when sharing information, aligning teams, and addressing concerns.
- **Collaboration and Teamwork:** Encourage collaboration and teamwork which allows for the pooling of diverse skills and perspectives, leading to more effective problem-solving (the MPC is a good example of effective use of this strategy).
- **Technology Adoption:** Embrace technology to streamline operations and enhance productivity.
- **Agile Project Management:** Implement agile project management methodologies to enhance flexibility and responsiveness to changing conditions. Agile approaches allow teams to adapt quickly to challenges.

As appropriate, these strategies will be tailored for specific circumstances, with a combination of these strategies often being more effective than relying on a single approach.

Section 5 – Hazard Identification and Risk Assessment

5.1 Introduction

The goal of this hazard mitigation is to reduce the future impacts of hazards, including deaths and injuries, property damage, and disruption to local and county economies, and to further reduce the amount of public and private funds spent to assist recovery. To complete this goal, hazard mitigation decision-making in this plan has been based on a robust risk assessment, completed to identify natural, human caused, and technological hazards that represent a risk to Torrance County. The following provide a definition of the risk assessment terms used during this assessment:

- **Hazard:** An act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing.
- **Exposure:** The people, property, systems, or functions that could be lost to a hazard. Generally, exposure includes what lies in the area the hazard could affect.
- **Vulnerability:** Vulnerability is susceptibility to physical injury, harm, damage, or economic loss. It depends on an asset's construction, contents, and economic value of its functions.
- **Risk:** A function of hazard, vulnerability, and exposure. It refers to the likelihood of an event resulting in an adverse condition that causes injury or damage.

In order to accomplish this assessment, all relevant natural, human caused, and technological hazards, potential vulnerabilities, and exposures were identified. As potential hazards, vulnerabilities, and exposure are identified Torrance County can continue to develop a strategy to identify and prioritize mitigation action to defend against these potential risks.

5.2 Declared Federal Disasters

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. §§ 5121-5206) provides for the Federal support of State and local governments and their citizens when impacted by an overwhelming disaster. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, establishes the process for requesting a Presidential disaster declaration and defines the type of assistance available.

If it is apparent that a Presidential disaster declaration may be necessary to assist in the recovery of an impacted area, Torrance County and FEMA Region VI will conduct a Preliminary Damage Assessment (PDA). This assessment is used to determine:

- The extent of the event.
- The impact of the event on individuals and public facilities.
- The types of federal assistance that may be needed.

Once the PDA is complete, and if a determination is made that the damages exceed available State of New Mexico resources, the Governor may submit through FEMA Region VI a declaration request to the President.

A major disaster declaration provides a wide range of federal assistance programs for individuals and public infrastructure, including funds for both emergency and permanent work. Not all programs, however, are activated for every disaster. The determination of which programs are authorized is based on the types of assistance specified in the Governor's request and the needs identified during the initial and subsequent PDAs. FEMA disaster assistance programs may include:

- Individual Assistance
- Public Assistance
- Hazard Mitigation

To recognize and encourage mitigation, FEMA considers the extent to which mitigation measures contributed to the reduction of disaster damages. This could be especially significant in those disasters where, because of mitigation, the estimated public assistance damages fell below the per capita indicator.

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. The MPC reviewed the historical federal disaster declarations to assist in hazard identification. The following table details Disaster Declarations for Torrance County:

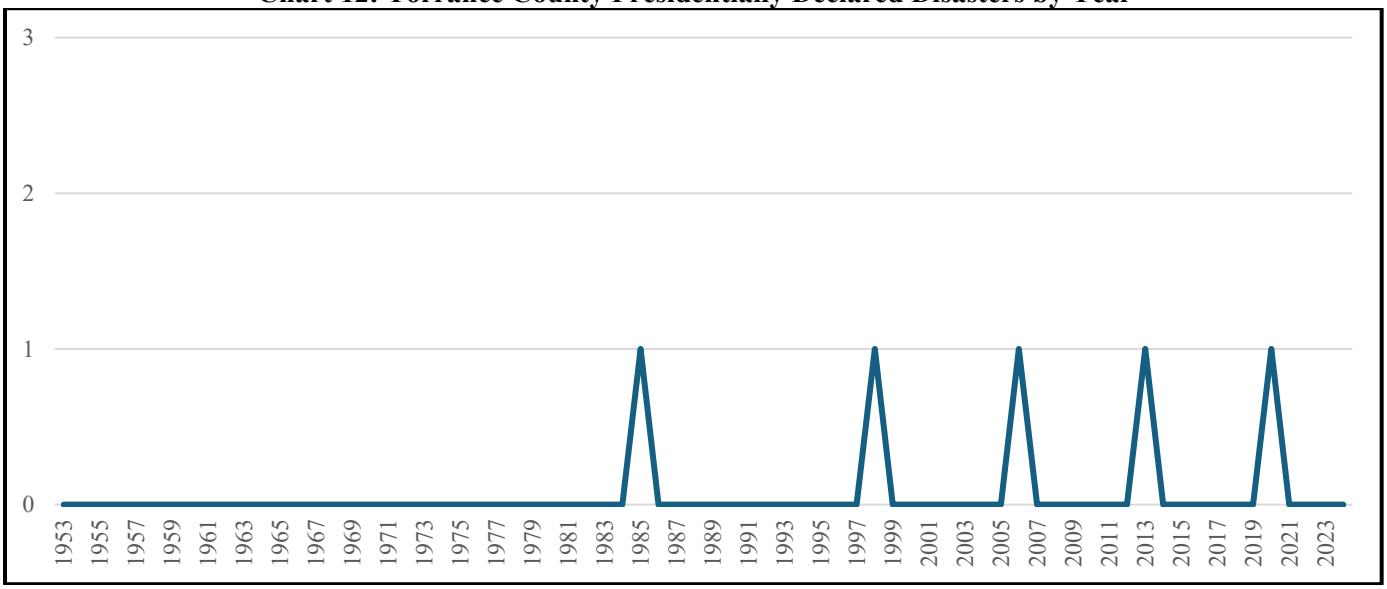
Table 25: Torrance County Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Individual Assistance	Public Assistance	Mitigation Grant Program
DR-4529-NM	04/05/2020	New Mexico Covid-19 Pandemic	$16,492,661	$369,628,567	$1,997,024
DR-4152-NM	10/29/2013	Severe Storms, Flooding, Mudslides	$41,827,081	-	-
DR-1659-NM	1/30/2006	Severe Storms, Flooding	$1,734,451	$32,673,169	-
DR-1202-NM	01/29/1998	Severe Winter Storms	-	-	-
DR-731-NM	01/18/1985	Severe Storms, Flooding	-	-	-

Source: FEMA
-: Not reported

The following chart represents Presidentially Declared Disasters in the Torrance County by year, starting in 1955:

Chart 12: Torrance County Presidentially Declared Disasters by Year



Source: FEMA

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency Declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe. The total amount of assistance provided for in a single emergency may not exceed $5,000,000. The following types of assistance are available under an Emergency Declaration:

- Public Assistance, Categories A (debris removal) and B (emergency protective measures)
- Individual Assistance, the Individuals and Households Program

The MPC reviewed the historical federal emergency declarations to assist in hazard identification. The following table details Emergency Declarations for Torrance County.

Table 26: Torrance County Emergency Declarations

Designation	Declaration Date	Incident Type	Public Assistance
EM-3460-NM	3/13/2020	New Mexico Covid-19 Pandemic	-
EM-3299-NM	9/7/2005	New Mexico Hurricane Katrina Evacuation	$1,036,862
EM-3154-NM	5/10/2000	New Mexico Fire	$4,385,738

Source: FEMA
-: Not reported

The Governor, or the Governor's Authorized Representative, may submit a request for a fire management assistance declaration as required. FEMA will approve declarations for fire management assistance when it is determined that a fire or fire complex on public or private forest land or grassland threatens such destruction as would constitute a major disaster.

The MPC reviewed the historical fire management declarations to assist in hazard identification. The following table details fire management declarations for Torrance County:

Table 27: Torrance County Fire Management Declarations

Designation	Declaration Date	Incident Type	Public Assistance
FM-5461-NM	04/02/2023	New Mexico Echo Ridge Fire	-
FM-5127-NM	06/16/2016	New Mexico Dog Head Fire	$5,905,956
FM-2777-NM	06/25/2008	New Mexico Big Springs Fire	$406,862
FM-2762-NM	04/21/2008	New Mexico Trigo Fire	$2,175,243
FM-2741-NM	11/21/2007	New Mexico Ojo Peak Fire	$58,526
FM-1329-NM	05/13/2000	New Mexico New Mexico Wildfire	$5,652,344

Source: FEMA
-: Not reported

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. This authority allows the governor to activate resources, issue orders, and coordinate responses to protect public safety. The Emergency Management Act (NMSA 1978, Section 12-10-1 to 12-10-10) gives the governor broad authority to declare a state of emergency or disaster when there is an “occurrence or imminent threat” of widespread or severe damage, injury, or loss of life or property due to natural or human-caused disasters. The following represent State of New Mexico disaster declarations for Torrance County from 2019-2024.

Table 28: Governor of New Mexico Torrance County Disaster Declarations, 2019 - 2024

Year	Executive Order	Incident Type
2023	2023-060	Drought and Severe Fire Conditions (statewide)
2023	2023-multiple	Renewal of Public Health Emergency, COVID-19
2022	2022-multiple	Renewal of Public Health Emergency, COVID-19
2021	2021-multiple	Renewal of Public Health Emergency, COVID-19
2021	2021-028	Drought and Severe Fire Conditions (statewide)
2020	2020-multiple	Renewal of Public Health Emergency, COVID-19
2020	2020-084	Drought (statewide)
2020	2020-040	Drought and Severe Fire Conditions (statewide)
2019	2019-009	Severe Wind, Tornados, Hail, and Power Outages (statewide)
2019	2019-008	Severe Winter Storms (statewide)

Source: NMDHSEM

5.3 Identified Potential Hazards

One of the first steps in developing a hazard assessment is to identify the hazards that have a reasonable risk of occurring. Proper identification allows for appropriate and well-planned action in order to mitigate the extent and cascading impacts of an incident. Furthermore, while not all disaster contingencies can be planned for, applying an all-hazards

approach to the mitigation process does yield greater awareness and better preparedness for unforeseen hazard incidents overall.

Public Comment: *Wildfire and flooding seem to be the most prominent issues affecting Torrance County.*

The MPC met to discuss previously identified hazards and deliberate on any changes or additions to the regional hazard profile. A thorough and comprehensive revision of data for each hazard was completed as part of this plan update. Additionally, this plan has worked, as per FEMA recommendations, to merge similar hazards together with the aim of both simplifying the usage of the plan and reducing duplication of effort.

The MPC confirmed the following natural hazards that may impact the Torrance County:

- Drought
- Extreme Heat
- Flood
- Severe Weather
- Severe Winter Weather
- Wildfire

The following table indicates the improvement of worsening of conditions related to the identified hazards in this LHMP since the completion of the 2017 LHMP:

Table 29: Natural Hazard Change in Conditions

Natural Hazard	Change in Conditions	Notes
Drought	Worsening	Available data indicates that the rate of drought occurrence is increasing.
Extreme Heat	Worsening	Data indicates that continued temperatures are expected to continue to rise.
Flood	Worsening	Data indicates that while rainfall occurrence has lessened, the number of heavy rainfall events have increased. Additionally, increased wildfire and drought occurrences have exacerbated conditions related to flash flood events.
Severe Weather	Worsening	Data indicates that incidences of severe weather are likely to increase due to changes in atmospheric conditions.
Severe Winter Weather	Improving	Data indicates that incidences of severe winter weather are likely to increase due to changes in atmospheric conditions.
Wildfire	Worsening	Increased extreme heat and drought occurrences have exacerbated conditions related to wildfire events.

Based on discussion with the MPC, a lack of identified risk or history, and geographic improbability, numerous FEMA identified hazards such as coastal erosion and hurricane were not included in the scope of this plan. Additionally, the following natural hazards, while recognized as potential hazards, did not warrant full discussion for the enumerated reasons:

- **Dam Failure:** One high hazard dam was noted in the county. This dam is currently dry and is being considered for removal pending available funding.
- **Earthquake:** Mapping from the USGS indicates an extremely low likelihood for occurrence and damage from an earthquake event.
- **Expansive Soils:** Information from the United States Geological Service (USGS) Swelling Clays Map of the Conterminous United States indicates that the majority of Torrance County has low susceptibility to swelling soils. Additionally, the 2023 State of New Mexico Hazard Mitigation Plan rates it as a low hazard for Torrance County.

- **Landslide:** Mapping by the New Mexico Bureau of Geology and Mineral Resources indicates that the far western edge of Torrance County is susceptible to landslides. This part of the county is sparsely populated. Additionally, no events have been recorded
- **Land Subsidence:** Mapping by the State of New Mexico indicates no known areas of collapsible soils in Torrance County. Additionally, no events have been recorded.
- **Tornado:** Data from the NCEI indicates that over the 75-year period from 1950-2024, Torrance County has recorded 16 tornadoes, all rated at F0 (the lowest rating for a tornado) with minor damage and no deaths or injuries.
- **Volcano:** There have been no geologically recent recorded damaging volcanic events in Torrance County in recent history. Additionally, the 2018 State of New Mexico LHMP indicates Torrance County has no risk to volcanoes.

5.4 Hazard Planning Significance

For the purposes of this plan, hazard planning significance refers to the relevance of the identified hazard to the jurisdictions of Torrance County when calculating risk and vulnerability. In order to help quantify the planning significance for a hazard, data was reviewed on three levels, federal (various data sets), state (State of New Mexico 2023 Hazard Mitigation plan and available state databases and GIS resources), and local (data relevant to occurrence and vulnerability on a county and local level). This allowed for a comparison between data sets for each hazard type and allowed for a summation at the county level. It is recognized that inconsistencies in methodologies and data make it difficult to make a direct comparison across all data levels. However, as possible, collected data was translated into a unified model that accounted for any variability in data and methodologies. The result of this assessment provides a larger scale snapshot of how Torrance County jurisdictions view risk and allowed for integration of hazard data into the LHMP.

Augmenting state and local data, FEMA's NRI dataset and online tool was used to help determine local community risk for identified natural hazards in this LHMP. This tool is useful in that it helps provide a simple, visual method of understating local level jurisdictional vulnerability. However, like all clearinghouse databases, it is recognized to have some limitations. As such, and as mentioned above, the data was vetted by Torrance County and participating jurisdictions against local and state data and analysis. Where discrepancies exist, they are noted and discussed in the relevant hazard section.

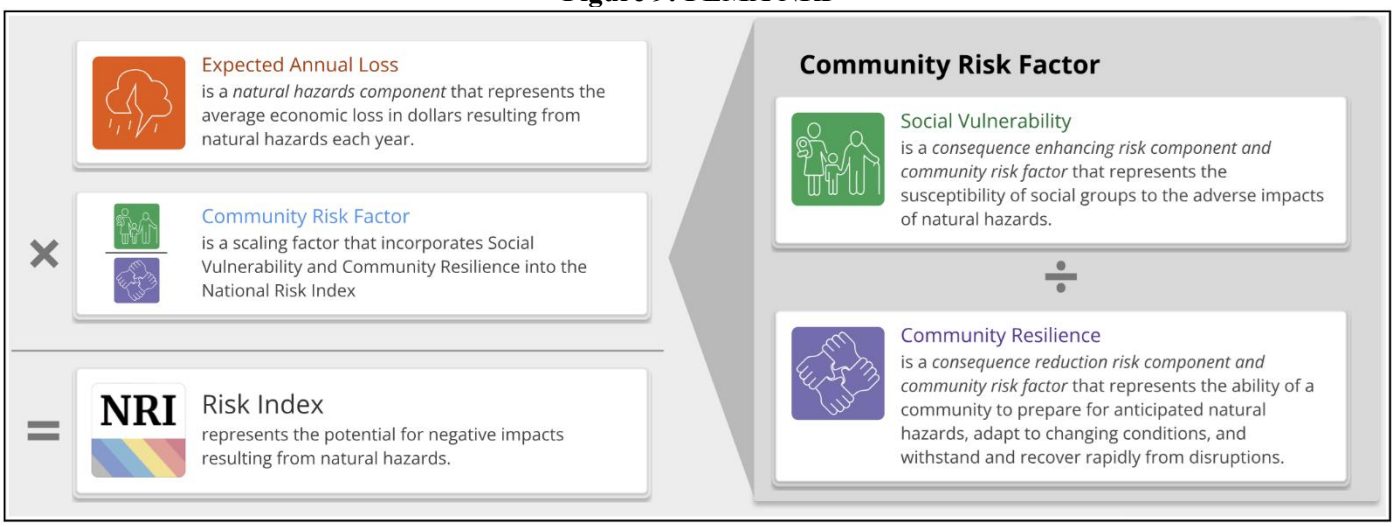
The risk equation behind the Risk Index includes three components, Expected Annual Loss (EAL), social vulnerability (previously discussed), and community resilience (previously discussed). The dataset supporting EAL provides estimates measured in 2022 U.S. dollars. The datasets supporting the social vulnerability and community resilience components have been standardized using a minimum-maximum normalization approach prior to being incorporated into the NRI risk calculation.

As part of the NRI, EAL represents the average economic loss in dollars resulting from a hazard each year. It quantifies loss for relevant consequence types, buildings, people, and agriculture. An EAL score and rating represent a community's relative level of expected losses each year when compared to all other communities at the same level. EAL is calculated using an equation that includes exposure, annualized frequency, and historic loss ratio risk factors. Exposure is a factor that measures the building value, population, and agriculture value potentially exposed to a natural hazard occurrence. Annualized frequency is a factor that measures the expected frequency or probability of a hazard occurrence per year. Historic loss ratio is a factor that measures the percentage of the exposed consequence type value (building, population, or agriculture) expected to be lost due to an occurrence. EAL represents the average economic loss in dollars resulting from natural hazards each year and is proportional to a community's risk.

To calculate Risk Index values, the NRI generates a Community Risk Adjustment to scale EAL values up or down, depending on their community risk factors, increasing with social vulnerability and decreases with community resilience. For a jurisdiction, a higher social vulnerability results in a higher Risk Index value while higher community resilience results in a lower Risk Index value.

Using these three components, Risk Index values are calculated for each jurisdiction (county and Census tract). The calculated Risk Index values form an absolute basis for measuring Risk within the NRI, and they are used to generate Risk Index percentiles and ratings across communities. The risk equation behind the NRI is as follows:

Figure 9: FEMA NRI



Source: FEMA

For both the Risk Index and EAL there is a qualitative rating that describes the nature of a community's score in comparison to all other communities at the same level, ranging from "Very Low" to "Very High." Because all ratings are relative, there are no specific numeric values that determine the rating.

The National Risk Index provides relative Risk Index percentiles and ratings based on data for Expected Annual Loss due to natural hazards, Social Vulnerability, and Community Resilience. Separate percentiles and ratings are also provided for each component: Expected Annual Loss, Social Vulnerability, and Community Resilience. For the Risk Index and Expected Annual Loss, percentiles and ratings can be viewed as a composite score for all hazards or individually for each of the 18 hazard types.

A community's score is represented by its percentile ranking among all other communities at the same level for Risk, Expected Annual Loss, Social Vulnerability and Community Resilience. For example, if a given Census tract's Risk Index percentile for a hazard type is 85.32 then its Risk Index value is greater than 85.32% of all US Census tracts. These scores are then assigned a qualitative rating that describes the community in comparison to all other communities at the same level, ranging from "Very Low" to "Very High." To determine Risk and Expected Annual Loss ratings, a methodology known as k-means clustering or natural breaks is applied to each value. This approach divides all communities into five groups such that the communities within each group are as similar as possible (minimized variance) while the groups are as different as possible (maximized variance). A cubed root transformation is applied to both Risk and Expected Annual Loss values before k-means clustering. Without the transformation, these values are heavily skewed by an extreme range of population and building value densities between urban and rural communities. By applying a cube root transformation, the National Risk Index controls for this characteristic and provides ratings with greater differentiation and usefulness.

The following table summarizes the FEMA NRI for Torrance County and participating jurisdictions for all identified natural hazards. Please note that NRI details specific to participating SWCDs are not detailed as the data is not applicable to these districts. NRI scores are published only at the county and Census-tract levels. SWCD boundaries rarely align with either, as participating districts span fractions of several tracts and/or cross county lines. Additionally, SWCD programs focus heavily on soil health, sediment transport, nutrient loading, and irrigation efficiency, factors either absent from, or too coarsely represented in, the NRI.

Table 30: Participating Jurisdiction All Natural Hazard Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile
Torrance County	All	Very Low	30.54
Moriarty	35057963202	Relatively Low	51.10
Estancia	35057963601	Relatively High	90.93
Encino, Mountainair and Willard	35057963700	Very Low	27.17

Source: FEMA NRI

In order to gain an understanding of vulnerability, the following table details the estimated FEMA EAL data for Torrance County and participating jurisdictions (by census tract):

Table 31: Participating Jurisdiction All Natural Hazard EAL

Jurisdiction	Census Tract	EAL	National Percentile	Building EAL	Population Equivalence Fatalities	Agricultural EAL	Composite EAL
Torrance County	All	Very Low	22.22	$745,649	0.07	$867,613	$2,432,39
Moriarty	35057963202	Relatively Low	38.94	$160,494	0.01	$65,590	$370,058
Estancia	35057963601	Relatively High	85.44	$321,357	0.05	$698,98	$1,566,516
Encino, Mountainair and Willard	35057963700	Very Low	23.53	$108,452	0	$83,029	$234,786

Source: FEMA NRI

Where appropriate, differences in vulnerability to identified hazards are noted in each individual hazard section.

5.5 Hazard Occurrence and Assessment Data

NOAA's National Centers for Environmental Information (NCEI) Storm Events Database was used as the primary source of information for previous occurrences of storm events. It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or National Weather Service (NWS) office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Most of the events from NCEI are not associated with a federal emergency or disaster. If the event occurred at the same time as an event that was later determined to be a federal emergency or disaster, it is included with the NCEI data even if it occurred in a county not included in the federal declaration.

Environmental Systems Research Institute ArcGIS v10 was used to determine which critical facilities were located within the boundaries of identified hazards (when applicable, and if data was available). Data was provided by the following agencies:

- Torrance County and participating jurisdictions
- FEMA's National Flood Hazard Layer
- University of Wisconsin–Madison Spatial Analysis for Conservation and Sustainability Silvis Lab
- NOAA

Data was also obtained and utilized using Hazus-MH, Version 2.2 SP1, a program administered by the FEMA used to model losses. Modelling for hazards uses Hazus analysis to estimate losses and projected impacts from historical and annualized hazard events. Hazus default data was used in the analysis, including the 2020 Census and other State and Federal government facility databases. A level I analysis was run in Hazus for flood and earthquake, meaning the default population, building stock, and critical infrastructure data within the program was used to calculate losses and damages. Multiple hazard scenarios were run to estimate losses for the identified hazards. For the earthquake and hurricane hazards, historic event scenarios and probabilistic scenarios were run. Flood losses were analyzed using the 100 return scenarios as well as a probabilistic scenario.

Where appropriate, other utilized modeling types and systems are detailed in the relevant hazard analysis section.

5.6 Jurisdictional Critical Facilities

Certain facilities and assets, such as infrastructure and community lifelines, have a net positive value on the community as they contribute to the public good by facilitating the basic functions of society. These facilities maintain order, public health, education, and help the economy function. Additionally, there are infrastructure and facilities integral to disaster response and recovery operations. Conversely, some infrastructure and facilities are of extreme importance due to the negative externalities created when they are impacted by a disaster. What fits these definitions will vary slightly from community to community, but the definitions remain as a guideline for identifying critical facilities. Torrance County maintains critical facility details under separate cover for security purposes. For this LHMP it is assumed that all critical facilities are at equal risk to non-point hazard occurrence but may have varying risk to point hazard occurrence (flood). Data concerning critical facilities potentially impacted by these point hazards, as available, is detailed under the respective hazard section.

5.7 Hazard Profiles

Each identified hazard is profiled in the subsequent sections, with the level of detail varying based on available information. Sources of information are cited in the detailed hazard profiles below.

For hazards that have a higher chance of occurrence for specific jurisdictions throughout Torrance County, a discussion is provided as to the differing levels of potential vulnerability. All other hazards have been determined to have an equal chance of occurrence for all participating jurisdictions.

The following hazards are presented in alphabetical order, and not by planning significance, for ease of reference.

5.8 Drought



5.8.1 Hazard Description

Drought is defined as an abnormally dry period lasting months or years when an area has a deficiency of water and precipitation in its surface and or underground water supply. It is, however, a normal, seasonal, and recurrent feature of climate that occurs in virtually all climate zones—typically in late spring through early fall. The duration of drought varies widely. There are cases when drought develops relatively quickly and lasts a very short period of time, exacerbated by extreme heat and/or wind, and there are other cases when drought spans multiple years, or even decades. The hydrological imbalance can be grouped into the following non-exclusive categories:

- Agricultural: When the amount of moisture in the soil no longer meets the needs of previously grown crops
- Hydrological: When surface and subsurface water levels are significantly below their normal levels
- Meteorological: When there is a significant departure from the normal levels of precipitation
- Socio-Economic: When the water deficiency begins to significantly affect the population

When below average, little or no rain falls, soil can dry out, and plants can die. If unusually dry weather persists and water supply problems develop, the period is defined as a drought. Human activity such as over-farming, excessive irrigation, deforestation, and poor erosion controls can exacerbate a drought's effects. It can take weeks or months before the effects of below average precipitation on bodies of water are observed. Depending upon the region, droughts can happen more quickly, and be noticed sooner, or have their effects naturally mitigated. The more humid and wet an area is, the faster the effects will be realized. A naturally dry region, which typically relies more on subsurface water, will take more time to actualize its effects.

Periods of drought can have significant environmental, agricultural, health, economic, and social consequences. The effects vary depending upon vulnerability and regional characteristics. Droughts can also reduce water quality through a decreased ability for natural rivers and streams to dilute pollutants and increase contamination. The most common effects are diminished crop yield, increased erosion, dust storms, ecosystem damage, reduced electricity production due to reduced flow through hydroelectric dams, shortage of water for industrial production, and increased risk of wildland fires.

5.8.2 Location and Extent

Torrance County experiences a semi-arid climate characterized by hot summers and mild winters. Average annual precipitation is approximately 14 inches, with the county receiving about 23 inches of snow each year.

All of Torrance County, including all participating jurisdictions, is susceptible to drought conditions. Data indicates that all jurisdictions have historically experienced a wide range of drought conditions, including the most severe level. However, the specific susceptibility to drought depends on various factors, including climate patterns, land use practices, and water management strategies.

Droughts are regularly monitored by multiple federal agencies using a number of different indices. One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor. The U.S. Drought Monitor provides a summary of drought conditions across the United States, including Torrance County. Often described as a blend of art and science, the map is updated weekly by combining a variety of data-based drought indices and indicators, along with local expert input, into a single composite drought indicator. The following table details the U.S. Drought Monitor categories:

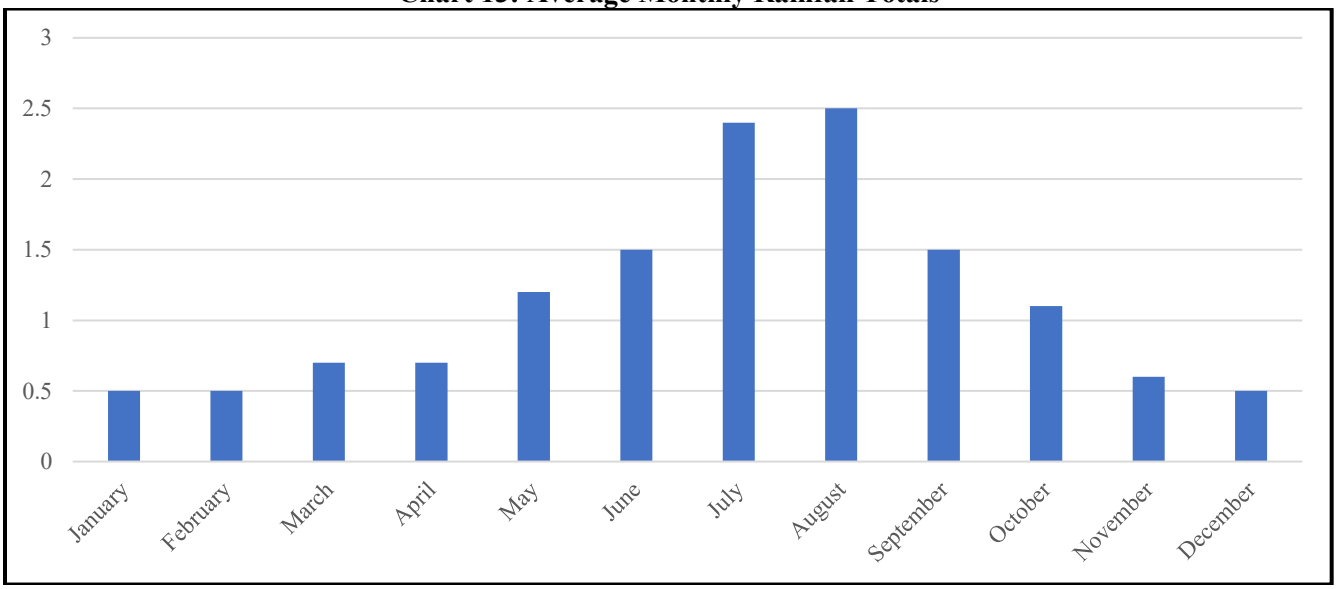
Table 32: U.S. Drought Monitor Categories

Rating	Described Condition	Possible Impacts
None	No drought conditions	None
D0	Abnormally Dry	Short-term dryness slowing planting, growth of crops Some lingering water deficits Pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures Some water shortages developing Voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture loss likely Water shortages are common Water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses Shortages of water creating water emergencies

Source: U.S. Drought Monitor

Precipitation data is collected by the NWS. The following chart indicates annual precipitation averages for Torrance County:

Chart 13: Average Monthly Rainfall Totals



Source: NWS

Torrance County primarily relies on groundwater for its drinking water needs. The county is situated within the Estancia Basin, where water is sourced from basin-fill aquifers. The New Mexico Office of the State Engineer oversees water rights and usage in the region, ensuring sustainable management of these vital groundwater resources.

While specific water usage data for Torrance County, New Mexico, is limited, statewide data from the New Mexico Office of the State Engineer provides insight into general water use patterns. The primary water use categories in New Mexico are:

- Irrigation: Approximately 79%
- Public Water Supply: 9%
- Livestock: 4%
- Industrial: 3%

- Commercial: 2%
- Mining: 2%
- Power: 1%

Many rural residents of Torrance County depend on groundwater for their domestic water needs, as municipal water systems are limited in more isolated areas. Private wells are common, and during times of drought or groundwater depletion, residents can face shortages or need to deepen wells.

Current drought conditions, which change weekly, may be found on the U.S. Drought Monitor website.

The MPC view drought as not only a local or county hazard, but as a regional hazard as well. Discussions with the MPC and a review of all available data indicated that drought is a concern for all participating jurisdictions, with all jurisdictions having similar concerns. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Encino:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Estancia:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Moriarty:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Mountainair:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Willard:** Drought identified as a community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in drought condition will have a negative impact on wildfire conditions.
- **Soil and Water Conservation Districts:** Drought identified as a concern as areas of stewardship are vulnerable to potential impacts. Any increase in drought conditions may increase events impacting both soil and water resources.

5.8.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Torrance County has experienced no Presidential Disaster Declarations related to drought.

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. The following details New Mexico drought disaster declarations:

Table 33: Governor of New Mexico Torrance County Disaster Declarations, 2019 - 2024

Year	Executive Order	Incident Type
2023	2023-060	Drought and Severe Fire Conditions (statewide)
2021	2021-028	Drought and Severe Fire Conditions (statewide)
2020	2020-084	Drought (statewide)
2020	2020-040	Drought and Severe Fire Conditions (statewide)

Source: NMDHSEM

Comprehensive data on droughts, drought impacts, and drought forecasting is extremely limited and often inaccurate. Due to the complexity of drought monitoring and the large areas droughts impact, agencies have difficulty quantifying and standardizing drought data.

One of the best indicators of historic drought periods is provided by the U.S. Drought Monitor, which lists weekly drought conditions for the Torrance County. Historical data was gathered from the U.S. Drought Monitor weekly reports for the 20-year period between 2005 and 2024. This data was compiled and aggregated to provide a yearly estimate of the percentage of Torrance County in each Drought Monitor category.

Table 34: Percentage Area in U.S. Drought Monitor Category, 2005 - 2024

Year	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
2024	9.3%	92.6%	51.0%	13.3%	0.5%	0.0%
2023	6.4%	93.6%	38.0%	32.0%	4.7%	0.0%
2022	0.0%	100.0%	77.0%	60.1%	40.1%	5.3%
2021	0.0%	100.0%	100.0%	97.9%	67.6%	43.8%
2020	12.7%	87.3%	48.4%	39.1%	21.4%	9.9%
2019	64.8%	37.1%	11.0%	0.0%	0.0%	0.0%
2018	0.0%	100.0%	89.3%	72.5%	23.0%	0.0%
2017	78.2%	21.8%	0.0%	0.0%	0.0%	0.0%
2016	39.3%	60.7%	0.5%	0.0%	0.0%	0.0%
2015	56.0%	44.0%	13.4%	0.0%	0.0%	0.0%
2014	0.0%	100.0%	75.1%	55.3%	4.9%	0.0%
2013	0.0	100.0%	100.0%	98.4%	58.9%	35.1%
2012	0.0%	100.0%	100.0%	99.6%	6.9%	0.0%
2011	0.0%	100.0%	80.8%	76.9%	65.6%	31.3%
2010	73.9%	26.1%	0.0%	0.0%	0.0%	0.0%
2009	54.6%	45.4%	17.3%	0.2%	0.0%	0.0%
2008	49.6%	52.3%	5.2%	0.0%	0.0%	0.0%
2007	87.1%	12.9%	0.0%	0.0%	0.0%	0.0%
2006	36.7%	63.3%	48.1%	35.7%	17.3%	0.0%
2005	19.7%	80.3%	26.1%	1.6%	0.0%	0.0%

Source: U.S. Drought Monitor

The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county. USDA Secretarial disaster designations must be requested of the Secretary of Agriculture by a governor or the governor's authorized representative, and there is an expedited process for drought. The following table represents the total number of Secretarial Disaster Declarations, by county, for the 10-year period of 2017 to 2024 for Torrance County:

Table 35: Secretarial Drought Disaster Declarations, 2017 -2024

Jurisdiction	2024	2023	2022	2021	2020	2019	2018	2017
Torrance County	S5678	S5378, S5509, S5557, S5585, S5603	S5451	S4724, S4749, S4757, S4800, S4850, S4855	S4724, S44749, S4757, S4779, S4800, S4850, S4855	S4469	S4300, S4310, S4316	-

Source: USDA Farm Service Agency
Note: - designates no declarations

5.8.4 Probability of Future Events

Historically, drought has affected Torrance County and all participating jurisdictions on a reoccurring basis. In reviewing historical data from the U.S. Drought Monitor weekly reports for Torrance County from 2005 through 2024 a weekly average can be created indicating the percentage time in each Drought Monitor category. This average can be used to extrapolate the potential likelihood of future drought conditions.

Table 36: Estimated Weekly Probability of Torrance County Being in U.S. Drought Monitor Category

None	D0-D4	D1-D4	D2-D4	D3-D4	D4
29.4%	70.9%	44.1%	34.1%	15.5%	6.3%

Data: U.S. Drought Monitor

Torrance County and all participating jurisdictions can experience rapid droughts, with a sudden onset of intense dry periods following a period of normal precipitation. While these conditions may last only a few months, they can result in agricultural losses, water supplies shortages, and low stream and river volume.

While predicting drought provides many challenges, NOAA's National Integrated Drought Information System provides the Drought Early Warning System to improve drought early warning capacity. The system is a network of regional and national partners that share information and coordinate actions to help communities in the region cope with drought. Developing and implementing the system allows New Mexico and Torrance County to quickly respond to emerging drought conditions. Through developing regional systems, the National Integrated Drought Information System is building the foundation for a nationwide system to improve drought forecasting.

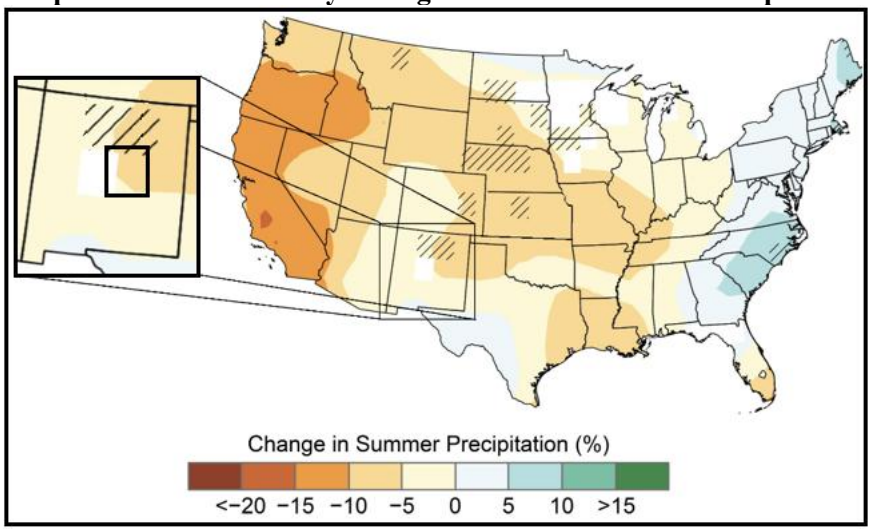
5.8.5 Projected Changes in Hazard Location, Intensity, Frequency, and Duration

According to the National Institutes of Health National Center for Biotechnology Information publication Global Drought Trends and Future Projections "Drought is one of the most difficult natural hazards to quantify and is divided into categories (meteorological, agricultural, ecological and hydrological), which makes assessing recent changes and future scenarios extremely difficult." However, using long term data estimates of future drought conditions can be determined through a combination of climate modeling, historical data analysis, and scientific assessments. This modelling takes into account factors such as temperature, precipitation, soil moisture, and other relevant variables.

Because snowpack plays an important role in the management of New Mexico's complex water system, some of the most impactful droughts have coincided with years of abnormally low snowpack accumulation during the winter months. The historical record indicates periodic prolonged wet and dry periods. Drought conditions can be exacerbated by warm temperatures. The record warmth in 2014 and 2015, in combination with multiple years of below average precipitation, led to one of New Mexico's most severe droughts.

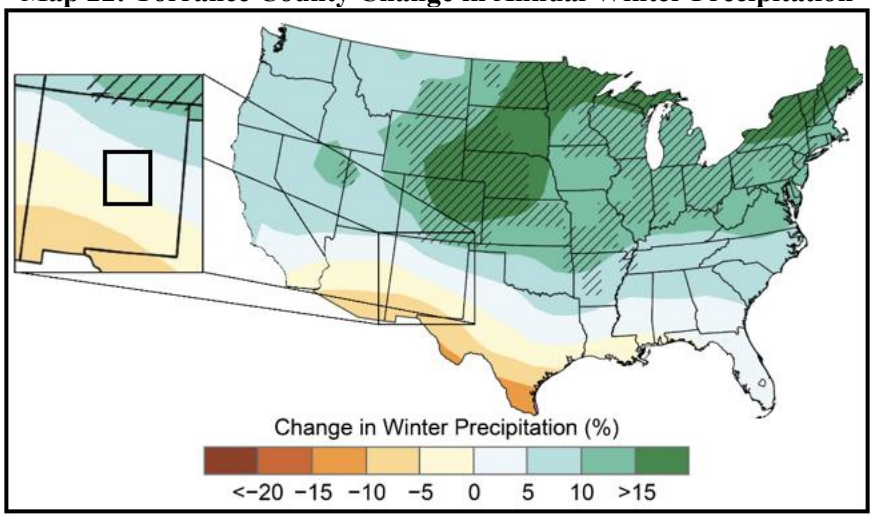
Current modelling from the NOAA State Climate Summary 2022 for New Mexico suggests that winter precipitation is projected to increase slightly in Torrance County and all participating jurisdictions, but these changes are small relative to the natural variability. The following map indicates the expected slight annual decrease in summer precipitation and a slight increase in winter precipitation for Torrance County and all participating jurisdictions:

Map 21: Torrance County Change in Annual Summer Precipitation



Source: NOAA NCEI State Climate Summary 2022 for New Mexico

Map 22: Torrance County Change in Annual Winter Precipitation

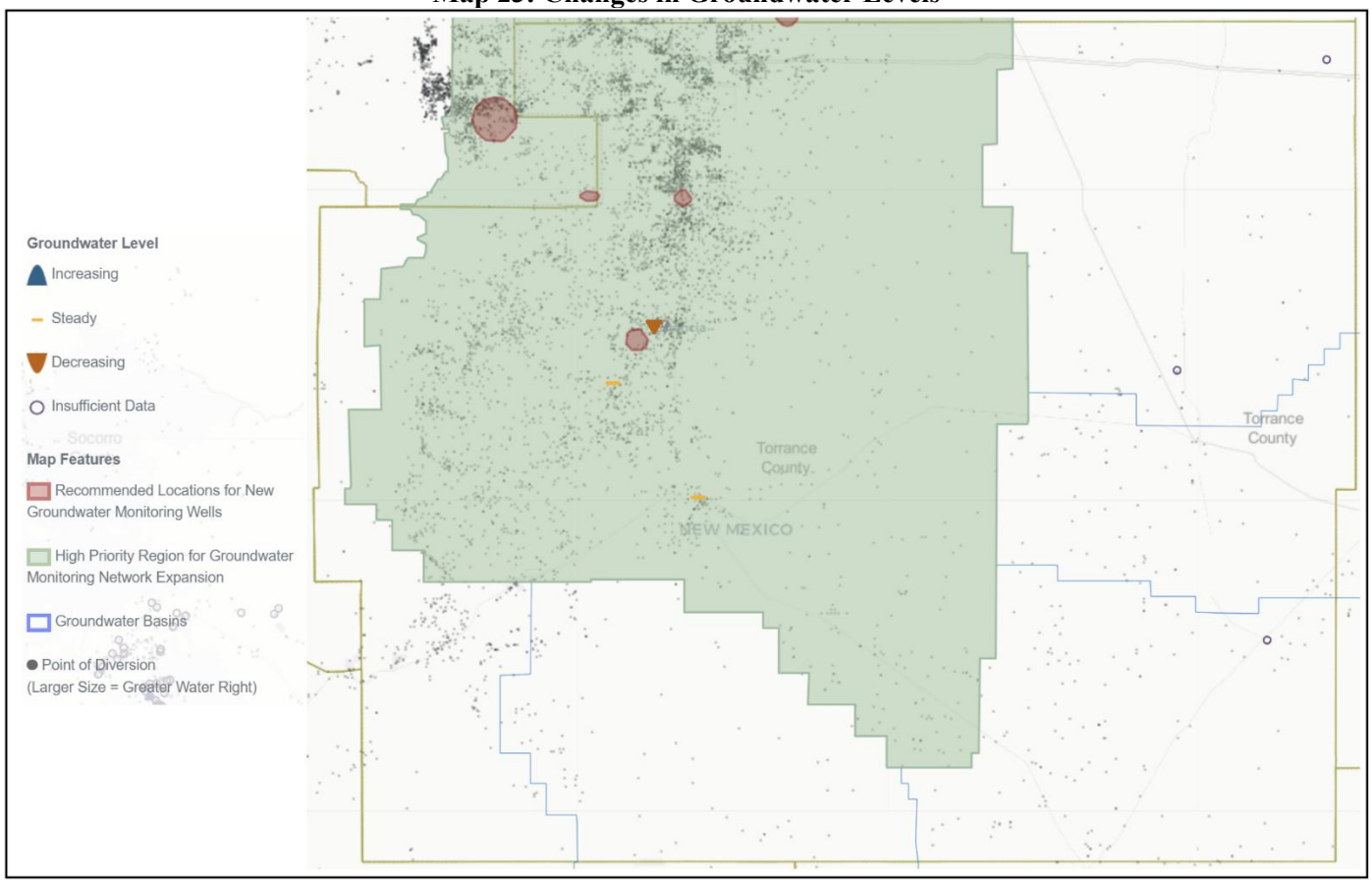


Source: NOAA NCEI State Climate Summary 2022 for New Mexico

Projected rising temperatures are projected to raise the snow line, which will increase the likelihood that precipitation will fall as rain rather than snow. This may result in a reduced snowpack and consequently a reduction in water storage. Additionally, projected higher spring temperatures will result in an earlier melting of the snowpack, which can have critical implications for Torrance County and participating jurisdictions for water storage.

The following map, based on data from New Mexico Bureau of Geology and Mineral Resource, groundwater trends in Torrance County. As indicated by the map, the is currently insufficient data to determine long term trends:

Map 23: Changes in Groundwater Levels



Source: New Mexico Bureau of Geology and Mineral Resource

5.8.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from drought. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

In order to gain an understanding of vulnerability, the following table details the estimated FEMA EAL data for Torrance County and participating jurisdictions (by census tract):

Table 37: Participating Jurisdiction Drought Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	94.9	85.8
Moriarty	35057963202	Relatively Moderate	97.6	75.7
Estancia	35057963601	Relatively High	99.7	75.7
Encino, Mountainair and Willard	35057963700	Relatively Moderate	97.6	92

Source: FEMA NRI

Table 38: Participating Jurisdiction Drought Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Moderate	92.4	$758K
Moriarty	35057963202	Relatively Moderate	97.3	$65K
Estancia	35057963601	Relatively High	99.6	$594K
Encino, Mountainair and Willard	35057963700	Relatively Moderate	97.6	$80K

Source: FEMA NRI

Population

Droughts are rarely a direct cause of death, though the associated heat, dust, and stress can all contribute to increased mortality. However, drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Additionally, the loss of community lifelines can have a direct economic impact on the population. As an overview, the May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report indicates the following loss values for community lifelines:

Table 39: Economic Impacts of Loss of Service Per Capita Per Day (in 2022 dollars)

Category	Loss
Loss of Wastewater Services	$66
Loss of Water Services	$138

Source: May 2023 FEMA Benefit-Cost Analysis Sustainment and Enhancements Standard Economic Value Methodology Report

At greater risk may be the vulnerable populations, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges. Vulnerable

populations may have pre-existing health conditions that make them more susceptible to heat-related illnesses and dehydration, both of which can be exacerbated during droughts. People on fixed incomes and with limited resources may face difficulties in adapting their homes to withstand hazard conditions or may lack financial resources to cope with the increased costs of food, water, and energy. Details concerning potentially vulnerable populations may be found in Section 3.4: Socially Vulnerable and At-Risk Populations.

Buildings and Structures
In general, buildings are not directly vulnerable to losses as a result of drought. However, there is a potential that building occupants could be impacted by power failures caused by either increased utility demand or damaged power delivery infrastructure. In addition, drinking water infrastructure may be specifically vulnerable to the impacts of drought. Any decrease in groundwater supplies would stress this infrastructure and may cause shortages or rationing.

Governmental Operations
Governmental operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages. However, reduced water availability would likely have an immediate impact on firefighting efforts in urban and suburban areas as fire suppression equipment requires a minimum level of water pressure to activate.

Transportation and Electrical Infrastructure
Droughts can have numerous impacts on both transportation systems, often leading to challenges that require proactive management. The impacts of droughts on transportation systems may include:

- **Cracking and Shifting:** Drought conditions can cause soil to dry out and shrink, leading to cracks and shifts in roadways, especially in areas with expansive clay soil. This can result in uneven surfaces, potholes, and damage to the structural integrity of roads, making them unsafe for use.
- **Roadbed Damage:** Low moisture levels can cause subsidence and roadbed instability, requiring more frequent road repairs and maintenance.
- **Soil Subsidence:** The foundations of bridges can be compromised if the surrounding soil dries out and shifts. This can increase the stress on bridge supports, potentially leading to structural issues that require costly repairs.
- **Track Shifting and Damage:** The ground beneath railroad tracks can shift or crack during prolonged droughts, leading to track misalignment or buckling. This increases the risk of derailments and requires more frequent inspection and maintenance.
- **Runway Damage:** The same soil subsidence issues that affect roadways can also impact runways, causing cracks and instability that may need repairs.

A wide variety of data sources, from the Federal Highway Administration to state and federal Departments of Transportation, can be sourced for construction and repair costs. Average per-mile repair costs for local roads, state highways, and interstates can vary widely depending on factors such as the type of repair (resurfacing, reconstruction, or major rehabilitation), local labor and material costs, geographic conditions, and traffic volumes. The following details a range of repair costs for local, state, and interstate roadway systems:

- **Local Roads**
  - Resurfacing/Repaving: Costs generally range between $20,000 to $100,000 per mile.
  - Major Rehabilitation or Reconstruction: Costs generally range between $150,000 to $1 million per mile.
- **State Highways**
  - Resurfacing/Repaving: Costs generally range between $100,000 to $300,000 per mile.
  - Major Rehabilitation or Reconstruction: Costs generally range between $500,000 to $2,000,000 per mile.
- **Interstates**
  - Resurfacing/Repaving: Costs generally range between $250,000 to $1,000,000 per mile.
  - Major Rehabilitation or Reconstruction: Costs generally range between $2,000,000 to $5,000,00 per mile.

Factors affecting roadway construction and repair costs can include:

- **Extent of Damage:** Minor repairs such as resurfacing are cheaper than full-depth reconstruction.
- **Geography and Terrain:** Roads in mountainous or difficult terrains may cost more due to drainage and foundation issues.
- **Traffic Control and Detours:** Roads with heavy traffic may require expensive detour systems and safety measures, especially for interstates and state highways.
- **Urban vs. Rural:** Repairs in urban areas are typically more expensive due to higher labor costs, complex traffic patterns, and higher land costs.
- **Material Costs:** Prices for materials like asphalt, concrete, and steel can vary significantly based on regional supply chains.
- **Environmental and Regulatory Costs:** Permitting, environmental mitigation, and compliance with federal/state regulations can add to the cost.

Bridges crossing rivers can pose significant concerns during flooding events resulting from a dam or levee failure due to the increased risk of structural failure. Floodwater caused by a dam failure can exert powerful hydraulic forces on bridge structures, with the flow of water, debris, and floating objects impacting the bridge's substructure and foundation. Scouring, the removal of soil or sediment around bridge foundations can increase during a flood event, increasing the risk of failure. Floodwater can also cause the deformation and misalignment of bridge components. As water levels rise and fall, the structural elements may undergo stress and strain, potentially leading to long-term damage and misalignment.

A wide variety of data sources, including the Federal Highway Administration and state and federal Departments of Transportation, can be sourced for bridge construction and repair costs. The average construction and repair costs for bridges vary significantly depending on factors like the size and complexity of the bridge, its location, materials used, and the extent of the repairs or construction required. The following details a range of construction costs for bridges:

- **Small Bridge (local, 2-lane bridge over a small waterway or road):** Costs generally range between $150 to $400 per square foot.
- **Medium-Sized Bridge (state highway, spanning larger rivers or railways):** Costs generally range between $300 to $600 per square foot.
- **Large Bridge (interstate or urban multi-lane bridge, often requiring complex engineering):** Costs generally range between $500 to $1,000+ per square foot.

The following details a range of repair costs for bridges:

- **Minor Repairs (deck resurfacing, guardrail fixes, minor structural repairs):** Costs generally range between $50,000 to $500,000.
- **Medium Repairs (replacing sections of the deck, repairing piers or abutments):** Costs generally range between $500,000 to $5,000,000.
- **Major Repairs or Rehabilitation (full deck replacement, structural strengthening, or seismic retrofitting):** Costs generally range between $5,000,000 to $50,000,000.
- **Emergency Repairs (post-disaster or structural failure):** Costs generally range between $10,000,000 to $100,000,000.

Factors affecting bridge construction and repair costs can include:

- **Bridge Type and Design:** Suspension, cable-stayed, truss, arch, or simple beam bridges each have different design requirements and associated costs.
- **Location:** Urban areas or difficult terrains (e.g., over water, in mountainous regions) can significantly increase costs due to land acquisition, permitting, and construction challenges.

- **Materials:** The use of steel, concrete, or composite materials impacts the price. Specialized materials (e.g., weathering steel for durability) increase costs.
- **Traffic Management:** Bridges over busy roads or waterways may require costly traffic diversion plans or temporary structures.
- **Environmental and Regulatory Compliance:** Projects near sensitive areas (rivers, wetlands, protected lands) or those requiring special permits may face higher costs.
- **Labor and Regional Costs:** Labor costs, equipment rates, and material availability can vary widely by region.

Drought can impact both the electrical generation capacity and transmission. The impacts of droughts on electrical systems may include:

- **Thermal Power Plant (Water-Cooled) Cooling Water Shortages:** Thermal power plants (such as coal, natural gas, and nuclear plants) rely on water for cooling. Drought can reduce the availability of water for these cooling processes, forcing plants to reduce output or shut down temporarily.
- **Damage to Power Lines:** Drought increases the risk of wildfires, which can damage or destroy electrical transmission lines, substations, and other infrastructure. Wildfires can cause widespread power outages, as seen in several instances in New Mexico and Australia.
- **Preemptive Power Shutoffs:** To prevent wildfires, power utilities may preemptively shut down power lines during extreme drought and dry wind conditions to avoid sparking fires. This can lead to significant disruptions for businesses and residents.
- **Transmission Line Sag:** Droughts often coincide with extreme heat, which can cause power as the wires expand. This increases the risk of contact with trees or the ground, potentially leading to power outages or safety hazards.

A wide variety of data sources, including the U.S. Energy Information Administration, Federal Energy Regulatory Commission, and the Electric Power Research Institute, can be sourced for construction and repair costs for electrical facilities. The repair costs can vary greatly depending on the type of repair, the size of the location, and the specific components that require attention. Typical repairs cost are:

- **Minor Repairs (Routine Maintenance & Component Replacement):** Costs generally range between $10,000 to $100,000.
- **Moderate Repairs (Replacing Medium-Sized Components):** Costs generally range between $100,000 to $1 million.
- **Major Repairs (Structural or Extensive Mechanical/Electrical Work):** Costs generally range between $1,000,000 to $50,000,000, depending on the scale.
- **Emergency Repairs (After Natural Disasters or Accidents):** Costs generally range between $5,000,000 to $100,000,000.

The cost to reconstruct high-capacity (voltage) power transmission lines varies significantly based on several factors, such as the voltage of the line, geographic terrain, regulatory requirements, and environmental considerations. The following present rough cost estimates for construction:

- **High-Voltage Alternating Current Transmission Lines:**
  - Overhead lines: Costs generally range between $300,000 to $1,000,000 per mile.
  - Underground lines: Costs generally range between $1,000,000 and $10,000,000 per mile.
- **High-Voltage Direct Current Transmission Lines:**
  - Overhead lines: Costs can range between $500,000 to $2 million per mile.
  - Underground lines: Costs can range between $3,000,000 to $15,000,000 per mile Key Factors Affecting Costs:

The cost to construct neighborhood power distribution lines (rather than large high-capacity transmission lines) depends on whether the lines are overhead or underground, as well as factors like geography, local labor rates, and regulatory requirements. The following present rough cost estimates for construction:

- **Overhead Neighborhood Power Distribution Lines:** Costs generally range between $150,000 to $500,000 per mile.
- **Underground Neighborhood Power Distribution Lines:** Costs generally range between $500,000 to $2,000,000 or more per mile.

The cost to repair high-capacity power transmission lines varies widely depending on the extent of the damage, the location, and the type of transmission line. Here are some general considerations:

- **High-Voltage Overhead Transmission Lines:**
  - Minor Repairs (fixing or replacing a small section of damaged wire, insulators, or hardware): Costs generally range between $10,000 and $50,000 per mile.
  - Moderate Repairs (replacing several towers or larger segments of lines): Costs generally range between $50,000 and $200,000 per mile.
  - Major Repairs (such as extensive damage from storms, fires, or other disasters requiring multiple towers, wires, and more complex restoration): Costs generally range between $200,000 to over $1,000,000 per mile.
- **High-Voltage Underground Transmission Lines:**
  - Minor Repairs: Costs generally range between $100,000 to $500,000 per mile.
  - Major Repairs: Costs generally range between $1,000,000 to $5,000,000 or more per mile.

The cost to repair neighborhood power distribution lines, which typically carry lower voltage power than high-capacity transmission lines, also depends on several factors, such as the extent of the damage, whether the lines are overhead or underground, and the location.

- **Overhead Neighborhood Distribution Lines:**
  - Minor Repairs (such as fixing downed lines, poles, or transformers): Costs generally range between $5,000 to $20,000 per mile.
  - Moderate Repairs (replacing several poles, wires, or small transformers): Costs generally range between $20,000 to $100,000 per mile.
  - Major Repairs (extensive damage from a major storm or accident affecting many poles, transformers, and lines): Costs generally range between $100,000 to $500,000 per mile.
- **Underground Neighborhood Distribution Lines:**
  - Minor Repairs (fixing small sections of cable or minor equipment malfunctions): Costs generally range between $50,000 to $150,000 per mile.
  - Moderate Repairs (replacing larger segments of underground cable): Costs generally range between $150,000 to $500,000 per mile.
  - Major Repairs (extensive damage to underground systems, possibly caused by floods, storms, or construction accidents): Costs generally range between $500,000 to $2,000,000 per mile.

Factors influencing both reconstruction and repair costs for electrical transmission lines include:

- **Terrain:** Building lines through mountainous or densely populated areas will increase costs.
- **Permitting and Land Acquisition:** Securing permits and land can add significant costs.
- **Environmental and Regulatory Costs:** Meeting environmental impact requirements and complying with local regulations can also influence the final price.
- **Voltage Level:** Higher voltage transmission lines, such as those over 500 kV, are generally more expensive than lower voltage lines.

Water and Wastewater Utilities

Water utilities are particularly vulnerable to drought conditions due to the direct impact on both water availability and supply. Water utilities can be affected by drought through:

- **Reduced Water Availability:** The reduction in water availability directly impacts the amount of water that water utilities can draw from local sources.
- **Lower Reservoir Levels**: Lower reservoir levels can affect the ability to meet water demand during periods of high usage.
- **Declining Groundwater** Levels: Lower groundwater levels make it more challenging for utilities to extract water.
- **Water Quality Challenges:** Lower water levels can lead to higher concentrations of contaminants, minerals, and sediments in the available water sources, requiring more extensive and costly treatment processes.
- **Increased Treatment Costs:** Treating water from depleted or lower-quality sources during drought conditions may require additional treatment steps, technologies, or chemicals, leading to increased operational costs for water utilities.
- **Competition for Water Resources:** During droughts, there is increased competition for limited water resources among various users, including agriculture, industry, and households. Water utilities may face challenges in securing sufficient water supplies amid this heightened competition.
- **Impact on Water Infrastructure:** Reduced water flow in rivers and streams can expose water infrastructure, such as pipelines, to the risk of corrosion.
- **Water Use Restrictions:** To conserve water during droughts, authorities may implement water use restrictions and conservation measures.

The New Mexico Environmental Department regulates public water systems in New Mexico. A public water system is any water system that serves at least 15 service connections or 25 individuals at least 60 days out of the year. In general, there are three classifications of systems, as follows:

- **Community (C) Water Systems:** A system that serves at least 15 service connections (which may include factories, schools, or places of housing that are on the same distribution system as residences) used by year-round residences or regularly serve at least 25 year-round residents.
- **Non-transient Non-Community (NTNC) Water Systems:** A system that serves at least 25 of the same persons over six months per year not at their residence (e.g., schools or factories that have their own water source).
- **Non-Community (NC) Water Systems:** A system that serves at least 25 persons (but not the same 25) over six months per year, not at their residence (e.g., campgrounds or highway rest stops that have their own water source).

The following have been identified as water utility providers in Torrance County:

Table 40: Torrance County Water Utility Providers

System Number	Water System Name	System Type	Primary Source Water Type
NM3501030	Abo Ruins Salinas Pueblo Missions	NC	Groundwater
NM3590030	Bowlin Flying C Ranch	NC	Groundwater
NM3500930	Carlos Lucero Subdivision	C	Groundwater
NM3500330	Cassandra Water System	C	Groundwater
NM3575330	Clines Corners Water System	C	Groundwater
NM3592530	Count Your Blessing	NTNC	Groundwater
NM3575430	Echo Valley Water Company	C	Groundwater
NM3524830	Edgewood Meadows Water Corp.	C	Groundwater
NM3523930	Encino Water System	C	Groundwater
NM3524030	Estancia Water System	C	Groundwater

Table 40: Torrance County Water Utility Providers

System Number	Water System Name	System Type	Primary Source Water Type
NM3590130	Gran Quivira - Salinas Pueblo Missions	NC	Groundwater
NM3575530	Homestead Water Company	C	Groundwater
NM3546930	Indian Hills Water System	C	Groundwater
NM3590230	Inlow Youth Camp	NC	Groundwater
NM3524130	Manzano Mdwca	C	Groundwater
NM3590330	Manzano Mountain State Park	NC	Groundwater
NM3500130	Melody Ranch Water Co	C	Groundwater
NM3524230	Moriarty Water System	C	Groundwater
NM3595130	Mountain View Elementary School	NTNC	Groundwater
NM3524330	Mountainair Water System	C	Groundwater
NM3524430	Punta De Agua Mdwca	C	Groundwater
NM3590430	Quarai Unit - Salinas Pueblo Missions	NC	Groundwater
NM3590530	Rattlesnake Draw Rest Area	NC	Groundwater
NM3500430	Sunset Acres Water Company	C	Groundwater
NM3524530	Tajique Mdwca	C	Groundwater
NM3524630	Torreon Mdwca	C	Groundwater
NM3524730	Willard Village Of	C	Groundwater
NM3591330	Zia Rv Park	NC	Groundwater
NM3500630	Aguas De Fernandez	NP	Not specified
NM3580030	Akin And Akin Water System	NP	Not specified
NM3500730	Buffalo Trails Water System	NP	Groundwater
NM3523830	Duran Water Users Association	C	Groundwater (purchased)
NM3595030	El Vaquero Cafe	NP	Not specified
NM3591130	Fourth Of July Campground	NC	Groundwater
NM3500530	Green Acres Water System	NP	Not specified
NM3591830	Jenks Cafe	NP	Groundwater
NM3591430	Longhorn Ranch Motel	NP	Not specified
NM3591630	Manzano Senior Citizens Center	NP	Groundwater
NM3591730	Mcintosh Pizza Place	NP	Not specified
NM3593130	Mcintosh Senior Citizen Center	NP	Not specified
NM3591230	New Canyon Campground	NC	Groundwater
NM3500230	Pajarito Estates	NP	Not specified
NM3590830	Pine Shadow Springs	NC	Groundwater
NM3500830	Pumpkin Patch	NP	Not specified
NM3593030	Rainbow Trout Farm	NP	Groundwater
NM3591530	Red Canyon Campground - Usfs	NC	Groundwater
NM3575630	Squaw Valley Water Supply System	NP	Not specified
NM3590630	Sufi Foundation Of America	NC	Groundwater
NM3590930	Wagon Wheel Water System	NP	Not specified
NM3590730	Woodmen Of The World Youth Camp	NC	Groundwater
NM3501130	Dollar General #23653	NP	Not specified
NM3501230	Emwt Regional Water Association	NP	Not specified

Source: New Mexico Environmental Department

Drought can severely challenge a public water supplier through depletion of the raw water supply and greatly increased customer water demand. Even if the raw water supply remains adequate, problems due to limited treatment capacity or limited distribution system capacity may be encountered. Water supply planning is the key to minimizing the effects of drought on the population. Public water suppliers should continue to work to identify vulnerabilities and develop infrastructure, conservation plans, and partnerships to reduce the likelihood of running out of water during a drought.

Communities and citizens served by private wells rather than water supply districts may be at higher risk to drought conditions, and may see the following impacts:

- **Lowering of Water Table:** Drought conditions can lead to a lowering of the water table, which is the level at which groundwater is located. Private wells that rely on groundwater may experience reduced yields or, in extreme cases, may run dry.
- **Decreased Well Recharge:** Drought reduces the amount of precipitation, leading to decreased recharge of groundwater. Private wells depend on a sustainable recharge rate to maintain a consistent and reliable water supply.
- **Increased Competing Demands:** During a drought, increased water demand for agricultural irrigation, municipal water supply, and other uses can create competition for the available groundwater. Private wells may face challenges due to this increased demand.
- **Water Quality Concerns:** Lower groundwater levels during droughts can lead to changes in water quality. Concentrations of minerals, contaminants, and pollutants may increase, affecting the suitability of water for drinking and other uses.

Should it be required to drill a private well deeper to accommodate for drought conditions impacting the level of the water table, on average, the cost to drill a private water well in the United States can range from $15 to $45 per foot. However, it's important to note that this is a general estimate, and actual costs can vary based on geological and hydrogeological conditions and well depth.

Additionally, drought can impact wastewater treatment facilities, and operations, including:

- **Biological Treatment Efficiency:** Many wastewater treatment plants use biological processes that rely on microorganisms to break down waste. These microorganisms depend on a certain balance of water, oxygen, and waste concentration to function effectively. During droughts, changes in the wastewater's composition and flow can reduce the efficiency of biological treatment systems, requiring process adjustments or additional chemical treatments.
- **Pipe Cracking and Ground Shifts:** Drought causes soil to dry out and shrink, potentially leading to ground shifts that can crack or damage underground sewer pipes. This can result in leaks, blockages, or sewer line failures that require costly repairs.
- **Increased Infiltration and Inflow:** During drought, groundwater levels may drop, and sewer systems can experience increased infiltration of saline or contaminated water, particularly in coastal areas. This can exacerbate the corrosion of pipes and other infrastructure.

Torrance County has one wastewater treatment plant in the City of Moriarty.

The costs to repair or reconstruct water and wastewater utility plants and distribution systems can vary significantly based on factors such as the size of the facility, the extent of the damage, local labor costs, and material availability. However, some general estimates can provide insight into the typical expenses.

- **Water Utility Plants**
    - Minor repairs: These may involve fixes to pumps, valves, or small sections of piping. On average, minor repairs for water treatment facilities can range from $10,000 to $100,000, depending on the scale of the damage and the equipment involved.
    - Moderate repairs: More substantial repairs, such as fixing filtration systems or repairing damaged tanks, can cost anywhere from $500,000 to $2,000,000. These projects often involve replacing large equipment and reconfiguring damaged systems.
    - Major repairs or partial reconstruction: For significant damage, such as structural failures, system-wide overhauls, or upgrades, the cost may rise to $10,000,000. This typically includes substantial replacement of infrastructure, new piping systems, and modernizations to meet current standards.

- Reconstruction Costs: Complete reconstruction of a water utility plant can be very expensive, often costing between $30,000,000 and $20,000,000, depending on the capacity of the plant and the complexity of the systems involved.

- **Wastewater Treatment Plants**
  - Minor repairs (such as fixing aerators, pumps, or control systems) can cost between $50,000 and $500,000, depending on the facility's size and the severity of the issues.
  - Moderate repairs: Involves fixing critical components like clarifiers or digesters and can range from $1,000,000 to $5,000,000.
  - Major repairs or upgrades: For larger systems, like upgrading an entire section of a plant or replacing significant infrastructure, the costs can escalate to $10,000,000.
  - Reconstruction Costs: Complete reconstruction of wastewater plants typically ranges between $50,000,000 and $30,000,000, depending on the plant's capacity and required technology. Factors such as meeting modern regulatory standards can also drive costs.
- **Distribution Systems (Water and Wastewater)**
  - Water Distribution System Repair Costs: Repairing or replacing damaged pipelines, pumps, or valves in water distribution systems can cost anywhere from $50,000 to $200,000 per mile for minor repairs. More extensive pipe replacement, especially in urban areas where digging and rerouting traffic are involved, can escalate to $500,000 to $2,000,000 per mile.
  - Wastewater Distribution Repair Costs: pipelines (especially those dealing with larger sewage systems) tend to have higher repair costs due to increased complexity. These can range from $1 million to $3 million per mile, especially in densely populated regions or for large diameter pipes.
  - Water Distribution Reconstruction Costs: For water distribution system reconstruction, costs can range from $1,000,000 to $5,000,000 per mile, particularly for high-capacity urban systems with large pipe diameters or advanced technology like smart metering.
  - Wastewater Distribution Reconstruction Costs: For wastewater system reconstruction, particularly for larger pipelines, the cost per mile can range from $3,000,000 to $8,000,000, depending on the urban density, excavation challenges, and regulatory requirements.

Medical and Response Facilities
In general, medical and response facilities are not directly vulnerable to losses as a result of drought. Both operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages.

Educational Facilities
In general, educational facilities are not directly vulnerable to losses as a result of drought. Both operations and facilities will likely experience minimal impacts from drought conditions, unless there are substantial power, communications, or water outages.

Communication Systems
In general, communications systems are not directly vulnerable to losses as a result of drought, and would likely experience minimal impacts from drought conditions, unless there are substantial power outages.

Environmental and Agricultural Impacts
Drought conditions can cause significant agricultural impacts. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of wildfires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Mapping from the United States Department of Agriculture details no reported total county-wide agricultural losses due to drought conditions for the period 1989 through 2023.

Although environmental losses are difficult to quantify, increasing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects. Environmental losses are the result of damage to plant and animal species, wildlife habitat, and air and water quality, wildfires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from it if it is a temporary aberration. However, the degradation of landscape quality, with increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** Drought conditions may increase the occurrences of wildfires. Additionally, drought conditions may increase the occurrences of wildfires.
- **Estancia:** With 11.0% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, drought conditions may increase the occurrences of wildfires. Finally, drought conditions may increase the occurrences of wildfires.
- **Moriarty:** With 39.1% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, drought conditions may increase the occurrences of wildfires. Finally, drought conditions may increase the occurrences of wildfires.
- **Mountainair:** With 28.6% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, drought conditions may increase the occurrences of wildfires. Finally, drought conditions may increase the occurrences of wildfires.
- **Willard:** With 38.2% of citizens living in poverty, drought is a concern as access to water may become more expensive due to supply limitations. Additionally, drought conditions may increase the occurrences of wildfires. Finally, drought conditions may increase the occurrences of wildfires.
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to a drought event. Impacts on sensitive areas may be significant.

Cascading Impacts
Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with drought may include:

- Decrease in water quality
- Increased wildfire risk
- Environmental degradation
- Land subsidence
- Damage to agricultural lands

Consequence Analysis
This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table : Drought Consequence Analysis

Subject	Potential Impacts
Impact on the Public	If the drought coincides with warmer months, vulnerable populations may face an increased risk of dehydration, death, heat-related illness, heat stroke. Lower quantities of water may also increase the likelihood of contamination due to higher concentratio41ns of bacteria. During droughts, dry soils and wildfires increase the number of airborne particles, such as pollen and smoke, which can worsen chronic respiratory illnesses.
Impact on Responders	Reduced water availability would likely complicate firefighting efforts in urban and suburban areas where wildfire-fighting tactics such as chemical retardants and controlled burns are less suitable. Some fire suppression equipment requires a minimum level of water pressure to activate. If the drought coincides with warm months, first responders may face increased risk of heat-related injuries or death.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. While the expectation is minimal, this threat may impact an agency's ability to implement their continuity plan based on the hazard's potential to impact power, communications, or water outages.
Delivery of Services	Droughts may impact the delivery of goods and services if there are shortages of raw materials.
Property, Facilities, and Infrastructure	Drought conditions may threaten the levels or quality of municipal public water supplies or impact small communities and/or private potable water wells.
Impact on Environment	The potential of drought-related impacts could have significant impacts on supplies of animal feed, livestock, meat and dairy products, and processed grain products, and on crop production. Drought conditions may also increase the potential for fires. Drought is also associated with insect infestations, plant disease, wind erosion of soil, and decrease in levels of water produced by natural aquifers.
Economic Conditions	The economic impacts from a drought could be significant. Droughts have the potential to drain state, and local resources, which will have a significant fiscal impact.
Public Confidence in Governance	Droughts can adversely affect the public, first responders, infrastructure, agriculture, economy, and overall operations. Direct, effective, and timely response by all levels of government is required for public confidence in governance, especially in recognizing and mitigating economic impacts of the drought.

5.8.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number of elderly citizens and citizens living below the poverty level in all jurisdictions as a percentage of total population. These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources
- Health vulnerabilities
- Dependence on agriculture for low level employment
- Social isolation

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease.

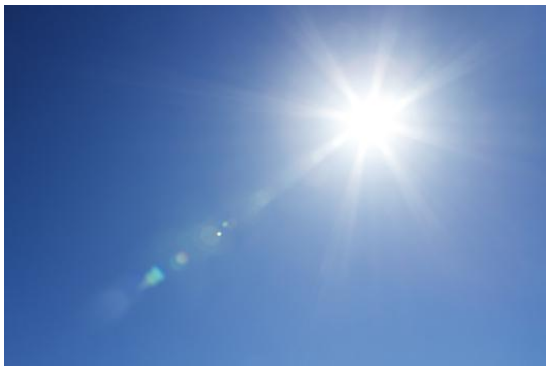
5.8.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the drought hazard.

Table 42: Example Drought Mitigation Actions

Category	Example Action
Planning and Regulation	Gather and analyze water and climate data to gain a better understanding of local climate and drought history.
	Identify available water supplies.
	Improve water supply monitoring.
	Develop a drought emergency plan.
	Develop criteria or triggers for drought-related actions.
	Develop a drought communication plan to facilitate timely communication of relevant information.
	Establish an irrigation time/scheduling program or process so that all agricultural land gets the required amount of water.
	Develop an ordinance to restrict the use of public water resources for non-essential usage.
	Adopt ordinances to prioritize or control water use, particularly for emergency situations like fire fighting.
Infrastructure	Design water delivery systems to accommodate drought events.
	Develop new or upgrading existing water delivery systems to eliminate breaks and leaks.
Natural Systems	Incorporate drought tolerance practices into landscape ordinances to reduce dependence on irrigation.
	Provide incentives for xeriscaping.
	Use permeable driveways and surfaces to reduce runoff and promote groundwater recharge.
Education	Provide information on installing low-flow water saving showerheads and toilets.
	Provide information on adjusting sprinklers to water the lawn and not the sidewalk or street.
	Provide information on installing rain-capturing devices for irrigation.
	Encourage the installation of graywater systems in homes to encourage water reuse.

5.9 Extreme Heat



5.9.1 Hazard Description

Extreme heat events occur when climate conditions produce temperatures well outside of the predicted norm. These extremes can have severe impacts on human health and mortality, natural ecosystems, agriculture, and other economic sectors.

The Centers for Disease Control and Prevention (CDC) identifies the following six groups as being especially vulnerable to extreme heat:

- Older Adults (aged 65)
- Infants and Children
- Individuals with Chronic Conditions
- Low-income Individuals
- Athletes
- Outdoor workers

5.9.2 Location & Extent

Torrance County exhibits a semi-arid climate with notable temperature variations influenced by seasonal changes and elevation differences. The following details temperature expectations by season:

- **Winter (December to February):** Average daytime highs range from the mid-30s°F in higher elevations to the mid-50s°F in lower areas. Nighttime lows often fall below freezing, with higher elevations experiencing colder temperatures.
- **Spring (March to May):** Temperatures gradually rise, with average highs ranging from the upper 50s°F to mid-70s°F.
- **Summer (June to August):** Daytime highs typically range from the upper 80s°F to low 90s°F, with July being the warmest month, averaging around 87.2°F.
- **Fall (September to November):** Temperatures begin to decline, with average highs ranging from the mid-70s°F in September to the upper 50s°F by November.

Elevation plays a significant role in temperature variations within Torrance County. Generally, temperatures decrease by approximately 3°F for every 1,000-foot increase in elevation. This means that higher elevations, such as those in the Manzano Mountains, experience cooler temperatures compared to the lower central plains of the county.

The county experiences a broad temperature range due to its altitude variations, with higher elevations experiencing cooler temperatures year-round. While all of Torrance County is vulnerable to extreme heat, in general terms mountainous communities are at a much lower risk of extreme heat events. Extreme heat may be defined as follows.

- **Extreme Heat:** Days when the maximum temperature is above 91.4 degrees Fahrenheit.

The following table, using data from the NWS, details the average high and low temperatures for Torrance County:

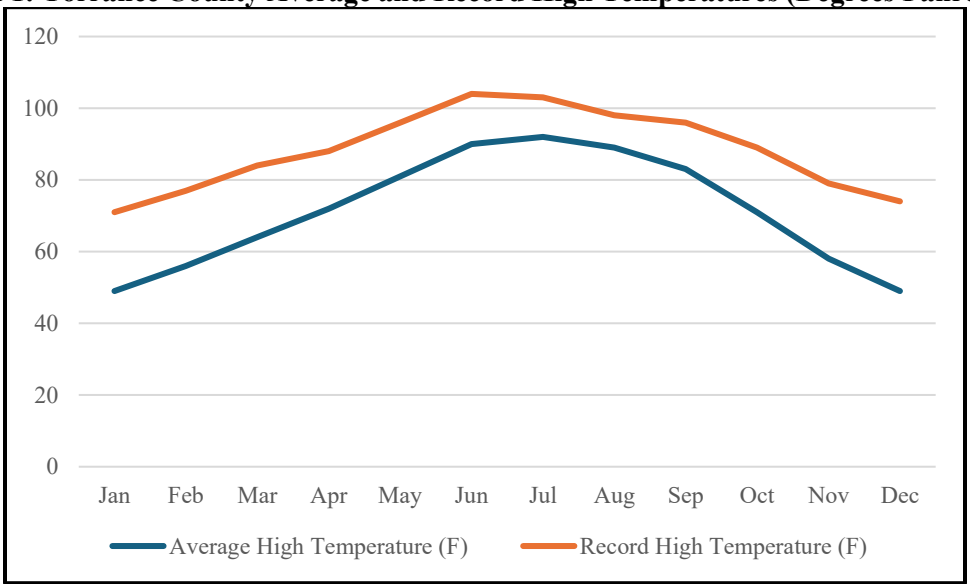
Table 43: Torrance County Temperature Averages (Degrees Fahrenheit)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High Temperature (F)	49°	56°	64°	72°	81°	90°	92°	89°	83°	71°	58°	49°
Record High Temperature (F)	71°	77°	84°	88°	96°	104°	103°	98°	96°	89°	79°	74

Source: NWS

The following graphs illustrate the above data.

Graph 1: Torrance County Average and Record High Temperatures (Degrees Fahrenheit)



Source: NWS

The following indicate the average summer high and recorded high temperatures (if available), and provide an indication of the potential extent of future events:

- **Encino:** Average summer high temperature is 88°F with a documented high of 104°F.
- **Estancia:** Average summer high temperature is 89°F with a documented high of 104°F.
- **Mountainair:** Average summer high temperature is 87°F with no documented high.
- **Moriarty** Average summer high temperature is 89°F with no documented high.
- **Willard:** Average summer high temperature is 88°F with no documented high.
- **SWCDs:** Spanning large areas, these districts can expect average summer temperatures ranging from 87-89°F.

The MPC view extreme heat as both a local and county-wide hazard. Discussions with the MPC and a review of all available data indicated that while extreme heat is a concern for all participating jurisdictions, some jurisdictions may have a greater concern. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Extreme heat identified as a potentially growing community concern as citizens, agriculture, and the environment are vulnerable. Additionally, an increase in extreme heat may increase wildfire events.
- **Encino:** Extreme heat identified as a minor, but potentially increasing community concern as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat may increase wildfire events. However, the elevation of the jurisdiction is expected to have a mitigation effect on temperatures.
- **Estancia:** Extreme heat identified as a minor, but potentially increasing community concern as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat may increase wildfire events. However, the elevation of the jurisdiction is expected to have a mitigation effect on temperatures.
- **Moriarty:** Extreme heat identified as a minor, but potentially increasing community concern as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat may increase wildfire events. However, the elevation of the jurisdiction is expected to have a mitigation effect on temperatures.
- **Mountainair:** Extreme heat identified as a minor, but potentially increasing community concern as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat may increase wildfire events. However, the elevation of the jurisdiction is expected to have a mitigation effect on temperatures.

- **Willard:** Extreme heat identified as a minor, but potentially increasing community concern as citizens, agriculture, and the environment are potentially vulnerable. Any increase in extreme heat may increase wildfire events. However, the elevation of the jurisdiction is expected to have a mitigation effect on temperatures.
- **Soil and Water Conservation Districts:** Extreme heat identified as a minor, but potentially increasing concern as areas of stewardship are vulnerable to potential impacts. Any increase in extreme heat may increase both drought and wildfire events, impacting both soil and water resources.

5.9.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Torrance County has experienced no Presidential Disaster Declarations related to extreme heat.

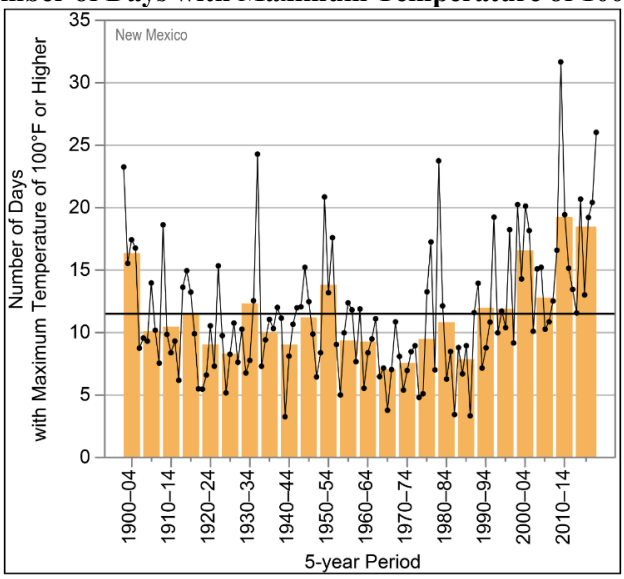
The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Torrance County has experienced no Emergency Declarations related to extreme heat.

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. Torrance County has experienced no proclamations of a State of Emergency related to extreme heat.

Additionally, data from the NCEI from 1950 through 2024 indicates no reported extreme heat events.

According to the NOAA NCEI State Climate Summary 2022 for New Mexico, since 1990 the number of extremely hot days has risen on average (although not all locations have experienced increases). The greatest number of days was recorded in the 2010–2014 period, with the 5 long-term stations averaging 19 days per year with temperatures higher than 100°F.

Chart 14: Number of Days with Maximum Temperature of 100° F or Higher



Source: NOAA NCEI State Climate Summary 2022 for New Mexico

5.9.4 Probability of Future Events

The following tables, using data from the NCEI, indicate the yearly probability of an extreme heat event, the number of deaths or injuries, and estimated property damage for all Torrance County participating jurisdictions based on 75 years' worth of reporting data:

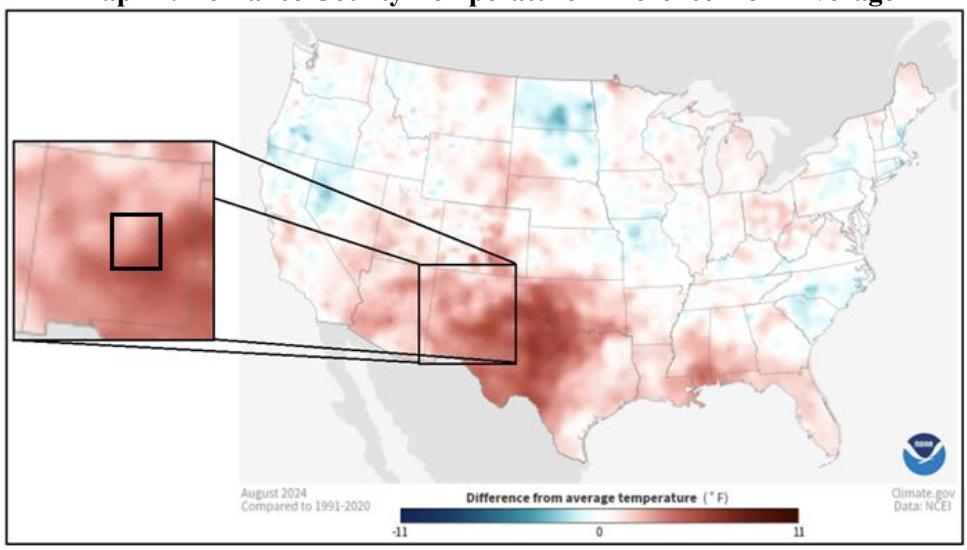
Table 44: Torrance County NCEI Extreme Heat Event Probability Summary

County	Number of Events	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Torrance	0	0	0	0	$0	$0

Source: NCEI

However, available data suggests that both the average high temperatures and the record high temperature will likely continue to increase over the coming years. as indicated by the following map from NOAA indicating the temperature difference from average:

Map 24: Torrance County Temperature Difference from Average



Source: NOAA

5.9.5 Projected Changes in Location, Intensity, Frequency, and Duration

Recent modeling results indicate that extreme heat events may become more common for Torrance County. Recent multiyear periods have been among some of the warmest on record for Torrance County. Rising average temperatures produce a more variable climate system which may result in an increase in the frequency and severity of some extreme weather events including longer and hotter heat waves. Additionally, rising temperatures can harm air quality and amplify existing threats to human health. Warmer weather can increase the production of ground-level ozone, a pollutant that causes lung and heart problems. Heat stress is expected to increase as changing conditions bring hotter summer temperatures and more humidity. Certain people are especially vulnerable, including children, the elderly, the sick, and those living below the poverty line.

Available data suggests that both the average high temperatures and the record high temperature will likely continue to increase over the coming years

5.9.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from extreme heat. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 45: Participating Jurisdiction Extreme Heat Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	No Rating	0	0
Moriarty	35057963202	No Rating	0	0
Estancia	35057963601	No Rating	0	0
Encino, Mountainair and Willard	35057963700	No Rating	0	0

Source: FEMA NRI

Table 46: Participating Jurisdiction Extreme Heat Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	No Expected Annual Losses	0	$0
Moriarty	35057963202	No Expected Annual Losses	0	$0
Estancia	35057963601	No Expected Annual Losses	0	$0
Encino, Mountainair and Willard	35057963700	No Expected Annual Losses	0	$0

Source: FEMA NRI

Population

A primary concern with this hazard is human health safety issues, as extreme heat can be a direct cause of death. Specific at-risk groups include outdoor workers, farmers, young children, and senior citizens. Impacts on human health can include:

- **Heat Exhaustion and Heat Stroke:** Prolonged exposure to high temperatures can lead to heat exhaustion, characterized by heavy sweating, weakness, and dizziness. If untreated, it can escalate to heat stroke, a life-threatening condition with symptoms like confusion, high body temperature, and loss of consciousness.
- **Respiratory Issues:** High temperatures can worsen air quality, increasing levels of ozone and allergens, which can exacerbate asthma and other respiratory conditions.
- **Cardiovascular Strain:** Extreme heat can put additional stress on the heart, increasing the risk of heart attacks and other cardiovascular problems, particularly in older adults.
- **Dehydration:** Heat can lead to increased fluid loss through sweating, which can result in dehydration, affecting bodily functions and overall health.

The following table discusses potential impacts on human health related to excessive heat by temperature range.

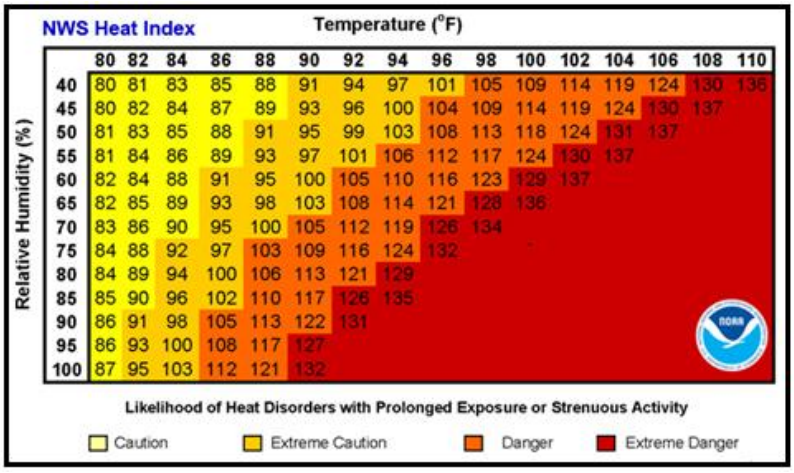
Table 47: Extreme Heat Impacts on Human Health

Heat Index Temperature	Potential Impact on Human Health
80-90° F	Fatigue possible with prolonged exposure and/or physical activity
90-105° F	Sunstroke, heat cramps, and heat exhaustion possible
105-130° F	Heatstroke/sunstroke is highly likely with continued exposure

Source: National Weather Service Heat Index Program

Exposure to direct sun can increase Heat Index values by as much as 15°F. The zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity. The following chart, from the NWS, indicates Heat Index values.

Chart 15: Heat Index



Source: NWS

Extreme heat may disproportionately affect socially vulnerable populations, exacerbating pre-existing inequalities and making recovery more difficult for these groups. Extreme heat may disproportionately impact vulnerable populations in the following ways:

- **Elderly Individuals:** Older adults often have reduced physiological resilience to heat due to age-related factors and chronic health conditions, making them more susceptible to heat-related illnesses.
- **Children: Young** children are less able to regulate their body temperature and are at a higher risk for heat exhaustion and dehydration.
- **Low-Income Communities:** Those in low-income neighborhoods may lack access to air conditioning, adequate housing, or resources to stay cool, increasing their risk during heat events.
- **People with Chronic Health Conditions:** Individuals with cardiovascular, respiratory, or other chronic health issues may face heightened risks from extreme heat, as their bodies may struggle to cope with elevated temperatures.
- **Homeless Individuals:** People experiencing homelessness often have limited access to shelter and cooling facilities, making them particularly vulnerable during heat waves.

All Torrance County and participating jurisdictions are vulnerable to the impacts of extreme heat. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures
In general, buildings and structures will not be impacted by short-term extreme heat events. It is possible that long-term heat events could cause impacts, including:

- **Thermal Expansion:** High temperatures can cause building materials, such as metal and concrete, to expand. This can lead to warping, cracking, and structural stress.
- **Roof Damage:** Prolonged exposure to extreme heat can deteriorate roofing materials, leading to leaks, reduced lifespan, and increased maintenance costs.
- **Foundation Issues:** Prolonged heat can affect the moisture content in the soil surrounding a building's foundation, potentially leading to shifting or settling.

Transportation and Electrical Infrastructure
Extreme heat can have numerous impacts on both transportation and electrical distribution systems, often leading to challenges that require proactive management. The impacts of extreme heat on transportation systems may include:

- **Road Surface Damage:** High temperatures can cause asphalt to soften, leading to ruts, cracks, and buckling. This can compromise road safety and require costly repairs.
- **Railway Tracks:** Steel tracks can expand in extreme heat, leading to potential warping or misalignment (known as "sun kinks"), which can disrupt train services and pose safety risks.
- **Bridges and Overpasses:** Expansion joints may be affected, and excessive heat can lead to structural stress, potentially compromising safety and necessitating inspections or repairs.
- **Traffic Signals and Signage:** Heat can affect the functionality of electronic traffic signals and signage, leading to malfunctions that could result in traffic disruptions or accidents.
- **Public Transit Systems:** Buses and trains may face increased operational challenges due to overheating engines and equipment failures, which can impact schedules and reliability.

Extreme heat can impact both the electrical generation capacity and transmission. The impacts of extreme heat on electrical systems may include:

- **Increased Demand:** High temperatures typically lead to increased use of air conditioning, resulting in a surge in electricity demand that can strain the grid.

- **Transformer Overheating:** Electrical transformers can overheat during extreme heat events, leading to failures or outages.
- **Power Lines:** Extreme heat can cause power lines to sag due to thermal expansion, increasing the risk of contact with trees or other objects, which can result in outages or fires.
- **Substation Performance:** High temperatures can impair the performance of substations, potentially leading to overloads and failures.
- **Energy Efficiency:** Excessive heat can reduce the efficiency of power generation, particularly for fossil fuel and nuclear plants, leading to decreased output during peak demand times.
- **Renewable Energy Impact:** While solar panels can generate more energy in high temperatures, their efficiency can drop significantly beyond certain heat thresholds.

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Facilities and Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.8.6.

Water and Wastewater Utilities

Water and wastewater utilities are vulnerable to extreme events due to the potential for plant damages and distribution system damages. Impacts may include:

- **Pipe bursts and leaks:** Heat can cause soil to dry and shift, leading to cracks or bursts in aging water distribution pipes. Temperature fluctuations also lead to expansion and contraction in pipes, potentially increasing the risk of failure.
- **Reduced efficiency of equipment:** Pumps, motors, and other mechanical systems in water treatment facilities may become less efficient or experience overheating during prolonged high temperatures.
- **Reduced water availability:** In open water storage or reservoirs, high temperatures lead to greater evaporation, reducing the overall available water supply. This may lead to restrictions or necessitate sourcing from alternative supplies.
- **Changes in treatment efficiency:** Biological treatment processes in wastewater treatment plants can be disrupted due to temperature, impacting the breakdown of organic matter and nutrient removal processes.

Information concerning the costs to repair or reconstruct water and wastewater infrastructure may be found in Section 5.8.6.

Medical and Response Facilities

While extreme heat may result in a temporary increase in patients, it is considered unlikely that any influx would overwhelm current medical capabilities. Depending on educational facility capability, extreme heat may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work. First response facilities are expected to be unimpacted.

Educational Facilities

Depending on educational facility capability, extreme heat may necessitate the closure of the facility for the duration of the event. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

Communication Systems

Extreme heat can disrupt this vital communications system, affecting reliability and functionality. Extreme heat can lead to power outages due to down power lines or damaging electrical substations. Communication systems that rely on electricity, such as landline phones, internet routers, and cellular towers, may cease to function during power outages.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. The following

data, from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency, indicates cost ranges for communications system components:

Table 48: Summary of Communication System Component Costs

Components	Examples	Cost	Expected Lifespan
Infrastructure	Towers, shelters, commercial and backup power equipment,	$$$–$$$$$	20–25 years
Fixed Station Equipment	Antennas, repeaters, towers on wheels, consoles, mobile stations, servers, computers, physical and electronic security elements (e.g., fencing, cameras, monitors, environmental conditions)	$$-$$$	3-15 years
Devices	Handheld portable radios, cellular phones, satellite phones, mobile data devices	$-$$	2-10 years
Accessories	Holsters, chargers, speakers, lapel microphone extensions, Bluetooth, vehicle kits, air cards, intercoms	$	2-10 years
Features	Encryption to protect against security risks, ruggedization to ensure reliant services, Over-the-Air-Programming, automatic roaming	$-$$$	-
Software and Data Storage	Global information system, emergency notifications, monitoring, call answering, database access, Automatic Vehicle Locator	$-$$	-

Source: U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency

Environmental and Agricultural Impacts

Extreme heat can cause significant damage to the local environment by dehydrating vegetation and wildlife, which may result in cascading effects to the surrounding environment, such as drought, wildfires, mudslides, or landslides. Extreme heat may severely decrease the yield of the agricultural sector. The yield of cash crops may be reduced, livestock may be adversely impacted by extreme heat, or grazing losses may be incurred by farmers or ranchers; potentially resulting in decreased food security. In the event of significant agricultural losses caused by extreme heat or drought, some assistance may be available to impacted farms or ranches.

Extreme heat conditions can cause significant agricultural impacts. Mapping from the United States Department of Agriculture indicates no reported total county-wide agricultural losses due to extreme heat conditions from 1989 – 2023.

Jurisdictional Concerns:

As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** With 26.2% of citizens living in poverty, and 20.6% of citizens over the age of 65, extreme heat is a minor concern as jurisdictional elevation somewhat mitigates potential occurrences. This is due to increased energy costs potentially impacting the ability to cool residences and the associated negative health effects. Any increase in extreme heat conditions may increase the potential for wildfires.
- **Estancia:** With 11.0% of citizens living in poverty, and 19.2% of citizens over the age of 65, extreme heat is a minor concern as jurisdictional elevation somewhat mitigates potential occurrences. This is due to increased energy costs potentially impacting the ability to cool residences and the associated negative health effects. Any increase in extreme heat conditions may increase the potential for wildfires.
- **Moriarty:** With 39.1% of citizens living in poverty, and 17.7% of citizens over the age of 65, extreme heat is a minor concern as jurisdictional elevation somewhat mitigates potential occurrences. This is due to increased energy costs potentially impacting the ability to cool residences and the associated negative health effects. Any increase in extreme heat conditions may increase the potential for wildfires.
- **Mountainair:** With 28.6% of citizens living in poverty, and 30.3% of citizens over the age of 65, extreme heat is a minor concern as jurisdictional elevation somewhat mitigates potential occurrences. This is due to increased

energy costs potentially impacting the ability to cool residences and the associated negative health effects. Any increase in extreme heat conditions may increase the potential for wildfires.

- **Willard:** With 38.2% of citizens living in poverty, and 8.3% of citizens over the age of 65, extreme heat is a minor concern as jurisdictional elevation somewhat mitigates potential occurrences. This is due to increased energy costs potentially impacting the ability to cool residences and the associated negative health effects. Any increase in extreme heat conditions may increase the potential for wildfires.
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to an extreme heat event. Impacts on sensitive areas may be significant.

Cascading Impacts

Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with extreme may include:

- Drought conditions, or worsening of drought conditions
- Heat-related illnesses and mortality
- Power outages
- Water shortage and/or diminished water quality
- Crop failure and reduced yields and livestock mortality
- Wildfires

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 49: Extreme Temperature Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Extreme heat can have severe consequences for health, particularly for the elderly and young. Loss of electricity may impact heating or air conditioning leading to poorly tolerated indoor temperatures. Physical effects of extreme heat can cause major health problems and may lead to injury or death.
Impact on Responders	Without proper mitigation efforts, responders may be susceptible to temperature-related illness. Extreme heat may also damage instruments or equipment necessary for response activities. First responders may face dangerous road conditions leading to accidents and prolonged response times.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. This hazard may impact an agency's ability to implement continuity operations due to power outages, causing a lack of computer/network access.
Delivery of Services	Extreme heat can impact efficient delivery or inability of goods or services due to potential health impacts on workers. Equipment and vehicles may be damaged, and the delivery of services may be delayed due to poor travel conditions
Property, Facilities, and Infrastructure	Facility integrity is at risk with regards to power cables and stations being overused and limiting operations. This could lead to limits on facility heating or cooling.
Impact on Environment	Extreme heat can cause significant damage to the local environment and result in habitat loss, invasive species, and changes in migration. Livestock are adversely affected by extreme heat and may suffer medical problems or death. A significant impact on water supply caused by elevated temperatures is the increase in frequency and impact of harmful algal blooms and occurrence of cyanobacteria.
Economic Conditions	Extreme heat may drain local resources. Under some conditions, some of the costs can be recouped through federal grant reimbursements.
Public Confidence in Governance	Governmental response, on all levels, requires direct actions that must be immediate and effective to maintain public confidence.

5.9.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number of elderly citizens and citizens living below the poverty level in all jurisdictions as a percentage of total population. These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources
- Health vulnerabilities
- Dependence on agriculture for low level employment
- Social isolation

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease

5.9.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 50: Example Extreme Heat Mitigation Actions

Category	Example Action
Planning and Regulation	Adopt and enforce updated building code provisions to properly insulate structures.
	Support financial incentives, such as low interest loans or tax breaks, for home and business owners who retrofit their structures to mitigate heat.
	Develop an inventory of public and commercial buildings that may be used for cooling shelters.
Infrastructure	Encourage installation of green roofs, which provide shade and remove heat from the roof surface and surrounding air.
	Use cool roofing products that reflect sunlight and heat away from a building.
Natural Systems Protection	Increase tree plantings around buildings to shade parking lots and along public rights-of-way.
Education	Develop an outreach program about extreme heat risk and mitigation activities in homes, schools, and businesses.
	Educate homeowners about retrofitting homes and encouraging retrofit to mitigate heat.

5.10 Flood

5.10.1 Hazard Description



Flooding is the overflow or accumulation of water on normally dry land, often caused by heavy rainfall, snowmelt, or the failure of natural or artificial barriers. Flooding can lead to the inundation of homes, roads, farmland, and other areas, causing damage to property, disruption of daily life, and potential threats to human safety and the environment.

A floodplain is a flat or gently sloping area adjacent to a river, stream, or other water body. These areas act as a buffer during periods of heavy rainfall or snowmelt, absorbing excess water and preventing it from rushing downstream too quickly. In its common usage, a floodplain refers to areas inundated by the 100-year flood, the flood that has a 1% chance of being equaled or exceeded in any given year, and the 500-year flood, the flood that has a 0.2% chance of being equaled or exceeded in any given year. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the NFIP.

5.10.2 Location and Extent

A variety of factors affect the severity of flooding within Torrance County. These include topography, weather characteristics, development, and geology. Intense flooding may create extreme damage and disruption in any jurisdiction affected.

Flash Flooding

Flash flooding occurs during heavy or extended periods of rain, generally when the ground is unable to rapidly absorb the water. Most flash flooding in Torrance County is caused by intense and stationary storm events and atmospheric rivers. Heavy sustained rain can create rapid flooding very quickly, and flooding can occur miles away from where the rain fell. Factors that can contribute to the severity of flash flooding include rainfall intensity, duration, drainage condition, and ground conditions (paved or unpaved). Flash floods are particularly dangerous to people and property, as six inches of moving water can knock a person down and two feet can lift a vehicle. As there is often little warning of a flash flood event, they are the cause of most flood fatalities.

Riverine Flooding

Riverine flooding refers to the overflow of water from a river or a stream onto adjacent land areas. This type of flooding occurs when the water level in a river or stream rises significantly and exceeds its banks, inundating the surrounding areas. The severity of riverine flooding can be influenced by the amount and intensity of rainfall in the watershed, the size, shape, and slope of the river or stream channel, and the presence of dams on the river system.

Urban Flooding

FEMA defines urban flooding as ‘the inundation of property in a built environment, particularly in more densely populated areas, caused by rain falling on increased amounts of impervious surfaces and overwhelming the capacity of drainage systems.” In Torrance County, urban flooding has consistently increased due to a number of factors, including the filling for development of natural wetlands and waterways, the reduction of permeable surfaces, and the aging and insufficient capacity of stormwater systems.

To establish floodplains, FEMA adopted the Base Flood Elevation (BFE), which is the computed elevation that floodwater is anticipated to rise during a flood that has a 1% chance of occurring in any given year. The BFE establishes the regulatory requirement for the elevation or floodproofing of structures, and the relationship between the BFE and a given structure’s elevation determines the flood insurance premium through the NFIP.

FEMA, through the Risk Mapping, Assessment, and Planning (Risk MAP) program, works with partners to assess and map these flood risks producing Flood Insurance Rate Maps (FIRMs). As an additional benefit, the FIRMs serve as the basis for NFIP regulations and flood insurance purchase requirements.

SFHAs are defined as the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance flood is also referred to as the base flood or 100-year flood. The FIRM depicts the SFHA, including the 1%-annual-chance flood. These areas are labeled on the map as zone, as explained in the following table:

The following table details FEMA's FIRM flood zone classifications.

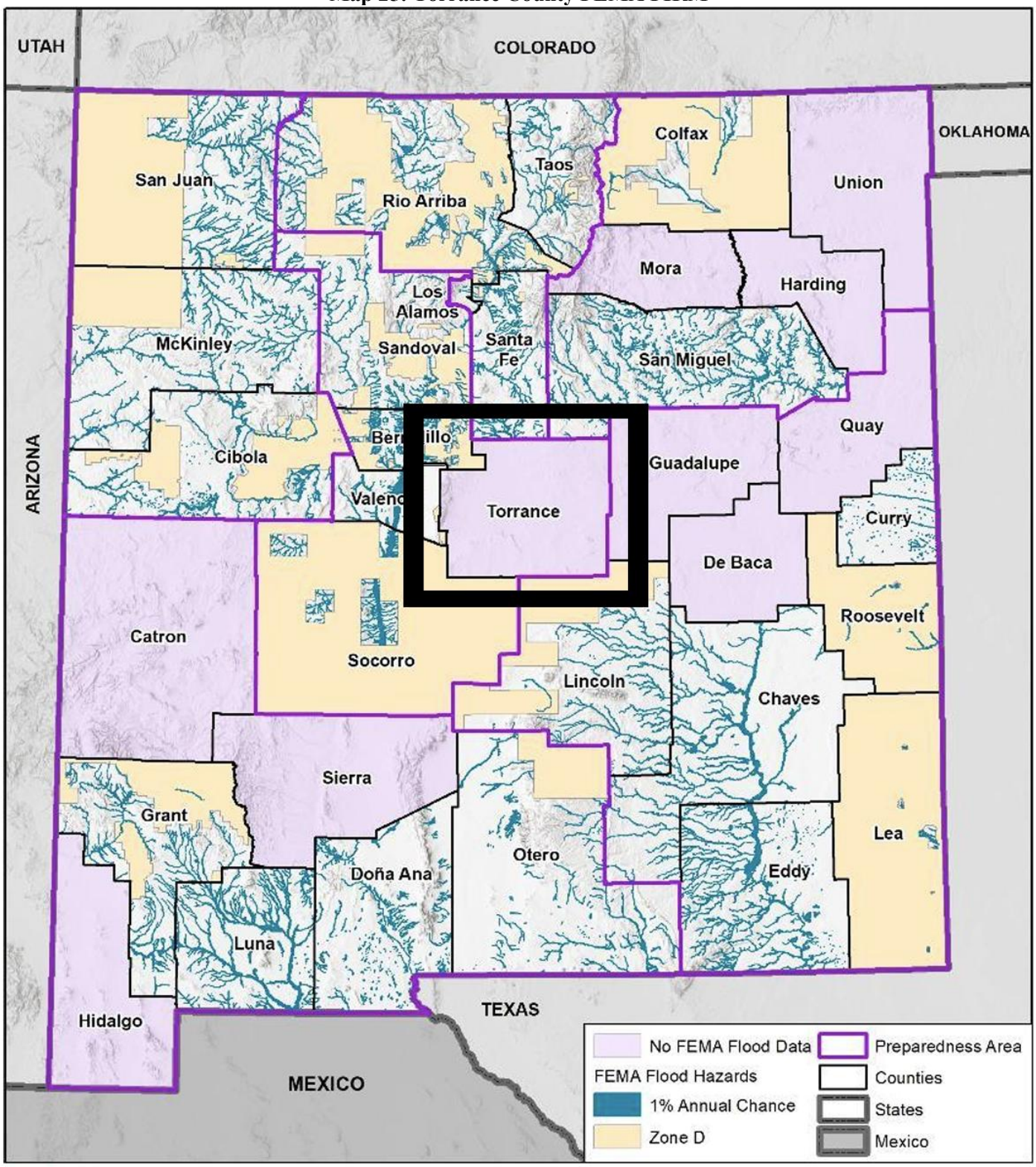
Table 51: Flood Zone Classifications

Zone	Description
A	The 1%-annual-chance or base floodplain. There are six (6) types of A Zones.
AE	The base floodplain where base flood elevations are provided.
AH	Shallow flooding base floodplain. BFEs are provided.
AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
AR	The base floodplain that results from the decertification of a previously accredited flood protection system that is in the process of being restored to provide a 1%-annual-chance or greater level of flood protection.
A99	Area to be protected from base flood by levees or Federal Flood Protection Systems under construction. BFEs are not determined.
B or Shaded X	Areas between the limits of the base flood and the 0.2% annual-chance (or 500-year) flood.
C or Unshaded X	Areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2% annual-chance flood

Source: FEMA

In general, current FEMA FIRMs are not available for Torrance county and participating jurisdictions. Estancia and Moriarty do have FIRMs, however the maps are from before 1990 and are likely no longer indicative of current flood areas.

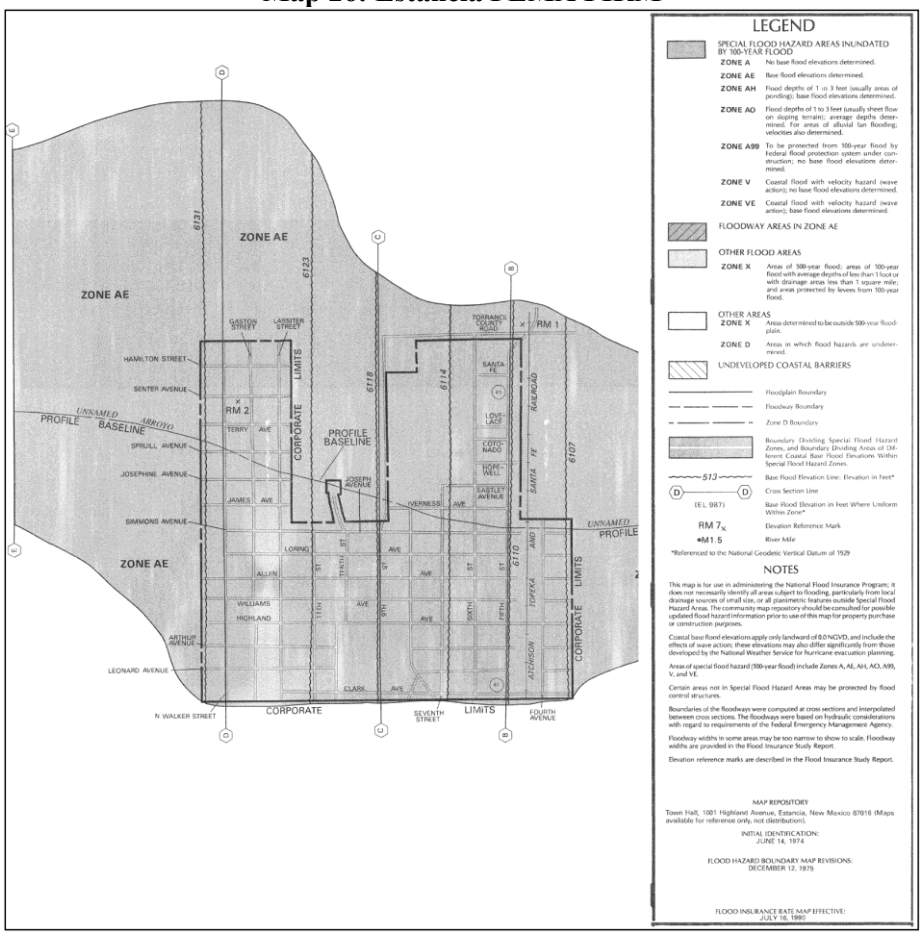
Map 25: Torrance County FEMA FIRM



Source: State of New Mexico

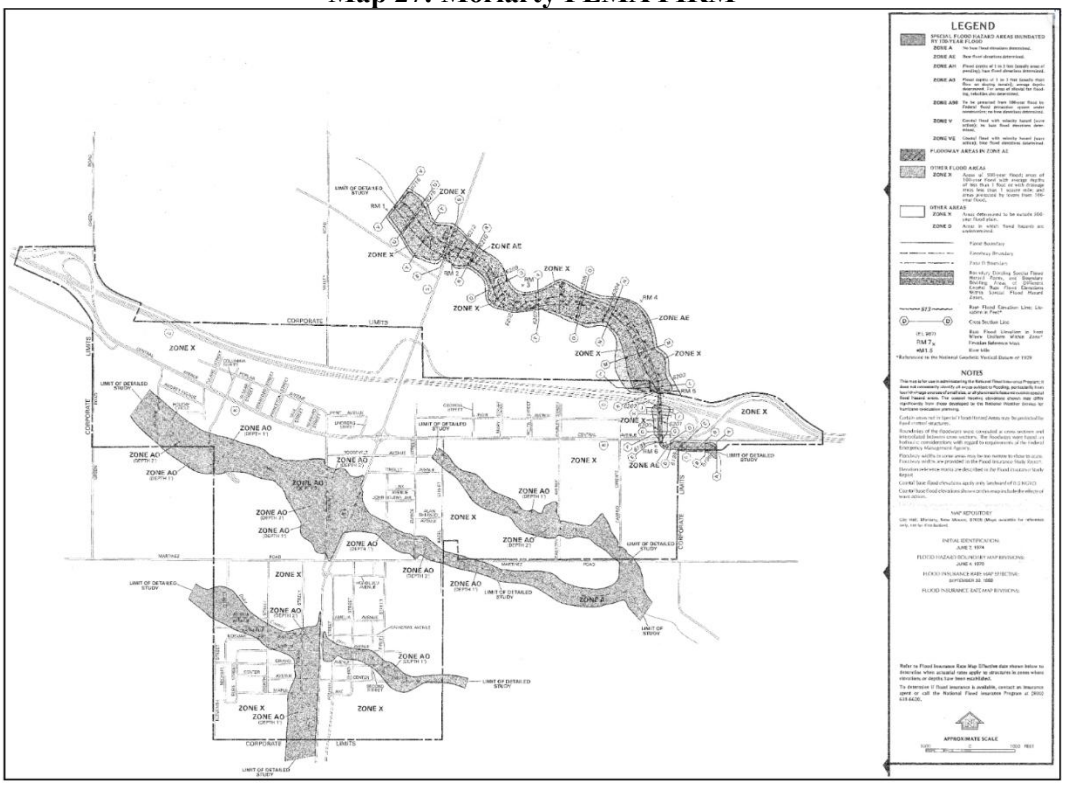
While the above map indicates that there is no FEMA flood data for Torrance County, the following hard copy FIRMs for Estancia and Moriarty were discovered in archives. These FIRMs have not seen an update in over 30 years:

Map 26: Estancia FEMA FIRM



Source: FEMA

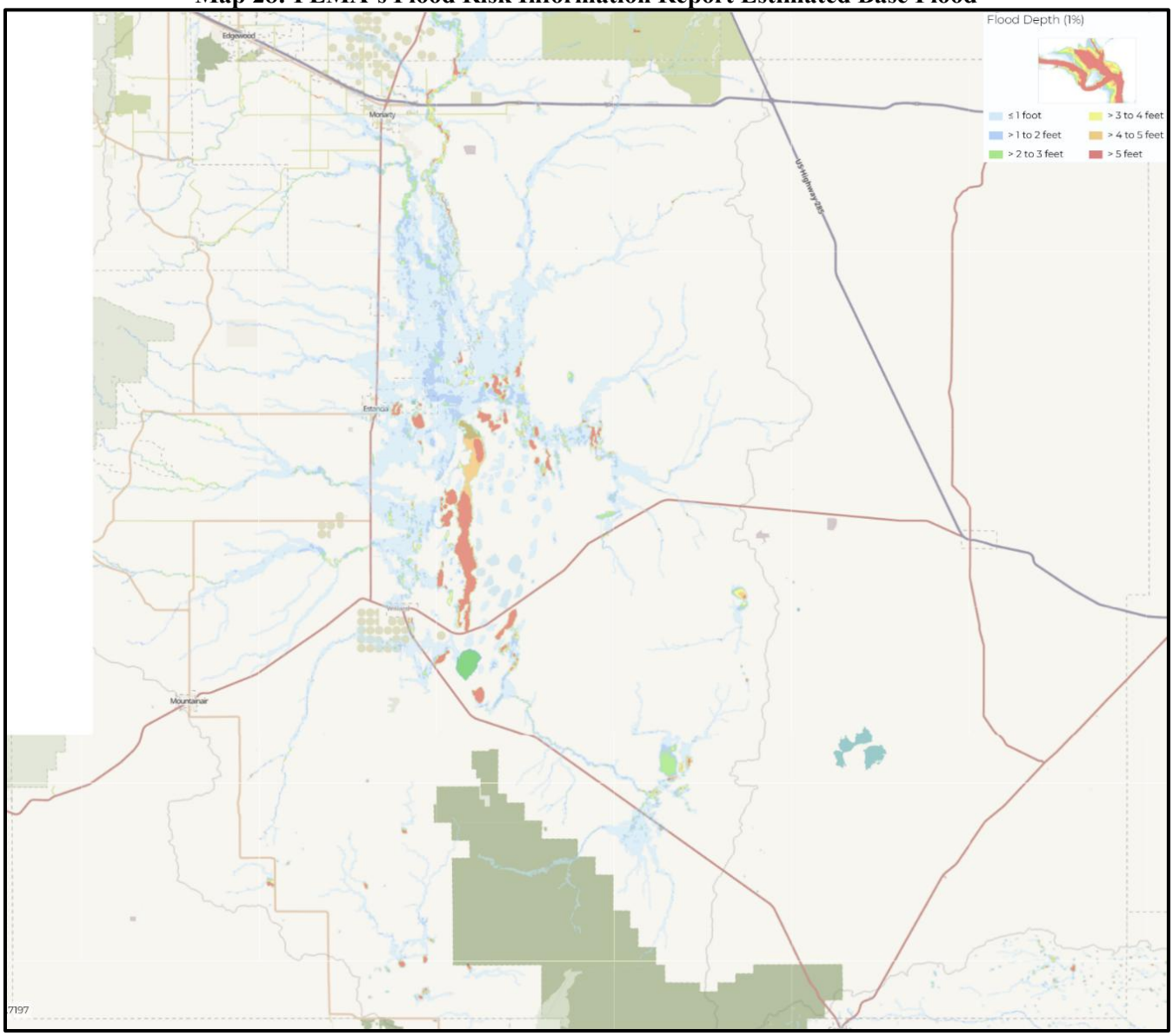
Map 27: Moriarty FEMA FIRM



Source: FEMA

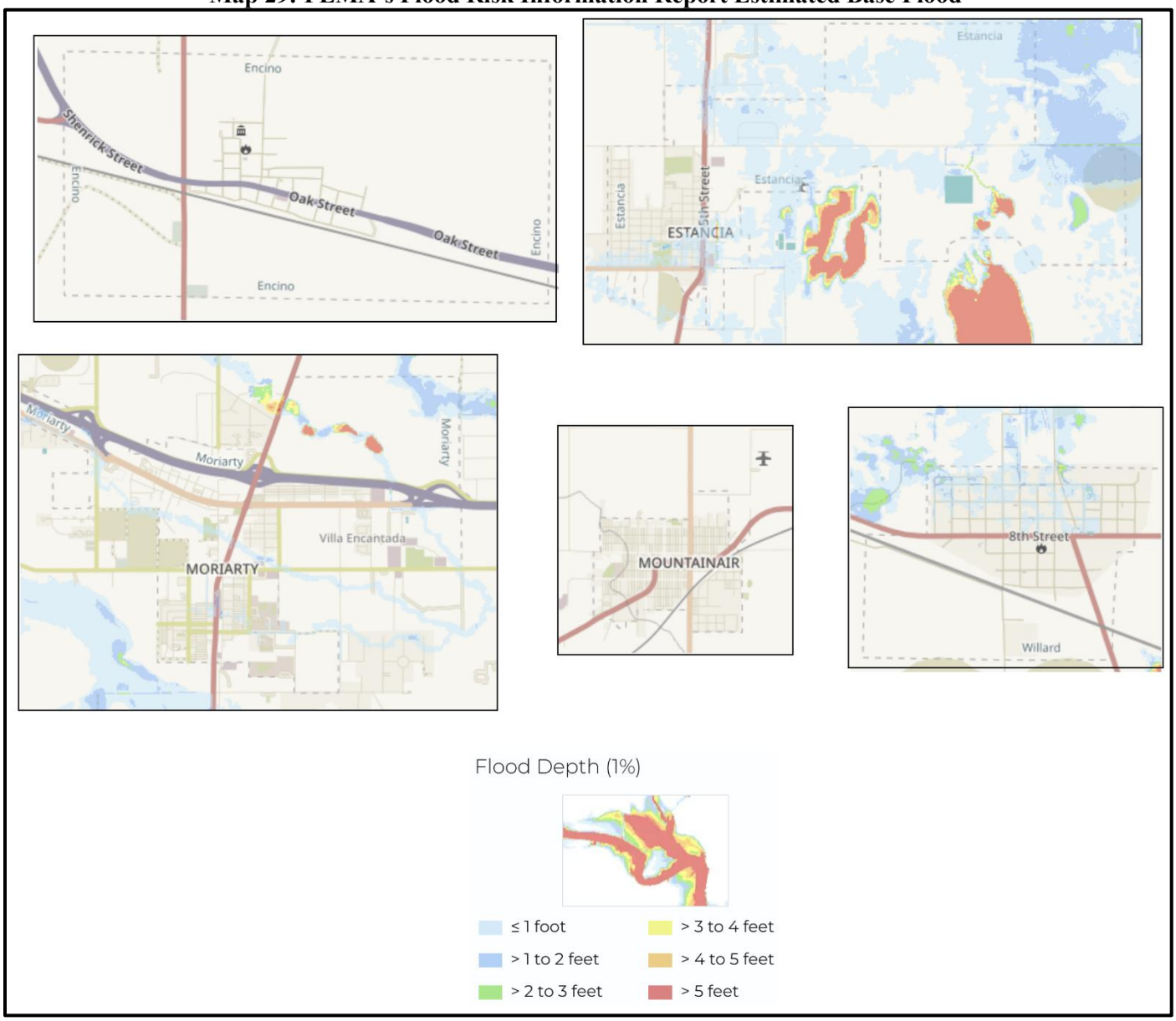
Augmenting this data, the FEMA's Flood Risk Information Report Estimated Base Flood Viewer includes base flood elevation and approximate flood depths determined from gridded datasets constructed from engineering flood models. This data may be used with available FIRMs as best available flood hazard information. However, jurisdictions should seek a professional review of the estimated base flood elevations before utilizing or relying on the data.

Map 28: FEMA's Flood Risk Information Report Estimated Base Flood



Source: FEMA

Map 29: FEMA's Flood Risk Information Report Estimated Base Flood



Source: FEMA

Flash flooding is a significant hazard in Torrance County, primarily occurring during the summer monsoon season (June through September). Short, intense storms can produce rapid runoff in dry arroyos and low-lying areas, with flooding often developing within minutes to a few hours of heavy rain. Floodwaters may rise quickly, posing risks to life, property, and infrastructure. Some channels and confined drainages may experience depths exceeding several feet in extreme events. Using available information, the following provide an indication of the potential extent of future events:

- **Encino:** No FEMA maps available. Risk is mainly shallow sheet flow in all flat areas and ponding around all low road crossings and playas.
- **Estancia:** FEMA maps effective 1990. Flood risk includes all local arroyo overflows and ponding near all playa margins. Shallow flooding (1–3 feet) is common in all low areas.
- **Mountainair:** No FEMA maps. Flash floods may result from rapid arroyo response from nearby uplands in all areas, with depths possibly exceeding three feet in all channels.
- **Moriarty:** FEMA maps effective 1988. Sheet flow across all flat areas and ponding behind all embankments are primary risks. Typical depths are 1–3 feet.

- **Willard:** No FEMA maps. Shallow overland flow and ponding around all playas can occur after intense storms. Shallow flooding (1–3 feet) is common in all low areas.

Assessing flood risk for the Central Tri-County, Claunch-Pinto, and East Torrance Soil and Water Conservation Districts is challenging due to incomplete and outdated FEMA mapping, limited hydrologic and rainfall monitoring, and the unique basin geography of Torrance County. Much of the area lies within the Estancia Basin, where flooding often occurs as highly localized flash events, shallow sheet-flow, or ponding in playas, hazards that are difficult to model and may not appear in mapped flood zones. Large portions of the SWCDs, including rural and agricultural lands, lack detailed flood studies or stream gauge data, making it hard to quantify hazard extent and depth. Variable storm patterns, unmapped drainageways, and closed depressions further complicate risk assessment, requiring reliance on local observations, post-event reports, and regional modeling to inform mitigation planning. Using available information, the following provide an indication of the potential extent of future flood and flooding events for SWCDs:

- **Central Tri-County SWCD:** This district spans northern Torrance County (plus portions of Bernalillo and Santa Fe counties). Flash-flood risks include arroyo surges from the Manzano and Sandia foothills and shallow sheet-flow across low-gradient terrain near transportation corridors and basin rim communities. Riverine flooding may occur along larger drainage corridors after prolonged storms, producing inundation in low-lying areas. Typical flood depths are 1–3 feet in overland areas, with greater than 3 feet possible in confined channels and low-water crossings.
- **Claunch-Pinto SWCD:** This district spans Mountainair and surrounding ranchlands/uplands, extending into neighboring counties. Steep tributaries draining to the Estancia Basin create fast-rising arroyo floods, while downstream areas see widespread ponding in closed depressions and playas. Riverine flooding can occur in major drainages after multi-day storms, with depths of 1–3 feet in mapped floodplains and higher in narrow channels or behind constrictions.
- **East Torrance SWCD:** This district covers much of the Estancia Valley, where broad, low-slope terrain is prone to sheet-flow and ponding after cloudbursts. Localized arroyo overtopping can occur along incised channels and at road crossings during flash-flood events. Riverine flooding risk is lower but possible in major drainage corridors after prolonged precipitation, producing inundation depths of 1–3 feet in mapped flood zones and higher in constrained flow paths

Discussions with the MPC and a review of all available data indicated that while flooding is a concern for all participating jurisdictions, levels of concern may vary. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Both flood and flash flood identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Encino:** This community is not mapped by FEMA for flooding. However, flash flood is identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Estancia:** Flood is identified as a community concern, as indicated by the above referenced FEMA FIRM. Additionally, flash flood identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Moriarty:** Flood is identified as a community concern, as indicated by the above referenced FEMA FIRM. Additionally, flash flood identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Mountainair:** This community is not mapped by FEMA for flooding. However, flash flood is identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Willard:** This community is not mapped by FEMA for flooding. However, flash flood is identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Soil and Water Conservation Districts:** Areas of stewardship are not mapped by FEMA for flooding. However, flood events could impact both soil and water resources.

5.10.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. The following table details flood Disaster Declarations for Torrance County:

Table 52: Torrance County Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Individual Assistance	Public Assistance	Mitigation Grant Program
DR-4152-NM	10/29/2013	Severe Storms, **Flooding**, Mudslides	$41,827,081	-	-
DR-1659-NM	1/30/2006	Severe Storms, **Flooding**	$1,734,451	$32,673,169	-
DR-731-NM	01/18/1985	Severe Storms, **Flooding**	-	-	-

Source: FEMA
-: Not reported

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency Declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe. There have been no Emergency Declarations for flood for Torrance County.

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. This authority allows the governor to activate resources, issue orders, and coordinate responses to protect public safety. The Emergency Management Act (NMSA 1978, Section 12-10-1 to 12-10-10) gives the governor broad authority to declare a state of emergency or disaster when there is an "occurrence or imminent threat" of widespread or severe damage, injury, or loss of life or property due to natural or human-caused disasters. There have been no disasters declared by the Governor for flood in Torrance County.

In addition to the above, the following table presents NCEI identified flood events in Torrance County from 1950 to 2024:

Table 53: Torrance County NCEI Flood and Flash Flood Events

Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Flood	1	$0	0
Flash Flood	23	$307,500	0

Source: NCEI

Recent events of note include:

- **September 12, 2013:** Heavy rainfall that produced flash flooding continued overnight resulting in further flooding of roadways and low-lying areas near Estancia. A barn, nearby building, and numerous roadways were impassable through the morning of the 12th.
- **September 4, 2021:** One to two inches of heavy rainfall caused flash flooding in Moriarty. Torrance County Dispatch reported torrential rainfall with a severe thunderstorm crossing Interstate 40 near Moriarty. Visibility was near zero which forced many travelers to pull off the road. Several Moriarty residents reported flood damage from the heavy rainfall. The water continued to flow southward through McIntosh and even caused Estancia Park Lake to overfill its banks. Damages were estimated at $250,000.

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages.

5.10.4 Probability of Future Incidents

Based on historical occurrences, Torrance County will continue to experience flood events on an annual basis. The definition of each flood zone's classification is used for the purpose of calculating the yearly probability of a riverine flood. Jurisdictions with property in a 100-year floodplain can expect a 1% annual chance of flooding within the designated areas. Jurisdictions with property in a 500-year floodplain can expect a 0.2% annual chance of flooding within the designated areas. FEMA FIRMs can be consulted to provide assistance in determining flooding probability for jurisdictions within Torrance County.

The following tables, using data from the NCEI, indicate the yearly probability of a flood or flash flood event, the number of deaths or injuries, and estimated property damage for Torrance County based on 75 years' worth of reporting data:

Table 54: Torrance County NCEI Flood and Flash Flood Event Probability Summary

Event Type	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Flood	1	<1	0	0	$0	$0
Flash Flood	23	1	0	0	$307,500	$4,100

Source: NCEI

5.10.5 Projected Changes in Location, Intensity, Frequency, and Duration

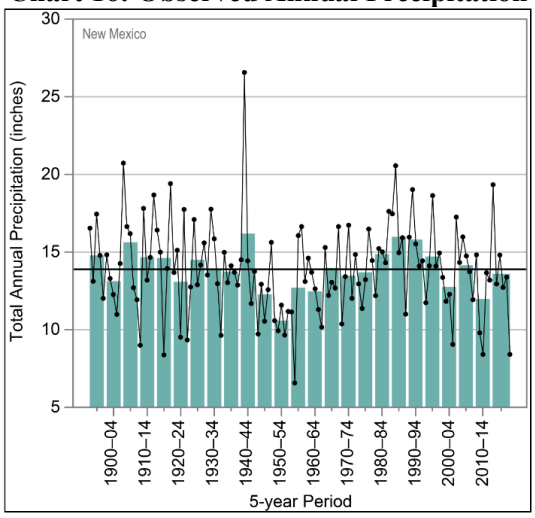
The location, intensity, frequency, and duration of flooding are influenced by a combination of natural and human-induced factors. Continued urbanization, deforestation, and changes in land use can alter natural drainage patterns along with burn scars from wildfires. The conversion of natural landscapes to impervious surfaces, such as roads and buildings, reduces the ability of the land to absorb water, leading to increased runoff and the potential for urban flooding. Alterations to river channels, including channelization and dam construction, can influence the flow of water. Modifications may lead to changes in river behavior, affecting the potential for both upstream and downstream flooding. Poorly planned infrastructure, inadequate stormwater management, and the lack of effective drainage systems in urban areas can contribute to localized flooding. The increase in impervious surfaces reduces natural infiltration, leading to more runoff during rainfall events.

The NOAA NCEI State Climate Summary 2022 for New Mexico indicates that although projections of annual precipitation are uncertain, precipitation in spring is projected to decrease across most of the state. Precipitation is highly variable from year to year and decade to decade. The wettest multiyear periods were in the early 1940s and mid-1980s, and the wettest consecutive 5 years was the 1984–1988 interval. The driest multiyear periods were in the early 1950s and early 2010s, and the driest consecutive 5 years was the 1952–1956 interval.

Unlike many areas of the United States, New Mexico has not experienced an upward trend in the frequency of extreme precipitation events. The annual number of 1-inch extreme precipitation events has been variable since 1985, fluctuating in a similar fashion to the pronounced variations in total annual precipitation.

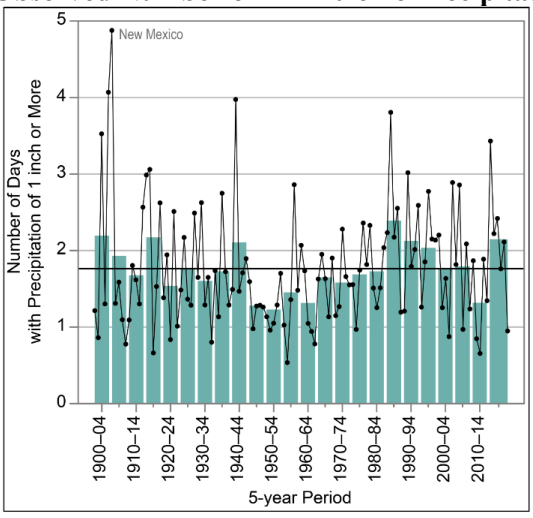
An important feature of New Mexico's summer climate is the North American Monsoon, which can start in late June and extend into September. In some regions of the state, monsoon rainfall accounts for half of the annual precipitation and plays an important role in supporting the agricultural economy.
The following charts, from the NOAA NCEI State Climate Summary 2022 for New Mexico, detail precipitation patterns:

Chart 16: Observed Annual Precipitation



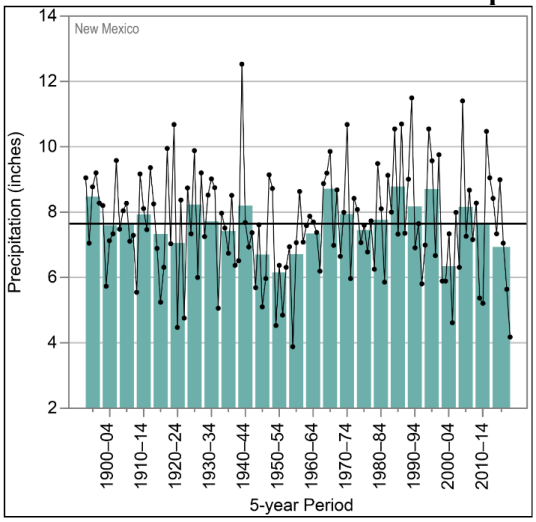
Source: NOAA NCEI Summary 2022 for New Mexico

Chart 17: Observed Number of 1" Extreme Precipitation Events



Source: NOAA NCEI Summary 2022 for New Mexico

Chart 18: Observed Monsoon Season Precipitation



Source: NOAA NCEI Summary 2022 for New Mexico

5.10.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from riverine flooding. To gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 55: Participating Jurisdiction Riverine Flood Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	**67.5**	**0.7**
Moriarty	35057963202	Relatively Moderate	87.9	0.7
Estancia	35057963601	Relatively High	98.1	0.7
Encino, Mountainair and Willard	35057963700	Relatively Low	59.0	0.7

Source: FEMA NRI

Table 56: Participating Jurisdiction Riverine Flood Expected Annual Loss

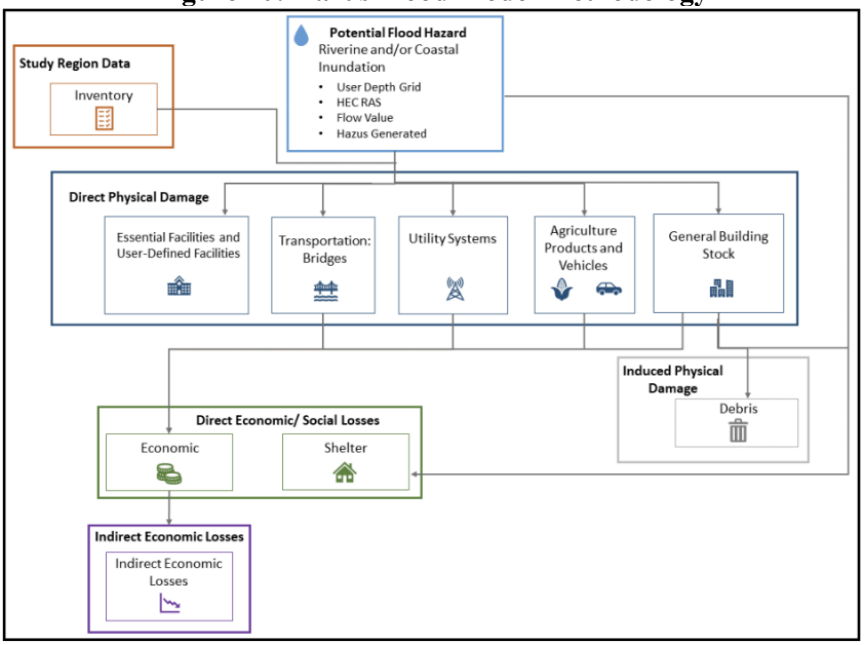
Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Low	61.3	$651K
Moriarty	35057963202	Relatively Moderate	85.2	$90K
Estancia	35057963601	Relatively High	97.3	$540K
Encino, Mountainair and Willard	35057963700	Relatively Low	57.4	$12K

Source: FEMA NRI

FEMA Hazus

For purposes of this plan, a Hazus Flood Model was generated to provide an estimate of the consequences to a flood. The resulting loss estimate generally describes the scale and extent of damage and disruption that may result from the modeled flood event. The Hazus software uses GIS technologies for performing analyses with inventory data and displaying losses and consequences on applicable tables and maps. The following figure provides a graphic representation of the modules that the Model Methodology is comprised of, and their interrelation in deriving estimates.

Figure 10: Hazus Flood Model Methodology



Source: FEMA

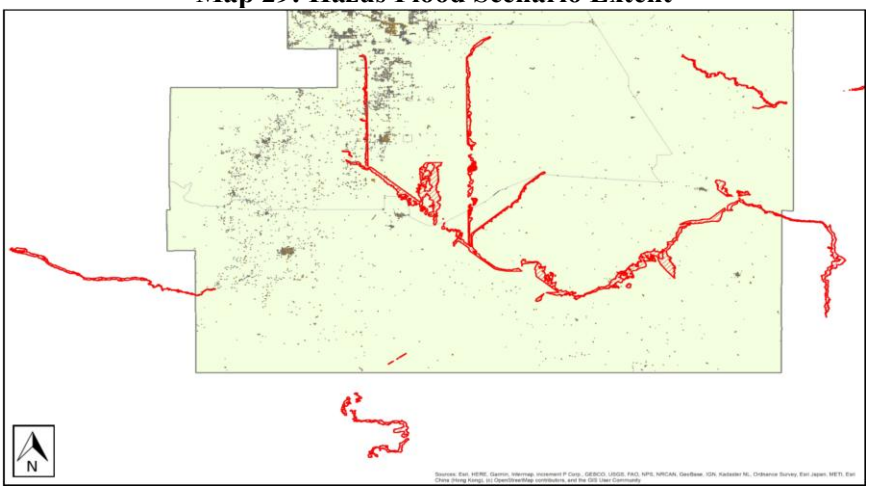
The results of the Hazus analysis were utilized to estimate potential losses for flooding. The intent of this analysis was to enable Torrance County to estimate where flood losses could occur and the degree of severity using a consistent methodology. The Hazus model helps quantify risk along known flood-hazard corridors as well as lesser streams and rivers that have a drainage area of ten square miles or more.

Hazus determines the displaced population based on the inundation area, not necessarily impacted buildings. As a result, there may be a population vulnerable to displacement even if the structure is not vulnerable to damage. Individuals and households will be displaced from their homes even when the home has suffered little or no damage either because they were evacuated or there was no physical access to the property because of flooded roadways. Flood sheltering needs are based on the displaced population, not the damage level of the structure. Hazus determines the number of individuals likely to use government-provided short-term shelters through determining the number of displaced households as a result of the flooding. To determine how many of those households and the corresponding number of individuals will seek shelter in government-provided shelters, the number is modified by factors accounting for income and age. Displaced people using shelters will most likely be individuals with lower incomes and those who do not have family or friends within the immediate area. Since the income and age factors are taken into account, the proportion of displaced population and those seeking shelter will vary from county to county.

Additionally, Hazus takes into account flood depth when modeling damage (based on FEMA's depth-damage functions). Generated reports capture damage by occupancy class (in terms of square footage impacted) by damage percent classes. Occupancy classes include agriculture, commercial, education, government, industrial, religion, and residential. Damage percentage classes are grouped by 10% increments up to 50%. Buildings that sustain more than 50% damage are considered to be substantially damaged. The Hazus analysis also provides an estimate of the repair costs for impacted buildings as well as the associated loss of building contents and business inventory. Building damage can also cause additional losses to a community by restricting a building's ability to function properly. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repair and job and housing losses. These losses are calculated by Hazus using a methodology based on the building damage estimates.

The damaged building counts generated by Hazus are susceptible to rounding errors and are likely the weakest output of the model due to the use of census blocks for analysis. Generated reports include this disclaimer: "Unlike the earthquake and hurricane models, the flood model performs its analysis at the census block level. This means that the analysis starts with a small number of buildings within each census block and applies a series of distributions necessary for analyzing the potential damage. The application of these distributions and the small number of buildings make the flood model more sensitive to rounding errors that introduces uncertainty into the building count results." Additionally, losses are not calculated for individual buildings, but instead are based on the performances of entire classes of buildings obtained from the general building stock data. In the flood model, the number of grid cells at each flood depth value is divided by the total number of grid cells in the census block. The result is used to weigh the flood depths applied to each specific occupancy type in the general building stock. First floor heights are then applied to determine the damage depths to analyze damages and losses. The following map illustrates the extent of the Hazus scenario:

Map 29: Hazus Flood Scenario Extent



Source: FEMA Hazus

The following table provides the Hazus results for damaged buildings, destroyed buildings, and total economic loss for Torrance County:

Table 57: Torrance County Hazus Flood Scenario Economic Impacts

Damaged Buildings	Destroyed Buildings	Total Economic Loss	Debris Generation (tons)
0	0	$8,190,000	100

Source: FEMA Hazus

The following table provides the HAZUS results for displaced households, damaged buildings, destroyed buildings, and total economic loss for Torrance County:

Table 58: Torrance County Hazus Flood Scenario Displaced Population

Displaced Households	Persons Seeking Shelter	Displaced Population
17	18	51

Source: FEMA Hazus

The Hazus model indicated that the following number of critical facilities are estimated to be damaged or suffer loss of use from the flood scenario.

Table 59: Torrance County Hazus Flood Scenario Number of Critical Facilities Damaged or Impacted

Emergency Operations Centers	Fire Stations	Hospitals	Police Stations	Schools
0	0	0	0	4

Source: FEMA Hazus

Population

A primary concern with this hazard is human health safety issues, as flooding can be a direct cause of death. Specific at-risk groups include outdoor workers, farmers, young children, and senior citizens. Impacts on human health can include:

- **Loss of Life**: Flooding is one of the leading causes of weather-related fatalities worldwide. Fast-rising floodwaters can lead to drowning and other water-related accidents, resulting in the tragic loss of lives.
- **Injuries:** Floods can cause injuries due to waterborne diseases, contaminated floodwaters, debris, and accidents during evacuation or rescue operations.
- **Displacement:** Many people may be forced to evacuate their homes during floods and will require emergency shelter or temporary housing. Prolonged displacement can be emotionally and economically challenging.
- **Health Risks:** Floodwaters often contain pollutants, sewage, and hazardous materials. Exposure to contaminated water can lead to waterborne diseases, infections, and other health risks.
- **Mental Health Effects:** Survivors of floods may experience a range of emotional and psychological challenges, including post-traumatic stress disorder, anxiety, depression, and grief.
- **Food and Water Shortages:** Floods can contaminate water supplies and disrupt the distribution of food. This can lead to shortages of clean drinking water and essential food items.
- **Impact on Vulnerable Populations:** Vulnerable populations, including the elderly, children, people with disabilities, and those living in poverty, are often disproportionately affected by floods due to limited resources and mobility challenges.

Especially critical is timely evacuation orders, and adherence to those orders. If evacuation is not heeded, or flood waters rise quickly enough, citizens could drown or become trapped for extended periods of time with no access to services or medical care. Of special concern are long-term care and medical facilities where it can take longer to evacuate, or evacuation may be impossible. Additionally, lower income citizens may not have the means to relocate, whether it be lack of transportation or lack of resources to afford temporary shelter.

Using available GIS data and census data concerning occupants per structure, the following table indicates the number of people in both 100 and 500-year floodplains for each participating jurisdiction:

Table 60: Population in 100- and 500-Year Floodplains

Jurisdiction	100-Year Floodplain	500-Year Floodplain
Torrance County	145	241
Encino	0	0
Estancia	0	0
Moriarty	0	0
Mountainair	0	0
Willard	0	0

Source: FEMA NRI and Janey Camp GIS

Buildings and Structures

Floods can have significant and often costly impacts on buildings and structures. These impacts can disrupt essential services, damage infrastructure, and pose safety risks. The extent of the impact depends on factors such as the severity of the flood, the preparedness of the infrastructure, and the effectiveness of flood management measures. Here are some of the common impacts of floods on facilities and critical infrastructure:

- **Foundation Damage:** Floodwaters can erode the soil supporting the foundation, leading to settling, cracks, or even collapse. Scouring and soil liquefaction during floods may undermine the stability of buildings, especially those on weak soils.
- **Wall and Floor Damage:** High water pressure, especially from fast-moving floods, can crack walls, warp floors, and cause floors to collapse.
- **Building Collapse:** If the foundation is significantly compromised, or if water levels rise too quickly, entire buildings may collapse, especially older structures or those not designed for flood resilience.
- **Water Seepage:** Even shallow flooding can cause water to seep into the building's structure, leading to rotting of wooden frames, mold growth, and damage to insulation and electrical systems.
- **Interior Damage:** Drywall, carpets, furniture, and appliances may all be ruined by prolonged exposure to floodwater, which often carries contaminants like sewage and chemicals.
- **Electrical Short Circuits and Fire:** Floodwaters can cause electrical systems to short-circuit, posing risks of fire or electrocution.
- **HVAC and Plumbing System Damage:** Heating, ventilation, and air conditioning systems, as well as plumbing systems, are vulnerable to water damage, potentially leading to the loss of potable water and proper sanitation in the building.
- **Mold:** After the floodwaters recede, mold and mildew can quickly develop in damp environments. This can lead to respiratory problems for occupants and further deterioration of the building materials.
- **Wood Rot and Corrosion:** Prolonged exposure to water can cause wooden materials to rot and metal components, like steel reinforcements, to corrode, weakening the building over time.

Using available GIS data, the following table indicates the number of buildings in both 100 and 500-year floodplains for each participating jurisdiction:

Table 61: Buildings in 100- and 500-Year Floodplains

Jurisdiction	Total Buildings	100-Year Floodplain	500-Year Floodplain
Torrance County	18,810	57	95
Encino	183	0	0
Estancia	907	0	0
Moriarty	1,636	0	0
Mountainair	1,001	0	0
Willard	219	0	0

Source: FEMA NRI and Janey Camp GIS

Transportation and Electrical Infrastructure

Flooding can have numerous impacts on both transportation and electrical distribution systems. The impacts of flooding on transportation systems may include:

- **Scour and Erosion:** Floodwaters can wash away the supporting soil around and beneath roads, a process known as scour. This can lead to the collapse of the roadbed and destabilization of bridges and overpasses.
- **Undermining of Pavement:** Prolonged exposure to floodwaters can weaken the pavement structure, leading to cracks, potholes, and eventual failure of the roadway. Roads not designed for water drainage are especially susceptible to being washed out.
- **Potholes and Cracks:** Water penetrates cracks in the pavement, weakening the sublayers. Once the floodwaters recede and the weight of vehicles passes over, potholes can quickly form, creating hazards for drivers.
- **Surface Damage:** Asphalt roads, in particular, can become brittle after repeated water exposure, resulting in chunks of road surface breaking off.
- **Bridge Collapse:** Flooding can damage the support structures of bridges, particularly if water levels rise to exert pressure on the bridge's piers. Debris carried by floodwaters can accumulate around bridge structures, further stressing them.
- **Blocked or Collapsed Culverts:** Culverts, which allow water to pass beneath roads, can become blocked by flood debris, leading to water pooling on roads or forcing water to erode the roadbed around the culvert.
- **Road Inundation:** Flash floods or slow-rising waters can make roads impassable, either because of deep standing water or swift currents.
- **Landslides:** In hilly or mountainous regions, flooding increases the risk of mudslides and landslides, which can bury roads and highways under tons of debris, blocking transportation routes and requiring significant cleanup.
- **Debris Flows:** Heavy rains can wash debris, rocks, and soil onto roads, making them impassable and causing further damage to the road surface.
- **Foundation Weakening:** Repeated flooding over time can weaken the structural foundation of roads, even if the damage isn’t immediately apparent. This could lead to long-term deterioration of highways and bridges, requiring expensive repairs or reconstruction.

Flooding can impact both the electrical generation capacity and transmission. The impacts of extreme heat on electrical systems may include:

- **Flooding of Substations:** Electrical substations, particularly those located in low-lying or flood-prone areas, are vulnerable to flooding. Water ingress into substations can cause short circuits and failures of critical equipment such as transformers, circuit breakers, and switchgear. If a substation is taken offline, large areas could lose power.
- **Transformer Damage:** Floodwaters can compromise oil-insulated transformers by causing leaks or mixing with the oil leading to transformer failures and extended outages.
- **Downed Power Lines:** Strong flood currents, debris, or trees falling due to saturated soil can bring down power lines, leading to localized or widespread outages.
- **Foundation Erosion:** Transmission towers and utility poles are susceptible to soil erosion during floods, which can undermine their foundations and cause structural instability or collapse.
- **Corrosion of Equipment:** Prolonged exposure to floodwaters can lead to the corrosion of metal components in transmission and distribution systems, shortening the lifespan of equipment and increasing the risk of failure.
- **Water Infiltration:** Electrical equipment, including power meters, transformers, and underground cabling, can experience short circuits if water infiltrates, leading to power outages and potential safety hazards. For example, underground electrical vaults can flood, damaging cables and transformers, and posing fire and electrocution risks.

Water and Wastewater Facilities

Water and wastewater utilities are vulnerable to flood events due to the potential for plant damages and distribution system damages. Impacts may include:

- **Damage to Water Treatment Plants:** Floodwaters can inundate water treatment plants, damaging pumps, electrical systems, and filtration equipment. This can prevent the proper treatment of drinking water, leading to unsafe water supplies.
- **Damage to Wastewater Treatment Plants:** Wastewater facilities may experience flooding that overwhelms the capacity to treat sewage, leading to raw or partially treated sewage being discharged into nearby water bodies, contaminating them.
- **Damage to Pumping Stations:** Flooded pumping stations can fail, leading to service interruptions in both water distribution and sewage removal. These failures may require costly repairs or replacements.
- **Drinking Water Contamination:** Floodwaters often carry contaminants such as chemicals, sewage, and industrial waste. If this water infiltrates drinking water systems through broken pipes or overwhelmed treatment systems, it can lead to widespread contamination.
- **Backflow of Sewage:** In severe flooding, sewage can backflow into homes, streets, and businesses through overwhelmed or broken sewer systems. This not only poses health risks but also results in costly cleanup.
- **Increased Flow in Sewer Systems:** During floods, combined sewer systems (which handle both stormwater and sewage) can be overwhelmed by the sheer volume of water. This leads to combined sewer overflows where untreated sewage is discharged directly into rivers, harming the environment and public health.
- **Overwhelmed Stormwater Systems:** Flooding can overwhelm stormwater management systems, causing backups that flood streets and neighborhoods. In older urban areas, this may also overwhelm the sewer system, as stormwater and sewage often share the same infrastructure.

Information concerning the costs to repair or reconstruct water and wastewater infrastructure may be found in Section 5.8.6.

Medical and Response Facilities

A FEMA Hazus and GIS analysis of medical and response facilities within the 100-year floodplain indicates the following:

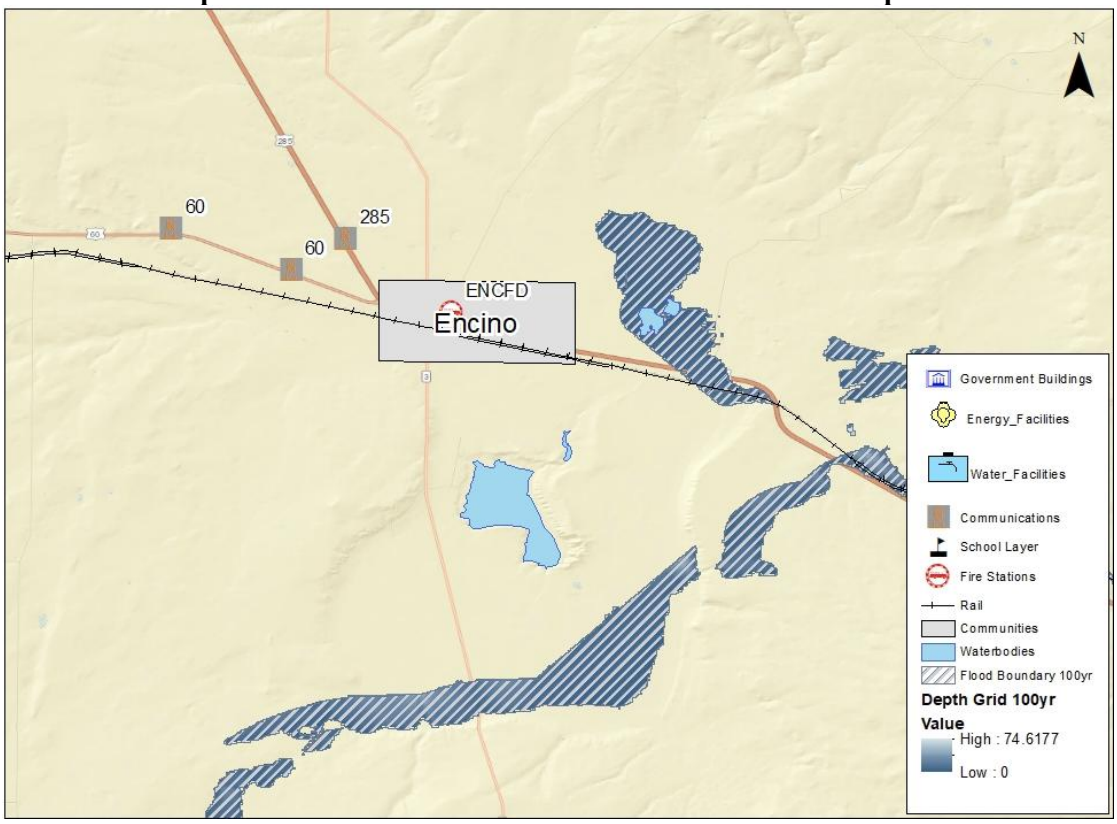
Table 62: Participating Jurisdiction Medical, Fire, and Response Facilities in 100-Year Floodplain

Jurisdiction	Medical Facilities	Fire Facilities	Police Facilities
Torrance County	0	0	0
Encino	0	0	0
Estancia	0	0	0
Mountainair	0	0	0
Moriarty	0	0	0
Willard	0	0	0

Source: FEMA Hazus and Janey Camp GIS

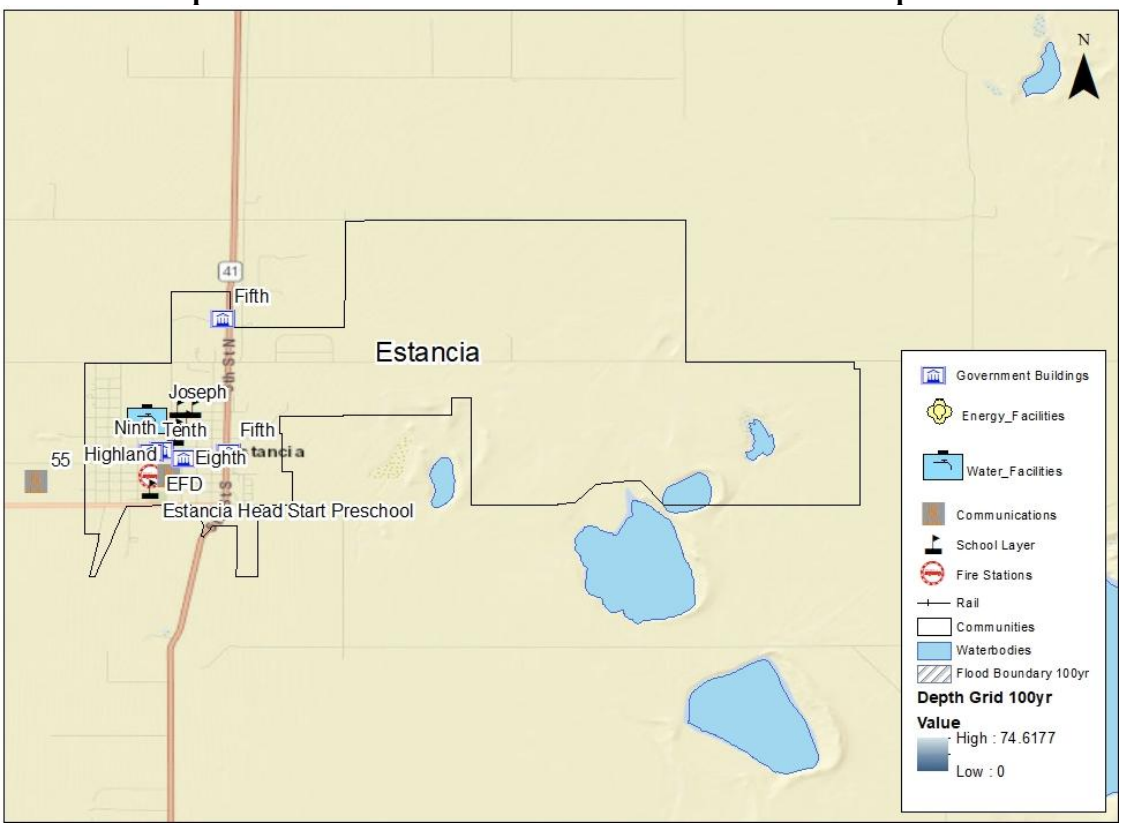
The following jurisdictional maps indicate the location of critical facilities in relation to identified floodplains:

Map 30: Encino Critical Infrastructure in 100-Year Floodplains



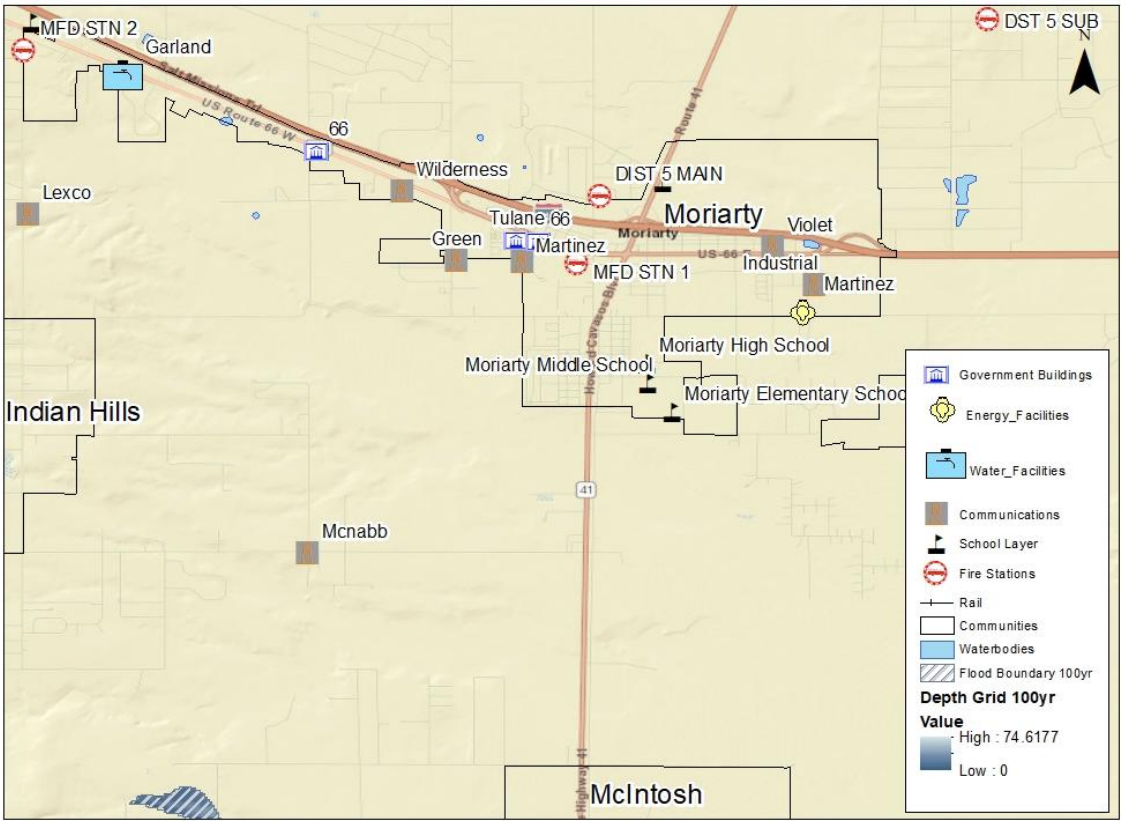
Source: Torrance County, FEMA and Janey Camp GIS

Map 31: Estancia Critical Infrastructure in 100-Year Floodplains



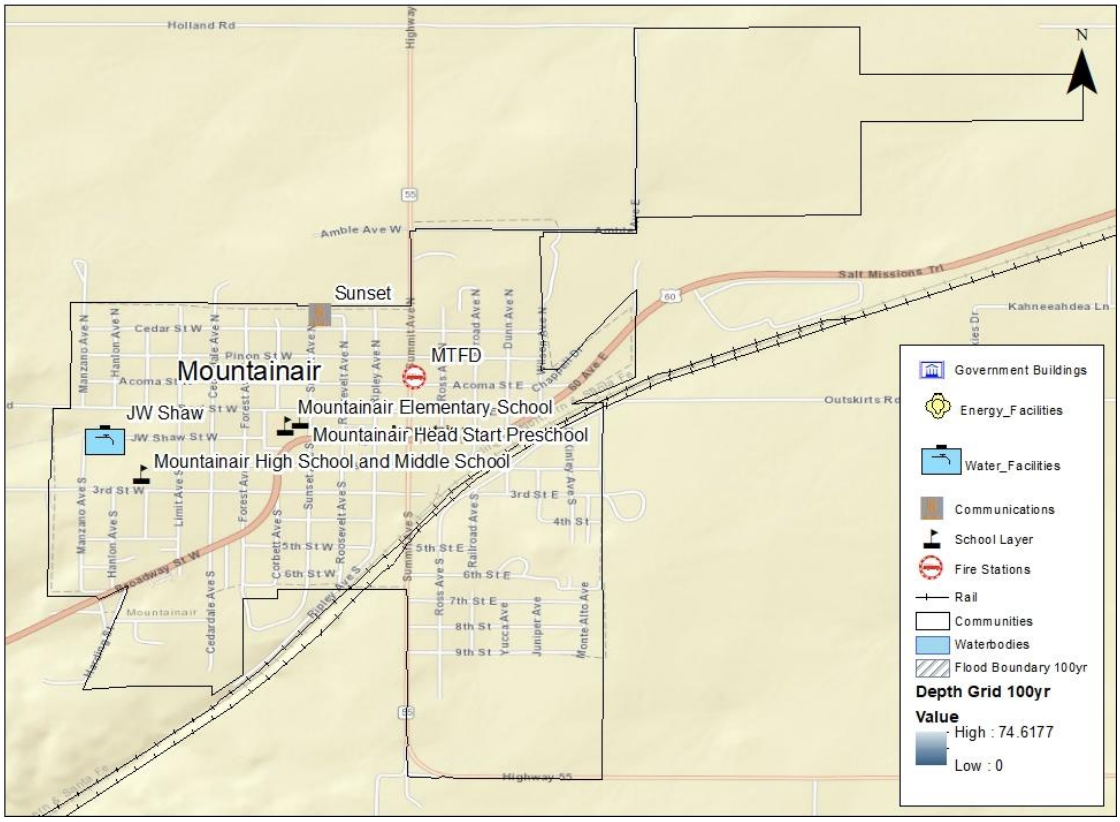
Source: Torrance County, FEMA and Janey Camp GIS

Map 32: Moriarty Critical Infrastructure in 100-Year Floodplains



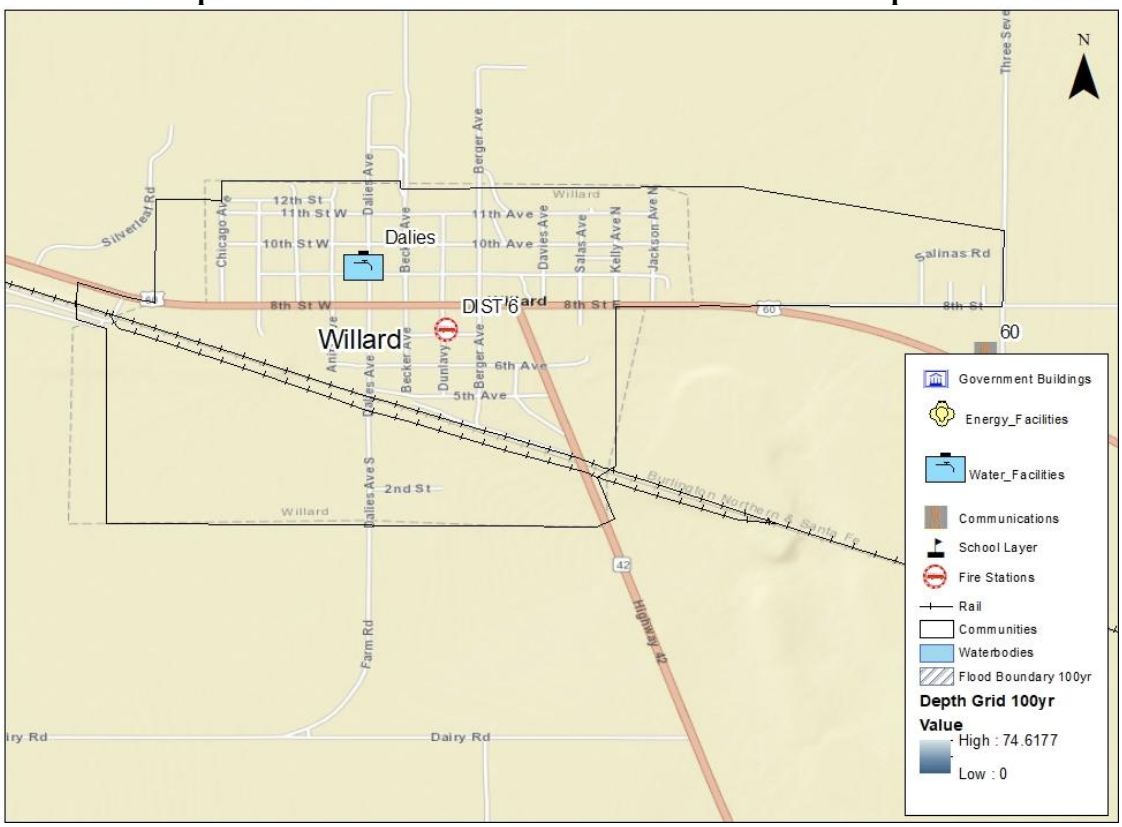
Source: Torrance County, FEMA and Janey Camp GIS

Map 33: Mountainair Critical Infrastructure in 100-Year Floodplains



Source: Torrance County, FEMA and Janey Camp GIS

Map 34: Willard Critical Infrastructure in 100-Year Floodplains



Source: Torrance County, FEMA and Janey Camp GIS

While flooding may result in a temporary increase in patients, it is considered unlikely that any influx would overwhelm current medical capabilities.

Depending on response facility capability and location, flooding may necessitate the closure of the facility for the duration of the event due to damage or lack of access. These closures are expected to have additional consequences through the disruption of emergency response capabilities.

Educational Facilities

A FEMA Hazus and GIS analysis of educational facilities within the 100-year floodplain indicates the following:

Table 63: Participating Jurisdiction Educational Facilities in 100-Year Floodplain

Jurisdiction	Educational Facilities
Torrance County	0
Encino	0
Estancia	0
Mountainair	0
Moriarty	0
Willard	0

Source: FEMA Hazus and Janey Camp GIS

Communication Systems

No comprehensive mapping of communications systems was available for review to compare against known flood hazard areas. However, it is assumed that communications lines and towers are in known hazard areas. Flooding can disrupt this vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Damage to Infrastructure:** Flood waters can cause physical damage to communication infrastructure such as cell towers, antennas, satellite dishes, and power lines. This damage can result in interruptions or complete failure of communication services.
- **Power Outages:** Flood waters can lead to power outages by knocking down power lines or damaging electrical substations. Communication systems that rely on electricity, such as landline phones, internet routers, and cellular towers, may cease to function during power outages.
- **Structural Instability:** Flood waters can cause structural instability in communication towers and buildings housing communication equipment. If these structures are not properly reinforced, they may collapse or sustain damage, disrupting communication services.

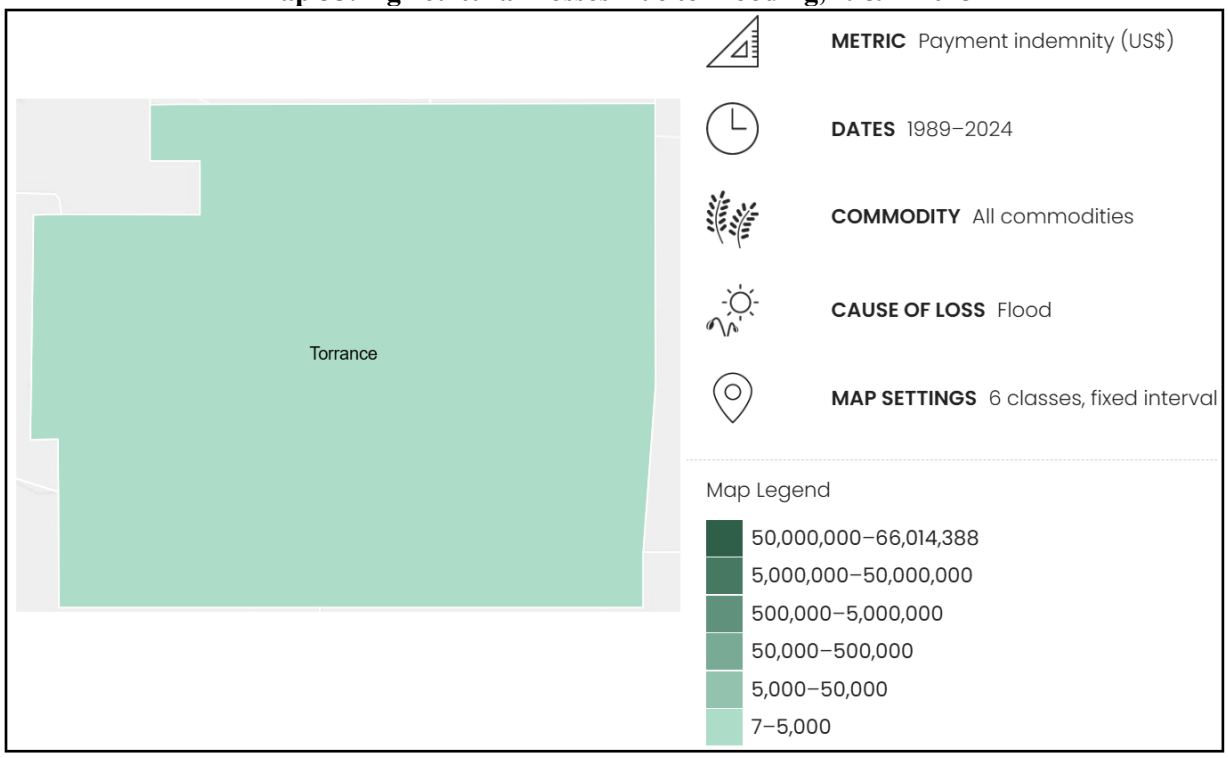
The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.9.6.

Environmental and Agricultural Impacts

Environmental impacts from flooding can be far reaching. Of particular concern is flood related runoff, potentially carrying sewage, pesticides, or hazardous chemicals, which can cause long lasting environmental harm. Expected negative outcomes could include changes in habitat, a decrease of available food, and an increase in the spread of vector-associated disease due to standing water.

Flooding can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to flooding from 1989 - 2023:

Map 35: Agricultural Losses Due to Flooding, 1989 - 2023



Source: United States Department of Agriculture

Jurisdictional Concerns:

As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to

citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** With 26.2% of citizens over the age of 65 and 16.7% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage.
- **Estancia:** With 11.0% of citizens living in poverty, 19.2% over the age of 65, and 28.3% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage.
- **Moriarty:** With 39.1% of citizens living in poverty, 17.7% over the age of 65, and 33.1% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage.
- **Mountainair:** With 28.6% of citizens living in poverty, 30.3% over the age of 65, and 17.3% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage.
- **Willard:** With 38.2% of citizens living in poverty, 8.3% over the age of 65, and 16.8% of the population under the age of 65 with a disability, flooding is a concern for all jurisdictions. These identified populations could potentially have difficulty with timely evacuation, medical concerns, and concerns about rebuilding due to lack of insurance coverage
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to a flash flood event. Impacts on sensitive areas may be significant.

Cascading Impacts

Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with extreme may include:

- Infrastructure and utility failure
- Economic disruption
- Flood related illnesses and mortality
- Power outages
- Population displacement
- Environmental degradation

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 64: Flood Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Significant flooding events can lead to the damage and loss of homes, property, and businesses. Flash flooding and excessive rainfall may lead to dangerous conditions on roadways. Closures of medical facilities is a major public health concern if flooding damages those facilities. Water sources may become contaminated, and water or sewer systems may be disrupted. Vector-associated disease may increase.
Impact on Responders	Fire, police, and emergency responders may be called on to evacuate people from impacted areas, as well as close roads, attend to the injured, and direct traffic away from the flooded area and roads. First responders may face challenges with transportation and

Table 64: Flood Consequence Analysis

Subject	Potential Impacts
	access to a location. Flash floods and mudslides due to heavy rainfall can also injure first responders, as well as delay response operations.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Floods which create power outages, debris damage, and road closures are not uncommon. This threat may impact an agency's ability to maintain continuity of operations based on the incidents impact on power, communications and the potential to damage equipment and records within primary and alternate facilities.
Delivery of Services	Flooding can cause road and bridge closures, as well as disrupt transit services, impacting the ability to deliver goods and services. Exposure to flood waters may also damage or destroy physical goods such as food, clothing, and hygiene products.
Property, Facilities, and Infrastructure	Flooding can cause significant property destruction. Floods can disrupt normal daily activities due to the potential impact on schools, hospitals, and other public infrastructure. Transportation infrastructure can be damaged which could impact the freedom of movement or provision of utilities. Water sources can become contaminated. Water and sewer systems may be disrupted. Solid-waste collection and disposal may also be impacted, causing dangerous public health risks.
Impact on Environment	Rising waters from flooding impact the environment by spreading pollution, inundating water and wastewater treatment plants, and disrupting wildlife. Standing water following a flood event can facilitate the spread of vector-associated diseases.
Economic Conditions	Significant and repeated flooding can lower property value throughout the state, which can have a deleterious effect on the tax base. Furthermore, flooding drains response resources, which can be costly during a large flooding event for disaster reimbursement
Public Confidence in Governance	Ineffective flooding response can decrease the public's confidence in the ability to respond and govern. Multi-level government response requires direct actions that must be immediate and effective to maintain public confidence. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.10.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number of citizens living below the poverty level in all jurisdictions as a percentage of total population. These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources
- Limited insurance coverage
- Health vulnerabilities

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease

5.10.8 National Flood Insurance Program Communities

The NFIP is a federal program, managed by FEMA, which exists to provide flood insurance for property owners in participating communities, to improve floodplain management practices, and to develop maps of flood hazard areas. The following table presents NFIP participating communities.

Table 65: Torrance County NFIP Communities

Community	Initial Flood Hazard Boundary Map Identified	Initial Flood Insurance Rate Map Identified	Current Effective Map Date
Torrance County	04/11/1978	10/01/2007	10/01/2017(L)
Estancia	06/14/1974	07/16/1990	07/16/1990
Moriarty	06/07/1974	09/30/1988	09/30/1988

Source: FEMA NFIP
(L): Original FIRM by Letter - All Zone A, C and X

The Community Rating System (CRS) is a voluntary program within the NFIP that provides insurance premium discounts to policy holders based on a jurisdiction's adherence to floodplain management activities that exceed minimum NFIP requirements. As of this plan, no participating jurisdictions within Torrance County are CRS participants.

5.10.9 FEMA Flood Policy and Loss Data

Torrance County flood policy information was sourced from FEMA's Flood Insurance Data and Analytics. The number of flood insurance policies in effect may not include all structures at risk of flooding, and it is likely that some properties are under-insured. The flood insurance purchase requirement is for flood insurance in the amount of federally backed mortgages, not the entire value of the structure. Additionally, contents coverage is not required. The following table shows the details of NFIP policy statistics for Torrance County:

Table 66: Torrance County NFIP Coverage

Jurisdiction	Number of Policies in Force	Total Coverage
Torrance County	72	$17,170,200
Estancia	3	$95,800
Moriarty	47	$11,756,900

Source: FEMA Flood Insurance Data and Analytics

The following table details NFIP coverage changes from 2023 to 2024 for Torrance County:

Table 67: Torrance County NFIP Coverage Changes

Jurisdiction	Policies in Force 2023	Policies in Force 2024	Change in Policies, 2023 - 2024	Total Coverage 2023	Total Coverage 2024	Change in Coverage, 2019 - 2024
Torrance County	134	122	-12	$32,708,400	$49,029,300	-$29,022,900

Source: FEMA

5.10.10 Repetitive Loss Structures

The NFIP defines a Repetitive Loss property as:

- Any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. At least two of the claims must be more than 10 days apart.

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a. A Severe Repetitive Loss property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the above, at least two of the referenced claims must have occurred within any ten-year period and must be greater than ten days apart.

No Repetitive Loss or Severe Repetitive Loss properties were noted in Torrance County.

5.10.11 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the flood hazard.

Table 68: Example Flood Mitigation Actions

Category	Example Action
Planning and Regulation	Determine and enforcing acceptable land uses to alleviate the risk of damage by limiting exposure in flood hazard areas. Floodplain and coastal zone management can be included in comprehensive planning.
	Develop a floodplain management plan and update it regularly.
	Establish a green infrastructure program to link, manage, and expand existing parks, preserves, greenways, etc.
	Prohibit or limit floodplain development through regulatory and/or incentive-based measures.
	Limit the percentage of allowable impervious surface within developed parcels.
	Encourage the use of porous pavement, vegetative buffers, and islands in large parking areas.
	Complete a stormwater drainage study for known problem areas.
	Develop engineering guidelines for drainage from new development.
	Design a “natural runoff” or “zero discharge” policy for stormwater in subdivision design.
	Regularly calculate the amount of flood-prone property preserved as open space.
	Revise the floodplain ordinance to incorporate cumulative substantial damage requirements.
Infrastructure	Install, re-route, or increase the capacity of a storm drainage system.
	Increase capacity of stormwater detention and retention basins.
	Require developers to construct on-site retention basins for excessive stormwater.
	Routinely clean debris from support bracing underneath low-lying bridges.
	Elevate structures so that the lowest floor, including the basement, is raised above the base flood elevation.
	Raise utilities or other mechanical devices above expected flood levels.
	Elevate roads and bridges above the base flood elevation to maintain dry access.
	Floodproof water and wastewater treatment facilities located in flood hazard areas.
	Require that all critical facilities including emergency operations centers, police stations, and fire department facilities be located outside of flood-prone areas.
Natural Systems	Establish and manage riparian buffers along rivers and streams.
	Protect and preserve wetlands to help prevent flooding in other areas.
	Develop an open space acquisition, reuse, and preservation plan targeting hazard areas.
	Protect and enhance landforms that serve as natural mitigation features
Education	Encourage homeowners to purchase flood insurance.
	Distribute flood protection safety pamphlets to the owners of flood-prone property.
	Educate citizens about safety during flood conditions.
	Encourage homeowners to install backflow valves to prevent reverse-flow flood damages.
	Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance.

5.11 Severe Weather



5.11.1 Hazard Description

Severe weather comprises the hazardous and damaging weather effects often found in violent storm fronts and severe winter storms. They can occur together or separate, they are common and usually not hazardous, but on occasion they can pose a threat to life and property.

This plan defines severe weather as a combination of the following as defined by the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS):

- **Hail:** Precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud.
- **Lightning:** A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud.
- **Thunderstorm Winds:** The same classification as high or strong winds but accompanies a thunderstorm. It is also referred to as a straight-line wind to differentiate from rotating or tornado associated wind. Additionally, these winds can rapidly create dust storms that severely impact visibility.

Severe weather has been so consistent throughout modern history that much of the vulnerability is mitigated. However, this section is not concerned with everyday wind, lightning, or mild precipitation. This section is concerned with common storm elements when they behave such that they pose a threat to property and life.

5.11.2 – Location and Extent

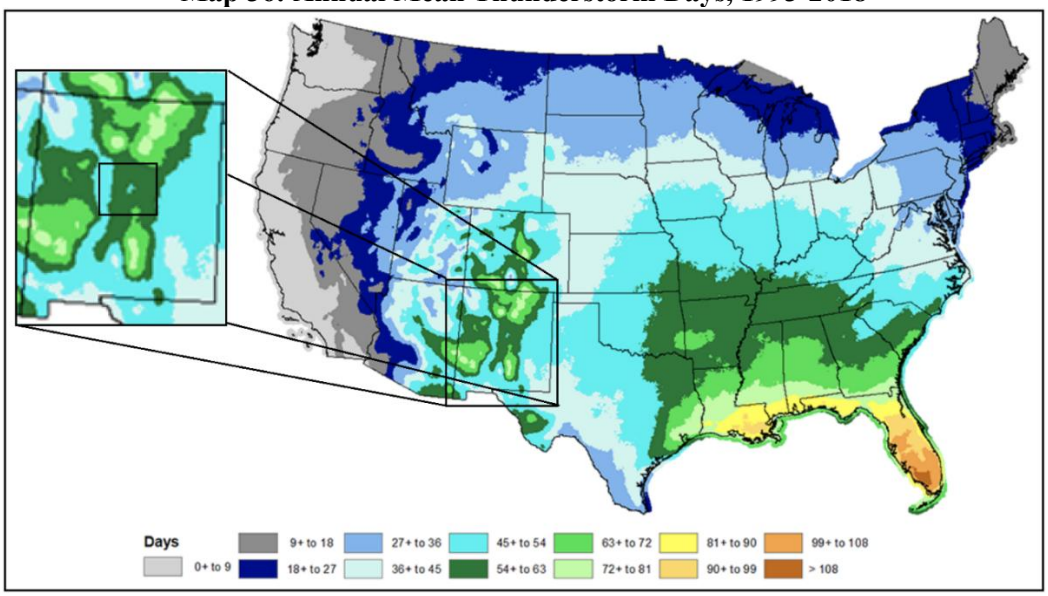
Severe weather can rapidly descend on an area, but in many cases is predictable. Most weather forecasts focus on changing conditions that may lead to the onset of severe storms. All of Torrance County is susceptible to severe weather in the form of thunderstorm events, but occurrence is infrequent.

The NWS classifies thunderstorms, often the generator of hail, lightning and high winds, using the following categories.

- **Marginal:** Isolated severe weather, limited in duration and/or coverage and/or intensity
- **Slight:** Scattered severe storms possible, short-lived and/or not widespread, isolated intense storms possible
- **Enhanced:** Numerous severe storms possible, more persistent and/or widespread, a few intense
- **Moderate:** Widespread severe storms likely, long-lived, widespread and intense
- **High:** Widespread severe storms expected, long-lived, very widespread and particularly intense

The frequent nature of thunderstorms makes hail, lightning, and high wind a relatively common occurrence for Torrance County. The following map, from NOAA, indicates annual mean thunderstorm days from 1993 to 2018.

Map 36: Annual Mean Thunderstorm Days, 1993-2018



Source: NOAA

In the United States, hail causes billions of dollars in damage to property each year. Vehicles, roofs of buildings and homes, and landscaping are most commonly damaged by hail. Hail has been known to cause injury and the occasional fatality to humans, often associated with traffic accidents. Based on information provided by the National Weather Service concerning size, the following table describes potential damage impacts of the various sizes of hail.

Table 69: Hail Size Comparison and Damage Descriptions

Diameter (inches)	Size Description	Potential Damage Impacts
1/4	Pea Size	No damage
1/2	Mothball, peanut, USB Plug	Slight damage to vegetation
3/4	Penny Size	Increased damage to crops and vegetation
7/8	Nickel Size	Severe damage to crops and vegetation, damage begins to glass and plastic
1	Quarter Size	Increased glass damage, damage begins to bodies of vehicles
1 1/4	Half Dollar Size	Large scale glass damage, begin roof damage, risk of injury to exposed persons
1 1/2	Ping Pong Ball Size	Large scale glass damage, begin roof damage, increased risk of injury to exposed persons
1 3/4	Golf Ball Size	Severe roof damage, risk of serious injuries to exposed persons
2	Lime or Medium Sized Hen Egg	Potential structural damage, risk of very severe injuries to exposed persons
2 1/2	Tennis Ball Size	Extensive structural damage, risk of very severe injuries or death to exposed persons

Source: National Weather Service

Using available NWS data, the following indicate the largest sized recorded hail by participating jurisdiction and provide an indication of the potential extent of future events:

- **Moriarty:** 2.50 inches (tennis-ball size) in 2025
- **Estancia:** 1.75 inches (golf-ball size) in 2017
- **Mountainair:** 1.75 inches (golf-ball size) in 2017
- **Encino:** 1.75 inches (golf-ball size) in 2023

- **Willard:** 2.00 inches (hen-egg size in 2024
- **SWCDs:** Spanning large areas, these districts can expect average hail size to vary, with estimates from 1.75 (golf-ball size) to 2.50 inches (tennis-ball size).

Lightning activity can be measured by the Lightning Activity Levels (LAL) scale, a 1–6 scale used in fire weather where 1 is none, 2 is isolated, 3–4 is scattered to numerous, 5 is widespread/wet, and 6 is widespread/dry with higher ignition potential. In Torrance County, lightning intensity typically ranges from routine storms with LAL 2–4 to occasional widespread events reaching LAL 5–6.

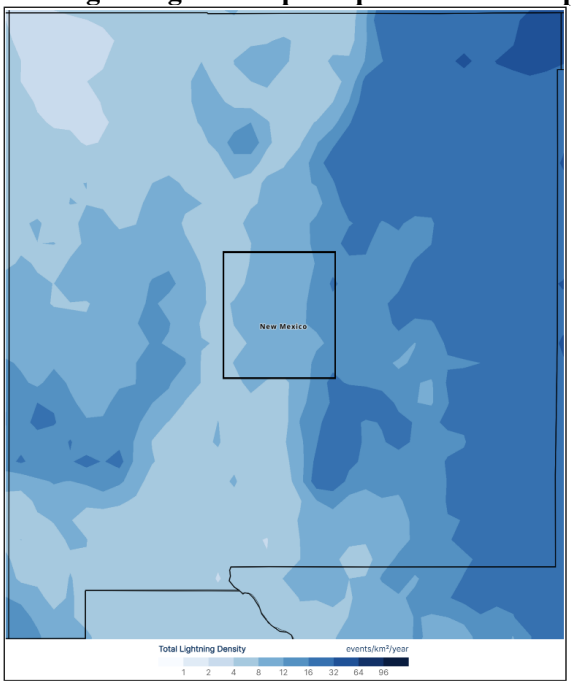
A single thunderstorm moving across the county usually produces dozens to 100+ total flashes, with about 10–50 cloud-to-ground strikes per storm cell (higher during outbreak days). Individual flashes commonly have 2–5 return strokes. Typical peak currents are about 20–50 kiloamperes (kA), with credible highs above 100 kA. Lightning channels reach approximately 20,000–30,000 Kelvin. Continuing current can last long enough to ignite fine fuels and damage electronics. Most strikes are negative polarity, while less frequent positive strikes carry higher energy. A reasonable county worst case is LAL 6, with hundreds of cloud-to-ground strikes in a single afternoon or evening and isolated current peaks above 150 kA.

For expressing extent via protection standards, Torrance County and participating jurisdictions should use the National Fire Protection Association 780 and International Electrotechnical Commission 62305 Lightning Protection Levels. Most public buildings and utility sites align with Lightning Protection Levels III–IV (design to roughly 100 kA). Critical sites, such as dispatch facilities, communications towers, water/wastewater control buildings, electrical substations, and information technology rooms, warrant Lightning Protection Levels I–II (design up to roughly 200 kA).

Lightning frequency and spatial extent in Torrance County, New Mexico, varies seasonally but is generally concentrated during the late spring through early fall monsoon period, when convective storms are most common. The communities of Encino, Estancia, Mountainair, Moriarty, and Willard all experience frequent lightning activity, often associated with fast-moving thunderstorms that develop over the surrounding high plains and Manzano Mountains. The relatively open terrain allows lightning to travel across broad swaths of the county.

Lightning is usually characterized by flash density and annual thunderstorm day frequency. The following map, from Vaisala, indicates the average annual light events per square kilometer per year for Torrance County:

Map 37: Average Annual Lightning Events per Square Kilometer per Year, 2016 - 2023



Source: Vaisala

The following provide an indication of the potential extent of future events:

- **Encino:** Moderate frequency (~3–6 flashes/km²/year)
- **Estancia:** Moderate frequency (~3–6 flashes/km²/year)
- **Mountainair:** Moderate frequency (~3–6 flashes/km²/year)
- **Moriarty:** Moderate frequency (~3–6 flashes/km²/year)
- **Willard:** Moderate frequency (~3–6 flashes/km²/year)
- **SWCDs:** Spanning large areas, these districts can expect moderate frequency (~3–6 flashes/km²/year).

To measure wind speed and its correlating potential for damage, experts use the Beaufort scale as shown below.

Table 70: Beaufort Scale

Beaufort Number	Wind Speed (mph)	Effects on Land
0	Under 1	Calm, smoke rises vertically
1	1-3	Smoke drift indicates wind direction, vanes do not move
2	4-7	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Leaves, small twigs in constant motion. Light flags extended.
4	13-18	Dust, leaves and loose paper raised up; small branches move
5	19-24	Small trees begin to sway
6	25-31	Large branches of trees in motion, whistling heard in wires
7	32-38	While trees in motion, resistance felt in walking against the wind
8	39-46	Twigs and small branches broken off trees
9	47-54	Slight structural damage occurs, slate blown from roofs
10	55-63	Seldom experienced on land, trees broken, structural damage occurs
11	64-72	Very rarely experienced on land, usually with widespread damage
12	73 or higher	Violence and destruction

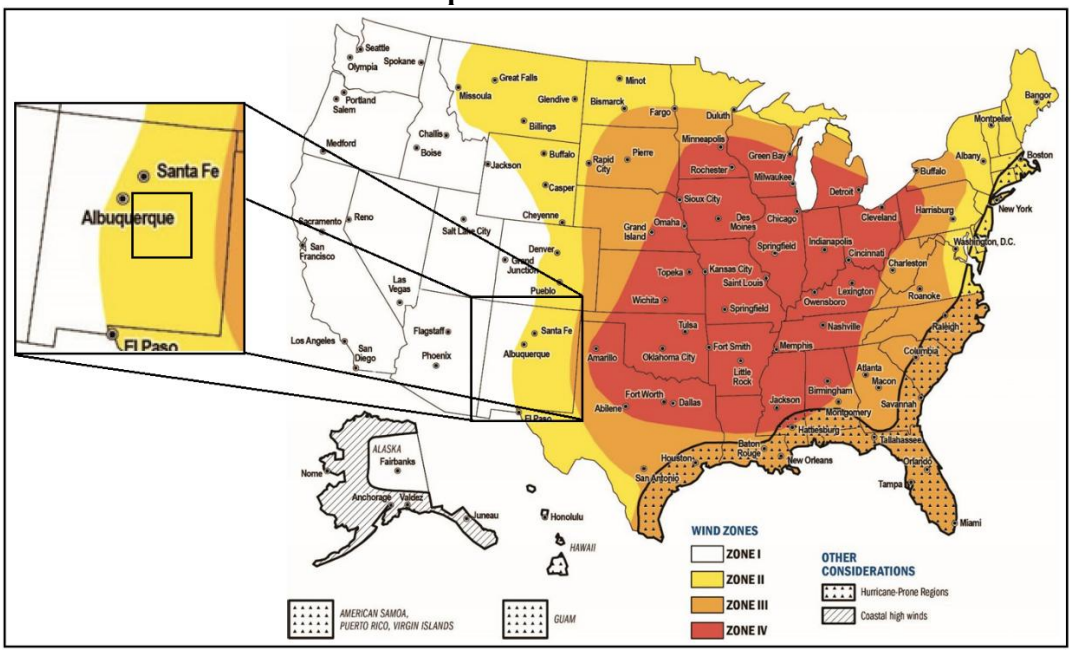
Source: NOAA

The following present documented peak wind gusts associated with each community (from NWS statements/briefings and nearby official stations) and provide an indication of the potential extent of future events:

- **Encino:** 57 mph on February 14, 2023.
- **Estancia:** 64 mph on April 1, 2025.
- **Mountainair:** 60 mph on April 1, 2025.
- **Moriarty:** 60 mph at Moriarty Municipal Airport on Mar 18, 2025.
- **Willard:** No permanent station in town; nearest long-term site is Clines Corners 76 mph on Mar 18, 2025.
- **SWCDs:** Spanning large areas, these districts can expect maximum wind speeds greater than 57 mph.

The following maps from FEMA indicate the highest possible expected wind speeds for Torrance County.

Map 38: Wind Zones



Source: FEMA

The MPC views severe weather as both a local and county-wide hazard. Discussions with the MPC and a review of all available data indicated severe weather is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Encino:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Estancia:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Moriarty:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Mountainair:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Willard:** Severe weather identified as a community concern as citizens, structures, and infrastructure are vulnerable.
- **Soil and Water Conservation Districts:** Severe weather identified as a concern as areas of stewardship are vulnerable to potential impacts.

5.11.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Torrance County has experienced six Presidential Disaster Declarations related to severe weather events, reflected in the following table:

Table 71: Torrance County Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Individual Assistance	Public Assistance
DR-4152-NM	10/29/2013	**Severe Storms**, Flooding, Mudslides	$41,827,081	-
DR-1659-NM	1/30/2006	**Severe Storms**, Flooding	$1,734,451	$32,673,169
DR-731-NM	01/18/1985	**Severe Storms**, Flooding	-	-

Source: FEMA
-: Not reported

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Torrance County has experienced no Emergency Declarations related to severe weather events.

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. The following New Mexico State of Emergencies shave been declared related to severe weather events:

Table 72: Governor of New Mexico Torrance County Disaster Declarations, 2019 - 2024

Year	Executive Order	Incident Type
2019	2019-009	Severe Wind, Tornados, Hail, and Power Outages (statewide)

Additionally, the following table presents NCEI identifies severe weather and severe winter weather events and the resulting damage totals in Torrance County from 1950 to 2024:

Table 73: NCEI Torrance County Severe Weather Events

Jurisdiction	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Torrance County	Hail	79	$1,389,000	10
	Lightning	3	$11,500	3
	Thunderstorm Winds	41	$309,000	0

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

Recent notable events include:

- **September 4, 2021:** A severe thunderstorm tracking southeast across Interstate 40 near Moriarty caused thunderstorm wind damage with estimated 60 to 70 mph winds. A Moriarty resident reported that multiple trees were downed in the area with widespread power outages. Another resident's above ground cistern was also moved several feet by the strong winds. Schwebach Farms in Moriarty reported extensive damage to their entire farm crops which forced them to harvest the entire crop immediately. Damages are a rough estimate. Damages were reported at $100,000.
- **July 23. 2021:** A trained spotter near Corona reported baseball size hail from a severe thunderstorm tracking north-northeast through the area. The spotter reported that their front and rear windshields on their truck were broken as well as their rearview mirrors. Other reports of damage to about 100 vehicles was received although the extent of the damage is not known. A horse trailer also sustained damage while a horse lost one of its eyes due to hail injuries. Damages were reported at $150,000.
- **June 25, 2017:** A major hailstorm struck Interstate 40 at State Road 3 producing significant damage and impacts to travel. Hail up to the size of tennis balls slammed the Interstate. Numerous vehicles had windshields smashed out. Traffic was stopped for over two hours. Emergency response personnel attended several stranded vehicles with injured motorists. Hail was up to five inches deep and flooding was reported along the highway. Damages were reported at $1,000,000 and 10 injuries were reported.
- **July 24. 2013:** A car traveling east bound on Interstate 40 three miles east of Moriarty at mile marker 199 with 4 occupants was struck by lightning. One child and one adult were injured and treated at the scene. The car's electronics were destroyed and vehicle towed from scene. Damages were reported at $10,000.

5.11.4 Probability of Future Events

Predicting the probability of severe weather occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Data and mapping from NOAA indicate that Torrance County can expect between 45 - 81 severe weather events per year.

Based on historical occurrences, Torrance County will continue to experience severe weather events on an annual basis. The following tables, using data from the NCEI, indicate the yearly probability of a severe weather component events, the number of deaths or injuries, and estimated property damage :

Table 74: Torrance County NCEI Severe Weather Event Probability Summary

Event	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Hail	79	1	10	<1	$1,389,000	$18,520
Lightning	3	<1	3	<1	$11,500	$153
Thunderstorm Winds	41	1	0	0	$309,000	$4,120

Source: NCEI

5.11.5 Projected Changes in Location, Intensity, Frequency, and Duration

Changing conditions can lead to increased temperatures and moisture levels in the atmosphere, which can provide favorable conditions for the development of severe weather. This can result in a higher frequency of severe weather events and an increase in their intensity. As a result of increased temperatures, warmer air can hold more moisture, leading to increased rainfall during severe weather. This can elevate the risk of flash flooding, particularly in areas prone to heavy precipitation. Changes in atmospheric circulation patterns can lead to stronger winds within thunderstorms. This can result in more powerful wind gusts, increasing the risk of wind damage and downed trees and power lines.

Warmer temperatures at the surface and greater instability in the atmosphere can contribute to larger and more damaging hailstones. Additionally, changes in atmospheric conditions can affect the frequency and distribution of lightning strikes. More lightning can increase the risk of wildfires in dry regions.

5.11.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from severe weather. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 75: Participating Jurisdiction Hail Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Very Low	**39.8**	**0.8**
Moriarty	35057963202	Relatively Moderate	78.7	1.2
Estancia	35057963601	Relatively Moderate	83.2	0.9
Encino, Mountainair and Willard	35057963700	Relatively Low	67.8	0.8

Source: FEMA NRI

Table 76: Participating Jurisdiction Hail Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Very Low	37.5	$47K
Moriarty	35057963202	Relatively Moderate	76.0	$12K
Estancia	35057963601	Relatively Moderate	80.1	$18K
Encino, Mountainair and Willard	35057963700	Relatively Low	67.6	$5.8K

Source: FEMA NRI

Table 77: Participating Jurisdiction Lightning Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	60.3	47.9
Moriarty	35057963202	Relatively High	88.8	43.5
Estancia	35057963601	Very High	98.6	44.4
Encino, Mountainair and Willard	35057963700	Relatively High	81.7	49.9

Source: FEMA NRI

Table 78: Participating Jurisdiction Lightning Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Low	54.3	$102K
Moriarty	35057963202	Relatively High	83.4	$17K
Estancia	35057963601	Very High	97.2	$41K
Encino, Mountainair and Willard	35057963700	Relatively High	80.6	$16K

Source: FEMA NRI

Table 79: Participating Jurisdiction Strong Wind Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Very Low	9.8	0.3
Moriarty	35057963202	Relatively Low	48.2	0.3
Estancia	35057963601	Relatively Moderate	61.2	0.3
Encino, Mountainair and Willard	35057963700	Relatively Low	36.2	0.3

Source: FEMA NRI

Table 80: Participating Jurisdiction Strong Wind Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Very Low	11.0	$28K
Moriarty	35057963202	Relatively Low	42.9	$6.4K
Estancia	35057963601	Relatively Low	53.3	$11K
Encino, Mountainair and Willard	35057963700	Relatively Low	35.6	$4K

Source: FEMA NRI

Population

Severe weather can have a wide range of effects on people, often posing significant risks to life, property, and general well-being. In the absence of proper shelter, hail, lightning, and high winds can cause serious injury. In general, if potentially exposed persons take shelter in a solid, well-constructed structure protection from these severe weather components would be provided. However, old or poorly constructed facilities may be more prone to damage, potentially increasing the impact on economically disadvantaged populations. Some of the potential effects of severe weather on people may include:

- **Death and Injury:** Severe weather can produce lightning and strong winds driving debris. Both of these elements can cause injuries or fatalities.
- **Power Outages:** Lightning strikes, strong winds, and falling trees can lead to power outages, disrupting daily life, and potentially affecting essential services, such as medical equipment and refrigeration.
- **Mental Health Impact:** Severe weather can be frightening and stressful, leading to anxiety and post-traumatic stress disorder in some individuals. The emotional toll of property damage and loss can also be significant.
- **Displacement:** People may need to evacuate their homes or be temporarily displaced due to storm damage, requiring emergency shelter and support.
- **Economic Costs:** Severe weather results in economic costs, including repair and recovery expenses, insurance claims, and potential loss of income due to property damage or work disruptions.

- **Public Safety Response:** Severe weather can strain public safety resources, including emergency services, law enforcement, and medical facilities.

At greater risk may be the vulnerable populations, including the especially young, the elderly, and those below the poverty level. Hazard occurrences can exacerbate existing vulnerabilities and create new challenges.

All Torrance County and participating jurisdiction populations are vulnerable to the impacts of severe weather. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures
All buildings and structures within Torrance County and participating jurisdictions can be impacted by severe weather. However, the location and construction of the facility will have a significant impact on the vulnerability. In general, older structures would be at higher risk of negative impacts. Some of the potential impacts include:

- **Electrical Infrastructure Damage:** Severe weather can damage electrical infrastructure, including power lines, transformers, and substations. This can result in widespread power outages, affecting homes, businesses, hospitals, and other critical facilities.
- **Communication Disruptions:** Severe weather can disrupt telecommunications infrastructure, including cell towers, data centers, and communication networks. This can impact emergency communication and coordination efforts.
- **Safety Risks:** Damage to infrastructure can pose safety risks to workers and the public. Fallen power lines, damaged buildings, and debris can be hazardous.
- **Building Damage:** High winds, large hail, and lightning strikes can cause damage to the building.

Governmental Operations
Severe weather can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Severe weather can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy rainfall during severe weather can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Severe weather can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Severe weather can make roads impassable due to flooding or debris. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after severe weather can strain budgets.

Transportation and Electrical Infrastructure
In general, severe weather components do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling and poor conditions impacting driving conditions.

Severe weather can have significant impacts on electrical utilities, leading to disruptions in power supply and potential damage to infrastructure. Severe weather can affect electrical utilities in the following ways:

- **Lightning Strikes:** Lightning is a common occurrence during severe weather and poses a substantial risk to electrical infrastructure. Lightning strikes can damage power lines, transformers, substations, and other critical components, leading to power outages.

- **Wind Damage:** High winds associated with severe weather can cause trees, branches, and other debris to fall onto power lines. This can result in downed power lines, structural damage to utility poles, and disruptions in electrical service.
- **Hailstorms:** Severe weather may produce hail, which can damage power lines, transformers, and other equipment. Hailstones can also lead to short circuits and insulation damage on electrical components.
- **Power Surges:** Lightning strikes, strong winds, and other storm-related events can lead to power surges in the electrical grid. These surges can damage electronic devices, appliances, and utility equipment connected to the power supply.

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Facilities and Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.8.6.

Water and Wastewater Utilities
In general, severe weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities or localized flooding from heavy overwhelming drainage systems may cause disruptions to operations.

Medical and Response Facilities
Severe weather can significantly impact emergency response infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of severe weather events. Severe weather can impact emergency response through:

- **Transportation Disruptions:** Debris on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Severe weather can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Severe weather can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks in severe weather conditions. Exposure to hail, high winds, and lightning can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Severe weather often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Severe weather can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously.

Educational Facilities
Depending on the educational facility capability and location, severe weather may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Severe weather can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
All communication systems within Torrance County are at risk to severe weather, which can disrupt vital communications system affecting reliability and functionality. Some of the key vulnerabilities include:

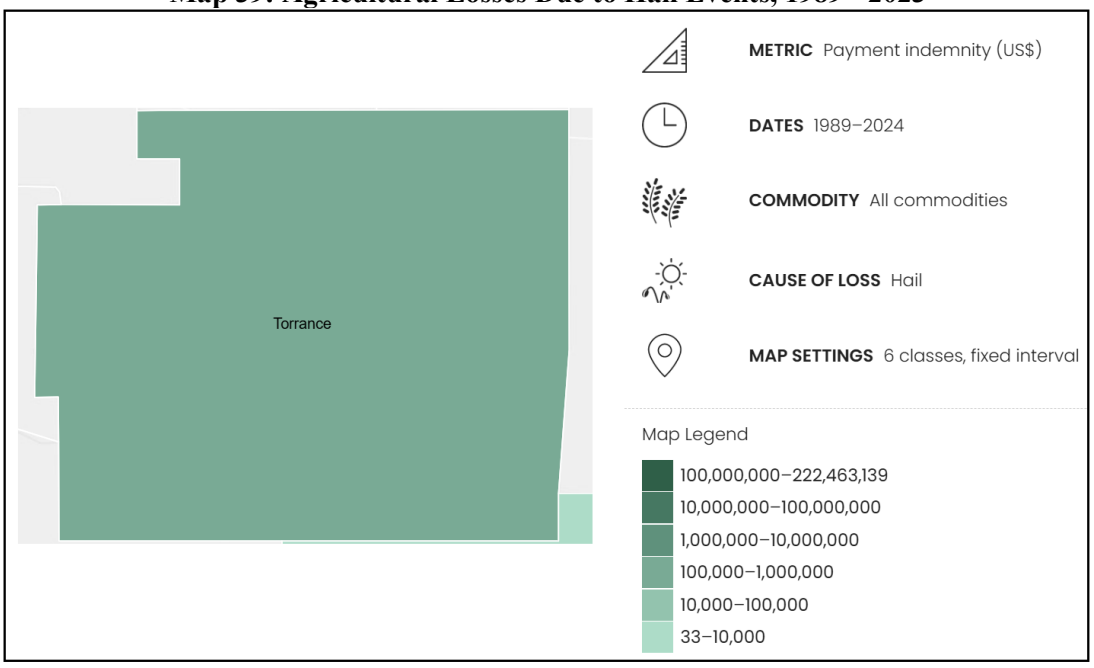
- **Physical Infrastructure Damage:** High winds, heavy rainfall, and other severe weather conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Severe storms often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Lightning Strikes:** Lightning poses a threat to communication infrastructure. Direct strikes or induced surges can damage electronic equipment, leading to the need for repairs or replacements and causing downtime.
- **Signal Interference:** Severe storms can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.
- **Loss of Backhaul Connectivity:** Severe weather events can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- **Communication Tower Instability:** High winds and extreme weather conditions can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.9.6.

Environmental and Agricultural Impacts

Hail events can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to hail events from 1989 - 2023:

Map 39: Agricultural Losses Due to Hail Events, 1989 - 2023



Source: USDA

Severe weather can pose various risks to the environment. These risks can have both short-term and long-term impacts on natural ecosystems. Severe weather can produce heavy rainfall over a short period of time, leading to flash floods and riverine flooding. This can result in soil erosion, damage to aquatic habitats, and the displacement of aquatic organisms. Large hailstones can damage crops, vegetation, and natural habitats. Hail can strip leaves from trees and plants, reducing their ability to photosynthesize and grow. It can also damage wildlife habitats. Severe weather often produces strong straight-line winds. These winds can uproot trees, damage forests, and disrupt animal habitats. They can also scatter debris and cause structural damage to buildings, which can lead to further environmental issues if hazardous materials are released. Lightning is a common occurrence during severe weather and can spark wildfires. These wildfires can have significant ecological impacts, including habitat destruction, loss of wildlife, and changes in the local ecosystem.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** With 2.7% of citizens living in poverty, severe weather and the associated property damage may disproportionately impact them due to underinsurance. Additionally, severe weather may impact tourism, lowering potential community revenue. With limited access and services, severe weather may cut the community off from necessary services due to limited road access. With limited response services, severe weather may affect overall community response and recovery. Of particular concern, 63.4% of the housing stock is mobile or modular homes, which are very susceptible to severe weather.
- **Estancia:** With 11.0% of citizens living in poverty, severe weather and the associated property damage may disproportionately impact them due to underinsurance. Additionally, severe weather may impact tourism, lowering potential community revenue. With limited access and services, severe weather may cut the community off from necessary services due to limited road access. With limited response services, severe weather may affect overall community response and recovery. Of particular concern, 43.7% of the housing stock is mobile or modular homes, which are very susceptible to severe weather.
- **Moriarty:** With 39.1% of citizens living in poverty, severe weather and the associated property damage may disproportionately impact them due to underinsurance. Additionally, severe weather may impact tourism, lowering potential community revenue. With limited response services, severe weather may affect overall community response and recovery. Of particular concern, 22.6% of the housing stock is mobile or modular homes, which are very susceptible to severe weather.
- **Mountainair:** With 28.6% of citizens living in poverty, severe weather and the associated property damage may disproportionately impact them due to underinsurance. Additionally, severe weather may impact tourism, lowering potential community revenue. With limited access and services, severe weather may cut the community off from necessary services due to limited road access. With limited response services, severe weather may affect overall community response and recovery. Of particular concern, 24.6% of the housing stock is mobile or modular homes, which are very susceptible to severe weather.
- **Willard:** With 38.2% of citizens living in poverty, severe weather and the associated property damage may disproportionately impact them due to underinsurance. Additionally, severe weather may impact tourism, lowering potential community revenue. With limited access and services, severe weather may cut the community off from necessary services due to limited road access. With limited response services, severe weather may affect overall community response and recovery. Of particular concern, 56.6% of the housing stock is mobile or modular homes, which are very susceptible to severe weather.
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to a severe weather event. Impacts on sensitive areas may be significant.

Cascading Impacts

Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe weather may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 81: Severe Weather Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Severe weather can cause extensive property damage, loss of utility service, and injury. Those most at-risk are low-income and homeless individuals without shelter.
Impact on Responders	First responders may be unable to access roadways due to flooding, trees, or debris. Exposure to lightning, flooding, and high winds may cause injuries to first responders. Vehicles and resources may be damaged, leading to impaired response activities. In addition, road conditions may become hazardous as a result of the by-products
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Severe Weather may impact an agency's ability to maintain continuity of operations due to power outages, flooding, and wind damage. If the activation of alternate facilities was required, travel may be difficult as well as computer/network access due to long-term power outages caused by severe weather.
Delivery of Services	Delivery of services may be impaired by flooding, obstruction, and damage to roadways and resources. The ability to deliver goods and services will be impacted locally, regionally, or statewide depending on the magnitude of the event. Goods, equipment, and vehicles may become damaged during transport.
Property, Facilities, and Infrastructure	Power lines and power generators are most at risk from severe weather and impacts could result in isolated power outages or full-scale blackouts. Building and vehicle damage can occur from hail and other debris created by severe weather. Properties and critical facilities also may face foundational and physical damage due to flooding, lightning strike, or excessive winds, delaying response and recovery operations.
Impact on Environment	Waste and debris from damaged treatment infrastructure or hazardous materials facilities could contaminate sources of water and food. Debris can impact and contaminate wildlife and natural areas. Lightning strikes may also ignite fires, leading to destruction of agricultural crops, critical ecosystems, and natural habitats.
Economic Conditions	Flooding, high winds, lightning, and hail can stress local resources. Even if some of the costs can be recouped through federal reimbursements (federal disaster declaration), there is a fiscal impact on the local government.
Public Confidence in Governance	Ineffective response can decrease the public's confidence in the ability to respond and govern. Governmental response across local, state, regional, and federal levels require direct actions that must be immediate and effective to maintain public confidence.

5.11.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number citizens living below the poverty level in all jurisdictions as a percentage of total population. These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources
- Limited insurance coverage
- Health vulnerabilities
- Social isolation

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease

5.11.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 82: Example Severe Weather Mitigation Actions

Category	Example Action
Planning and Regulation	Review building codes and structural policies to ensure they are adequate to protect older structures from wind damage.
	Require tie-downs with ground anchors appropriate for the soil type for manufactured homes.
	Incorporate passive ventilation in the site design., which use a series of vents in exterior walls or at exterior windows to allow outdoor air to enter the home in a controlled way.
	Establish standards for all utilities regarding tree pruning around lines.
	Inspect utility poles to ensure they meet specifications and are wind resistant.
	Ensure the development and enforcement of building codes.
Infrastructure	Install lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities.
	Install and maintain surge protection on critical electronic equipment.
	Retrofit buildings with load-path connectors to strengthen the structural frames.
	Avoid placing flag poles or antennas near buildings.
	Protect traffic lights and other traffic controls from high winds.
	Add building insulation to walls and attics.
Natural Systems	Properly maintain stream and river channels to ensure flow.
	Use living fences (e.g., rows of trees or other vegetation) to limit blowing dust and debris.
Education	Develop a lightning brochure for distribution by recreation equipment retailers or outfitters in mountainous areas.
	Educate design professionals to include wind mitigation during building design.
	Instruct property owners on how to properly install temporary window coverings.
	Produce and distribute family and traveler emergency preparedness information.
	Organize outreach to vulnerable populations, including establishing and promoting accessible shelters in the community.

5.12 Severe Winter Weather



5.12.1 Hazard Description

Severe winter weather encompasses multiple effects caused by winter storms and conditions. Included are strong winds, ice storms, heavy or prolonged snow, sleet, and extreme cold. Winter storms can be increasingly hazardous in areas and regions that only see winter storms intermittently.

This plan defines severe winter weather as a combination of the following effects as defined by NOAA and the NWS.

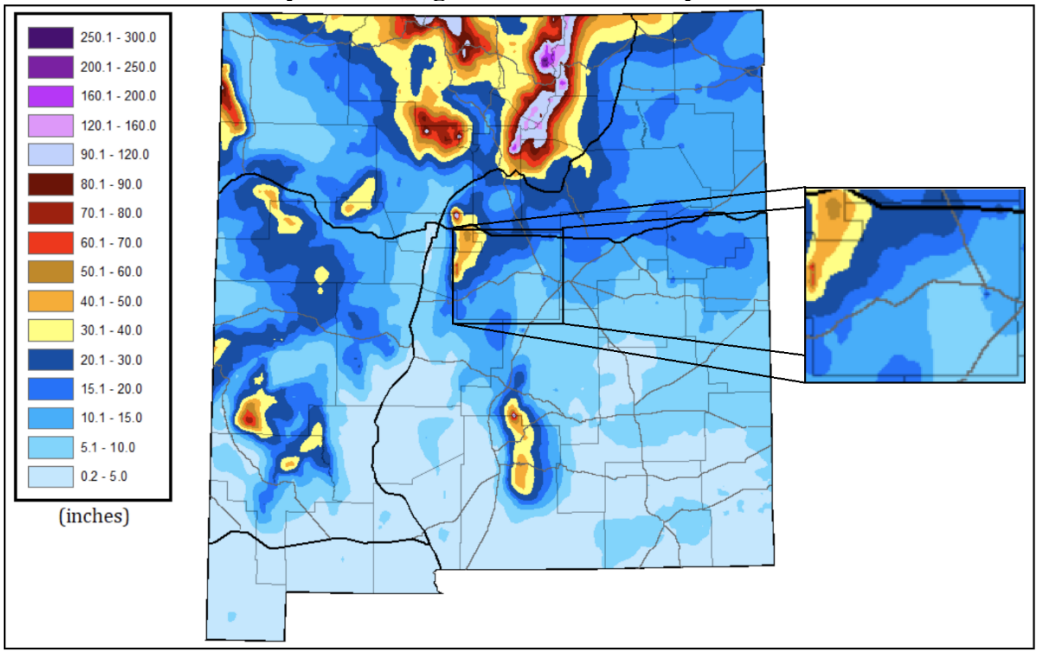
- **Ice Storm:** Damaging accumulations of ice from a freezing rain situation. These events can pull down trees and utility lines resulting in loss of power and communication and can make travel extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater.
- **Heavy Snow:** This generally means snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less.
- **Winter Storm:** Hazardous winter weather in the form of heavy snow, freezing rain, or heavy sleet. It may also include extremely low temperatures and increased wind.
- **Cold Wave/Extreme Cold:** As described by NWS, a cold wave is a rapid fall in temperature within a 24-hour period requiring substantially increased protection to agriculture, industry, commerce, and social activities.

5.12.2 – Location and Extent

Severe winter weather occurs regularly throughout Torrance County. These events occur on a large geographic scale, often affecting multiple counties, regions, and states. Winter storms typically form with some warning and are often anticipated. Like other large storm fronts, the severity of a storm is not as easily predicted due to myriad factors that can influence its impact. Although meteorologists estimate the amount of snowfall a winter storm will drop, it is not known exactly how much snow will fall, whether or not it will form an ice storm, or how powerful the winds will be.

The following map from the NWS indicates the average annual snowfall for Torrance County from 2008 – 2019. It is worth noting that the northwest corner of the county, and the western boundary of the county (Manzano Mountains) see greater snowfall totals than the remainder of the county.

Map 40: Average Annual Snowfall per Year



Source: NWS

The Northeast Snowfall Impact Scale is a scale used to assess and rank the impact of snowfall events in the northeastern United States, but allows for an idea of intensity for Torrance County. It was developed by NOAA to provide a standardized way of measuring the societal and economic impacts of snowstorms. The scale takes into account factors such as snowfall amount, population density, and the area affected by the storm to determine its impact. The scale has five categories, each with its own associated impacts:

Table 83: Snowfall Impact Scale

Category	Description	Impacts
1	Notable 10-20”	Light to moderate snowfall. Limited impacts on transportation and daily life. Typically localized to small areas.
2	Significant 20-30”	Moderate to heavy snowfall. Widespread impacts on transportation, including delays and disruptions. Some school and business closures. Widespread power outages are rare.
3	Major 30-40”	Heavy snowfall, often exceeding one foot or more. Significant transportation disruptions, including major highway closures. Widespread school and business closures. Power outages may occur, especially in areas with wet, heavy snow.
4	Crippling 40-50”	Extreme snowfall, often exceeding two feet or more. Severe and prolonged transportation disruptions, including highway closures. Widespread school and business closures for an extended period. Widespread and prolonged power outages, especially in areas with ice accumulation.
5	Extreme 50+”	Exceptional snowfall, often exceeding three feet or more. Complete paralysis of transportation systems, including major highways and airports. Extended school and business closures. Widespread and prolonged power outages with significant damage to the electrical infrastructure.

Source: NOAA

The following snowfall information was compiled using NOAA’s NCEI climate normal, historical event data from nearest long-term weather stationsand from the Western Regional Climate Center station summary and extremes pages and provide an indication of the potential extent of future events:

- **Encino:** Average seasonal snowfall approximately 28 inches, with a typical single-storm ranging from 2–12 inches, and a recorded high snowfall of 30 inches+ in December 2006 (Category 3).
- **Estancia:** Average seasonal snowfall approximately 20–30 inches, with a typical single-storm ranging from 2–12 inches, and a recorded high snowfall of 30 inches+ in December 2006 (Category 3).
- **Mountainair:** Average seasonal snowfall approximately 25–35 inches, with a typical single-storm ranging from 3–12 inches, and a recorded high snowfall of 36 inches in December 2006 (Category 3).
- **Moriarty:** Average seasonal snowfall approximately 26 inches, with a typical single-storm ranging from 2–10 inches, and a recorded high snowfall of 28 inches+ in December 2006 (Category 3).
- **Willard:** Average seasonal snowfall approximately 25–35 inches, with a typical single-storm ranging from 3–12 inches, and a recorded high snowfall of 36 inches in December 2006 (Category 3).
- **SWCDs:** Spanning large areas, these districts can expect average seasonal snowfall approximately 20–35 inches, with a typical single-storm ranging from 2–12 inches, and a recorded high snowfall of greater than 26 inches 2006 (Category 3).

The scale provides information for emergency management, public safety agencies, and the public to understand the potential impacts of a snowstorm and to prepare accordingly. It helps to quantify and communicate the severity of winter weather events, especially where snowfall can have a major impact on daily life and the economy.

Ice storms are characterized by the accumulation of freezing rain or freezing drizzle, which coats surfaces with a layer of ice. These storms can have significant impacts on transportation, infrastructure, and the environment. Ice storms occur when there's a layer of warm air above a layer of cold air near the surface. Precipitation falls as rain in the warm layer and then freezes upon contact with surfaces at or below freezing temperatures in the cold layer. The most common type of precipitation during an ice storm is freezing rain. This is rain that falls as a liquid but freezes upon contact with cold surfaces, forming a layer of ice.

The Sperry–Piltz Ice Accumulation Index is an ice accumulation and ice damage prediction index that, when combined with NWS data, predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms.

Figure 11: Sperry–Piltz Ice Accumulation Index

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

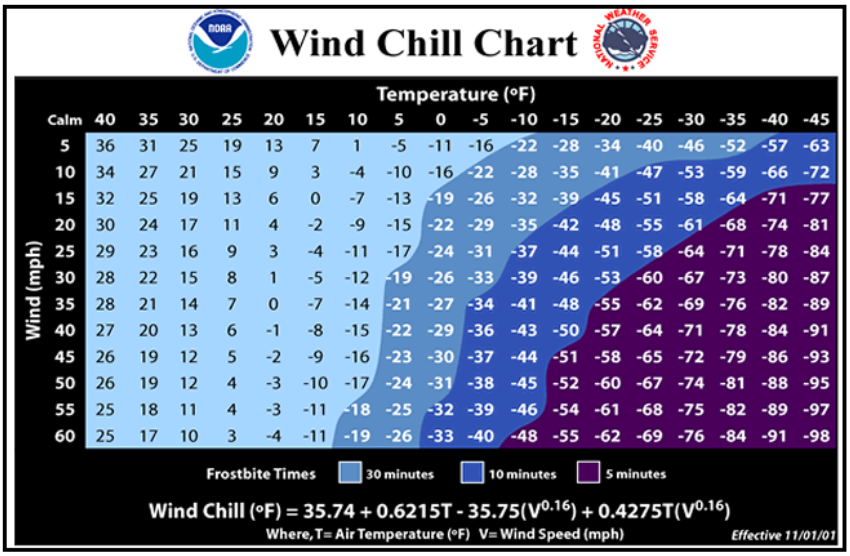
Source: Sperry–Piltz Ice Accumulation Index

Ice storms in Torrance County, including the communities of Encino, Estancia, Mountainair, Moriarty, and Willard, are relatively rare but can cause significant disruption when they occur. Most events produce light glaze under 0.25 inches, creating slick roads and minor utility interruptions, but on occasion, freezing rain can accumulate. The following summary, using data from the NOAA Storm Events Database for historical ice storm occurrences, nearest long-term weather station records for local context, and the Sperry–Piltz Ice Accumulation Index (SPIA) and provide an indication of the potential extent of future events:

- **Encino:** Most ice storms produce minimal impacts (SPIA 0), with rare events reaching SPIA 3.
- **Estancia:** Most ice storms produce minimal impacts (SPIA 0), with rare events reaching SPIA 3.
- **Mountainair:** Most ice storms produce minimal impacts (SPIA 0), with rare events reaching SPIA 3.
- **Moriarty:** Most ice storms produce minimal impacts (SPIA 0), with rare events reaching SPIA 4
- **Willard:** Most ice storms produce minimal impacts (SPIA 0), with rare events reaching SPIA 4.
- **SWCDs:** Spanning large areas, these districts can expect a SPIA range from 0 to 4.

Extreme cold in Torrance County, including the communities of Encino, Estancia, Mountainair, Moriarty, and Willard, is an infrequent but potentially high-impact hazard that typically occurs during strong Arctic air outbreaks in winter. The following wind chill chart illustrates how cold temperatures combined with wind speed increase the risk of frostbite and hypothermia, with higher winds rapidly accelerating heat loss from exposed skin. In Torrance County, extreme cold events can push wind chills into dangerous ranges, creating health risks for residents, stressing infrastructure, and impacting vulnerable populations and livestock.

Chart 19: Wind Chill Chart



Source: NOAA

The following provided the lowest recorded temperatures (as available), along with calculated wind chill values, and provide an indication of the potential extent of future events:

- **Estancia:** Lowest recorded temperature of -37 °F in 1971, with a wind of 10 mph, equating to a wind chill of −62 °F.
- **Moriarty:** Lowest recorded temperature of −16 °F in the modern period, with a wind of 10 mph, equating to a wind chill of −36 °F.
- **Mountainair:** Data unavailable. For planning, a conservative −20 °F would yield a wind-chill near −41 °F at 10 mph.
- **Encino:** Data unavailable. For planning, a conservative −20 °F would yield a wind-chill near −41 °F at 10 mph.
- **Willard:** Data unavailable. For planning, a conservative −20 °F would yield a wind-chill near −41 °F at 10 mph.
- **SWCDs:** Spanning large areas, these districts can expect record lows up to -37 °F, and potential wind chills of −62 °F.

The MPC views severe winter weather as both a local and county-wide hazard. Discussions with the MPC and a review of all available data indicated severe weather is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.
- **Encino:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.
- **Estancia:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.
- **Moriarty:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow, increasing hazard concerns).

- **Mountainair:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.
- **Willard:** Severe winter weather identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.
- **Soil and Water Conservation Districts:** Severe winter weather identified as a concern as areas of stewardship are vulnerable to potential impacts. Additionally, continued warming may result in a change in the nature of winter precipitation (ice and freezing rain as opposed to snow), increasing hazard concerns.

5.12.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Torrance County has experienced one Presidential Disaster Declaration related to severe winter weather events, reflected in the following table:

Table 84: Torrance County Presidentially Declared Disasters

Designation	Declaration Date	Incident Type	Individual Assistance	Public Assistance
DR-1202-NM	01/29/1998	Severe Winter Storms	-	-

Source: FEMA
-: Not reported

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Torrance County has experienced no Emergency Declarations related to severe winter weather events.

In New Mexico, the governor has the authority to declare a state of emergency or disaster under various state statutes and provisions. The following New Mexico State of Emergencies have been declared related to severe winter weather events:

Table 85: Governor of New Mexico Torrance County Disaster Declarations, 2019 - 2024

Year	Executive Order	Incident Type
2019	2019-008	Severe Winter Storms (statewide)

Source: NMDHSEM

Additionally, the following table presents NCEI identifies severe weather and severe winter weather events and the resulting damage totals in Torrance County from 1950 to 2024:

Table 86: NCEI Torrance County Severe Winter Weather Events

Jurisdiction	Event Type	Number of Days with Events	Property Damage	Deaths and Injuries
Torrance County	Blizzard	4	$0	0
	Extreme Cold	3	$0	0
	Ice Storm	2	$100,000	0

Source: NCEI

It is worth noting that damage estimates indicated by the NCEI are often artificially low. This underreporting is a result of the way the events are reported to the NCEI, often by the local and/or NWS office. When reporting an event, the NWS office does not have access to the actual damage assessment resulting from that event. As such, the report often details a very low amount or zero-dollar amount for damages. Additionally, deaths and injuries may be underreported as they may be a result of a concurrent event, such as a person driving unsafely during heavy rain and passing away.

Recent notable events include:

- **November 27, 2015:** One quarter to one half inch of freezing rain and light snow accumulations impacted the U.S. Highway 54 corridor. Treacherous driving conditions were reported. Numerous accidents were reported,

including an overturned semi-truck. The highway was closed for several hours. Damages are a rough estimate. Damages were reported at $100,000.

5.12.4 Probability of Future Events

Predicting the probability of severe weather occurrences is tremendously changing due to the large number of factors involved and the random nature of formation. Data and mapping from NOAA indicate that Torrance County can expect, depending on location within the county, 5” – 70” of snow per year.

Based on historical occurrences, Torrance County will continue to experience severe weather events on an annual basis. The following tables, using data from the NCEI, indicate the yearly probability of a severe weather component events, the number of deaths or injuries, and estimated property damage :

Table 87: Torrance County NCEI Severe Winter Weather Event Probability Summary

Event	Days with Event	Average Events per Year	Deaths / Injuries	Average Deaths / Injuries per Year	Property Damage	Average Property Damage per Year
Blizzard	4	<1	0	0	$0	$0
Extreme Cold	3	<1	0	0	$0	$0
Ice Storm	2	<1	0	0	$100,000	$1,333

Source: NCEI

5.12.5 Projected Changes in Location, Intensity, Frequency, and Duration

Changing conditions can lead to greater variability in precipitation patterns. This may result in more erratic winter storms with periods of heavy snowfall followed by rain or freezing rain. These mixed precipitation events can make winter storms more changing to predict and can lead to a greater risk of ice accumulation. Additionally, the region may experience milder winters as average temperatures rise. While this could lead to a decrease in the frequency of traditional snowstorms, it may also increase the likelihood of winter storms that produce mixed precipitation, including freezing rain and sleet. Warmer temperatures can lead to a higher snowfall threshold, meaning that storms that would have produced snow in the past may now bring more rain or a mix of precipitation types. This can affect the accumulation of snow in the state. Changes in atmospheric circulation patterns can influence the tracks of winter storms. This could lead to a shift in the amounts of heavy snowfall, ice, and other winter weather hazards.

5.12.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from severe weather. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 88: Participating Jurisdiction Cold Wave Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	51.8	0.1
Moriarty	35057963202	Relatively Moderate	79.2	0.1
Estancia	35057963601	Relatively High	92.9	0.1
Encino, Mountainair and Willard	35057963700	Relatively Moderate	73.1	0.1

Source: FEMA NRI

Table 89: Participating Jurisdiction Cold Wave Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Low	50.2	$51K
Moriarty	35057963202	Relatively Moderate	75.3	$8.2K
Estancia	35057963601	Relatively Moderate	89.8	$26K
Encino, Mountainair and Willard	35057963700	Relatively Moderate	72.1	$6.3K

Source: FEMA NRI

Table 90: Participating Jurisdiction Ice Storm Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Very Low	17.9	0.2
Moriarty	35057963202	Very Low	10.8	0
Estancia	35057963601	Relatively Moderate	71.6	0.2
Encino, Mountainair and Willard	35057963700	Relatively Low	34.2	0.2

Source: FEMA NRI

Table 91: Participating Jurisdiction ice Storm Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Very Low	15.5	$6.2K
Moriarty	35057963202	Very Low	8.2	$208
Estancia	35057963601	Relatively Low	64.2	$4.5K
Encino, Mountainair and Willard	35057963700	Very Low	32.9	$1.2K

Source: FEMA NRI

Table 92: Participating Jurisdiction Winter Weather Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	30.5	5.7
Moriarty	35057963202	Relatively Moderate	71.7	5.9
Estancia	35057963601	Relatively High	90.8	5.9
Encino, Mountainair and Willard	35057963700	Relatively Low	59.2	5.6

Source: FEMA NRI

Table 93: Participating Jurisdiction Winter Weather Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Low	28.0	$18K
Moriarty	35057963202	Relatively Moderate	66.0	$3K
Estancia	35057963601	Relatively High	87.1	$9.8K
Encino, Mountainair and Willard	35057963700	Relatively Low	57.8	$2K

Source: FEMA NRI

Population

Severe winter weather, and the extremely cold temperatures that often accompany it, is a threat to anyone exposed to them. Extreme cold can cause frostbite and hypothermia. Bitterly cold temperatures can also burst water and create an excessive demand on providers to deliver energy for household heating. There are also fire dangers associated with home heating. Heavy snow and/or ice can paralyze communities. Roads can become hazardous which may cause accidents, disrupted flow of supplies, and challenges in the delivery of emergency and medical services. Additional impacts on people and the community may include:

- **Injuries and Fatalities:** Slippery sidewalks, roads, and driveways can lead to slip and fall accidents, vehicle crashes, and pedestrian injuries. Exposure to extreme cold temperatures can cause frostbite, hypothermia, and cold-related illnesses, which can be life-threatening.

- **Power Outages:** Heavy snow, ice, and freezing rain can bring down power lines and disrupt electricity supply. Power outages can lead to heating and lighting challenges, particularly in extreme cold conditions.
- **Transportation Disruptions:** Winter storms can make roads and highways treacherous, leading to travel delays, accidents, and stranded motorists.
- **Stranded or Isolated Communities:** Severe winter weather can leave communities isolated and cut off from emergency services and supplies. Residents may need to shelter in place or rely on local resources until conditions improve.
- **Health Risks:** Exposure to extreme cold can lead to a range of health risks, including frostbite, hypothermia, and cold-related illnesses. Individuals with pre-existing health conditions may face exacerbated risks.
- **Increased Heating Costs:** Cold weather can result in higher heating costs, which can be a financial burden for many households. Low-income individuals and families may struggle to afford adequate heating.
- **Disruption of Essential Services:** Severe winter weather can disrupt essential services such as healthcare, emergency response, and utilities. Hospitals may face increased patient volumes due to weather-related injuries and illnesses.

When extremely cold temperatures are accompanied by strong winds the result can be potentially lethal wind chills. Wind chill is the temperature your body feels when the air temperature is combined with the wind speed and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the speed of the wind increases, it can carry heat away from your body much more quickly, causing skin temperature to drop. The wind chill chart shows the difference between the actual air temperature and the perceived temperature due to wind, and amount of time until frostbite occurs.

All Torrance County and participating jurisdiction populations are vulnerable to the impacts of severe winter weather. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

All buildings and structures within Torrance County and participating jurisdictions can be impacted by severe winter weather. However, the location and construction of the facility will have a significant impact on the vulnerability. In general, older structures would be at higher risk of negative impacts. Some of the potential impacts include:

- **Electrical Infrastructure Damage:** Severe winter weather can damage electrical infrastructure, including power lines, transformers, and substations. This can result in widespread power outages, affecting homes, businesses, hospitals, and other critical facilities.
- **Communication Disruptions:** Severe winter weather can disrupt telecommunications infrastructure, including cell towers, data centers, and communication networks. This can impact emergency communication and coordination efforts.
- **Safety Risks:** Damage to infrastructure can pose safety risks to workers and the public. Fallen power lines, damaged buildings, and debris can be hazardous.
- **Building Damage:** Heavy snow or ice loads can cause damage to the building.

Governmental Operations

Severe winter weather can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Severe winter weather can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy snow, or rapid melting of snow during severe winter weather can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.

- **Communication Disruptions:** Severe winter weather can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Severe winter weather can make roads impassable due to snow or ice. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after severe winter weather can strain budgets.

Transportation and Electrical Infrastructure
Severe winter weather can have significant impacts on road infrastructure, creating changing conditions for transportation and necessitating proactive measures for maintenance and safety. Winter storms can impact road infrastructure through:

- **Snow Accumulation:** Snowfall can accumulate on road surfaces, creating slippery and hazardous conditions for drivers. Accumulated snow can reduce road visibility and make travel difficult.
- **Ice Formation:** Freezing temperatures can lead to the formation of ice on roadways, increasing the risk of accidents and making roads slippery. Black ice, which is nearly invisible, poses a particular hazard.
- **Snowdrifts:** Strong winds during winter storms can lead to the formation of snowdrifts on roads, especially in open areas. These drifts can obstruct visibility and impede traffic flow.
- **Road Surface Damage:** The freeze-thaw cycle, where melted snow refreezes, can lead to the formation of ice patches and potholes on road surfaces. This cycle can contribute to the deterioration of road infrastructure over time.
- **Freeze-Thaw Cycling:** Alternating freezing and thawing can cause the expansion and contraction of water within pavement cracks, leading to the formation and enlargement of potholes.
- **Snowplow and Deicing Operations:** Snowplows and deicing operations are necessary to clear roads and improve driving conditions. However, the use of salt and chemicals for deicing can contribute to corrosion and deterioration of road surfaces and infrastructure.
- **Infrastructure Stress:** Bridges and overpasses are particularly susceptible to ice formation due to the lack of ground contact. Winter storms can stress these structures, potentially leading to structural issues over time.

Significant cost can be incurred for snow removal from transportation routes. In smaller jurisdictions with fewer resources and equipment, the cost may be on the lower end of the spectrum, ranging from a few thousand dollars to around $10,000 per snow event. In larger counties or urban areas with extensive road networks and higher population densities, the cost can be much higher, potentially ranging from $10,000 to $50,000 or more per snow event.

In general, the priority for snow removal is based on traffic volume, speed limits and road surface types. Preference is generally given in the following order:

- State trunklines
- Primary roads
- Major local roads
- Residential / subdivision streets

Severe winter weather can impact electrical utilities in various ways, potentially leading to disruptions in service. These impacts include:

- **Power Outages:** Low temperatures can strain electrical systems, leading to increased demand for heating systems. This heightened demand can overload power grids, resulting in power outages.
- **Equipment Failure:** Electrical equipment, such as cables and switches, may experience higher stress during extremely cold weather, increasing the likelihood of equipment failures.
- **Icing on Power Lines:** Ice accumulation on power lines can lead to increased weight, potentially causing lines to sag or break. This can result in power outages and safety hazards.

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Facilities and Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.8.6.

Water and Wastewater Utilities
In general, severe winter weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities, localized flooding from heavy overwhelming drainage systems, or frozen pipes in water distribution systems, can cause system disruptions.

Medical and Response Facilities
Severe winter weather can significantly impact emergency response and medical infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of severe winter weather events. Winter storms can impact emergency response and medical services through:

- **Transportation Disruptions:** Snow and ice accumulation on roads can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Severe winter weather can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Severe winter weather can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks in severe winter weather conditions. Exposure to hail, high winds, extreme cold, snow, and ice can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Severe winter weather often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Severe winter weather can result in an increased demand for emergency services, including medical assistance, search and rescue operations, and responses to accidents. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Severe winter weather can increase the demand for emergency shelters, particularly in cases of widespread power outages. Setting up and managing these shelters can strain resources.

Educational Facilities
Severe winter weather can significantly impact school operations. Impacts may include:

- **Transportation Disruptions:** Snow and ice accumulation on roads can hinder the ability of school vehicles to navigate and reach both students and facilities. Hazardous road conditions may result in delays or closures.
- **School Closures:** Severe winter weather can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems
All communication systems within Torrance County are at risk to severe winter weather. Severe winter weather can disrupt vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Infrastructure Damage:** Heavy snow or ice conditions can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Severe winter storms often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.

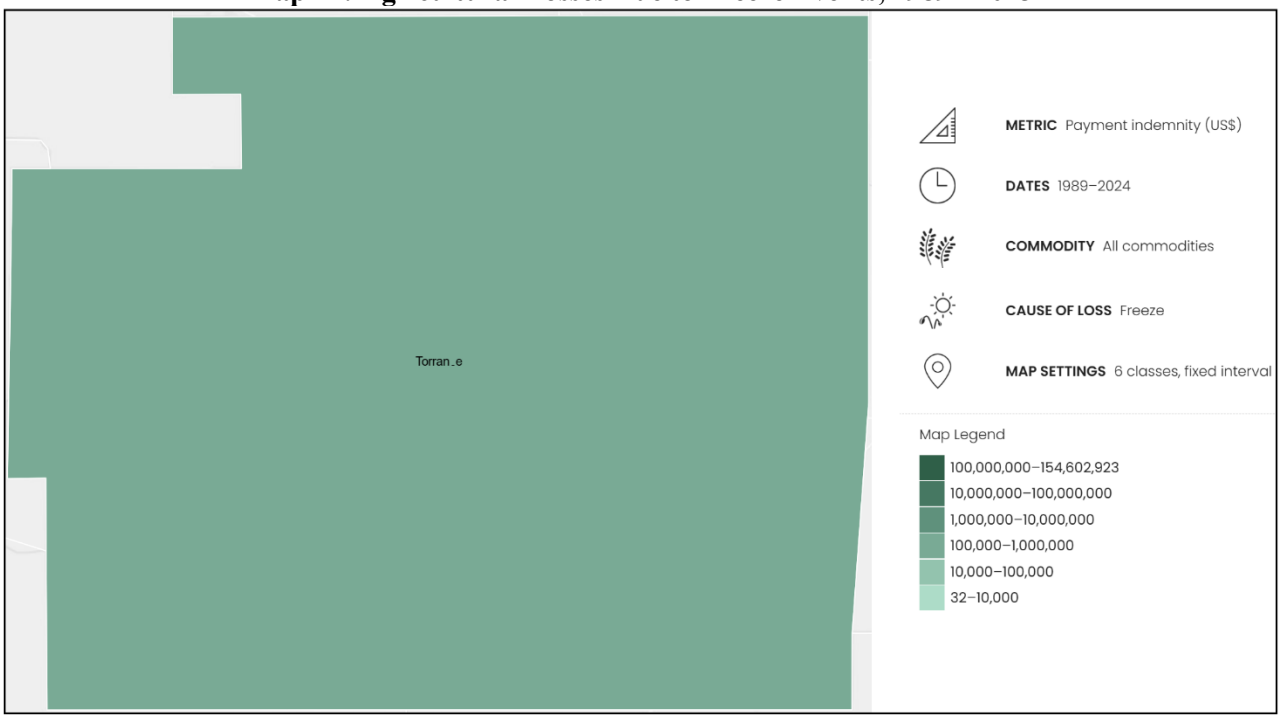
- **Signal Interference:** Severe winter storms can create electromagnetic interference that disrupts radio signals used in wireless communication. This interference can lead to poor signal quality, dropped calls, and slower data speeds.
- **Loss of Backhaul Connectivity:** Severe winter weather events can damage the backhaul infrastructure that connects various communication nodes. This backbone infrastructure is crucial for transmitting data between local and regional networks, and any disruption can impact overall network performance.
- **Communication Tower Instability:** Heavy snow and ice loads can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.9.6.

Environmental and Agricultural Impacts

Severe winter weather conditions can cause significant agricultural impacts. The following map from the United States Department of Agriculture details total county-wide agricultural losses, by county, due to freeze events from 1989 - 2023:

Map 41: Agricultural Losses Due to Freeze Events, 1989 - 2023



Source: USDA

Severe winter weather can have various impacts on the environment, particularly in regions prone to cold and snowy winters. These impacts can affect ecosystems, wildlife, and natural resources and can include habitat disruption, reduction of food sources, changes in migration patterns, and damage to foliage (especially if a spring storm). Additionally, the use of salt and de-icing chemicals on roads and sidewalks can have negative environmental impacts. These chemicals can find their way into nearby water bodies, leading to water pollution and harm to aquatic ecosystems. Snowmelt can also introduce pollutants from roadways and urban areas into rivers and streams, leading to reduced water quality. Elevated sediment levels and changes in water temperature can also affect aquatic life.

Jurisdictional Concerns:
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** With 2.7% of citizens living in poverty, severe winter weather may disproportionately impact them due to underinsurance and the inability to properly heat a residence. With limited access and services, severe winter weather may cut the community (especially the elderly) off from necessary services due to limited road access. With limited response services, severe winter weather may affect overall community response and recovery.
- **Estancia:** With 11.0% of citizens living in poverty, severe winter weather may disproportionately impact them due to underinsurance and the inability to properly heat a residence. With limited access and services, severe winter weather may cut the community (especially the elderly) off from necessary services due to limited road access. With limited response services, severe winter weather may affect overall community response and recovery.
- **Moriarty:** With 39.1% of citizens living in poverty, severe winter weather may disproportionately impact them due to underinsurance and the inability to properly heat a residence. With limited access and services, severe winter weather may cut the community (especially the elderly) off from necessary services due to limited road access. With limited response services, severe winter weather may affect overall community response and recovery.
- **Mountainair:** With 28.6% of citizens living in poverty, severe winter weather may disproportionately impact them due to underinsurance and the inability to properly heat a residence. With limited access and services, severe winter weather may cut the community (especially the elderly) off from necessary services due to limited road access. With limited response services, severe winter weather may affect overall community response and recovery.
- **Willard:** With 38.2% of citizens living in poverty, severe winter weather may disproportionately impact them due to underinsurance and the inability to properly heat a residence. With limited access and services, severe winter weather may cut the community (especially the elderly) off from necessary services due to limited road access. With limited response services, severe winter weather may affect overall community response and recovery.
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to a severe winter weather event. Impacts on sensitive areas may be significant.

Cascading Impacts
Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with severe winter weather may include:

- Direct physical damage to buildings and structures:
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis
This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance

County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 94: Severe Winter Weather Consequence Analysis

Subject	Potential Impacts
Impact on the Public	Freezing temperatures coupled with heavy snow accumulation can cause dangerous travel conditions, leading to accidents and road closures. Downed power lines can lead to a loss of electricity and heat, with the young and the elderly especially vulnerable. Extremely cold temperatures may lead to hypothermia and death.
Impact on Responders	Dangerous road conditions create transportation challenges for first responders. First responders will need to control their own exposure to the elements for prolonged periods of time and will need to continuously seek heat and shelter to stay warm. Equipment may also be damaged or destroyed due to cold temperatures, heavy wind, ice, and heavy snowfall, which may lead to a decrease in response capabilities.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary. Severe winter weather may impact an agency's ability to maintain operations due to power outages and transportation difficulties. If the activation of alternate facilities was required, travel may be difficult. Additionally, computer/network and other communication access may be impacted due to power outages.
Delivery of Services	The ability to deliver services can be impacted locally, regionally, or statewide depending on the severity of the severe winter weather event. Dangerous road conditions may lead to roadway and bridge closures, as well as transit service disruptions. Businesses and places of commerce may completely shut down, which leads to the disruption of goods and services.
Property, Facilities, and Infrastructure	Transportation, governmental operations, and communications may be heavily disrupted. Roads and bridges may be heavily impacted by severe winter weather, and may be completely obstructed by downed trees, powerlines, and snow accumulation. Snow and ice can impact access to homes and critical facilities such as hospitals, schools, and supermarkets. Power loss can lead to disruption of critical infrastructure and technology.
Impact on Environment	Heavy snow and ice accumulation can weigh down and damage vegetation, tree limbs, and power lines. Flooding may also occur after the rapid melting of a heavy snowfall, causing bodies of water to flood, damaging the surrounding areas. Exposure to extreme winter weather may result in animal death. Chemicals used to treat roadways may contaminate natural environments and water reservoirs if used in large quantities.
Economic Conditions	Severe winter weather poses a fiscal impact on the governments, even if some of those costs can be recouped through federal grant reimbursements. Local, county, and state resources may be drained by a severe winter weather event.
Public Confidence in Governance	The public's confidence in governance is affected by immediate local and state response through direct and effective actions. Efficiency in response and recovery operations is critical in keeping public confidence high.

5.12.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number citizens living below the poverty level and elderly citizens in all jurisdictions as a percentage of total population . These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources

- Limited insurance coverage
- Health vulnerabilities
- Social isolation

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease

5.12.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the extreme heat hazard.

Table 95: Example Severe Winter Weather Mitigation Actions

Category	Example Action
Planning and Regulation	Review building codes and structural policies to ensure they are adequate to protect older structures from snow loads.
	Require tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes.
	Incorporate passive ventilation in the site design to allow outdoor air to enter the home in a controlled way.
	Establish standards for all utilities regarding tree pruning around lines.
	Inspect utility poles to ensure they meet specifications and are ice resistant.
	Ensure the development and enforcement of building codes for roof snow loads.
Infrastructure	Protect traffic lights and other traffic controls from ice.
	Add building insulation to walls and attics.
Natural Systems	Property maintain stream and river channels to ensure flow.
	Use snow fences or “living snow fences” (e.g., rows of trees or other vegetation) to limit blowing and drifting of snow over critical roadway segments.
Education	Develop a winter weather brochure for distribution by recreation equipment retailers or outfitters in mountainous areas.
	Educate design professionals to include snow mitigation during building design.
	Instruct property owners on how to properly install temporary window coverings before a storm.
	Produce and distribute family and traveler emergency preparedness information about severe winter weather hazards.
	Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community.

5.13 Wildfire

5.13.1 Hazard Description



The National Weather Service defines a wildfire as any free burning uncontainable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. They can occur naturally and through human action. Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of urban areas and in rural areas with attractive recreational and aesthetic amenities, especially forests. This expansion has increased the likelihood that wildfires will threaten life and property.

According to the National Park Service there are three classifications of wildfires:

- **Surface Fire:** Burning which may spread rapidly and ignite leaf litter, fallen branches and other fuels located at ground level.
- **Ground Fire:** Burning of organic matter in the soil beneath the surface.
- **Crown Fire:** Burning through the top layer (canopy) of trees. Crown fires, which can be very intense and difficult to contain, require strong winds, steep slopes, and large amounts of fuel to burn.

Wildfires are strongly influenced by multiple factors, including:

- **Weather:** Factors such as relative humidity, wind speed, ambient temperature and precipitation all influence the formation and growth of wildfires.
- **Topography:** Natural features, such as canyons or ridges, can increase the spread rate of a fire by funneling or drawing heated air and fire.
- **Fuel Type, Distribution and Moisture:** Available fuels, the spacing and density of available fuels, and fuel moisture content can determine spread rates and intensity of wildfires.
- **Drought Conditions:** Drought tends to increase both the likelihood and severity of wildfires.

Fire science distinguishes between wildland fires and wildland urban interface (WUI) fires**.** The primary difference between a wildland fire and a WUI fire lies in their location and the type of areas they impact:

- **Wildland Fire:**
    - **Definition:** A wildland fire occurs in undeveloped, natural areas such as forests, grasslands, and shrublands. It is driven by natural fuels like trees, grass, brush, and dead vegetation.
    - **Characteristics:** These fires are often started by natural causes (lightning) or human activity (campfires, equipment use). They can spread rapidly depending on fuel, weather conditions (wind and temperature), and topography.
    - **Impact Area:** Wildland fires primarily affect forests and other natural ecosystems, causing habitat loss, ecosystem changes, and environmental damage, though they can also impact air quality over a large region.
- **WUI Fire:**
    - **Definition:** A WUI fire occurs where wildland areas meet or intermingle with human development. It involves not only natural vegetation but also structures (homes, businesses, infrastructure).
    - **Characteristics:** These fires are especially dangerous because they can ignite homes, buildings, and other man-made structures, often in suburban or rural areas where homes are built near forests or brush.
    - **Impact Area:** WUI fires are particularly destructive to property and can result in large-scale evacuations and property loss. They are challenging for firefighters because of the dual threat to both natural landscapes and human communities.

5.13.2 – Location and Extent

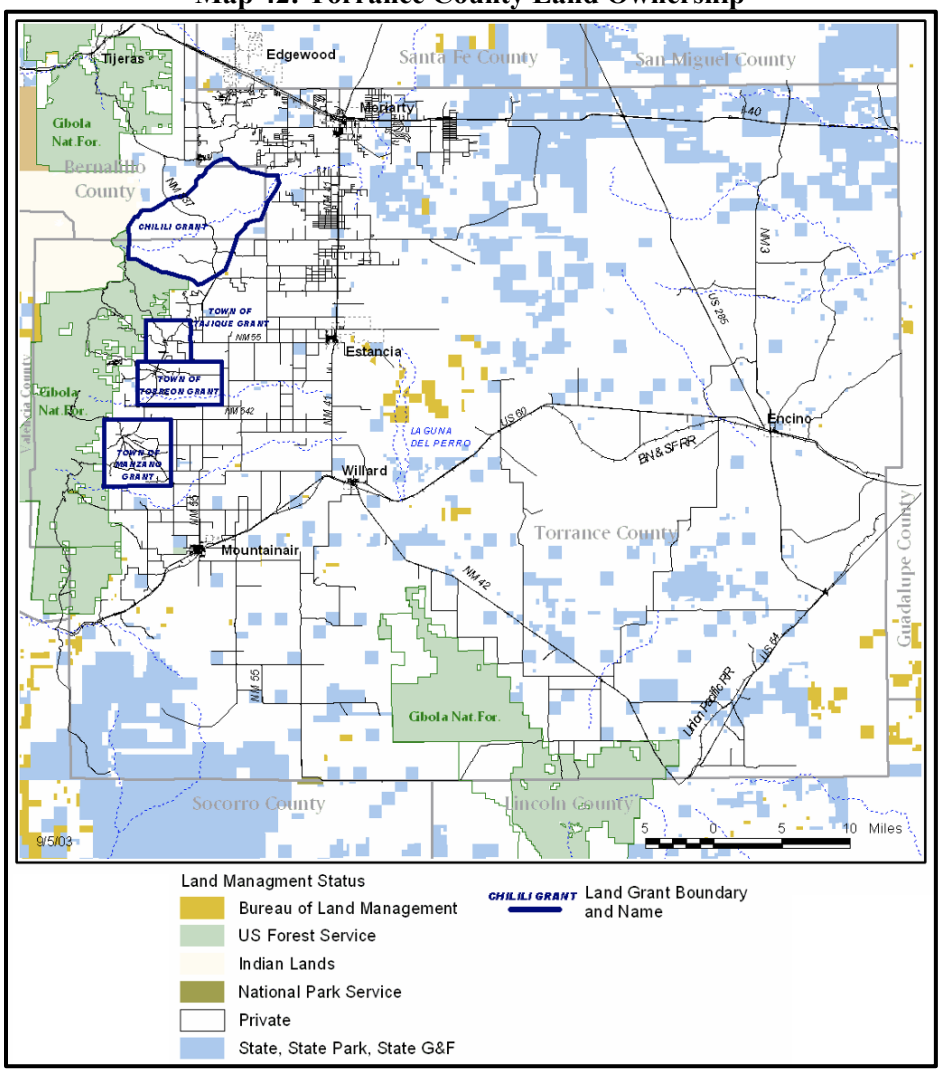
Public Comment: *Wildfire is one of our greatest hazards.*

Land ownership plays a crucial role in wildfire management, where multiple agencies manage large tracts of land. Ownership determines which agency has the primary responsibility for fire prevention, firefighting, and post-fire recovery. Large wildfires often require coordination between federal, state, county, and local firefighting teams. Here's how different types of land ownership impact wildfire management:

- **Federal Land**:
  - Responsibility: Federal agencies like the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and National Park Service (NPS) are responsible for managing wildfires on federal lands.
  - Firefighting Resources: These agencies often have extensive resources for fire suppression, including trained personnel, equipment, and aerial support. They coordinate with each other for large-scale fires that cross multiple jurisdictions.
  - Policies: Federal policies, like prescribed burns and fuel reduction programs, help manage wildfire risk. However, policies may vary depending on the agency's objectives, such as forest preservation, recreational use, or habitat conservation, influencing how aggressively fires are fought.
- **State Land**
  - Responsibility: State agencies, such as the New Mexico State Forestry Division, are responsible for wildfires on state lands and often assist in fire suppression on neighboring lands.
  - Coordination: State agencies frequently collaborate with federal, county, and local firefighting teams, especially in areas where state land borders other jurisdictions.
  - Funding: State budgets influence the resources available for firefighting. During intense wildfire seasons, states may need to request additional federal funds or assistance to handle large fires.
- **County Land**
  - Local Fire Departments: Counties often rely on local fire departments or volunteer fire departments for initial fire response on county lands.
  - Limited Resources: Many county fire agencies have fewer resources than federal or state agencies, meaning they might depend on state or federal assistance for large fires.
  - Fire Codes and Ordinances: Counties can set fire prevention rules, like burn bans or building codes in fire-prone areas, which impact local wildfire risk.
- **Private Land**
  - Landowner Responsibility: Private landowners bear responsibility for maintaining defensible space around structures, following local fire ordinances, and reducing fire hazards on their property.
  - Coordination for Protection: Private lands are often close to public lands, so fire prevention and suppression strategies need coordination to protect both areas. Landowners may participate in cooperative agreements with federal or state agencies for shared fire protection efforts.
  - Limited Access to Resources: Private landowners may have limited resources for wildfire suppression and rely heavily on nearby public agencies for help in case of a wildfire.

The following map, from the Torrance County, details land ownership within Torrance County:

Map 42: Torrance County Land Ownership



Source: Torrance County

Vegetation types are closely related to wildfire occurrence because they directly influence the availability of fuel, the intensity of the fire, and its potential spread. Different vegetation types have distinct characteristics in terms of flammability, moisture content, and fuel load, all of which determine how easily they can catch fire and how a wildfire behaves. The following provides an overview of how specific vegetation types impact wildfire occurrence:

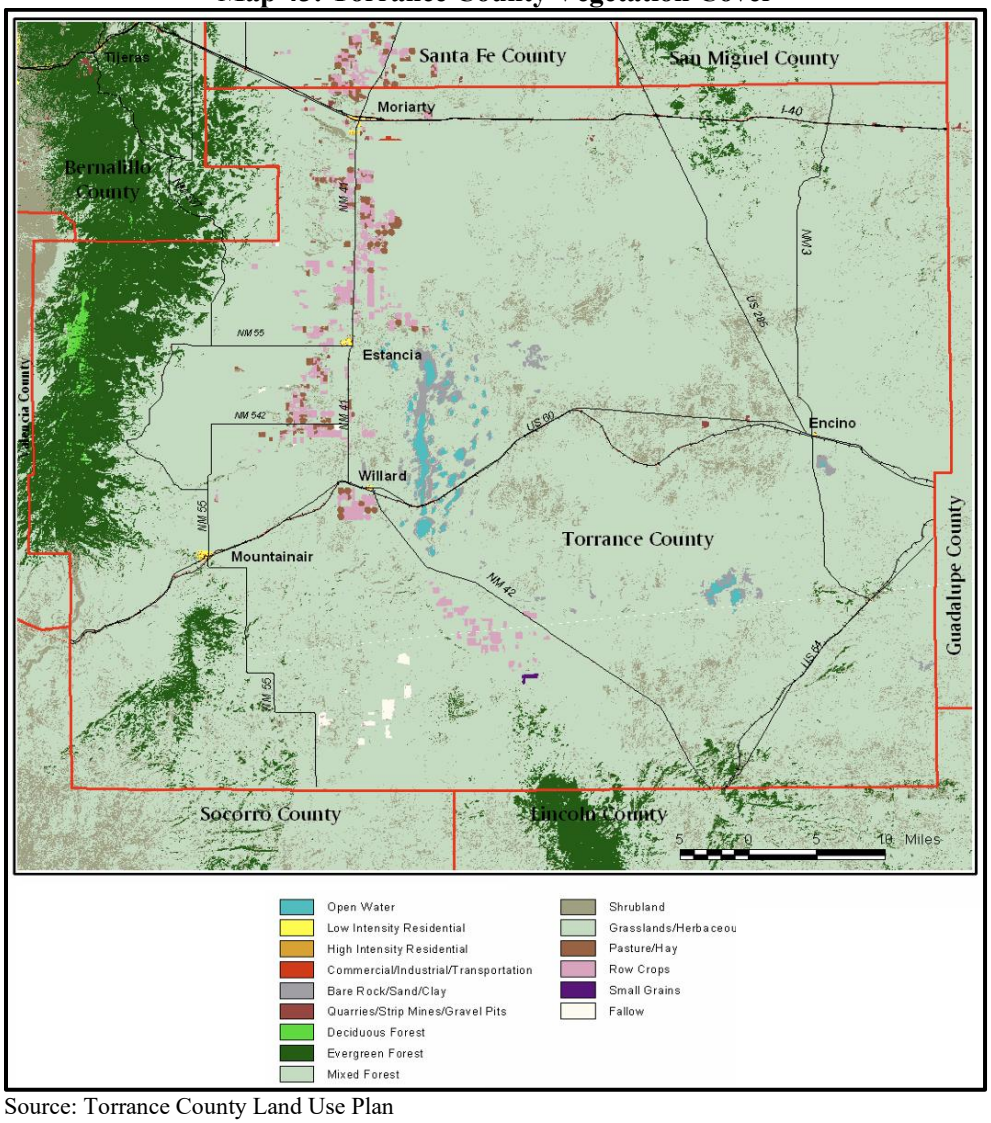
- **Grasslands:** Dominated by fine, fast-drying fuels like grasses, they have a relatively low fuel load but dry out quickly and ignite easily. Fires in grasslands tend to spread rapidly but burn with lower intensity because the available fuel is less dense. The fast-moving nature of grass fires can make them dangerous, especially in windy conditions.
- **Shrublands:** These areas consist of dense shrubs, small trees, and brush with a high content of oils and resins, which are highly flammable. Chaparral is particularly common in New Mexico and other Mediterranean climates. Fires in chaparral ecosystems are intense, producing extreme heat and flames that can rapidly spread. These fires often exhibit "crown fire" behavior, where the fire moves through the canopy, jumping from shrub to shrub.
- **Forests:** Forests provide heavy fuel loads in the form of trees, dead wood, leaf litter, and underbrush. The type of forest plays a significant role in fire behavior. Coniferous Forests, particularly with species like pines and firs, tend to have higher resin content, making them highly flammable. They also shed needles that dry out and accumulate on the forest floor, increasing fire risk. Deciduous Forests typically have lower flammability due to higher moisture content in leaves and less resin. However, during dry seasons, they can still support wildfires,

especially if there's significant leaf litter. Forest fires can vary from low-intensity surface fires that burn ground-level fuels to high-intensity crown fires that spread through the tree canopy.

- **Dry Forests:** These ecosystems, such as pinon-juniper woodlands or oak woodlands, are characterized by low-density tree cover, and can have significant understory fuels, especially in drought conditions. Fires in these areas are moderate to high intensity and can spread quickly if the understory is dense or dry.
- **Urban and Agricultural Areas:** While urban areas are not typically thought of as wildland, many are located near or within WUI zones, where wildfires from surrounding natural vegetation can spread into developed areas. Fires in these areas can spread from wildlands into structures, significantly increasing the damage potential. Vegetation in agricultural lands can also burn, especially during dry periods.

The following map, from the Torrance County Land Use Plan, details vegetation cover throughout the county:

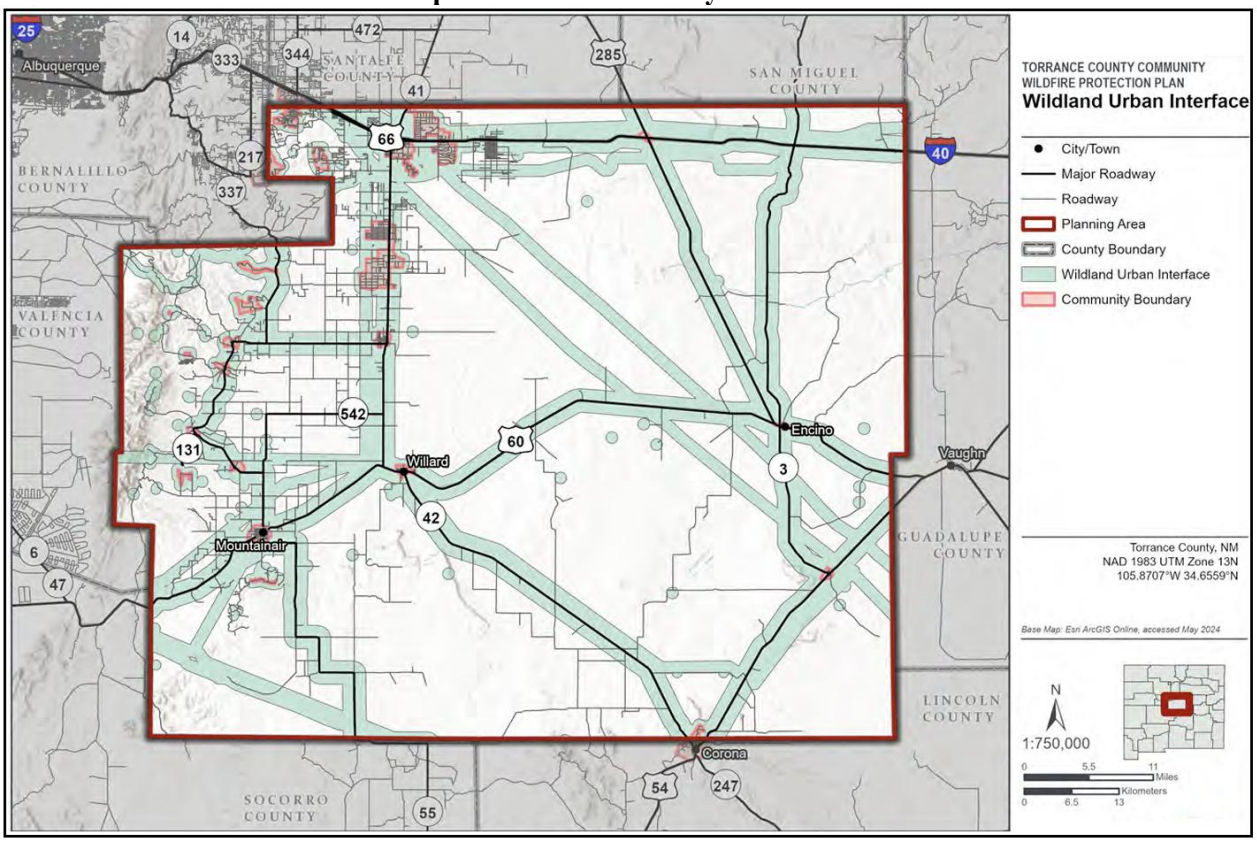
Map 43: Torrance County Vegetation Cover



Source: Torrance County Land Use Plan

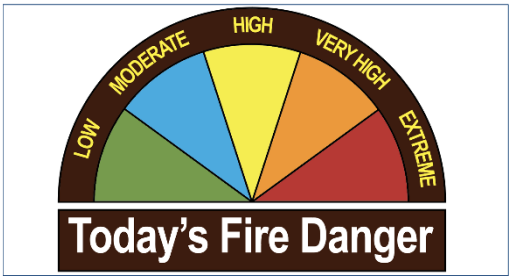
The WUI is the area where human improvements such as homes, ranches and farms come in contact with the wildlands. The WUI creates an environment in which fire can move readily between structure and vegetation fuels, often resulting in massive fires, or conflagrations, that may lead to widespread evacuations. The expansion of the WUI in recent decades has significant implications for wildfire management and its impact. There are two types of WUI, intermixed and interface. Intermix WUI are areas where housing and vegetation intermingle, and interface WUI are areas with housing in the vicinity of dense, contiguous wildland vegetation. The following map illustrates WUI areas throughout the Torrance County:

Map 44: Torrance County WUI Areas



Source: Torrance County Community Wildfire Protection Plan

The duration of a wildfire depends on the weather conditions, how dry it is, the availability of fuel to spread, and the ability of responders to contain and extinguish the fire. Historically, some wildfires have lasted only hours, while other fires have continued to spread and grow for an entire season. If fuel is available, and high wind speeds hit, a wildfire can spread over a large area in a very short amount of time. These factors make the difference between small upstart fires easily controlled by local fire services to fires destroying thousands of acres requiring multiple state and federal assets for containment and suppression.



The National Fire Danger Rating System allows fire managers to estimate today's or tomorrow's fire danger for a given area. It combines the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an area's fire protection needs. It links an organization's readiness level (or pre-planned fire suppression actions) to the potential fire problems of the day. The following is a brief explanation of the different fire danger levels based on criteria established by the National Fire Danger Rating System.

Table 96: National Fire Danger Rating System

Rating	Description
Low	Fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn easily a few hours after a rain, but most wood fires will spread slowly, creeping or smoldering. Control of fires is generally easy.
Moderate	Fires can start from most accidental causes, but the number of fire starts is usually pretty low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Most wood fires will spread slowly to moderately. Average fire intensity will be moderate except in heavy concentrations of fuel, which may burn hot. Fires are still not likely to become serious and are often easy to control.

Table 96: National Fire Danger Rating System

Rating	Description
High	Fires can start easily from most causes and small fuels (such as grasses and needles) will ignite readily. Unattended campfires and brush fires are likely to escape. Fires will spread easily, with some areas of high intensity burning on slopes or concentrated fuels. Fires can become serious and difficult to control unless they are put out while they are still small.
Very High	Fires will start easily from most causes. The fires will spread rapidly and have a quick increase in intensity, right after ignition. Small fires can quickly become large fires and exhibit extreme fire intensity, such as long-distance spotting and fire whirls. These fires can be difficult to control and will often become much larger and longer-lasting fires.
Extreme	Fires of all types start quickly and burn intensely. All fires are potentially serious and can spread very quickly with intense burning. Small fires become big fires much faster than at the "very high" level. Spot fires are probable, with long-distance spotting likely. These fires are very difficult to fight and may become very dangerous and long lasting.

Source: Wildfire Fire Assessment System

The severity of wildfire depends on several quickly changing environmental factors. It is impossible to strategically estimate the severity of a wildfire as these factors, including drought conditions and wind speed, have such a great influence on the wildfire conditions. The Characteristic Fire Intensity Scale (CFIS) within the Southern Wildfire Risk Assessment Summary Report specially identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories.

The following table details the range of wildfire intensity:

Table 97: Characteristic Fire Intensity Scale

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

Source: Southern Wildfire Risk Assessment Summary Report

Using the CFIS, the following provide an indication of the potential extent of future wildfire events based on local vegetation, topography, and historic fire behavior:

- **Encino:** Predominantly grassland fuels can produce CFIS 3–4 fires (flame lengths 4–12 ft) in windy, dry conditions, allowing rapid spread and threatening structures at the wildland–urban interface.
- **Estancia:** Mixed grassland and agricultural edges support CFIS 3–4 potential, with faster spread in open valley areas and moderate resistance to control during drought.
- **Mountainair:** Surrounding piñon–juniper woodlands and grass fuels can yield CFIS 4–5 fires (flame lengths >12 ft) under extreme wind, enabling crown fire potential and challenging suppression.
- **Moriarty:** Open grasslands with scattered development present CFIS 3–4 potential, with long runs possible when driven by spring winds.

- **Willard:** The grass-dominated landscape supports CFIS 3–4 fires, with high rates of spread possible before initial attack arrives.
- **SWCDs:** Spanning large areas, the varied ground cover of these districts indicate that they can expect CFIS 3-5 fires.

A Red Flag Warning is an alert issued by the National Weather Service to indicate that critical fire weather conditions are either occurring or expected shortly. A Red Flag Warning is typically issued under the following conditions:

- **Low relative humidity (often below 15%):** Dry air makes vegetation more likely to ignite and sustain fire.
- **High winds (usually sustained winds above 25 mph):** Winds can quickly spread embers and flames, helping fires move faster and become more intense.
- **Dry vegetation:** Vegetation become highly flammable when moisture levels are lowd.
- **High temperatures:** Hot weather exacerbates dryness and lowers fuel moisture, increasing fire potential.

When a Red Flag Warning is issued, it means that the potential for wildfire ignition and rapid spread is extremely high. The warning often leads to heightened preparedness among firefighting agencies and advisories for the public to avoid activities that could spark fires, such as outdoor burning or using machinery that could create sparks.

The State Forestry Division's Fire Policy and Procedures established the Wildland Fire Readiness Levels as a method for dictating the overall preparedness levels for the Division. District Foresters and District Fire Management Officers shall assess the following criteria in determining readiness levels:

- Current and long-range forecasted weather
- Current and forecasted fire behavior
- Current and trend of five-day average energy release component
- Comparison of current and trend of the seasonal data
- Southwest Area preparedness levels
- Individual agency or district fire activity

Because of the extreme geographical and topographical differences in the State, the districts may be at different levels of fire readiness throughout the year. District Foresters and District Fire Management Officers shall determine fire readiness levels for their respective districts as determined by the following criteria and notify the State Fire Management Officer of the situation.

Fire Readiness Level 1:

- Most areas have low fire danger.
- Fire activity is light (occasional A, B, and C class fires) and all wildland fires are of short duration, usually lasting only one burning period.
- Moisture content in light fuels is high and heavy fuels are moist.
- State resources and interagency dispatch center cooperators are capable of handling fire
- incidents with minimum staffing levels.
- Initial attack forces are suppressing wildland fires.
- There is little or no commitment of State resources besides volunteer fire departments.
- Energy release component -5 day mean average is consistently below 30.

Fire Readiness Level 2:

- Fire danger is moderate.
- Class A, B, and C fires may occur and the potential exists for escapes to become larger but only have a potential duration of two burning periods.

- Heavy fuels are drying; frontal system winds increase the potential for rapid fire spread over a 36 to 48 hour period.
- State and volunteer fire department resources with limited assistance from the individual dispatch centers are capable of handling the situation.
- Fire department cooperators provide initial attack.
- High wind warnings and "Red Flag" alerts the National Weather Service issues are indicators that the districts may need additional resources.
- Energy release component 5-day mean average is consistently between 30 and 45.

Fire Readiness Level 3:

- Generally, all agencies are experiencing high fire danger.
- Numerous A, B, and C class fires, with a high potential for wildland fires to become Class D or larger in size, that may require additional resources.
- Light fuels are cured and heavy fuels are rapidly drying.
- Fires are escaping initial attack on a consistent basis and require extended attack support.
- The initial attack dispatch centers are requesting additional resources to increase initial attack
- capabilities.
- Federal cooperators provide critical initial attack and extended attack support during fire
- suppression.
- FEMA Fire Suppression Grants apply to urban/interface fires. The State Forester initiates FEMA Presidential Emergency Declaration requests.
- Energy release component 5 day mean average is consistently between 45 and 60.

Fire Readiness Level 4:

- Division and cooperating agencies are experiencing very high or greater fire danger.
- Numerous A, B, C, and D class fires that have the potential to exhaust dispatch area, State, Southwest Area, and national resources are common within the region.
- Division personnel implement and enforce fire restrictions.
- The Division may have Type 1 and Type 2 Incident Management Teams committed to incidents under this readiness level within the State.
- Energy release component 5 day mean average is consistently between 60 and 80.

Fire Readiness Level 5:

- All criteria for Fire Readiness Level 4 plus the following additional criteria are met:
- Fire danger is extreme throughout the State and region.
- Several dispatch centers and agencies are experiencing major fires and national resources are exhausted.
- Air resources are in short supply.
- Fire restrictions require closures.
- Emergency Operations Center is activated.
- Area Command has been implemented.
- High potential for catastrophic fires exists.
- Extreme fire behavior, scarce resources, and extremely unsafe working conditions for fire fighters hinder efforts of Type 1 and 2 Incident Management Teams.
- A multi-agency Coordination Group is allocating resources to high priority fires.
- Energy release component 5 day average is consistently at or above 80.

The MPC views wildfire as a local, county-wide, and regional hazard, with historic fires indicating that wildfires can be rated among the highest intensities for all jurisdictions. Discussions with the MPC and a review of all available data indicated wildfire is a community concern for all participating jurisdictions. The following provides a narrative of the level of jurisdictional concern:

- **Torrance County:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Any increase in drought conditions and/or higher temperatures are likely to exacerbate conditions.
- **Encino:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Any increase in drought conditions and/or higher temperatures are likely to exacerbate conditions.
- **Estancia:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing drought conditions and higher temperatures are likely to exacerbate this concern.
- **Moriarty:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Additionally, continuing drought conditions and higher temperatures are likely to exacerbate this concern.
- **Mountainair:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Any increase in drought conditions and/or higher temperatures are likely to exacerbate conditions. **Willard:** Wildfire identified as a community concern as citizens, structures, and infrastructure are vulnerable. Any increase in drought conditions and/or higher temperatures are likely to exacerbate conditions.
- **Soil and Water Conservation Districts:** Wildfire identified as a concern as areas of stewardship are vulnerable to potential impacts. Any increase in drought conditions and/or higher temperatures are likely to exacerbate conditions.

5.13.3 Previous Occurrences

Historical events of significant magnitude or impact can result in a Presidential Disaster Declaration. Torrance County has experienced no Presidential Disaster Declarations related to wildfire events:

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency Declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe. The following table details wildfire Emergency Declarations for Torrance County.

Table 98: Torrance County Wildfire Emergency Declarations

Designation	Declaration Date	Incident Type	Public Assistance
EM-3154-NM	5/10/2000	New Mexico Fire	$4,385,738

Source: FEMA

The Governor, or the Governor's Authorized Representative, may submit a request for a fire management assistance declaration as required. FEMA will approve declarations for fire management assistance when it is determined that a fire or fire complex on public or private forest land or grassland threatens such destruction as would constitute a major disaster. The MPC reviewed the historical fire management declarations to assist in hazard identification. The following table details fire management declarations for Torrance County:

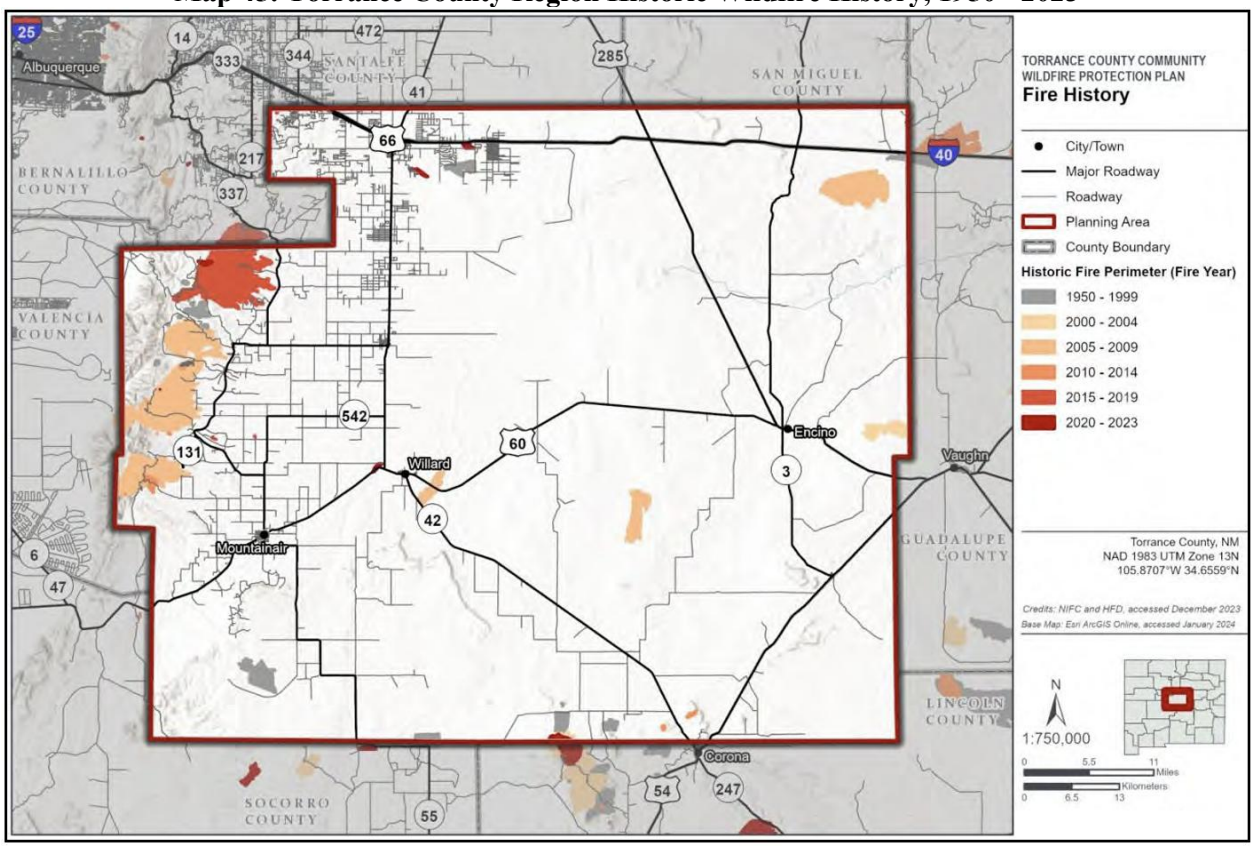
Table 99: Torrance County Fire Management Declarations

Designation	Declaration Date	Incident Type	Public Assistance
FM-5461-NM	04/02/2023	New Mexico Echo Ridge Fire	-
FM-5127-NM	06/16/2016	New Mexico Dog Head Fire	$5,905,956
FM-2777-NM	06/25/2008	New Mexico Big Springs Fire	$406,862
FM-2762-NM	04/21/2008	New Mexico Trigo Fire	$2,175,243
FM-2741-NM	11/21/2007	New Mexico Ojo Peak Fire	$58,526
FM-1329-NM	05/13/2000	New Mexico New Mexico Wildfire	$5,652,344

Source: FEMA
-: Not reported

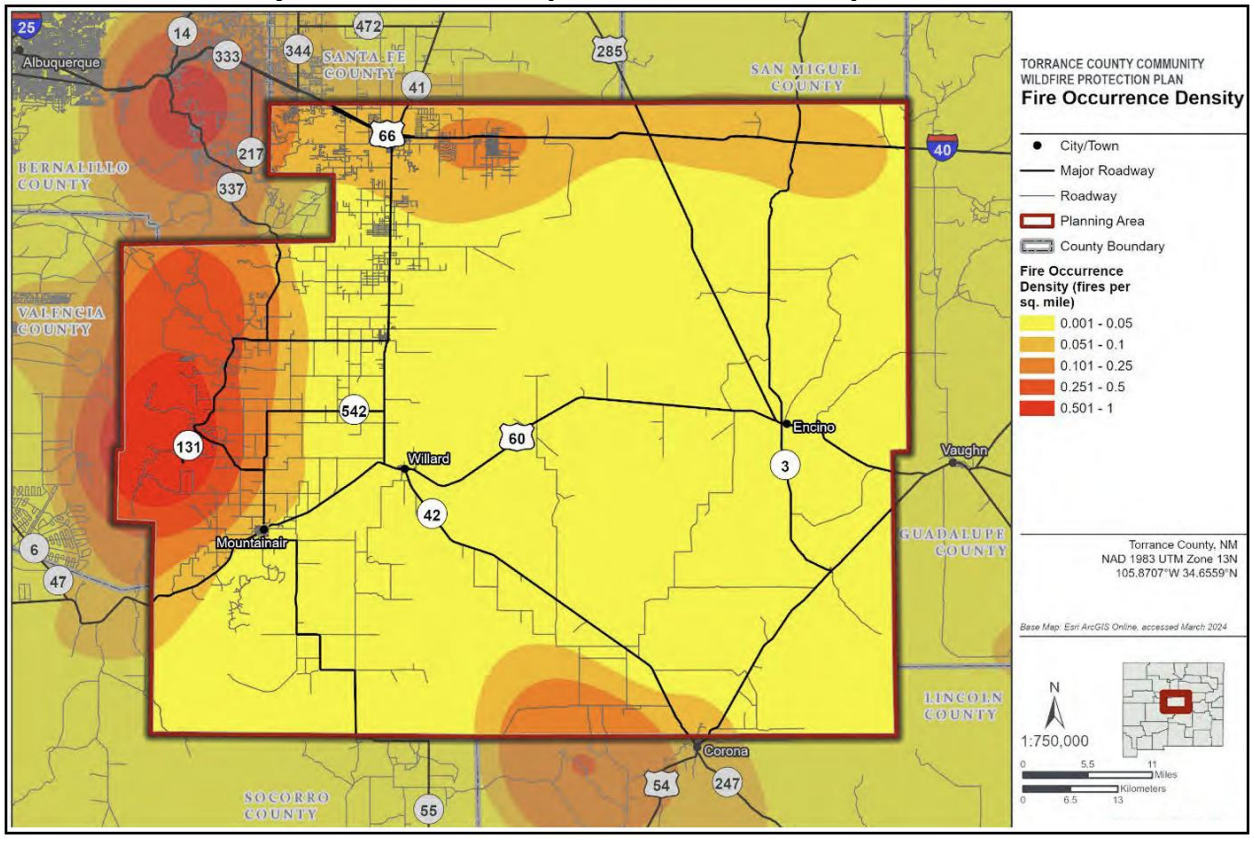
The following maps, detailing the locations of historic wildfires from 1950 to 2023 and fire occurrence density from 2000 to 2022, show historic fires generally occuring in the western portion of the county in the Manzano Mountains, in the northern portion of the county near Moriarty, and in the southern portion of the county near Corona:

Map 45: Torrance County Region Historic Wildfire History, 1950 - 2023



Source: Torrance County Community Wildfire Protection Plan

Map 46: Torrance County Fire Occurence Density, 2000 - 2022



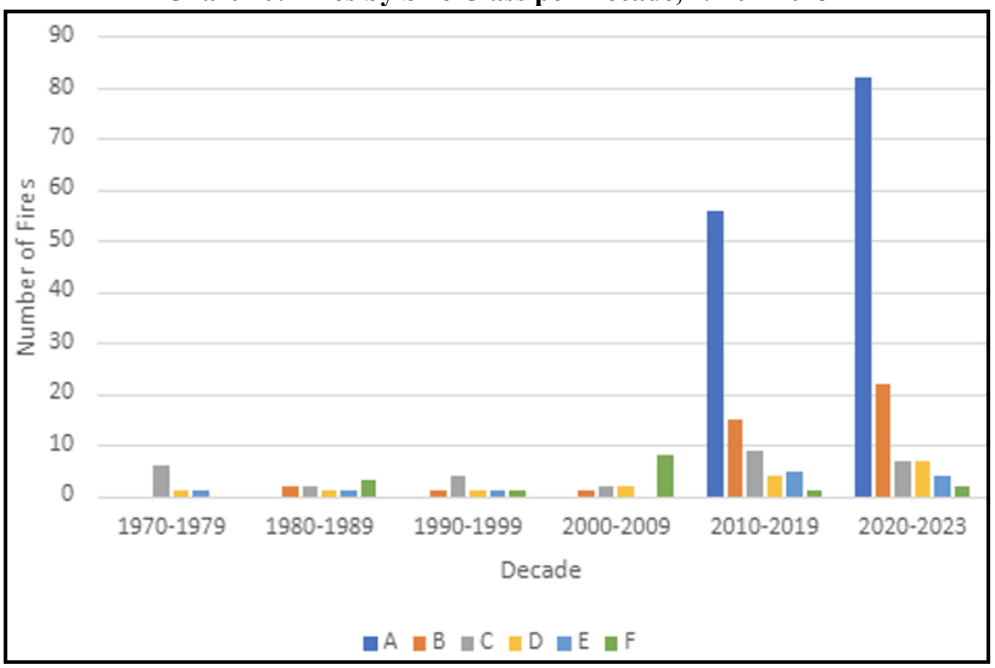
Source: Torrance County Community Wildfire Protection Plan

Wildfires are classified by size into specific categories, referred to as Classes A through G, based on the total area burned. These classifications help firefighting agencies prioritize resources and communicate fire activity effectively, and are categorized as follows:

- Class A: 0 to 0.25 acres
- Class B: 0.26 to 9.9 acres
- Class C: 10 to 99 acres
- Class D: 100 to 299 acres
- Class E: 300 to 999 acres
- Class F: 1,000 to 4,999 acres
- Class G: 5,000 to 9,999 acres
- Class H: 10,000 to 49,999 acres
- Class I: 50,000 to 99,999 acres

The following chart sourced from the Torrance County Community Wildfire Protection Plan details historic fires by size class for the Torrance County region from 1970 – 2023:

Chart 20: Fires by Size Class per Decade, 1970 - 2023



Source: Torrance County Community Wildfire Protection Plan

Since 2000, a total of 73,884 acres in and around Torrance County have burned, with 11 fires buring more than 1,000 acres. Torrance County has experienced several significant wildfires in its history, with the Dog Head Fire being the most notable:

- **June 2016, Dog Head Fire:** The Dog Head Fire occurred in the Manzano Mountains, affecting both Torrance and Bernalillo Counties. The fire rapidly expanded, consuming approximately 12,000 acres by June 16, 2016, and prompting concerns about potential damage to homes in the area. By the time the fire was fully contained, it had burned around 17,912 acres, with approximately 6,600 acres on the Cibola National Forest. In response to the severity of the situation, New Mexico Governor Susana Martinez declared a State of Emergency for the affected counties, allocating emergency funding to mitigate economic and physical harm. The fire's rapid growth and impact were exacerbated by "red flag" conditions, including sustained winds of 15 mph and gusts up to 30 mph, which challenged firefighting efforts.

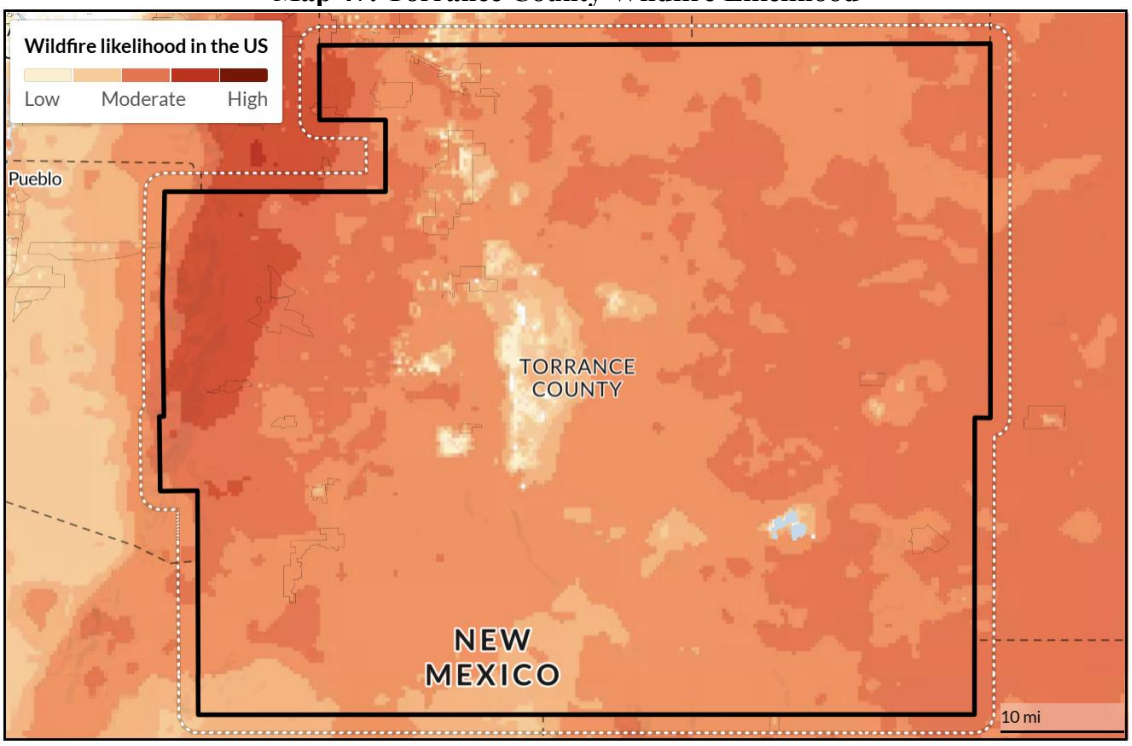
5.13.4 Probability of Future Events

NOAA's Wildfire Risk to Communities mapping, which uses the best available science to identify risk, was used to help determine the probability of future wildfires within Torrance County. Wildfire likelihood is the probability of a wildfire occurring based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions, are varied based on patterns derived from observations in recent decades. Wildfire likelihood is not predictive and does not reflect any currently forecasted weather or fire danger conditions. For communities, tribal areas, and counties, Wildfire Likelihood is summarized and ranked for the risk calculation area. This includes a 2.4 km buffer around populated areas to incorporate the risk of embers. Wildfire likelihood classification is based on the following national percentile rank:

- **Low:** <40th percentile
- **Medium:** >40th and <70th percentile
- **High:** >70th and <90th percentile
- **Very High:** >90th percentile

According to NOAA's Wildfire Risk to Communities Torrance County has, on average, greater wildfire likelihood than 82% of counties in the US. The following map indicates the likelihood of a wildfire within Torrance County:

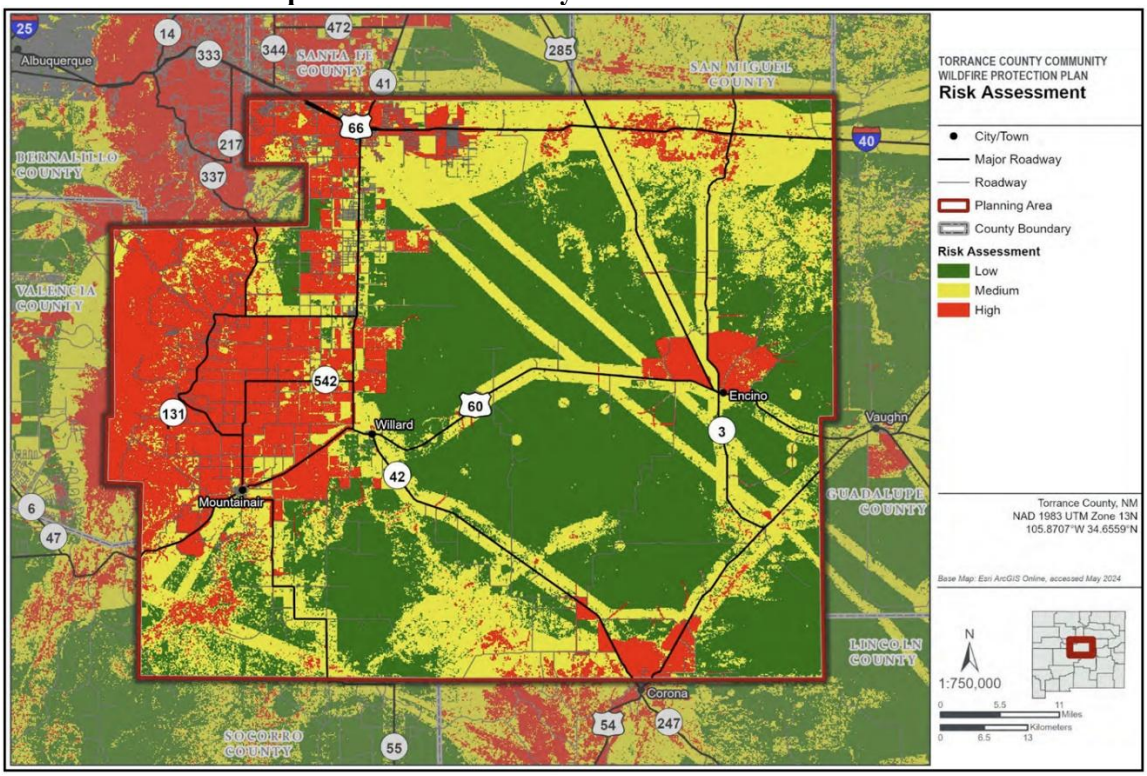
Map 47: Torrance County Wildfire Likelihood



Source: NOAA's Wildfire Risk to Communities

The following map, from the Torrance County Community Wildfire Protection Plan, utilizes the Composite Risk-Hazard Assessment modeling approach to assign a wildfire risk ranking to Torrance County and participating jurisdictions

Map 48: Torrance County Wildfire Risk Assessment



Source: Torrance County Community Wildfire Protection Plan

5.13.5 Projected Changes in Location, Intensity, Frequency, and Duration

The occurrence of more frequent and longer lasting droughts can increase the availability of fuels for wildfires through the drying of vegetation. Additionally, both the increased occurrence and continued decline of native species due to lack of precipitation can cause the proliferation of invasive species which can provide quick-burning fuels that contribute to the start and spread of fire.

Changing conditions may impact the frequency and magnitude of wildfire in the following ways:

- **Increased Frequency:** Warmer temperatures and prolonged periods of drought can favor more frequent wildfires. Extended fire seasons are becoming the new norm in many regions.
- **Greater Intensity:** Higher temperatures and drier conditions can lead to more intense wildfires. These fires burn hotter and spread more rapidly, making them more challenging to control and extinguish.
- **Longer Fire Seasons:** Drought and warmer temperatures are extending the length of fire seasons, leading to earlier starts and later endings. This puts additional stress on firefighting resources and increases the risk of wildfires overlapping with other disasters.
- **Altered Precipitation Patterns:** Changes in precipitation patterns, including more intense rainfall events followed by extended dry periods, can promote the growth of vegetation, which can then become fuel for wildfires during subsequent dry periods.
- **Drought Conditions:** Prolonged droughts reduce soil moisture levels and the availability of water sources. Dry conditions increase the susceptibility of vegetation to ignition.
- **Vegetation Changes:** Dry conditions can foster the expansion of drought-tolerant species. This can change fuel availability and make ecosystems more fire prone.
- **Insect Infestations:** Warmer temperatures can lead to increased insect infestations in forests. Infested and dead trees provide additional fuel for wildfires.

While both population and housing levels have remained static, or slightly decreased, in Torrance County any continued expansion into WUI areas significantly increases the risk and potential damage from wildfires for several reasons, including:

- **Proximity to Natural Fuels:** As development spreads into previously undeveloped wildland areas, homes and infrastructure are built in close proximity to natural fuels which can ignite during a wildfire. Natural landscapes in WUI zones are often dense with vegetation, providing a continuous fuel source that allows fires to spread quickly from wildland areas to residential zones. This increases the likelihood of structure ignition, as homes are surrounded by flammable vegetation.
- **Increased Human Activity:** Human activities, such as outdoor recreation, construction, and the use of equipment, are more common in WUI areas, and these activities can inadvertently start fires
- **Difficulty in Fire Suppression:** WUI fires are harder to control because firefighting efforts must focus on both the natural landscape and protecting homes and infrastructure. Firefighters face the dual challenge of containing the wildfire and defending structures, which can divert resources and increase the complexity of suppression efforts. Narrow or inaccessible roads in WUI areas can make it difficult for firefighting equipment and personnel to reach homes at risk, delaying response times.

In Torrance County, various forest management projects are being implemented to help mitigate the future risk and severity of wildfires. These projects combine techniques such as prescribed burns, thinning of dense forests, and the development of defensible space around communities. The following are some of the key forest management strategies and projects being used:

- **Prescribed Burns:** Controlled burns, or prescribed fires, are intentionally set under specific weather conditions to reduce excess vegetation that can fuel larger wildfires. These burns help mimic the natural fire cycles that were historically suppressed, leading to less fuel buildup. The U.S. Forest Service have expanded the use of prescribed burns, targeting areas that have accumulated significant fuel loads.
- **Fuel Thinning:** Thinning involves the removal of smaller trees, deadwood, and brush to reduce the density of forests. By decreasing the amount of available fuel, thinning can lower the intensity of potential fires. Thinning projects are particularly common in the WUI areas, where dense vegetation near communities poses a significant fire risk.
- **Mechanical Fuel Reduction:** In some areas where prescribed burns are not feasible, mechanical methods such as cutting and removing dead or overgrown vegetation are employed. This includes removing hazardous trees, logging dead trees, and clearing brush. This strategy is particularly effective in northern New Mexico and areas with large tree populations, where mechanical fuel reduction projects can make a substantial difference in decreasing fire intensity.
- **Collaborative Forest Management Programs:** Public and private agencies work together on collaborative forest management programs to share resources and implement broader fire mitigation strategies.

5.13.6 Vulnerability and Impact

FEMA NRI

Using the FEMA NRI, and consisting of three input components (expected annual loss, social vulnerability, and community resilience), the first table was created indicating the potential risk to Torrance County and all participating jurisdictions from wildfire. In order to gain an understanding of vulnerability, the second table details the estimated annual loss data for Torrance County and participating jurisdictions. To help understand the risk and vulnerability participating jurisdictions data from the FEMA NRI was run on a census tract level. As the NRI does not generate data for individual jurisdictions, census tract analysis is the closest analogue available to understand individual jurisdiction conditions.

Table 100: Participating Jurisdiction Wildfire Risk Index

Jurisdiction	Census Tract	Risk Index	National Percentile	Events per year
Torrance County	All	Relatively Low	80.3	0.089%
Moriarty	35057963202	Relatively Moderate	92.5	0.073%
Estancia	35057963601	Relatively High	96.8	0.094%
Encino, Mountainair and Willard	35057963700	Relatively Moderate	92.8	0.088%

Source: FEMA NRI

Table 101: Participating Jurisdiction Wildfire Expected Annual Loss

Jurisdiction	Census Tract	EAL	National Percentile	EAL
Torrance County	All	Relatively Low	78.4	$361K
Moriarty	35057963202	Relatively Moderate	91.4	$48K
Estancia	35057963601	Relatively High	95.8	$171K
Encino, Mountainair and Willard	35057963700	Relatively Moderate	92.5	$63K

Source: FEMA NRI

Population

Wildfires have profound and far-reaching impacts on people, affecting physical health, mental well-being, and socio-economic conditions. These impacts can vary depending on the severity, location, and preparedness of the communities affected. Key wildfire impacts include:

- **Health Impacts**
  - Smoke inhalation: Wildfire smoke contains fine particulate matter that can penetrate deep into the lungs and exacerbate respiratory and cardiovascular problems. It is especially dangerous for people with pre-existing conditions like asthma, COPD, or heart disease. Exposure to smoke can cause short-term issues like coughing, throat irritation, and difficulty breathing, as well as long-term health effects from prolonged exposure.
  - Burn injuries: Direct exposure to flames or heat during evacuations or firefighting efforts can result in serious burn injuries.
  - Mental health: Survivors of wildfires often experience stress, anxiety, depression, and post-traumatic stress disorder, especially those who have lost homes, loved ones, or livelihoods.

- **Economic and Financial Impacts**
  - Property damage: Wildfires can destroy homes, businesses, and infrastructure, leading to significant financial losses. Insurance premiums in wildfire-prone areas often increase, and many homeowners struggle to rebuild after losing their property.
  - Loss of livelihoods: Wildfires can disrupt local economies, particularly in agricultural and forestry-based communities. Employment in affected areas may decline, and businesses may close either temporarily or permanently.
  - Cost of relocation: In cases of long-term displacement, families must bear the costs of relocation, housing, and rebuilding, which can be a financial burden, especially for low-income households.
- **Evacuations and Displacement**
  - Evacuations: Wildfires often force mass evacuations, leaving people displaced from their homes for extended periods. Evacuations can be stressful, especially if there is little warning, leading to rushed departures where families leave behind essential belongings or pets.
  - Long-term displacement: In severe cases, entire communities may be permanently displaced if homes are destroyed or if areas are deemed too hazardous to return to, leading to loss of community.

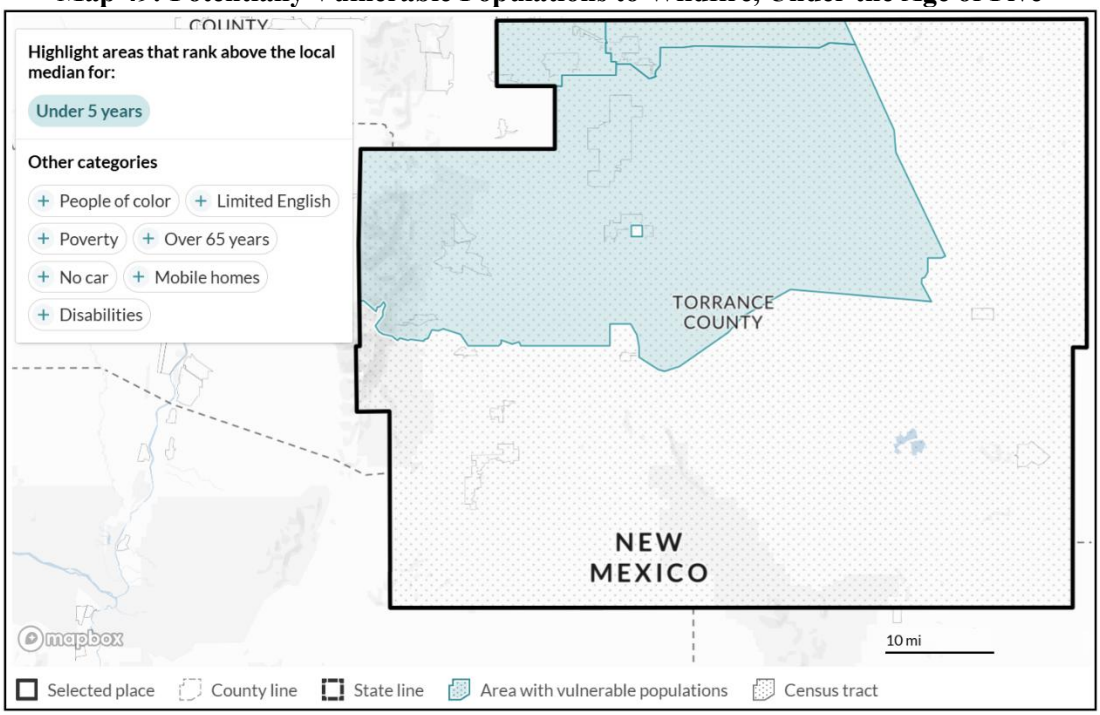
- **Social and Community Disruption**
  - Community dislocation: Wildfires can cause permanent damage to communities, forcing people to relocate and resulting in the breakdown of social networks and support systems.
  - Loss of heritage**:** In some cases, wildfires destroy culturally significant sites, landmarks, and natural heritage, such as forests and ecosystems that communities may depend on or cherish.

Wildfires can disproportionately affect vulnerable populations due to their limited resources, reduced mobility, and pre-existing health or socio-economic challenges. These groups often include the elderly, disabled individuals, low-income households, children, and those with chronic health conditions. Ways that wildfires may have a greater impact on these populations include:

- **Health Vulnerabilities**
    - Respiratory and cardiovascular risks: Vulnerable populations, such as the elderly, children, and those with pre-existing respiratory or heart conditions, are more susceptible to the harmful effects of wildfire smoke. The fine particulate matter from the smoke can exacerbate asthma, bronchitis, and heart disease, leading to increased hospitalizations and, in severe cases, mortality.
    - Limited healthcare access: Vulnerable groups often have less access to healthcare services, which can delay critical treatment during or after wildfire exposure. Health facilities may be overwhelmed during wildfire events, and transportation to care facilities may be hindered by road closures or evacuations.
- **Challenges with Evacuation**
    - Mobility issues: Elderly individuals, people with disabilities, and those without access to vehicles may struggle to evacuate quickly. They may depend on public transportation, community aid, or emergency services, which can be delayed or overburdened during a wildfire emergency.
    - Language barriers: Immigrant communities or non-English speakers may not fully understand emergency alerts or evacuation instructions, making it harder for them to react swiftly. This can increase the risk of delayed evacuation, which is particularly dangerous in fast-moving wildfires.
    - Poverty and housing instability: Low-income families are less likely to have the means to evacuate, such as access to a car or money for temporary shelter. They may also live in less resilient housing, which is more vulnerable to wildfire damage.
- **Economic Disparities**
    - Loss of homes and belongings: Vulnerable populations are often more likely to live in fire-prone or poorly constructed homes that are less resistant to wildfires. They may lack adequate insurance coverage to rebuild or replace what is lost, which can lead to long-term displacement and financial hardship.
    - Job loss and economic disruption: After a wildfire, vulnerable populations are more likely to experience prolonged economic disruption. Many people in low-wage jobs or agriculture may face unemployment if the local economy is disrupted, or if their place of work is destroyed. Recovery can take months or years, leaving them with few financial safety nets.
- **Increased Long-Term Vulnerability**
    - Difficulty in recovery: Vulnerable populations often face more significant challenges during the recovery phase of wildfires. They may lack insurance, savings, or government support to rebuild homes, replace belongings, or relocate. This can lead to prolonged displacement or homelessness, further exacerbating their vulnerabilities.
    - Disruption of social networks: Vulnerable groups rely heavily on community networks for support during and after disasters. Wildfires may displace communities, breaking apart these networks and leaving people isolated during their recovery process.
- **Disparities in Resource Allocation**
    - Limited access to relief aid: Vulnerable populations may struggle to access emergency relief services due to logistical, language, or bureaucratic barriers. They may not be prioritized for resource distribution, further exacerbating their difficulties in recovering from wildfire impacts.

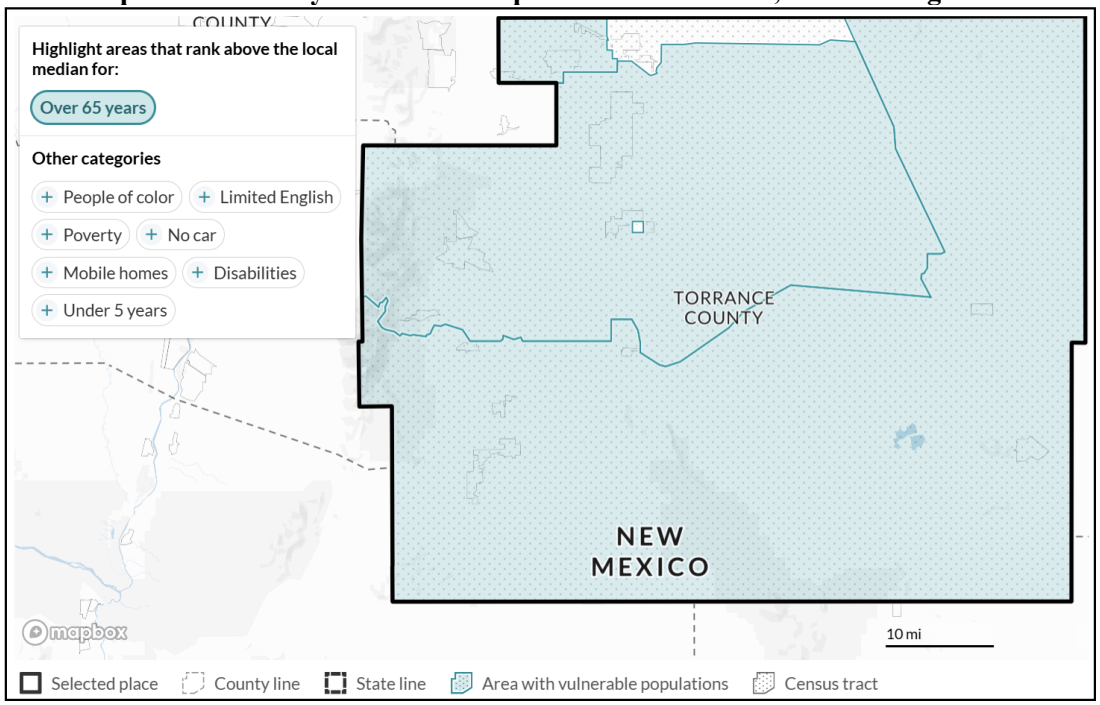
The following maps show the location of vulnerable populations compared to wildfire risk. Census tracts are highlighted that have values equal to or greater than the community median:

Map 49: Potentially Vulnerable Populations to Wildfire, Under the Age of Five



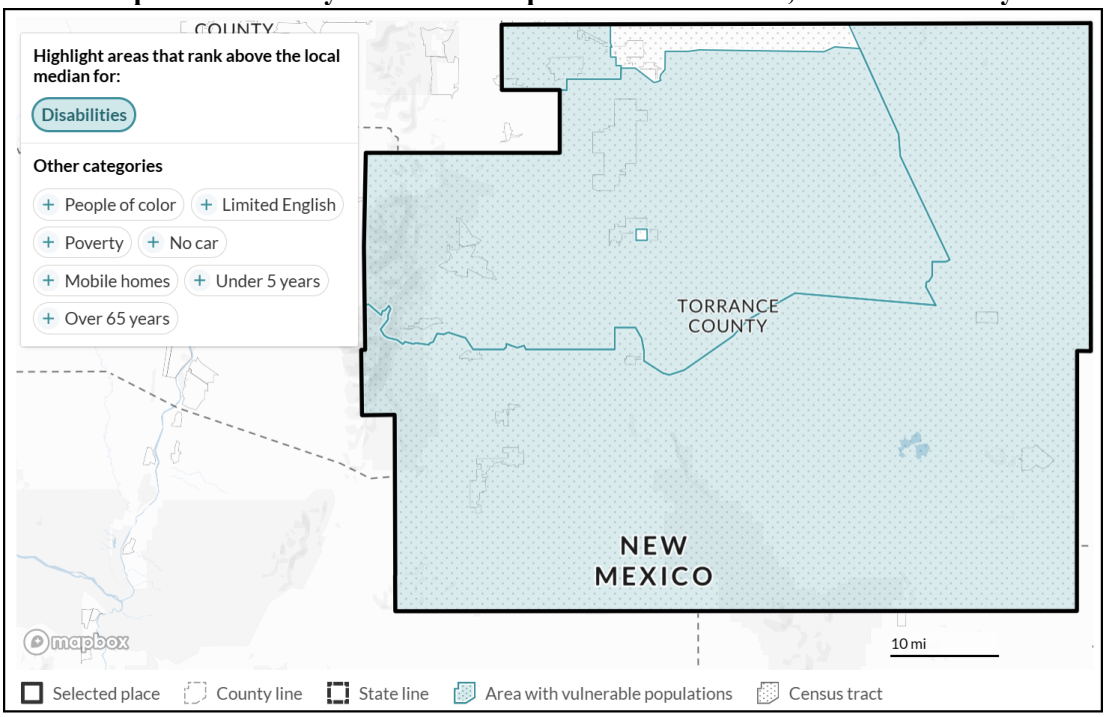
Source: NOAA's Wildfire Risk to Communities

Map 50: Potentially Vulnerable Populations to Wildfire, Over the Age of 65



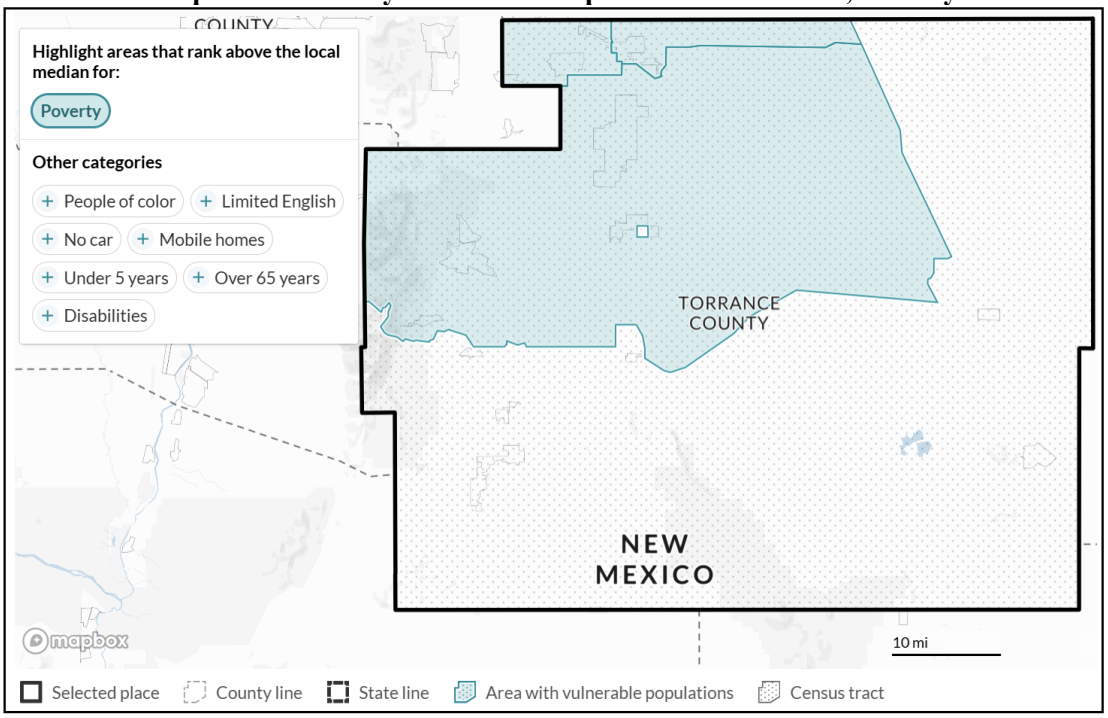
Source: NOAA's Wildfire Risk to Communities

Map 51: Potentially Vulnerable Populations to Wildfire, With a Disability



Source: NOAA's Wildfire Risk to Communities

Map 52: Potentially Vulnerable Populations to Wildfire, Poverty



Source: NOAA's Wildfire Risk to Communities

All Torrance County and participating jurisdiction populations are vulnerable to the impacts of wildfires. Please see Section 3.3: Population Data and Section 3.4: Socially Vulnerable and At-Risk Populations for data concerning jurisdictional populations.

Buildings and Structures

Buildings and structures are vulnerable to wildfires primarily due to their location, materials, and surrounding environment. These factors determine how easily a structure may ignite, sustain damage, or be destroyed by fire. Here's how these vulnerabilities manifest:

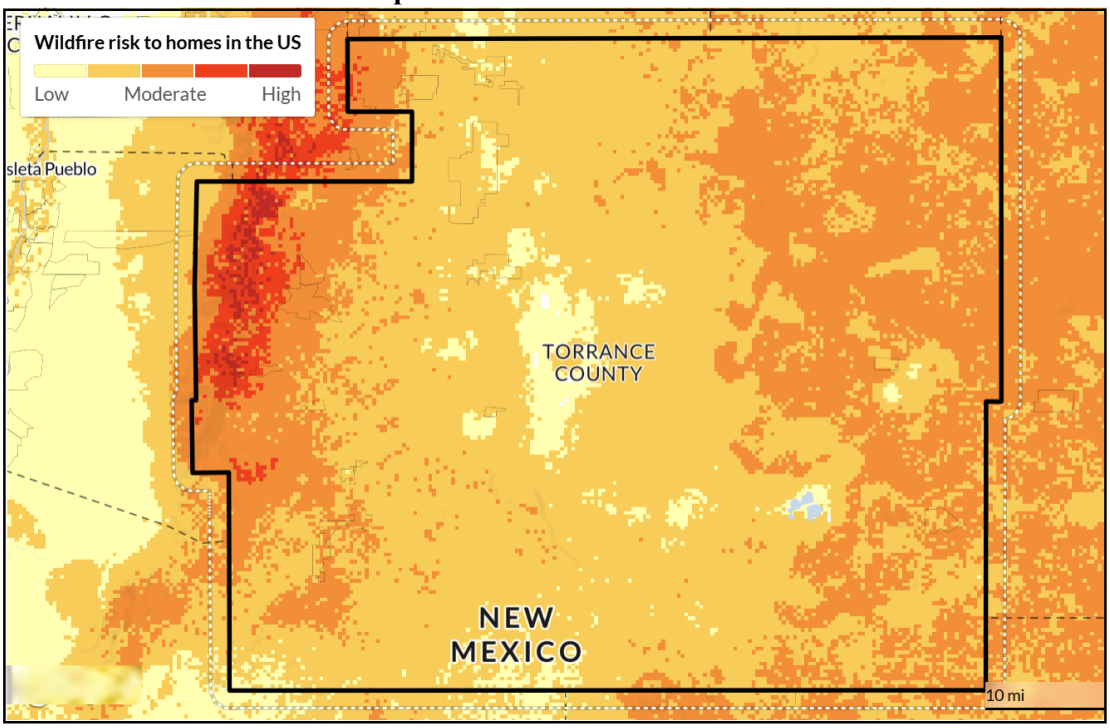
- **Proximity to Vegetation:** Homes located in the WUI are particularly vulnerable as they are closer to dense vegetation that serves as fuel for wildfires. If the vegetation (trees, shrubs, dry grasses) is not properly managed around the property, fire can easily spread to homes.
- **Flammable roofing materials:** Roofs made from materials like wood shingles are highly flammable and can easily ignite from embers. Non-flammable materials like metal, tile, or asphalt are more resistant to fire.
- **Siding and exterior walls:** Homes with wood siding or other combustible materials are more vulnerable to fire than homes built with fire-resistant materials like stucco, brick, or concrete.
- **Windows:** Single-pane windows are more likely to break during a wildfire due to heat exposure, allowing embers and flames to enter the building. Double-pane or tempered glass windows offer more protection.
- **Eaves and vents:** Eaves and vents can allow embers to enter the attic or other vulnerable spaces in the home. If they are not properly screened or fireproofed, they become entry points for embers to ignite the structure.
- **Decks and porches:** Wooden decks and porches are highly susceptible to wildfire if they are not made from fire-resistant materials or if they have combustible items stored underneath them.
- **Lack of defensible space:** Defensible space is the buffer zone between a building and surrounding vegetation. If this space is not cleared of flammable materials (like dry leaves, dead trees, or fire-prone plants), a wildfire can spread rapidly to a home. Homes without sufficient defensible space are much more likely to ignite during a fire.
- **Combustible materials near the home:** Storing firewood, propane tanks, or other flammable items near the structure increases vulnerability, as these materials can easily catch fire and ignite the building.
- **Distance from fire services:** Homes located far from fire stations or without adequate road access may experience delayed emergency response times, leaving them more vulnerable to destruction.
- **Neglected maintenance**: Homes that are not well-maintained, such as those with clogged gutters full of leaves or overgrown vegetation, are more likely to catch fire. Regular maintenance, such as clearing gutters and removing dead vegetation, is essential to reducing wildfire vulnerability.

When homes and buildings ignite in a wildfire the damage can be severe. Wildfire impacts on structures typically include:

- **Complete destruction:** Buildings can be completely consumed by flames, leaving nothing but the foundation.
- Partial damage: Fire can damage parts of the building, such as roofs, walls, or outdoor structures, necessitating costly repairs.
- **Smoke damage:** Even if a structure does not burn down, smoke can infiltrate the building, causing significant damage to the interior, furniture, and electronics.
- **Water damage:** In the process of firefighting, water can cause additional damage to structures, particularly if fire suppression efforts are extensive.

Summarizing available data, the following map from NOAA's Wildfire Risk to Communities details the overall risk to homes from wildfires in Torrance County and for all participating jurisdictions:

Map 53: Wildfire Risk to Homes



Source: NOAA's Wildfire Risk to Communities

Governmental Operations

Wildfires can pose various risks to government operations. These risks can have significant economic and operational consequences, and can include:

- **Power Outages:** Severe weather can lead to power outages by damaging electrical infrastructure such as power lines and substations. Government buildings may lose power, affecting critical operations and services.
- **Flooding:** Heavy rainfall after a wildfire can lead to flooding, which can damage government buildings and disrupt operations. Flood damage may require extensive repairs and cleanup.
- **Communication Disruptions:** Wildfires can damage communication equipment, including telephone lines and computer systems. This can hinder communication between government agencies and the public.
- **Transportation Disruptions:** Wildfires can make roads impassable due to debris, smoke, heat, and potentially after event flooding or landslides. This can impact the ability of government employees to commute to work.
- **Budgetary Impact:** The costs associated with repairing and restoring government buildings and infrastructure after a wildfire can strain budgets.

Transportation and Electrical Infrastructure

In general, wildfires do not have a large impact on transportation infrastructure, with the exception of power loss disrupting signaling, road closures due to events, and poor conditions impacting driving conditions.

Wildfires can have severe and widespread impacts on electric infrastructure, disrupting power distribution and causing long-term damage. Here are some key ways wildfires affect electric infrastructure:

- **Damage to Transmission Lines and Power Poles**
  - Direct fire damage: Wildfires can burn through wooden power poles and even damage steel or aluminum transmission towers due to extreme heat. Transmission lines are especially vulnerable in heavily forested or remote areas where wildfires tend to occur.
  - Melting of cables and equipment: High temperatures can cause transmission lines and electrical equipment to melt or warp, leading to failures or shutdowns.

    - Power outages: Wildfires can lead to widespread power outages by directly damaging transmission lines or transformers. In some cases, utilities may also proactively shut off power (public safety power shutoffs, or PSPS) to prevent the ignition of fires by downed or sparking power lines.
- **Smoke and Soot Contamination**
    - Conductivity of smoke: Smoke and ash from wildfires can increase the conductivity of the air, leading to short circuits or arcing in power lines, especially in high-voltage systems.
    - Soot buildup: Wildfire soot can accumulate on insulators and electrical equipment, reducing efficiency and causing potential equipment failures if not cleaned.
- **Substation and Equipment Vulnerability**
    - Heat and embers: Substations, transformers, and electrical panels can be damaged by heat or flying embers. Damage to substations can have a particularly large impact since they are key distribution points for electricity.
    - Component failures**:** Equipment such as switches, transformers, and circuit breakers may suffer from thermal stress or fire-related damage, leading to breakdowns and costly repairs.
- **Challenges for Utility Workers**
    - Delayed repairs: Repair crews face significant challenges during and after wildfires. Access to damaged areas can be restricted due to ongoing fires, road closures, or unsafe conditions, delaying repairs.
    - Safety hazards: Workers may be exposed to unsafe conditions, including the risk of encountering smoldering areas or downed power lines.
- **Disruptions to Power Generation Facilities**
    - Hydroelectric plants: Wildfires in watersheds that supply hydroelectric plants can disrupt water flow, reducing power generation capacity.
    - Thermal power plants: Plants using coal, natural gas, or other fuel sources may also face interruptions if transportation of fuel is hindered due to wildfires or if nearby infrastructure is damaged.

During period of strong winds and dry conditions New Mexico electric utilities have the authority to shut off electric power to protect public safety, since power supply systems have the potential to ignite wildfires (a public safety power shutoff). In general terms, these shutoffs are instituted to lower the potential of a downed electrical line sparked wildfire. Conditions that may trigger a shutoff include:

- Red flag warning from the National Weather Service
- Low humidity
- High winds
- Situational determination by on the ground crews

Mapping concerning transportation and electrical infrastructure may be found in Section 3.9: Critical Facilities and Infrastructure. Information concerning the costs to repair or reconstruct transportation and electrical infrastructure may be found in Section 5.8.6.

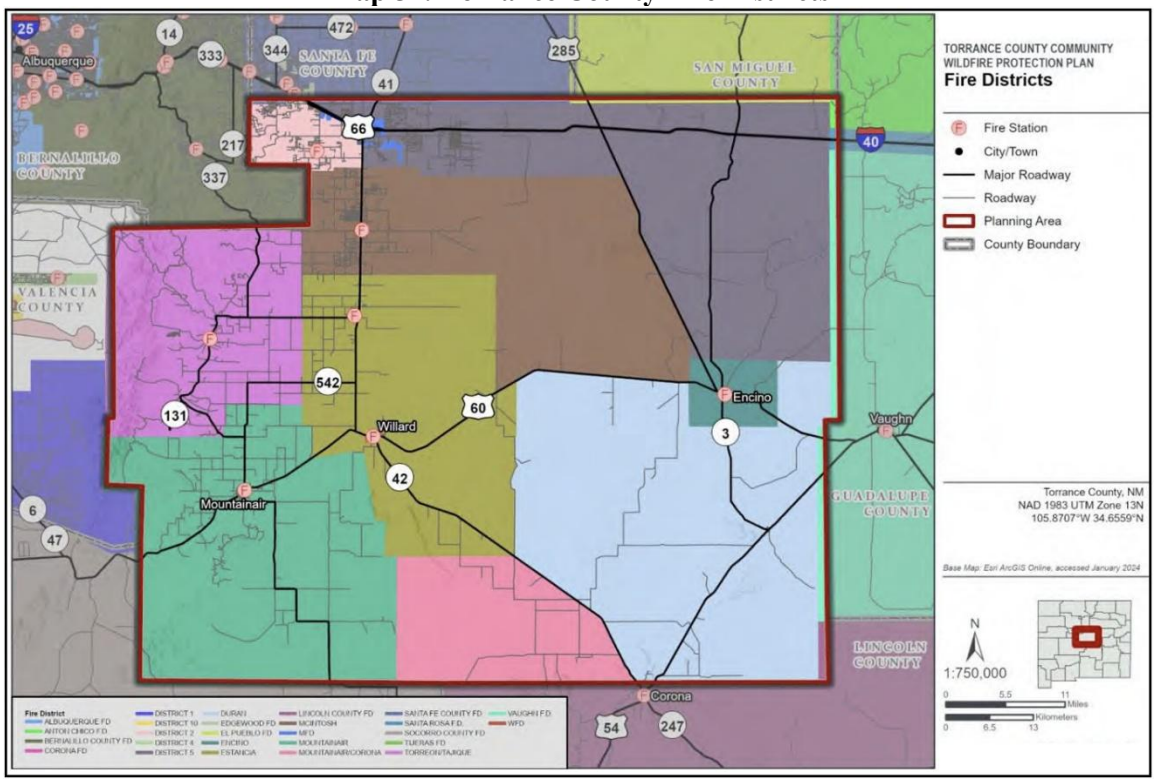
Water and Wastewater Utilities
In general, severe weather and severe winter weather components do not have a large impact on water and wastewater infrastructure and operations. However, the cascading impacts from an event such as power loss disrupting pumping and treatment capabilities, localized flooding from heavy overwhelming drainage systems, or frozen pipes in water distribution systems, causing water outages and expensive repairs when pipes burst.

Medical and Response Facilities
Wildfires can significantly impact emergency response and medical infrastructure, creating challenges for first responders and organizations involved in managing and mitigating the effects of wildfire events. Winter storms can impact emergency response through:

- **Transportation Disruptions:** Debris on roads and road closures can hinder the ability of emergency vehicles to navigate and reach affected areas promptly. Hazardous road conditions may result in delays in response times.
- **Communication Disruptions:** Wildfires can disrupt communication networks, affecting the ability of emergency responders to coordinate and communicate effectively. Downed power lines and damage to communication infrastructure contribute to these disruptions.
- **Power Outages:** Wildfires can lead to power outages. Emergency response facilities, such as command centers and fire stations, may lose power, affecting their operational capabilities.
- **Exposure:** Emergency responders face increased health and safety risks during wildfire events. Exposure to fire, ash, particulate matter, and high temperatures can impact the well-being of responders and affect their ability to provide effective assistance.
- **Resource Allocation Challenges:** Wildfires often requires the allocation of additional resources, including personnel, equipment, and supplies, to address immediate needs. This can strain emergency response organizations and impact their ability to respond to other concurrent incidents.
- **Increased Demand for Services:** Wildfires can result in an increased demand for emergency services, including medical assistance, and search and rescue operations. Emergency response organizations may need to manage a higher volume of incidents simultaneously. Wildfires can also increase the demand for emergency shelters, particularly in cases of widespread evacuations.

The following map details fire departments and districts throughout Torrance County:

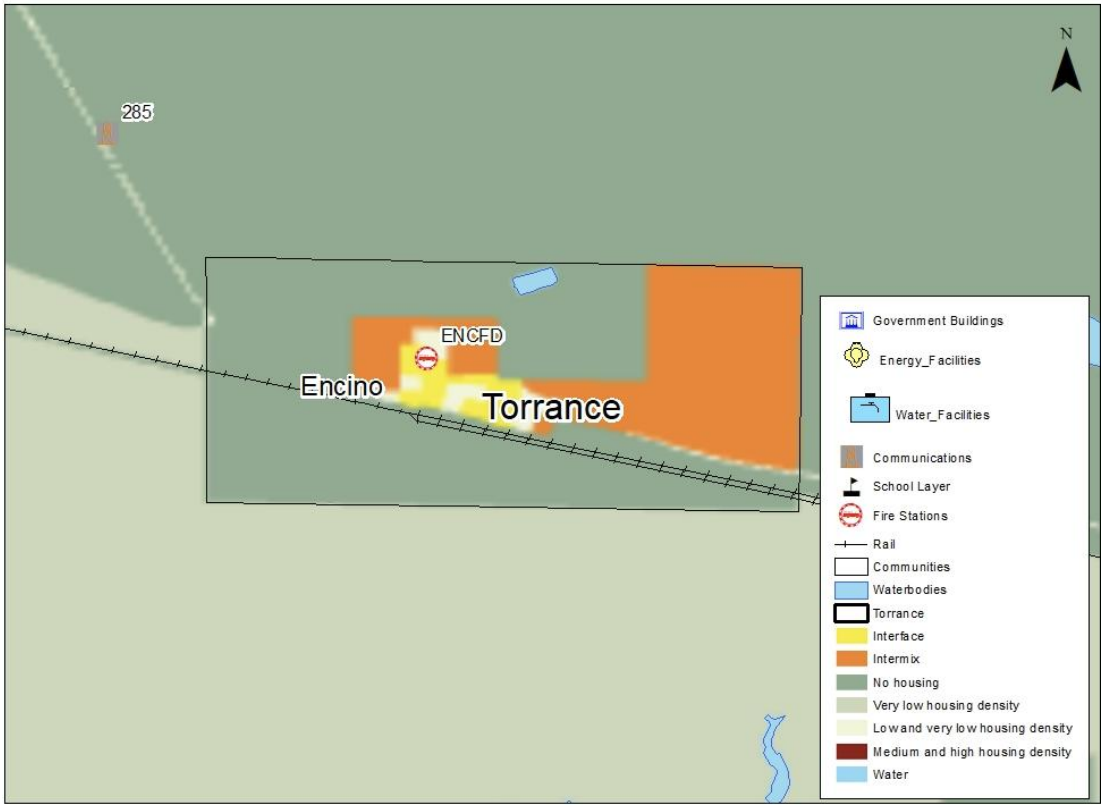
Map 54: Torrance County Fire Districts



Source: Torrance County Community Wildfire Protection Plan

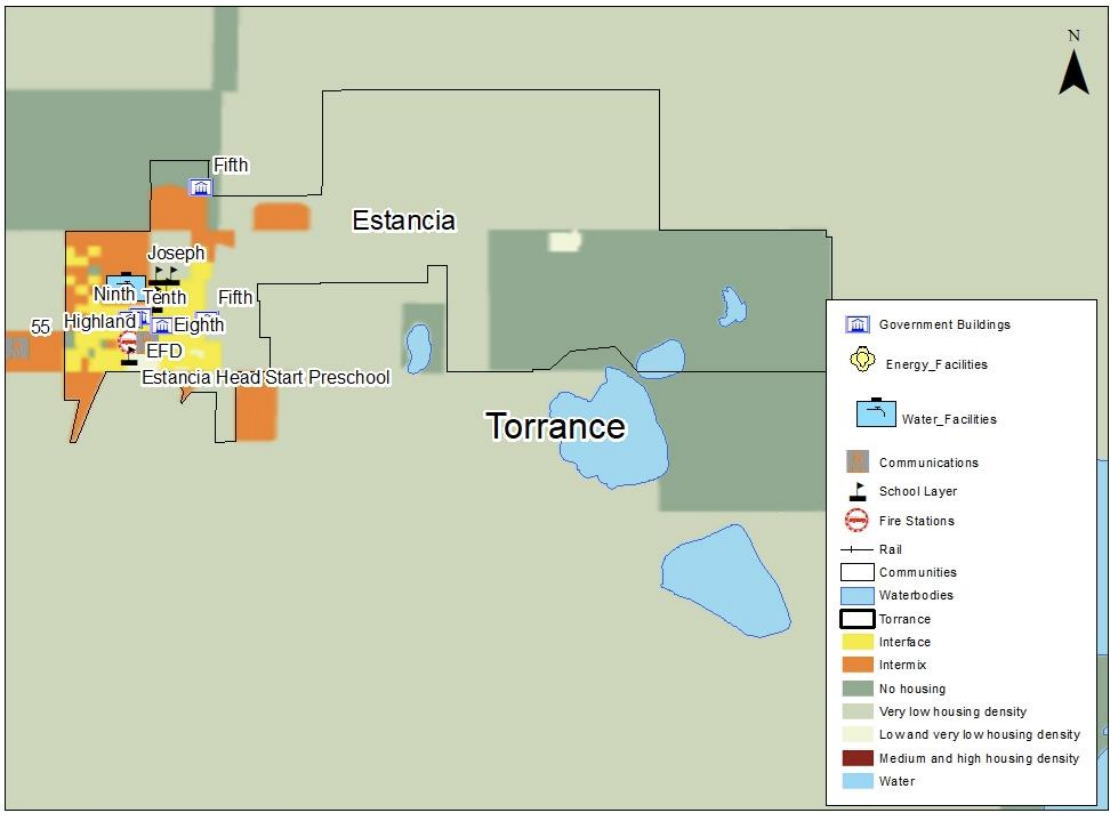
The following maps detail critical facility locations mapped to the FEMA mapped WUI areas:

Map 55: Encino Critical Facilities In WUI Areas



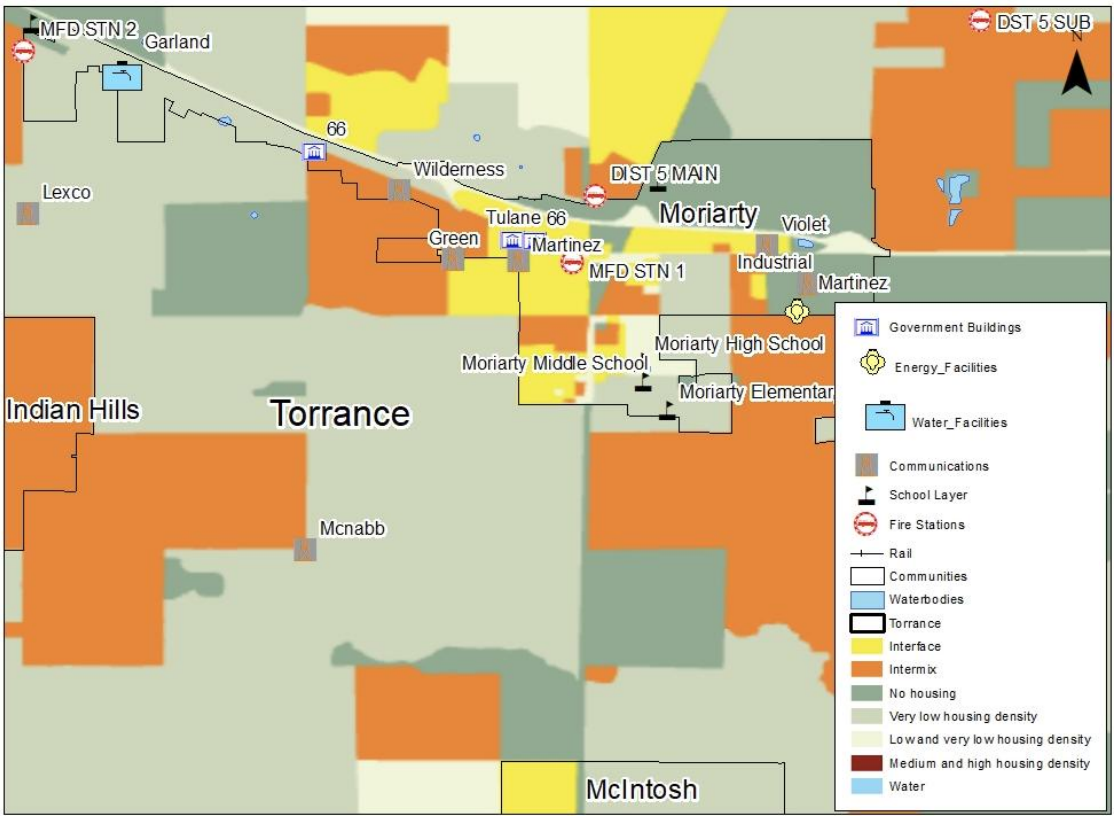
Source: Torrance County and Janey Camp

Map 56: Estancia Critical Facilities In WUI Areas



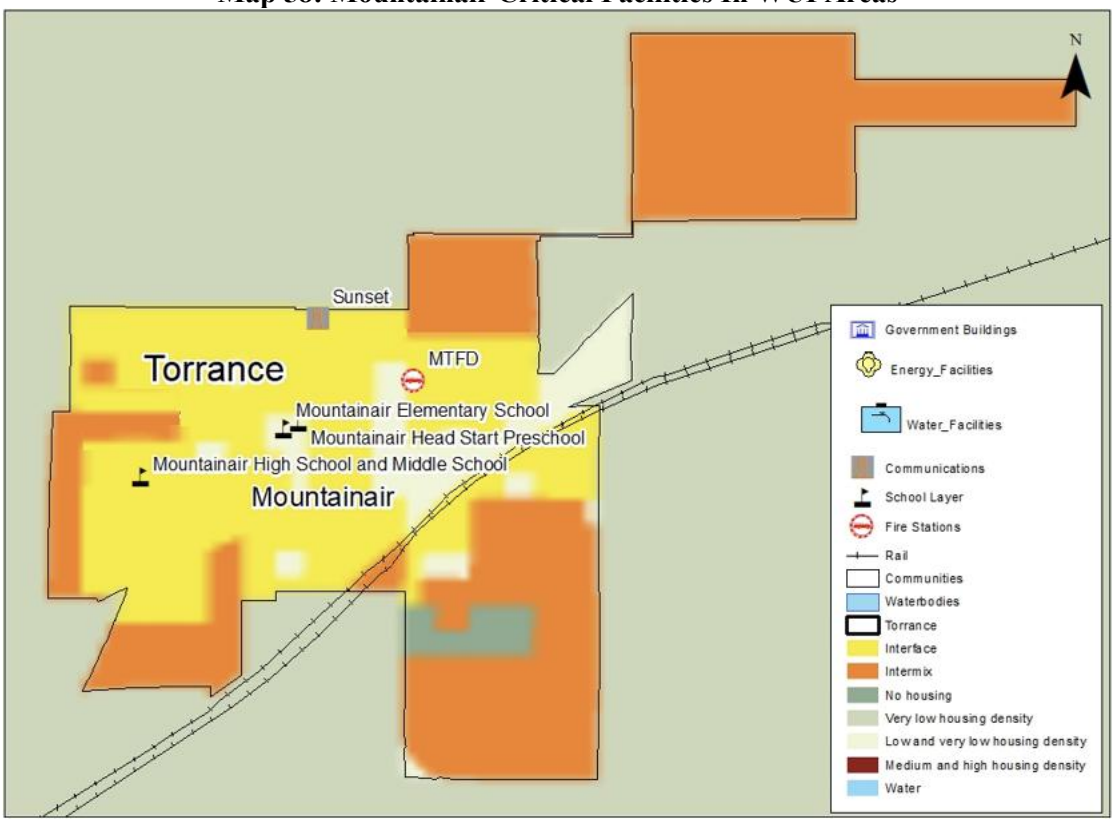
Source: Torrance County and Janey Camp

Map 57: Moriarty Critical Facilities In WUI Areas



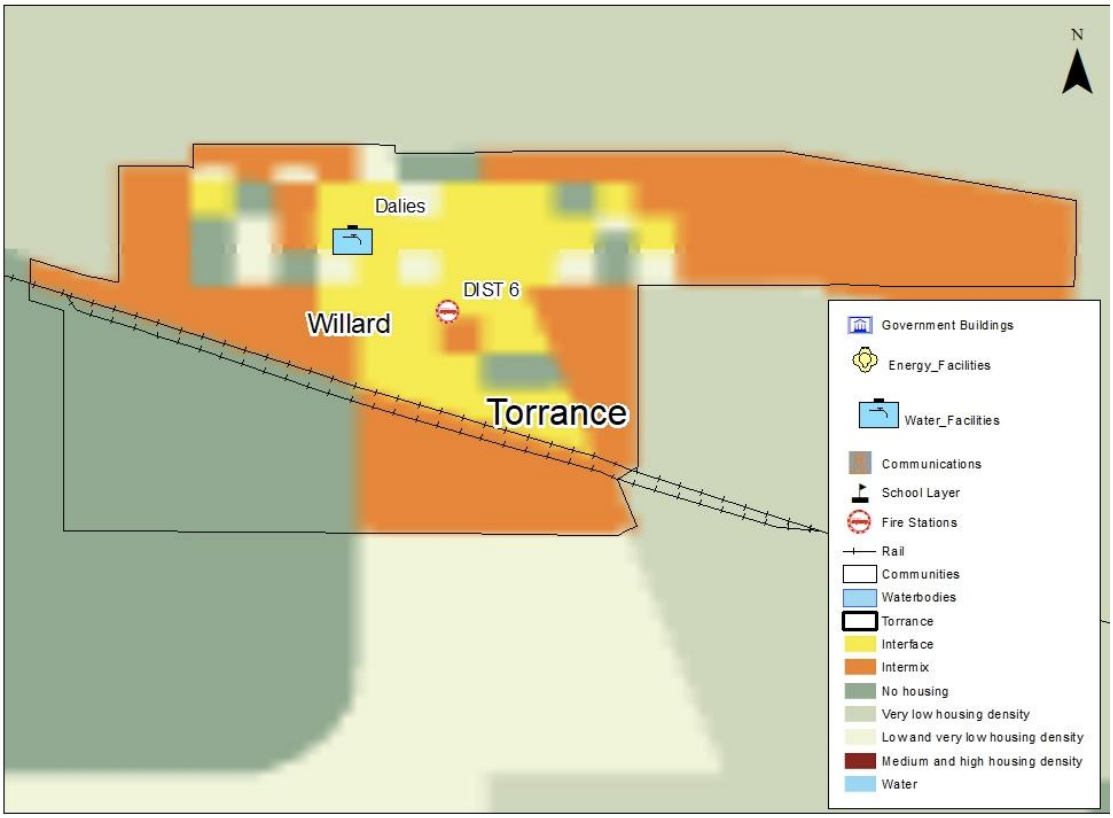
Source: Torrance County and Janey Camp

Map 58: Mountainair Critical Facilities In WUI Areas



Source: Torrance County and Janey Camp

Map 59: Willard Critical Facilities In WUI Areas



Source: Torrance County and Janey Camp

Educational Facilities

Depending on the educational facility capability and location, wildfires may necessitate the closure of the facility for the duration of the event due to damages or lack of access. These closures are expected to have additional economic consequences as caregivers may be required to miss or modify work.

- **School Closures:** Wildfires can lead to the closure of schools due to hazardous conditions. This can strain caregivers and result in lower work attendance.

Communication Systems

All communication systems within Torrance County are at risk to wildfire events. Wildfires can disrupt vital communications system, affecting reliability and functionality. Some of the key vulnerabilities include:

- **Physical Infrastructure Damage:** Wildfires can cause physical damage to communication infrastructure such as cell towers, antennas, cables, and data centers. This damage can result in network outages and disruptions.
- **Power Outages:** Wildfires often lead to power outages, which can affect the operation of communication networks. Without a stable power supply, cell towers, data centers, and other critical components may become non-functional, leading to service interruptions.
- **Communication Tower Instability:** Wildfires can compromise the stability of communication towers. If towers are not designed to withstand severe weather, they may collapse, leading to network outages.
- **Network Congestion:** In the event of a disaster, communication networks may experience a surge in usage as people attempt to contact emergency services, friends, and family. This increased demand can lead to network congestion, making it difficult for users to connect.

The cost to repair communications networks can vary widely depending on the extent of the damage, the size of the network, and the specific technologies involved. Repair costs may include expenses for labor, equipment replacement or repair, materials, and any additional resources required to restore the network to full functionality. Estimated repair

cost from the U.S. Department of Homeland Security Cybersecurity and Infrastructure Security Agency may be found in Section 5.9.6.

Environmental and Agricultural Impacts
Wildfires have significant and often devastating effects on the environment. These impacts can be both immediate and long-lasting, affecting air quality, ecosystems, water resources, soil stability, and wildlife. Wildfires release large quantities of smoke, which contain fine particulate matter, carbon monoxide, and other harmful pollutants. These particles can travel long distances, reducing air quality far from the fire itself, and can cause respiratory issues, especially for vulnerable populations.

Fires can decimate forests, grasslands, and other plant ecosystems. The loss of vegetation can result in habitat destruction for countless species, reducing biodiversity and altering the structure of the ecosystem. Recovery can take decades, depending on the severity of the fire and the resilience of the vegetation. Wildfires can degrade soil by burning away organic matter, making it less fertile. Intense heat can also cause soil to become hydrophobic (water-repellent), increasing the risk of erosion and reducing water infiltration, which impacts plant regrowth.

After a wildfire, ash, debris, and eroded soil can be washed into rivers and streams during rainstorms, contaminating water supplies. This can affect both aquatic ecosystems and human water sources, requiring extensive treatment. The destruction of vegetation disrupts the local hydrological cycle by reducing transpiration (the release of water vapor from plants). This can result in lower humidity levels, reduced rainfall, and potentially longer drought periods.

Animals are often killed directly by fire, especially those that are less mobile (like reptiles, amphibians, and small mammals) or those caught in fast-moving fires. Wildfires destroy habitats, which can lead to displacement, loss of food sources, and increased competition for remaining resources. This can cause population declines in already vulnerable species. Wildfires can disrupt key ecosystem services such as pollination, seed dispersal, and predator-prey relationships, affecting the balance of the ecosystem.

With the loss of vegetation, the soil becomes more susceptible to erosion. Without plants to stabilize the soil, rain and wind can easily carry away topsoil, which is crucial for plant regrowth and nutrient cycling. In steep areas, the loss of vegetation can lead to landslides during subsequent rain events. These slides can cause further destruction to the landscape, waterways, and infrastructure.

Wildfires can create opportunities for invasive species to take hold. Invasive plants, often better adapted to disturbed environments, may outcompete native species in the post-fire landscape, leading to long-term changes in ecosystem composition and reducing biodiversity. Some ecosystems, like certain forests and grasslands, are adapted to periodic fire and even rely on it for regeneration. However, the increasing intensity and frequency of wildfires can overwhelm these ecosystems, preventing recovery and pushing them beyond their adaptive capacity.

Jurisdictional Concerns
As of this plan there is a deficit of community specific data to help quantify both vulnerability and historic impact. However, over the life of this plan the MPC will work to quantify the local level impacts of hazard occurrences to citizens, vulnerable populations, structures, and infrastructure to better inform both this living LHMP and future planning efforts. The following initial vulnerabilities and potential impacts have been identified on a jurisdictional level:

- **Encino:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult. As the majority of the jurisdiction is in areas identified as either WUI interface or WUI intermix, all structures and identified critical facilities are at risk.
- **Estancia:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an

identified fire difficult. As the majority of the jurisdiction is in areas identified as either WUI interface or WUI intermix, all structures and identified critical facilities are at risk.

- **Moriarty:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult. As the majority of the jurisdiction is in areas identified as either WUI interface or WUI intermix, all structures and identified critical facilities are at risk.
- **Mountainair:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult. As the majority of the jurisdiction is in areas identified as either WUI interface or WUI intermix, all structures and identified critical facilities are at risk.
- **Willard:** All populations would be at risk to a wildfire event. Due to limited road systems, an evacuation of citizens would be problematic. The presence of vulnerable populations, including the elderly, the very young, citizens with a disability, and citizens in poverty would further exacerbate timely evacuation. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult. As the majority of the jurisdiction is in areas identified as either WUI interface or WUI intermix, all structures and identified critical facilities are at risk.
- **Soil and Water Conservation Districts:** All areas of stewardship would be at risk to a wildfire event. Due to limited road systems, rapid fire response would be problematic. Compounding the issues, these limited road systems, along with limited local capabilities, would make the timely attack of an identified fire difficult. As the majority of the districts are in areas identified as either WUI interface or WUI intermix, all structures and infrastructure within the footprint are at risk.

Cascading Impacts

Cascading impacts often result when one hazard event triggers one or more differing hazard events or loss of community lifelines. Cascading impacts associated with wildfires may include:

- Direct physical damage to buildings and structures:
- After event flooding, landslides, and mudslides
- Transportation infrastructure disruption
- Power outages and electrical grid disruption
- Communication system disruption
- Transportation and supply chain disruptions
- Environmental and ecological damage
- Economic impacts and business closures
- Emergency services overload

Consequence Analysis

This consequence analysis lists the potential impacts of a hazard on various elements of a community. The impact of each hazard is evaluated in terms of disruption of operations, recovery challenges, and overall wellbeing to all Torrance County residents and first responder personnel. The consequence analysis supplements the hazard profile by analyzing specific impacts.

Table 102: Wildfire Consequence Analysis

Subject	Potential Impacts
Impact on the Public	People located in the immediate area of the fire face the risk injury or death if not evacuated in time. Once evacuated, they may face a lengthy period of relocation. Fires can release toxic components which can cause adverse health effects including

Table 102: Wildfire Consequence Analysis

Subject	Potential Impacts
	respiratory and cardiovascular system impacts. Psychological and psychiatric concerns may arise due to exposure to the traumatic event. Young children and the elderly are especially vulnerable to health issues stemming from fire and smoke exposure.
Impact on Responders	Fire, police, and emergency responders may be called to evacuate people from the fire area, close roads, create fire breaks, attend to the injured, and direct traffic. Firefighters are at a higher risk of smoke inhalation, burns, and health problems due to working in close proximity to fires and the subsequent smoke.
Continuity of Operations	Local jurisdictions maintain continuity plans which can be enacted as necessary based on the situation. Wildfires may impact an agency's ability to maintain continuity of operations due to impacts on critical infrastructure.
Delivery of Services	Fires can cause disruption of services, including the ability to deliver goods and services. Impacts on operations could lead to a reduction or cessation of services. Goods and facilities may be damaged or destroyed by fire, smoke, or extremely high temperatures.
Property, Facilities, and Infrastructure	Fire can damage or completely destroy property and critical facilities, as well as lead to interruption of the power supply system. A fire of significant strength can cause major damage to buildings or farmland. Large fires may also interrupt transportation systems such as train and bus lines, creating a challenge for public transit and evacuation.
Impact on Environment	Fires can have significant impact to the environment by spreading pollution, damaging agricultural crops, and disturbing the wildlife and natural areas. Water and soil pollution caused by fire can cause longer term threats to ecosystem health. Fire damage may also affect soil formation, nutrient cycling, and carbon sequestration and storage.
Economic Conditions	Fires can cause a fiscal impact on the local government, even if costs can be recouped by federal grants. Agriculture is a major component of the local, county and local economy, and major fires could cause significant impact. Costs may be associated with loss of income, damage to property, and firefighting can be significant.
Public Confidence in Governance	Governmental response, on all levels, state and local, would require direct action that must be immediate and effective to maintain public confidence.

5.13.7 Future Development

Torrance County and all participating jurisdictions are experiencing either a largely static population or a consistent population decline as people increasingly migrate from rural areas to urban centers. The rural-to-urban population movement has significant implications for all participating jurisdictions, including school closures and reduced economic activity. Based on projections from the New Mexico Geospatial and Population Studies, the overall decreasing population trend is expected to continue in Torrance County through 2050.

Additionally, it is expected that there may be an increase in the number citizens living below the poverty level in all jurisdictions as a percentage of total population. These higher percentages may increase future vulnerability due to the following factors:

- Limited financial resources
- Limited insurance coverage
- Limited capacity to evacuate
- Health vulnerabilities
- Social isolation

Closely tracking population data, but tending to lag population changes, housing data is a good indicator of changing demographics and growth. Torrance County and all participating jurisdictions have generally seen static or decreasing housing growth over the previous 20-year period. As the population continues to decline, it is expected that housing development will also mirror this decrease

5.13.8 Mitigation Opportunities

The following table presents examples of potential actions that can be instituted for mitigating the volcanic activity hazard.

Table 103: Example Wildfire Weather Mitigation Actions

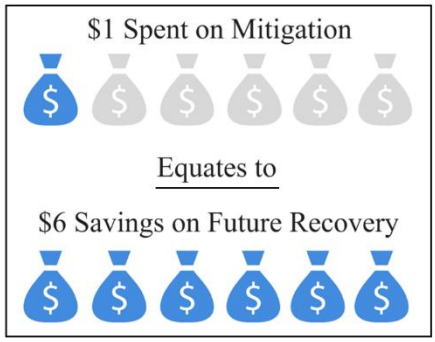
Category	Example Action
Planning and Regulation	Use GIS mapping of wildfire hazard areas to facilitate analysis and planning decisions through comparison with zoning, development, infrastructure, etc.
	Use zoning and/or a special wildfire overlay district to designate high-risk areas and specify the conditions for the use and development of specific areas.
	Promote conservation of open space or wildland-urban boundary zones to separate developed areas from high-hazard areas.
	Set guidelines for annexation and service extensions in high-risk areas
	Address fire mitigation through access, signage, fire hydrants, water availability, vegetation management, and special building construction standards.
	Establish wildfire mitigation planning requirements for large scale developments or planned unit developments.
	Require the use fire resistant roofing and building materials in remodels, upgrades, and new construction.
Infrastructure	Install roof coverings, sheathing, flashing, skylights, roof and attic vents, eaves, and gutters that conform to ignition-resistant construction standards.
	Protect propane tanks or other external fuel sources.
	Create buffers around residential and non-residential structures through the removal or reduction of flammable vegetation, including vertical clearance of tree branches.
	Perform arson prevention cleanup activities in areas of abandoned or collapsed structures, accumulated trash or debris, and with a history of storing flammable materials where spills or dumping may have occurred.
	Prevent or alleviate wildfires by proper maintenance and separation of power lines as well as efficient response to fallen power lines.
	Require and maintain safe access for fire apparatus to wildland-urban interface neighborhoods and properties.
Natural Systems	Perform maintenance including fuel management techniques such as pruning and clearing dead vegetation, selective logging, cutting high grass, planting fire-resistant vegetation, and creating fuel/fire breaks (i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels).
	Use prescribed burning to reduce fuel loads that threaten public safety and property.
	Cut firebreaks into public wooded areas in the wildland-urban interface.
	Develop a vegetation management plan
Education	Join the “Firewise Communities/USA” recognition program .
	Offer GIS hazard mapping online for residents and design professionals.
	Sponsor awareness workshops for local officials, developers, civic groups, and neighborhood/homeowners’ associations.
	Educate local elected officials and planners on the most vulnerable areas of the community’s wildland-urban interface and increase their understanding of risks.
	Work with insurance companies, utility providers, and others to include wildfire safety information in materials provided to area residents.
	Develop partnerships with neighborhood groups to conduct outreach activities.

Section 6 – Mitigation Strategy

6.1 Introduction

As part of this planning effort, Torrance County worked to minimize the risk of future impacts from identified hazards to all citizens of the region. In an attempt to shape future regulations, ordinances and policy decisions the MPC reviewed, revised, and developed a comprehensive hazard mitigation strategy. This comprehensive strategy includes:

- Goals to guide the selection of activities to mitigate and reduce potential loss.
- A discussion of funding capabilities for hazard mitigation projects.
- Identification, evaluation, and prioritization of mitigation actions along with potential funding sources.



Torrance County's mitigation strategy promotes long-term hazard resilience that will have a positive impact on quality-of-life issues. By minimizing both the exposure to, and potential impacts from, identified hazards jurisdictions can expect to minimize injuries and loss of life, reduce property damage, and minimize the day-to-day social and economic disruptions that follow hazard events.

According to an analysis by the National Institute of Building Sciences, natural hazard mitigation saves $6 on average for every $1 spent on federal mitigation grants.

6.2 Hazard Mitigation Goals

Torrance County, participating jurisdictions, and all stakeholders reviewed the previous LHMP's goals and objectives to determine if they remained viable and valid. In general terms, the relationship between goals and objectives is as follows:

- **Hierarchy:** Goals provide the overarching direction and desired outcomes, while objectives break down those goals into specific, actionable steps.
- **Alignment:** Objectives should align with and support the achievement of goals. Each objective should be directly related to one or more goals.
- **Measurement:** Goals set the vision, and objectives provide the means to measure progress toward that vision. Objectives are often used to track and evaluate the success of achieving broader goals.

During this process, and after a thorough review and discussion with all stakeholders, it was determined that the priorities of the Torrance County in relation to hazard mitigation planning have not changed during the five years of the previous planning cycle. Additionally, and based on discussion with all stakeholders, it was determined that the goals and objectives identified in the previous LHMP remained viable and valid. The following represent the identified goals for the 2024 LHMP:

- **Goal 1:** Reduce the risk to the people and property from the identified hazards in this plan.
- **Goal 2:** Work to protect all vulnerable populations, structures, and critical facilities from the impacts of the identified hazards.
- **Goal 3:** Improve public outreach initiatives to include education, awareness, and partnerships with all entities in order to enhance the understanding identified hazards and hazard mitigation opportunities.
- **Goal 4:** Enhance communication and coordination among all agencies and between agencies and the public.

Participants in the LHMP will continuously evaluate these identified goals and objectives against current capabilities and conditions. As part of this process, and where possible, data and feedback from plan stakeholders will be collected and analyzed to help identify gaps, roadblocks, and achievements. Using this information, strategies will be developed to bridge identified gaps, remove identified roadblocks, and celebrate identified successes in achieving the goals of this

LHMP. Additionally, when necessary, goals and objectives will be modified, updated, or expanded based on the review process.

6.3 Review and Creation of Hazard Mitigation Actions

Hazard mitigation actions are proactive measures taken to reduce or eliminate the long-term risk and impact of natural and human-made hazards. These actions are designed to minimize the damage caused by disasters and contribute to the overall resilience of communities and infrastructure.

For this plan update members of the MPC were provided with a complete list of previously identified mitigation actions and asked to review them to determine their status. Previously identified mitigation status was reported using the following definitions:

- **Completed:** The action has been fully completed.
- **Not Completed:** The action was not started or has been started and is not completed.
- **Revised:** Action has been revised to reflect current planning environment or identified changes.
- **Cancelled:** The action has been removed from consideration due to either a lack of resources or changing mitigation priorities.
- **Ongoing:** The action is completed and has become an ongoing activity or capability.

Additionally, MPC members and stakeholders were provided with opportunities to identify and incorporate newly identified actions based on the changing hazard environment or previously unidentified needs. When considering new mitigation actions, participating jurisdictions were guided to the January 2013 FEMA publication Mitigation Ideas, A Resource for Reducing Risk to Natural Hazards. This document offers a comprehensive collection of strategies and best practices for reducing risks associated with natural hazards. It covers various types of natural hazards, and provides practical ideas for communities, local governments, and individuals to implement.

In preparing a mitigation strategy all reasonable and obtainable mitigation actions were considered to help achieve the general goals. Priorities were developed based on past damage, existing exposure to risk, and weaknesses identified by the State and local capability assessments. In identifying mitigation actions, the following activities were considered:

- The use of applicable building construction standards.
- Hazard avoidance through appropriate land-use practices.
- Relocation, retrofitting, or removal of structures at risk.
- Removal or elimination of the hazard.
- Reduction or limitation of the amount or size of the hazard.
- Segregation of the hazard from that which is to be protected.
- Modification of the basic characteristics of the hazard.
- Control of the rate of release of the hazard.
- Provision of protective systems or equipment for both cyber and physical risks.
- Establishment of hazard warning and communication procedures.
- Redundancy or duplication of essential personnel, critical systems, equipment, and information materials.

In general, all identified mitigation actions were classified under one of the following broad categories:

- **Local plans and regulations:** Actions that create or update plans to reflect situational changes and/or actions that aid in the creation, revision, or adoption of regulations related to hazard mitigation and management.
- **Infrastructure:** Actions that facilitate the modification of existing buildings or structures or involve the construction of structures to reduce the impact of hazard.
- **Natural system protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

6.4 Prioritization of Mitigation Actions

The MPC and subject matter experts worked together to prioritize both previously identified and newly identified hazard mitigation actions. The methodology used to determine mitigation action priorities was based upon the following:

- Review of the updated risk assessments.
- Review of revised goals and objectives.
- Review of capabilities.

A multi-pronged and flexible analysis method was used for determining and prioritizing mitigation actions. An initial review of previously identified but not completed actions was conducted to ensure that, based on current condition and capabilities, the actions were still viable. Actions that were considered viable were retained in this plan update, with minor revisions completed as necessary.

For identified actions that were retained, and for newly identified actions, the FEMA recommended Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria were used to assist with prioritization. The following table details the STAPLEE criteria:

Table 104: STAPLEE Review Criteria

Criteria	Discussion	Example Considerations
Social	There should be community acceptance and support for the mitigation action?	Does the action have community acceptance? Will the proposed action adversely affect one segment of the population?
Technical	The proposed mitigation action should be technically feasible and should provide a long-term reduction in losses.	How effective is the action in avoiding or reducing future losses? Does it solve a problem or only a symptom? Does the action create additional problems?
Administrative	Personnel and administrative capabilities should be available to administer all phases of the project.	Are the staffing and administrative capabilities to implement the action in place? Is there someone to coordinate and lead the effort?
Political	Political support for the mitigation action needs to be present.	Is the action politically acceptable? Have political leaders been involved in the planning process? Is there a political champion to help see the project to completion?
Legal	The legal authority to implement the actions need to be in place or possible with the passing of laws or regulations.	Does the legal authority to implement the proposed action exist? Are there potential legal repercussions?
Economic	The current budget (and/or general obligation bonds or other instruments) need to be in place to fully fund the mitigation action.	Do the potential benefits of this action exceed the potential costs? Has funding been secured for the proposed action? What are the potential funding sources (public, non-profit, and private)? How will this action affect the fiscal capability of the community(s)? Does the action contribute to other community goals, such as capital improvements or economic development?
Environmental	Actions should interface with the need for sustainable and environmentally healthy communities. Also, statutory considerations, such as the National Environmental Policy Act need to considered for federal funds.	How will the action affect the environment? Will the action need environmental regulatory approvals? Will it meet federal, state, and local state regulatory requirements? Are endangered or threatened species likely to be affected?

Based on the prioritization review, the MPC assigned each action the following prioritized ranking:

- **High Priority:** Actions that provide substantial progress towards improving resiliency and are determined as potentially urgent in nature by the MPC. This would include actions that strongly support the reduction of high hazard risks and meet mitigation goals. Additionally, actions in this ranking may have imminent funding availability or strong community support.
- **Medium Priority:** Actions that provide reasonable progress towards improving resiliency and are determined as moderately urgent in nature by the MPC. This would include actions that would lessen impact hazard events, but not eliminate the impact completely.
- **Low Priority:** Actions that provide incremental progress towards improving resiliency and are determined as slightly urgent in nature by the MPC. This would include actions that are generally the responsibility of the local community, actions outside the normal authority of the State, or actions whose cost/benefit analysis returns a low yield.

6.5 Mitigation Action Funding Sources

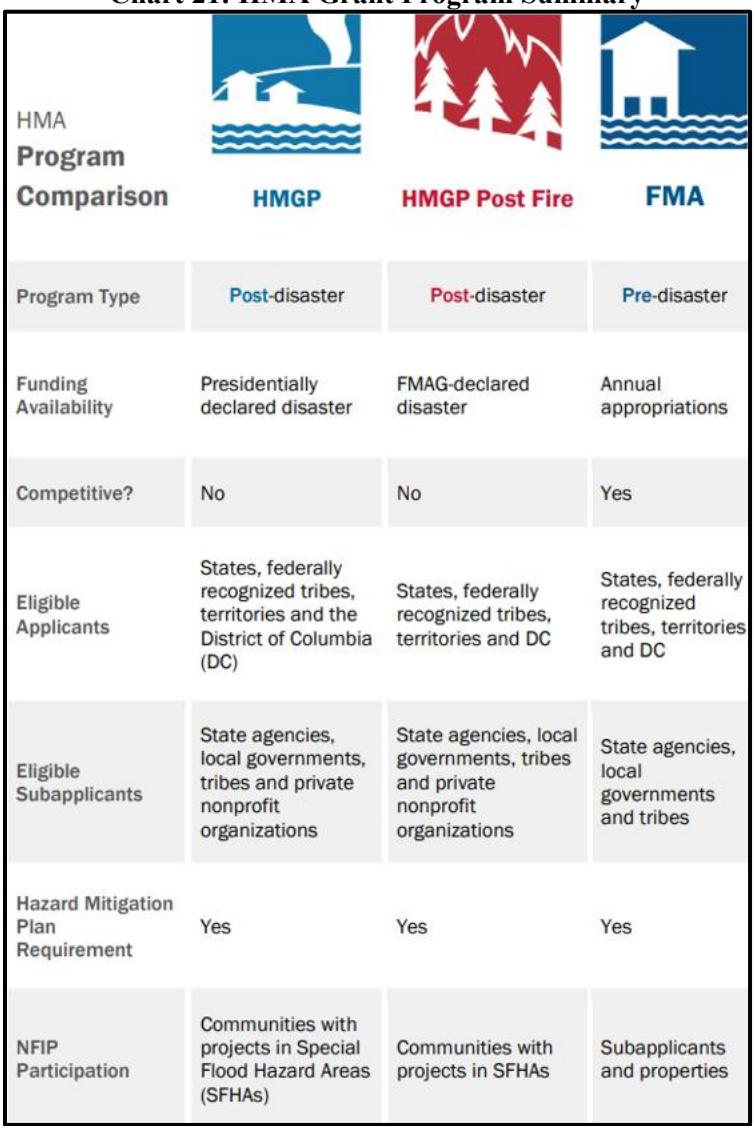
It is generally recognized that mitigation actions help realize long term savings by preventing future losses due to hazard events. However, many mitigation actions are beyond the budgetary capabilities of a single jurisdiction. This section provides a general description of some of the avenues available to defray the cost of implementing mitigation actions.

FEMA provides financial assistance to state, local, tribal, and territorial governments, as well as certain private non-profit organizations, to implement projects that help reduce the risk and impact of future disasters. These grant programs are designed to support initiatives aimed at mitigating hazards and improving resilience. The main grant program offered by FEMA for hazard mitigation is the Hazard Mitigation Assistance (HMA) program. The HMA program includes four subprograms, the Hazard Mitigation Grant Program (HMGP), the HMGP Post-Fire, and the Flood Mitigation Assistance (FMA) grant program. Applicants to these grant programs are required to submit project proposals that demonstrate the effectiveness of their proposed mitigation projects. The eligibility criteria, application process, and specific requirements for each program are outlined by FEMA in their guidelines and announcements, which are typically published on FEMA's website.
The following provides a general overview of major grant funding streams:

- **HMGP and HMGP Fire:** The HMGP grants assist in implementing long-term hazard mitigation measures following Presidential disaster declarations, including fire declarations. Funding is available to implement projects in accordance with State, Tribal, and local priorities.

The following chart summarizes HMA grants programs:

Chart 21: HMA Grant Program Summary



HMA Program Comparison	HMGP	HMGP Post Fire	FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	Annual appropriations
Competitive?	No	No	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments and tribes
Hazard Mitigation Plan Requirement	Yes	Yes	Yes
NFIP Participation	Communities with projects in Special Flood Hazard Areas (SFHAs)	Communities with projects in SFHAs	Subapplicants and properties

Additionally, the following provide available grant funding avenues for hazard mitigation projects:

- **Rehabilitation Of High Hazard Potential Dam (HHPD) Grant Program:** HHPD awards provide technical, planning, design and construction assistance in the form of grants for rehabilitation of eligible high hazard potential dams. A state or territory with an enacted dam safety program, the State Administrative Agency, or an equivalent state agency, is eligible for the grant.
- **Emergency Management Performance Grant:** Program provides state, local, tribal and territorial emergency management agencies with the resources required for implementation of the National Preparedness System and works toward the National Preparedness Goal of a secure and resilient nation. Allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response and recovery mission areas.
- **State Homeland Security Program:** Program includes a suite of risk-based grants to assist state, local, tribal and territorial efforts in preventing, protecting against, mitigating, responding to and recovering from acts of terrorism and other threats. This grant provides grantees with the resources required for implementation of the National Preparedness System and working toward the National Preparedness Goal of a secure and resilient nation.
- **Public Assistance Program:** The mission of FEMA's Public Assistance program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the

Public Assistance program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit organizations. The Public Assistance Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee determines how the non-Federal share (up to 25%) is split with the eligible applicants.

- **Individual Assistance Program:** After a disaster, the federal government determines if any county in the state meets the criteria for individual disaster assistance. The decision is based on damage related to the severity and magnitude of the event. When a county receives an Individual Assistance declaration from the President of the United States, anyone who lives in that county can apply for assistance.
- **Small Business Administration Disaster Loans:** The Small Business Administration provides low-interest disaster loans to homeowners, renters, businesses of all sizes, and most private nonprofit organizations. Small Business Administration disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.
- **The Housing and Urban Development Agency**: Provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations.
- **Community Development Block Grant Program**: This is a flexible program that provides communities with resources to address a wide range of unique community development needs. The program provides annual grants on a formula basis to general units of local government and States.
- **Individual and Households, Other Needs Assistance Program:** This program provides financial assistance to individuals or households who sustain damage or develop serious needs because of a natural or man-made disaster. The funding share is 75% federal funds and 25% state funds. The program provides grants for necessary expenses and serious needs that cannot be provided for by insurance, another federal program, or other source of assistance. The current maximum allowable amount for any one disaster to individuals or families is $25,000. The program gives funds for disaster-related necessary expenses and serious needs, including personal property, transportation, medical and dental, funeral, essential tools, flood insurance, and moving and storage.
- **WUI Grants:** The 10-Year Comprehensive Strategy focuses on assisting people and communities in the WUI to moderate the threat of catastrophic fire through the four broad goals of improving prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance. The WUI Grant may be used to apply for financial assistance towards hazardous fuels and educational projects within the four goals of: improved prevention, reduction of hazardous fuels, restoration of fire-adapted ecosystems and promotion of community assistance.

Small and impoverished communities that receive grants may receive a federal cost share of up to 90% of the total amount approved under the grant award. As defined in 44 CFR 201.2, a small and impoverished community is:

- A community of 3,000 or fewer individuals that is identified by the State as a rural community
- Is not a remote area within the corporate boundaries of a larger city
- Is economically disadvantaged, by having an average per capita annual income of residents not exceeding 80% of national, per capita income
- The local unemployment rate exceeds by one percentage point or more, the most recently reported, average yearly national unemployment rate
- Any other factors identified in the State Plan in which the community is located

6.6 Previously Identified Jurisdictional Mitigation Actions

Previously identified hazard mitigation actions were reviewed by the relevant jurisdiction to determine the status of each action. The status of these previously identified hazard mitigation actions indicates if the action has been completed, is carried over to this version of the plan, has been revised, or is no longer being considered. Additionally, each action was assigned a new number to conform with the numbering system in this LHMP.

The following tables detail the status of previously identified actions for each participating jurisdictions, if actions were identified in the previous LHMP. Please note that Central Tri-County SWCD and East Torrance SWCD are new to the LHMP and have no previously identified actions.

Table 105: Torrance County Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
14	2	Accelerate forest thinning programs on federal, state, and all public and private lands.	Ongoing, modified.
16	3	Educate public on Wildland-Urban Interface (WUI) best practices through demonstration site and educational brochures	Carried over due to lack of staff, modified.
7	5	Update floodplain and floodway maps in Torrance County and conduct new hydraulic studies where necessary.	Carried over due to lack of funding.
15	8	Create and maintain defensible space around all vulnerable residential structures and critical facilities.	Ongoing, modified
10	9	Establish county-wide community participation in StormReady, to enable preparedness for the impacts of severe weather through better planning, education, and awareness.	Carried over due to lack of staff, modified.
18	11	Increase water storage capacity for fire suppression with new 50,000-gallon storage tanks in central location in East Mountain area and in vulnerable subdivisions.	Carried over due to lack of funding, modified.
-	12	Develop and support public safety interagency planning, training, and response to wildfires in Torrance County – Participate in East Mountain Interagency Fire Planning Agency (EMIFPA).	Deleted.
4	13	Require city, county, and village officials to participate in creation and implementation of the State Drought Management Plan.	Carried over due to lack of staff, modified.
2	14	Conduct study to examine and map the vulnerability of critical facilities, manufactured homes, and other structures to hazards.	Carried over due to lack of funding.
18	15	Develop cistern water storage in high wildfire risk areas with limited water supply.	Carried over due to lack of funding, modified.
5	17	Require participation and provide educational programs to pursue alternative agricultural practices that conserve water use both for large-scale agriculture and residential uses.	Carried over due to lack of staff, modified.
18	18	Develop cistern water storage in new subdivisions with limited water supply.	Carried over due to lack of staff, modified.
3	7	Prevent Water Transfers out of the Estancia Basin	Deleted, not feasible.
-	10	Protect wells from actual and potential sources of contamination during flooding, and wellhead management.	Deleted, not feasible.
-	19	Increase awareness of potential for earthquakes in Torrance County.	Deleted, hazard no longer considered
-	21	Conduct Technical Assistance Visits to help homeowners implement non-structural earthquake retrofits of their home.	Deleted, hazard no longer considered

Table 106: Encino Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
4	1	Mitigate the impacts of on-site ponding from heavy, direct-precipitation rainfall using road and impacted area construction. Conduct a Hydrology study to determine the impacted areas with an engineered plan to ensure life of project.	Carried over due to lack of funds, modified.

Table 107: Estancia Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
3	1	Complete study and construction of flood control structure in Estancia on west side, near 55. Identified in engineering reports.	Carried over due to lack of funds

Table 108: Moriarty Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
5	3	Update flood maps within municipal limits and conduct new hydraulic studies where necessary.	Carried over due to lack of funds
1	5	Implement an educational water conservation program.	Carried over due to lack of staff

Table 109: Mountainair Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
9	1	Require implementation of fuel reduction management plan with BNSF RR along rail lines.	Ongoing
10	2	Conduct a study to determine the feasibility of re-routing the natural gas distribution line and regulator that crosses the railroad tracks near town.	Carried over due to lack of funds

Table 110: Willard Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
9	2	Require implementation of fuel reduction management plan with BNSF RR along rail lines.	Ongoing

Table 111: Claunch-Pinto SWCD Previous Plan Hazard Mitigation Actions

New Action Number	Previous Action Number	Description	Status
14	2	Accelerate forest thinning programs on federal, state, and all public and private lands.	Ongoing, modified.

Completed actions may be found in the following section. Carried over, revised, and deleted actions may be found in 6.8.

6.7 Completed Mitigation Actions

Torrance County and all participating jurisdictions remain committed to investigating and obtaining all available grant funding for the completion of hazard mitigation projects. Since the completion of the previous LHMP in 2017 the following mitigation actions have been completed:

Table 112: Torrance County Previous Plan Hazard Mitigation Actions

Previous Action Number	Description	Status
1	Expand county GIS data to Identify Hazard Prone and Sensitive-Areas for new building codes.	Complete
6	Create an agreement between USFS, NM State Forestry, and private landowners to utilize water held in private cisterns during wildfires	Complete

Neither Torrance County nor any participating jurisdictions have received any FEMA Hazard Mitigation Grant funding (HMGP, BRIC, PDM, FMAG) as of this plan.

6.8 Jurisdictional Mitigation Actions

To support the mitigation goals identified in this LHMP, Torrance County and all participating jurisdictions identified a comprehensive range mitigation projects and activities. The selected set carefully takes an all-hazards approach to mitigation while simultaneously addressing each of the plan's profiled hazards. The list of mitigation actions is based upon the potential to reduce risk to life and property with an emphasis on ease of implementation, community and agency support, consistency with local jurisdictions' plans and capabilities, available funding, and jurisdictional vulnerability.

It is important to note that since the previous LHMP, requirements for plan approval have changed. In the previous plan, all jurisdictions identified only a few actions, with many of the actions identified at the county level to cover local participants. As such, the actions in this plan have been re-written and reclassified on a wholesale basis to ensure each participating jurisdiction has identified at least one action per identified hazard. In doing so, presenting a comparison to previously identified actions in impractical. However, any actions previously identified that have been completed are noted to illustrate successes.

The strategy for development and revision of hazard mitigation actions in this LHMP allows a more tailored approach to mitigation planning, ensuring that communities address the hazards most relevant to their circumstances while also acknowledging that not all hazards may be equally significant across different areas. It promotes a more efficient use of resources by focusing efforts on mitigating the most pressing risks faced by each community.

For each identified action, the following applies:

- New actions that have been added to this plan update are identified as such
- Some actions have been reassigned or reclassified. In these cases, not all information is provided under the original listing, rather the newly assigned responsible entity has been given the opportunity to detail the requested information
- All mitigation action information was provided by jurisdictional officials through outreach from the MPC

The following table provides a mitigation action cross check for each participating jurisdiction.

Table 113: Participating Jurisdiction Mitigation Action Cross Check

Jurisdiction	All Hazards	Drought	Extreme Heat	Flood	Severe Weather	Severe Winter Weather	Wildfire
Torrance County	1, 2	3-6	7	8,9,10	11,12,13	7,14, 15	13, 16-20
Encino	-	1	2	3,4	5,6	2,7	5,8,9
Estancia	-	1	2	3,4	5,6	2,7	5,8,9
Moriarty	-	1,2	3	4,5,6	7,8	3,9	7,10,11
Mountainair	-	1	2	3,4	5,6	2,7	5,8-11
Willard	-	1	2	3,4	5,6	2,7	5,8,9,10
Central Tri-County SWCD	-	1,2	3	4,5	6	3,7	6,8,9
Claunch-Pinto SWCD	-	1,2	3	4,5	6	3,7	6,8,9
East Torrance SWCD	-	1,2	3	4,5	6	3,7	6,8,9

The following tables identify mitigation action items for each participating jurisdiction, along with the following information:

- Hazard addressed
- Responsible party
- Overall priority
- Goal(s) addressed
- Estimated cost
- Potential funding source
- Proposed completion timeframe
- Current status

It is important to note that when assigning a responsible party for these actions the participating jurisdictions have limited staff and departments. As such, the overall assignment has been given to the highest-ranking employee or overarching department.

Table 114: Torrance County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Torrance County-1	Conduct education programs hazard mitigation for citizens and businesses of Torrance County.	All hazards	Emergency Manager	Medium	3	Staff time, $500 per event	General Fund	Continuous	Ongoing
Torrance County-2	Conduct study to examine and map the vulnerability of critical facilities to hazards.	All hazards	Emergency Manager, Planning and Zoning Director	High	1, 2, 4	$40,000	General Fund	Five years	Carried over due to lack of funding
Torrance County-3	Replace existing plantings with low water native plants at all jurisdictional owned facilities	Drought	Facilities Director	Medium	1, 2	$5,000 - $20,000 per facility	HMGP, General Fund	Ten years	New
Torrance County-4	Encourage city, county, and village officials to participate in creation and implementation of the Local Drought Management Plan.	Drought	Emergency Manager	Medium	3, 4	Staff time	General Fund	Two years	Carried over due to lack of staff
Torrance County-5	Provide educational programs to pursue alternative agricultural practices that conserve water.	Drought	County Manager, Planning and Zoning Director	Medium	3, 4	Staff time	General Fund	Continuous	Carried over due to lack of staff
Torrance County-6	Evaluate the land development code to determine feasibility of cistern water storage requirement.	Drought	Emergency Manager, Planning and Zoning Director	Medium	1, 2, 3	Staff time	General Fund	Two years	Carried over due to lack of staff
Torrance County-7	Identify and prepare county buildings for usage as heat shelters.	Extreme Heat	Facilities Director	Low	1, 2	$2,000 per facility	General fund	Five years	New
Torrance County-8	Update floodplain and floodway maps in Torrance County.	Flood	GIS	Medium	1, 2	Per project cost	FMA, HMGP, General Fund	Ten years	Carried over due to lack of funding

Table 114: Torrance County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Torrance County-9	Construct rainwater retention/detention ponds at strategic locations.	Flood	Road Department Supervisor	Medium	1, 2	Facility size dependent	HMGP, General Fund	Ten years	Carried over due to lack of funding
Torrance County-10	Procure permanent signage to warn of flood hazard areas.	Flood	Planning & Zoning Director, Road Department	Medium	1, 2	Location dependent	HMGP, General Fund	Five years	New
Torrance County-11	Establish county-wide community participation in StormReady program.	Severe Weather	Emergency Manager	Medium	1, 2, 3, 4	Staff time	General Fund	Three years	Carried over due to lack of staff
Torrance County-12	Install signage on highways in known high wind areas alerting high profile vehicles.	Severe Weather	Road Department Supervisor	Medium	1, 2, 3	$20,000	HMGP, General Fund	Five years	New
Torrance County-13	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Facilities Director	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Torrance County-14	Provide education classes for the public on the health effects of severe cold and on winter driving practices.	Severe Winter Weather	Emergency Manager	Low	1, 2, 3	Staff time	General Fund	Five years	Ongoing
Torrance County-15	Use snow fences or “living snow fences” (e.g., rows of trees or other vegetation) to limit blowing and drifting of snow over critical roadway segments.	Severe Winter Weather	Emergency Manager	Low	1, 2	Location dependent	General Fund, HMGP	Ten years	New
Torrance County-16	Conduct a fuel thinning program on all county lands to reduce potential wildfire hazard.	Wildfire	Emergency Manager, Fire Chiefs	High	1, 2	$500 per acre	HMGP, General Fund	Continuous	On-going
Torrance County-17	Create defensible space buffers at all critical facilities	Wildfire	Fire Chiefs, Emergency Manager	High	1, 2	Facility size dependent	HMGP, General Fund	Continuous	On-going

Table 114: Torrance County Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Torrance County-18	Increase public training on wildland-urban interface fire prevention.	Wildfire	Fire Chiefs, Emergency Manager	High	3	Staff time	General fund	Three years	Carried over due to lack of staff
Torrance County-19	Develop and support public safety interagency planning, training, and response to wildfires in Torrance County.	Wildfire	Fire Chiefs, Emergency Manager	High	1, 2	Facility size dependent	HMGP, General Fund	Continuous	On-going
Torrance County-20	Develop cistern water storage in high wildfire risk areas with limited water supply.	Wildfire	Fire Chiefs, Emergency Manager	High	1, 2	Staff time	General fund	Five years	Carried over due to lack of funding

Table 115: Encino Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Encino-1	Conduct a native, low water planting program for all jurisdictional owned facilities.	Drought	Mayor	Low	1, 2	$5,000 - $50,000 per location	HMGP, General Fund	Five years	New
Encino-2	Identify and prepare jurisdictional buildings for usage as extreme temperature shelters.	Extreme Heat, Severe Winter Weather	Mayor	Low	1, 2	$2,000 per facility	General fund	Five years	New
Encino-3	Join the National Flood Insurance Program.	Flood	Mayor	High	1, 2, 3	Staff Time	General Fund	Two years	New
Encino-4	Construct rainwater retention/detention ponds at strategic locations.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	Carried over due to lack of funding. Modified.
Encino-5	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Mayor	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Encino-6	Install and maintain surge protection on critical electronic equipment.	Severe Weather	Mayor	Low	1, 2	$10,000 per location	General Fund, HMGP	Five years	New
Encino-7	Provide education classes for the public on winter driving.	Severe Winter Weather	Mayor	Low	3	Staff Time	General fund	One year	New
Encino-8	Create defensible space buffers at all critical facilities	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	New
Encino-9	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Mayor	High	3	$30 per student per training session	Forest Service and HMGP-Post Fire	Three to five years	New

Table 116: Estancia Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Estancia-1	Conduct a native, low water planting program for all jurisdictional owned facilities.	Drought	Mayor	Low	1, 2	$5,000 - $50,000 per location	HMGP, General Fund	Five years	New
Estancia-2	Identify and prepare jurisdictional buildings for usage as extreme temperature shelters.	Extreme Heat, Severe Winter Weather	Mayor	Low	1, 2	$2,000 per facility	General fund	Five years	New
Estancia-3	Continue to participate in the National Flood Insurance Program.	Flood	Mayor	High	1, 2, 3	Staff Time	General Fund	Continuous	On-going
Estancia-4	Complete study and construction of flood control structure in Estancia on west side, near 55.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	Carried over, lack of funding
Estancia-5	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Mayor	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Estancia-6	Install and maintain surge protection on critical electronic equipment.	Severe Weather	Mayor	Low	1, 2	$10,000 per location	General Fund, HMGP	Five years	New
Estancia-7	Provide education classes for the public on winter driving.	Severe Winter Weather	Mayor	Low	3	Staff Time	General fund	One year	New
Estancia-8	Create defensible space buffers at all critical facilities	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	New
Estancia-9	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Mayor	High	3	$30 per student per training session	Forest Service and HMGP-Post Fire	Three to five years	New

Table 117: Moriarty Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Moriarty-1	Implement an educational water conservation program	Drought	Mayor	Medium	1, 2	Staff time	General Fund	Five years	Carried over due to lack of funds
Moriarty-2	Conduct a native, low water planting program for all jurisdictional owned facilities.	Drought	Mayor	Low	1, 2	$5,000 - $50,000 per location	HMGP, General Fund	Five years	New
Moriarty-3	Identify and prepare jurisdictional buildings for usage as extreme temperature shelters.	Extreme Heat, Severe Winter Weather	Mayor	Low	1, 2	$2,000 per facility	General fund	Five years	New
Moriarty-4	Continue to participate in the National Flood Insurance Program.	Flood	Mayor	High	1, 2, 3	Staff Time	General Fund	Continuous	On-going
Moriarty-5	Construct rainwater retention/detention ponds at strategic locations.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	New
Moriarty-6	Update flood maps and conduct new hydraulic studies where necessary.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	Carried over due to lack of funds
Moriarty-7	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Mayor	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Moriarty-8	Install surge protection on critical electronic equipment.	Severe Weather	Mayor	Low	1, 2	$10,000 per location	General Fund, HMGP	Five years	New
Moriarty-9	Provide education classes for the public on winter driving.	Severe Winter Weather	Mayor	Low	3	Staff Time	General fund	One year	New
Moriarty-10	Create defensible space buffers at all critical facilities	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	New
Moriarty-11	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Mayor	High	3	$30 per student per training session	Forest Service and HMGP-Post Fire	Three to five years	New

Table 118: Mountainair Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Mountainair-1	Conduct a native, low water planting program for all jurisdictional owned facilities.	Drought	Mayor	Low	1, 2	$5,000 - $50,000 per location	HMGP, General Fund	Five years	New
Mountainair-2	Identify and prepare jurisdictional buildings for usage as extreme temperature shelters.	Extreme Heat, Severe Winter Weather	Mayor	Low	1, 2	$2,000 per facility	General fund	Five years	New
Mountainair-3	Join the National Flood Insurance Program.	Flood	Mayor	High	1, 2, 3	Staff Time	General Fund	Two years	New
Mountainair-4	Construct rainwater retention/detention ponds at strategic locations.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	New
Mountainair-5	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Mayor	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Mountainair-6	Install and maintain surge protection on critical electronic equipment.	Severe Weather	Mayor	Low	1, 2	$10,000 per location	General Fund, HMGP	Five years	New
Mountainair-7	Provide education classes for the public on winter driving.	Severe Winter Weather	Mayor	Low	3	Staff Time	General fund	One year	New
Mountainair-8	Create defensible space buffers at all critical facilities	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	New
Mountainair-9	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Mayor	High	3	$30 per student per training session	Forest Service and HMGP-Post Fire	Three to five years	New
Mountainair-10	Require implementation of fuel reduction management plan with BNSF along rail lines.	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	Ongoing
Mountainair-11	Conduct a study to determine the feasibility of re-routing natural gas	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	Five years	Carried over due to lack of funding

Table 118: Mountainair Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
	line that crosses railroad tracks near town.								

Table 119: Willard Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Willard-1	Conduct a native, low water planting program for all jurisdictional owned facilities.	Drought	Mayor	Low	1, 2	$5,000 - $50,000 per location	HMGP, General Fund	Five years	New
Willard-2	Identify and prepare jurisdictional buildings for usage as extreme temperature shelters.	Extreme Heat, Severe Winter Weather	Mayor	Low	1, 2	$2,000 per facility	General fund	Five years	New
Willard-3	Join the National Flood Insurance Program.	Flood	Mayor	High	1, 2, 3	Staff Time	General Fund	Two years	New
Willard-4	Construct rainwater retention/detention ponds at strategic locations.	Flood	Mayor	Medium	1, 2	Project dependent	General Fund, FMA, HMGP	Ten years	New
Willard-5	Install high wind, hail, and fire-resistant roofing on all jurisdictional facilities.	Severe Weather, Wildfire	Mayor	Medium	1, 2	Project dependent	General Fund, HMGP	Five years	New
Willard-6	Install and maintain surge protection on critical electronic equipment.	Severe Weather	Mayor	Low	1, 2	$10,000 per location	General Fund, HMGP	Five years	New
Willard-7	Provide education classes for the public on winter driving.	Severe Winter Weather	Mayor	Low	3	Staff Time	General fund	One year	New
Willard-8	Create defensible space buffers at all critical facilities	Wildfire	Mayor	High	1, 2	Facility size dependent	HMGP, General Fund	As required	New
Willard-9	Increase public and fire department training on wildland-urban interface fire prevention.	Wildfire	Mayor	High	3	$30 per student per training session	Forest Service and HMGP-Post Fire	Three to five years	New
Willard-10	Require implementation of fuel reduction management plan with BNSF RR along rail lines in Willard.	Wildfire	Mayor	High	3	Staff time	General Fund	Continuous	Ongoing

Table 120: Central Tri-County SWCD Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Central Tri-County SWCD-1	Conduct a native, low water planting program for all facilities.	Drought	District Manager	Low	1, 3	$5,000 - $50,000 per location	District General Budget, HMGP,	Five years	New
Central Tri-County SWCD-2	Conduct agricultural education program on water reduction methods.	Drought	District Manager	High	1, 2, 3	Staff Time	District General Budget	Five years	New
Central Tri-County SWCD-3	Conduct public education classes on ways to adapt to extreme temperatures.	Extreme Heat, Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Five years	New
Central Tri-County SWCD-4	Construct rain gardens next to paved parking areas.	Flood	District Manager	Medium	1, 2	Project dependent	District General Budget, FMA, HMGP	Ten years	New
Central Tri-County SWCD-5	Educate public on water conservation methods.	Flood	District Manager	Medium	3	Staff time	District General Budget	Two years	New
Central Tri-County SWCD-6	Install high wind, hail, lightning, and fire-resistant roofing and equipment on all district facilities.	Severe Weather, Wildfire	District Manager	Medium	1, 2	Project dependent	District General Budget, HMGP	Five years	New
Central Tri-County SWCD-7	Educate employees and field staff on impacts of severe winter weather, including education on proper driving techniques.	Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Ten years	New
Central Tri-County SWCD-8	Create defensible space buffers at all district facilities.	Wildfire	District Manager	High	1, 2	Facility size dependent	District General Budget	As required	New
Central Tri-County-9	Conduct a fuel thinning program on all SWCD managed lands to reduce potential wildfire hazard.	Wildfire	District Manager	High	1, 2	$500 per acre	District General Budget, HMGP-PF	Continuous	New

Table 121: Claunch-Pinto SWCD Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
Claunch-Pinto SWCD-1	Conduct a native, low water planting program for all facilities.	Drought	District Manager	Low	1, 3, 6	$5,000 - $50,000 per location	District General Budget, HMGP,	Five years	New
Claunch-Pinto SWCD-2	Conduct agricultural education program on water reduction methods.	Drought	District Manager	High	1, 2, 3, 6	Staff Time	District General Budget	Five years	New
Claunch-Pinto SWCD-3	Conduct public education classes on ways to adapt to extreme temperatures.	Extreme Heat, Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Five years	New
Claunch-Pinto SWCD-4	Construct rain gardens next to paved parking areas.	Flood	District Manager	Medium	1, 2	Project dependent	District General Budget, FMA, HMGP	Ten years	New
Claunch-Pinto SWCD-5	Educate public on water conservation methods.	Flood	District Manager	Medium	3	Staff time	District General Budget	Two years	New
Claunch-Pinto SWCD-6	Install high wind, hail, lightning, and fire-resistant roofing and equipment on all district facilities.	Severe Weather, Wildfire	District Manager	Medium	1, 2	Project dependent	District General Budget, HMGP	Five years	New
Claunch-Pinto SWCD-7	Educate employees and field staff on impacts of severe winter weather, including education on proper driving techniques.	Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Ten years	New
Claunch-Pinto SWCD-8	Create defensible space buffers at all district facilities.	Wildfire	District Manager	High	1, 2	Facility size dependent	District General Budget	As required	New
Claunch-Pinto SWCD-9	Conduct a fuel thinning program on all SWCD managed lands to reduce potential wildfire hazard.	Wildfire	District Manager	High	1, 2	$500 per acre	District General Budget, HMGP-PF	Continuous	On-going

Table 122: East Torrance SWCD Hazard Mitigation Actions

Action Identification	Description	Hazard Addressed	Responsible Party	Overall Priority	Goal(s) Addressed	Estimated Cost	Potential Funding Source	Proposed Completion Timeframe	Status
East Torrance SWCD-1	Conduct a native, low water planting program for all facilities.	Drought	District Manager	Low	1, 3, 6	$5,000 - $50,000 per location	District General Budget, HMGP,	Five years	New
East Torrance SWCD-2	Conduct agricultural education program on water reduction methods.	Drought	District Manager	High	1, 2, 3, 6	Staff Time	District General Budget	Five years	New
East Torrance SWCD-3	Conduct public education classes on ways to adapt to extreme temperatures.	Extreme Heat, Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Five years	New
East Torrance SWCD-4	Construct rain gardens next to paved parking areas.	Flood	District Manager	Medium	1, 2	Project dependent	District General Budget, FMA, HMGP	Ten years	New
East Torrance SWCD-5	Educate public on water conservation methods.	Flood	District Manager	Medium	3	Staff time	District General Budget	Two years	New
East Torrance SWCD-6	Install high wind, hail, lightning, and fire-resistant roofing and equipment on all district facilities.	Severe Weather, Wildfire	District Manager	Medium	1, 2	Project dependent	District General Budget, HMGP	Five years	New
East Torrance SWCD-7	Educate employees and field staff on impacts of severe winter weather, including education on proper driving techniques.	Severe Winter Weather	District Manager	Low	3	Staff Time	District General Budget	Ten years	New
East Torrance SWCD-8	Create defensible space buffers at all district facilities.	Wildfire	District Manager	High	1, 2	Facility size dependent	District General Budget	As required	New
East Torrance SWCD-9	Conduct a fuel thinning program on all SWCD managed lands to reduce potential wildfire hazard.	Wildfire	District Manager	High	1, 2	$500 per acre	District General Budget, HMGP-PF	Continuous	New

Prior to the implementation of any action further feasibility analysis will be performed. Additionally, a Benefit-Cost Analysis that determines the future risk reduction benefits of a hazard mitigation project and compares those benefits to its costs will be conducted as required. Applicants and sub-applicants will use FEMA approved methodologies and tools, such as the Benefit-Cost Analysis Toolkit, to demonstrate the cost-effectiveness of their projects. The result of the analysis is a Benefit-Cost Ratio, and a project is considered cost-effective when the Benefit-Cost Ratio is 1.0 or greater. Depending on the project, either a full Benefit-Cost Analysis will be completed by entering documented values into the FEMA Benefit-Cost Analysis Toolkit, which calculates a benefit-cost ratio or, if the project meets specified criteria, a streamlined Benefit-Cost Analysis may be completed (FEMA's cost-effectiveness requirement is never waived).

Torrance County and all participating jurisdictions acknowledge that the adoption and approval of this plan does not obligate the completion of each identified action. Rather, the MPC understands that progress should be shown in mitigation efforts which may include the completion of mitigation actions or other actions or progress in achieving the goals of the LHMP.

6.9 Mitigation Action Implementation and Monitoring

Torrance County and each participating jurisdiction is responsible for implementing and managing identified mitigation actions. To foster accountability and increase the likelihood that actions will be implemented, every proposed action is assigned to a specific department or position as a champion. In general:

- The identified champion will be responsible for tracking and reporting on action status.
- The identified champion should provide input on whether the action as implemented is successful in reducing vulnerability, if applicable.
- If the action is unsuccessful in reducing vulnerability, the identified champion will be tasked with identifying deficiencies and additional required actions.

Additionally, each action has been assigned a proposed completion timeframe to determine if the action is being implemented according to plan.

TCOEM is responsible for monitoring the progress of mitigation activities and projects throughout the county in conjunction with the participating stakeholder communities. To facilitate the tracking of any awarded hazard mitigation grants, the TCOEM will compile a list of projects funded throughout the calendar year, if any, and add it to an electronic database. Additionally, TCOEM will monitor information on any other mitigation projects that were not funded through hazard mitigation grants. TCOEM will utilize the NMDHSEM system to provide a streamlined and efficient way to apply for and manage grant funding.

Providing grant oversight, NMDHSEM will continuously monitor the grant process to ensure compliance with federal and state regulations and requirements. Monitoring focuses on providing technical assistance and guidance to validate or improve administrative and fiscal efficiencies in managing award funds. As part of the monitoring process, NMDHSEM will provide as needed compliance assessment to review all related transactions and processes to verify that Grant Subaward funds were expended in compliance with federal and state regulations and the terms and conditions of the Subaward.

During the monitoring process, NMDHSEM may determine that the process is not in compliance with federal and state regulation and requirements. The following are common areas of non-compliance:

- Internal Controls
    - Lack of segregation of duties for smaller nonprofit organizations
    - Inadequate policies for victim petty cash/financial assistance
    - Single audit findings, audit reports submitted late, lack of required audits
    - Inadequate monitoring of second tier subrecipients
- Financial Management
    - Improper/inadequate tracking and recording of Subaward costs
    - Costs not allocated properly and/or Inadequate cost allocation plan

    - Overcharging of office facility rent or indirect costs
    - Inadequate/unsupported/unallowable required match
    - Match not recorded or not identified in accounting records as match
    - Match not claimed on reimbursement request as occurred
    - Reimbursement requests not submitted timely
- Personnel
    - Functional timesheets not used for Subaward Personnel costs
    - Fringe benefit costs claimed in incorrect cost category
    - Unsupported/unallowable Personnel costs
    - Unsupported volunteer in-kind match claimed on reimbursement request
- Operating
    - Unsupported/unallowable operating cost items
    - Lack of proof of payment of cost item(s)
    - Cost claimed on reimbursement request prior to expending money
- Equipment
    - Equipment inventory records missing required information
    - Disposal data and information missing from records
    - Physical equipment inventory/record reconciliation not performed
    - Missing or unidentifiable equipment (onsite equipment inspections)
- Procurements/Contracts
    - Lack of written procurement procedures
    - Lack of written code of conduct covering conflicts of interest in procurements
    - Improper procurement
    - Non-competitive procurement not justified/approved
    - Procurement documentation not maintained
    - Suspension/debarment not checked prior to awarding contract
    - Competition requirements not met (quotes, bids, proposals)
    - No cost/price analysis
    - Lack of negotiating profit/discount when required
    - Contracts/purchase orders do not contain all required provisions

Should any areas be determined as non-complaint, a Corrective Action Plan may be required to address any identified issues, with the plan needing to be completed and implemented in a specific time frame.

Upon completion of a project, a member of the awarded jurisdiction, a member of the Torrance County MPC, and a NMDHSEM representative will conduct a closeout site visit to:

- Review all files and documents
- Review all procurement files and contracts to third parties
- Take photos of the completed project

Project closeout packages will generally be submitted 90 days after a project has been completed, and will include the following:

- Summary of documentation
- Pictures of completed project
- Materials, labor, and equipment forms, if required
- Close-out certification

Section 7 – Plan Maintenance

7.1 Introduction

The LHMP is a living document that will be updated and submitted to FEMA for approval every five years as required by 44 CRF 201.4. During the five-year cycle, the plan will undergo continuous monitoring and evaluation to ensure that the policies, procedures, priorities, and state environment established in the plan reflect current conditions. Torrance County and all participating jurisdictions will utilize the MPC to provide plan updates, revisions, and data collection for future LHMP planning purposes.

7.2 Plan Maintenance Responsibilities

TCOEM serves as the lead coordinating agencies for plan maintenance. Additional assistance in the plan maintenance process is provided by members of the MPC, subject matter experts, and representatives of local jurisdictions.

TCOEM will facilitate the review and revision of the LHMP every five years, with each participating jurisdiction managing the revision of their specific jurisdictional annex. The review and revision will be an ongoing process. This process will incorporate all of the revisions made during the life of the plan, especially newly obtained data on hazard occurrence or identified vulnerability.

7.3 Plan Review Meetings

The MPC will meet annually for the first two years after plan approval. MPC members will determine the meeting dates and locations and will ensure that the meetings are open to all interested parties. The Torrance County Emergency Manager will be the main point of contact for these meetings and will maintain attendance and meeting minutes.

The purpose of these meetings is to discuss capability changes, the status of proposed projects, and any new studies or mapping that may inform the LHMP. Should a specific plan element or section require revision or amendment due to a state or federal legislation or policy change, the MPC will work with NMDHSEM to complete a plan addendum and submit it to FEMA as quickly as is practicable.

During these meetings, and in order to monitor LHMP progress, the following information will be tracked:

- How the actions from the mitigation strategy are being pursued and completed
    - Are actions being prioritized
- How the plan goals and objectives are being carried out
- How mitigation funding mechanisms are being utilized
- How is technical assistance being received

Additionally, the MPC will monitor the following elements to ensure the LHMP is current and correct:

- Reviewing the hazards and determining if any of them have changed
- Determining if there are new hazards that pose a risk to the state
- Ensuring goals and objectives are still relevant
- Determining if any actions have been completed or are deemed irrelevant
- Determining if new actions should be added
- Determining if capabilities have changed

After each meeting, the MPC will compile a meeting report for usage in future plan revisions.

In addition to these meetings, MPC members will monitor and evaluate the progress of mitigation projects via quarterly reports, site visits, correspondence, and reimbursements. Completed projects will be evaluated for loss avoidance and alignment with local development plans.

NMDHSEM may request a non-scheduled report on the monitoring, evaluation, or updating of any portion of the LHMP due to irregular progress on mitigation actions and or projects, in the aftermath of a hazard event, or for any reason deemed appropriate.

7.4 Plan Monitoring and Situational Change

Plan monitoring can be defined as the ongoing process by which stakeholders obtain regular feedback on the progress being made towards achieving their goals and objectives. In the more limited approach, monitoring may focus on tracking projects and the use of the agency's resources. In the broader approach, monitoring also involves tracking strategies and actions being taken by partners and non-partners, and figuring out what new strategies and actions need to be taken to ensure progress towards the most important results.

The MPC will track and record all substantial situational changes and will address, as appropriate, the following questions:

- Is the mitigation project under, over, or on budget?
- Is the mitigation project behind, ahead of, or on schedule?
- Are there any changes in jurisdictional capabilities which impact the plan?
- Are there any changes in jurisdictional hazard risk?
- Has the mitigation action been initiated, or its initiation planned?
- Is the current process of prioritizing mitigation actions and projects appropriate and accurate?
- Has the current method of incorporating mitigation actions and projects yielded a comprehensive action and project strategy to address seen and unforeseen hazards?
- If applicable, has participation in a mitigation action's collaboration been regular?
- Was a negative result caused directly or indirectly by insufficient levels of public outreach?
- If any, what plan updates occurred, why they occurred, and what is their impact?

7.5 Post-Disaster Review

After each Presidential disaster declaration, and in coordination with FEMA and the NMDHSEM, the MPC will convene to document impacts on Torrance County and to determine if any mitigation actions should be considered to reduce future risk. This will allow for the development of hazard mitigation recommendations to FEMA during the disaster operation as well as to update the mitigation strategy as needed. The post-disaster review may coincide with established meetings or may be convened as separate events.

7.6 Plan Evaluation

A plan evaluation is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated goals and contributing to decision making.

A plan evaluation report, conducted by the MPC, will be completed when the situation dictates. The following situations are typical examples of when an evaluation will be necessary:

- Post hazard event
- Post training exercise
- Post tabletop or drill exercise
- Significant change or completion of a mitigation project
- Significant change or completion of a mitigation action

An evaluation report will ask the following questions in response to the previously listed events.

- Do the mitigation objectives and goals continue to address the current hazards?
- Are there new or previously unforeseen hazards?
- Does a change in hazard vulnerability demand a change of or addition of mitigation actions or projects?
- Does a change in the mitigation strategy demand a change of or addition of mitigation actions or projects?
- Are current resources appropriate for implementing a mitigation project?
- Was the outcome of a mitigation action/project expected?
- Are there implementation problems?

- Was the public engaged to the point where they were satisfied with current engagement strategies?
- Did the public participate in a number that produced a positive yield on the plan, action, or project?
- Are there coordination problems?

7.7 Plan Updates

Typically, the updating of a LHMP is initiated upon the completion of a plan evaluation when the evaluation determines an update is appropriate. A plan update also occurs every five years per FEMA guidelines or at any time it is deemed necessary by MPC.

According to FEMA DMA 2000 guidelines for mitigation planning, Torrance County will begin the update process three years from this plan's adoption. An increase in meeting tempo to twice a year will allow MPC to gather relevant information needed for the next plan update. The following meeting schedule indicates the tasks to be performed during this plan update period:

- **2028 Spring Meeting:** The MPC will begin updating the risk assessment portion of the plan. Hazards will be analyzed to determine if they are still relevant, if location should be updated, and if new hazards should be added. Previous occurrences will be reviewed to help determine the probability of future events.
- **2028 Fall Meeting:** The MPC will begin updating the vulnerability assessment. The MPC will update the vulnerability assessment portion of the plan. Data will need to be gathered for assets, critical facilities, building stock values, jurisdictional damages, etc.
- **2029 Spring Meeting:** The MPC will review information received and determine if the goals and objectives are still relevant and if new ones should be added. Actions will be reviewed to determine if they should remain in the plan, have been completed, or are no longer relevant. The MPC will review the potential funding sources for each action.
- **2029 Fall Meeting:** As appropriate, a new MPC for Torrance County will be formed to take over the planning process. The new MPC will evaluate the policies, programs, capabilities, and funding sources from the previous plan to determine if they are still accurate and if any new items should be added.
- **2030 Spring Meeting:** The new MPC will review the draft copy of the mitigation plan and make comments and updates if necessary. Formal submittal to FEMA for re-approval will follow.

In general, the following steps will be taken to complete the next LHMP revision:

Table 123: LHMP Update Task List

Task	Action
1	Evaluate and update the planning process.
2	Review the stakeholder contact list and identify new stakeholders.
3	Initiate plan outreach and discussion, including a stakeholder meeting.
4	Consider the addition, removal, or modification of hazards identified in the plan.
5	Update and revise membership of the MPC.
6	Evaluate risk assessment methodologies and data sources.
7	Evaluate and update critical facility inventory information.
8	Evaluate and update the hazard profiles.
9	Evaluate and update the risk assessment summary.
10	Evaluate and update the mitigation strategy, including proposed mitigation actions.
11	Evaluate and update the mitigation implementation system.
12	Integrate new and updated local plans.
13	Evaluate and update other plans sections.
14	Identify and add any additional sections or information needed.
15	Review updated plan in its entirety.
16	Conduct updated plan outreach, including public information, comment period, and meetings.
17	Integrate additional comments received.
18	Finalize plan document.

Table 123: LHMP Update Task List

Task	Action
19	Complete crosswalk and submit final plan to FEMA for review and approval.
20	Make additional modifications as required.
21	Obtain jurisdictional adoption resolutions.

7.8 Continued Public Involvement

Torrance County and all participating jurisdictions are dedicated to involving the public in the continual shaping of the LHMP and in the development of its mitigation projects and activities.

The Torrance County MPC will continue to keep the public informed about hazard mitigation projects and activities through jurisdictional websites, and as appropriate, public announcements. The public will also be invited to participate in all meetings to review and discuss the mitigation-related events. Additionally, participating jurisdictions will present to public officials in a public forum concerning the progress of mitigation actions identified in this plan as progress is made.

Copies of the Torrance County LHMP will be made available to the public. Methods of public availability may include electronically posted on a website or a hard copy kept at a jurisdictional office.

7.9 Plan Amendment

Amending the approved and adopted Torrance County LHMP does not necessarily result in the need to reevaluate the entire plan against all requirements. As the Torrance County MPC will consistently review this LHMP, FEMA Region VI expects modifications to the risk assessment or adding/removing mitigation actions, especially in preparation for submitting applications to FEMA for assistance and ensuring the project conforms with the mitigation plan. Torrance County and all participating jurisdictions are encouraged to keep the State of New Mexico and FEMA Region VI informed, but these amendments do not need to be reviewed by either. If these changes identify new mitigation actions that might be eligible for FEMA assistance programs, then Torrance County and/or the participating jurisdiction will advise FEMA Region VI and the State of New Mexico. FEMA will acknowledge and note the receipt of the added action(s), where appropriate, but will not need to formally review or approve the action(s).

7.10 Amendment to Include New Jurisdiction

Jurisdictions may be added to this existing and approved LHMP only if the following conditions below met:

- The jurisdiction asking to be included is within the boundaries of Torrance County.
- Torrance County agrees with adding the requesting jurisdiction(s) to the mitigation plan.
- An analysis of the natural hazards that have the potential to affect the additional jurisdiction must be completed and integrated into any current analysis within the LHMP.
- The new jurisdiction must meet all requirements of 44 CFR § 201.6, including:
    - Review the multi-jurisdictional hazard analysis and determine if any additional hazards that have not been addressed threaten the jurisdiction(s).
    - Document their agreement with the stated mitigation goals
    - Develop a list of proposed mitigation actions
    - Document the involvement of both the general public and the local government in the planning process
    - Submit the annex or appendix, along with the multi-jurisdictional mitigation plan and correspondence of concurrence from Torrance County for formal review.
    - Adopt the LHMP.

7.11 Late LHMP Adoption

Any participating jurisdiction that did not adopt the plan within one year of the Approved Pending Adoption date must either:

- Validate that the information in the plan remains current with respect to both the risk assessment and mitigation strategy.

Or

- Make the necessary updates before submitting the adoption resolution to State of New Mexico and FEMA Region VI.

This late adoption does not affect the plan expiration date, with the adopted LHMP expiring five years from the date the first adoption was received.

Appendix A – Torrance County Adoption Documentation and FEMA Region VI Approval Documentation

Appendix B – Community Feedback

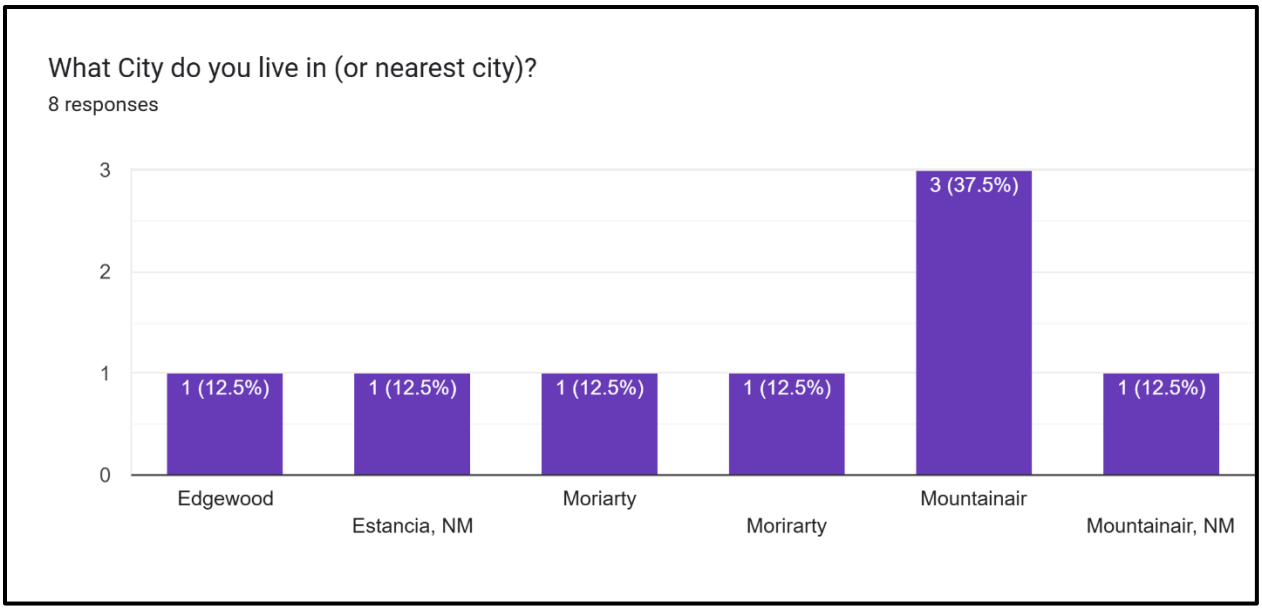
Kickoff Survey

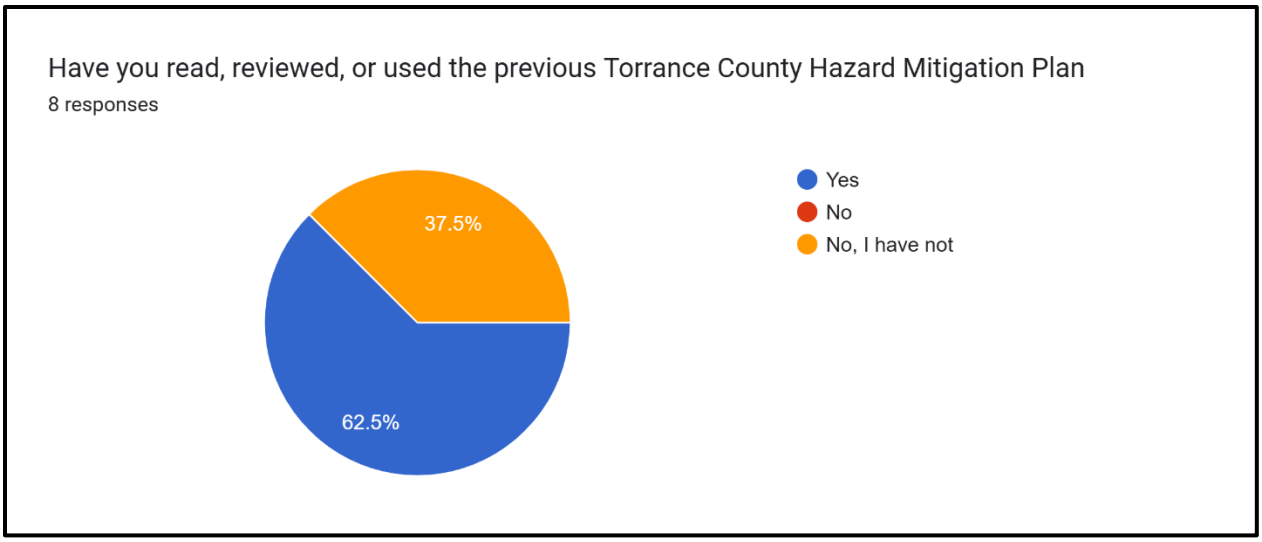
What is your name, title (if applicable), and email address?

- Pedro Vallejo, Superintendent, Pedro.vallejo@mpschools.net
- Tom Carter, Chief of Police
- David Dean
- Michael Myrick. Detailed FMO, Michael.Myrick@usda.gov
- Tom Carroll, Chair Ops & Safety Committees, tf_carroll@msn.com
- Todd Brogowski, Vice-Chair, LEPC and Editor, Mountainair Dispatch todd@mountainairdispatch.com
- Samantha O'Dell, Emergency Manager, sodell@tcnm.us
- Shannon Waldorf, Admin, swaldorf@torrancecounty911.com

Who are you here representing?

- Mountainair Public Schools
- Town of Estancia Police
- Village of Willard
- US Forest Service
- Deer Canyon Preserve Community
- LEPC
- Torrance County
- TC Dispatch Center





Is there anyone else you know (person, department, agency) that should be included in the planning process? If yes, please provide the contact information.

- No
- USFS, USDA, High Desert Amateur Radio Club's ARES program
- Selena Carroll, Dispatch Director, scarroll@torrancecounty911.com

How did you hear about this meeting?

- Emailed
- County emergency management
- Emergency management
- Cooperator
- Email
- On executive committee
- I scheduled it.
- Asked to represent department

Are there any departments or agencies working with underserved or vulnerable (elderly, disabled, those in poverty, etc.) communities that should be included in the planning process? If yes, please provide the contact information.

- Unknown
- All land grants
- No info
- Unsure
- N/A

Do you have any specific concerns about any hazard that could impact Torrance County?

- Yes
- Trains water semi traffic
- Wildfire

- Wildfire and train derailment
- How road/infrastructure degradation or lack of maintenance causes a negative impact on evacuation
- Wildfire
- N/A

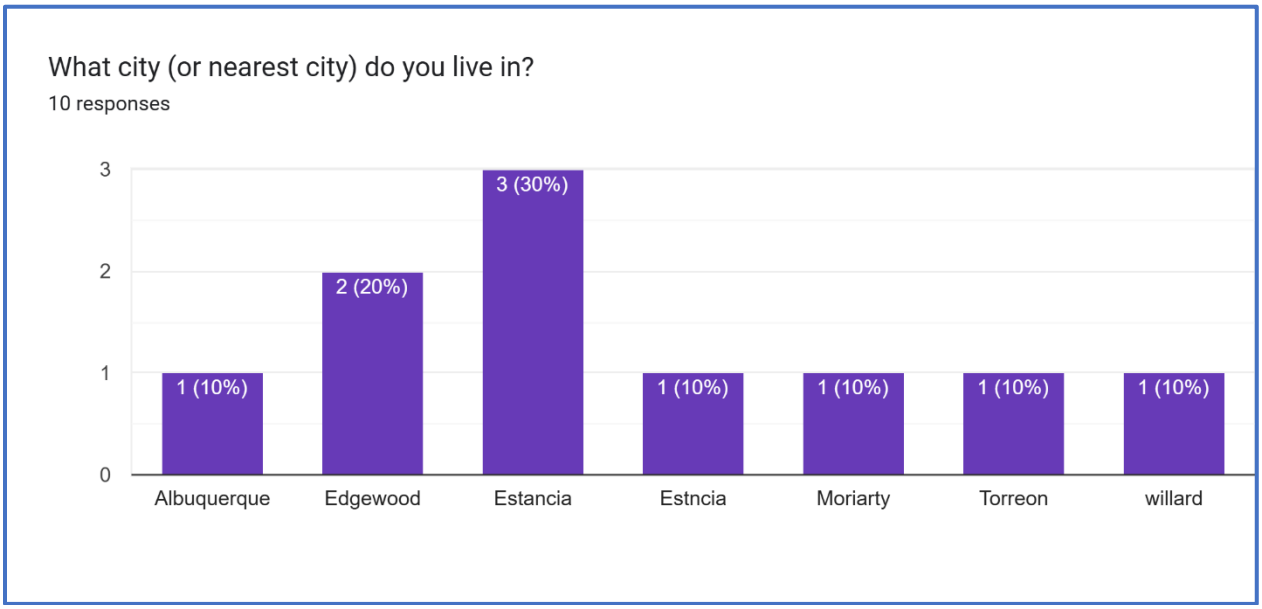
Is there anything else concerning hazard mitigation that you would like us to know?

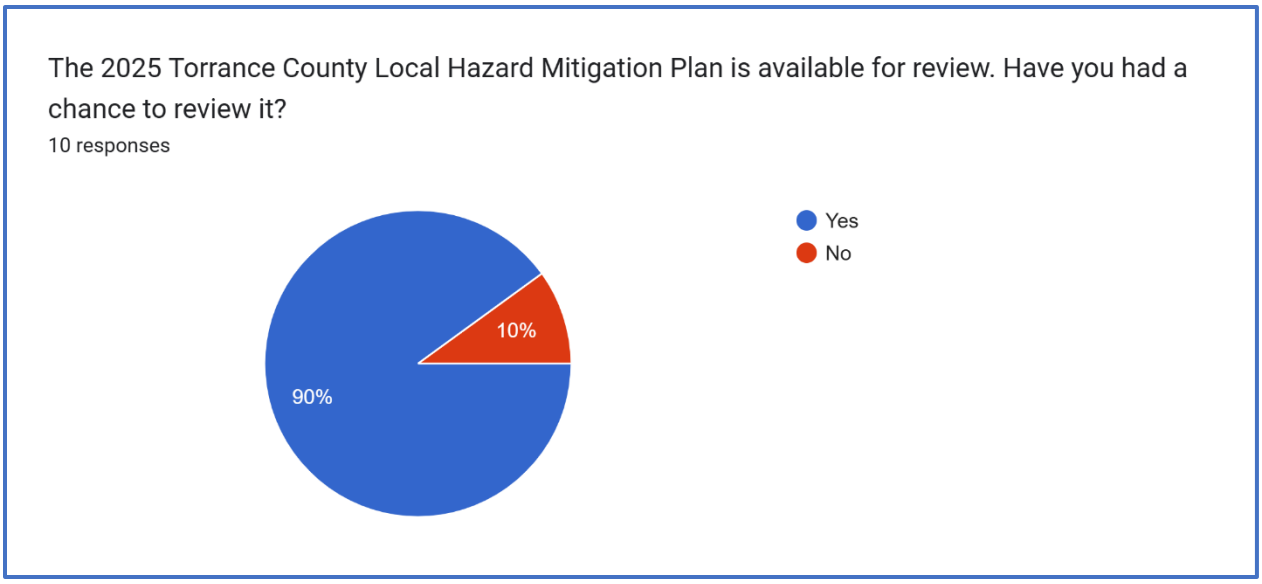
- No
- Not at this time
- Water cold weather Wind
- No
- N/A

Final LHMP Survey

What is your name and title (if applicable)

- Shawn Penman, Cooperating Technical Partner Coordinator, Earth Data Analysis Center, UNM
- Kate Ullrich
- Victoria Sedillo, Admin contractor Claunch Pinto SWVD
- Samantha O'Dell, Emergency Manager
- Linda Jaramillo
- Leonard N Howell
- Don Goen Torrance County P&Z Director
- Lainey Fastnacht - Admin. Assistant Claunch-Pinto SWCD
- Mayor
- Tom Carter, Chief of Police for Estancia





Are there any changes or additions you would like to see to the plan?

- No
- No
- Yes, in the flooding section there is no mention of the Base Level Engineering (BLE) analysis that was done for the Western Estancia Watershed that covers most of the populated area of Torrance County that was conducted by the CTP and funded by FEMA Region 6. This is non-regulatory flood hazard but provides flood hazard data for a wider area of the County than the paper FIRMS. This would have been a more appropriate dataset to utilize when determining which critical facilities were within an identified hazard. The data can be download from the Region 6 viewer - https://webapps.usgs.gov/infrm/estbfe/
- Yes, I would like to see an Incident Preparedness and Response Strategy for the Enterprise Refined Product Terminal located on 2960 NM-41, Moriarty, NM 87035.
- NO

Is there anything else concerning hazard mitigation that you would like us to know?

- No
- No
- It is reasonable to expect in the near future, that we will see a reduction of health, safety, environmental protections and oversight at the federal level in the next several years. As a result of this lack of safety requirements, it increases the likelihood of a future incident occurring at the Enterprise Terminal located in Moriarty.
- Recently, a terminal fire in 2019 in Deer Park TX can be used to demonstrate that an accident at our local terminal is possible. The terminal in Texas burned for 3 days, and caused significant disruption to the local area. https://www.csb.gov/csb-releases-final-report-on-2019-massive-tank-farm-fire-at-the-intercontinental-terminals-company-facility-in-deer-park-texas/ https://www.aiha.org/news/230831-csb-regulatory-exemptions-contributed-to-2019-fire-at-texas-tank-farm /
- No

Would you like to be involved in future hazard mitigation meetings or planning sessions? If yes, please let us know how to best contact you.

- If you have questions about the BLE data or downloading you can contact me at spenman@edac.unm.edu
- Yes, Kate Ullrich: 858.263.5122, kateullrich@gmail.com
- Yes sodell@tcnm.us
- Yes
- When time permits.
- Possible dgoen@tcnm.us
- claunchpinto@gmail.com
- Yes, Village of Willard
- Yes, email is best. tcarter@estancianm.gov