Engagement Plan / Pre-Discovery Report

Rio Grande-Santa Fe Watershed, HUC *13020201*

Bernalillo, Los Alamos San Miguel, Sandoval, and Santa Fe, New Mexico

September 30, 2026

FEMA

Project Area Community List

Community Name*	CID
Rio Grande-Santa Fe Watershed Communities	
Bernalillo County, Unincorporated Areas	350001D
Edgewood, Town of	350018
Los Alamos County	350035
Sandoval County, Unincorporated Areas	350055
San Miguel County, Unincorporated Areas	350132
Santa Fe County, Unincorporated Areas	350069
Santa Fe, City of	350070

*Communities without CIDs are not included.

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The basis and format of this document is derived from FEMA Guidance and Specification, Procedure Memorandums, Operational Guidance, Regional Standard Operating Procedures, and current draft revisions and proposed guidance to include, but not limited to;

Guidance and Specifications: Appendix I - Discovery

Guidance and Specifications: Appendix M – Data Capture Standards

PM 56: Guidelines for Implementation of Coordinated Needs Management Strategy (CNMS)

PM 59: Guidance for Implementation of Watershed-Based Studies

PM 60: Guidance for Flood Risk Assessment Data Development and Analysis

Operational Guidance No. 1-11: Risk MAP Guidance for Incorporating Mitigation Planning Technical Assistance and Training into Flood Risk Projects

Operational Guidance No. 4-11: Risk MAP Meeting Guidance

FEMA Region 6 Discovery & Project Pre-Planning SOP

Any revisions or changes to this document will require FEMA Region 6 Authorization prior to implementation.

Acronyms and Abbreviations

BFE	base (1-percent-annual-chance) flood elevation
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
cfs	cubic feet per second
CID	Community Identification number
CLOMR	Conditional Letter of Map Revision
CNMS	Coordinated Needs Management Strategy
CRS	Community Rating System
DFIRM	Digital Flood Insurance Rate Map
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FPA	Floodplain Administrator
GIS	geographic information system
HEC-1	Hydrologic Engineering Center – Hydrologic Model Program
HEC-2	Hydrologic Engineering Center – Hydraulic Model Program
HEC-HMS	Hydrologic Engineering Center – Hydrologic Modeling System
H&H	hydrologic and hydraulic
HMP	Hazard Mitigation Plan
HUC	Hydrologic Unit Code
LiDAR	Light Detection and Ranging System
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
MDP	Master Drainage Plan
MXD	Map Exchange Document
NFIP	National Flood Insurance Program
NHD	National Hydrologic Dataset
NMDHSEM	New Mexico Department of Homeland Security and Emergency Management
NM RGIS	New Mexico Resource Geographic Information System

NVUE	New Validated or Updated Engineering
Risk MAP	Risk Mapping, Assessment, and Planning
RL	Repetitive Loss
PMR	Physical Map Revision
RSC	Regional Service Center
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SHP	ESRI Shape File
SRL	Severe Repetitive Loss
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

I. Discovery Overview

The Federal Emergency Management Agency (FEMA) is currently implementing the Risk Mapping, Assessment, and Planning (Risk MAP) Program across the Nation. The purpose of Risk MAP is continued improvement of flood hazard information for the National Flood Insurance Program (NFIP), the promotion of increased national awareness and understanding of flood risk and the support of Federal, State, and local mitigation actions to reduce risk.

The vision and intent of the Risk MAP program is to, through collaboration with the State of New Mexico, local and tribal entities, deliver quality data that increases public awareness and leads to mitigation actions that reduce risk to life and property. To achieve this vision, FEMA has transformed its traditional flood identification and mapping efforts into a more integrated process of more accurately identifying, assessing, communicating, planning and mitigating flood risks. Risk MAP attempts to address gaps in flood hazard data and form a solid foundation for risk assessment, floodplain management, and provide the State of New Mexico, local and tribal entities with information needed to mitigate flood related risks.

The FEMA Region 6 office, in partnership with the Earth Data Analysis Center, University of New Mexico began the Discovery process in the Rio Grande Santa Fe watershed in January 2023 to gather local information and readily available data to determine project viability and the need for Risk MAP products to assist in the movement of communities towards resilience. The watershed location can be seen in Figure 1.

Through the Discovery process, FEMA can determine which areas of the HUC8 Discovery watersheds may/will be funded for further flood risk identification and assessment in a collaborative manner, taking into consideration the information collected from local communities during this process. Discovery initiates open lines of communication and relies on local involvement for productive discussions about flood risk. The process provides a forum for a watershed-wide effort to understand how the included watershed community's flood risks are related to flood risk throughout the watershed. In Risk MAP, projects are analyzed on a watershed basis, so Discovery Meetings target numerous stakeholders from throughout the watershed on local, regional, State, and Federal levels.

In November 2026 FEMA and the CTP held a Discovery Meeting in this watershed area. During Discovery, FEMA and the State reached out to local communities to:

- Gather information about local flood risk and flood hazards
- Reviewed current and historic mitigation plans to understand local mitigation capabilities, hazard risk assessments, and current or future mitigation activities.
- Include multi-disciplinary staff from within their community to participate and assist in the development of a watershed vision.

The results of the Discovery process are presented in a Discovery Report, a watershed scale Discovery Map and the digital data that were gathered or developed during the process under fiscal year 2022 CTP Agreement, EMT-2022-CA-00011, Mapping Activity Statement (MAS) 21 between FEMA and EDAC.

i. Watershed Selection

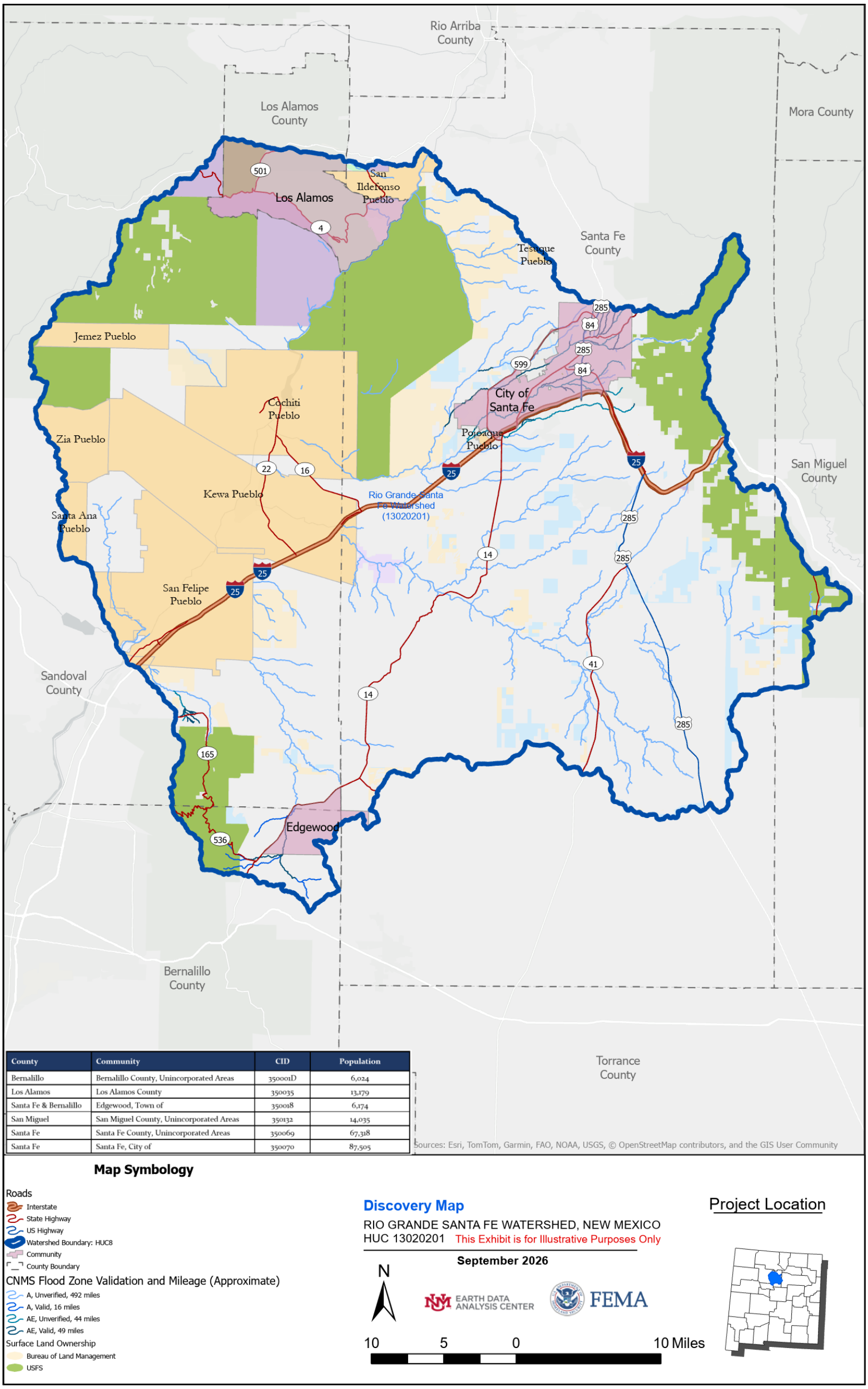
The Rio Grande Santa Fe Watershed (HUC 13020201) encompasses an area of approximately 1,871 square miles and extends across four counties in central New Mexico. Major communities include the cities of Santa Fe, Edgewood, and Los Alamos. There are no levees in the watershed that are shown to provide protection from the base flood on the DFIRMs.

Table 1 provides a status update for each community's NFIP participation, CRS rating, and current FIRMs. Five of the counties and three of the communities are participating in the NFIP. Two communities are not participating in the NFIP. Figure 1 shows the locations of all communities in the watershed.

Table 1: NFIP Status of Project Area Communities

County	Community Name	Community Identification Number (CID)	Participating Community?	CRS Rating	FIRM Date	FIRM Status	Population (2020 Census)
Bernalillo	Bernalillo County, Unincorporated Areas	350001D	Yes	8	11/04/16	Revised	6,024
Los Alamos	Los Alamos County	350035	Yes	NR	07/18/11	Revised	13,179
Santa Fe Bernalillo	Edgewood, Town of	350018	Yes	NR	12/04/12	Revised	6,174
San Miguel	San Miguel County, Unincorporated Areas	350132	Yes	NR	12/03/10	Revised	14,035
Santa Fe	Santa Fe County, Unincorporated Areas	350069	Yes	NR	12/04/12	Revised	61,144
Santa Fe	Santa Fe, City of	350070	Yes	NR	12/04/12	Revised	87,505
Sandoval	Sandoval County, Unincorporated Areas	350055	Yes	NR	03/18/08	Revised	

Figure 1: Watershed and Communities



County	Community	CID	Population
Bernalillo	Bernalillo County, Unincorporated Areas	350001D	6,024
Los Alamos	Los Alamos County	350035	13,179
Santa Fe & Bernalillo	Edgewood, Town of	350018	6,174
San Miguel	San Miguel County, Unincorporated Areas	350132	14,035
Santa Fe	Santa Fe County, Unincorporated Areas	350069	67,318
Santa Fe	Santa Fe, City of	350070	87,505

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Map Symbology

Roads
- Interstate
- State Highway
- US Highway
- Watershed Boundary: HUC8
- Community
- County Boundary

CNMS Flood Zone Validation and Mileage (Approximate)
- A, Unverified, 492 miles
- A, Valid, 16 miles
- AE, Unverified, 44 miles
- AE, Valid, 49 miles

Surface Land Ownership
- Bureau of Land Management
- USFS

Discovery Map

RIO GRANDE SANTA FE WATERSHED, NEW MEXICO
HUC 13020201 This Exhibit is for Illustrative Purposes Only

September 2026

N

EARTH DATA ANALYSIS CENTER

FEMA

10 5 0 10 Miles

Project Location

The Bureau of Land Management (BLM) owns 88 square miles of the watershed. The United States Forest Service (USFS) Santa Fe National Forest own 160 square miles. The State of New Mexico owns 343 square miles of the watershed. The National Park Service owns 53 square miles. The state of New Mexico owns 52 square miles. The Department of Defense and Department of energy own 40 square miles. Tribal nations own 422 square miles. The majority of the watershed, 856 square miles, is in private ownership. There are no EPA Superfund Sites in this watershed. There is one levee in this watershed but none of them are accredited or provide protection from flooding.

Population

The population in this watershed totals *145,264* people, based on the 2020 census. The City of Santa Fe is the watershed's highest population center (population: 87,505). Figure 2 shows the population densities within the Rio Grande Santa Fe Watershed based on U.S. Census Data 2020.

Land Use

The Rio Grande Santa Fe Watershed is predominantly shrubland and herbaceous cover being the dominant vegetation types. Figure 3 identifies the relative percent urban cover for areas within the watershed. Figure 4 shows the changes in the percent urban coverage that have occurred in the watershed between 2001-2021. There has been a small increase in urban area in the watershed as more houses are built in this predominantly rural area.

Figure 5 shows the wildfire potential in the Rio Grande Santa Fe watershed. The USDA Forest Service Rocky Mountain Research Station classifies the wildfire hazard potential from very low to very high. In the watershed there are 75 square miles of high and very high wildfire potential or about 3% of the watershed. These areas in the watershed have a higher probability of catastrophic wildfire that can then lead to post-fire flooding and debris flows. The New Mexico State Hazard Mitigation plan cycle of wildfire and flooding:

> "Catastrophic wildfire occurs when vegetation is consumed at a high-intensity leaving the forest floor susceptible to erosion and is referred to as the burn scar area. The burn scar area is where topsoil, duff, woody materials and ash from the catastrophic wildfire event can intensify post-fire flooding. Largescale erosion from burn scars can lead to the degradation of water resources for an entire region due to sediment transport. This type of sedimentation is due in part to soil damage during catastrophic wildfire. Organic components of the soil are lost and burnt which creates a soil condition called "hydrophobic." Hydrophobic soils lack the ability to infiltrate water which in turn can increase the potential for post wildfire flooding events by a four-hundred fold increase. Monsoon rainstorms can amplify the poor soil condition with high volumes of precipitation which is then transported during flood events settling in arroyos, ditches and flood control infrastructure.
>
> Vegetation loss from wildfire can also increase flooding potential and water stress. When New Mexico's coniferous dominated forest communities burn, their natural ability to absorb and deflect the precipitation load is lost. The combination of vegetation loss, hydrophobic soils and monsoon rainstorms can lead to highly destructive flooding events called "debris flows." Debris flows are a long-term

risk to watersheds that have experienced wildfire. Loss of life, damage to property and significant infrastructure impacts are commonplace when debris flow flooding events occur. …. Debris flows move high amounts of sediment leading to sedimentation issues, including temporary dams or sediment plugs along existing waterways which can have further flooding impacts to downstream ecosystems and communities when the dams or plugs fill and break, resulting in a flood wave. The waterway is also damaged limiting its functionality as a both a natural water storage and/or water delivery conveyance for communities, thus increasing water stress." 2018 New Mexico State Hazard Mitigation Plan pp. 38-39.

Figure 2: Population Density in the Watershed

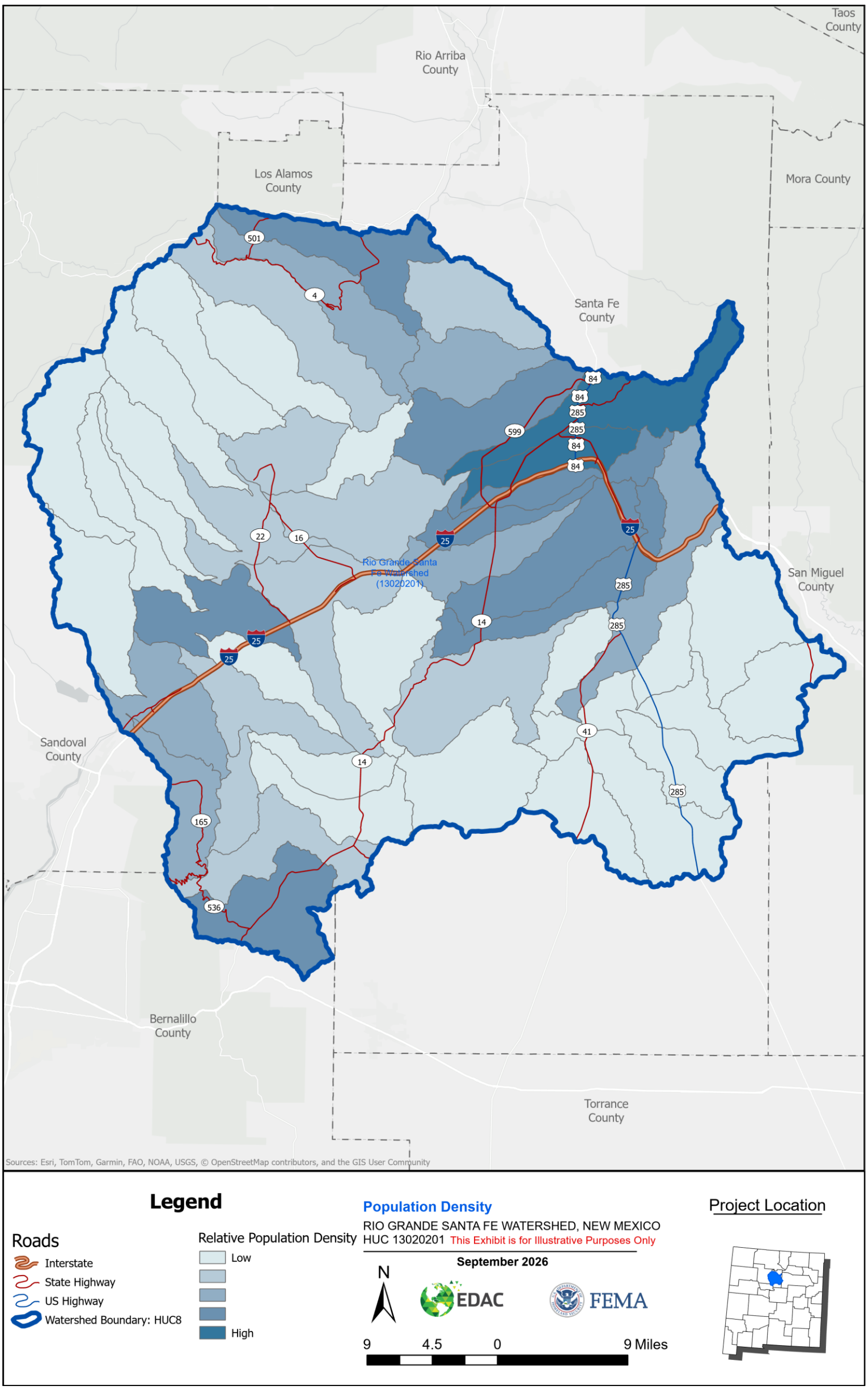


Figure 3: Current Percent Urban Coverage

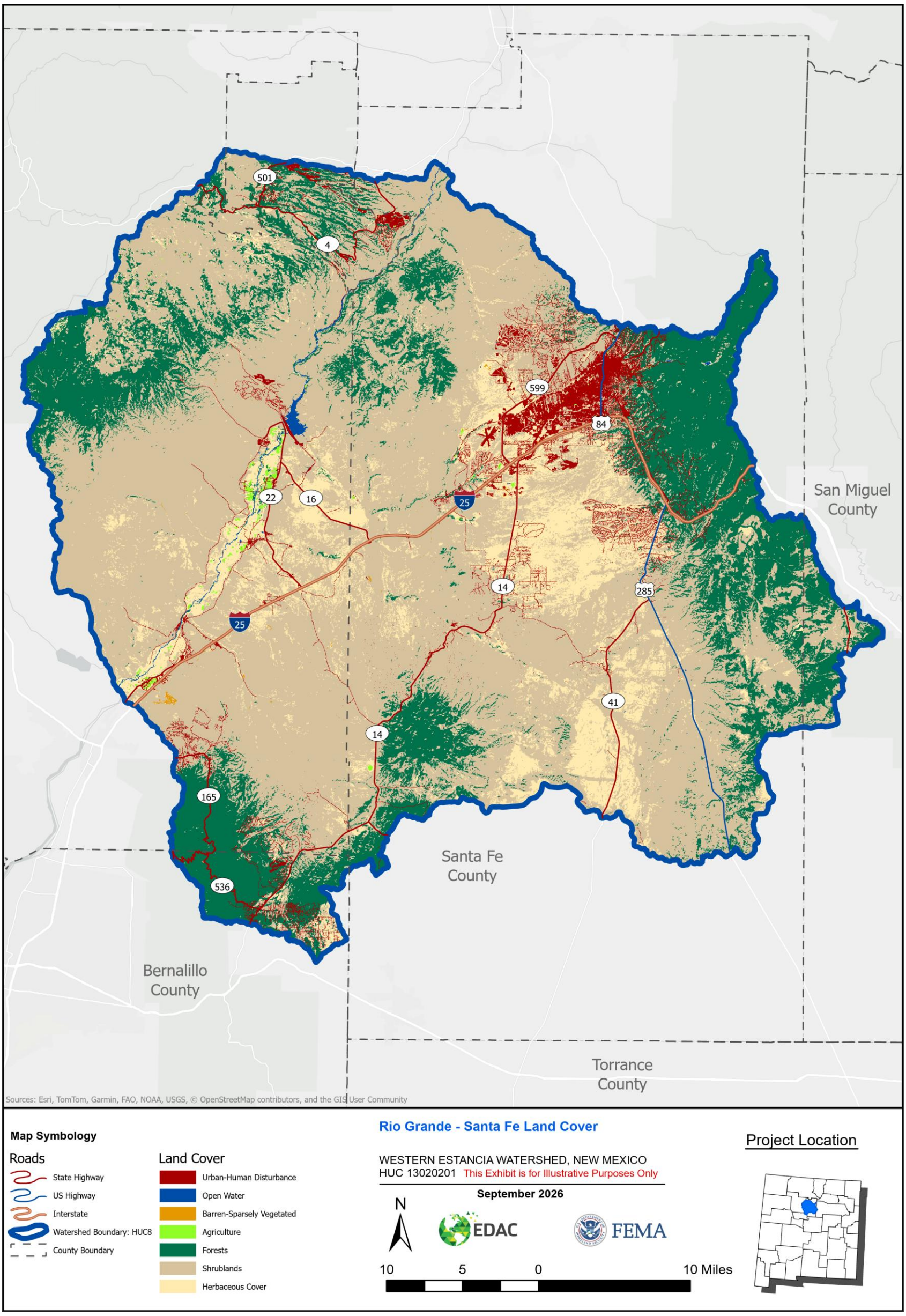


Figure 4: Urban Changes 2001-2021

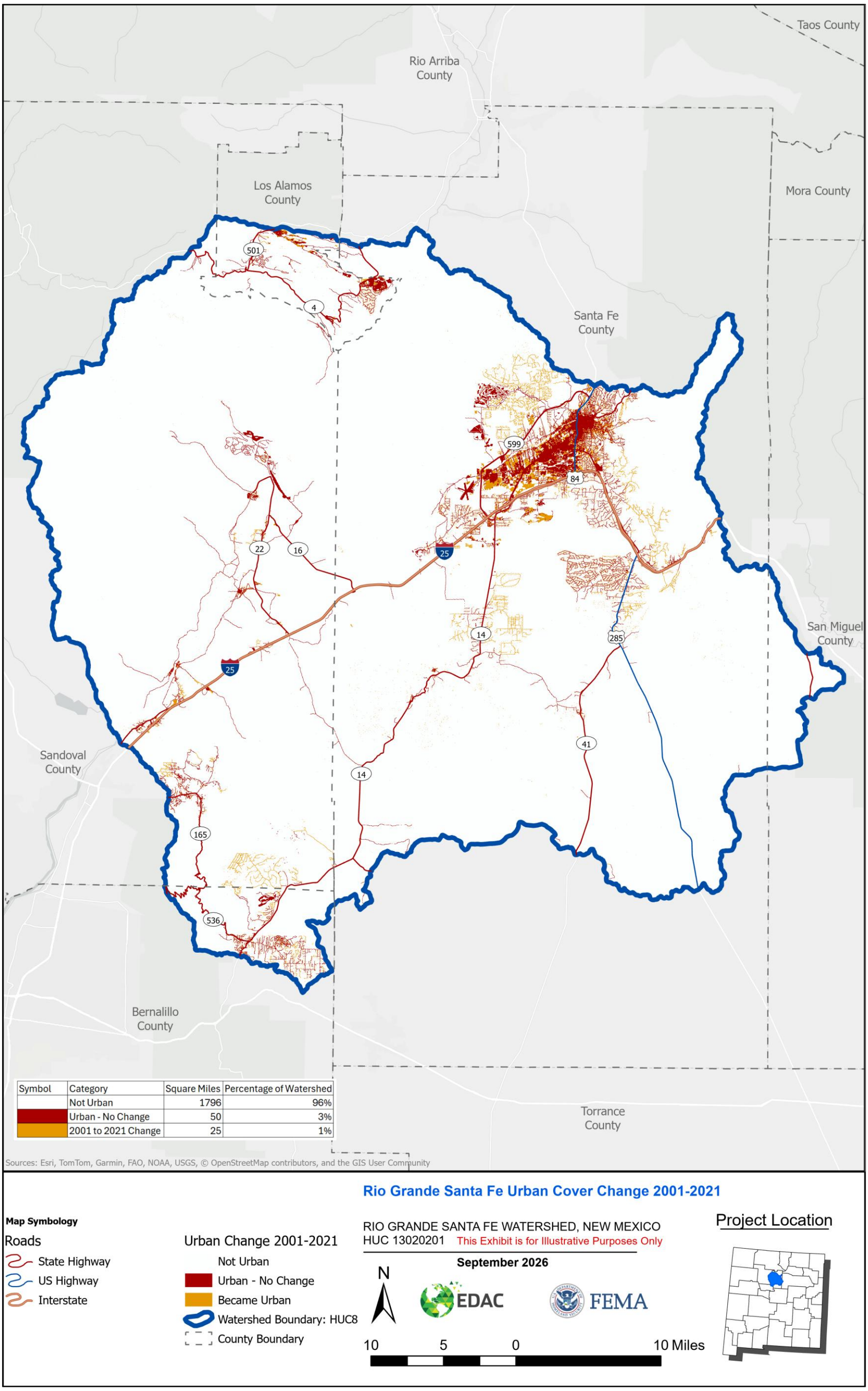


Figure 5: Wildfire Hazard Potential

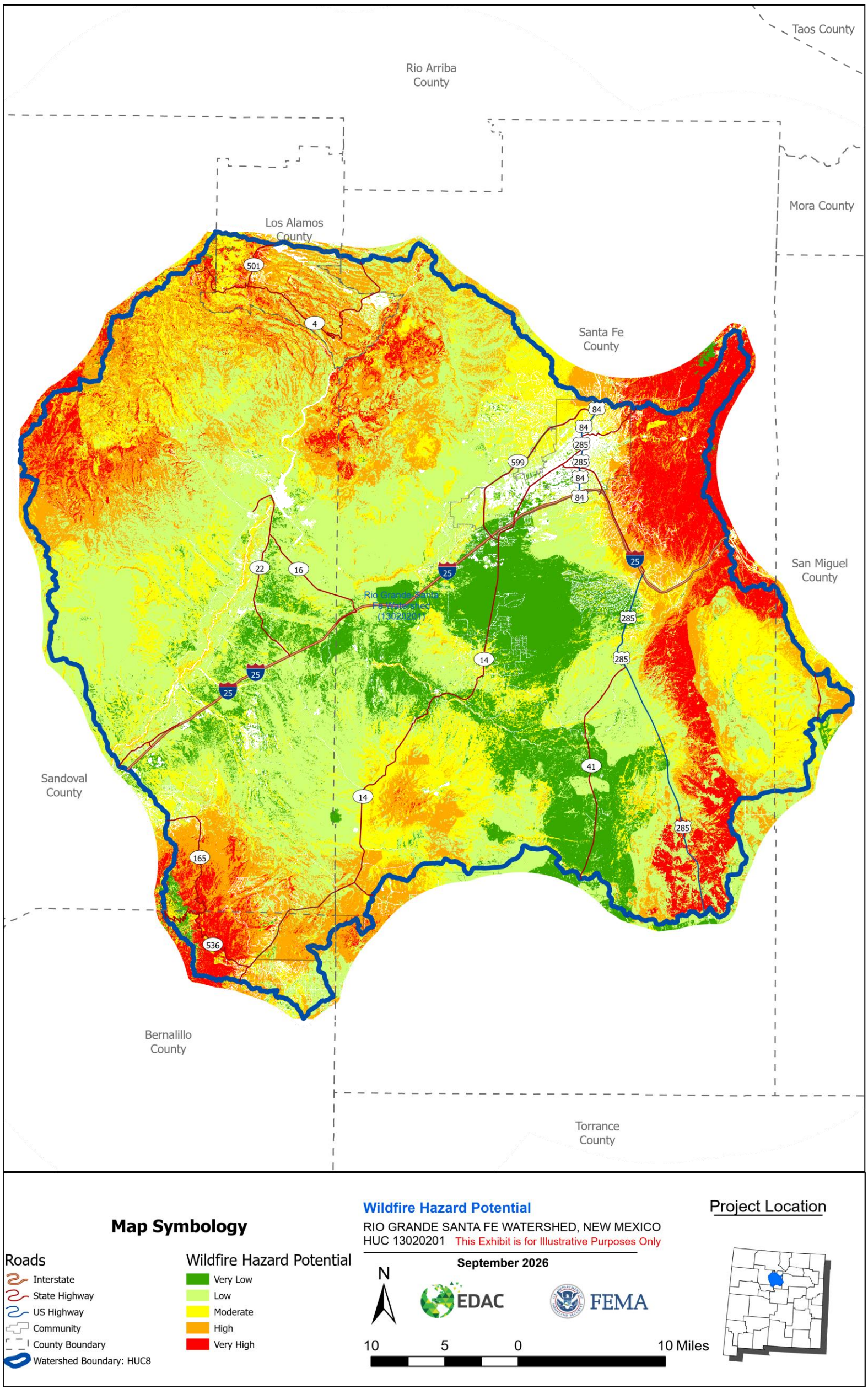


Table 2 lists the number of NFIP insurance claims for the counties within the Watershed. NFIP claims information is aggregated to the County and the claims listed in the table could be anywhere in the county. The majority of the claims in San Miguel County were after the Hermit's Peak Calf Canyon wildfire and the resultant flooding and debris flow.

Table 2: Total NFIP Insurance Claims, 1980-2025

Total NFIP Insurance Claims by Community	
Community	**Claims**
Bernalillo County	73
Los Alamos County	5
San Miguel County	56
Santa Fe County	27
Sandoval County	20

In addition to no NFIP claims, there are no locations of Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties within the Rio Grande Santa Fe Watershed. Table 3 summarizes RL and SRL claims by county and community within the Watershed.

Table 3: Repetitive or Severe Repetitive Loss within the Watershed

Repetitive Losses/Severe Repetitive Losses By Community			
Community	**Number of Properties**	**Total Claims**	**Average Claim Per Property**
None	None	None	None

Table 4: Historical Floods within the watershed lists the flooding and flash flooding from the NOAA Storm Events Database that have occurred in the watershed over the last 25 years.

The Rio Grande Santa Fe Watershed has had a history of flooding as demonstrated by the presidential disaster declarations issued in the past ten years. Table 5: Disaster Declarations in the Watershed lists recent disaster declarations for multiple hazards within the watershed.

Table 4: Historical Floods within the watershed

Historical Floods in Rio Grande Santa Fe Watershed			
Location	**Type of Flood**	**Date**	**Description**
Agua Fria	Flash Flood	7/31/2010	Cerrillos Rd. between St. Michael's Dr. and Camino Carlos Rey was flooded and impassable.
Agua Fria	Flash Flood	7/3/2010	A couple driving home from dinner was caught in the swollen Santa Fe River at San Ysidro Crossing. The couple attempted to drive through the flooded roadway, when the river surged and a tree came down changing the flow of the river, they were successfully rescued.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Agua Fria	Flash Flood	7/8/2013	One death was reported in a southside arroyo. Additionally, one to two feet of water was reported on some roads on the south side of Santa Fe. Rainfall reports ranged from 0.50-1.41. Arroyos were reported to be filled with about 8 feet of fast-moving water at the peak of the flooding.
Agua Fria	Flash Flood	7/8/2015	Significant flooding with estimated 6 inches of flowing water at the corner of Cerrillos and Richards. Gravel washed across the road at the corner of West Alameda and Siler.
Agua Fria	Flash Flood	7/20/2021	Multiple sources reported flooding around Eldorado.
Agua Fria	Flash Flood	6/25/2022	Heavy rain in the Santa Fe area caused the arroyos to fill up, and unfortunately, one death was reported in the arroyo near Cerrillos and Rodeo.
Agua Fria	Flash Flood	7/31/2025	Reported a collapsed sidewalk at the intersection of Corte de Princesa and Camino Consuela along the Arroyo de los Pinos in Sante Fe.
Algodones	Flash Flood	9/14/2013	Water and debris flooding over Interstate 25 near Algodones.
Algodones	Flash Flood	7/23/2014	Rapid runoff from an estimated 2 to 4 inch downpour resulted in a breached levee that flooded several homes across from the Algodones fire station.
Algodones	Flash Flood	7/27/2014	Heavy rainfall in the area from Cochiti south to Kewa Pueblo, San Felipe Pueblo, Algodones, and Rio Rancho resulted in numerous reports of flooding. All arroyos around San Felipe Pueblo were reported to be running fast and full. Residents of Sile were cut off due to flooding across a low water crossing that formed due to repeated flooding from the Las Conchas burn scar. A low water crossing also formed by the Las Conchas flooding was reported fast and full along Tribal Road 84 near Cochiti.
Algodones	Flash Flood	7/31/2015	100 feet of railroad track for the Rail Runner between Albuquerque and Sante Fe was washed out. The tracks were located on north side of the bridge at the Arroyo Maria Chavez. Rail Runner service was suspended for the rest of the weekend.
Algodones	Flash Flood	9/16/2025	Heavy rainfall from slow moving thunderstorms resulted in water and debris from nearby drainages covering portions of I-25 between mile markers 248 and 249 near Algodones. The interstate was reduced to 1 lane with traffic backed up 4 miles in both directions for several hours during the evening. The Rail Runner tracks at mile marker 14 on Pan American Central Highway in Algodones was also flooded with debris over the railroad tracks and a bridge being washed out.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Canada De Los Alamos	Flash Flood	7/23/2018	Torrential rainfall resulted in significant flash flooding around Santa Fe. A total of 10 roadways were closed due to flood debris and high water. Local emergency services responded to five swift water rescues. A total of 100 homes experienced damage from flood waters, of which 33 saw major damage and 6 were completely destroyed. Flood waters inundated the basement of the county courthouse. Flash flooding also occurred along Cienega Creek resulting in damage to several homes in La Cienega.
Cochiti Pueblo	Flash Flood	8/5/2011	A creek that parallels Dixon Apple Orchard overflowed with rushing water and debris. It likely did not rain at this location, rather heavy rains fell on the southern portion of the Las Conchas burn scar, and runoff quickly moved down the canyons. Radar estimated between one and two inches of rain fell.
Cochiti Pueblo	Flash Flood	8/22/2011	During the damage survey of the previous days flooding, abundant rain above Cochiti Canyon resulted in another, more devastating flood, to Dixon's Apple Orchard The force of the flow was estimated to be 3 times as that of the previous days flood. At least 10 feet high, the width of the flood waters was approximately 100 yards wide. 20 to 40 percent more of the apple orchard was destroyed.
Cochiti Pueblo	Flash Flood	8/4/2013	High flows reported over several low water crossings beneath Bland and Peralta Canyons.
Cochiti Pueblo	Flood	9/12/2013	NM 85 and 90 were initially flooded with 5,000 cfs flow through the area on the 12th then extremely heavy rainfall created severe flooding through the 13th. Numerous roads were flooded and partially destroyed.
Cochiti Pueblo	Flash Flood	9/13/2013	All roads washed out in the community of Sile. Road in Elk Run Estates washed out near La Cueva.
Cochiti Pueblo	Flash Flood	7/10/2014	Roadway within Peralta Canyon was washed out and recently built culverts were destroyed.
Cochiti Pueblo	Flash Flood	8/10/2018	The main road and several trails were washed out at Tent Rocks National Monument. Facilities at the monument were also damaged. Flash flooding forced the closure of the monument for several days until clean up and mitigation efforts were completed.
Cochiti Pueblo	Flash Flood	8/6/2019	Tent Rocks National Monument was closed for two days due to washed out roads from flood waters. Rocks, mud, and debris covered several sections of the main road to the monument.
Cochiti Pueblo	Flash Flood	7/21/2025	Heavy rain from slow moving thunderstorms resulted in mud and rockslides onto the Cochiti Golf Course and across the road at the entrance of the course. Additionally, the golf cart barn got an inch or so of water in it. Property damage is an estimate.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Frijoles	Flash Flood	8/21/2011	Major flash flooding ensued after an estimated 3 to 4 inches of rain fell across the southern portion of the Las Conchas burn scar. Flooding in Frijoles Creek caused damage in and around Bandelier National Monument. Along and downstream of Cochiti Canyon sustained the most damage from flood waters. Flows were reported to be 8 to 10 feet high when they reached Dixon's Apple Orchard.
Frijoles	Flash Flood	7/16/2012	Several foot bridges washed out at Bandelier National Monument and two people stranded within Frijoles Canyon.
Frijoles	Flash Flood	7/25/2013	Bland and Peralta Canyons flooded across low water crossings and was described as a flash flood situation by Cochiti Pueblo emergency management. Water came up to Cochiti highway but did not top it.
Frijoles	Flash Flood	9/13/2013	Worst flash flood event ever recorded at Bandelier National Monument as the creek near the visitor center crested to 11 feet at 830am. Several points of infrastructure were damaged. The entrance road to the park was undermined and nearly destroyed.
Frijoles	Flash Flood	7/8/2014	Wall of water 4.5 feet surged down Frijoles Canyon within Bandelier.
Frijoles	Flash Flood	7/19/2014	Six feet of water was reported to be flowing through the channel and over a footbridge at Bandelier National Monument. The water was out of its banks but not all the way to the parking area.
Frijoles	Flash Flood	8/4/2014	Water rose 5 to 6 feet in the Frijoles Creek at the Bandalier National Monument Visitors Center.
Frijoles	Flash Flood	7/20/2015	Several foot bridges were washed away within Frijoles Canyon as the creek overflowed it's banks. Water did not make it into the parking lot at the visitor center. Rain gage reports averaged between 1 and 2 inches within the canyon.
Frijoles	Flash Flood	9/5/2024	Damage reported throughout Bandelier National Monument from significant flash flooding. All trails on the property were closed except for one within the official park boundaries.
Galisteo	Flash Flood	7/6/2013	A trained spotter reported that heavy rains had washed out roads in his neighborhood. Water on roads of 3ft deep and 50-60ft wide were reported (all dirt roads).
Galisteo	Flood	9/15/2013	The Galisteo Creek below Galisteo Dam measured its highest crest on record dating back to 1971. The gage was above action stage between 9pm on the 15th and 3pm on the 16th with a record peak crest of 2,850 cfs. Low lying areas along the creek were flooded. NM 22 and Pueblo Route 85 were closed due to flooded arroyo over roadways.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Galisteo	Flood	8/10/2015	The river gage along Galisteo Creek below Galisteo rose to above minor flood stage at 1 am on the 11th due to rains late on the 10th. It peaked above moderate flood stage around by 330am before dropping below moderate flood stage around 515am, and completely below minor flood stage at 730am.
Galisteo	Flash Flood	10/4/2017	Large rocks and boulders washed over county road 42 near Galisteo. Road closed. Galisteo Creek below Galisteo Dam crested at 10.84 feet, the second highest crest on record since 1971.
Golden	Flash Flood	8/2/2014	New Mexico DOT reported an overnight deluge caused ballasts under portions of the Rail Runner line within Waldo Canyon to wash out. Service was suspended for the entire day on Saturday for repairs.
La Cienega	Flash Flood	7/3/2010	The intersection of Los Pinos and Sunrise in La Cienega was not passable due to high water and the road was closed for a time. A nearby arroyo had debris in it with fast moving water about 6 feet high. A backhoe had been left in the arroyo somewhat downstream the previous day. This piece of equipment was almost entirely enveloped in water and mud.
La Cienega	Flash Flood	7/3/2010	Multiple roads closed due to at least 10 inches of water flowing over the road. This included the low water crossing at Dawn Trail and Arroyo Trail, and also at Turquoise Trail and County Road 45.
La Cienega	Flash Flood	7/19/2013	Gold Mine Road was flooded and impassable for nearly 200 yards near Cerrillos. Major torrents of water raging in San Marcos Arroyo between Eldorado and NM 14 near Cerrillos .
Lamy	Flash Flood	7/1/2010	A garage on Avalon Place flooded due to heavy rain. Just north of this area, 2.32 inches of rain was reported in the Santa Fe Seton Village. This rain fell in just over one hours time.
Lamy	Flash Flood	7/1/2022	Heavy rain near Lamy caused Old Lamy Trail Road to nearly wash out by the Legal Tender Saloon. Three to four feet of water was also reported along the railroad.
Lamy	Flash Flood	7/26/2022	Heavy rain of 2 to 3 inches near Lamy and Glorieta caused flash flooding in the area.
Los Alamos	Flash Flood	8/3/2011	Both Highway 4 and 501 were closed in the Jemez Mountains due to flooding. Heavy rains on the Las Conchas burn scar caused significant runoff and debris flow over the roadways. At least a 50 yard stretch of debris several inches deep was noted along State Highway 501.
Los Alamos	Flash Flood	8/21/2011	Water and debris flowed over Highway 501 after approximately one inch of rain fell over central portions of the Las Conchas burn scar. The highway was temporarily closed.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Los Alamos	Flash Flood	7/11/2012	Mud, logs and large rocks washed onto State Road 501 (West Jemez Rd.) near State Road 4, as well as in Los Alamos Canyon and along Camp May road.
Los Alamos	Flash Flood	7/11/2012	The intersection of State Road 4 and State Road 501 (West Jemez Rd.) was closed due to flash flooding.
Los Alamos	Flash Flood	7/12/2013	Power outages as well as flooding in the basement at Los Alamos National Labs were reported. A
Madrid	Flash Flood	7/19/2013	A major mudslide off the hill behind property ended up a couple feet deep on the deck and patio. Unpaved driveway completely destroyed by flood waters. The arroyo that crossed the property along NM 14 was at least 40 feet wide and 10 feet deep.
Madrid	Flash Flood	9/15/2013	State EOC Situation Report #12 indicated 10 businesses were flooded in Madrid. Most significant damage done to Mine Shaft Tavern and nearby museums. Mud and coal damage to most structures. Gold Mine Road, Rogersville Road, and Puebla Road 76 were cleared of flooding debris.
Madrid	Flood	7/30/2015	The Galisteo Creek below the Galisteo Dam reached flood stage of 9 feet for about 2 hours, cresting at 9.18 feet.
Madrid	Flash Flood	7/31/2015	Water rushed over Red Rock Road near Madrid and making it impassable. The depth of the water over the road peaked at 3 feet.
Madrid	Flash Flood	8/6/2019	One to two inches of rainfall in less than an hour around Cerrillos produced flash flooding along Galisteo Creek and nearby rural areas. Galisteo Creek at Galisteo Dam rose 5.5 feet in one hour. Many dirt roads were flooded and washed out with rocks, mud, and debris.
Madrid	Flash Flood	7/26/2020	A sudden torrent of rainfall filled several arroyos around Madrid and Cerrillos. Flood damage was reported to low water crossings, culverts, and driveways.
Madrid	Flash Flood	7/31/2021	Flash flooding along New Mexico State Road 14 in Madrid and south of Los Cerillos along with mud and other debris washed onto the roadway.
Placitas	Flash Flood	8/2/2016	High water, mud, rocks, and debris flowing across highway 165 from nearby dirt roads.
Placitas	Flash Flood	8/2/2016	Las Huertas Creek flooded out of it's banks and up to back door of one home.
Placitas	Flash Flood	7/26/2021	An estimated 2.5 to 3.5 inches of heavy rainfall in under an hour caused flash flooding in Placitas. Several roads and drainage ditches in the Placitas area were flooded with mud and debris also covering roadways.
Placitas	Flash Flood	8/9/2022	Heavy rain near Golden caused flash flooding on Puertocito Road, forcing the closure of the roadway with debris and large boulders rendering it unpassable.
Ponderosa	Flash Flood	7/8/2014	Several drainages flooded within the Paliza area of the Jemez Mountains. Water flooded Forest Road 266 before Forest Road 10 in two places.

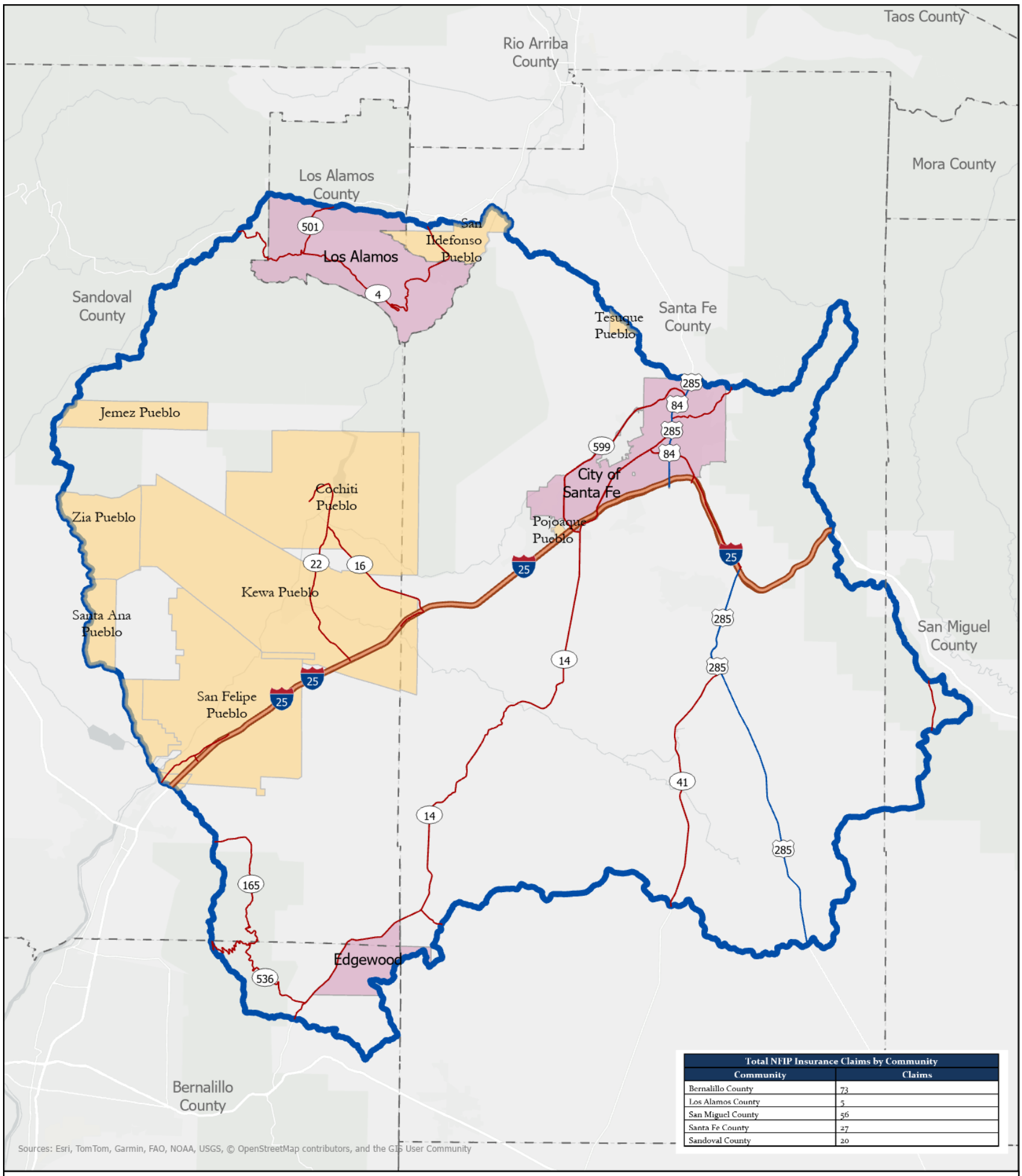
Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
San Felipe Pueblo	Flood	9/13/2013	Initial flooding over the area became severe as the San Francisco Dam spillway was compromised. Water Tank Dam was full and clogged. Many village roads were damaged.
San Felipe Pueblo	Flash Flood	9/14/2013	Mud and water washed into several homes in San Felipe Pueblo.
San Felipe Pueblo	Flash Flood	9/14/2013	One foot of mud and rocks covered portions of the San Felipe Casino gas station parking lot. A 2 feet section of the lot west of the casino was undermined exposing a large conduit.
San Felipe Pueblo	Flash Flood	7/26/2018	Flash flooding reported at Black Mesa Casino on San Felipe Pueblo.
San Felipe Pueblo	Flash Flood	7/26/2018	Flash flooding between San Felipe Pueblo and Kewa Pueblo damaged a one mile stretch of tracks on the New Mexico Railrunner. A section along one bridge was completely washed away.
San Ildefonso Pueblo	Flood	9/13/2013	Water over roadways and several bridges along NM 502 and 30. One car was stuck in the water.
Sandia Park	Flash Flood	8/9/2013	Highway 14 and Frost Rd. in near Sandia Park.
Sandia Park	Flash Flood	7/30/2017	Observer reported Las Huertas Creek flooding over Tecolote Road. Six to eight inches of water, mud, and rocks covered roadway.
Sandia Park	Flash Flood	9/28/2025	A NWS Employee reported flash flooding stretching from San Pedro Creek at NM 14 where the creek was out of its banks. Numerous spots along NM 14 between Cedar Crest and the county line were flooded with rocks and debris over the road, with the worst of it at Ponderosa Park near Lantern Ridge. A USGS gage along the Tijeras Arroyo also observed a nine foot spike to 10 feet, coupled with a report of the arroyo overtopping Via Sedillo Road by two feet. The road was nearly impassible due to large rocks covering the roadway.
Santa Fe	Flash Flood	7/27/2014	Wash out along an arroyo in Santa Feand The berm estimated to be 4 or 5 feet high was completely .
Santa Fe	Flash Flood	9/22/2014	One death was reported of an individual who may have been sleeping in or near the Santa Fe River and was swept away by rushing waters
Santa Fe	Flash Flood	7/31/2010	Heavy rain caused an awning at the Giant gas station to collapse and fall on three cars at the intersection of Sawmill Rd. and St. Francis Dr.
Santa Fe	Flash Flood	8/19/2011	Near the intersection of Valmora Road and Serafina Street water was reported to be two feet deep and 40 feet wide. Two feet of water was also reported at the intersection of Rodeo Road and Old Pecos Trail. Two feet of water was also reported to have flooded a home at the Rainbow Vision Condominium Complex at I-25 and St. Francis Dr.

Historical Floods in Rio Grande Santa Fe Watershed			
Location	Type of Flood	Date	Description
Santa Fe	Flash Flood	8/21/2011	Flash flooding was reported in homes on Galisteo Street, within the Forest Circle Street and Calle Torreador subdivisions, Miguel Chaves Road and the Tuscany at St. Francis Apartments. Street flooding was also reported on portions of Cerrillos, St. Francis Dr., and St. Michaels Road.
Santa Fe	Flash Flood	8/26/2014	Car was stranded due to flooding at 5th Street and St. Michaels Dr. in Santa Fe. The driver drove into deep water that had accumulated on roadways from short duration, very heavy rainfall.
Santa Fe	Flash Flood	9/22/2014	Damage to E.J. Martinez Elementary School from flash flooding. It was reported that there was damage to 3 classrooms, the gym, and an office.
Santa Fe	Flash Flood	8/1/2015	Public weather station reported 3.35 inches of rainfall in 1 hour near Las Campanas. Video showed flash flood waters flowing quickly over East Sunrise Road northwest of Santa Fe, making it impassable. The water depth was reported to be between 1 and 1.5 feet.
Santa Fe	Flash Flood	7/5/2018	Flash flooding in the area of Agua Fria and Upper Hills. Roads closed.
Santo DOMINGO	Flash Flood	8/16/2012	The New Mexico Rail Runner suspended operations around 6pm as a southbound train was stranded near Pena Blanca due to flash flooding beneath a large rail bridge. There was significant flash flooding observed in nearby low lying areas along the rail tracks. This event garnered significant local media attention and numerous You Tube videos were posted capturing the dramatic flooding around the area.
Santo Domingo Pueblo	Flash Flood	7/8/2014	Local news reporting that flood waters washed away a main road on the Santo Domingo Pueblo leading to Sile. The rushing flood waters crushed the metal culverts meant to transport water underneath the roadway.
Tesuque	Flash Flood	7/26/2022	Heavy rain in the Tesuque and Chupadero areas resulted in flash flooding. North-northwest of Tesuque, an arroyo overflowed its banks and flooded a backyard near the intersection of Tesuque Village Road and Highway 592. Flash flooding and mud flow also trapped 15 cars in a Tesuque market. Near Chupadero, the emergency manager reported that water over Rio En Medio Road in six locations along roadway.

Table 5: Disaster Declarations in the Watershed

Date of Declaration	Watershed Counties Declared	For Hazard
2015	Sandoval, San Miguel, and Santa Fe	Severe Storms and Flooding
2017	Sandoval	El Cajete Fire
2022	Los Alamos and Sandoval	Wildfires, Straight-Line Winds, Flooding, Mudflows, and Debris Flows
2022	San Miguel	Hermit's Peak Calf Canyon Fire
2022	San Miguel	Wildfires, Straight-Line Winds, Flooding, Mudflows, and Debris Flows
2023	San Miguel	Las Tusas Fire
2026	San Ildefonso Pueblo and Sandoval	Severe Storms and Flooding

Figure 6: Single Claims in the Watershed



Total NFIP Insurance Claims by Community	
Community	**Claims**
Bernalillo County	73
Los Alamos County	5
San Miguel County	56
Santa Fe County	27
Sandoval County	20

Map Symbology

- Community
- Watershed Boundary: HUC8
- County Boundary
- Tribal

Roads

- Interstate
- State Highway
- US Highway

Note: NFIP Claim information is only available at the Community/County level.

Claims Activity

RIO GRANDE SANTA FE WATERSHED, NEW MEXICO
HUC 13020201 This Exhibit is for Illustrative Purposes Only

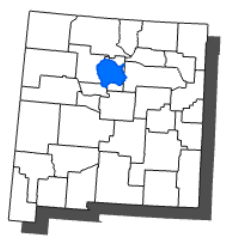
September 2026

N

EARTH DATA ANALYSIS CENTER FEMA

10 5 0 10 Miles

Project Location



Topographic Data
Recent acquisitions of topographic data have been made for this watershed. Lidar data collected in 2014, 2017, and 2018, cover 100% of the area of the watershed.

Figure 7 provides a snapshot of CNMS factors for each stream segment, the HUC 12 risk decile, and the availability of topographic data.

Congressional Involvement
Senator Ben Ray Luján serves on the Committee on Commerce, Science, and Transportation the Committee on Finance; the Committee on Agriculture, Nutrition, and Forestry; the Committee on Indian Affairs; and the Committee on the Budget. Senator Luján grew up in Nambé, a small community within the Upper Rio Grande Watershed. Senator Luján is a long-time advocate for New Mexico's acequias and traditional lands. Senator Martin Heinrich serves on the Committee on Energy and Natural Resources; the Committee on Appropriations and serves on the Senate Appropriations Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Subcommittee; the Interior, Environment, and Related Agencies Subcommittee; and the Military Construction, Veterans Affairs, and Related Agencies Subcommittee. Representative Melanie Stansbury serves on the House Committee on Natural Resources, House Committee on Oversight and Government Reform.

Significant streams in this watershed include the Alamo Canyon, Frost Arroyo, Las Huertas Creek, Pajarito Canyon Creek, Rio Grande, Rito de los Frijoles, and San Pedro Creek. In addition significant streams, The USGS provides a National Hydrologic Dataset (NHD) that can be used to identify stream miles that reflect drainage areas of one square mile from available topographic data. The NHD stream mileage may be used to gain a sense of the total potential stream miles for a watershed.

The Coordinated Needs Management Strategy (CNMS) Inventory provides a snapshot of the status and attributes of currently studied streams existing within FEMA's floodplain study inventory. In general, the stream mileage shown in CNMS reflects streams with an approximately one-mile drainage area and that currently have effective Special Flood Hazard Areas (SFHA) designated for them. CNMS does not reflect the total potential of stream miles to be studied within a watershed.

In addition to listing the miles of studied stream within a watershed, CNMS documents certain physiological, climatological, or engineering methodological factors that may have changed since the date of the effective study. The stream miles shown in CNMS are attributed with an evaluation of a Validation Status and Status Type that allows an examination of the condition of a given study or group of studies. Studies which are considered Valid in CNMS are the only studies which contribute to the New Validated or Updated Engineering (NVUE) metric.

The NVUE metric is used as an indicator the status of studies for FEMA's mapped SFHA Inventory. Those studies which are categorized as 'unverified', typically indicate that there are some factor of change since the SFHA became effective or may have a deficiency warranting restudy. CNMS stream mileage categorized as 'Requires Assessment' require further input to determine their validity – often because they represent paper inventory or non-modernized studies. CNMS aids in identifying areas to consider for study during the Discovery process by highlighting needs on a map, quantifying them (mileage), and providing further categorization of these needs in order to differentiate factors that identify the needs.

Table 6 compares the NHD data to the CNMS data and summarizes the Validated NVUE stream mileage from CNMS for the watershed.

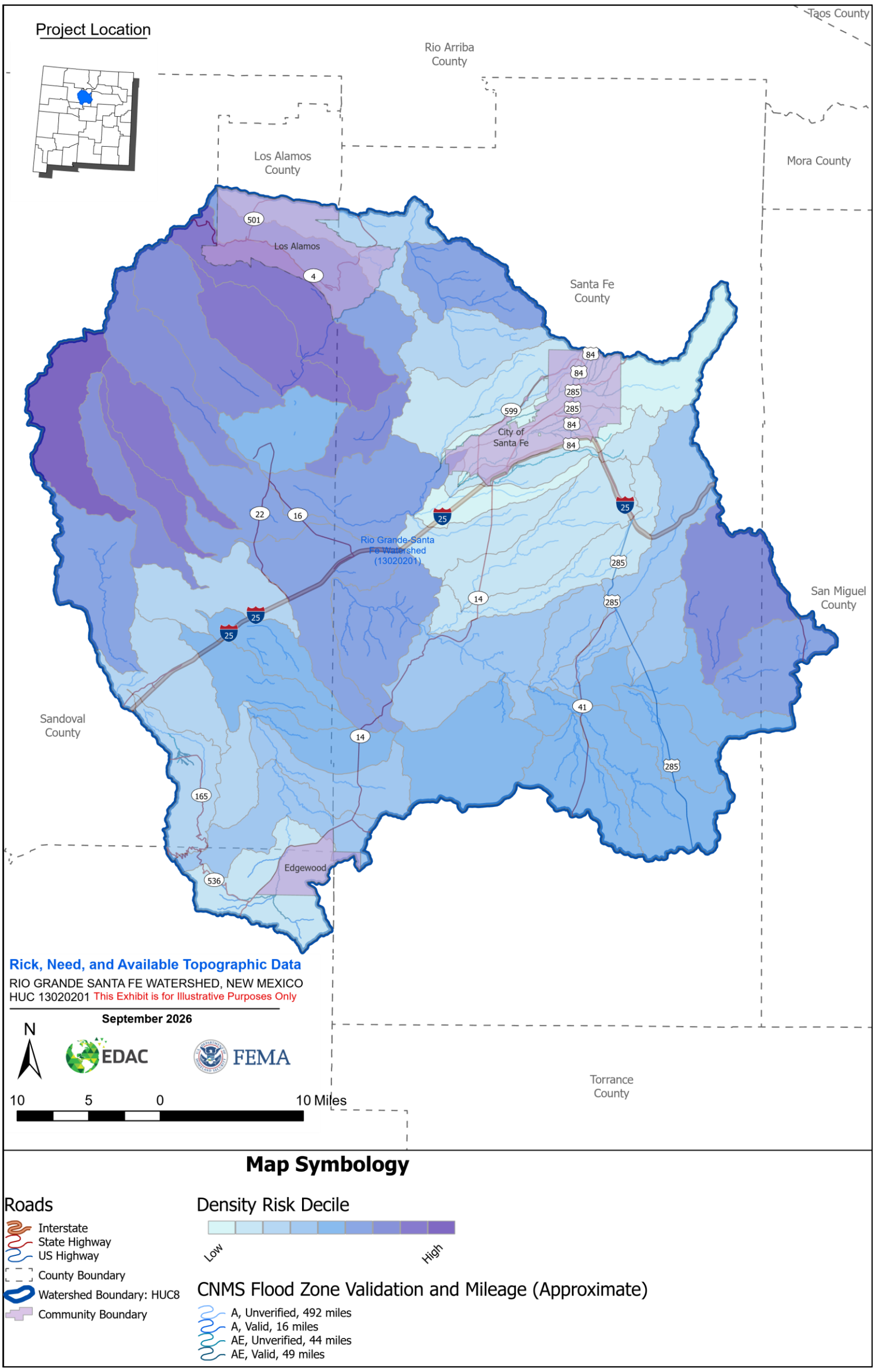
Table 6: NVUE Approximate Stream Mileage in the Watershed

NVUE Validation	Stream Miles
NHD Streams (streams with a drainage area of greater than one square mile)	**467**
CNMS Streams (streams with effective SFHA)	**596.9**
Stream Miles not accounted for in CNMS	**0**
CNMS Valid Zone AE / AH	2.9
CNMS Valid Zone A	0
CNMS Unverified Zone AE / AH	0
CNMS Unverified Zone A	594
CNMS Zone AE / AH Requiring Further Assessment or in the process of being studied	0
CNMS Zone A Requiring Further Assessment	0
All Stream Miles not accounted for in CNMS as there are no effective SFHAs (sum of the below)	0
Stream Miles not accounted for in CNMS that would fall in land that *could be* developed	0
Stream Miles not accounted for in CNMS that would fall in land that *could not be* developed	0

Within the Rio Grande Santa Fe Watershed and using these criteria from CNMS, approximately *492.79* miles of Zone A and 44.36 miles of Zone AE areas were identified as being unverified. Streams included in the unverified grouping include Alamo Canyon, Alamo Creek, Arroyo Hondo, Galisteo Creek, Rio Grande, and Santa Fe River with approximately 44.36 miles of Zone AE flagged as requiring further assessment or are in the current process of being studied with on-going projects. Additionally, 48.60 miles of Zone AE in the watershed were characterized as being Valid under the NVUE metrics.

Figure 7 provides a snapshot of CNMS factors for each stream segment, the HUC 12 risk decile, and the availability of topographic data.

Figure 7: Risk, Need and Available Topographic Data



II. Discovery Efforts

i. Engagement Plan

Pre-Discovery Community Engagement

Table 7 provides the members of the Regional Project Team was made up of the following staff.

Table 7: Regional Project Team

Organization	Name	Project Role
FEMA R6	Tiffany Comiskey	Project Monitor
FEMA R6		Tribal Liaison and Mitigation Planning
FEMA R6		Floodplain Management & Insurance
State of New Mexico	Laura Manghram	State Floodplain Coordinator
State of New Mexico	Yolanda Buckles	State Hazard Mitigation Officer
Earth Data Analysis Center	Shawn L. Penman	CTP Coordinator

FEMA and the Regional Project Team were in contact with all Watershed stakeholders via letters, email, and phone calls before this Discovery meeting to request local participation. In addition to assisting scheduling the meeting, locals were asked to help identify additional key people who should be included in the Discovery process and acquire any data that will assist in the risk identification and assessment for the Rio Grande Santa Fe Watershed. A detailed list of Communities, local officials, federal, state and regional agencies that were invited to participate in the Discovery Process is included with the supplemental digital data accompanying this report.

In preparation for the Discovery meeting, the Regional Project Team:

- Gathered information about local flood risk and flood hazards
- Reviewed mitigation plans to understand local mitigation capabilities, hazard risk assessments, current or future mitigation activities, and areas of mitigation interest
- Encouraged communities within the watershed to develop a vision for the watershed's future
- Used all information gathered to determine which areas of the watershed may require further study through a Risk MAP project

The Regional Project Team began outreach efforts to the local governments within the Watershed, Congressional and public officials, to inform them of the Discovery process and to invite them to participate and contribute information about the Watershed about water resource concerns. The following are key steps that were taken before the Discovery workshops:

Discussions are being held with these agencies about potential partnership opportunities, as well as their help in identifying flood risk throughout the watershed.

Table 8: FEMA History of Engagement

*

Community Name	Type of Engagement	Date	Agency
Bernalillo County	CAV	2024-ongoing	NMDHSEM/FEMA
Los Alamos County			
San Miguel County	CAC	2023	NMDHSEM/FEMA
Santa Fe County	CAV	2016	NMDHSEM/FEMA
Sandoval County			

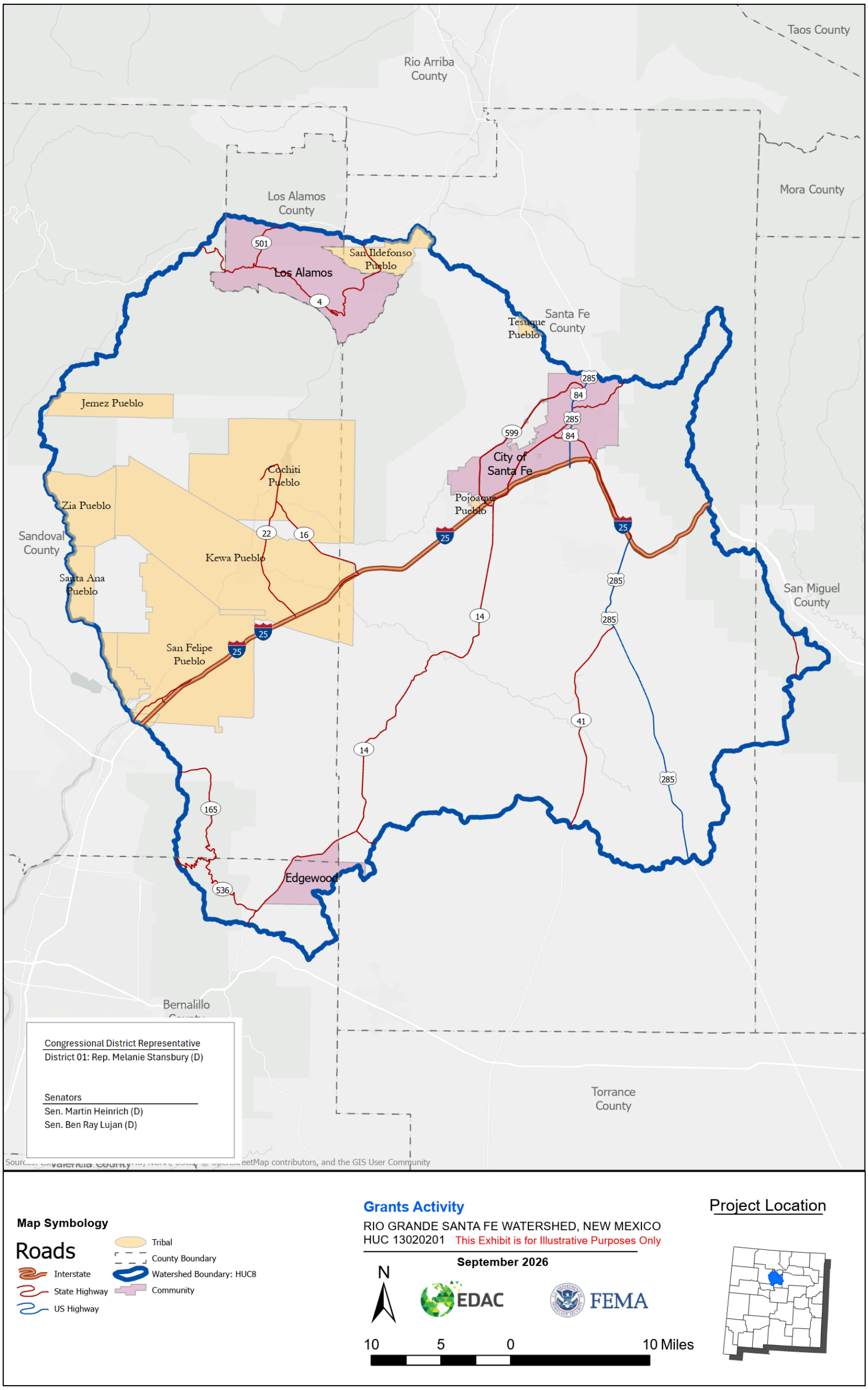
Meetings or other FEMA engagement activities that have occurred in the watershed in the past 10 years.

Table 9: Mitigation Plan Status

Community Name	Community Mitigation Action:	Hazard Mitigation Plan Name:	Plan Status:	Plan Approved	Plan Expires
Bernalillo County		Albuquerque/Bernalillo County 2022 Hazard Mitigation Plan	Approved	1/18/2022	1/17/2027
City of Santa Fe		City of Santa Fe Mitigation Plan	Expired	1/12/2021	1/11/2026
Santa Fe County		Santa Fe County Hazard Mitigation Plan	Approved	7/8/2025	7/7/2030
Los Alamos County		Los Alamos County Local Hazard Mitigation Plan	Approved	4/17/2024	4/16/2029
San Miguel County		San Miguel County All Hazard Mitigation Plan	Approved	7/8/2025	17/7/2030
Sandoval County		Sandoval County Multi-Jurisdictional Hazard Mitigation Plan	Update In Progress		

Figure 8 displays the locations and types of mitigation grant activity in the Rio Grande Santa Fe Watershed which have been approved by FEMA. This map only shows approved grant activity. There may be additional grants being pursued at both the state and local level within the watershed.

Figure 8: Grants Activity



Pre-Discovery Congressional and Media Engagement

In order to achieve success with any Region 6 Risk MAP project, members of Congress and their staff members, as well as the media must be aware and understand the study process. Working with FEMA External Affairs to inform both legislators and the media will improve credibility and opens the door to understanding risk in a more holistic, comprehensive manner. An initial contact briefing of the legislators will occur approximately 8 weeks prior to the Discovery meeting.

Table 10: Congressional Information

U.S. Senator		Term Expiration	FEMA History of Engagement
Martin Heinrich		2031	
Ben Ray Luján		2027	
U.S. Representative	**District Number**	**Term Expiration**	**FEMA History of Engagement**
Melanie Stansbury	1	2027	

State Representatives	
District	**Name**
22	Stefani Lord
43	Christine chandler
45	Linda Serrato
46	Andrea Romero
47	Reena Szczepanski
48	Tara Lujan
50	Matthew McQueen
65	Derrick Lente
70	Anita Gonzales

State Senatprs	
District	**Name**
5	Anthony L. Thornton
6	Roberto Gonzales
8	Pete Campos
9	Cindy Nava
19	Anthony Thornton
22	Benny Shendo, Jr.
24	Linda Trujillo
25	Peter Wirth
39	Elizabeth Stefanics

Contact information for the community and additional stakeholders can be found with the supplemental digital data.

ii. Pre-Discovery Data Collection

Table 11: Data Collection for the Watershed

Data Types	Deliverable/Product	Source
Average Annualized Loss Data	Discovery Map Geodatabase	FEMA Region VI
Boundaries: Community	Discovery Map Geodatabase	RGIS
Boundaries: County and State	Discovery Map Geodatabase	RGIS
Boundaries: Watersheds	Discovery Map Geodatabase	RGIS
Census Blocks	Discovery Map Geodatabase	U.S. Census Bureau
Contacts	Table	Local Web Sites, State/FEMA Updates
Community Assistance Visits	Discovery Report	New Mexico Department of Homeland Security and Emergency Management, State Floodplain Coordinator
Community Rating System (CRS)	Discovery Report	FEMA's "Community Rating System Communities and Their Classes"
Dams and Levees	Discovery Map Geodatabase	National Inventory of Dams USACE National Levee Inventory USACE

iii. Discovery Meeting

A two-hour Discovery meeting or workshop will be held September 4, 2024. Workshop times and locations are shown in Table 12. Each Workshop site was prepared with a series of stations, envisioned to be an interactive setting for the Regional Project Team and Discovery Workshop attendees listen, discuss and document any issues for the Watershed.

Table 12: Project Discovery Workshop Times and Locations

Workshop	Date and Time	Location
1	November 19, 2026 1:00-3:00 PM	New Mexico State Library Pinon Room 1209 Camino Carlos Rey Santa Fe, NM 87507

CTP personnel will greet each attendee as they arrive. Attendees will be rotated around the following four Discovery stations:

- Community Benefits and Grant Opportunities *(Grants station)* – Maps of current floodplain-related grants; risk, needs and topographic availability; RL/SRL properties; letters of map change (LOMCs); urban changes over the last 5 years; and single claims. The station also had handouts on various FEMA grant programs.
- Mitigation Planning and Mitigation Activities *(Planning station)* – Handouts on mitigation plans, understanding Risk MAP and determining risk.
- NFIP Community Actions *(Compliance and Mitigation station)* – Effective FIRMs, FIS and LOMCs; maps of RL/SRL properties; single claims; and urban changes over the last 5 years.
- Risk Identification and Communication *(Mapping station)* – Maps of risk/need/topographic availability, LOMCs, population density in the watershed, urban change in the watershed, estimated dollar exposure of parcels near SFHA areas, high-water marks and low water crossings.

At each station, attendees were asked to actively contribute information about concerns in the Watershed by identifying a relevant location on the large watershed map and then providing a short explanation on the comment form. The activity at the stations was intended to be interactive where attendees and staff at the stations work together to listen, discuss and document any topical items for the watershed. Members of the Regional Project Team (State of New Mexico and CTP) were at the stations to answer questions and engage the attendees. During each workshop, Regional Project Team members requested that attendees provide any additional information within 2 weeks of the workshop.

Each station will be equipped with a series of large-format watershed maps with an aerial photo of the Watershed displayed, along with community boundaries and road names to assist in identifying areas of concern. Additionally, the stations had several 11-inch by 17-inch laminated maps of the watershed with information related to that station's content.

Information sheets were collected at each station for locations that were identified and labeled on the Discovery watershed maps. These information sheets are included in the external files included with this report.

iv. Discovery Implementation (TO BE COMPLETED POST-DISCOVERY)

All Discovery Workshops were attended by local stakeholders. A full list of attendees is provided in the sign-in sheets included with the supplemental digital data accompanying this report. Some attendees included:

- Local community elected officials and councilpersons
- Local floodplain managers, emergency management staff, community planners, public works staff
- Add other notable attendees

The Workshops afforded personal, interactive communication with attendees at each station. The Project Team interviewed attendees and discussed areas of positive mitigation and areas of continuing concern for the Watershed as a whole. As attendees visited each station, they not only discussed their own local concerns but also listened to the concerns of others in the Watershed.

Attendees were polled by the FEMA Project Monitor as they exited the Workshop. Verbal feedback from the attendees indicated they felt the Workshop was an opportunity to express their issues and concerns for the Watershed. Many attendees were appreciative of the chance to speak with the various Regional Project Team members from FEMA and the State of New Mexico. The community perception conveyed to FEMA was that attendees felt more engaged in the process to determine where needs and projects may be identified.

v. Data Gathering Overview

Information about the Rio Grande Santa Fe Watershed was gathered both prior to the Discovery Workshops and interactively during the Workshop. Much of data collected in pre-discovery was obtained from FEMA or other national datasets. Additional data was collected from NMRGIS and local communities via their public web sites. Table 13 summarizes the data collected prior to the Discovery Workshop and the primary sources of the data.

During the pre-discovery process phone calls were made to local FPAs, Emergency Managers, and Mitigation planners to collect current and proposed mitigation actions. This data was collected in spreadsheets and will be used by FEMA to track mitigation actions within the region. The final spreadsheets are included in the supplemental digital data.

Table 13: Data Collection Summary – Pre-Discovery Workshop

Data Location	Data Custodian	Data Set Description
Watershed-wide	FEMA	Effective FIRM and FIS and backup information available from FEMA's Map Service Center and FEMA Library
Watershed-wide	FEMA	LOMC locations from FEMA's Map Service Center and FEMA Library
Watershed-wide	FEMA	Locations of RL/SRL properties and Claims
Watershed-wide	FEMA	Location of Grants being funded
Watershed-wide	FEMA	Participation in the NFIP, Community Rating System (CRS) ratings
Watershed-wide	FEMA	Disaster Declarations
Watershed-wide	FEMA	CNMS information
Watershed-wide	FEMA	AAL data
Watershed-wide	FEMA	Approved HMPs
Watershed-wide	FEMA, RGIS	Location of available or planned areas of updated LiDAR or other topographic data
Watershed-wide	U.S. Census, RGIS	Transportation features

Data Location	Data Custodian	Data Set Description
Watershed-wide	FEMA, U.S. Census, RGIS	Populated places and population characteristics
Watershed-wide	USGS	Watershed HUC (8 & 12) boundaries, NHD streams, stream gage information, land use and land cover
Watershed-wide	USDA	NAIP Imagery
Watershed-wide	Local FPAs, Mitigation Planners and Emergency Managers, FEMA	Mitigation Actions identified by local stakeholders and collected by phone call

At the Discovery Workshop stations, attendees completed data information sheets and placed stickers on the hard copy maps to identify the approximate locations of their concern within the Watershed. This information was later captured in GIS format (ESRI Personal Geodatabase, point features named "*Other_Community_Concerns")* and the data from the forms was matched with each point location on the watershed maps. Data from all of the stations were compiled into a single data set. The watershed collection maps with the sticker locations as well as the individual comment forms are included in the supplemental digital data accompanying this report.

Table 14 summarizes the comments that were made at each of the stations. If the same comment was made at different stations by the same attendee, it is only listed once. If multiple attendees made the same comment, the "Information Provided By" column lists more than one attendee. Item numbers tie directly back to the GIS data and the data collection sheets. In addition, data collected in pre-Discovery from Santa Fe County and from calls with local community officials have also been placed in GIS format and are shown on the watershed collection. Discovery data collection continued after the Discovery Workshop as additional datasets were provided. This data set are also included in Table 14. Some comments collected at the Discovery Workshop reflect on areas outside of the Rio Grande Santa Fe Watershed. This information was collected for future use in future Discovery efforts and is noted below.

Table 14: Data Collection Summary - During and After Discovery Workshop

Item	Flooding Source	Information Provided By	Discovery Workshop Comment Summary

III. Watershed Findings

Figure 9: Repetitive and Severe Repetitive Losses

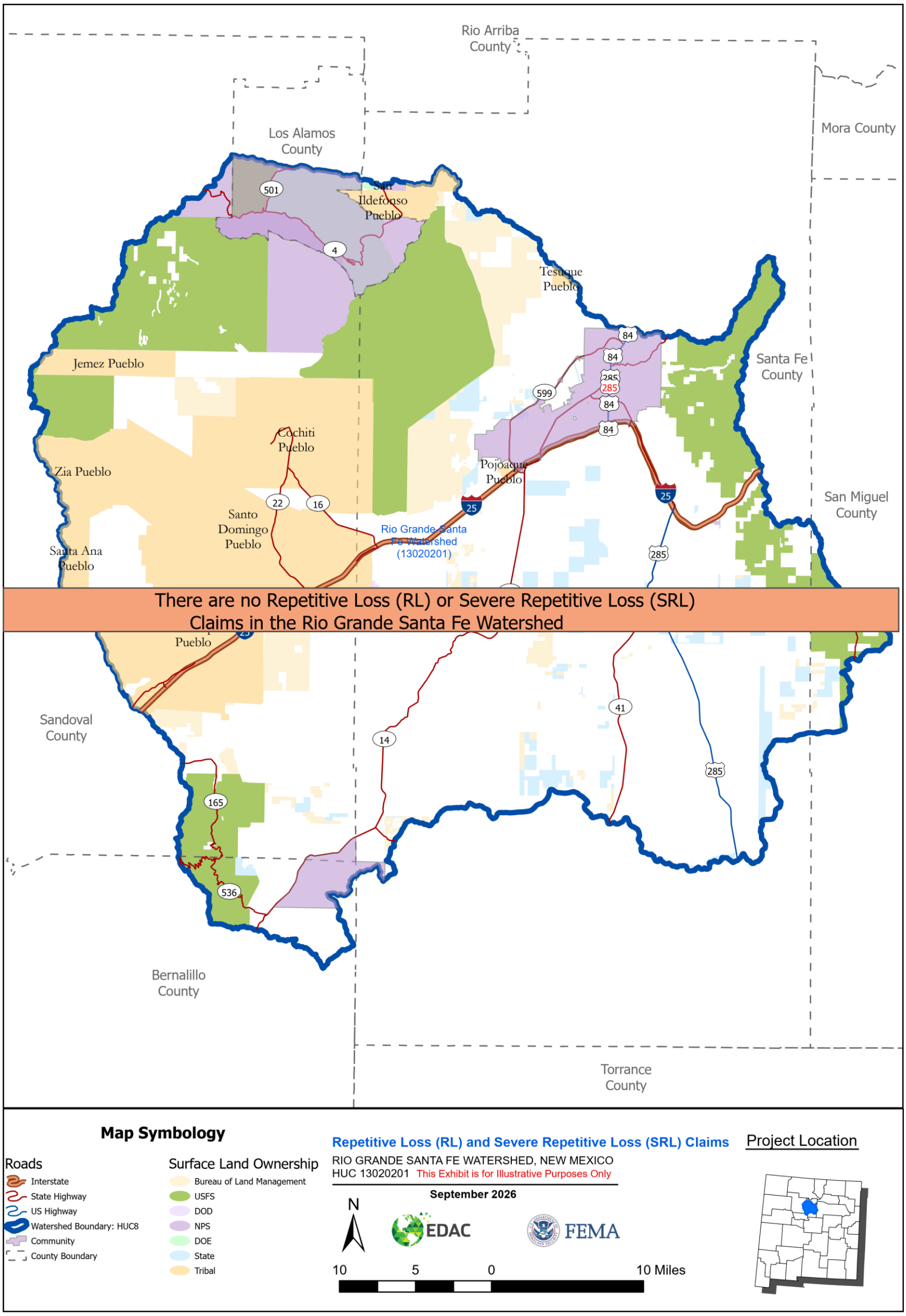
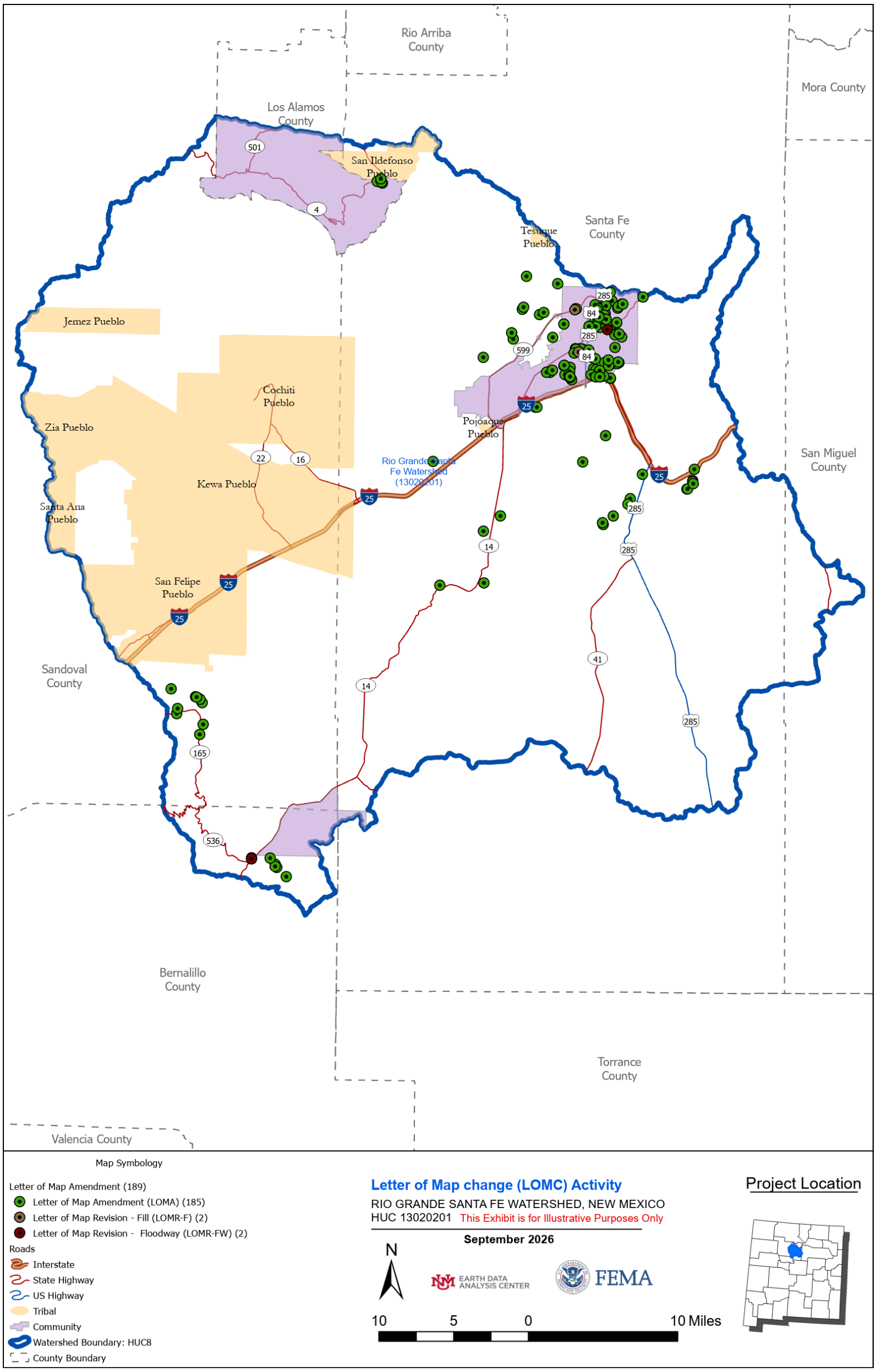


Figure 10: Letter of Map Changes (LOMCs)



i. Pre-Discovery Hydrology

Two limited reviews of hydrologic information were performed for Discovery analysis within the Rio Grande Santa Fe Watershed. The reviews were kept at a high level of informational research and were performed by senior engineering staff that relied on engineering judgment, some limited analysis, and regional experience. These reviews were focused on:

- Review of Peak Discharges in the watershed
- Limited Gage analysis for the watershed

For the watershed as a whole, the **one-percent** annual chance peak discharges were reviewed for all streams within a community and across community boundaries looking for discharge anomalies, places where LOMRs demonstrate that the effective discharges may be suspect on a more global basis. Any notes were added if these changes can be eliminated as a concern due to hydrologic factors including local flood control structures, detention, flow break outs, sinks or other natural or manmade factors that may significantly alter hydrology flows. Finally, a watershed wide high-level gage analysis was reviewed comparing the information on any available gages within the watershed that had appropriate historical information to the effective FIS, discharges for streams with gages. This analysis could potentially flag any anomalies that would indicate that the hydrology may be out of date, too high, or too low for sub-basin areas within the watershed.

Review of Peak Discharges

Peak discharges were reviewed based on available FIS reports, hydraulics models, flow gages and available LOMRs within the watershed at the crossing of SHFA areas at corporate limits (county, city and town). A comparison of discharges was made for the same streams across county boundaries as shown in Table 15, Discharge Comparison at Community Limits.

Table 15: Discharge Comparison at Community Limits

Stream Name	County/Parish	Effective one-percent annual chance discharge (cfs)	Effective Discharges Source	Notes
No discharge across a county boundary or community limits				

Frequency Analysis

The BLE Analysis for the Rio Grande Santa Fe Watershed generated the hydrologic analysis shown in Table 16: Summary of Hydrologic Analysis.

Table 16: Summary of Hydrologic Analysis

HUC 10	Drainage Area (mi^2)	Lower Limit (cfs)	Q1% (cfs)	Upper Limit (cfs)	2D Model flow (cfs)
1302020101 - Santa Fe River	231.0	5,950	10,488	30,059	10,018
1302020102 - Canada Ancha-Rio Grande	67.5	1,080	3,620	12,100	3,752
1302020103 - Headwaters Galisteo Creek	350.2	3,680	11,300	41,300	13,185
1302020104 - Outlet Galisteo Creek	669.9	2,638	3,376	5,619	3,016
1302020105 - Arroyo Tonque	193.8	2,720	9,110	30,500	9,204
1302020106 - Arroyo Tonque-Rio Grande	75.3	1,930	6,480	21,700	6,776

ii. Pre-Discovery Hydraulics and Floodplain Analysis

A Base Level Engineering (BLE) analysis for the Rio Grande Santa Fe Watershed Hydrologic and hydraulic computations and analyses for the BLE study consisted of determining discharges and calculating Water Surface Elevations (WSELs) for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events, as well as the 1-percent plus and minus events.

Table 17 shows the hydraulic analyses used for streams studied by enhanced methods.

Table 17: Summary of Hydraulic Analysis

Stream Name	Validation Status	Date of Effective Analysis	Hydrology Model	Hydraulic Model
Alamo Canyon	Unverified	8/1/1980	Unknown	Unknown
Alamo Creek	Unverified	10/31/1986	Possibly Regression Equations	Possibly HEC-2
Apache Canyon River	Unverified	10/31/1986	Possibly Regression Equations	Possibly HEC-2
Arroyo Barranca	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo Calabasas	Unverified	10/31/1986	Possibly Regression Equations	Possibly HEC-2
Arroyo Chorro	Unverified	10/31/1986	Possibly Regression Equations	Possibly HEC-2
Arroyo Colorado	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Coyote	Unverified	8/1/1980	Unknown	Unknown
Arroyo Cuchillo	Unverified	8/1/1980	Unknown	Unknown
Arroyo De La Jara	Unverified	10/31/1986	Unknown	Unknown
Arroyo De La Paz	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo De La Piedra	Valid	5/23/2019	Regression Equations	HEC-RAS 5.0
Arroyo De La Piedra	Valid	1/31/1978	OTHER	HEC-2
Arroyo De La Piedra	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo De La Piedra	Valid	2/21/2014	HEC-HMS	HEC-RAS 4.1
Arroyo De La Tierra Blanca	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo De La Vaca	Unverified	10/31/1986	Unknown	Unknown
Arroyo De La Vega De Los Tanos	Unverified	8/1/1980	Unknown	Unknown
Arroyo De Los Amigos	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1

Stream Name	Validation Status	Date of Effective Analysis	Hydrology Model	Hydraulic Model
Arroyo De Los Amigos	Unverified	10/31/1986	Unknown	Unknown
Arroyo De Los Antores	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo De Los Chamisos	Unverified	10/31/1986	Unknown	Unknown
Arroyo De Los Chamisos	Unverified	10/31/1986	Bulletin 17B	HEC-2
Arroyo De Los Chamisos	Unverified	12/31/2010	Unknown	Unknown
Arroyo De Los Chamisos	Valid	1/2/2020	Bulletin 17B	HEC-RAS 5.0
Arroyo De Los Chamisos	Unverified	2/16/1999	Other	Unknown
Arroyo De Los Chamisos	Unverified	1/31/1978	Other	HEC-2
Arroyo De Los Chamisos North Fork	Valid	12/31/2010	Other	Unknown
Arroyo De Los Chamisos North Fork	Valid	1/11/2007	Other	Unknown
Arroyo De Los Chamisos North Fork	Valid	2/16/1999	Other	Unknown
Arroyo De Los Chamisos North Fork	Valid	1/31/1978	Other	HEC-2
Arroyo De Los Frijoles	Valid	6/28/2018	Regression Equations	HEC-RAS 5.0
Arroyo de Los Lovatos	Unverified	10/31/1986	Unknown	Unknown
Arroyo De Lucero	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Del Carricito	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Del Carricito Tributary	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Del Ojo De La Circuela	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Del Ojo Del Orno	Unverified	12/22/2011	AHYMO 97	HEC-RAS 4.0
Arroyo Del Oso	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0

Stream Name	Validation Status	Date of Effective Analysis	Hydrology Model	Hydraulic Model
Arroyo del Rosario	Valid	8/24/2009	Regression Equations	HEC-RAS 4.0
Arroyo Del Rosario	Unverified	10/31/1986	Unknown	Unknown
Arroyo Del Tuerto	Unverified	8/1/1980	Unknown	Unknown
Arroyo En Medio	Unverified	10/31/1986	Unknown	Unknown
Arroyo En Medio	Unverified	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo En Medio	Valid	2/11/2015	HEC-HMS	Unknown
Arroyo Hondo	Unverified	10/31/1986	Unknown	Unknown
Arroyo Hondo	Unverified	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo Hondo	Valid	12/31/2010	HEC-HMS	HEC-RAS 5.0.3
Arroyo Hondo Split Flow	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo Mascaras	Valid	1/31/1978	Other	HEC-2
Arroyo Mascaras	Valid	1/31/1978	Other	HEC-2
Arroyo Montoso	Unverified	8/1/1980	Unknown	Unknown
Arroyo Puertacito De Lo Salado	Unverified	10/31/1986	Unknown	Unknown
Arroyo Ranchito	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo Saiz	Unverified	12/31/2010	HEC-HMS	HEC-RAS 4.1
Arroyo Saiz	Unverified	11/30/2005	Regression Equations	HEC-RAS 3.1.3
Arroyo Tetilla	Unverified	10/31/1986	Unknown	Unknown
Arroyo Tonque	Unverified	8/1/1980	Unknown	Unknown
Arroyo Torreon	Valid	1/31/1978	OTHER	HEC-2
Arroyo Torreon	Unverified	10/31/1986	Unknown	Unknown
Arroyo Tyerto	Unverified	10/31/1986	Unknown	Unknown
Arroyo Una De Gato	Unverified	8/1/1980	Unknown	Unknown
Arroyo Val Verde	Unverified	8/1/1980	Unknown	Unknown
Arroyo Viejo	Unverified	10/31/1986	Unknown	Unknown
Bonanza Creek	Unverified	10/31/1986	Unknown	Unknown
Canada Ancha	Valid	1/31/1978	Other	HEC-2
Canada Ancha	Unverified	10/31/1986	Unknown	Unknown
Canada Ancha	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
Canada De La Cueva	Unverified	10/31/1986	Unknown	Unknown
Canada De La Vaca	Unverified	10/31/1986	Unknown	Unknown
Canada De Los Alamos	Unverified	10/31/1986	Unknown	Unknown
Canda Del Buey, Trib 1,2,3	Unverified	8/31/2000	Unknown	Unknown
Canada Del Medio	Unverified	10/31/1986	Unknown	Unknown

Stream Name	Validation Status	Date of Effective Analysis	Hydrology Model	Hydraulic Model
Canada Del Rancho	Unverified	10/31/1986	Unknown	Unknown
Canada Estacada	Unverified	10/31/1986	Unknown	Unknown
Canada Rincon	Valid	1/31/1978	Other	HEC-2
Canada Rincon	Valid	8/25/2009	Other	Unknown
Canada Rincon	Unverified	10/31/1986	Unknown	Unknown
Canon Del Agua	Unverified	8/1/1980	Unknown	Unknown
Capulin Canyon	Unverified	8/1/1980	Unknown	Unknown
Cienega Creek	Unverified	10/31/1986	Unknown	Unknown
Cochiti Rio Canyon Chiquito	Unverified	8/1/1980	Unknown	Unknown
Cunningham Creek	Unverified	10/31/1986	Unknown	Unknown
East Arroyo De La Piedra	Unverified	12/31/2010	HEC-HMS	HEC-RAS 4.1
Frost Arroyo	Valid	11/30/2010	Regression Equations	HEC-RAS 4.1
Frost Arroyo	Valid	12/31/2007	Regression Equations	HEC-RAS (1D)
Galisteo Creek	Unverified	10/31/1986	Unknown	Unknown
Galisteo Creek	Unverified	12/31/2010	Regression Equations	HEC-RAS 4.1
Gallina Arroyo	Unverified	10/31/1986	Unknown	Unknown
Gaviso Arroyo	Unverified	10/31/1986	Unknown	Unknown
Hondo Canyon	Unverified	8/1/1980	Unknown	Unknown
Jemez River	Unverified	8/1/1980	Unknown	Unknown
Las Huertas Creek	Unverified	8/1/1980	Unknown	Unknown
Lummis Canyon	Unverified	8/1/1980	Unknown	Unknown
Mcclure Reservoir	Unverified	10/31/1986	Unknown	Unknown
NE Arroyo De Los Pinos	Valid	12/31/2010	HEC-HMS	HEC-RAS 4.1
NE Arroyo De Los Pinos	Unverified	12/31/2010	Other	Unknown
Nichols Reservoir	Unverified	10/31/1986	Unknown	Unknown
NP	Valid	11/30/2010	Regression Equations	HEC-RAS 4.1
Pajarito Canyon Creek	Unverified	8/31/2000	Unknown	Unknown
Peralta Canyon	Unverified	8/1/1980	Unknown	Unknown
Rio Grande	Unverified	10/31/1986	Unknown	Unknown
Rio Grande	Unverified	8/1/1980	Unknown	Unknown
Rio Grande	Unverified	8/31/2000	Unknown	Unknown

Stream Name	Validation Status	Date of Effective Analysis	Hydrology Model	Hydraulic Model
Rito De Los Frijoles	Unverified	8/1/1980	Unknown	Unknown
San Marcos Arroyo	Unverified	10/31/1986	Unknown	Unknown
San Marcos Arroyo	Unverified	12/31/2010	Regression Equations	HEC-RAS 4.1
San Pedro Creek	Unverified	8/1/1980	Unknown	Unknown
San Pedro Creek	Valid	12/31/2007	Regression Equations	HEC-RAS (1D)
Sanchez Canyon	Unverified	8/1/1980	Unknown	Unknown
Sandia Canyon Creek	Unverified	10/31/1986	Unknown	Unknown
Santa Fe River	Unverified	10/31/1986	Unknown	Unknown
Santa Fe River	Unverified	8/1/1980	Unknown	Unknown
Santa Fe River	Valid	8/5/2016	Regression Equations	HEC-RAS 4.1
Santa Fe River	Valid	12/21/2010	Regression Equations	HEC-RAS 4.0
Santa Fe River	Unverified	1/31/1978	Other	HEC-2
Santa Fe River	Valid	1/9/2013	Regression Equations	HEC-RAS 4.1
Santa Fe River	Valid	2/24/2011	Regression Equations	HEC-RAS 4.1
Santa Fe River	Unverified	11/30/2005	Regression Equations	HEC-RAS 3.1.3
Santa Fe River	Valid	11/30/2005	Regression Equations	HEC-RAS 3.1.3
Santa Fe River	Unverified	10/31/1986	Unknown	Unknown
Southwest San Felipe Ditch	Unverified	8/1/1980	Unknown	Unknown
SW Arroyo De Pinos	Unverified	12/31/2010	Other	Unknown
Tunnel Springs	Valid	12/22/2011	AHYMO 97	HEC-RAS 4.0
Water Street	Valid	11/30/2005	Regression Equations	HEC-RAS 3.1.3

iii. Pre-Discovery CNMS Analysis

Table 18 shows the detailed study streams in the Rio Grande Santa Fe Watershed that have failed one or more validation elements during the CNMS stream reach level validation process. The CNMS validation elements attempt to identify changes to the Physical Environment, Climate and Engineering Methodologies since the date of the Effective Analysis (different from the Effective issuance date). Per the CNMS validation process, the study is

considered as having a need or assigned an 'Unverified' status, if one of seven critical elements fail, or if four or more of the 10 secondary elements fail during stream reach level validation.

Table 18: CNMS Analysis

Stream Name	Validation Status	Failed CNMS Elements	Date Hydrology & Hydraulics Effective
Arroyo Colorado	Valid	S6	12/22/2011
Arroyo De La Tierra Blanca	Valid	S6	12/22/2011
Arroyo De Los Chamisos	Unverified	C6, S9	1/31/1978, 10/31/1986, 2/16/1999
Arroyo De Lucero	Valid	S6	12/22/2011
Arroyo Del Carricito	Valid	S6	12/22/2011
Arroyo Del Carricito Tributary	Valid	S4, S6	12/22/2011
Arroyo Del Ojo De La Circuela	Valid	S4, S6	12/22/2011
Arroyo Del Ojo Del Orno	Unverified	C5, S4, S6	12/22/2011
Arroyo del Oso	Valid	S6	12/22/2011
Arroyo En Medio	Unverified	C5, C6, S6	12/31/2010
Arroyo Hondo	Unverified	C5, S4, S6	12/31/2010
Arroyo Saiz	Unverified	C6, S6	11/30/2005, 12/31/2010
Canada Ancha	Valid	S6	1/31/1978
East Arroyo De La Piedra	Unverified	C5, S4, S6	12/31/2010
Frost Arroyo	Valid	S9	12/31/2007
San Pedro Creek	Valid	S9	12/31/2007
Santa Fe River	Unverified	C2, C7, S4, S9	1/31/1978
Tunnel Springs	Valid	S6	12/22/2011
Water street	Valid	S9	11/30/2005

Table 19 provides a description of the validation elements that failed as identified in the CNMS database.

Table 19: CNMS Category Descriptions

Element Name	Issue being identified by the Element	Element Description
C2	Hydrologic Gage Record	Failure of this element indicates that more than 10 years of additional stream gage data has become available since the original study, rendering the old flow calculations outdated.
C5	Current channel reconfiguration outside effective SFHA	Failure of this element indicates the streamline is seen on imagery as outside the SFHA and cannot be explained by a minor mapping error, which could be corrected through base fitting.
C6	Five or more new or removed hydraulic structures bridge/culvert) that impact BFEs	Failure of this element indicates that five new or removed hydraulic structures that impacts BFEs have been observed since the effective analysis was completed.
C7	Significant channel fill or scour	Failure of this element indicates a significant channel or scour has been identified.
S4	More than one and less than five new or removed hydraulic structures (bridge/culvert) impacting BFEs	This element identifies addition or removal of more than one, but less than five hydraulic structures along the studied streams since the date of the Effective Study.
S6	Better topographic or bathymetric data available	Failure of this element indicates better topographic or bathymetric data has been made available since the Effective Study date.
S9	New regression equations available	Failure of this element indicates new regression equations available.

Summary of CNMS Concerns

1. Bernalillo County contains 38.89 miles of streams with the Rio Grande Santa Fe Watershed. The county contains 8.3 miles of valid Zone AE, 16. 48 miles of valid Zone A, and 14.99 miles of assessed Zone X. Main streams are the San Pedro Creek and Frost Arroyo.
2. San Miguel County contains 32.54 miles of streams within the Rio Grande Santa Fe Watershed . The County contains 4.74 miles of unverified Zone A and has 27.8 miles of assessed Zone X.
3. Santa Fe County contains 303.7 miles of streams within the Rio Grande Santa Fe Watershed . The County contains 2.74 miles of valid Zone AE and 2.86 miles of unverified Zone AE and 42 miles of unverified Zone A. The County contains 668

miles of assessed Zone X. Main streams include Rio Grande, Santa Fe River, Rito de los Frijoles, and Alamo Canyon.

4. Sandoval County contains 884.59 miles of streams within the Rio Grande Santa Fe Watershed. The county contains 8.5 miles of valid Zone AE, 102.05 miles of unverified Zone A, and 668 miles of unverified Zone X. Main streams are Rio Grande, Las Huertas Creek, San Pedro Creek, and Arroyo Coyote.
5. Los Alamos County contains 94.82 miles of streams with the Rio Grande Santa Fe Watershed. The county contains 10.04 of verified Zone A and 87.79 miles of assessed Zone X. Mains streams are Rio Grande and Pajarito Canyon Creek.

IV. Watershed Options

In conjunction with the assessment of risk, need, and the availability of topographic data, as well as the input of stakeholders within in this Watershed, future projects within the Rio Grande Santa Fe Watershed are recommended. FEMA looks to promote mitigation action within the watershed.

Table 20 lists some potential needs in the Watershed and actions that could be taken under each of the four areas discussed during the Discovery meetings, including:

- Risk Identification and Communication – traditional flood studies and data updates
- NFIP Community Actions – insurance-related mitigation or information
- Mitigation Planning and Mitigation Actions – items related to planning updates
- Community Benefits and Grant Opportunities – outreach and disaster activities as well as non-flooding hazards like safe room information

Table 20: Potential Watershed Activities

Risk Identification and Communication
•
NFIP Community Actions
• Discuss the CRS program with interested communities
Mitigation Planning and Mitigation Actions
•
Community Benefits and Grant Opportunities
•

BFE = Base Flood Elevation
CAV = Community Assistance Visit
CFM = Certified Floodplain Manager
CLOMR = Conditional Letter of Map Revision
CNMS = Coordinated Needs Management Strategy
CRS = Community Rating System
DEM = Digital Elevation Model
FIRM = Flood Rate Insurance Map
FPA = Floodplain Administrator
G&S = FEMA's *Guidelines and Standards for Flood Hazard Mapping Partners*
H&H = hydrologic and hydraulic
Hazus = Hazards U.S.
HMP = Hazard Mitigation Plan
LiDAR = Light Detection and Ranging System
LOMR = Letter of Map Revision
LSU = Louisiana State University
NFIP = National Flood Insurance Program
NVUE = New, Validated, or Updated Engineering
PMRS = Physical Map Revision
Risk MAP = Risk Mapping, Assessment, and Planning
RL/SRL = Repetitive Loss/Severe Repetitive Loss
SFHA = Special Flood Hazard Area
SRA = Sabine River Authority
TNRIS = Texas Natural Resources Information System
TXDOT = Texas Department of Transportation
USGS = U.S. Geological Survey

Table 21 provides specific evaluation guidelines for streams or areas that could benefit from additional study. Any FEMA-based metrics that would be met if the need or issue was addressed are noted, as well as any current FEMA map actions that would affect the activity. Any comments or concerns raised by a stakeholder during the Discovery process that could be tied to one of the needs or actions for the Watershed are also noted. Some needs/actions are listed that were not raised by any specific community but were identified as general improvements that could be made in the Rio Grande Santa Fe Watershed to meet general FEMA regional goals.

Needs are identified as being on the critical path as high, medium, or low priority or as a task that could be assigned to a State or local community to complete. These definitions are also included in Table 21.

- **High** – The local community would immediately benefit from the action and FEMA's metrics would also be met.
- **Medium** – The local community would benefit over the longer term from the action and a portion of FEMA's metrics may be met.
- **Low** – The local community activities can continue without this revision and FEMA's metrics are not affected.

- **Community Action** – The activity would be more appropriate as a community-led action rather than a FEMA-led action.

Table 21 Metrics and Rankings of Needs

Item	Description of Need Evaluation Guide **High** – Local community would immediately benefit from the action, and FEMA's metrics would also be met **Medium** – Local community would benefit over the longer term from the action, and a portion of FEMA's metrics may be met **Low** – Local community activities can continue without this revision, and FEMA's metrics are not impacted **Community Action** – Activity would be more appropriate as a community-led action rather than a FEMA-led action		Impacts From Any Current Map Actions	FEMA Metric or Community Benefit	Evaluation	Relates to Community Comment Number
	Location of Need/Project	Details				
		•	•	•		
		•	•	•		

i. Project Prioritization

Flood risk projects are intended to be initiated and cataloged at a HUC-8 unit. This means that when a project is initiated, all flood hazards within the HUC-8 will be evaluated to determine the project scope within that HUC-8 boundary. Evaluation means that risk, need, available data, and desired output products are assessed for the entire HUC-8. Evaluation does not mean the actual development of new or updated flood risk products, only the assessment of what products would be required to fulfill the identified needs in light of the level of risk. Unmet needs must be cataloged in the Coordinated Needs Management Strategy Database (CNMS).

Once the entire HUC-8 has been evaluated, the Region will select the project tasks necessary to respond to the identified levels of risk and need. The Region is expected to maximize the amount and usefulness of project work to be performed in any HUC-8, but is not expected to perform every project task and meet all needs in every watershed. All scope with the HUC-8 boundary must be tasked/ordered at one time.