

# **ALAMOSA CITY COUNCIL Regular Meeting Agenda**

Council Chambers  
300 Hunt Avenue, Alamosa, CO  
July 6, 2016

***As a full service municipal government, our mission is to enhance the quality of life for our residents, visitors, and businesses. We strive to provide balanced business, employment, recreational, and residential opportunities.***

Any person needing reasonable accommodation to attend or participate in a public meeting, please contact the Alamosa City Clerk's office by telephone (719) 589-2593, by email [cityclerk@ci.alamosa.co.us](mailto:cityclerk@ci.alamosa.co.us), in person at 300 Hunt Avenue, or by mail at POB 419, Alamosa, CO 81101.

---

**5:30 PM - Work Session: CIP**

**7:00 PM - Regular Meeting**

**I. CALL TO ORDER AND PLEDGE OF ALLEGIANCE**

**II. ROLL CALL**

**III. AGENDA APPROVAL**

**IV. CITIZEN COMMENT**

Alamosa City Council welcomes your comments. Citizens wishing to speak may obtain and complete a speaker card through the City Clerk at the start of the meeting.

- A. Audience Comments
- B. Follow-Up

**V. CONSENT CALENDAR A**

The Consent Calendar allows multiple actions with one motion. Consent Calendar A contains routine items which have been recommended for action by staff or advisory boards. Council may remove a consent calendar item for separate consideration.

C.7.a. Approve Minutes of Meeting June 15, 2016

**VI. REGULAR BUSINESS**

**A. Presentations from Outside Agencies**

- 1. Valley Humane League
- 2. Alamosa High School Government Class

**B. Board/Commission Business**

- 1. Board/Commission Appointments

**C. Business Brought Forward by City Staff**

- 1. Police

- a. First Reading, Ordinance No. 14-2016, An Ordinance Approving An Intergovernmental Agreement with the Alamosa School District to Provide a School Resource Officer from the Alamosa Police Department to the Alamosa School District

**2. Fire**

- a. Letter of Intent to participate in the Alamosa County Hazard Mitigation Plan

**3. City Clerk/Municipal Court**

- a. Public Hearing and Second Reading, Ordinance No. 13-2016, An Ordinance Amending Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* to Allow for the Setting of the Nature and Amount of Court Costs By Resolution and Providing for Implementation of a Surcharge to be Utilized for the Operational Expense of the Police Department as Needed on Municipal Court Convictions (With the Exception of Parking Tickets and Dog Violations) Within the Jurisdiction of the City of Alamosa.

**D. Committee Reports**

**E. Staff Announcements**

**COUNCIL COMMENT**

**ADJOURNMENT**

**ALAMOSA CITY COUNCIL  
COUNCIL COMMUNICATION**

---

**Subject/Title:**

Approve Minutes of Meeting June 15, 2016

**ATTACHMENTS:**

| Description                        | Type       |
|------------------------------------|------------|
| 📎 Minutes of Meeting June 15, 2016 | Cover Memo |

# **ALAMOSA CITY COUNCIL**

## **Regular Meeting Minutes**

Council Chambers  
300 Hunt Avenue, Alamosa, CO  
June 15, 2016

***As a full service municipal government, our mission is to enhance the quality of life for our residents, visitors, and businesses. We strive to provide balanced business, employment, recreational, and residential opportunities.***

Any person needing reasonable accommodation to attend or participate in a public meeting, please contact the Alamosa City Clerk's office by telephone (719) 589-2593, by email [cityclerk@ci.alamosa.co.us](mailto:cityclerk@ci.alamosa.co.us), in person at 300 Hunt Avenue, or by mail at POB 419, Alamosa, CO 81101.

---

### **7:00 PM - Regular Meeting**

#### **I. CALL TO ORDER AND PLEDGE OF ALLEGIANCE**

The Regular Meeting of the Alamosa City Council was called to order on the above date by Mayor Josef Lucero at 7:00 p.m. The Pledge of Allegiance was recited.

#### **II. ROLL CALL**

Present at roll call: Mayor Josef Lucero, Councilors Ty Coleman, Michael Stefano, Jan Vigil, Liz Hensley, Charles Griego, and Kristina Daniel. Also present: City Manager Heather Brooks and City Clerk Holly Martinez.

#### **III. AGENDA APPROVAL**

Councilor Griego moved, seconded by Councilor Vigil to approve the agenda as presented. The motion carried unanimously.

#### **IV. CITIZEN COMMENT**

Alamosa City Council welcomes your comments. Citizens wishing to speak may obtain and complete a speaker card through the City Clerk at the start of the meeting.

##### **A. Audience Comments**

Shane Benms spoke in regards to the SLV N.E.E.D. Project, giving Council and the community an update of the use of naloxone in the community and informing them of how it works.

Jenene Holcomb spoke in regards to the multi-use facility.

Rob Pickett also spoke in regards to the multi-use facility.

**B. Follow-Up**

Council asked Mr. Benns questions related to the administration of naloxone. Mr. Benns followed up. Council thanked him for doing this and educating the community.

**V. CONSENT CALENDAR A**

The Consent Calendar allows multiple actions with one motion. Consent Calendar A contains routine items which have been recommended for action by staff or advisory boards. Council may remove a consent calendar item for separate consideration.

Councilor Vigil moved, seconded by Councilor Daniel to approve Consent Calendar A as presented. The motion carried unanimously.

C.7.a. Approve Minutes of Meeting June 1, 2016

C.8.a. Receive May 2016 Monthly Reports

C.2.a. Receive April and May 2016 Expenditure Report

C.1.a. Request of Crown Castle for an expansion of an existing permitted use by special review to allow the installation of additional telecommunications equipment on an existing tower.

**VI. REGULAR BUSINESS**

**A. Presentations from Outside Agencies**

**1. SLV N.E.E.D. Project**

Mr. Benns spoke during the Public Comment section of the agenda.

**B. Business Brought Forward by City Staff**

**1. Parks and Recreation**

**a. Allow Non-Motorized Boating Activities at Blanca Vista Park**

Heinz Bergann presented information to Council. Staff has been approached by the public asking if kayaking or paddle boarding is allowed in the Blanca Vista Park. The ponds at Blanca Vista Park are currently posted "No Boating, No Hunting, No Swimming." To ensure the least negative impact on the local water fowl, staff's recommendation would be to only allow water activities from July through October and ban the public from walking on the interior islands.

The City's insurance carrier is not opposed to adding this to the city's policy. There are no restrictions from an insurance point of view and no

additional costs to the City.

Councilor Daniel moved, seconded by Councilor Vigil to approve the Recreation Board's recommendation to allow non-motorized boating activities at Blanca Vista Park. The motion carried unanimously.

## **2. Information Technology**

- a. Public Hearing and Second Reading, Ordinance No. 11-2016. An ordinance approving an Intergovernmental Agreement between the City of Monte Vista and the City of Alamosa for the provision of Information Technology services.

Jim Belknap reviewed this Ordinance with Council.

Mayor Lucero opened the public hearing at 7:30 p.m. and asked for those wishing to speak on this ordinance.

City Manager of Monte Vista, Forrest Neuerburg, spoke in favor of this ordinance, stating he is looking forward to this opportunity.

Councilor Coleman thanked the City of Alamosa staff, the City of Monte Vista staff and Council for being able to collaborate and work together to be able to do this joint effort and opportunity.

There being no one else wishing to speak, the hearing closed at 7:34 p.m.

Councilor Daniel spoke in regards to this being one of the first IGA's in the State. Heather Brooks confirmed its one of five in the state to this degree.

Councilor Vigil asked Jim in regards to whether this is going to expand to other counties and asked where the City of Monte Vista where they were at in their decision with this.

Monte Vista City Manager Forrest Neuerburg explained the process for them on how they handle IGA's.

Councilor Griego stated why he was questioning this at the last meeting and that there has been a procedure but that he is absolutely in favor of this ordinance.

Councilor Hensley echoed Council's comments.

Councilor Vigil made comments in regards to the process of how IGA's are done. Councilor Griego confirmed that clarification of this process does need to happen.

Councilor Stefano moved, seconded by Councilor Vigil to finally adopt Ordinance No. 11-2016. The motion carried unanimously.

### **3. Fire**

- a. Public Hearing and Second Reading, Ordinance No. 12-2016. An ordinance approving an Intergovernmental Agreement By and Between the Colorado Division of Fire Prevention and Control and The City of Alamosa Fire Department

Fire Chief Don Chapman reviewed this Ordinance with Council. This IGA is between the Colorado Division of Fire Prevention and Control and the City of Alamosa Fire Department.

Mayor Lucero opened the public hearing at 7:45 p.m. and asked for those wishing to speak on this ordinance.

There being no one wishing to speak, the hearing closed at 7:46 p.m.

Councilor Daniel moved, seconded by Councilor Girego to finally adopt Ordinance No. 12-2016. The motion carried unanimously.

### **4. City Clerk/Municipal Court**

- a. First Reading, Ordinance No. 13-2016, An Ordinance Amending Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* to Allow for the Setting of the Nature and Amount of Court Costs By Resolution and Providing for Implementation of a Surcharge to be Utilized for the Operational Expense of the Police Department as Needed on Municipal Court Convictions (With the Exception of Parking Tickets and Dog Violations) Within the Jurisdiction of the City of Alamosa.

Holly Martinez presented information to Council. This ordinance is an amendment to Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* and allows for the setting of the nature and amount of court costs by resolution and also provides for the implementation of a surcharge to be utilized for the operational expense of the police department as needed on municipal court convictions (with the exception of parking tickets and dog violations) within the jurisdiction of the City of Alamosa.

Over time it is necessary to compare court costs and fees to other municipalities and be sure that all costs and fees are being captured. The procedure that was been desired is to adopt such fees by resolution. The ordinance will amend the *Code* to allow this. There are many municipalities throughout the State of Colorado that assess a surcharge that directly impacts the municipal police department. This ordinance also allows for that implementation.

Councilor Vigil moved, seconded by Councilor Stefano to approve Ordinance No. 13-2016 on first reading and set for a public hearing on Wednesday, July 6, 2016 at 7:00 p.m. or as soon thereafter as the matter may be heard. The motion carried unanimously.

**5. City Manager/Legal**

a. Ice Rink/Multi-Purpose Facility Direction

Heather Brooks gave an overview of information to Council. Beginning in 2014, a group was assembled to explore the feasibility of building an ice rink/multi-purpose facility. After numerous presentations, Council vote to pursue the project for construction in 2016. The City has been successful in securing \$590,000 in grants and just under \$10,000 in local donations.

Unfortunately, during the process to create the proper bid specifications, staff determined that the initial budget of \$1.3 million was off by approximately \$1.1 million, which is a dramatic difference in the project budget. A work session was held May 18th to review this information and allow Council an opportunity to begin processing what the next steps might be. The Rec board reviewed the new information at their June 2nd meeting and voted unanimously to recommend that the ice rink/multi-purpose facility still be constructed.

Amanda McDonald reviewed the fund balance with Council. Council further discussed this item.

Councilor Daniel moved, seconded by Councilor Coleman to approve and direct staff to move forward with construction of an Ice Rink/Multi-Purpose Facility as it is currently outlined. The motion carried 6-1 with Councilor Griego casting the no vote.

b. Motion to approve construction of a septic system and bathroom for the Valley Humane League shelter in partnership with Alamosa County.

Heather Brooks presented information to Council. The Valley Humane League is a nonprofit organization operating the only animal shelter in Alamosa County. Both the City and County of Alamosa utilize the shelter for stray dogs.

Alpine Veterinary Hospital is constructing a new, larger facility to conduct their veterinary services. While this is a great project for the community, it has created unintended consequences for the shelter. Once the construction is complete, the current septic system will not be in compliance. Additionally, if a new septic system is built to allow



continued operation of the shelter, code requirements will warrant the construction of a bathroom.

The short-term solution is to build a new septic system (estimated at \$10,000-\$15,000) and a bathroom (estimated at \$4,000-\$8,000) at the current location. This would be a total cost of \$14,000-\$23,000. The County has been part of the discussion and project and the cost would be split between the agencies. Additionally, both the City and County would dedicate employees to try to conduct as much of the work in-house as possible in order to minimize the actual expenses.

The City will be creating simple contracts with each entity to ensure the continued operation of the shelter at the current location for up to five years for this investment. Given that this is a short-term solution, staff also recommends Council appoint one or two members to participate in the discussions that are needed to determine a long-term solution for an animal shelter.

Councilor Stefano moved seconded by Councilor Daniel to authorize the construction of a septic system and bathroom for the Valley Humane League in partnership with Alamosa County, and instruct the City Manager to enter into a contract satisfactory to the City Manager and City Attorney with the property owner and with Valley Humane League for the animal shelter to remain on the property for up to five years. The motion carried unanimously.

Council discussed the appointments for the discussions related to a long-term solution for the animal shelter and appointed Councilor Hensley and Councilor Daniel.

#### **C. Committee Reports**

Councilor Vigil reported on the library board meeting that he attended.

Councilor Daniel reported on the rec board meeting that she attended.

Councilor Hensley reported on the marketing board meeting that she attended.

#### **D. Staff Announcements**

Heather Brooks updated Council on the following:

- Street improvement projects.

Heinz Bergann updated Council on the following:

- Carnival this weekend.
- Father's day Rollin' Deep car show - June 19th.

- Alamosa Round-Up Rodeo:
  - Parade is this Sat.
  - Tuesday is the Ranch rodeo.
  - Wednesday is the Kickoff BBQ/Muttin' Bustin'
  - Thursday and Friday is the PRCA rodeo
  - Saturday is the Derby
  - Sunday is the ATV Rodeo
- Art Walk is on Friday and Saturday the 24th and 25th.

Heather Brooks also updated council on the following

- Patches on 12th and 9th street.
- Pat and Heather walked downtown with comp plan consultants on the 6th, getting a feel for the public space. They will continue to do some more outreach.
  - Vision workshops scheduled for June 27th and 28th at the Rec center.
- SLV Health leadership committee.
- She participated in a community readiness for the survey and the topic was focused on drug abuse.
- Met with Shanna Hobbs in regards to her desire to a petition in regards to marijuana.
- August 3rd is the work session on marijuana discussion and at that point will also have something on the agenda in case something needs to be moved forward with the County in regards to the election.
- Concerns regarding contraband issues with Community Corrections.
- Board Appreciation Dinner
- Consultant meeting with DRG for the broadband study.
- Launch for Economic Development for the Health Care Sector Partnership.
- CML Conference is next week and Xcel's request for meeting. She also stated about dinner options for next week as well.
- Gave Council an update on upcoming work sessions.

## **VII. LOCAL LIQUOR LICENSING AUTHORITY ACTIONS**

- A. Decision, New Application, Beer and Wine License, Society Hall Foundation d/b/a Society Hall Foundation

Counselor Schwiesow prepared findings for Council's consideration. One that grants the approval of the license, and one that denies the approval. Council may adopt either one or make amendments as they see fit.

In the absence of the City Attorney, Heather Brooks shared with Council that the City Attorney did share with her that he did struggle a little bit with the materials to find any reasons to deny the license and that it was a very good presentation.

Councilor Griego moved, seconded by Councilor Stefano to approve the beer and wine license application for the Society Hall Foundation. The motion carried unanimously.

Councilor Coleman stated that to the applicants that they did a very good job with their presentation and thanked them for that.

## **COUNCIL COMMENT**

Councilor Griego addressed the City Attorney's absence. Heather Brooks stated that there are arrangements for someone to be present in his absence, however, she was unable to do so for this meeting but the agenda was evaluated and they felt there was nothing legal would need to have weighed in on.

Councilor Vigil informed Council that he accepted the Recycling award in Grand Junction and thanked Council and the community.

Mayor Lucero congratulated Councilor Vigil for his award.

Councilor Daniel stated how proud she was to be part of the community and mentioned the Standing Strong event put on by ASU on Sunday.

Councilor Coleman also congratulated Councilor Vigil on his award and thanked various people for events that have been put on recently and will be upcoming. He also thanked everyone who came out to clean up the community and sends his condolences to the Gerald Vigil family.

Mayor Lucero thanked the Monte Vista City Council for being in attendance at the meeting tonight.

## **EXECUTIVE SESSIONS**

1. Executive Session pursuant to C.R.S. §24-6-402(4)(f) for Personnel Matters - Evaluation of City Clerk

Councilor Daniel moved, seconded by Councilor Stefano to move into Executive Session (8:58 p.m.) pursuant to C.R.S. §24-6-402(4)(f) for Personnel Matters - Evaluation of the City Clerk. The motion carried unanimously.

The Executive Session closed at 9:32 p.m.

When back in Regular Session (9:32 p.m.), Mayor Lucero affirmed that the Executive Session was held solely for the stated purpose.

## **ADJOURNMENT**

The meeting adjourned immediately following the executive session.

---

Holly C. Martinez, City Clerk

---

Josef P. Lucero, Mayor

# ALAMOSA CITY COUNCIL COUNCIL COMMUNICATION

---

**Subject/Title:**

Appointment of Board/Commission Members

**Recommended Action:**

Staff recommends that Council consider making Board appointments.

**Background:**

Council has received notice from citizens wishing to be appointed to various boards for the June 2016 appointment cycle. The following are currently seated board members that would like to be reappointed to the various boards:

- **Planning Commission.** Three seats available; one for Ward 2, one for 1st alternate position, and one for 2nd alternate position with terms ending 6/1/2021, 6/1/2020, and 6/1/2021, respectively.  
Applicants:
  - Mark Manzanares (Current member, Ward 2, requesting reappointment)Farris Bervig (Current member, 2nd Alternate, requesting reappointment and re-positioned to the 1st Alternate position)
- **Library Board.** One position available with a term ending 6/1/2021  
Applicants:
  - Larry Greenwood (Current member, requesting reappointment)
- **Recreation Advisory Board.** One position available with a term ending 6/1/2019  
Applicants:
  - Jon Brownell (Current member, requesting reappointment)

Council also interviewed the following applicants on June 29, 2016. This is a summary of the seats and interested applicants:

- **Historic Preservation Advisory Committee.** One seat available with a term ending 6/1/2020.  
Applicants:
  - Rob Mabry, new applicant
  - Christopher Quintana, new applicant
- **Planning Commission.**Three seats available; one for Ward 2, one for 1st alternate position, and one for 2nd alternate position with terms ending 6/1/2021, 6/1/2020, and 6/1/2021, respectively.  
Applicants:
  - Darrel Cooper, new applicant
- **Personnel Board.** Four seats available with terms ending 6/1/2018, 6/1/2021, 6/1/2022, respectively.  
Applicants:

- Larry Vigil, new applicant

**Issue Before the Council:**

Does Council wish to make appointments for those that are interested in serving on the boards?

**Alternatives:**

1. Consider making appointments.
2. Do not make appointments and further direct staff.

**Fiscal Impact:**

N/A

**Legal Opinion:**

The City Attorney will be available at the meeting for any questions.

**Conclusion:**

Advisory boards play an important role in providing advice and direction to Council and staff. If the proposed applicants meet Council's expectations, then it would be appropriate to make appointments to these positions. It is also appropriate for Council to direct staff to continue recruitment if these applicants do not meet Council's expectations.

# ALAMOSA CITY COUNCIL COUNCIL COMMUNICATION

---

**Subject/Title:**

First Reading, Ordinance No. 14-2016, An Ordinance Approving An Intergovernmental Agreement with the Alamosa School District to Provide a School Resource Officer from the Alamosa Police Department to the Alamosa School District

**Recommended Action:**

Approve the Ordinance on first reading and set it for a public hearing on July 20, 2016 at 7:00 p.m. or soon thereafter entering into the intergovernmental agreement with the Alamosa School District to provide a school resource officer from the Alamosa Police Department in the Alamosa schools.

**Background:**

For the last several years the Alamosa Police Department has been working with the Alamosa School District to provide a school resource officer in the Alamosa Schools, primarily Alamosa High School, but also Ortega Middle School and occasionally Alamosa Elementary School. The position was initially established with grant money, but that grant has expired. The School Resource Officer's salary is split between the City and the School District, but the officer remains a full time employee of the Alamosa Police Department.

The officer provides a program of law and education-related issues to the school community, including parents, on such topics as: tobacco, alcohol, and other drug issues, and in addressing violent situations, violence prevention, and other safety issues in the school community, and can gather information regarding potential problems such as criminal activity, gang activity and student unrest, and attempt to identify particular individuals who may be a disruptive influence to the school and/or students. The Police Department feels it is a very good use of officer time and fosters the Department's commitment to community policing.

**Issue Before the Council:**

Does Council wish to enter into this intergovernmental agreement for a school resource officer with the Alamosa School District?

**Alternatives:**

- (1) Approve the ordinance on first reading and set it for public hearing on September 2nd.
- (2) Decline to approve the ordinance on first reading, and give staff further direction.

**Fiscal Impact:**

No new position is created. The cost of the City's portion of the officer's salary is less than \$25,000. The officer is available in emergencies for other duties, but otherwise is dedicated to the school resource position, thus taking one position away from the general force.

**Legal Opinion:**

City Attorney will be available to discuss any legal issues pertaining to the Agreement.

**Conclusion:**

This agreement ensures the continued provision of a school resource officer in the Alamosa schools, which has proven a beneficial aspect of community policing.

**ATTACHMENTS:**

| Description                                  | Type            |
|----------------------------------------------|-----------------|
| ▢ Ordinance __ 2016 SRO with Alamosa Schools | Ordinance       |
| ▢ School Resource Officer IGA                | Backup Material |

**ORDINANCE NO. - 2016**

**AN ORDINANCE APPROVING AN INTERGOVERNMENTAL AGREEMENT WITH  
THE ALAMOSA SCHOOL DISTRICT TO PROVIDE A SCHOOL RESOURCE  
OFFICER FROM THE ALAMOSA POLICE DEPARTMENT TO THE ALAMOSA  
SCHOOL DISTRICT**

**WHEREAS**, the City of Alamosa Police Department and the Alamosa School District currently cooperate through an intergovernmental agreement to provide for an officer from the Alamosa Police Department to be stationed at one or more of the schools within the Alamosa School District as a school resource officer; and

**WHEREAS**: public safety and crime prevention is enhanced by the presence of a school resource officer in the schools, where the officer can provide a program of law and education-related issues to the school community, including parents, on such topics as: tobacco, alcohol, and other drug issues, and in addressing violent situations, violence prevention, and other safety issues in the school community, and can gather information regarding potential problems such as criminal activity, gang activity and student unrest, and attempt to identify particular individuals who may be a disruptive influence to the school and/or students; and

**WHEREAS**: C.R.S. § 22-32-146 specifically envisions an on-campus role for school resource officers; and

**WHEREAS**: Article XIV, Section 18 of the Colorado Constitution and C.R.S. Section 29-1-201, *et seq.*, encourages, permits and authorizes intergovernmental agreements to accomplish mutually beneficial objectives such as shared public safety dispatch services; and

**NOW, THEREFORE, BE IT ORDAINED** by the City Council of Alamosa as follows:

**Section 1.** Approval of Intergovernmental Agreement. The Intergovernmental Agreement between the Colorado Alamosa School District and the City of Alamosa Police Department attached to this Ordinance is hereby adopted and approved, and the Police Chief is directed to execute Agreement on behalf of the City of Alamosa;

**Section 2.** General Repealer. All other acts, orders, ordinances, resolutions, or portions thereof in conflict with the sections adopted in this Ordinance, are hereby repealed to the extent of such conflict.

**Section 3.** Recording and Authentication. This ordinance, immediately upon its passage, shall be authenticated by the signatures of the Mayor and City Clerk, recorded in the City book of Ordinances kept for that purposes, and published according to law.

**Section 4.** Publication and Effective Date. This ordinance shall take effect ten (10) days after publication following final passage. Publication both before and after final passage



shall be by the title of this ordinance, which Council determines constitutes a sufficient summary of the ordinance, together with the statement that the full text of the ordinance is available for public inspection and acquisition on the City's website and in the office of the City Clerk.

**Section 5.**     Declaration of Public Interest. This ordinance is necessary to preserve the peace, health, safety, welfare, and to serve the best interest of the citizens of the City of Alamosa, Colorado.

**INTRODUCED, READ AND APPROVED** on first reading the 6th day of July, 2016, and ordered published by title and reference as provided by law with notice of a public hearing to be held for consideration of the adoption of said ordinance on the 20th day of July, 2016, at 7:00 p.m., or as soon thereafter as the matter may be heard, or on such subsequent date to which the public hearing or Council consideration may be continued.

**APPROVED, AND ADOPTED** after public hearing the 20<sup>th</sup> day of July, 2016.

CITY OF ALAMOSA

By \_\_\_\_\_  
Josef P. Lucero, Mayor

ATTEST:

\_\_\_\_\_  
Holly Martinez, City Clerk

## **SCHOOL RESOURCE OFFICER AGREEMENT**

City of Alamosa Police Department  
Alamosa Public School District

This Agreement is entered into this 27<sup>th</sup> day of July, 2015, by and between the City of Alamosa Police Department, hereinafter referred to as "City" and, the Alamosa Public School District, hereinafter referred to as "District."

Both entities are political subdivisions of the State of Colorado. Article XIV, Section 18 of the Colorado Constitution and C.R.S. Section 29-1-201, *et seq.*, encourages, permits and authorizes intergovernmental agreements to accomplish mutually beneficial objectives such as shared public safety responsibility. The City and the District have determined that public safety is enhanced by the cooperation between their entities set forth in this Agreement.

### **THEREFORE**

For and in consideration of the mutual promises, terms, covenants, and conditions set forth herein, the parties agree as follows:

1. Purpose of Agreement:

The purpose of this Agreement is for the City to assign a police officer to provide law enforcement services as specified herein; full-time to the District at the Alamosa High School, with the option to work in the same capacity at Ortega Middle School and the elementary school.

The police officer will work with school personnel in providing alcohol and other drug education, maintaining a safe campus environment, serving as law enforcement problem-solving resource persons, and providing the appropriate response regarding on-campus or school related criminal activity.

2. Term:

The term of this Agreement shall be from August 2015 until the end of the 2015-2016 school year, May 2016, provided the term may be mutually extended by the parties as they deem necessary to satisfy attendance requirements that may have been affected by weather or other factors. During days that schools are not in session, the officers shall perform regular police duties at a duty station as determined by the Chief of Police.

3. Termination:

This Agreement may be terminated without cause by either party upon 30 days prior written notice.

4. Relationship of Parties:

The City and assigned police officer shall have the status of an independent contractor for purposes of this Agreement. The police officer assigned to the District shall be considered to be an employee of the City and shall be subject to its formal control and supervision. The assigned officer will be subject to current procedures in effect for other Alamosa police officers, including attendance at all mandated training and testing to maintain state law enforcement officer certification. This Agreement is not intended to and will not constitute, create, give rise to, or otherwise recognize a joint venture, partnership, or formal business association or organization of any kind between the parties, and the rights and obligations of the parties shall be only those expressly set forth in this Agreement. The parties agree that no person supplied by the District to accomplish the goals of this Agreement is a City employee and that no rights under City civil service, retirement, or personnel rules accrue to such person.

5. Consideration:

In consideration of the assignment of police officer to work with the District as provided herein, the District agrees to pay the City 50% of the officer's salary and benefits. This amount will not exceed \$25,000 per school year. The amount will be billed by the City to the District for each paycheck issued to the officer. The District will not be responsible for payment of overtime, unless it is requested by the District. The officer's weekly District schedule will be mutually agreed upon in consultation with the principal of the school the officer is assigned to. The officer may be asked to attend afternoon or evening events in lieu of regular day duty. The City will maintain a budget for expenditures under this Agreement. Payment from District to City is due upon District's receipt of an itemized statement of cost from the City.

6. Officer Responsibilities:

The Officer assigned to the District shall:

- 6.1. Provide a program of law and education-related issues to the school community, including parents, on such topics as: tobacco, alcohol, and other drug issues, and in addressing violent situations, violence prevention, and other safety issues in the school community.
- 6.2. Act as a communication liaison with law enforcement agencies; providing basic information concerning students on campuses served by the officer.

- 6.3 Provide informational services and be a general resource for the school staff on issues related to alcohol, and other drugs, violence prevention, gangs, safety and security.
- 6.4 The officer will gather information regarding potential problems such as criminal activity, gang activity and student unrest, and attempt to identify particular individuals who may be a disruptive influence to the school and/or students.
- 6.5 When a crime occurs, the officer will take the appropriate steps consistent with a Colorado law enforcement officer's duties. These will specifically include, but are not limited to, compliance with C.R.S. § 22-32-146.
- 6.6 The officer will present educational programs to students and school staff on topics agreed upon by both parties.
- 6.7 The officer will refer students and/or their families to the appropriate agencies for assistance when a need is determined.
- 6.8 The officer will attempt to advise the school principal prior to taking any legal action, subject to the officer's duties under the law, in an attempt to foster a cooperative decision making process good for all involved.
- 6.9 The SRO shall not act as a school disciplinarian, nor make recommendations regarding school discipline. The School Resource Officer is not to be used for regularly assigned lunchroom duties, as regular hall monitors, bus duties or other monitoring duties. If there is an unusual/temporary problem in one of these areas, the SRO may assist District employees until the problem is solved. Provided further that nothing required herein is intended to nor will it constitute a relationship or duty for the assigned police officer or the City beyond the general duties that exist for law enforcement officers within the state.

7. Time and Place of Performance:

The City will endeavor to have the police officer available for duty each day that school is in session during the regular school year. The City is not required to furnish a substitute officer on days when regular the School Resource Officer is absent due to illness or police department requirements. The officer's SRO activities will be restricted to the assigned school grounds except for:

- 7.1 Follow up home visits when needed as a result of school related student problems.
- 7.2 School related off-campus activities when officer participation is requested by the principal and approved by the City.
- 7.3 In response to off-campus, but school related, criminal activity.
- 7.4 In response to emergency police activities.

8. District Responsibilities:

District will provide the police officer an office and such equipment as is necessary at his/her assigned schools. This equipment shall include a telephone and filing space capable of being secured and access to a computer. The City will provide personal equipment to include all uniforms and a fully equipped police patrol vehicle that will be parked on campus when the officer is working

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date and year first written above.

CITY OF ALAMOSA POLICE DEPARTMENT

  
By: Duane C. Oakes, Chief of Police 8/10/15

ATTEST:

\_\_\_\_\_  
Holly Martinez, City Clerk

Alamosa School District, RE11J

  
By: Robert Alejo, Superintendent 07-08-2015

# ALAMOSA CITY COUNCIL COUNCIL COMMUNICATION

---

**Subject/Title:**

Letter of Intent to participate in the Alamosa County Hazard Mitigation Plan

**Recommended Action:**

Authorize the Mayor to sign the letter of intent to participate in the 5 year update of the Alamosa County Hazard Mitigation Plan, in the form attached.

**Background:**

The City of Alamosa has been participating in the Alamosa County Hazard Mitigation Plan with the County. FEMA requires the plan to be updated every 5 years. The plan identifies critical hazards to the area (flood, fire, earthquake, etc..) and the planning on how to handle such events. The plan is due for updating this year and the County has already selected a contractor to update the plan.

**Issue Before the Council:**

Does Council wish to participate in the plan update with the County and authorize the signing of the letter of intent?

**Alternatives:**

The choices are

- 1) To participate with the County;
- 2) Hire a contractor to do the City's own Mitigation Plan.
- 3) Not participate in any Mitigation Plan, thereby foregoing any grants from FEMA Hazard Mitigation Assistance Programs, which consists of five separate grant programs, the Pre-Disaster Mitigation Program (PDM), the Flood Mitigation Assistance Program (FMA), the Repetitive Flood Claims Program (RFC), the Severe Repetitive Loss Program (SRL), and the Hazard Mitigation Grant Program (HMGP).

**Fiscal Impact:**

None other than staff resources dedicated to engaging in the planning process for the update, the outlines of which are set forth in the form letter of intent.

**ATTACHMENTS:**

| Description                                   | Type       |
|-----------------------------------------------|------------|
| ☐ Alamosa County Multi Hazard Resolution      | Cover Memo |
| ☐ Milti Hazard Letter of Intent               | Cover Memo |
| ☐ FEMA Overview                               | Cover Memo |
| ☐ Alamosa County Multi Hazard Mitigation Plan | Cover Memo |

**BEFORE THE BOARD OF COUNTY COMMISSIONERS  
ALAMOSA COUNTY COLORADO**

**RESOLUTION NO: 2011 – G – 5**

**RE: ADOPTION OF ALMOSA COUNTY MULTI-HAZARD MITIGATION PLAN**

---

Commissioner Wilkinson moved for the adoption of the following resolution.  
Commissioner Yohn seconded the motion.

WHEREAS, Alamosa County recognizes the threat that natural hazards pose to people and property within the community; and

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property from future hazard occurrences and save taxpayer dollars; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS, Alamosa County, with the assistance from Alamosa Emergency Manager, URS and Colorado Division of Emergency Management participated in the mitigation planning process and prepared the Alamosa County Multi-Hazard Mitigation Plan; and

WHEREAS, said Plan has been prepared in accordance with FEMA requirement at 44 C.F.R. 201.6; and

WHEREAS, the Alamosa County Board of Commissioners has reviewed the Plan and has afforded the community the opportunity to comment and provide input.

NOW, THEREFORE, BE IT RESOLVED, that the Alamosa County Commissioners hereby adopts the Alamosa County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that Alamosa County will submit on behalf of the participating entities the adopted Multi-Hazard Mitigation Plan to the Colorado Division of Emergency Management and the Federal Emergency Management Agency for final review and approval.

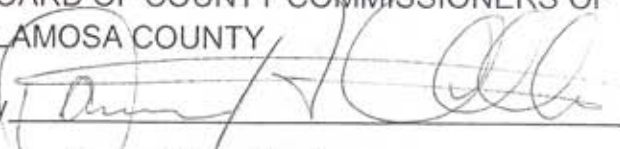
Roll call vote resulting in approval:      Three in favor. None against.

DATED: July 27, 2011

(SEAL)

BOARD OF COUNTY COMMISSIONERS OF  
ALAMOSA COUNTY

By

  
Darius Allen, Chairman

ATTEST: Melanie Woodward  
Melanie Woodward, Clerk of the Board



# **LETTER OF INTENT TO PARTICIPATE**

(Participating Jurisdiction Letterhead)

February \_\_, 2016

\_\_\_\_ County

Contact

Address

City, CO, Zip Code

Re: "Statement of Intent to Participate" as a participating jurisdiction in the 5-year update of the \_\_\_\_ County Hazard Mitigation Plan (HMP)

In accordance with the Federal Emergency Management Agency's (FEMA) Local Hazard Mitigation Plan (HMP) requirements, [Participating Jurisdiction] is submitting this letter of intent to confirm that [Participating Jurisdiction] has agreed to participate in the \_\_\_\_ County plan update effort, including conformance with FEMA requirements.

[Participating Jurisdiction] understands that it must engage in the following planning process, as detailed in FEMA's *Local Mitigation Planning Handbook* dated March 2013, including:

- Identification of hazards unique to [Participating Jurisdiction];
- An update of the local vulnerability analysis and an analysis of risks associated with each hazard;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals;
- Outreach to all community stakeholders to participate in the plan update process;
- Participation in the plan update process, including attending planning meetings, commenting on drafts of the updated plan, and contributing research, data, or other information;
- Participation in the process to maintain and implement the plan;
- Formal adoption of the \_\_\_\_ County Plan.

Therefore, with a full understanding of the obligations incurred by an agreement between \_\_\_\_ County and [Participating Jurisdiction], I [Name of Authorized Jurisdiction Official], commit [Participating Jurisdiction] to the process of updating the \_\_\_\_ County Hazard Mitigation Plan.

Executed this \_\_ day of February, 2016

[Signature of Chief Elected Official or Authorized Agent]

# FEMA's Hazard Mitigation Assistance (HMA) Program

## Overview

The FEMA Hazard Mitigation Assistance Program consists of five separate grant programs, the *Pre-Disaster Mitigation Program (PDM)*, the *Flood Mitigation Assistance Program (FMA)*, the *Repetitive Flood Claims Program (RFC)*, the *Severe Repetitive Loss Program (SRL)*, and the *Hazard Mitigation Grant Program (HMGP)*. Eligible applicants must have a FEMA approved local hazard mitigation plan in order to be eligible for HMA grant funds. Given the small number of properties that have made multiple flood claims under the National Flood Insurance Program, Colorado communities generally do not pursue funds under RFC or SRL. The Colorado Division of Homeland Security & Emergency Management (DHSEM) Mitigation and Recovery Team administers all Hazard Mitigation Assistance programs. The following is a brief description of eligible projects under these programs:

***Pre-Disaster Mitigation Grant Program:*** The Pre-Disaster Mitigation Program provides funding on a nationally competitive basis for plans and for natural hazards mitigation projects. Eligible activities include local hazard mitigation plans, property acquisition and demolition, elevation or relocation, minor localized flood reduction projects (i.e. detention ponds, improved culverts, channel stabilization), structural retrofitting of existing buildings, infrastructure retrofits, construction of tornado safe rooms and wildfire defensible space or fuels reduction projects. Applicants can apply for up to \$3 million in Federal funds, with a minimum of a 25% local match.

***Flood Mitigation Assistance Program:*** The FMA program provides funding for flood risk reduction activities. Communities eligible for FMA funding must be participants in the National Flood Insurance Program. Additionally, projects funded through FMA must protect at least one property that is insured under the NFIP. Eligible activities include property acquisition and demolition, elevation or relocation, and minor localized flood reduction projects (i.e. detention ponds, improved culverts, channel stabilization). Applicants can apply for up to \$3 million in Federal funds, with a minimum of a 25% local match.

***Hazard Mitigation Grant Program:*** The Hazard Mitigation Grant Program provides post-disaster mitigation funding in the event of a Presidential Disaster Declaration. Funding for HMGP, when provided, is equal to 15% of post-disaster Individual and Public Assistance. Potential activities funded through HMGP include all eligible PDM activities, in addition to post-disaster code enforcement activities. Federal funding can pay for up to 75% of an eligible project.



# Alamosa County

## Multi-Hazard Mitigation Plan

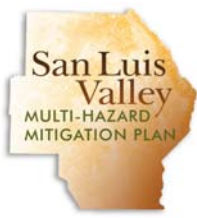
July 2010

# Acknowledgements

|                         |                                                                |
|-------------------------|----------------------------------------------------------------|
| <b>Pete Magee</b>       | Alamosa County Emergency Manager/San Luis Valley GIS Authority |
| <b>Ken Vanlwarden</b>   | Alamosa County Land Use Administrator                          |
| <b>David Osborn</b>     | Alamosa County – Emergency Planning Region                     |
| <b>Frank Mestas</b>     | Alamosa County Commissioner                                    |
| <b>George Wilkinson</b> | Alamosa County Commissioner                                    |
| <b>Don Koskelin</b>     | City of Alamosa – Assistant City Manager                       |
| <b>Debbie Canada</b>    | Town of Hooper                                                 |
| <b>Steve Vandiver</b>   | Rio Grande Water Conservation District                         |
| <b>Kent Mitchell</b>    | San Luis Valley Red Cross                                      |
| <b>Sue Davis</b>        | San Luis Valley Citizen Corps                                  |
| <b>Jon Montano</b>      | San Luis Valley RETAC                                          |
| <b>Jim Jaminet</b>      | USDA Forest Service                                            |
| <b>Greg Gillaspie</b>   | US Bureau of Reclamation                                       |
| <b>Jim Bowman</b>       | National Park Service                                          |
| <b>Sandy Rayl</b>       | United States Army Corps of Engineers                          |
| <b>Patricia Gavelda</b> | State of Colorado – Division of Emergency Management           |
| <b>Rich Hansen</b>      | State of Colorado – Division of Emergency Management           |
| <b>Adam Padilla</b>     | Colorado Department of Transportation                          |
| <b>Kevin Houck</b>      | Colorado Water Conservation Board                              |
| <b>David Noe</b>        | Colorado Geological Survey                                     |
| <b>Julie Baxter</b>     | URS Corporation, now with FEMA                                 |
| <b>David Cooper</b>     | URS Corporation                                                |
| <b>Margaret Doherty</b> | URS Corporation, now with FEMA                                 |
| <b>Kyle Ness</b>        | URS Corporation                                                |
| <b>Jennifer Orozco</b>  | URS Corporation                                                |
| <b>Tareq Wafaie</b>     | URS Corporation                                                |

# Table of Contents

|           |                                                        |            |
|-----------|--------------------------------------------------------|------------|
| <b>1.</b> | <b>Introduction to Mitigation Planning .....</b>       | <b>1-1</b> |
| 1.1       | Plan Purpose and Participating Jurisdictions .....     | 1-1        |
| 1.2       | Mitigation Planning Requirements .....                 | 1-1        |
| 1.3       | Grant Programs Requiring Hazard Mitigation Plans ..... | 1-2        |
| 1.4       | Plan Organization .....                                | 1-3        |
| <b>2.</b> | <b>Community Profile .....</b>                         | <b>2-1</b> |
| 2.1       | Location, Geography, and Climate.....                  | 2-1        |
| 2.2       | History.....                                           | 2-2        |
| 2.3       | Population .....                                       | 2-3        |
| 2.4       | Economy .....                                          | 2-3        |
| 2.5       | Government .....                                       | 2-4        |
| <b>3.</b> | <b>Planning Process.....</b>                           | <b>3-1</b> |
| 3.1       | Steering Committee and County Planning Teams.....      | 3-1        |
| 3.2       | Multi-Jurisdictional Participation .....               | 3-2        |
| 3.3       | 10-Step Planning Process.....                          | 3-3        |
| <b>4.</b> | <b>Risk Assessment.....</b>                            | <b>4-1</b> |
| 4.1       | Hazard Identification.....                             | 4-2        |
| 4.2       | Hazard Profiles .....                                  | 4-4        |
| 4.3       | Flood.....                                             | 4-6        |
| 4.4       | Wildfire .....                                         | 4-12       |
| 4.5       | Lightning .....                                        | 4-17       |
| 4.6       | Windstorm .....                                        | 4-19       |
| 4.7       | Tornado.....                                           | 4-21       |
| 4.8       | Hail.....                                              | 4-25       |
| 4.9       | Severe Winter Storm .....                              | 4-28       |
| 4.10      | Drought.....                                           | 4-30       |



---

|           |                                                               |            |
|-----------|---------------------------------------------------------------|------------|
| 4.11      | Dam and Levee Failure .....                                   | 4-34       |
| 4.12      | Avalanche .....                                               | 4-37       |
| 4.13      | Landslide.....                                                | 4-40       |
| 4.14      | Earthquake.....                                               | 4-42       |
| 4.15      | Community Asset Inventory .....                               | 4-46       |
| 4.16      | Land Use and Development Trends .....                         | 4-55       |
| 4.17      | Capability Assessment.....                                    | 4-57       |
| <b>5.</b> | <b>Mitigation Strategy .....</b>                              | <b>5-1</b> |
| 5.1       | Plan Goals .....                                              | 5-1        |
| 5.2       | Identification of Mitigation Action Alternatives.....         | 5-2        |
| 5.3       | Prioritization and Implementation of Mitigation Actions ..... | 5-3        |
| <b>6.</b> | <b>Plan Maintenance .....</b>                                 | <b>6-1</b> |
| 6.1       | Monitoring, Evaluating, and Updating the Plan .....           | 6-1        |
| 6.2       | Incorporation into Existing Planning Mechanisms.....          | 6-3        |
| 6.3       | Continued Public Involvement .....                            | 6-3        |
| <b>7.</b> | <b>Regional Annex .....</b>                                   | <b>7-1</b> |

# Appendices

**Appendix A: Plan Review Crosswalk**

**Appendix B: Planning Process Documentation**

**Appendix C: Mitigation Action Evaluation**

**Appendix D: Plan Maintenance Forms**

**Appendix E: References**

# Figures

|                                                                                           |      |
|-------------------------------------------------------------------------------------------|------|
| Figure 2-1: Map of Alamosa County .....                                                   | 2-2  |
| Figure 4-1: 100-year floodplains for Alamosa County .....                                 | 4-7  |
| Figure 4-2: Value of Improvements within the City of Alamosa 100-year Floodplain .....    | 4-11 |
| Figure 4-3: Fire Protection Districts and Wildfire Risk Composite in Alamosa County ..... | 4-13 |
| Figure 4-4: Alamosa County Fire Hazard based on Slope, Aspect, and Vegetation .....       | 4-16 |
| Figure 4-5: Tornado Safe Room Design Wind Speed Map .....                                 | 4-23 |
| Figure 4-6: United States Percent of Time in Drought, 1895–1995 .....                     | 4-32 |
| Figure 4-7: 1999-2003 Drought Impacts in the Rio Grande Basin .....                       | 4-33 |
| Figure 4-8: Alamosa County Levees .....                                                   | 4-36 |
| Figure 4-9: Colorado Avalanche Zones .....                                                | 4-38 |
| Figure 4-10: Landslide Incidence and Susceptibility, Alamosa County .....                 | 4-41 |
| Figure 4-11: Probability of 5.0 or greater Earthquake in the next 150 years .....         | 4-44 |
| Figure 4-12: Colorado Seismic Hazard Map—10% Probability of Exceedance in 50 Years .....  | 4-45 |
| Figure 4-13: Alamosa County Critical Facilities .....                                     | 4-48 |
| Figure 4-14: Social Vulnerability by County Compared with the Nation .....                | 4-53 |
| Figure 4-15: Conceptual Land Use Plan for Alamosa County .....                            | 4-56 |
| Figure 5-1: Criteria for Prioritization .....                                             | 5-3  |

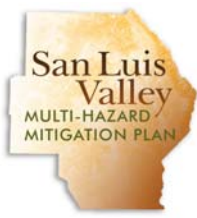


# Tables

|                                                                                          |      |
|------------------------------------------------------------------------------------------|------|
| Table 2-1: Alamosa County Population .....                                               | 2-3  |
| Table 2-2: Industry Distribution for Alamosa County.....                                 | 2-4  |
| Table 3-1: Steering Committee and Planning Team Participants .....                       | 3-2  |
| Table 3-2: 10-Step Planning Process Used to Develop the Plan.....                        | 3-3  |
| Table 3-3: San Luis Valley Hazard Mitigation Plan Meetings.....                          | 3-4  |
| Table 4-1: FEMA and State Disaster Declaration History in Alamosa County, 1965-2008..... | 4-2  |
| Table 4-2: Hazards Not Profiled in Plan.....                                             | 4-3  |
| Table 4-3: Hazards Identified for Each Participating Jurisdiction.....                   | 4-4  |
| Table 4-4: Major Flood Events in Alamosa County.....                                     | 4-7  |
| Table 4-5: Alamosa County NFIP Information .....                                         | 4-9  |
| Table 4-6: Structures damaged in a 100-Year Flood in Alamosa County .....                | 4-9  |
| Table 4-7: HAZUS 100-Year Flood Building Damage Estimates for Alamosa County.....        | 4-10 |
| Table 4-8: Alamosa County Recent Wildfire History .....                                  | 4-14 |
| Table 4-9: WUI Subdivisions Community Wildfire Hazard Ratings for Alamosa County.....    | 4-15 |
| Table 4-10: Major Lightning Events in Alamosa County, 1950 to 2009 .....                 | 4-18 |
| Table 4-11: Major Wind Events in Alamosa County, 1950 to 2009.....                       | 4-20 |
| Table 4-12: Tornado Intensity Scales .....                                               | 4-22 |
| Table 4-13: Tornado Events in Alamosa County, 1950 to 2009.....                          | 4-24 |
| Table 4-14: TORRO Hailstorm Intensity Scale .....                                        | 4-26 |
| Table 4-15: Hailstorm Events in Alamosa County, 1950 to 2009 .....                       | 4-27 |
| Table 4-16: Reported Winter Storm Damages in Alamosa County, 1960-2008 .....             | 4-28 |
| Table 4-17: Alamosa County Winter Weather Summary .....                                  | 4-29 |
| Table 4-18: Significant Drought Periods Affecting Alamosa County .....                   | 4-31 |
| Table 4-19: Potential Earthquake Losses in Alamosa County .....                          | 4-46 |
| Table 4-20: Population and Building Exposure in Alamosa County .....                     | 4-47 |

|                                                                                                |      |
|------------------------------------------------------------------------------------------------|------|
| Table 4-21: Alamosa County Critical Facilities .....                                           | 4-47 |
| Table 4-22: Hooper Critical Facilities .....                                                   | 4-48 |
| Table 4-23: List of Rare Species in Alamosa County.....                                        | 4-50 |
| Table 4-24: Alamosa County Historic Properties/Districts in State and National Registers ..... | 4-51 |
| Table 4-25: Top Employers in Alamosa County .....                                              | 4-52 |
| Table 4-26: Social Vulnerability from 2000 U.S. Census .....                                   | 4-54 |
| Table 4-27: Population Growth in Alamosa County, 2000-2007 .....                               | 4-56 |
| Table 4-28: Growth in Housing Units in Alamosa County, 2000-2007 .....                         | 4-57 |
| Table 4-29: Population and Housing Unit Density in Alamosa County, 2000-2007.....              | 4-57 |
| Table 4-30: Population Projections for Alamosa County, 2005-2035 .....                         | 4-57 |
| Table 4-31: Regulatory Mitigation Capabilities.....                                            | 4-58 |
| Table 4-32: Alamosa County Master Plan Policies .....                                          | 4-59 |
| Table 4-33: Administrative and Technical Capabilities.....                                     | 4-60 |
| Table 4-34: Fiscal Mitigation Capabilities.....                                                | 4-60 |
| Table 5-1: Alamosa County Multi-Hazard Mitigation Plan Goals.....                              | 5-2  |
| Table 5-2: Categories of Mitigation Actions .....                                              | 5-2  |
| Table 5-3: Mitigation Action Matrix .....                                                      | 5-5  |

# Prerequisites



[Insert documentation of plan adoption]

# Executive Summary

The purpose of the San Luis Valley hazard mitigation planning process was to eliminate or reduce long-term risks to people and properties due to natural hazards. This multi-hazard mitigation plan (hereafter the “Plan”) was developed by Alamosa County, the City of Alamosa, the Town of Hooper, the Alamosa County Fire Protection District, and the Rio Grande Water Conservation District to reduce future losses to communities in Alamosa County caused by natural hazards.

The Plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to achieve eligibility for the Federal Emergency Management Agency (FEMA) hazard mitigation grant programs including:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Severe Repetitive Loss (SRL)
- Repetitive Flood Claim (RFC)

This is a multi-jurisdictional Plan covering the participating jurisdictions in Alamosa County. This process was initiated by the San Luis Valley GIS/GPS Authority, who solicited the participation of governmental departments, the public, and other stakeholders in the Valley. Although five counties were involved in the overall San Luis Valley Multi-Hazard Mitigation Planning project, this Plan reflects the efforts of Alamosa County in particular. The other four counties in the San Luis Valley are preparing their own Plans simultaneously with Alamosa County. With the leadership of the Alamosa County Emergency Manager, the Alamosa County Planning Team was formed to assist with the development of this Plan including data collection, public input on history, community assets and strategies, and identification of preferred mitigation alternatives. This Plan represents the collective work of the citizens, elected and appointed officials, and other stakeholders in Alamosa County.

Following FEMA’s guidelines in developing a Pre-Disaster Mitigation Plan, Alamosa County identified risks, assessed vulnerabilities, and identified and prioritized goals and actions for mitigating the affects of natural hazards on the communities in the county. The following hazards were profiled in this Plan:

- |             |                       |
|-------------|-----------------------|
| • Flood     | • Severe Winter Storm |
| • Wildfire  | • Drought             |
| • Hail      | • Dam & Levee Failure |
| • Lightning | • Avalanche           |
| • Windstorm | • Landslide           |
| • Tornado   | • Earthquake          |

The results of the probability and severity of these hazards in Alamosa County are summarized below.

| Severity ><br>Probability v | Catastrophic           | Critical                   | Limited   | Negligible |
|-----------------------------|------------------------|----------------------------|-----------|------------|
| Highly Likely               |                        | Severe<br>Winter Storm     | Windstorm |            |
| Likely                      | Flood<br>Levee Failure | Hail<br>Tornado<br>Drought | Lightning |            |
| Occasional                  |                        | Wildfire                   | Avalanche |            |
| Unlikely                    |                        | Earthquake                 |           | Landslide  |

The Planning Team used the risk and vulnerability assessment to develop a countywide mitigation strategy through a list of goals and actions. The following goals were developed for the Alamosa County mitigation strategy:

| Goals                                                                                                            |
|------------------------------------------------------------------------------------------------------------------|
| 1. Reduce the loss of life and personal injury caused by natural hazards                                         |
| 2. Reduce damage to critical facilities, personal property, and other community assets caused by natural hazards |
| 3. Minimize economic losses associated with natural hazards                                                      |

The Planning Team identified and prioritized mitigation actions to achieve these goals and support the purpose of this planning process. The mitigation actions are summarized in the following table.

| No.                    | Mitigation Action Description                                                                                         | Hazard              | Responsible Agency                            | Goals Addressed |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------|-----------------|
| <b>Alamosa County</b>  |                                                                                                                       |                     |                                               |                 |
| 1                      | Update floodplain regulations throughout the county                                                                   | Flood               | Land Use Administrator                        | 1,2,3           |
| 2                      | Update/Adopt County DFIRMs                                                                                            | Flood/Levee Failure | Land Use Administrator                        | 1,2,3           |
| 3                      | Implement the Rio Grande Restoration Plan                                                                             | Flood               | San Luis Valley Water Conservancy District    | 2,3             |
| 4                      | Facilitate construction of power line redundancy                                                                      | All Hazards         | Land Use Administrator                        | 1,3             |
| 5                      | Increase public awareness for severe weather                                                                          | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| 6                      | Increase shelter capacity throughout the county (coordinate with the Red Cross)                                       | All Hazards         | American Red Cross                            | 1,3             |
| 7                      | Prepare a Drought Preparedness Action Guide                                                                           | Drought             | Alamosa County OEM                            | 2,3             |
| 8                      | Revise land use regulations to include earthquake and wildfire mitigation                                             | Earthquake/Wildfire | Land Use Administrator                        | 1,2,3           |
| 9                      | Develop accessibility/evacuation routes for Zapata subdivision (planning phase)                                       | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| 10                     | Continue to improve involvement in the NFIP and improve classification rating for the Community Rating System (NFIP). | Flood               | Land Use Administrator                        | 2,3             |
| 11                     | Study Base Flood Elevation (BFE) mapping opportunities                                                                | Flood               | Alamosa County OEM                            | 1,2,3           |
| 12                     | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper)                                  | All Hazards         | Alamosa County OEM                            | 1               |
| 13                     | Incorporate student population into mitigation studies, actions, and/or planning                                      | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| <b>City of Alamosa</b> |                                                                                                                       |                     |                                               |                 |
| 1                      | Address issues raised in the US Army Corps of Engineers Study Continuing Eligibility Inspection (CEI) 9/15/2008       | Levee Failure       | City of Alamosa, Public Works                 | 1,2,3           |
| 2                      | Continue to improve involvement in the NFIP and improve classification rating for the Community Rating System (NFIP). | Flood               | Land Use Administrator and/or City of Alamosa | 2,3             |

| No.                                            | Mitigation Action Description                                                        | Hazard              | Responsible Agency                                                                       | Goals Addressed |
|------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------|-----------------|
| 3                                              | Study Base Flood Elevation (BFE) mapping opportunities                               | Flood               | Alamosa County OEM and/or City of Alamosa                                                | 1,2,3           |
| 4                                              | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper) | All Hazards         | Alamosa County OEM and/or City of Alamosa                                                | 1               |
| 5                                              | Incorporate student population into mitigation studies, actions, and/or planning     | All Hazards         | Alamosa County OEM and/or City of Alamosa                                                | 1,2,3           |
| 6                                              | Revise land use regulations to include earthquake and wildfire mitigation            | Earthquake/Wildfire | Land Use Administrator and/or City of Alamosa                                            | 1,2,3           |
| 7                                              | Facilitate construction of power line redundancy                                     | All Hazards         | Land Use Administrator and/or City of Alamosa                                            | 1,3             |
| 8                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County OEM and/or City of Alamosa                                                | 1,2,3           |
| <b>Town of Hooper</b>                          |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper) | All Hazards         | Alamosa County OEM and/or Town of Hooper                                                 | 1               |
| 2                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County OEM and/or Town of Hooper                                                 | 1,2,3           |
| <b>Alamosa County Fire Protection District</b> |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Develop accessibility/evacuation routes for Zapata subdivision (planning phase)      | All Hazards         | Alamosa County OEM and/or Fire Protection District                                       | 1,2,3           |
| 2                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County OEM and/or Fire Protection District                                       | 1,2,3           |
| <b>Rio Grande Water Conservation District</b>  |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Implement the Rio Grande Restoration Plan                                            | Flood               | San Luis Valley Water Conservancy District and/or Rio Grande Water Conservation District | 2,3             |
| 2                                              | Prepare a Drought Preparedness Action Guide                                          | Drought             | Alamosa County OEM and/or Rio Grande Water Conservation District                         | 2,3             |



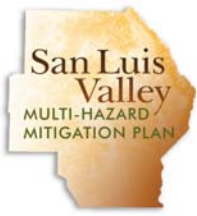


Following the County Planning Team meetings within the San Luis Valley, the region as a whole developed a Regional Mitigation Strategy at a workshop on January 12, 2010. Invitees and participants included the State Division of Emergency Management, the US Army Corps of Engineers, the US Forest Service, neighboring county officials, amongst others. Each county in this planning process (Alamosa, Conejos, Mineral, Rio Grande, and Saguache) presented their list of mitigation actions. These actions were further grouped through an interactive process to result in distinct regional mitigation actions with assigned champions and team members for implementing those actions. The following specific regional mitigation actions developed through that workshop:

1. Develop a drought action plan
2. Develop and implement a hazard-specific public awareness program
3. Work with the US Army Corps of Engineers to develop a regional floodplain management study
4. Review building permitting and land use requirements with neighboring counties
5. Develop a strategy for developing redundant power for the region
6. Improve fire prevention public education and promote resource sharing among valley fire departments

These actions are discussed in further detail in the Regional Annex (Chapter 7).

The Alamosa County Multi-Hazard Mitigation Plan has been formally adopted by the Alamosa County Board of County Commissioners and the governing bodies of each participating jurisdiction and will be updated within five years. (Please see the Prerequisites section, which precedes the Executive Summary, for documentation of plan adoption and the adoption date.)



[Page intentionally left blank to facilitate 2-sided printing]

# 1. Introduction to Mitigation Planning

This chapter provides information on the purpose of the Alamosa County Multi-Hazard Mitigation Plan, describes an overview of federal hazard mitigation planning requirements and grant programs, lists the participating jurisdictions, and provides an outline of the Plan's organization.

## 1.1 Plan Purpose and Participating Jurisdictions

---

Alamosa County, the City of Alamosa, the Town of Hooper, the Alamosa Fire Protection District, and the Rio Grande Water Conservation District prepared this multi-jurisdictional, local hazard mitigation Plan to better protect people and property from the impacts of natural hazard events. The City of Alamosa and the Town of Hooper are the only incorporated municipalities in Alamosa County.

Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA) as “any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event.” Mitigation creates safer communities by reducing loss of life and property damage. Hazard mitigation planning is a process in which hazards are identified, impacts on communities are assessed, and strategies to reduce the loss of life and property are identified, prioritized, and implemented. This Plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers develop pro-active policies to prevent future disasters. It also serves as a necessary first-step towards making application for federal funding for mitigation activities, as discussed further in Section 1.3.

## 1.2 Mitigation Planning Requirements

---

The Federal Disaster Mitigation Act of 2000 (DMA 2000) passed by Congress includes a mitigation planning section (322). This section emphasizes the need for State, Tribal, and local entities to coordinate mitigation planning and implementation efforts. In addition, it provides the legal basis for FEMA's mitigation plan requirements for mitigation grant assistance.

To implement these planning requirements, FEMA published an Interim Final Rule in the *Federal Register* on February 26, 2002 (FEMA 2002a), 44 CFR Part 201 with subsequent updates. The planning requirements for local entities are identified in their appropriate sections throughout this Plan. FEMA's October 31, 2007 changes to 44 CFR Part 201 combined and expanded flood mitigation planning requirements with local mitigation plans (44 CFR §201.6). It also required participating National Flood

Insurance Program (NFIP) communities' risk assessments and mitigation strategies to identify and address properties repetitively damaged by flood. Appendix A includes a completed FEMA crosswalk, which is an official report card used by FEMA reviewers, for local hazard mitigation plans documenting compliance with 44 CFR§201.6.

### 1.3 Grant Programs Requiring Hazard Mitigation Plans

---

Local hazard mitigation plans now qualify communities for the following federal mitigation grant programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)
- Severe Repetitive Loss (SRL)
- Repetitive Flood Claim (RFC)

The HMGP and PDM grant programs are authorized under the Stafford Act and DMA 2000, while the FMA, SRL, and RFC grant programs are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act. The HMGP is a state competitive grant program for communities in areas covered by a recent disaster declaration. The PDM, FMA, RFC, and SRL programs are also competitive but are available on an annual basis and do not require a disaster declaration; they rely on specific pre-disaster grant funding sources. In 2008, FEMA combined the PDM program with the FMA, RFC, and SRL programs into a unified Hazard Mitigation Assistance (HMA) program application cycle. The intent of this alignment is to enhance the quality and efficiency of grant awards on an allocation and competitive basis to state and local entities for worthwhile, cost-beneficial activities designed to reduce the risks of future damage in hazard-prone areas.

#### Disaster Funded Mitigation Assistance

***Hazard Mitigation Grant Program (HMGP):*** Provides grants to States, Tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to purchasing supplies to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a disaster declaration is limited. The program may provide a state or tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share eligibility requirement for this grant is 75 percent federal/25 percent non-federal.

#### Hazard Mitigation Assistance Programs

***Pre-Disaster Mitigation (PDM) Program:*** Provides funds to States, Tribes, and local entities, including public universities, for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The cost-share eligibility requirement for this grant is 75

percent Federal/25 percent non-Federal. There is approximately \$50 million to \$150 million available each year. Communities compete nationally for the funds although the State is guaranteed \$500,000 in project dollars. So, it is expected that at least one community in Colorado will receive money; assuming approvable grant applications are received.

***Flood Mitigation Assistance (FMA) Grant Program:*** The goal of the FMA grant program is to reduce or eliminate flood insurance claims under the National Flood Insurance Program (NFIP). Particular emphasis for this program is placed on mitigating repetitive loss properties. Repetitive loss properties are properties for which two or more NFIP losses of at least \$1,000 each have been paid within any 10-year period since 1978. Grant funding is available for three types of grants, including planning, project, and technical assistance. Project grants, which use the majority of the program's total funding, are awarded to states, tribes, and local entities for planning and technical assistance and/or to apply mitigation measures to reduce flood losses to properties insured under the NFIP. The cost-share eligibility requirement for this grant is 75 percent federal/25 percent non-federal. In Colorado there is approximately \$100K - \$150K available annually state-wide. Communities must compete state-wide first and then nationally, if there is money left over in the system.

***Severe Repetitive Loss (SRL) Program:*** Provides funding to reduce or eliminate the long-term risk of flood damage to residential structures insured under the NFIP that have at least four NFIP claim payments over \$5,000 each, when at least two such claims have occurred within any 10-year period, and the cumulative amount of such claims payments exceeds \$20,000; or for which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any 10-year period. The cost-share eligibility requirement for this grant is 75 percent federal/25 percent non-federal.

***Repetitive Flood Claims (RFC) Program:*** Provides funding to reduce or eliminate the long-term risk of flood damage to residential and nonresidential structures insured under the NFIP that have had one or more claim payments for flood damages. All RFC grants are eligible for up to 100 percent federal funding. There is \$100 million available each year. This is nationally competitive, for "small and impoverished" communities and only to mitigation properties with flood insurance that have previous flood claims.

### 1.4 Plan Organization

---

This Multi-Hazard Mitigation Plan is organized as follows:

- **Prerequisites** include the resolutions of adoption for each participating jurisdiction.
- **Executive Summary** provides an overview of the process and findings.
- **Chapter 1: Introduction** describes the participating jurisdictions, the Plan's purpose, hazard mitigation planning requirements, and federal hazard mitigation grant programs.
- **Chapter 2: Community Profile** provides a general description of the county, including its location, geography, climate, history, population, economy, and government.
- **Chapter 3: Planning Process** describes the planning process used to develop the Plan, including how it was prepared, who was involved in the process, and how the public was involved.

- **Chapter 4: Risk Assessment** identifies and profiles the hazards that could affect the county and assesses vulnerability to those hazards. It provides an inventory of critical facilities and other community assets in the county, and describes land use and development trends. Chapter 4 also includes a capability assessment of the existing plans, programs, and policies in the county related to mitigation.
- **Chapter 5: Mitigation Strategy** identifies goals and actions to mitigate hazards in each participating jurisdiction based on the results of the risk assessment. The mitigation actions are analyzed and prioritized for each community. This chapter also includes an implementation strategy.
- **Chapter 6: Plan Maintenance** provides a formal process for monitoring, evaluating, and updating the Plan; discusses how to incorporate the Plan into existing planning mechanisms; and plans for continued public involvement.
- **Chapter 7: Regional Annex** describes where the five counties participating in the process can consider their combined resources to work most efficiently on their mitigation plans and how they will work together to evaluate progress and update their mitigation plans and the regional annex over time.
- **Appendix A: Plan Review Crosswalk** includes a completed FEMA plan review crosswalk for local hazard mitigation plans documenting compliance with 44 CFR§201.6.
- **Appendix B: Planning Process Documentation** compiles agendas, sign-in sheets, press releases, and other materials documenting the planning process.
- **Appendix C: Mitigation Action Evaluation** includes the worksheets used by the County Hazard Mitigation Planning Team to identify and prioritize mitigation actions.
- **Appendix D: Plan Maintenance Forms** provides a mitigation action progress reporting form and an annual Plan review questionnaire to assist in evaluating and maintaining the Plan as described in Chapter 6: Plan Maintenance.
- **Appendix E: References** provides a list of key contacts, web resources, and acronyms used in the Plan.

## 2. Community Profile

This section describes the location, geography, climate, history, population, economy, and government of Alamosa County and the other four participating jurisdictions: the City of Alamosa, the Town of Hooper, the Alamosa Fire Protection District, and the Rio Grande Water Conservation District.

### 2.1 Location, Geography, and Climate

---

#### Location

Alamosa County is located in the middle of the San Luis Valley (the Valley) of south central Colorado. Figure 2-1 shows Alamosa County's location within the state. The county seat, the City of Alamosa, is located in the middle of the county, and is the largest city in the San Luis Valley. The Town of Hooper's jurisdictional boundaries are located within both Alamosa and Saguache Counties. The greatest population areas within the Town of Hooper are within Alamosa County, therefore they have chosen to participate in the Alamosa County Plan. The City of Alamosa and the Town of Hooper are the only incorporated municipalities in Alamosa County. Alamosa East is a census-designated place covering 3.6 square miles of unincorporated land. Mosca is an unincorporated town with a post office.

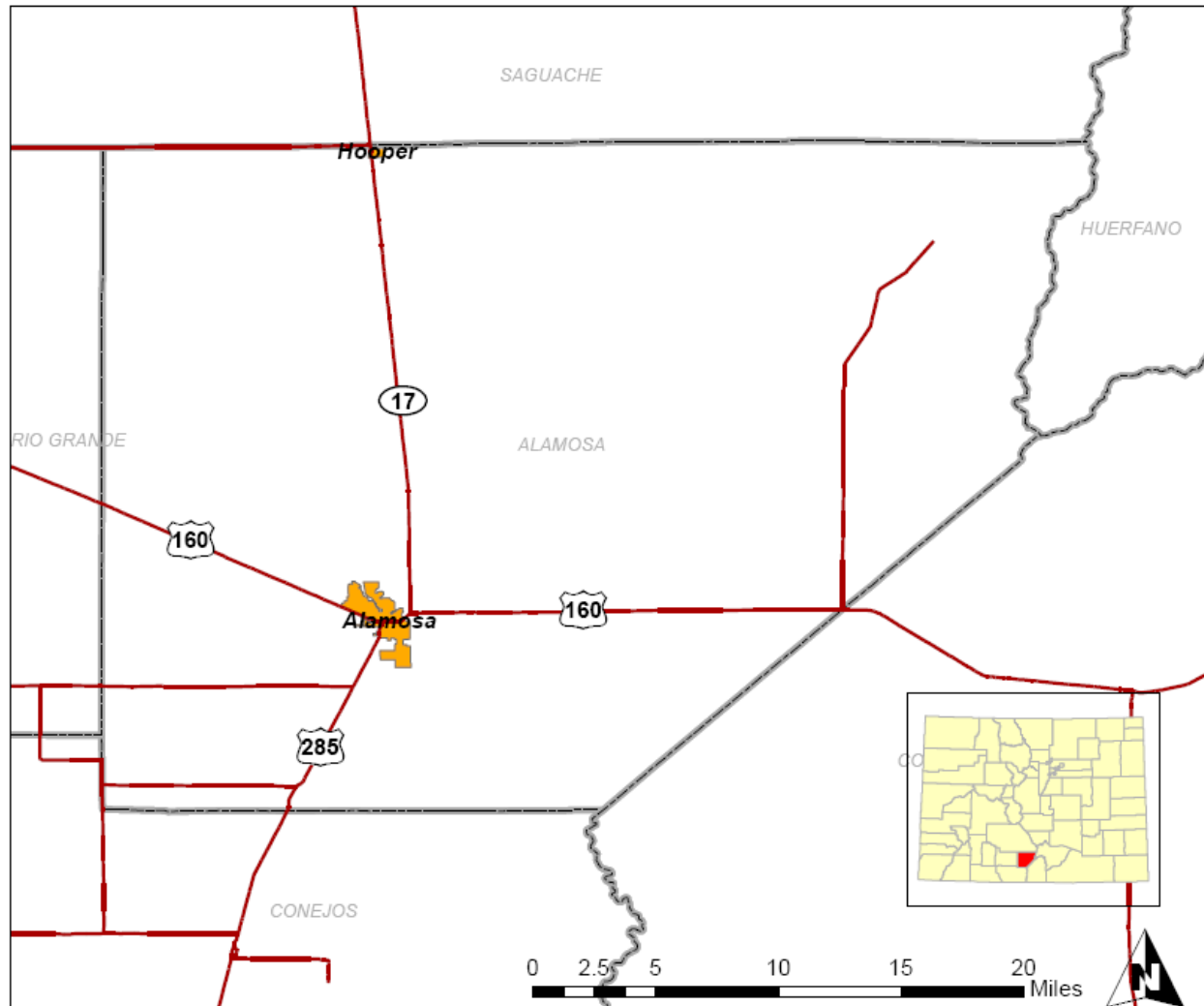
#### Geography

Spanning 8,000 square miles, the San Luis Valley is the world's largest alpine desert. It is approximately 122 miles long and 74 miles wide, extending from the Continental Divide on the northwest rim into the state of New Mexico on the south. The Valley sits atop the Rio Grande Rift, a split in the crust of the Earth where the sides are pulling away from each other. The Valley floor is covered with approximately 30,000 feet of rock, sand, and earth, deposited over millions of years as the rift has separated and the surrounding mountains have eroded. A number of mountain streams flow into the Valley and then sink into the desert sand creating an expansive aquifer under the Valley floor. The only surface water to leave the valley is the Rio Grande River, which runs through the City of Alamosa.

#### Climate

The climate of the Valley is marked by moderate summers and cold winters, light precipitation and many days of sunshine each year. 80 percent of the annual precipitation occurs from April to October. Typically, light scattered showers will result from thunderstorms that develop over the mountains and move into the Valley during the afternoon, providing the county with approximately 7.6 inches of rain per year and an average summer temperature of 65 degrees. The county receives approximately 41.7 inches of snow each winter with an average temperature of 14 degrees. Although the winters are cold, Alamosa County experiences approximately 350 days with sunshine per year.

Figure 2-1: Map of Alamosa County



Source: Compiled by URS, intended for planning purposes only

## 2.2 History

The San Luis Valley was long part of the lands of the Ute Indian Tribes. The Spanish, and later the Mexicans, slowly conquered the area from these tribes during the seventeenth and eighteenth centuries. The Valley was the first portion of Colorado to be settled by Europeans. The area was administered as part of the Spanish, later Mexican, province of Nuevo Mexico (New Mexico) until the area was purchased by the United States as part of the Treaty of Guadalupe Hidalgo in 1848. Extensive settlement began in the Valley by Hispanic farmers and ranchers in the 1850s. Today, the Valley has the largest native Hispanic population in Colorado and many families are directly descended from the original Nuevo Mexican settlers. The Valley became part of the



Territory of Colorado in 1861. For the remainder of the 19<sup>th</sup> century the Valley saw the removal of the Native Americans to reservations elsewhere and the slow migration of farmers and ranchers into the area.

Alamosa County was created by the Colorado legislature on March 8, 1913. The county name is the Spanish word for a grove of cottonwood trees. The City of Alamosa was established in May 1878 by the Denver and Rio Grande Railroad and quickly became an important rail center. The railroad had an extensive construction, repair and shipping facility in Alamosa for many years and headquartered its remaining narrow gauge service here. Alamosa remains the commercial center of the Valley and is now a tourist town with many nearby attractions including the Great Sand Dunes National Park. Alamosa is home to Adams State College and Trinidad Junior College. The Town of Hooper is a primarily farming and ranching town, although nearby points of interest, such as the UFO Watch Tower, bring tourists as well. Three of Colorado's eight National Wildlife Refuges (NWR) are located in the San Luis Valley, including the Alamosa NWR, Baca NWR, and Monte Vista NWR.

### 2.3 Population

---

The 2007 population of Alamosa County was estimated at 15,313. This represents a 4.6 percent increase from 1997. The 2000 population for the City of Alamosa was 7,960; 123 for the Town of Hooper. Table 2-1 provides population estimates for Alamosa County for the time period from 1997 to 2007.

**Table 2-1: Alamosa County Population**

| Area           | 1997        | 2007        | Percent Change |
|----------------|-------------|-------------|----------------|
| Alamosa County | 14,634      | 15,313      | 4.6%           |
| Colorado       | 4,018,293   | 4,861,515   | 21%            |
| United States  | 272,646,925 | 301,621,157 | 10.6%          |

Source: US Census Bureau Estimates

### 2.4 Economy

---

The total number of employees located in Alamosa County in the second quarter of 2008 was 7,799. Health Care and Social Assistance was the largest major industry sector (17 percent of the employment), followed by Retail Trade (14 percent), and Education Services (13 percent). Table 2-2 shows a list of major industries in Alamosa County for the second quarter of 2008.

**Table 2-2: Industry Distribution for Alamosa County**

| Industry                                 | Establishments | Employees |
|------------------------------------------|----------------|-----------|
| Total, all industries                    | 589            | 7,799     |
| Health Care and Social Assistance        | 63             | 1,322     |
| Retail Trade                             | 82             | 1,083     |
| Education Services                       | 6              | 1,045     |
| Accommodation and Food Services          | 58             | 850       |
| Public Administration                    | 31             | 738       |
| Construction                             | 61             | 535       |
| Agriculture, Forestry, Fishing & Hunting | 27             | 449       |
| Finance and Insurance                    | 36             | 295       |
| Wholesale Trade                          | 26             | 206       |
| Transportation and Warehousing           | 24             | 201       |
| Professional, Scientific & Technical Svc | 41             | 195       |
| Other Services (except Public Admin.)    | 42             | 171       |
| Manufacturing                            | 19             | 127       |
| Information                              | 12             | 117       |
| Management of Companies and Enterprises  | 5              | 116       |
| Real Estate and Rental and Leasing       | 23             | 103       |
| Arts, Entertainment, and Recreation      | 9              | 95        |

Source: Colorado Dept. of Labor

## 2.5 Government

A Board of County Commissioners governs the County. The County government includes 21 departments and includes Building, Community and Development Services, Emergency Management, Health and Environment, Road and Bridge, and the Sheriff's Office. The County Administrator serves as the chief operating official of the county and is responsible for all county departments. The City of Alamosa is a Home Rule Municipality, and operates under the Council-Manager form of government. Hooper is a Statutory Town with a County Clerk and no regular staff.

# 3. Planning Process

This chapter describes the planning process used to develop the Plan, including how it was prepared, who was involved in the process, and how the public was involved.

## 3.1 Steering Committee and County Planning Teams

---

The San Luis Valley GIS/GPS Authority (GIS Authority) contracted with URS Corporation (URS) in April 2009 to assist in developing multi-jurisdictional, multi-hazard mitigation plans for five counties in the San Luis Valley. The GIS Authority and URS worked together to convene the San Luis Valley Hazard Mitigation Steering Committee (Steering Committee), which included emergency managers from each county, federal and state agencies, and city and county staff and elected officials. At the Steering Committee Kick-off Meeting, the Emergency Managers were given instructions for creating County Planning Teams (Planning Teams), which would include representatives of each participating jurisdiction in their county as well as local utility providers, police and fire, land use administrators, health care providers, elected officials, local stakeholders and concerned citizens. Table 3-1 lists the Steering Committee and Alamosa County Planning Team Participants.

To ensure participation in the Plan development, each Planning Team member was asked to complete the following:

- Attend and participate in meetings
- Collect risk assessment data
- Make decisions on Plan process and content
- Complete homework assignments
- Submit mitigation action implementation worksheets
- Coordinate and assist with the public outreach strategy
- Review Plan drafts
- Coordinate the final adoptions of the Plan

This Multi-Hazard Mitigation Plan was prepared over nine months. Table 3-3 lists the dates and agenda items for the meetings of the Planning Team. Full agendas and sign-in sheets are included in Appendix B: Planning Process Documentation.

## 3.2 Multi-Jurisdictional Participation

### FEMA Requirement

Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Alamosa County invited incorporated towns and cities and special districts within the county to participate in the multi-jurisdictional Plan. The Disaster Mitigation Act of 2000 requires that each participating jurisdiction be involved in the planning process and formally adopt the mitigation Plan. Table 3-1 records the attendance of representatives from each participating jurisdiction at the Planning Committee meetings. The complete list of invited participants and sign-in sheets for each meeting are included in Appendix B.

**Table 3-1: Steering Committee and Planning Team Participants**

| Agencies that participated in the San Luis Valley Hazard Mitigation Steering Committee:                                                                                                                                                                                                                                                                                                                                                      | Agencies that participated on the Alamosa County Planning Team (Planning Team) included:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Emergency Managers from Alamosa, Conejos, Mineral, Rio Grande and Saguache Counties</li> <li>• Town of Romeo</li> <li>• Colorado Geological Survey</li> <li>• Colorado Department of Transportation</li> <li>• Colorado Office of Emergency Management</li> <li>• Colorado Division of Water Resources</li> <li>• Great Sand Dunes National Park</li> <li>• U.S. Army Corps of Engineers</li> </ul> | <ul style="list-style-type: none"> <li>• Alamosa County Office of Emergency Management</li> <li>• Alamosa County Commissioners Office</li> <li>• Alamosa County Land Use</li> <li>• City of Alamosa</li> <li>• Alamosa County Emergency Medical Response</li> <li>• Alamosa Fire Protection District</li> <li>• Rio Grande Water Conservation District</li> <li>• Town of Hooper</li> <li>• San Luis Valley Red Cross</li> <li>• San Luis Valley Citizen Corps</li> <li>• San Luis Valley Regional EMS/Trauma Advisory Council</li> <li>• USDA Forest Service</li> <li>• US Bureau of Reclamation</li> <li>• Colorado Division of Emergency Management</li> </ul> |

### 3.3 10-Step Planning Process

#### FEMA Requirement

Requirement §201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

The County Planning Team used FEMA's 10-step planning process integrating recommendations from FEMA's *Local Multi-Hazard Mitigation Planning Guidance* (2008), the Local Mitigation Planning How-To Guides, and the 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Table 3-2 shows how the modified 10-step process corresponds with the planning requirements of the Disaster Mitigation Act.

**Table 3-2: 10-Step Planning Process Used to Develop the Plan**

| Disaster Mitigation Act Requirements 44CFR 201.6  | Modified CRS Planning Steps                            |
|---------------------------------------------------|--------------------------------------------------------|
| Phase I: Organize Resources                       |                                                        |
| 201.6(c)(1)                                       | Step 1: Organize the Planning Effort                   |
| 201.6(b)(1)                                       | Step 2: Involve the Public                             |
| 201.6(b)(2) and (3)                               | Step 3: Coordinate with Other Departments and Agencies |
| Phase II: Assess Risks                            |                                                        |
| 201.6(c)(2)(i)                                    | Step 4: Identify the Hazards                           |
| 201.6(c)(2)(ii)                                   | Step 5: Assess the Risks                               |
| Phase III: Develop the Mitigation Plan            |                                                        |
| 201.6(c)(3)(i)                                    | Step 6: Set Goals                                      |
| 201.6(c)(3)(ii)                                   | Step 7: Review Possible Activities                     |
| 201.6(c)(3)(iii)                                  | Step 8: Draft an Action Plan                           |
| Phase IV: Implement the Plan and Monitor Progress |                                                        |
| 201.6(c)(5)                                       | Step 9: Adopt the Plan                                 |
| 201.6(c)(4)                                       | Step 10: Implement, Evaluate, and Revise the Plan      |

Source: FEMA Local Multi-Hazard Mitigation Planning Guidance, 2008

The following section provides a narrative description of the planning process.

#### Phase I: Organize Resources

##### *Step 1: Organize the Planning Effort*

The planning process began with a Steering Committee Kick-off Meeting in Alamosa, Colorado, on June 19, 2009. The SLV Authority emailed letters of invitation to county, municipal, district, federal, state, and other stakeholder representatives to form the Steering Committee discussed in Section 3.1. The Steering Committee discussed ideas for involving the public (Step 2) and coordination with other agencies and departments (Step 3). Complete Steering Committee contact information is provided in Appendix B.

At each Planning Team meeting, URS presented information on the scope and purpose of the Plan, roles and responsibilities of participating jurisdictions, and an overview of the planning process and schedule. The Planning Teams developed public outreach strategies, prioritized their list of hazards, confirmed their critical facilities, and prioritized mitigation actions. The Steering Committee reconvened for a joint meeting with the Planning Teams to develop a mitigation implementation strategy for the Valley. Table 3-3 describes the dates of all project meetings with agenda highlights. Complete meeting documentation information is included in Appendix B.

**Table 3-3: San Luis Valley Hazard Mitigation Plan Meetings**

| Date                                      | Meeting Type and Agenda                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| June 19, 2009                             | <b>Steering Committee Kick-off Meeting:</b> <ul style="list-style-type: none"> <li>• Introduce the Disaster Mitigation Act of 2000 and purpose and requirements of hazard mitigation planning;</li> <li>• Discuss multi-jurisdictional requirements and expectations for participation on the Hazard Mitigation Planning Teams;</li> <li>• Discuss public outreach strategies; and</li> <li>• Share expectations for the planning process and results.</li> </ul>                                                  |
| July 20, 2009 through July 22, 2009       | <b>County Planning Team Meeting #1:</b> <ul style="list-style-type: none"> <li>• Introduce the Disaster Mitigation Act of 2000 and purpose and requirements of hazard mitigation planning, including multi-jurisdictional participation;</li> <li>• Discuss the planning process and the public outreach requirements and strategies;</li> <li>• Begin hazard identification and data collection process; and</li> <li>• Distribute homework regarding capability assessment and citizen questionnaire.</li> </ul> |
| October 26, 2009 through October 28, 2009 | <b>County Planning Team Meeting #2:</b> <ul style="list-style-type: none"> <li>• Finalize jurisdictional participation and public outreach strategy;</li> <li>• Review results of risk assessment; Introduce mitigation goals and actions;</li> <li>• Develop Mitigation Strategies for each County;</li> <li>• Prioritize mitigation actions; and</li> <li>• Distribute homework regarding critical facilities and San Luis Valley Regional Implementation Workshop.</li> </ul>                                   |
| January 12, 2010                          | <b>San Luis Valley Regional Implementation Workshop:</b> <ul style="list-style-type: none"> <li>• Share results of Planning Team Meetings; and</li> <li>• Determine regional strategies for implementation to be included in the SLV Regional Annex.</li> </ul>                                                                                                                                                                                                                                                    |

### ***Step 2: Involve the Public***

#### **FEMA Requirement**

Requirement §201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process, *shall* include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

At their first two meetings, the Planning Team discussed different options for involving the public in the hazard mitigation planning process and finalized the following outreach plan.

**Mitigation Plan flyer and questionnaire:** URS developed a document to be distributed at public events located in Alamosa County over the summer and fall of 2009 that included information about the Plan on one side and a questionnaire on the reverse. A copy of the flyer is included in Appendix B. The flyer was posted on the GIS Authority's website and distributed by Alamosa County officials and Town of Hooper officials. No survey responses were received.

**Alamosa County Planning Commission Presentation:** The Alamosa County Emergency Manager updated the Alamosa County Planning Commission and the City of Alamosa Planning Commission on the status of the planning process at their regularly scheduled meetings in December 2009. These meetings were open to the public. The agendas and newspaper articles advertising the public meetings are included in Appendix B.

**Public Review of Plan Draft:** The participating jurisdictions worked together to make the Plan available for public review in electronic or hard copy from mid-March to May 2010, at the following locations: Alamosa County Building in the Clerks Office, the office on Independence Way, and in the Town of Hooper at the Town Hall building. The Plan was available for electronic review at the following website:

*San Luis Valley GIS/GPS Authority* - <http://slvgis.info/>

The Planning Team publicized the availability of the draft Plan by issuing a press release to the Valley Courier. A Copy of the notification is available in Appendix B. Public comments are also included in Appendix B.

### ***Step 3: Coordinate with Other Departments and Agencies***

Alamosa County Office of Emergency Management invited a range of local, state, and federal departments and agencies and other interested parties to be involved in the Planning Team. The Planning Team also invited additional stakeholders to 1) complete the public input questionnaire and 2) review and comment on the Plan draft. These additional stakeholders were the following:

- Colorado Geological Survey
- Colorado State Forest Service
- Colorado Department of Transportation
- National Parks Service
- Colorado State Patrol
- US Forest Service/BLM
- US Army Corps of Engineers
- US Fish and Wildlife
- FEMA Region VIII
- National Weather Service
- Neighboring Counties
- Trinidad State Junior College
- Adams State College

#### ***Incorporation of other plans and studies***

As part of the coordination with other departments and agencies, URS and the Planning Team reviewed and incorporated existing plans, studies, reports, and technical information. This information was used in the development of the hazard identification, vulnerability assessment, and capability assessment in Chapter 4 and in the formation of goals and mitigation actions in Chapter 5. These sources are documented throughout the Plan and in Appendix E: References. The plans and studies specific to Alamosa County included the following:

- FEMA Flood Insurance Studies, Alamosa County & City of Alamosa, Revised April 21, 1999
- Results of US Army Corps of Engineers Continuing Eligibility Inspection, December 15, 2008
- Alamosa County Fire Protection District Community Wildfire Protection Plan, May 2009
- Town of Hooper Zoning Code
- 2008 Alamosa County Master Plan
- 2009 Land Use Code for Alamosa County

## **Phase II: Assess Risks**

### ***Step 4: Identify the Hazards***

At the first Planning Team meeting, URS presented information on the requirements for the risk assessment section of a hazard mitigation plan. Planning Team participants reviewed the list of hazards FEMA recommends for consideration in mitigation planning and discussed the past and potential impacts of these hazards on communities in the county. The Team agreed to eliminate three hazards due to low risk and insufficient data and due to lack of relevance with this Plan's purpose and scope (subsidence, extreme heat, and expansive soils). Section 4-2 describes the hazards that impact Alamosa County.



### ***Step 5: Assess the Risks***

A profile of each identified hazard was created using available GIS data, online data sources, and existing plans and reports. The profiles included a hazard description, geographic location, past occurrences, probability of future occurrences, and magnitude/severity (extent) for each hazard. Members of the Planning Team used a worksheet to provide information to URS about hazard data sources and past events in the county. The profiles also describe overall vulnerability of each jurisdiction to each hazard and identify structures and estimate potential losses to structures in identified hazard areas.

Participating jurisdictions inventoried their assets at risk to natural hazards—overall and in identified hazard areas—and analyzed development trends in hazard areas. They provided this information through worksheets and GIS data.

Each participating jurisdiction also completed a mitigation capability assessment, which identifies the existing government programs, policies, regulations, ordinances, and plans that mitigate or could be used to mitigate risk to disasters. Participating jurisdictions collected information on their regulatory, personnel, fiscal, and technical capabilities, as well as ongoing initiatives related to interagency coordination and public outreach. This assessment is summarized in Section 4.15.

## **Phase III: Mitigation Strategy**

### ***Step 6: Set Goals***

At Planning Team Meeting #2, URS provided an overview of the mitigation strategy and the goals of the Colorado State Natural Hazards Mitigation Plan. The Planning Team discussed goals for their Plan and listed possible mitigation actions.

### ***Step 7: Review Possible Activities***

The Planning Team identified and prioritized mitigation actions at Planning Team Meeting #2. Details on this process are included in Chapter 5 - Mitigation Strategy. The Planning Team identified the responsible agency, cost estimates, and timeline for each identified action.

### ***Step 8: Draft the Plan***

URS developed a first complete draft of the Plan document for review by the Planning Team. The draft was made available online and in hard copy for review and comment by the public and other agencies and interested stakeholders. This review period was from March through May 2010. Methods for inviting interested parties and the public to review and comment on the Plan were discussed in Steps 2 and 3, and materials are provided in Appendix B. Comments were integrated into a final draft for submittal to the Colorado Division of Emergency Management, Colorado Water Conservation Board, and FEMA Region VIII.

#### **Phase IV: Plan Maintenance**

##### ***Step 9: Adopt the Plan***

The governing bodies of each participating jurisdiction adopted the Plan. Copies of resolutions of adoption are included in the Prerequisites section of the Plan.

##### ***Step 10: Implement, Evaluate, and Revise the Plan***

The Planning Committee developed and agreed upon a method and schedule for Plan implementation and for monitoring, evaluating, and maintaining the Plan over time. This information is described in Chapter 6. Plan Maintenance.

# 4. Risk Assessment

## FEMA Requirements

Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the types of all natural hazards that can affect the jurisdiction.

Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the location and extent of all natural hazards that affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and the probability of future hazard events.

Requirement §201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

Requirement §201.6(c)(2)(ii)(B): The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

This chapter profiles the natural hazards that affect Alamosa County and assesses vulnerability to those hazards. The risk assessment allows Alamosa County communities to better understand their risks and provides a framework for developing and prioritizing mitigation actions to reduce risk from future natural hazard events.

This risk assessment chapter is organized as follows:

- **Section 4.1 Hazard Identification** identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- Hazard profiles in **Section 4.2 through Section 4.14** describe the location of the hazard in the planning area, previous occurrences of hazard events, probability of future occurrence, and potential magnitude or severity for each identified hazard. These sections also describe overall vulnerability to each hazard and identify structures and estimate potential losses to structures in identified hazard areas.

- **Section 4.15 Community Asset Inventory** assesses the county's total exposure to natural hazards and considers assets and populations at risk, including critical facilities and infrastructure; natural, historic, and cultural resources; economic assets; and socioeconomic variables.
- **Section 4.16 Land Use and Development Trends** analyzes trends in population growth, housing demand in hazard areas, and land use patterns.
- **Section 4.17 Capability Assessment** identifies the existing programs, policies, and plans that mitigate or could be used to mitigate risk of natural hazards for each jurisdiction.

## 4.1 Hazard Identification

The Planning Team considered a number of sources for determining the natural hazards that affect Alamosa County. The Team considered the hazards identified in the State of Colorado Natural Hazards Mitigation Plan (2007), and the hazards recommended by the Federal Emergency Management Agency (FEMA publication 386-2, *Understanding Your Risks: Identifying Hazards and Estimating Losses* (2002)). The Planning Team also reviewed events that triggered federal and/or state disaster declarations. Disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration. FEMA also issues emergency declarations, which are more limited in scope and do not warrant the long-term federal recovery programs of major disaster declarations.

Table 4-1 lists state and federal disaster declarations in which Alamosa County was a designated county.

**Table 4-1: FEMA and State Disaster Declaration History in Alamosa County, 1965-2008**

| Year | Event Type               | Disaster Number |
|------|--------------------------|-----------------|
| 1970 | Heavy rains and flooding | 293             |
| 1973 | Flooding and landslides  | 396             |

Source: State of Colorado Natural Hazards Mitigation Plan; Public Entity Risk Institute Presidential Disaster Declaration Site, [www.peripresdecusa.org/mainframe.htm](http://www.peripresdecusa.org/mainframe.htm).

### United States Department of Agriculture (USDA) Disaster

A USDA disaster declaration certifies that the affected county has suffered at least a 30 percent loss in one or more crop or livestock areas and provides affected producers with access to low-interest loans and other programs to help mitigate the impact of the drought. All counties neighboring those receiving disaster declarations are named as contiguous disaster counties and are eligible for the same assistance in accordance with the Consolidated Farm and Rural Development Act.

From 2005 to 2007<sup>1</sup>, the USDA issued four disaster designations for Alamosa County. These declarations were for drought, winter storms, wildfire, insects, extreme heat, high winds, and below normal temperatures.

<sup>1</sup> Source: USDA Farm Service Agency, [www.fsa.usda.gov/Internet/FSA\\_File/2005\\_2007eligible\\_county.xls](http://www.fsa.usda.gov/Internet/FSA_File/2005_2007eligible_county.xls)

At the first Planning Team meeting, individual hazards were considered based upon the prior occurrence as part of a federal or state disaster declaration, the understanding of relative risk, and whether the hazard could be mitigated. The Planning Team determined that twelve natural hazards pose a threat to the county, as listed below.

- Flood
- Wildfire
- Hail
- Lightning
- Windstorm
- Tornado
- Severe Winter Storm
- Drought
- Dam and Levee Failure
- Avalanche
- Landslide
- Earthquake

The Planning Team recognizes bark beetle infestation as a potential future hazard that contributes to the risk for wildfire and extreme heat as a hazard that contributes to drought.

Other hazards not profiled in the Plan, due to the low likelihood of occurrence or low probability that property or populations would be significantly affected, are listed in Table 4-2 along with an explanation.

**Table 4-2: Hazards Not Profiled in Plan**

| Hazard          | Explanation for Omission                                                                                                                                                       |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Expansive Soils | Although some underlying swelling clays may exist in Alamosa County, the overall impacts are negligible and are mitigated through existing development policies and practices. |
| Extreme Heat    | This hazard has not created problems in the past that are unrelated to drought. It is primarily an issue of human and livestock health.                                        |
| Land Subsidence | The Planning Team is not aware of any previous occurrences or problems associated with this hazard.                                                                            |

Table 4-3 lists the hazards profiled in the Plan and the jurisdictions impacted by each hazard.

**Table 4-3: Hazards Identified for Each Participating Jurisdiction**

| Hazard                | Alamosa County | City of Alamosa | Town of Hooper | Rio Grande WCD | Alamosa FPD |
|-----------------------|----------------|-----------------|----------------|----------------|-------------|
| Dam and Levee Failure | ✓              | ✓               | ✓              | ✓              | ✓           |
| Flood                 | ✓              | ✓               | ✓              | ✓              | ✓           |
| Wildfire              | ✓              | ✓               | ✓              | ✓              | ✓           |
| Hail                  | ✓              | ✓               | ✓              | ✓              | ✓           |
| Lightning             | ✓              | ✓               | ✓              | ✓              | ✓           |
| Windstorm             | ✓              | ✓               | ✓              |                | ✓           |
| Tornado               | ✓              | ✓               | ✓              |                | ✓           |
| Winter Storm          | ✓              | ✓               | ✓              | ✓              | ✓           |
| Drought               | ✓              | ✓               | ✓              | ✓              | ✓           |
| Landslide             | ✓              |                 |                |                | ✓           |
| Avalanche             | ✓              |                 |                |                | ✓           |
| Earthquake            | ✓              | ✓               | ✓              | ✓              | ✓           |

## 4.2 Hazard Profiles

Each of the hazards identified as posing a threat in Alamosa County are profiled in subsequent sections. Each profile includes a summary of the overall risk and vulnerability for each identified hazard for each participating jurisdiction. This section describes the research methodology and defines the elements of the hazard profiles.

The sources used to collect information for the hazard profiles include, but are not limited to the following:

- State of Colorado Natural Hazards Mitigation Plan (2007);
- Information on past hazard events from the Spatial Hazard Event and Loss Database; (SHELDUS), a component of the University of South Carolina Hazards Research Lab, that compiles county-level hazard data for 18 natural hazard event types;
- Information on past extreme weather and climate events from the National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC);
- Disaster declaration history from FEMA, the Public Entity Risk Institute (PERI), and the U.S. Department of Agriculture (USDA) Farm Service Agency;
- Geographic information systems (GIS) data from the San Luis Valley GIS/GPS Authority;
- Statewide GIS datasets compiled by state and federal agencies;
- Existing plans and reports; and
- Information collected from the Planning Team and additional stakeholders.

Detailed profiles and vulnerability assessments include the following characteristics of each identified hazard:

**Hazard Description** provides a general description of the hazard and considers the relationship between hazards.

**Geographic Location** describes the geographic extent or location of the hazard in the planning area and determines which participating jurisdictions are affected by each hazard.

**Previous Occurrences** includes information on the known hazard incidents and includes information related to the impact of those events, if known.

**Probability of Future Occurrence** uses the frequency of past events to estimate the likelihood of future occurrence. The probability, or chance of occurrence, was calculated based on existing data. The probability was determined by dividing the number of events observed by the number of years and multiplying by 100. This provides the percent chance of the event happening in any given year. For example, three droughts occurring over a 30-year period suggests a 10 percent chance of a drought occurring in any given year.

Based on historical data, the probability of future occurrences is categorized as follows:

- *Highly Likely*: Near 100 percent chance of occurrence next year or it happens every year
- *Likely*: 10-100 percent chance of occurrence next year or it has a recurrence interval of 10 years or less
- *Occasional*: 1-10 percent chance of occurrence in the next year or it has a recurrence interval of 11 to 100 years
- *Unlikely*: Less than 1 percent chance of occurrence in the next 100 years or it has a recurrence interval of greater than every 100 years

**Magnitude/Severity** summarizes the extent or potential extent of a hazard event in terms of deaths, injuries, property damage, and interruption of essential facilities and services.

Magnitude and severity is categorized as follows:

- *Catastrophic*: Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service for more than 72 hours
- *Critical*: Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours
- *Limited*: Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours
- *Negligible*: No or few injuries or illnesses; minor quality of life loss; little or no property damage; and/or brief interruption of essential facilities and services

**Vulnerability Assessment** describes the county's overall vulnerability to each hazard; identifies existing and future structures, critical facilities, and infrastructure in identified hazard areas; and estimates potential losses to vulnerable structures, where data is available.

**Data Limitations** makes note of where the Planning Team encountered data limitations when completing the hazard profile.

### **4.3 Flood**

---

#### **Hazard Description**

Alamosa County is at risk to riverine and stormwater flooding. Riverine flooding occurs when a watercourse exceeds its “bank-full” capacity and generally occurs as a result of prolonged rainfall, or rainfall that is combined with soils already saturated from previous rain events. The area adjacent to a river channel is its floodplain. In its common usage, “floodplain” most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The one percent annual flood is the national standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

Stormwater refers to water that collects on the ground surface or is carried in the stormwater system when it rains. In runoff events where the amount of stormwater is too great for the system, or if the channel system is disrupted by vegetation or other debris that blocks inlets or pipes, excess water remains on the surface. This water may pond in low-lying areas, often in street intersections. Stormwater ponding, also known as localized flooding, may result in deep water and pollution. Stormwater can pick up debris, chemicals, dirt, and other pollutants from impervious surfaces.

The potential for flooding is altered by land use changes that change the impervious characteristics of the land surface. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining watersheds or natural drainage channels. These changes are commonly created by development and can also be created by other events such as wildfires. Wildfires create hydrophobic soils, a hardening of the earth’s surface that prevents rainfall from being absorbed into the ground, which can increase runoff, erosion, and downstream sedimentation of channels.

#### **Geographic Location**

Alamosa County is located within the Rio Grande River drainage basin in south central Colorado. The Rio Grande River is the greatest source of flood hazards. Alamosa County is particularly vulnerable to flooding related to Severe Weather events between May and June when snowmelt runoff fills the Rio Grande River to its capacity.

Flooding along the Rio Grande River has caused damage in the City of Alamosa for over a century. A particularly destructive flood occurred in June 1927. This flood was caused by snowmelt and heavy rains. It destroyed five bridges, halted train service, and contributed to three deaths. Mitigation measures along the river include levees that have reduced, but not eliminated the vulnerability of the City’s residents.<sup>2</sup>

Alamosa County does not currently have FEMA approved Digital Flood Insurance Rate Maps (DFIRMS). Data for riverine flooding in Alamosa County was generated using HAZUS-MH MR3 (HAZUS), FEMA’s software program for estimating potential losses from disasters. HAZUS was used to generate a 1 percent annual flood, or 100-year flood, in Alamosa County. The software

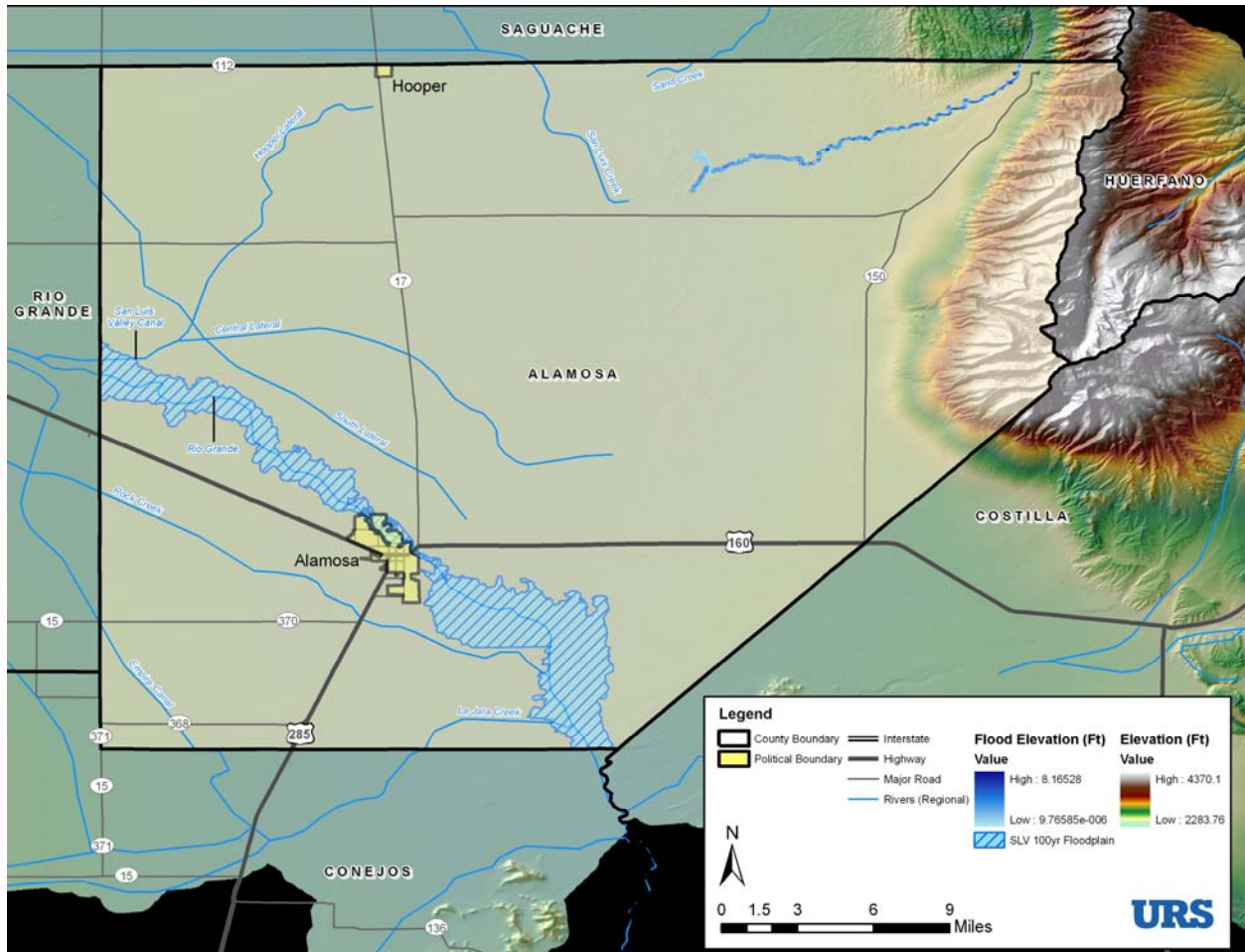
---

<sup>2</sup> Alamosa County Description, Colorado State Hazard Mitigation Plan, 2008.



produces a flood polygon and flood-depth grid that represents the 100-year flood. While not as accurate as DFIRMs, these floodplain boundaries are useful for GIS-based loss estimation. Figure 4-1 is a map of the 100-year floodplain for Alamosa County.

**Figure 4-1: 100-year floodplains for Alamosa County**



Source: HAZUS MH (MR3), output October 2009. Intended for planning purposes only.

### Previous Occurrences

Major flood events in Alamosa County were compiled from a number of sources, as listed in Table 4-4.

**Table 4-4: Major Flood Events in Alamosa County**

| Year | Location         | Description                                                | Data Source |
|------|------------------|------------------------------------------------------------|-------------|
| 1869 |                  | Some damage to Alamosa                                     | FEMA FIS    |
| 1884 | Rio Grande       | Melting of very heavy snow cover, augmented by heavy rains | FEMA FIS    |
| 1905 |                  | Snowmelt                                                   | FEMA FIS    |
| 1911 | Upper Rio Grande | Wholly caused by heavy rains                               | FEMA FIS    |

| Year      | Location | Description                                                                 | Data Source   |
|-----------|----------|-----------------------------------------------------------------------------|---------------|
| 1927      |          | 250 year recurrence interval flood caused by melting snow and precipitation | FEMA FIS      |
| 1970      |          | FEMA Declaration Number 293 – Heavy Rains and Flooding                      | PERI          |
| 1973      |          | FEMA Declaration Number 396 – Flooding and Landslides                       | PERI          |
| 1977      |          | Flooding & Hail                                                             | SHELDUS       |
| 1979      |          | Flooding, Severe Storms                                                     | SHELDUS       |
| 1984      |          | Flooding                                                                    | SHELDUS       |
| 1985-1987 |          | High water period on the Rio Grande                                         | Planning Team |

### Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence next year or it has a recurrence interval of 10 years or less

There were nine documented major flood events from 1884 to 1984. Therefore, the mathematical probability of a major flood event occurring in any given year is 9 percent. In other words, a major flood event would be expected to occur every 11 years. This frequency corresponds with an “occasional” probability of future occurrence; however, when the risk assessment was reviewed by the Planning Team, the local audience reported that flooding is a more frequent occurrence and that a “likely” probability is more appropriate.

### Magnitude/Severity

**Catastrophic:** Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service for more than 72 hours

Floods can result in loss of life and property with the extent of the damage dependent on the depth and velocity of floodwaters. Past flood events in Alamosa County have damaged roads and bridges, public facilities, private property, and businesses. These events are likely to continue in the future and may be exacerbated by increasing development. Large portions of the City of Alamosa are protected by a levee system. Should the levee system fail, the results would be devastating.

### Vulnerability Assessment

**Overall Summary and Impacts:** Most of the structures located within the 100-year floodplain in Alamosa County are residential (1,121 of the 1,259 total structures in the floodplain). There are four critical facilities located within the floodplain, as listed below. In a 100-year event, it is estimated that the total incurred losses to these facilities would be over \$1 million. The total incurred losses to the county would be over \$57 million. New development in the floodplain is controlled through development regulations. The levee protecting properties within the City of Alamosa requires ongoing maintenance to remain an effective mitigation measure.

**National Flood Insurance Program:** Alamosa County joined the National Flood Insurance Program (NFIP) in 1978. Any structure built in the floodplain has to meet Alamosa County’s floodplain regulations. Table 4-5 provides information on the NFIP participation of communities in Alamosa County. NFIP insurance data indicates that as of July 31, 2009, there were 45

flood insurance policies in force (\$8,542,500 in coverage) in the unincorporated areas of the county and 50 policies in the City of Alamosa (\$11,787,700 in coverage). The Town of Hooper does not participate in the NFIP. There are no mapped floodplains, nor known flood hazard areas, within the Town of Hooper. There are no repetitive loss properties identified in Alamosa County.

**Table 4-5: Alamosa County NFIP Information**

| Jurisdiction    | Date Joined                | Effective FIRM Date | Policies in Force | Insurance in Force (\$) | Number of Claims | Claims Total (\$) |
|-----------------|----------------------------|---------------------|-------------------|-------------------------|------------------|-------------------|
| Alamosa County  | 1/19/78<br>Regular Program | 4/21/99             | 45                | \$8,542,500             | 3                | \$1,214.98        |
| City of Alamosa | 9/15/77<br>Regular Program | 4/21/99             | 50                | \$11,787,700            | 14               | \$9,225.29        |
| Town of Hooper  | Not Participating          | --                  | --                | --                      | --               | --                |

Sources: National Flood Insurance Program BureauNet, [http://bsa.nfipstat.com/comm\\_status/index.htm](http://bsa.nfipstat.com/comm_status/index.htm); <http://bsa.nfipstat.com/reports/1011.htm#COT>; and <http://bsa.nfipstat.com/reports/1040.htm>, all on October 1, 2009.

### ***Identifying Structures and Estimating Potential Losses:***

#### **HAZUS Analysis**

HAZUS was used to identify the structures located in the 100-year floodplain. Table 4-6 illustrates the results of the HAZUS analysis, which provides the number of structures damaged in a 100-year flood event.

**Table 4-6: Structures damaged in a 100-Year Flood in Alamosa County**

| County  | Total Structures in County | Number of Structures Damaged | Structures in 100-yr Floodplain | % of Total Structures Damaged |
|---------|----------------------------|------------------------------|---------------------------------|-------------------------------|
| Alamosa | 7,493                      | 223                          | 1,259                           | 3.0                           |

Source: HAZUS- MH MR3

HAZUS results include the number of buildings impacted, building repair costs, and the associated loss of building contents and business inventory. Building damage can also cause function losses to a community, which relate to the opportunity loss while a building remains vacant. Income loss data accounts for 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. Flood damage is directly related to the depth of flooding. For example, a two-foot flood results in about 20 percent of the structure being damaged (which translates to 20 percent of the structure's replacement value).

Table 4-7 shows that HAZUS estimates total building damages of over \$57 million in Alamosa County. In addition, HAZUS estimates that the number of people displaced by the flood event is 3,785 and the number of people requiring short-term sheltering is 3,063.

**Table 4-7: HAZUS 100-Year Flood Building Damage Estimates for Alamosa County**

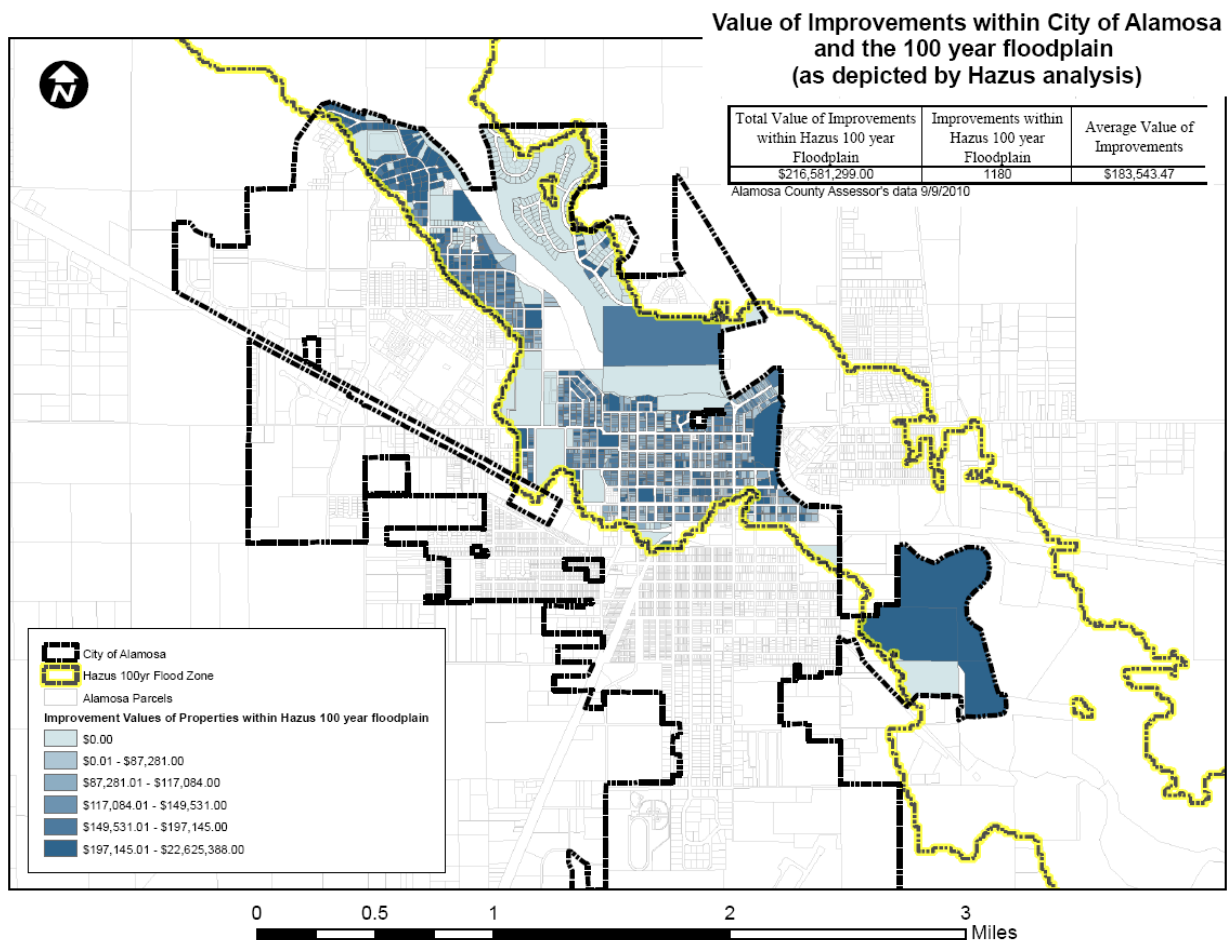
| Type               | Damage Estimate |
|--------------------|-----------------|
| Building Damage    | \$15,041,000    |
| Contents Damage    | \$15,041,000    |
| Inventory Loss     | \$25,000,000    |
| Relocation Loss    | \$511,000       |
| Wages Losses       | \$1,240,000     |
| Income Loss        | \$367,000       |
| Rental Income Loss | \$241,000       |
| Total Loss         | \$57,441,000    |

Source: HAZUS-MH MR3, 2009

### **Parcel Data Analysis**

The planning team conducted additional analysis of the vulnerability to flood for jurisdictions where data was available. Using parcel data, the team was able to overlay the HAZUS 100-year floodplain on the City of Alamosa and calculate the number of improvements and the total value of those improvements within the 100-year floodplain. The results on the following figure show that within the City of Alamosa there is nearly 1,200 improvements worth over \$200 Million within the 100-year floodplain. The Town of Hooper did not note any particular vulnerability to flood hazard during the planning process.

Figure 4-2: Value of Improvements within the City of Alamosa 100-year Floodplain



**Critical Facilities and Infrastructure:** To identify critical facilities located in the floodplain, GIS data from Alamosa County showing the locations of critical facilities was combined with the 100-year floodplain map. The following critical facilities were identified in the 100-year floodplain: Cottonwood Christian School, Evans Elementary School, the Police Department, and the Alamosa Fire Department.

**Future Development:** New development within the floodplain is managed through floodplain regulations adopted by Alamosa County and the City of Alamosa.

### Data Limitations

Alamosa County has created updated flood maps utilizing local engineering, which require FEMA approval. The City of Alamosa is anticipating new DFIRMs to be prepared in 2011. Once these maps are adopted, estimates of structures and values within the floodplain should be revised.

## **4.4 Wildfire**

---

### **Hazard Description**

There are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are fuel, topography, and weather. Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Manmade structures, such as homes and associated combustibles, are also considered a fuel source. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for the spread of fire. In addition, "ladder fuels" can spread a ground fire up through brush into trees, leading to a devastating crown fire that burns in the upper canopy and cannot be controlled.

Topography, or an area's terrain and land slopes, affects its susceptibility to wildfire spread. Due to the convection of heat, both fire intensity and rate of fire spread increases as slope increases. The arrangement of vegetation on a hillside can also contribute to increased fire activity on slopes.

Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread and the more intense it will become. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires; often in terrain that is difficult for firefighters to reach. Drought conditions contribute to wildfire vulnerability. During periods of drought, the threat of wildfire increases. Human-caused fires result from activities such as campfires, smoking, equipment use, and arson.

### **Geographic Location**

The Colorado State Forest Service in partnership with federal agencies developed the Colorado Wildland Urban Interface Assessment, which uses three GIS layers to determine fire danger: risk, hazard, and values. Following is the data used to create each layer:

#### **Risk:** Probability of ignition

- Lightning strike density
- Road buffer – 100 meter buffer of roads and railroads

#### **Hazard:** Vegetative and topological features affecting intensity and rate of spread

- Slope
- Aspect
- Fuels – Interpreted from Colorado Division of Wildlife Gap vegetation information



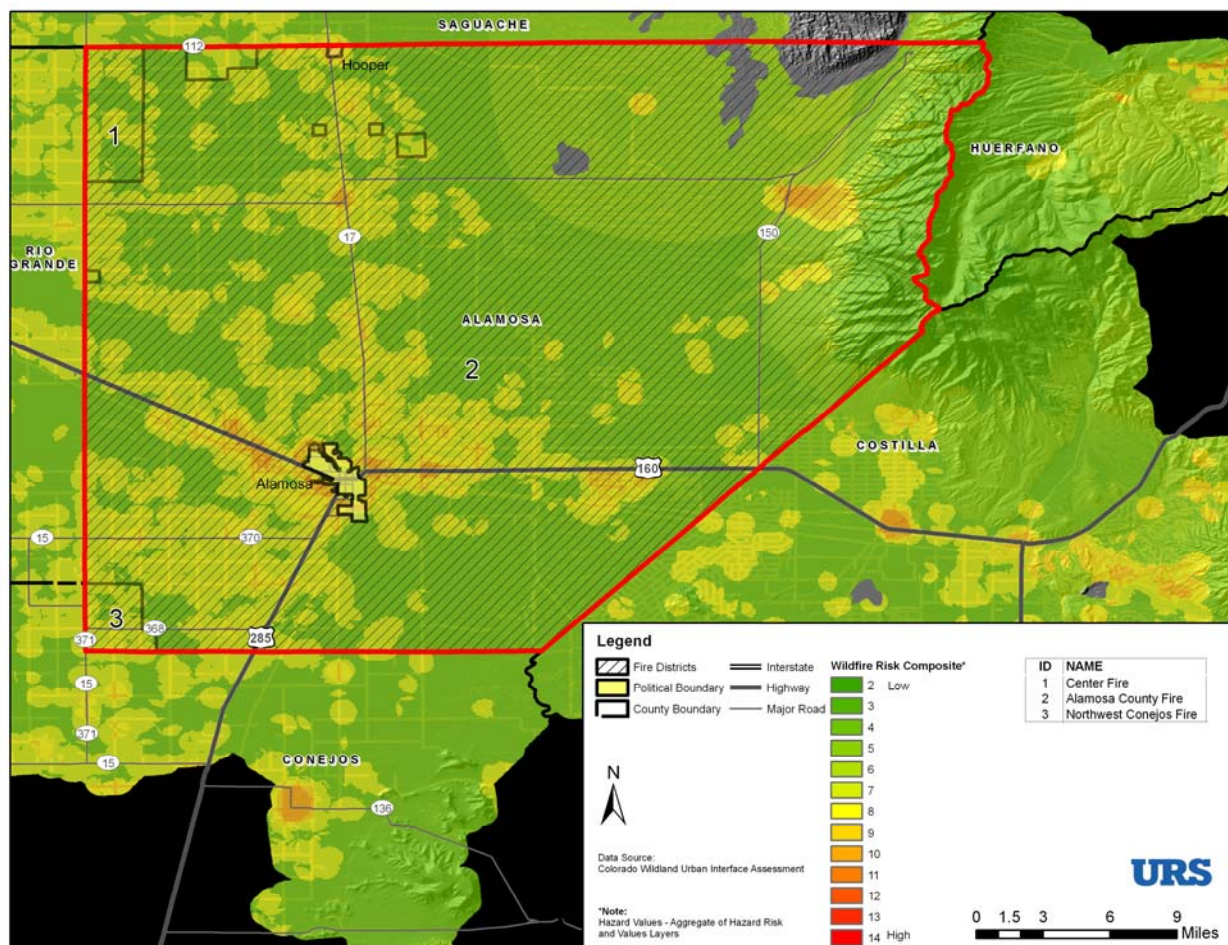
## 4. Risk Assessment

**Values:** Natural or manmade components of the ecosystem on which a value can be placed

- Housing density

These layers were combined to create an overall wildfire risk composite ranking, which is shown with fire protection district boundaries, in Figure 4-3.

**Figure 4-3: Fire Protection Districts and Wildfire Risk Composite in Alamosa County**



The map indicates that the wildfire hazard in Alamosa County is elevated near the northeastern quadrant of the County, along the foothills of the Sangre de Cristo Mountains. The wildfire risk is predominantly associated with wildland-urban interface areas (areas where development occurs within or immediately adjacent to wildlands, near fire-prone trees, brush, and/or other vegetation).

Alamosa County has a diverse range of vegetation types from the dense cottonwoods in the riparian edge of the Rio Grande River to the desert shrubs on the valley floor. Vegetation on the slopes of the Sangre de Cristo Mountains includes high-

elevation cold desert shrubs, pinyon-juniper, Ponderosa Pine, Douglas-fir, Aspen, Engelmann Spruce, and Alpine meadows. The Ponderosa Pine and Douglas-fir forests are typically at higher risk for dense fire susceptibility.

Much of the wildfire risk in the valley is derived from agricultural ditches and overgrown grasses and weeds in the vicinity of these ditches. A majority of the wildland fires in the valley occur when controlled burns ignite their immediate surroundings. Spring ditch burning season typically results in escaped wildfires.

### Previous Occurrences

Previous occurrences of wildfires are not well documented. Table 4-8 lists known previous wildfires in Alamosa County and the data source.

**Table 4-8: Alamosa County Recent Wildfire History**

| Year | Location                       | Description                                                                                                                                                                                                                                                   | Data Source                             |
|------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 1973 | Mt. Blanca                     | Lightning-ignited fire burned thousands of acres.                                                                                                                                                                                                             | State Hazard Mitigation Plan            |
| 2000 | 18 miles NE of Alamosa         | A strong cold front brought strong winds and wildfire to parts of southern Colorado. A wildfire spread from a neighborhood burning pit near the Great Sand Dunes National Monument, where about 5000 acres of grass and juniper burned.                       | NCDC                                    |
| 2006 | Alamosa County                 | 35 counties were designated as primary natural disaster areas. Due to losses caused by drought, fire, high winds and heat that occurred from Jan. 1, 2006, and continuing, Alamosa County was designated as a primary natural disaster area on July 10, 2006. | USDA                                    |
| 2007 | Alamosa County                 | A wildfire caused approximately \$500 in property damages.                                                                                                                                                                                                    | SHELDUS                                 |
| 2010 | Great Sand Dunes National Park | Wildfire burned 4,312 acres (as of June 21 <sup>st</sup> , 2010). No structures damaged as of June 21 <sup>st</sup> , 2010.                                                                                                                                   | Rocky Mountain Area Coordination Center |

### Probability of Future Occurrence

**Occasional:** 1-10 percent chance of occurrence in the next year or it has a recurrence interval of 11 to 100 years

Based on past experience, wildfires occur at least occasionally in Alamosa County. Chances for wildfires increase with periods of drought, high winds, and extreme heat conditions.

### Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours



Potential losses from wildfire include human life; structures and other improvements; natural and cultural resources; the quality and quantity of the water supply; range and crop lands, and economic losses (tourism, fire expenditures, etc.). Smoke and air pollution from wildfires can be a severe health hazard. Other secondary impacts include future flooding and erosion during heavy rains.

### Vulnerability Assessment

**Overall Summary and Impacts:** The Alamosa County Fire Protection District recently completed their Community Wildfire Protection Plan (May 2009). This Plan identifies 27,854 acres located within wildland-urban interface (WUI) areas. This represents approximately 6.2 percent of the total 448,000 acres within Alamosa County. The most significant wildfire hazard is in the Zapata subdivision where 61 structures at a high risk. New development in the WUI and expanding bark beetle infestations may increase the wildfire threat in the future.

**Identifying Structures and Estimating Potential Losses:** The most significant wildfire hazard in the Alamosa Fire Protection District is in the Zapata subdivision where heavy coniferous fuels on the lower slopes of the Sangre de Cristo Mountains place 61 structures at a high risk. Table 4-9, below, provides an overview of the wildland-urban Interface areas within Alamosa County and their respective risk levels. The greatest vulnerability lies within the unincorporated parts of Alamosa County.

**Table 4-9: WUI Subdivisions Community Wildfire Hazard Ratings for Alamosa County**

| Low Risk                 | Moderate Risk | High Risk     |
|--------------------------|---------------|---------------|
| Riverdance Preserves     | Oasis         | Zapata/Urraca |
| San Luis Valley Ranches  |               |               |
| Deer Valley Meadows      |               |               |
| Hooper                   |               |               |
| Mosca                    |               |               |
| Sangre de Cristo Estates |               |               |
| Henry                    |               |               |
| 4-D Subdivision          |               |               |
| Cool Sunshine Ranch      |               |               |

Source: Alamosa County Fire Protection District Community Wildfire Protection Plan, 2009

The following map (Figure 4-4), taken from the Alamosa County Fire Protection District Community Wildfire Protection Plan, shows the Alamosa County Fire Hazard based on slope, aspect, and vegetation. This map illustrates the high risk areas at the lower elevations of the Sangre de Cristo Mountains, including the Zapata subdivision.

# ALAMOSA COUNTY FIRE HAZARD

Map showing fire hazard levels (Low, Moderate, High) across Alamosa County, New Mexico. The map includes major roads (Interstates 4, 25, 70, and State Routes 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949,

***Future Development and Other Considerations:*** As new development continues to occur in the wildland-urban interface, more people and property are at risk. The threat of wildfire and potential losses will increase as human development and population increases and the wildland-urban interface expands.

*Bark Beetle*<sup>3</sup>: Colorado forests have been infested with pine beetle or “bark beetle.” Alamosa County, surrounded by the Sangre de Cristo Mountains, is susceptible to future infestation. Older trees, trees in crowded or poor growing conditions, and those with root damage or disease are most likely to be attacked. The beetles kill the trees by tunneling under the bark and mating in a vertical tunnel, producing about 75 eggs. Following the egg hatch, bark beetle larvae tunnel away from the egg gallery, and spend winter under the bark. The larvae continue to feed in the spring and transform into pupae in late spring/early summer, emerging as adults in late summer and leaving behind the yellowed and reddened needles. Bark beetles are able to transmit spores of bluestain fungi, which grow within the tree and assist the beetle in killing the tree, leaving a blue-gray tint to the sapwood. These are often coordinated mass attacks. Under epidemic or outbreak conditions, enough beetles can emerge from an infested tree to kill two or more trees the following year. As the beetle population grows, so does the fuel for wildfire.

### Data Limitations

The wildfire risk map from the Colorado Wildland-Urban Interface Assessment project is raster data and suitable for use at the county scale, but not suitable for subdivision or parcel level hazard determinations. The maps taken from the Alamosa County Community Wildfire Protection Plan are more detailed; yet still do not wholly represent the true risk of each parcel or subdivision because individual landowners utilize different mitigation strategies including fuel reduction, choice of landscaping, debris, etc.

## 4.5 Lightning

---

### Hazard Description

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. It is sudden, extremely destructive and potentially deadly. Intracloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Although not as common, cloud-to-ground lightning is the most damaging and dangerous form of lightning. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm’s life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as five or ten miles from the storm in areas that most people do not consider to be a threat. Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

### Geographic Location

Lightning can occur anywhere in Alamosa County and poses a similar risk to all participating jurisdictions.

---

<sup>3</sup> Mountain Pine Beetle by D.A. Leatherman, I. Aguayo, and T.M. Mehall, Colorado State University, online <http://www.ext.colostate.edu/pubs/insect/05528.html>, 8/28/09.

## Previous Occurrences

Data collected from the NCDC and SHELDUS identified several lightning events in Alamosa County that caused injury, property damage, and death. On August 19, 1996, two students from Alamosa High School were struck by lightning and knocked to the ground. One student suffered a minor burn. On September 6, 1997, a mobile home was completely destroyed by a lightning-ignited fire. On August 2, 2003, a man slipped and fell to his death as he hurried down a mountain to avoid several lightning strikes. On July 15, 2007, a lightning strike just west of the Town of Hooper set 14 bales of hay on fire.

**Table 4-10: Major Lightning Events in Alamosa County, 1950 to 2009**

| Location         | Date      | Property and Crop Damages* | Injuries | Fatalities |
|------------------|-----------|----------------------------|----------|------------|
| Alamosa County** | 8/1/1960  | \$161                      |          |            |
| Alamosa County** | 8/5/1964  | 0                          | 0.1      |            |
| Alamosa County   | 7/30/1973 | \$2,658                    |          |            |
| Alamosa          | 8/19/1996 | 0                          | 1        |            |
| Alamosa County   | 9/6/1997  | \$40,000                   |          |            |
| Alamosa County   | 8/2/2003  | 0                          |          | 1          |
| Hooper           | 7/15/2007 | \$2,000                    |          |            |

\*Amounts not adjusted for inflation.

\*\*Event occurred across multiple counties and losses represent a fractional share.

Sources: NCDC at <http://www4.ncdc.noaa.gov/cgi-win/wwwcgi.dll?wwEvent~Storms>, accessed on October 7, 2009; SHELDUS at [http://webra.cas.sc.edu/hvriapps/sheldus\\_setup/sheldus\\_location.aspx](http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_location.aspx), accessed on October 7, 2009.

## Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less

NCDC and SHELDUS records indicate seven major lightning events in Alamosa County in 59 years, which averages to one every 15 years, or an 11.9 percent chance in any given year. However, it should be noted that most lightning events go unreported.

Most lightning occurs during the summer months, but it can also strike during the winter months in a rare thunder snowstorm. Pockets of lightning intensity are found in the mountains where the topography causes thunderstorms to form with regularity.

## Magnitude/Severity

**Limited:** Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours

Although the frequency of lightning events is relatively high, the magnitude is limited. Generally damages are limited to single buildings and in most cases, personal hazard insurance covers any losses. Although rare, lightning can cause deaths, injuries, and property damage, including damage to buildings, communications systems, power lines, and electrical systems. It also causes forest and brush fires.

From 1999 to 2008, Colorado had 28 lightning deaths, an average of about 3 per year. According to the National Weather Service, the State of Colorado ranks second nationally, behind Wyoming, with a death rate of 0.61 per one million people.<sup>4</sup> From 1996 to 2008, Colorado averaged 529,243 cloud-to-ground lightning flashes per year. Averaged over the state's large land area, Colorado's flash density is only 5.1 per square mile, placing the state 31<sup>st</sup> nationally.<sup>5</sup> The reason for the discrepancy between the Colorado's low lightning flash density and high casualty rate is that many people participate in popular outdoor activities such as hiking and camping in the lightning-prone high country.

### Vulnerability Assessment

**Overall Summary and Impacts:** Lightning has the potential to injure or kill people and damage structures either directly or by subsequent wildfire. Communications systems are also at risk. Structure damage is typically limited and covered by insurance.

**Identifying Structures and Estimating Potential Losses:** Lightning can affect the entire planning area, including all above-ground structures and people; however, it is unpredictable where it will strike.

**Future Development:** Increasing population growth and development in the mountains increases vulnerability to lightning. Building standards can offer only limited protection from lightning damage.

## 4.6 Windstorm

---

### Hazard Description

Windstorms represent the most common type of severe weather. Often accompanying severe thunderstorms (convective windstorms), they can cause significant property and crop damage, threaten public safety, and disrupt utilities and communications. Straight-line winds are generally any wind not associated with rotation and in rare cases can exceed 100 miles per hour (mph). The National Weather Service defines high winds as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. Windstorms are often produced by super-cell thunderstorms or a line of thunderstorms that typically develop on hot and humid days.

### Geographic Location

Windstorms can occur anywhere in Alamosa County and pose a similar risk to all participating jurisdictions.

### Previous Occurrences

Wind events in Alamosa County often correspond with a major thunderstorm or winter weather.

---

<sup>4</sup> National Weather Service, "Lightning Deaths by State and Deaths Population Weighted: 1999-2008," [http://www.lightningsafety.noaa.gov/stats/99-08\\_deaths\\_by\\_state.pdf](http://www.lightningsafety.noaa.gov/stats/99-08_deaths_by_state.pdf), accessed October 2, 2009.

<sup>5</sup> National Weather Service, "Number and Rank of Cloud-To-Ground Flashes by State from 1996 to 2008," [http://www.lightningsafety.noaa.gov/stats/96-08Cloud\\_to\\_Ground.pdf](http://www.lightningsafety.noaa.gov/stats/96-08Cloud_to_Ground.pdf), accessed October 2, 2009.

Table 4-11: Major Wind Events in Alamosa County, 1950 to 2009

| Location         | Date       | Type                | Magnitude (knots) | Property and Crop Damages* | Injuries | Fatalities |
|------------------|------------|---------------------|-------------------|----------------------------|----------|------------|
| Alamosa County** | 4/16/1960  | Wind                |                   | \$794                      | 0.08     | 0          |
| Alamosa County** | 4/7/1962   | Wind                |                   | \$781                      | 0.02     | 0          |
| Alamosa County   | 5/31/1962  | Thunderstorm Wind   | 51                |                            |          |            |
| Alamosa County   | 8/3/1970   | Thunderstorm Wind   | 52                |                            |          |            |
| Alamosa County** | 11/30/1970 | Wind                |                   | \$794                      | 0        | 0          |
| Alamosa County   | 7/15/1972  | Thunderstorm Wind   | 60                |                            |          |            |
| Alamosa County   | 9/19/1972  | Thunderstorm Wind   | 50                |                            |          |            |
| Alamosa County   | 6/13/1974  | Thunderstorm Wind   | 57                |                            |          |            |
| Alamosa County   | 6/16/1975  | Thunderstorm – Wind | n/a               |                            |          |            |
| Alamosa County   | 5/23/1984  | Thunderstorm – Wind | 50                |                            |          |            |
| Alamosa County** | 9/24/1986  | Wind                |                   | \$7,937                    | 0.02     | 0          |
| Alamosa County** | 5/2/1988   | Wind                |                   | \$16,667                   | 0        | 0          |
| Alamosa County** | 5/6/1988   | Wind                |                   | \$15,873                   | 0        | 0          |
| Alamosa County** | 2/1/1989   | Wind                |                   | \$794                      | 0        | 0          |
| Alamosa County** | 5/2/1991   | Wind                |                   | \$1,923                    | 0        | 0          |
| Alamosa County   | 4/18/1996  | High Wind           | 53                |                            |          |            |
| Alamosa County** | 1/26/1999  | Wind                |                   | \$3,750                    | 0.06     | 0          |
| Alamosa County** | 2/10/1999  | Wind                |                   | \$10,000                   | 0        | 0          |
| Alamosa County** | 4/8/1999   | High Wind           | 90                | \$33,000                   | 2        | 0          |
| Alamosa County   | 4/9/1999   | High Wind           | 77                |                            |          |            |
| Alamosa County** | 4/18/2000  | High Wind           | 63                | \$10,000                   | 0        | 0          |
| Alamosa County   | 5/17/2000  | Wind                |                   | \$1,667                    | 0        | 0          |
| Alamosa Airport  | 9/8/2000   | Thunderstorm – Wind | 58                |                            |          |            |
| Alamosa County   | 4/18/2004  | High Wind           | 59                |                            |          |            |
| Alamosa County   | 5/11/2004  | High Wind           | 62                |                            |          |            |
| Alamosa County   | 7/17/2006  | Thunderstorm – Wind | 51                |                            |          |            |
| Mosca            | 10/5/2007  | Thunderstorm – Wind | 52                |                            |          |            |

\*Amounts not adjusted for inflation.

\*\*Event occurred across multiple counties and losses represent a fractional share.

Sources: NCDC at <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms>, accessed on October 7, 2009; SHELUDS at [http://webra.cas.sc.edu/hvriapps/sheldus\\_setup/sheldus\\_location.aspx](http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_location.aspx), accessed on October 7, 2009.

## Probability of Future Occurrence

**Highly Likely:** Near 100 percent chance of occurrence next year or it happens every year

According to the record, as indicated above, windstorms occur regularly in Alamosa County.

## Magnitude/Severity

**Limited:** Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours



Windstorms in Alamosa County are rarely life threatening, but do disrupt agriculture and cause damage to buildings. Impacts of strong, straight line winds can be erosion, dryland farming seed loss, wind blown weeds, and building damage.

### Vulnerability Assessment

**Overall Summary and Impacts:** In Alamosa County, windstorms primarily damage structures, trees, utilities, and crops. Building codes are the greatest protection from wind. Damages are typically covered by private insurance.

**Identifying Structures and Estimating Potential Losses:** Windstorms affect the entire planning area, including all above-ground structures and utilities. In general, the height, rigidity, and surface area/weight ratio of objects are the primary indicators of their susceptibility to damage from windstorms. Trees, barns, mobile homes, high-profile vehicles, and power lines are at specific risk from either direct or indirect wind impacts. Roofs, windows, and wall assemblies of residential homes can be severely damaged as wind speeds increase. All above-ground buildings, infrastructure, and critical facilities are at risk to damage and destruction by windstorms as there are no specific identified hazard areas.

**Future Development:** Future residential or commercial buildings built to code should be less vulnerable to high winds. However, building standards can offer only limited protection. Increasing population growth and development increases vulnerability to windstorms.

### Data Limitations

Major wind storms are often secondary effects of other severe weather events. Therefore, many major windstorms are not classified as such. Also, major wind events often go unreported to the National Weather Service or other archiving agencies.

## 4.7 Tornado

---

### Hazard Description

The National Weather Service defines a tornado as a “violently rotating column of air extending from a thunderstorm to the ground.” Tornadoes are the most violent of all atmospheric storms. Wind speeds can exceed 250 miles per hour, and damage paths can be more than one mile wide and 50 miles long.

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) Scale. An updated and revised version of the Fujita scale is the Enhanced Fujita (EF) Scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado.

**Table 4-12: Tornado Intensity Scales**

| Intensity Category (F-Scale) | Wind Estimate (3 Second Gust) | Intensity Category (Operational EF-Scale) | Wind Estimate (3 Second Gust) | Typical Damage Impacts                                                                                                                                                                                                  |
|------------------------------|-------------------------------|-------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F0                           | 45-78 mph                     | EF0                                       | 65-85 mph                     | <b>Light damage:</b> Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.                                                                                         |
| F1                           | 79-117 mph                    | EF1                                       | 86-110 mph                    | <b>Moderate damage:</b> Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.                                                                                       |
| F2                           | 118-161 mph                   | EF2                                       | 111-135 mph                   | <b>Considerable damage:</b> Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.                         |
| F3                           | 162-209 mph                   | EF3                                       | 136-165 mph                   | <b>Severe damage:</b> Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.                                             |
| F4                           | 210-261 mph                   | EF4                                       | 166-200 mph                   | <b>Devastating damage:</b> Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.                                                        |
| F5                           | 262-317 mph                   | EF5                                       | Over 200 mph                  | <b>Incredible damage:</b> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur. |

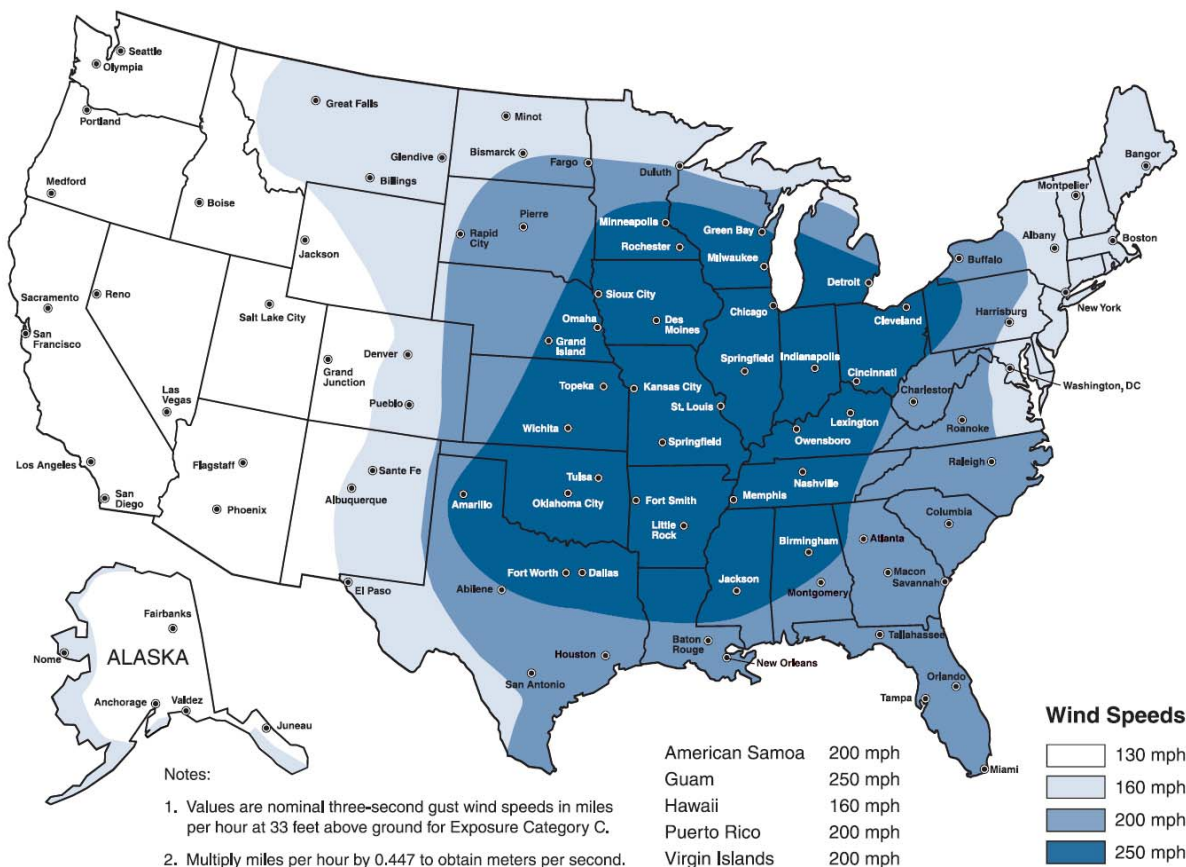
Source: NOAA Storm Prediction Center at <http://www.spc.noaa.gov/faq/tornado/ef-scale.html> and <http://www.spc.noaa.gov/faq/tornado/f-scale.html>, accessed 23 October 2009.

## Geographic Location

Tornadoes can occur anywhere in Alamosa County and pose a similar risk to all participating jurisdictions. FEMA's map of Wind Zones in the United States shows Alamosa County located in Wind Zone II with tornado winds of up to 160 mph. Tornado Safe Room Design Speeds are illustrated in Figure 4-5.



Figure 4-5: Tornado Safe Room Design Wind Speed Map



Source: <http://www.fema.gov/plan/prevent/saferoom/fema361.shtm>

### Previous Occurrences

Most tornadoes in Colorado occur between May and July and during the late afternoon or evening hours. Colorado ranks ninth in the country for number of tornadoes, although the tornadoes are relatively weak and have a short duration (Colorado Division of Emergency Management, 2009). The most deaths (10) from a tornado event in Colorado occurred on August 10, 1924, in Washington County.

There have been fifteen recorded tornadoes since 1950 in Alamosa County. No deaths have been attributed to these events. The magnitude of these tornadoes ranged from F0 to F2. An F1 tornado on March 19, 1995 caused \$11,000 in property damage at a farm two miles south of Alamosa in Alamosa County. A large tractor shed was detached from its concrete foundation and windshields of vehicles and fences were damaged as well.

**Table 4-13: Tornado Events in Alamosa County, 1950 to 2009**

| Location       | Date      | Magnitude |
|----------------|-----------|-----------|
| Alamosa County | 7/10/1955 | F2        |
| Alamosa County | 6/25/1956 | F1        |
| Alamosa County | 7/18/1958 | F0        |
| Alamosa County | 3/23/1974 | F0        |
| Alamosa County | 6/19/1982 | F1        |
| Alamosa County | 6/22/1983 | F1        |
| Alamosa County | 3/19/1995 | F1        |
| Alamosa County | 6/27/1995 | F0        |
| Mosca          | 8/5/1997  | F0        |
| Alamosa County | 5/25/1998 | F0        |
| Alamosa County | 8/10/2003 | F0        |
| Alamosa County | 7/15/2004 | F0        |
| Alamosa County | 6/26/2006 | F0        |
| Alamosa County | 7/9/2006  | F0        |
| Mosca          | 8/16/2008 | F1        |

Sources: NCDC at <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms>, accessed on October 7, 2009; SHELDUS at [http://webra.cas.sc.edu/hvriapps/sheldus\\_setup/sheldus\\_location.aspx](http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_location.aspx), accessed on October 7, 2009.

## Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less

NCDC and SHELDUS data reveal 15 tornados in a 59-year period. This averages to one every four years, or a 25 percent chance that a tornado will occur in any given year. The greatest probability for a tornado in Alamosa County is middle to late June.

## Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Tornados can injure and kill people and livestock and destroy structures, infrastructure, and crops. The severity of a tornado is based on wind speed and the amount of property damage incurred. Tornados develop quickly and change direction rapidly, therefore response is difficult.

Most tornados in Colorado are weak, with wind speeds of less than 110 miles per hour. Of the previous recorded events in Alamosa County, only one was classified F2, five classified F1, and the remaining were F0. However, should even a weak tornado touch down in a population center, the results could be devastating.

## Vulnerability Assessment

**Overall Summary and Impacts:** Tornados can cause significant damage to structures, trees, utilities, crops, and have the potential to injure and kill people.

**Identifying Structures and Estimating Potential Losses:** Tornadoes affect the entire planning area, including all above-ground structures and utilities. Due to the erratic movement of tornadoes, destruction often appears random. There are no specific identified hazard areas as the entire county is equally susceptible to tornadoes.

**Future Development:** Future residential or commercial buildings built to code should be less vulnerable to tornadoes. However, building standards can offer only limited protection.

### Data Limitations

Due to the isolated nature of tornado events, it is difficult to determine the vulnerability of specific areas. Tornado data is often collected by observations and many events are not reported to the National Weather Service.

## 4.8 Hail

---

### Hazard Description

Hail is associated with thunderstorms that can also bring high winds and tornadoes. It forms when updrafts carry raindrops into extremely cold areas of the atmosphere where they freeze into ice. Hail falls when it becomes heavy enough to overcome the strength of the updraft and is pulled by gravity towards the earth. Hailstorms cause damage to structures and other types of property, as well as crops and livestock, and in rare cases to humans.

The Tornado and Storm Research Organization (TORRO) describes the typical damage and impacts of the various sizes of hail, as described in Table 4-14.

**Table 4-14: TORRO Hailstorm Intensity Scale**

| Intensity Category   | Diameter (in.) | Size Description           | Typical Damage Impacts                                                                            |
|----------------------|----------------|----------------------------|---------------------------------------------------------------------------------------------------|
| Hard Hail            | 0.2-0.4        | Pea                        | No damage                                                                                         |
| Potentially Damaging | 0.4-0.6        | Mothball                   | Slight general damage to plants, crops                                                            |
| Significant          | 0.6-0.8        | Marble, grape              | Significant damage to fruit, crops, vegetation                                                    |
| Severe               | 0.8-1.2        | Walnut                     | Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored   |
| Severe               | 1.2-1.6        | Pigeon's egg > squash ball | Widespread glass damage, vehicle bodywork damage                                                  |
| Destructive          | 1.6-2.0        | Golf ball                  | Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries               |
| Destructive          | 2.0-2.4        | Hen's egg                  | Bodywork of grounded aircraft dented, brick walls pitted                                          |
| Destructive          | 2.4-3.0        | Tennis ball > cricket ball | Severe roof damage, risk of serious injuries                                                      |
| Destructive          | 3.0-3.5        | Large orange > Soft ball   | Severe damage to aircraft bodywork                                                                |
| Super Hailstorms     | 3.6-3.9        | Grapefruit                 | Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open. |
| Super Hailstorms     | 4.0+           | Melon                      | Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open. |

Source: Tornado and Storm Research Organisation (TORRO), Department of Geography, Oxford Brookes University

## Geographic Location

Hail can occur anywhere in Alamosa County and poses a similar risk to all participating jurisdictions.

## Previous Occurrences

According to the National Climatic Data Center (NCDC) and SHELDUS, multiple hail events have been recorded in Alamosa County. One particularly severe hailstorm on August 10, 1993 produced 0.5-inch diameter hail that caused an estimated \$75,000 in damage to nine aircraft at the Alamosa Airport. In addition, the hail damaged vehicles in the airport parking lot, as well as destroying barley fields southwest of Alamosa. The Planning Team agreed that they expect a hail storm with the potential to cause damage to crops and property to occur nearly every year.

**Table 4-15: Hailstorm Events in Alamosa County, 1950 to 2009**

| Location       | Date      | Magnitude<br>(diameter, in.) |
|----------------|-----------|------------------------------|
| Alamosa County | 6/14/1961 | 0.75                         |
| Alamosa County | 7/8/1965  | n/a                          |
| Alamosa County | 6/17/1969 | 1                            |
| Alamosa County | 7/20/1977 | n/a                          |
| Alamosa County | 9/7/1986  | 1                            |
| Alamosa County | 8/10/1993 | 0.5                          |
| Alamosa County | 7/1/1995  | 1.75                         |
| Alamosa County | 7/18/1998 | 0.75                         |
| Hooper         | 10/1/1998 | 0.88                         |
| Alamosa County | 6/27/2000 | 0.75                         |
| Mosca          | 8/16/2008 | 2.5                          |

Sources: NCDC at <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms>, accessed on October 7, 2009; SHELUDS at [http://webra.cas.sc.edu/hvriapps/sheldus\\_setup/sheldus\\_location.aspx](http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_location.aspx), accessed on October 7, 2009.

### Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence next year or it has a recurrence interval of 10 years or less

According to the record, as indicated above, hail is a regular occurrence in Alamosa County. Data from the NCDC and SHELUDS identify one event with hail diameter greater than two inches (which the National Weather Service classifies as severe weather) in a 59 year period. There were 10 other hail events with smaller or unreported hail size.

### Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Hailstorms cause damage to property, crops, and the environment and kill and injure livestock. Vehicles, structures and crops are commonly damaged by hail. Hail can also cause injury to humans, occasionally fatal. In addition to hail diameter, number and density of hailstones, hail fall speed and surface wind speeds affect severity.

### Vulnerability Assessment

**Vulnerability Summary:** Hail affects the entire planning area, including all above-ground structures and utilities, but hail primarily causes crop damage. In populated areas, like the City of Alamosa, hail can cause significant damage to roofs, automobiles, and windows. Hail can also block culverts and drainage structures, causing flooding.

**Identifying Structures and Estimating Potential Losses:** Structure damage due to hail is usually covered under private insurance. Personal injury can also occur as a result of very large hail.

**Future Development:** Hail affects the entire planning area, including all above-ground structures and utilities. Building standards can offer only limited protection from hail damage.

## 4.9 Severe Winter Storm

### Hazard Description

Severe winter storm hazards may include snow, ice, blizzard conditions, and extreme cold. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Extreme cold often accompanies or follows a winter storm.

### Geographic Location

Severe winter storms occur throughout the entire county at approximately the same frequency.

### Previous Occurrences

Data from the NCDC, SHELDUS, and DOLA were combined to identify 56 winter storm/heavy snow/extreme wind chill events from 1960-2008. Table 4-16 lists the events that include specific damage information.

**Table 4-16: Reported Winter Storm Damages in Alamosa County, 1960-2008**

| Year | Description                                                                                                                                                                     | Cost      | Data Source      |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------|
| 1961 | Early snow on September 2, 1961.                                                                                                                                                | \$2,632   | SHELDUS          |
| 1962 | January storm with snow, wind, and cold weather.                                                                                                                                | \$7,937   | SHELDUS          |
| 1966 | Spring snow and cold weather.                                                                                                                                                   | \$8,016   | SHELDUS          |
| 1975 | November storm brought heavy snow and wind, resulting in considerable damages.                                                                                                  | \$22,727  | SHELDUS          |
| 1982 | Blizzard on December 23, 1982 caused damages over \$800,000.                                                                                                                    | \$801,588 | SHELDUS          |
| 1983 | November snow and wind.                                                                                                                                                         | \$7,937   | SHELDUS          |
| 1984 | October storm with heavy snow.                                                                                                                                                  | \$11,122  | SHELDUS          |
| 1989 | February storm brought heavy snow, causing damages.                                                                                                                             | \$158,730 | SHELDUS          |
| 1996 | Spring storm with heavy snow caused considerable damages.                                                                                                                       | \$75,000  | SHELDUS          |
| 1996 | Extreme windchill in December brought temperatures to 20 to 40 below zero.                                                                                                      |           | SHELDUS/<br>NCDC |
| 1997 | Strong storm on November 27, 1997 brings 10-20 inches of accumulation in the San Luis Valley.                                                                                   |           | NCDC             |
| 2003 | Blizzard conditions pushed heavy snow accumulations in the San Luis Valley and much of the State. Alamosa County was included in a Presidential Emergency declaration for snow. |           | NCDC/<br>DOLA    |
| 2004 | Strong spring storm delivering 12-18 inches of wet heavy snow in April.                                                                                                         |           | NCDC             |
| 2006 | Heavy snow and blizzard conditions December 19, 2006 producing 16-19 inches.                                                                                                    |           | NCDC             |

Sources: NCDC at <http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent-Storms>, accessed on October 7, 2009; SHELDUS at [http://webra.cas.sc.edu/hvriapps/sheldus\\_setup/sheldus\\_location.aspx](http://webra.cas.sc.edu/hvriapps/sheldus_setup/sheldus_location.aspx), accessed on October 7, 2009; DOLA, Alamosa County Description, Colorado State Hazard Mitigation Plan, 2008 at [http://www.dola.state.co.us/dem/mitigation/plan\\_2007/2008\\_plan.htm](http://www.dola.state.co.us/dem/mitigation/plan_2007/2008_plan.htm), accessed on October 13, 2009.

### Probability of Future Occurrence

**Highly Likely:** Near 100 percent chance of occurrence next year or it happens every year

There were 56 severe winter storm events in Alamosa County in the last 48 years. On average, there is at least one severe winter storm event each year, or a 100 percent chance of annual occurrence.

### Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

From 1948-2009, as recorded at the Alamosa weather station, the coldest month on average is January, with an average minimum temperature of -1.9°F and maximum of 34.4°F. The highest annual snowfall was 97.5 inches during the winter of 1972-1973. The coldest temperature on record was -42°F in December 1964.

**Table 4-17: Alamosa County Winter Weather Summary**

| Station                  | Winter Average Maximum | Winter Average Minimum | Extreme Minimum Temperature/ Date | # Days Max Temp < 32°F /Year | Average Annual Snowfall | Winter Average Snow Depth | Snowiest Month/ Average Inches |
|--------------------------|------------------------|------------------------|-----------------------------------|------------------------------|-------------------------|---------------------------|--------------------------------|
| Alamosa WSO AP 1948-2009 | 37.0                   | 1.3                    | -42/December 1964                 | 34.3                         | 32.45                   | 1-2 in.                   | March/5.57                     |

Source: Western Regional Climate Center, <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co0130>, accessed October 14, 2009.

Heavy snow can immobilize a region by stranding motorists, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and tear down trees and power lines. Loss of power affects homes, businesses, and water, sewer, and other utility services operated by electric pumps. The cost of snow removal, damage repair, and business losses can have a tremendous impact.

Heavy accumulations of ice and or strong winds can bring down trees, power lines, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until damage can be repaired. Blowing snow can severely reduce visibility. Serious vehicle accidents can result with injuries and deaths. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening; infants and the elderly are most at risk.

### Vulnerability Assessment

**Overall Summary and Impacts:** Winter storms will occur with frequency throughout the county and cause widespread impacts. The greatest threat is to public safety. The rural nature of the county and isolated stretches of roadway can create problems with stranded motorists and access to supplies and emergency services. In rural areas, vulnerable populations and livestock may be isolated for days or weeks. Power outages caused by snow, ice, and wind accompanied by cold temperatures create additional need for shelter. Other impacts are related to school and business closures, road closures, snow removal, and



maintaining critical services. The losses associated with winter storm are difficult to measure, but may warrant additional analysis.

**Identifying Structures and Estimating Potential Losses:** It is difficult to predict future losses to winter storms as the hazard is not limited to a specific geographic location and can vary in severity based on storm characteristics. Structure damage is typically covered by property insurance. Public safety costs and infrastructure losses may be considered in future evaluations.

**Future Development:** New structures and facilities built to code should be able to withstand snow loads associated with winter storms. Future development, particularly in more isolated areas, will create emergency access issues and increase demand on road crews and emergency services.

### Data Limitations

Dollar figures reported for Severe Weather events in both SHELUS and the National Climatic Data Center Storm Events database are fractional shares of total damages averaged across all counties associated with an event. Specific Alamosa County losses are not available. This weather data is also limited by the observations reported; many events are never reported or recorded with the National Weather Service. Data on past temperature and snowfall extremes over a larger period of record are not available.

## 4.10 Drought

---

### Hazard Description

Drought is a shortage of water associated with a deficiency of precipitation, and occurs when a normal amount of moisture is unavailable to satisfy an area's usual water consumption. Drought can be defined regionally based on its effects in the following categories:

- **Meteorological** drought is usually defined by a period of below average water supply.
- **Agricultural** drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological** drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic** drought occurs when a drought impacts health, well-being, and quality of life or when a drought starts to have an adverse economic impact on a region.

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or wildfires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.



### Geographic Location

Drought is a regional phenomenon and affects all areas of the county and participating jurisdictions with similar frequency and severity. The U.S. Drought Monitor provides online maps of the current drought status nationwide, updated weekly.

### Previous Occurrences

According to the 2004 Drought and Water Supply Assessment, by the Colorado Water Conservation Board (CWCB), Colorado has experienced multiple severe droughts. Table 4-18 lists the significant droughts that have affected Alamosa County since the 1930s.

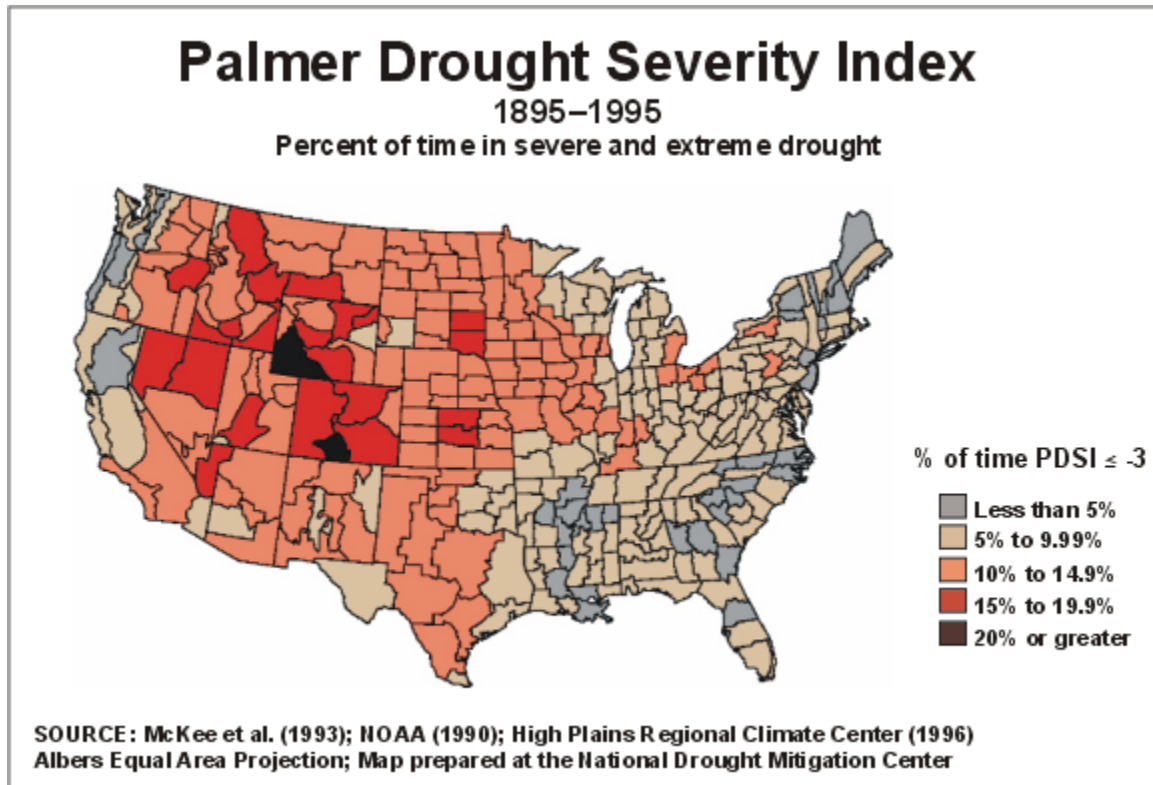
**Table 4-18: Significant Drought Periods Affecting Alamosa County**

| Years     | Location/Description                                                                                                                                                                                                                                                                                                                                           | Cost                                                                                                                  | Data Source   |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------|
| 1930–1940 | Widespread, severe, and long lasting drought in Colorado                                                                                                                                                                                                                                                                                                       |                                                                                                                       | CWCB          |
| 1950–1956 | Statewide, worse than the 1930s in the Front Range                                                                                                                                                                                                                                                                                                             | \$40 million in federal aid made available for 13 drought stricken states and used to defer cost of transporting hay. | NDMC          |
| 1976–1977 | Statewide, driest winter in recorded history for Colorado’s high country and Western Slope.                                                                                                                                                                                                                                                                    | Colorado agricultural producers and municipalities received over \$110 million in federal drought disaster aid.       | NDMC          |
| 2000–2003 | Significant multi-year statewide drought, with many areas experiencing most severe conditions in Colorado in instrumented history. 2002 was the driest year on record for the Denver region and much of the state. For the first time in state history, the Colorado governor asked the federal government to declare all of Colorado a drought disaster area. | Estimated 1.1 billion in losses to Colorado’s agricultural, tourism, and recreational industries.                     | CWCB          |
| 2004      | Hundreds of domestic wells going dry, decimated aquifers, and loss of soil moisture                                                                                                                                                                                                                                                                            |                                                                                                                       | Planning Team |
| 2006      | USDA designated 59 of 64 Colorado counties including Alamosa as disaster areas due to ongoing drought winds, insect pests, and a late freeze.                                                                                                                                                                                                                  |                                                                                                                       | NDMC          |
| 2008      | In September, the USDA declared 22 counties, in Colorado a natural disaster area due to drought since January 1, 2008. Alamosa County was eligible for aid because it bordered one of the primary counties (contiguous eligibility). Small businesses in the county were also eligible for SBA disaster funds due to economic losses attributed to drought.    |                                                                                                                       | NDMC          |

Source: Colorado Water Conservation Board (CWCB) Drought and Water Supply Assessment, 2004, [http://cwcb.state.co.us/Conservation/Drought/Drought\\_Water/index\\_DWSA.html](http://cwcb.state.co.us/Conservation/Drought/Drought_Water/index_DWSA.html); National Drought Mitigation Center (NDMC) Drought Impact Reporter, <http://droughtreporter.unl.edu/>.

Figure 4-6 shows that Alamosa County is located in an area of Colorado that experienced drought more than 20 percent of the time over the 100-year period from 1895-1995.

**Figure 4-6: United States Percent of Time in Drought, 1895–1995**



Source: <http://drought.unl.edu/whatis/palmer/pdi1895.gif>

### Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less

According to the Palmer Drought Severity Index 1895-1995, Alamosa County experienced severe and extreme drought more than 20 percent of the time during that 100-year period. The 2007 Colorado State Emergency Operations Plan estimates hazard probabilities by regions and assigns a high probability for drought in the San Luis Region.

### Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

Periods of drought are common occurrences in Colorado and can cause significant economic and environmental impacts. The severity of drought depends on the degree of moisture deficiency, duration, and size of the affected area. Alamosa County has

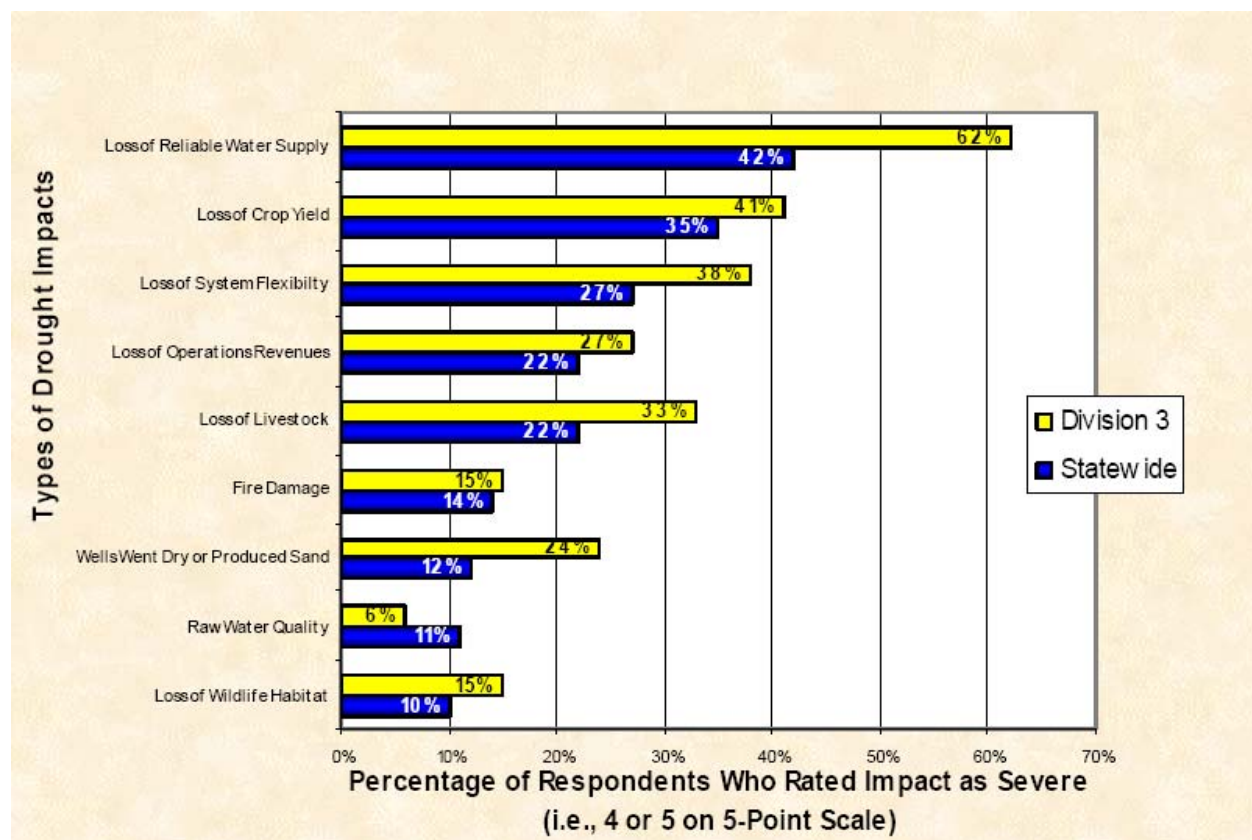
experienced severe to extreme droughts in the past. Climate change is likely to increase the magnitude and severity of drought in Alamosa County in the future.

### Vulnerability Assessment

**Overall Summary and Impacts:** The most significant impacts from drought are related to water-intensive activities, such as agriculture (both crops and livestock), wildfire protection, municipal usage, commerce, recreation, and wildlife preservation, as well as a reduction of electric power generation and water quality deterioration. Secondary impacts of drought are wildfires, wind erosion, and soil compaction that can make an area more susceptible to flooding. Drought impacts increase with the length of a drought.

In the 2004 Drought and Water Supply Assessment for the Rio Grande Basin (Division 3) water users rated the severity of impacts from the recent 1999–2003 drought. The results shown in Figure 4-7 indicate that the loss of reliable water supply was the impact ranked as most severe.

**Figure 4-7: 1999–2003 Drought Impacts in the Rio Grande Basin**



Source: Colorado Drought and Water Supply Assessment, 2004: <http://cwcb.state.co.us/NR/rdonlyres/2B2AC04D-78A8-4556-9497-85C6507767B4/0/RioGrandeDWSA.pdf>

The National Drought Mitigation Center developed the Drought Impact Reporter in response to the need for a national drought impact database for the United States. Information comes from a variety of sources: online drought-related news stories and scientific publications, members of the public who visit the website and submit a drought-related impact for their region, and government agencies. The Drought Impact Reporter contains information on 108 drought impacts from droughts that affected Alamosa County between 1953 and 2009. The highest numbers of impacts in Alamosa County were related to agriculture, followed by the social and wildfire categories. Social impacts are those associated with the public or the recreation/tourism, such as health-related low-flow problems (e.g., reduced fire fighting capabilities, increased pollutant concentrations, cross-connection contamination); loss of human life (e.g., from heat stress, suicides); increased respiratory ailments; loss of aesthetic values; and the reduction or modification of recreational activities.

The unincorporated county is most vulnerable to drought impacts related to agriculture and wells. Incorporated cities and towns in Alamosa County are most vulnerable to losses related to water supply reliability, operations revenue, and system flexibility. The fire protection district is vulnerable to impacts related to increased wildfire risk and water supply for wildfire protection.

**Identifying Structures and Estimating Potential Losses:** Drought normally does not impact structures, although water and sewer infrastructure may be affected by drought. Data is not available to estimate potential losses to structures in identified hazard areas. The greatest risk to people from drought is the loss of drinking water supply through water systems or individual wells. Most of the unincorporated areas of the county are on individual domestic wells.

**Future Development:** As the population grows, so do the water needs for household, commercial, industrial, recreational, and agricultural uses. Vulnerability to drought will increase with these growing demands on existing water supplies. Future water use planning in Colorado is complex and has to account for increasing population size as well as the potential impacts of climate change. Population centers of the county and agricultural industries are most likely to experience hardships associated with reduced water supply.

### Data Limitations

Most data on drought is available for the state or the Rio Grande Basin. There is little information on past damages and losses specific to Alamosa County. In addition, total event-specific losses are difficult to assess due to the inability to determine the exact beginning and ending of a drought period.

## 4.11 Dam and Levee Failure

---

### Hazard Description

There are no dams located in Alamosa County, therefore the profile for dam and levee failure focuses entirely on levees.

Levees are embankments (typically earthen) designed to contain, control, or divert the flow of water to provide some level of protection from flooding. Some levee systems were built for agricultural purposes and provide flood protection and flood loss reduction for farm fields and other land used for agricultural purposes. Urban levee systems are built to provide flood protection

and flood loss reduction for population centers and the industrial, commercial, and residential facilities within them (FEMA 2009). Urban levee systems, because they are designed to protect urban areas, have typically been built to higher standards. No levee system provides full protection from all flooding events to the people and structures located behind it. Some level of flood risk exists in these levee-impacted areas (FEMA 2009).

### **Geographic Location**

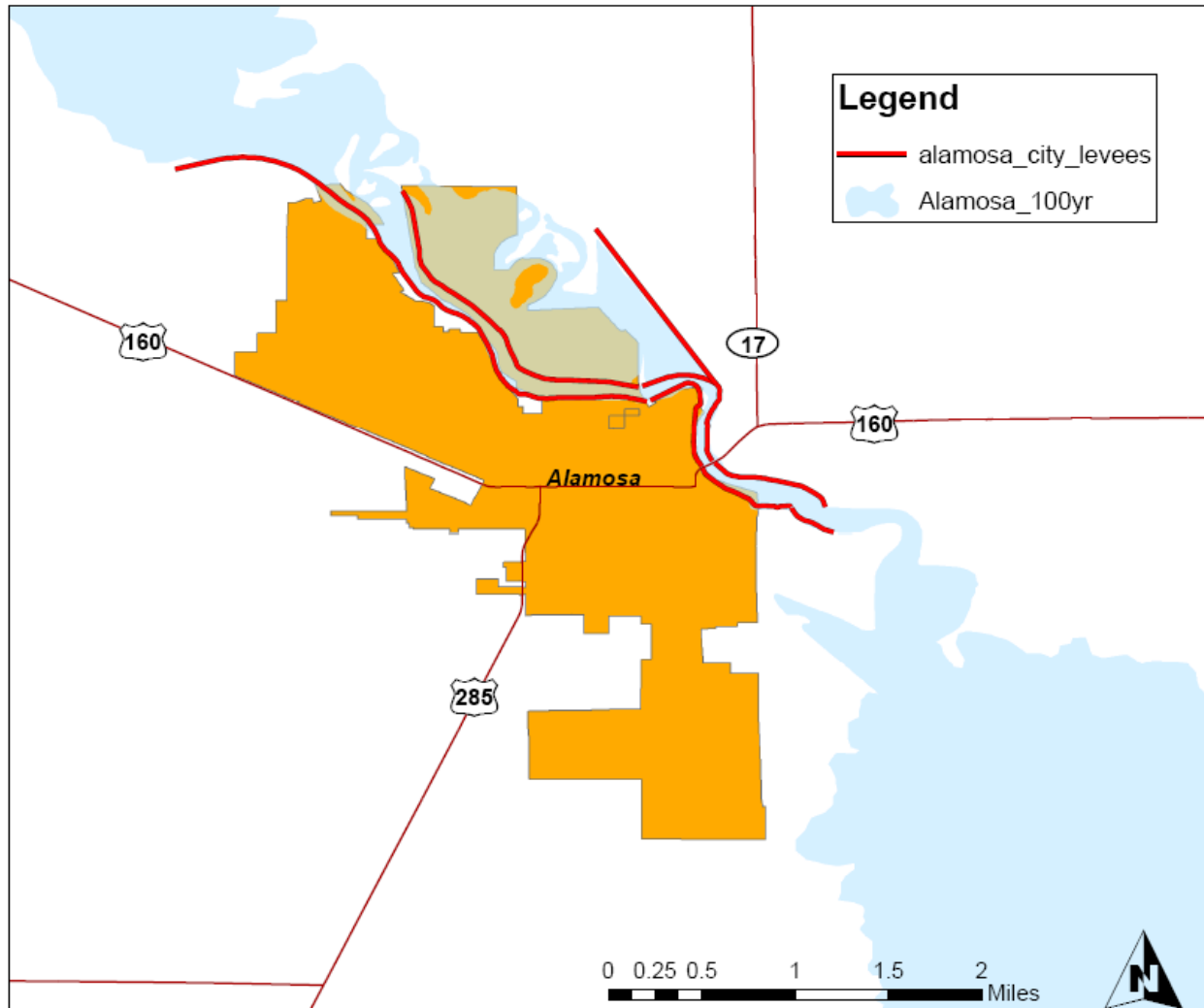
The National Inventory of Dams does not include any dams in Alamosa County.

According to an article written for the Pueblo Chieftain on July 5, 2009, the Alamosa levee, which parallels approximately four miles of the Rio Grande River, does not comply with current United States Army Corps of Engineers (USACE) regulations. The levee, built in 1997, is laden with cottonwood and willow trees which are viewed by the USACE as potential weakening factors in the overall levee stability.<sup>6</sup> Figure 4-8 is a map illustrating the location of the Alamosa County Levees.

---

<sup>6</sup> *Alamosa Levee Not Up to Snuff*, online at <http://www.chieftain.com/articles/2009/07/05/news/local/doc4a5045be396f8978285321.txt>, accessed on October 20, 2009.

Figure 4-8: Alamosa County Levees



Source: Created by URS, levee data from San Luis Valley GIS/GPS Authority. Intended for planning purposes only.

### Previous Occurrences

There are no known previous levee failures in Alamosa County.

### Probability of Future Occurrence

**Likely:** 10-100 percent chance of occurrence next year or it has a recurrence interval of 10 years or less

Because there are no previous events to base a probability on, the Planning Team used their local experience to determine the probability. Because the Alamosa levee is currently rated “unacceptable” following inspection by the United States Army Corps of Engineers (USACE), the Planning Team determined that the potential for breach of the levee during a major storm event is likely.

### Magnitude/Severity

**Catastrophic:** *Multiple deaths; property destroyed and severely damaged; and/or interruption of essential facilities and service for more than 72 hours*

Should a major breach of the Alamosa levee occur, the results would be devastating. Hundreds of structures would be inundated, and thousands of people displaced. The City of Alamosa in particular would be significantly inundated compared to other participating jurisdictions.

### Vulnerability Assessment

**Overall Summary and Impacts:** The Alamosa levee provides flood protection to the City of Alamosa and parts of unincorporated Alamosa County. As previously discussed, there are potential compliance and maintenance issues currently being considered by the USACE and the City of Alamosa. Without certification of the levee, the USACE has placed the project on the inactive status for the rehabilitation inspection program.

**Identifying Structures and Estimating Potential Losses:** The existence of the levee removes structures from the floodplain. However, if the levee is at risk for failure, the structures that are relying on it are at risk as well. HAZUS does not allow an analysis of structures that are protected by the levee. Without certification of the levee, the DFIRM maps will not view the levee as protection from a 100-year flood event.

**Future Development:** Without certification of the Alamosa Levee, FEMA will not recognize it as protection against a 100-year flood event. When the DFIRMS are adopted (expected 2011), parcels within the inundation area will be susceptible to further regulation as far as floodplain permitting is concerned. Any development within these Flood Hazard Areas must adhere to rules and regulations in the Land Development Code the NFIP regulations.

### Data Limitations

There is little data available regarding dam and levee failure. There are no existing inundation maps available, should the Alamosa Levee fail.

## 4.12 Avalanche

---

### Hazard Description

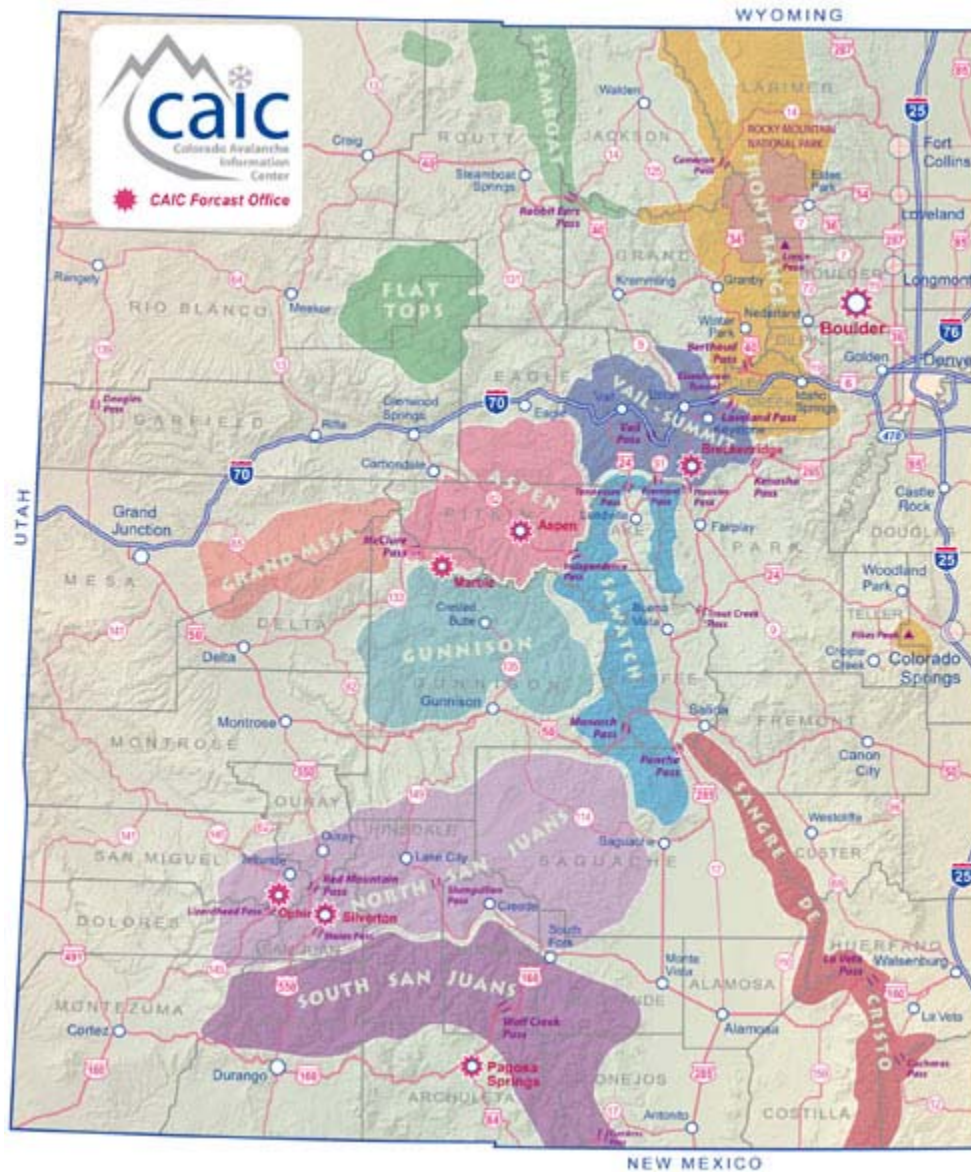
The US Forest Service defines an avalanche as a mass of snow sliding, tumbling, or flowing down an inclined surface. Avalanches (or slides) are the cause of many deaths each winter in the United States. Avalanches can be naturally triggered (by wind, snow, rain, etc.) or human triggered (skiers, snowboarders, snowmobilers, climbers, etc.). Deep snow deposits often become susceptible to avalanche based on the slope stability and the structure of the snow deposits through multiple storms. An avalanche occurs when the deposit reaches its breaking point, whether triggered naturally or by human intervention. There are more avalanche-related deaths in Colorado than any other state.



## Geographic Location

Slopes in the Sangre de Cristo Mountains on the eastern edge of Alamosa County are susceptible to avalanche. Figure 4-9 below shows the avalanche zone boundaries for Colorado.

**Figure 4-9: Colorado Avalanche Zones**



Source: Colorado Avalanche Information Center (CAIC)



### Previous Occurrences

According to the Colorado Avalanche Information Center (CAIC), there was one death attributed to avalanche from the period 1950 to 2007. An article in the Denver Post notes an avalanche death of a young woman while climbing Little Bear Peak on January 11, 2008. Little Bear Peak, one of Colorado's 14,000-foot peaks, straddles Alamosa and Costilla Counties.

### Probability of Future Occurrence

**Occasional:** 1-10 percent chance of occurrence in the next year or it has a recurrence interval of 11 to 100 years

The likelihood of an avalanche increases with heavy accumulation of snow. The probability of future occurrence will depend on weather patterns and levels of recreational activity within known avalanche zones.

### Magnitude/Severity

**Limited:** Minor injuries and illnesses; minimal property damage that does not threaten structural stability; and/or interruption of essential facilities and services for less than 24 hours

Alamosa County's avalanche area is not heavily populated. Recorded avalanche events are often human-triggered; and frequently result in injuries or fatalities. Loss to structures or interruption of essential facilities is not expected.

### Vulnerability Assessment

**Overall Summary and Impacts:** Avalanche events in Alamosa County primarily impact individual safety of outdoor recreation enthusiasts. The avalanche prone areas within the county are accessible only by trail systems. Snowmobilers, skiers, snowboarders, hikers, climbers, and snowshoers are all at risk when participating in activities near known avalanche zones. Because the Colorado Avalanche Information Center receives few observations in Alamosa County, the specific danger on any given year is difficult to determine. In particularly heavy snow years, the avalanche risk is greater. With prime conditions of wind or snow load, an avalanche may be triggered quite easily. The use of avalanche prone areas for recreation and development will likely increase as growth continues in the San Luis Valley and Colorado. Although most avalanche prone areas are located on public lands, the cost of response and recovery is a local issue.

**Identifying Structures and Estimating Potential Losses:** No known structures exist within avalanche paths, however as described above, the data for existing avalanche paths in the county is not readily available.

**Future Development:** Large lot subdivisions are permitted in rural areas. Should any development occur near avalanche paths, the risk for damages and injuries/fatalities may increase. With a general increase in population in the San Luis Valley, the number of mountain enthusiasts will likely increase and lead to more potential triggers for avalanches.

### Data Limitations

Avalanche paths located in Alamosa County have not been mapped. CDOT completed the Colorado Avalanche Atlas (2001), which shows avalanche paths along state highways; however the information does not include Alamosa County. The best

source for information and accident reports is through the Colorado Avalanche Information Center. The Colorado Avalanche Information Center relies on weather forecasting, snowpack analysis from professionals, and observations from the public in the backcountry. However, insufficient observations from the Sangre de Cristo Mountains make it difficult to assess the overall avalanche danger in Alamosa County.

### **4.13 Landslide**

---

#### **Hazard Description**

Landslides include a wide range of ground movements from rock fall to slope failure, and are primarily attributed to gravity acting on steep slopes. Landslides are a very common geological hazard throughout the nation. The United States Geological Survey (USGS) lists the following contributing factors to landslide occurrences:

- Erosion by rivers, glaciers, or ocean waves creates over-steepened slopes.
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains.
- Earthquakes create stresses that make weak slopes fail.
- Earthquakes of magnitude 4.0 and greater have been known to trigger landslides.
- Volcanic eruptions produce loose ash deposits, heavy rain, and debris flows.
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or from man-made structures may stress weak slopes to failure and other structures.

#### **Geographic Location**

Most of Alamosa County consists of flat desert and is not susceptible to landslide. The only potential risk for landslides is in eastern Alamosa County in the Sangre de Cristo Mountains. There is a fair amount of steep terrain in this area, particularly near the boundaries with Costilla and Huerfano Counties.

#### **Previous Occurrences**

There are no documented landslide events in Alamosa County.

#### **Probability of Future Occurrence**

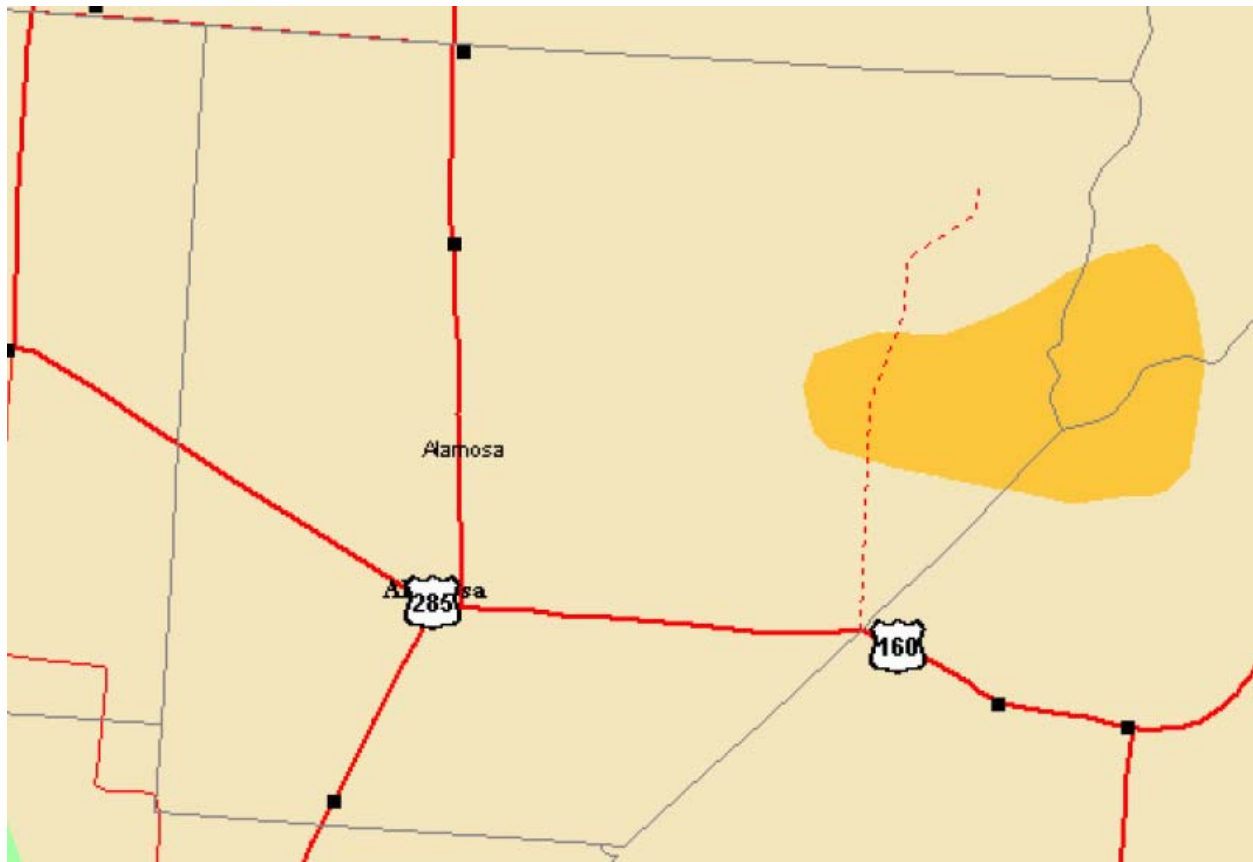
**Unlikely:** *Less than 1 percent chance of occurrence in the next 100 years or it has a recurrence interval of greater than every 100 years*

The Colorado Geological Survey Landslide Mitigation Plan<sup>7</sup> does not identify any vulnerable communities, areas, or facilities in Alamosa County. This does not mean that the susceptibility is wholly absent, but rather not listed as a location having the most serious or immediate potential impacts on communities, transportation corridors, life lines, or the economy. Figure 4-10 illustrates the overall landslide incidence and susceptibility according to the USGS national atlas.

---

<sup>7</sup> Colorado Landslide Hazard Mitigation Plan, Colorado Geological Survey, Department of Natural Resources, 1988.

**Figure 4-10: Landslide Incidence and Susceptibility, Alamosa County**



- Landslide Incidence and Susceptibility**
- Landslide Incidence**
- Low (less than 1.5 % of area involved)
  - Moderate (1.5%-15% of area involved)
  - High (greater than 15 % of area involved)
- Landslide Susceptibility/ Incidence**
- Moderate susceptibility/low incidence
  - High susceptibility/low incidence
  - High susceptibility/moderate incidence

Source: U.S. Geological Survey, [www.nationalatlas.gov](http://www.nationalatlas.gov)

### Magnitude/Severity

**Negligible:** No or few injuries or illnesses; minor quality of life loss; little or no property damage; and/or brief interruption of essential facilities and services

Landslide events are typically gradual movements in areas of steep topography and where the soil conditions contribute to the movement of the slope. Damages are often limited to cracks in foundations and damage to roads. Individual property owners may experience more or less damage depending on site specific movement. Rockfall, however, is a sudden movement, and could potentially result in significant damages, injuries, or death.

### Vulnerability Assessment

**Overall Summary and Impacts:** Because much of the land susceptible to landslides in Alamosa County is publicly owned, there is a relatively low risk for injury, loss of life, or damage to property. There is no record of any previous landslide event occurring within the county; however that does not preclude the chance for a landslide. Most structures and population centers in Alamosa County are located in the valley, far from any potentially dangerous slope failure.

**Identifying Structures and Estimating Potential Losses:** The conditions resulting in a landslide are site-specific. A major landslide could potentially destroy anything in its path. The vulnerability of individual structures could be assessed through detailed studies of buildings and infrastructure located within the landslide area shown in Figure 4-10; however, given the lack of improvements in that area, the study is not currently warranted.

**Future Development:** Most of the landslide prone areas in Alamosa County are within publicly owned lands. Should development occur within landslide areas, there could be impacts to buildings and infrastructure. Development in areas where landslide potential exists should undergo geotechnical studies for slope stability.

### Data Limitations

Landslide data for Alamosa County is limited. Although the susceptibility for landslide has been mapped, the risk for landslides impacting people, buildings, and/or infrastructure is not known.

## 4.14 Earthquake

---

### Hazard Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed measured directly from the earthquake as recorded on seismographs using the Richter scale. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking, typically the greatest cause of losses to structures during earthquakes, at any given location on the surface as felt by humans and defined in the Modified Mercalli Intensity Scale.

According to the Colorado Geological Survey, Colorado is comprised of areas with low to moderate potential for damaging earthquakes. There are about 90 potentially active faults that have been identified in Colorado, with documented movement within the last 1.6 million years. However, there are several thousand other faults that have been mapped in Colorado that are believed to have little or no potential for producing future earthquakes.

### Geographic Location

The Sangre de Cristo fault runs along the eastern edge of the valley in the Sangre de Cristo Mountains. One of the three USGS operated permanent seismic stations in Colorado is located in northeastern Alamosa County.

### Previous Occurrences

One earthquake was noted in the Colorado State Earthquake Report.<sup>8</sup> The Blanca-Fort Garland earthquake occurred on December 28, 2003.

### Probability of Future Occurrence

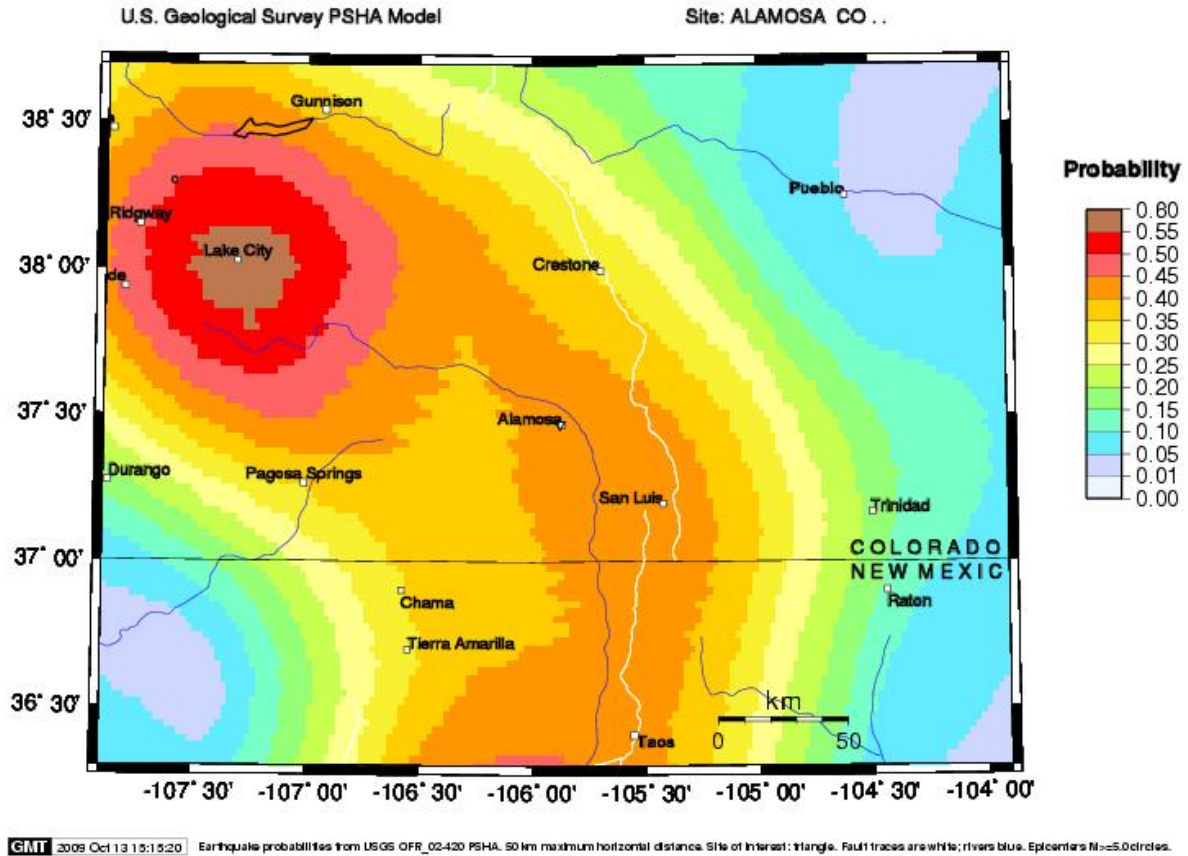
**Unlikely:** *Less than 1 percent chance of occurrence in the next 100 years or it has a recurrence interval of greater than every 100 years*

There have been no past damaging events. The occurrence of earthquakes is relatively infrequent in Colorado, and the historical earthquake record is short (only about 130 years). However, the earthquake hazard in Colorado is thought to be not well understood and the potential for unknown active faults exists. The USGS offers an online mapping system for earthquake probability as part of the USGS National Seismic Hazard Mapping Project. Figure 4-11 illustrates the probability of a 5.0 or greater magnitude earthquake occurring within the San Luis Valley area in the next 150 years. This map shows a 40-45% probability of an earthquake of that magnitude near the City of Alamosa in the next 150 years.

---

<sup>8</sup> <http://www.dola.colorado.gov/dem/mitigation/earthquakerpt.pdf>, accessed on October 12, 2009

Figure 4-11: Probability of 5.0 or greater Earthquake in the next 150 years



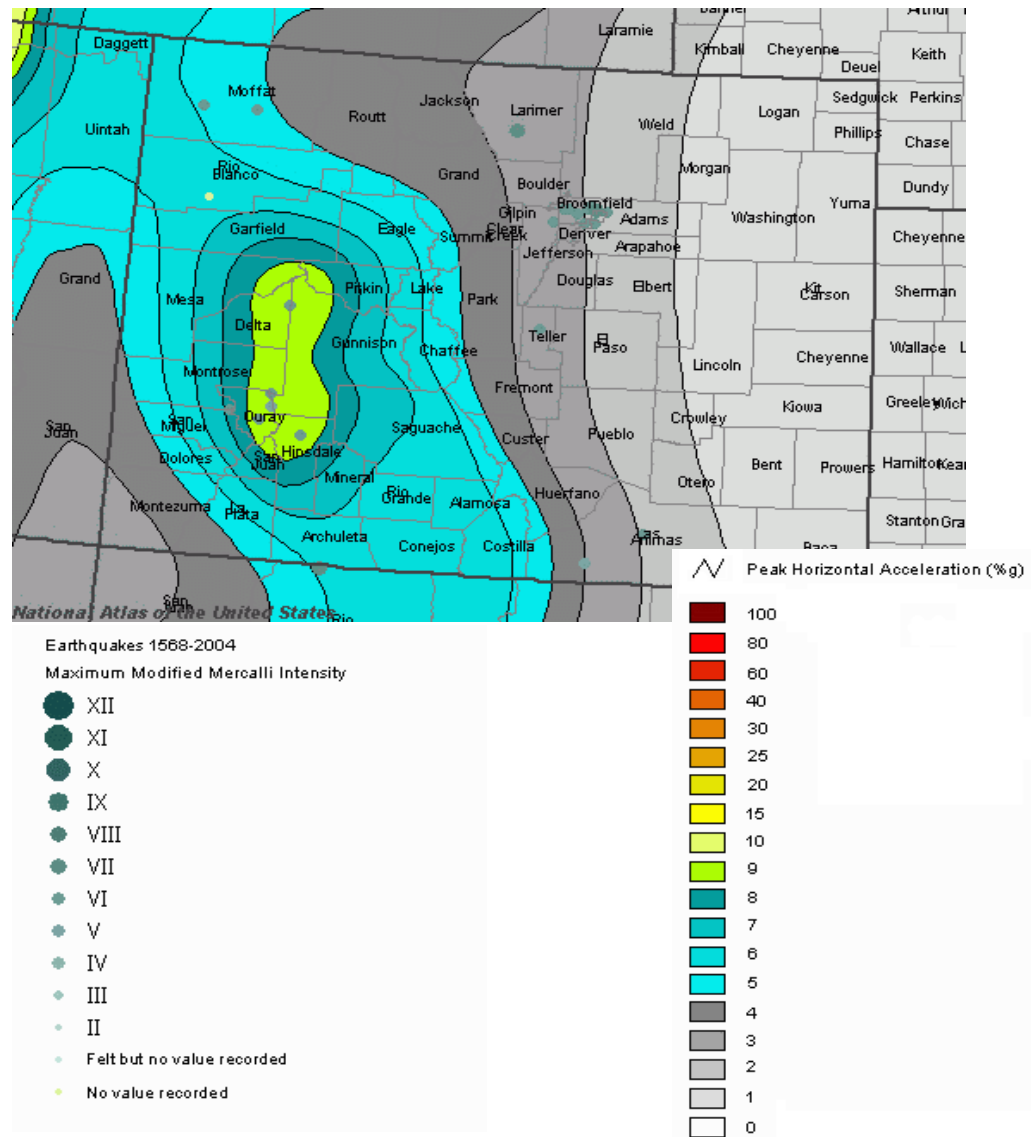
Source: <http://eqint.cr.usgs.gov/eqprob/2002/index.php>, accessed on October 12, 2009.

## Magnitude/Severity

**Critical:** Isolated deaths and/or multiple injuries and illnesses; major or long-term property damage that threatens structural stability; and/or interruption of essential facilities and services for 24-72 hours

As shown in Figure 4-12, in Alamosa County the shaking level, with a 10 percent chance of being exceeded over a period of 50 years, is in the range of 5 to 6 percent peak acceleration. Significant earthquake damage typically does not occur until peak accelerations are greater than 30 percent. Secondary impacts of earthquakes may include landslides, seiches, liquefaction, fires, and dam failure.

**Figure 4-12: Colorado Seismic Hazard Map—10% Probability of Exceedance in 50 Years**



Source: U.S. Geological Survey, [www.nationalatlas.gov](http://www.nationalatlas.gov)

### Vulnerability Assessment

**Overall Summary and Impacts:** Although the probability of a major earthquake is low, the impacts could be devastating. The probability of a minor earthquake is high and historic structures and infrastructure are at risk.

**Identifying Structures and Estimating Potential Losses:** All structures in Alamosa County are potentially vulnerable to seismic ground shaking. The most vulnerable are historic buildings constructed of unreinforced masonry. Historic buildings in Alamosa County, such as the American National Bank building or Bain's Department Store may be damaged in a seismic event.



Other critical facilities or infrastructure at risk are unknown; their construction determines their ability to withstand seismic shaking.

The Colorado Geological Survey (CGS) ran a series of deterministic scenarios for selected Colorado faults using HAZUS to assess potential economic and social losses due to earthquake activity in Colorado. The earthquake magnitudes used for each fault were the “maximum credible earthquake” as determined by the U.S. Geological Survey. There are four known faults in Alamosa County: the Alamosa Horst Fault Zone East, the Alamosa Horst Fault Zone West, the Manassa, and the North Sangre de Cristo. The only fault analyzed for Alamosa County was the North Sangre de Cristo. Table 4-19 summarizes the results for estimated potential losses for Alamosa County. The loss ratio is the percentage of the total building stock value damaged. The higher this ratio, the more difficult it is to restore a community to viability (loss ratios of 10 percent or greater are considered critical by FEMA).

The greatest losses to Alamosa County would likely result from a magnitude 7.5 earthquake or greater on the Sangre de Cristo fault, which is predicted to cause four fatalities and more than \$150 million in economic loss.

**Table 4-19: Potential Earthquake Losses in Alamosa County**

| Fault               | Magnitude | Fatalities | Total Economic Loss (\$) | Loss Ratio (%) |
|---------------------|-----------|------------|--------------------------|----------------|
| N. Sangre de Cristo | M7.5      | 4          | 152.7 million            | -8.0           |
| N. Sangre de Cristo | M6.5      | 0          | 11.9 million             | -0.6           |
| N. Sangre de Cristo | M5.5      | 0          | 0.9 million              | -0.05          |

Source: Earthquake Evaluation Report, [www.dola.colorado.gov/dem/mitigation/earthquakerpt.pdf](http://www.dola.colorado.gov/dem/mitigation/earthquakerpt.pdf)

**Future Development:** The participating jurisdictions that have adopted building codes will substantially reduce the potential cost of damages to future structures from earthquakes. The magnitude and intensity of any earthquake will be the key determinant as to total damages.

## Data Limitations

It is not possible to accurately estimate the timing or location of the next major earthquake in Colorado. The lack of an adequate network of seismometers in Colorado makes it difficult to detect and locate earthquakes. The historical record also is quite short – about 150 years.<sup>9</sup>

## 4.15 Community Asset Inventory

The community asset inventory describes the assets at risk to natural hazards in Alamosa County, including the total exposure of people and property; critical facilities and infrastructure; natural, cultural, and historic resources; and economic assets.

<sup>9</sup> Colorado Geological Survey, *Colorado's Earthquake and Fault Map 2007*.



### Total Exposure of Population and Structures

Table 4-20 shows the total population, number of structures, and assessed value of improvements to parcels in the county. Building counts and values (includes building contents) were taken from HAZUS census block-level data. Land values have been purposely excluded because land remains following Colorado disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Additionally, state and federal disaster assistance programs generally do not address loss of land or its associated value. The type of all structures is not available.

**Table 4-20: Population and Building Exposure in Alamosa County**

| County  | Population 2007 | Number of Structures 2000 | Total Structure Value (\$) * 2000 |
|---------|-----------------|---------------------------|-----------------------------------|
| Alamosa | 15,760          | 7,493                     | \$1,105,000,000                   |

\*Value represents "improved structure value" and includes contents

Source: HAZUS-MH (MR 3) (structures), Colorado Division of Local Government State Demography Office, [www.dola.colorado.gov/dlg/demog/pop\\_cnty.html](http://www.dola.colorado.gov/dlg/demog/pop_cnty.html)

### Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. In addition, critical facilities are those that house vulnerable populations, such as schools and assisted living or senior housing. The tables below list information on each identified critical facility. A map of critical facilities for each jurisdiction is shown in Figure 4-13.

**Table 4-21: Alamosa County Critical Facilities**

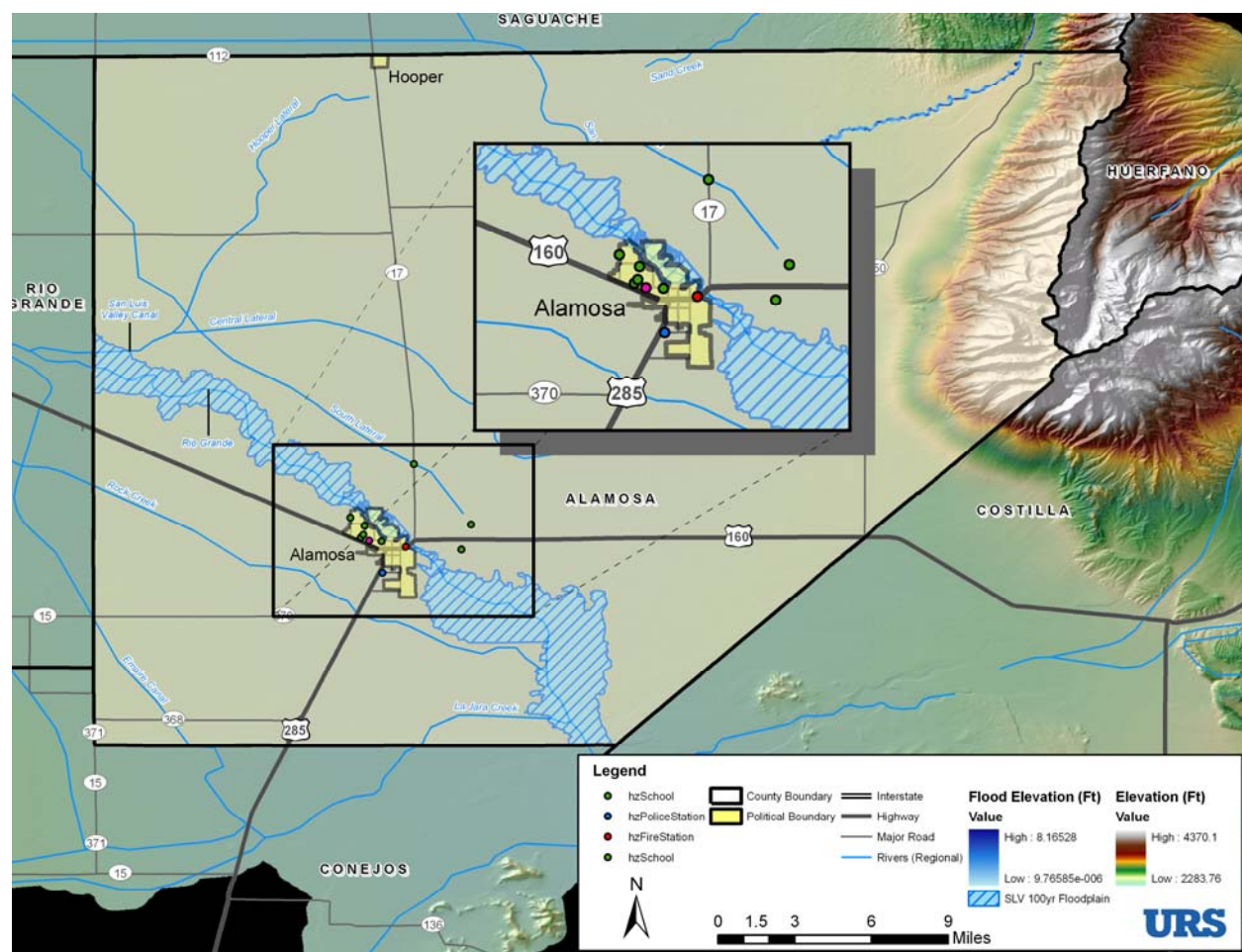
| Facility Type  | Name                                    | Address                        | Replacement Value |
|----------------|-----------------------------------------|--------------------------------|-------------------|
| Hospital       | San Luis Valley Regional Medical Center | 106 Blanca Ave.                | \$6,790,000       |
| Fire Station   | Alamosa Fire Department                 | 425 4 <sup>th</sup> St.        | \$582,000         |
| Police Station | Alamosa County Sheriff                  | 1315 17 <sup>th</sup> St.      | \$1,358,000       |
| Police Station | Alamosa Police Department-Detectives    | 1315 17 <sup>th</sup> St.      | \$1,358,000       |
| Police Station | Police Department                       | 425 4 <sup>th</sup> St.        | \$1,358,000       |
| School         | Trinity Lutheran School                 | PO Box 787                     | \$485,000         |
| School         | Boyd Elementary School                  | 11 <sup>th</sup> and Hunt Ave. | \$485,000         |
| School         | Evans Elementary School                 | 108 La Veta Ave.               | \$485,000         |
| School         | Ortega Middle School                    | 401 Victoria Ave.              | \$485,000         |
| School         | Alamosa Open School                     | 216 Victoria St.               | \$485,000         |
| School         | Cottonwood Christian School             | 408 Victoria PO Box 455        | \$485,000         |
| School         | Alamosa Christian School                | 7160 Brush Ln.                 | \$485,000         |
| School         | Alamosa High School                     | 805 Craft Drive                | \$485,000         |
| School         | Polston Elementary School               | 6935 State Highway 17          | \$485,000         |

Source: HAZUS-MH MR3 output

| Facility Type        | Name                            | Address | Replacement Value |
|----------------------|---------------------------------|---------|-------------------|
| School               | Sangre De Cristo Elementary     | -       | -                 |
| Fire Station         | Mosca/Hooper Fire Department    | -       | -                 |
| Historical Structure | Hooper Town Hall/Community Room | -       | -                 |

Source: Email from Debbie Canada, Hooper Town Clerk, November 10, 2009.

**Figure 4-13: Alamosa County Critical Facilities**



Source: HAZUS-MH MR3 output. Intended for planning purposes only.

### **Natural, Historic, and Cultural Assets**

Assessing the vulnerability of Alamosa County to disaster also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing this ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

#### ***Natural Resources: Wetlands and Endangered Species***

Natural resources are important to include in a benefit-cost analyses for future projects. They may be used to leverage additional funding for projects that contribute to other community goals as well. A number of natural resources exist in Alamosa County, including wetlands and endangered species.

Wetlands are a valuable natural resource for communities, due to their ability to improve water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water. Wetlands also provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital.

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

According to the U.S. Fish and Wildlife Service, as of February 2008, there were seven Federal endangered, threatened, or candidate species in Alamosa County. These species are listed in Table 4-23.

**Table 4-23: List of Rare Species in Alamosa County**

| Common Name                    | Scientific Name                       | Type of Species | Status     |
|--------------------------------|---------------------------------------|-----------------|------------|
| Black-footed ferret            | <i>Mustela nigripes</i>               | Mammal          | Endangered |
| Canada lynx                    | <i>Lynx canadensis</i>                | Mammal          | Threatened |
| Gunnison's prairie dog         | <i>Cynomys gunnisoni</i>              | Mammal          | Candidate  |
| Mexican spotted owl            | <i>Strix occidentalis lucida</i>      | Bird            | Threatened |
| Rio Grande cutthroat trout     | <i>Oncorhynchus clarki virginalis</i> | Fish            | Candidate  |
| Southwestern willow flycatcher | <i>Empidonax traillii extimus</i>     | Bird            | Endangered |
| Yellow-billed cuckoo           | <i>Coccyzus americanus</i>            | Bird            | Candidate  |

Source: Endangered, Threatened, Proposed and Candidate Species Colorado Counties (August 2009), U.S. Fish and Wildlife Service Mountain-Prairie Region, [www.fws.gov/mountain-prairie/endsp/](http://www.fws.gov/mountain-prairie/endsp/)

Alamosa County is home to two of only eight National Wildlife Refuges in the State of Colorado; the Alamosa National Wildlife Refuge and the Baca National Wildlife Refuge. The Alamosa NWR consists of wet meadows, river oxbows and riparian corridor primarily within the flood plain of the Rio Grande, and dry uplands vegetated with greasewood and saltbush. These areas support songbirds, water birds, raptors, mule deer, beaver and coyotes.<sup>10</sup>

### ***Historical and Cultural Resources***

National and state historic inventories were reviewed to identify historic and cultural assets in Alamosa County. The National Register of Historic Places is the nation's official list of cultural resources worthy of preservation. The Colorado State Register of Historic Properties is a listing of the state's significant cultural resources worthy of preservation for the future education and enjoyment of Colorado's residents and visitors. Table 4-24 lists the properties in Alamosa County that are on the Colorado State Register of Historic Properties. Those properties that are also on the National Register of Historic Places are indicated with an asterisk.

<sup>10</sup> <http://www.fws.gov/alamosa/AlamosaNWR.html>, accessed on October 14, 2009.

**Table 4-24: Alamosa County Historic Properties/Districts in State and National Registers**

| Property Name                                               | City    | Location                                 | Date Listed |
|-------------------------------------------------------------|---------|------------------------------------------|-------------|
| Alamosa County Courthouse*                                  | Alamosa | 702 Fourth Street                        | 9/29/1995   |
| Alamosa Masonic Hall                                        | Alamosa | 514 San Juan                             | 5/14/1997   |
| American National Bank Building*                            | Alamosa | 500 State Ave.                           | 4/15/1999   |
| Bain's Department Store                                     | Alamosa | 510 Main St. & 509 Hunt Ave.             | 9/13/1995   |
| Denver & Rio Grande Railroad Depot*                         | Alamosa | 610 State St.                            | 2/11/1993   |
| Denver & Rio Grande Railroad Locomotive No. 169*            | Alamosa | Cole Park                                | 8/9/2000    |
| First Baptist Church*                                       | Alamosa | 408 State Ave.                           | 5/22/2005   |
| Husung Hardware*                                            | Alamosa | 625 Main St.                             | 1/28/2000   |
| Mt. Pleasant School*                                        | Alamosa | Junction of County Rd 3S and Rd. 103S    | 5/3/2006    |
| Sacred Heart Catholic Church*                               | Alamosa | 727 4th St                               | 3/13/1996   |
| St. Thomas Episcopal Church*                                | Alamosa | 607 Fourth St.                           | 3/4/2003    |
| Hooper Store (Town Hall)*                                   | Hooper  | 8681 Main St.                            | 2/1/2006    |
| Medano Ranch Headquarters*                                  | Mosca   | Approximately 9 miles northeast of Mosca | 2/4/2004    |
| Superintendent's Residence, Great Sand Dunes National Park* | Mosca   | Colo. Highway 150, southwest of Mosca    | 11/2/1989   |
| Trujillo Homestead*                                         | Mosca   | Approximately 4 miles north of 6N Lane   | 2/4/2004    |
| Zapata Ranch Headquarters*                                  | Mosca   | 5303 Colo. Hwy. 150                      | 4/5/1993    |

\*On both the Colorado State Register of Historic Properties and the National Register of Historic Places  
Source: Directory of Colorado State Register Properties, [www.coloradohistory-oahp.org/programareas/register/1503/](http://www.coloradohistory-oahp.org/programareas/register/1503/)

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

### Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community. Table 4-25 lists the top employers in Alamosa County by number of employees.

**Table 4-25: Top Employers in Alamosa County**

| Name                               | City    |
|------------------------------------|---------|
| <b>250-500 Employees</b>           |         |
| Adams State College                | Alamosa |
| Rakhra Mushroom Farm Corp.         | Alamosa |
| San Luis Valley Medical Center     | Alamosa |
| SLV Regional Medical Center Phys.  | Alamosa |
| <b>100-250 Employees</b>           |         |
| Blue Peaks Developmental Services  | Alamosa |
| City Market                        | Alamosa |
| Colorado Transportation Department | Alamosa |
| San Luis Valley BOCES              | Alamosa |
| Town & Country Ford                | Alamosa |

Source: Colorado Department of Labor and Employment, <http://imgateway.coworkforce.com/>

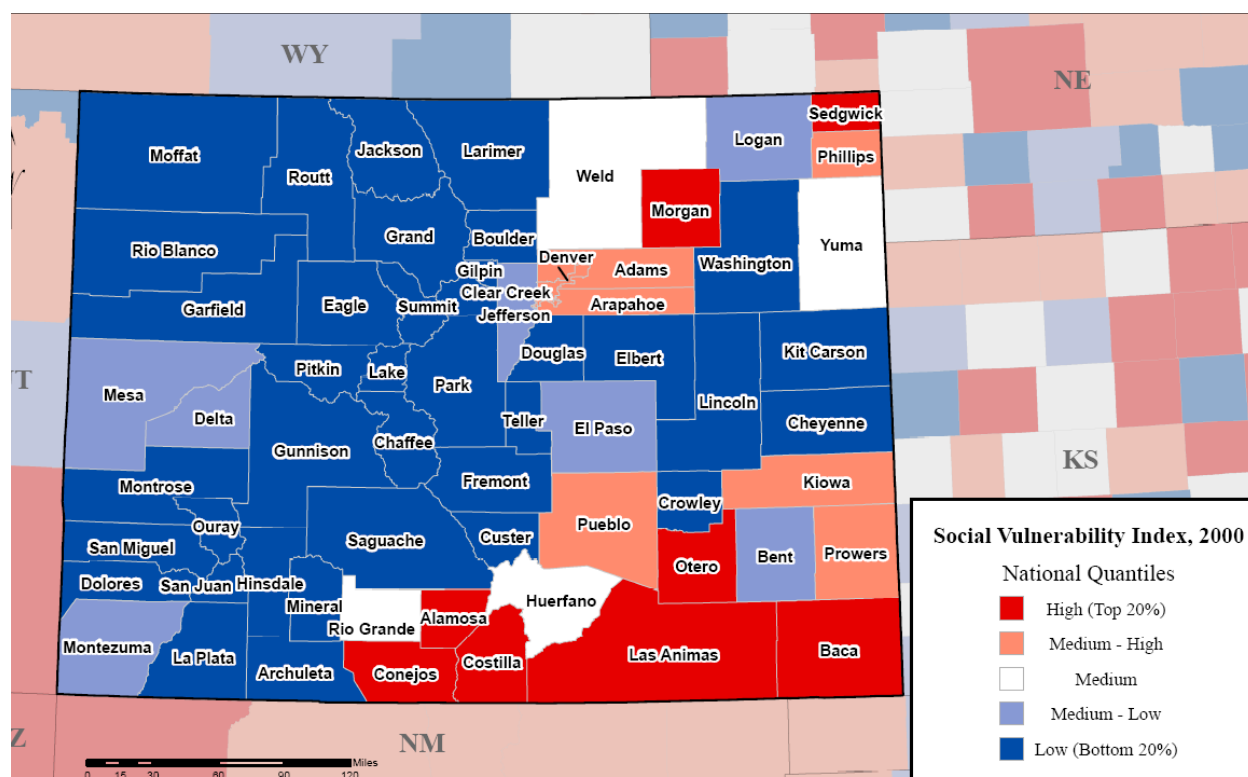
## Social Vulnerability

Certain demographic and housing characteristics affect overall vulnerability to hazards. These characteristics, such as age, race/ethnicity, income levels, gender, building quality, public infrastructure, all contribute to social vulnerability.

A Social Vulnerability Index compiled by the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina measures the social vulnerability of U.S. counties to environmental hazards for the purpose of examining the differences in social vulnerability among counties. Based on national data sources, primarily the 2000 Census, it synthesizes 42 socioeconomic and built environment variables that research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. Eleven composite factors were identified that differentiate counties according to their relative level of social vulnerability: personal wealth, age, density of the built environment, single-sector economic dependence, housing stock and tenancy, race (African American and Asian), ethnicity (Hispanic and Native American), occupation, and infrastructure dependence. Figure 4-14 below illustrates the Colorado Counties compared to the Nation.



Figure 4-14: Social Vulnerability by County Compared with the Nation



Source: [http://webra.cas.sc.edu/hvriapps/SOVI\\_Access/SoVI\\_Access\\_Page.htm](http://webra.cas.sc.edu/hvriapps/SOVI_Access/SoVI_Access_Page.htm), October 2009.

Compared to other counties in the nation and in Colorado, Alamosa County's social vulnerability is high (top 20 percent).<sup>11</sup> To better understand the characteristics behind this ranking, the Planning Team researched information from the 2000 Census on four factors of social vulnerability: gender, age, language spoken in home, and poverty. These factors were analyzed for Alamosa County as a whole and for the City of Alamosa and the Town of Hooper. One characteristic of social vulnerability is differential access to resources and greater susceptibility to hazards. All factors considered here are related to this characteristic.

Table 4-26 displays these variables and compares them to the same variables for Colorado and the United States. These factors of social vulnerability hold many implications for disaster response and recovery and are important considerations when identifying and prioritizing mitigation actions and overall goals of the Plan.

<sup>11</sup> [http://webra.cas.sc.edu/hvriapps/SOVI\\_Access/SoVI\\_Access\\_Page.htm](http://webra.cas.sc.edu/hvriapps/SOVI_Access/SoVI_Access_Page.htm), accessed October 2009.

**Table 4-26: Social Vulnerability from 2000 U.S. Census**

| <b>Jurisdiction</b> | <b>Total Population</b> | <b>Total Housing Units</b> | <b>% Female</b> | <b>% Under Age 18</b> | <b>% Age 65 and Over</b> | <b>% Speak Language Other than English in Home*</b> | <b>% Individuals Below Poverty Level*</b> |
|---------------------|-------------------------|----------------------------|-----------------|-----------------------|--------------------------|-----------------------------------------------------|-------------------------------------------|
| United States       | 281,421,906             | 115,904,641                | 50.9            | 25.7                  | 12.4                     | 17.9                                                | 12.4                                      |
| Colorado            | 4,301,261               | 1,808,037                  | 49.6            | 25.6                  | 9.7                      | 15.1                                                | 9.3                                       |
| Alamosa County      | 14,966                  | 6,088                      | 50.2            | 27.2                  | 9.6                      | 28.3                                                | 21.3                                      |
| City of Alamosa     | 7,960                   | 3,215                      | 52.2            | 24.4                  | 10.9                     | 29.9                                                | 25                                        |
| Town of Hooper      | 123                     | 57                         | 48              | 28.5                  | 13                       | 17.7                                                | 21                                        |

\*Based on sample data. The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. Source: 2000 Census, U.S. Census Bureau

### ***Age***

Age can affect the ability of individuals to move out of harm's way. The Planning Team analyzed two variables for age: percentage over 65, and percentage under age 18. The percentage of Alamosa County's population under 18 (27%) is six percent higher than Colorado. The percentage over age 65 (9%) is similar to Colorado. The exception is the Town of Hooper, where the population over the age of 65 (13%) is slightly higher than the rest of the county.

### ***Language Spoken in Home***

The language spoken in the home can signify language and cultural barriers that affect communication of warning information and access to post-disaster information. In Alamosa County, 28 percent of the population speaks a language in the home other than English. This is significantly higher than both the U.S. (18%) and Colorado (15%). The language spoken in the home is not likely to increase social vulnerability in the planning area, given the long history of Spanish speakers in the region, but should still be considered by the County in regards to public education and awareness efforts.

### ***Poverty***

Wealth and poverty also are indicators of social vulnerability. Low income and impoverished populations have fewer resources available for mitigation, preparedness, and recovery and are more likely to live in vulnerable structures. Individuals and communities with greater wealth have more ability to absorb losses and be resilient in the face of disaster due to factors such as insurance and social safety nets. They also have greater capabilities to mitigate hazards and greater access to funds for recovery.

To compare wealth and poverty, the Planning Team analyzed the percentage of individuals below the poverty level and the median home value in each community in Alamosa County. Overall, Alamosa County's percentage of individuals living below



the poverty level (21%) is much higher than that of the nation (12%) or Colorado (9%). In the City of Alamosa, 25 percent of are living below the poverty level.

### 4.16 Land Use and Development Trends

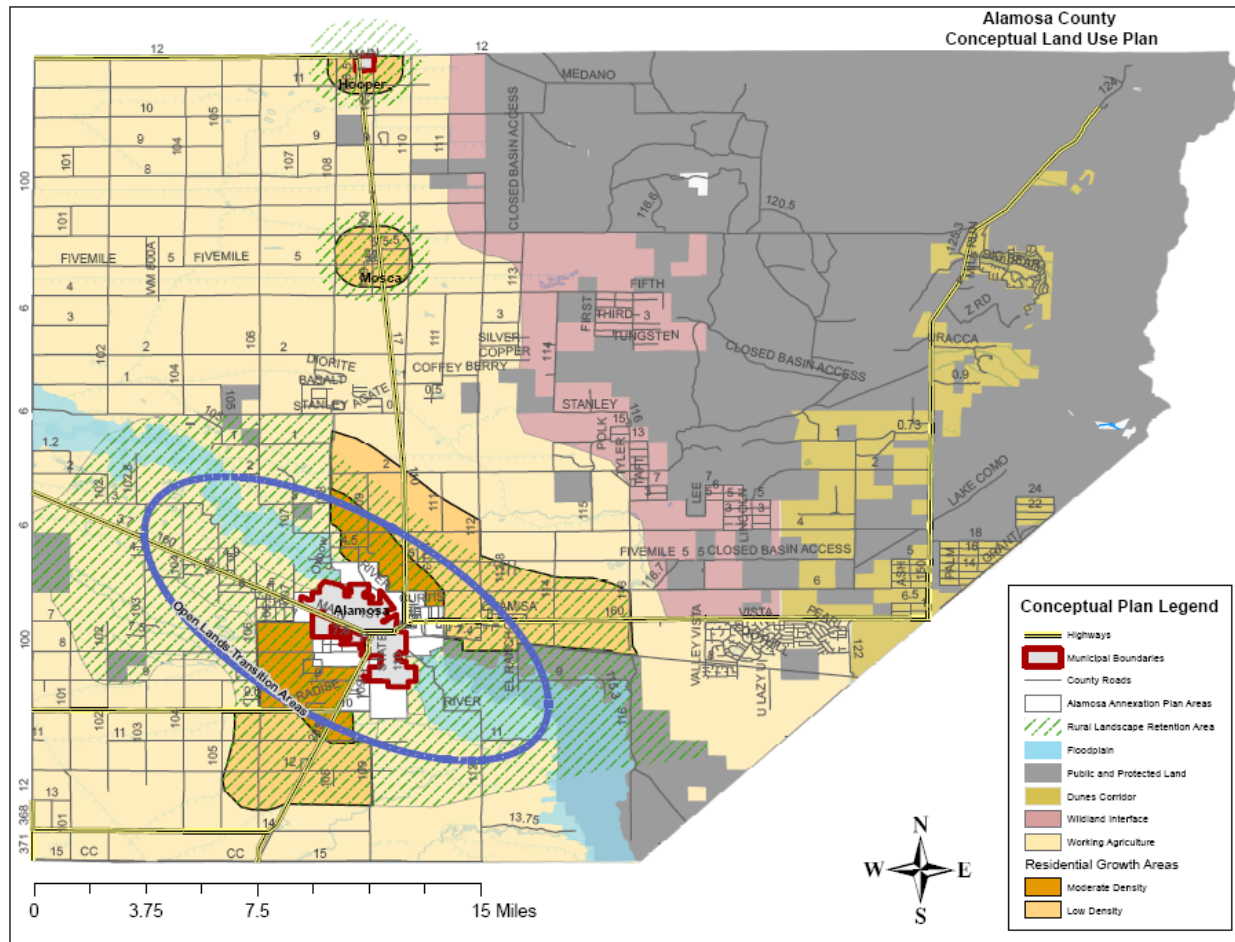
---

This section provides a general description of land uses and development trends within unincorporated Alamosa County, the City of Alamosa, and the Town of Hooper and includes data on growth in population and housing units for each jurisdiction.

The county is expected to grow at about a 1 to 2% growth rate. Most new developments are small subdivisions consisting of four or five lots carved out of a forty-acre parcel. Within the City of Alamosa, primary growth areas have been to the west and southwest, not particularly subject to spatially defined natural hazards. Recent development in the City has occurred in the Cottonwoods subdivision by the golf course. The Town of Hooper expects negative growth rather than new development.

Alamosa County recently updated their Master Plan (2008). Figure 4-15 shows the land use map for Alamosa County. This Plan shows moderate density near the periphery of the City of Alamosa. Should development occur in potential annexation areas, regulation of the floodplain will be critical. In addition, future build-out of homes in the foothills of the Sangre de Cristos will prove particularly vulnerable to wildfire hazard, as they exist within the wildland-urban Interface.

Figure 4-15: Conceptual Land Use Plan for Alamosa County



Source: 2008 Alamosa County Master Plan

Table 4-27,

Table 4-28, and Table 4-29 provide information on growth in population and housing units for each jurisdiction. Table 4-30 provides population projections for Alamosa County at 5-year intervals to 2035.

Table 4-27: Population Growth in Alamosa County, 2000-2007

| Jurisdiction        | 2000          | 2007          | Percent Change (%) |
|---------------------|---------------|---------------|--------------------|
| City of Alamosa     | 7,960         | 8,458         | 6.3                |
| Hooper              | 123           | 120           | -2.4               |
| Unincorporated Area | 6,883         | 7,182         | 4.3                |
| <b>Total County</b> | <b>14,966</b> | <b>15,760</b> | <b>5.3</b>         |

Source: Colorado Department of Local Affairs Demography Section, [www.dola.colorado.gov/dlg/demog/](http://www.dola.colorado.gov/dlg/demog/)

**Table 4-28: Growth in Housing Units in Alamosa County, 2000-2007**

| Jurisdiction        | 2000         | 2007         | Percent Change (%) |
|---------------------|--------------|--------------|--------------------|
| City of Alamosa     | 3,215        | 3,445        | 7.5                |
| Hooper              | 57           | 57           | --                 |
| Unincorporated Area | 2,816        | 2,964        | 5.3                |
| <b>Total County</b> | <b>6,088</b> | <b>6,466</b> | <b>6.2</b>         |

Source: Colorado Department of Local Affairs Demography Section, [www.dola.colorado.gov/dlg/demog/](http://www.dola.colorado.gov/dlg/demog/)

**Table 4-29: Population and Housing Unit Density in Alamosa County, 2000-2007**

| Jurisdiction        | Area in Square Miles | 2000 Population Density* (per sq. mile) | 2007 Population Density* (per sq. mile) | 2000 Housing Unit Density* (per sq. mile) | 2007 Housing Unit Density* (per sq. mile) |
|---------------------|----------------------|-----------------------------------------|-----------------------------------------|-------------------------------------------|-------------------------------------------|
| City of Alamosa     | 4                    | 1,990                                   | 2115                                    | 804                                       | 861                                       |
| Hooper              | 0.2                  | 615 (only 123 total)                    | 600 (only 120 total)                    | 285 (only 57 total)                       | 285 (only 57 total)                       |
| Unincorporated Area | 718.8                | 10                                      | 10                                      | 4                                         | 4                                         |
| <b>Total County</b> | <b>723</b>           | <b>21</b>                               | <b>22</b>                               | <b>8</b>                                  | <b>9</b>                                  |

\*Densities rounded to the nearest integer.

Source: Colorado Department of Local Affairs Demography Section, [www.dola.colorado.gov/dlg/demog/](http://www.dola.colorado.gov/dlg/demog/)

**Table 4-30: Population Projections for Alamosa County, 2005-2035**

|                    | 2005   | 2010   | 2015   | 2020   | 2025   | 2030   | 2035   |
|--------------------|--------|--------|--------|--------|--------|--------|--------|
| Population         | 15,741 | 16,392 | 18,048 | 19,843 | 21,687 | 23,587 | 25,597 |
| Percent Change (%) | --     | 4.0    | 9.5    | 9.5    | 9.0    | 8.5    | 8      |

Sources: Colorado Department of Local Affairs Demography Section, [www.dola.colorado.gov/dlg/demog/](http://www.dola.colorado.gov/dlg/demog/), November 2008.

This analysis predicts that Alamosa County will experience slow growth (5%) over the through 2035. Population growth will be greatest in the City of Alamosa (6.3%). In the past, housing density remained relatively flat. Zoning ordinances in the county allow for large lot subdivisions, which are highly sought after in the marketplace. However, these types of developments and rural areas in general are the most difficult to serve in emergency situations, where roads are often unpaved and can become impassable during winter storms. The continuing trend of landowners wishing to develop in flood prone areas along the river corridor, and in rural areas that are difficult to access, increases the hazard risks.

### 4.17 Capability Assessment

Mitigation capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capability assessment is divided into four sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, and mitigation outreach and

partnerships. This section includes information that was available during the planning process. It is expected that future updates will include further information.

### Regulatory Mitigation Capabilities

The existing regulatory tools and planning mechanisms for Alamosa County and other jurisdictions are summarized in Table 4-31. These plans, codes, and ordinances form a framework that supports this hazard mitigation Plan. It is expected that future updates of these planning mechanisms will acknowledge, integrate, and implement this hazard mitigation Plan, as necessary.

**Table 4-31: Regulatory Mitigation Capabilities**

| Capability                                   | Alamosa County | City of Alamosa | Hooper |
|----------------------------------------------|----------------|-----------------|--------|
| Master or Comprehensive Plan                 | Yes            | Yes             | No     |
| Economic Development Plan                    |                | No              |        |
| Capital Improvements Plan                    |                | Yes             |        |
| Community Wildfire Protection Plan           | Yes            | No              |        |
| Building Code                                | Yes            | Yes             | Yes    |
| Building Code Year                           | 2003           | 2003            | 2003   |
| Floodplain Ordinance                         | Yes            | Yes             |        |
| Zoning Ordinance                             | Yes            | Yes             | Yes    |
| Subdivision Ordinance                        | Yes            | Yes             |        |
| Stormwater Ordinance                         | Yes            | Yes             |        |
| Growth Management Ordinance                  |                | No              |        |
| Site Plan Review Requirements                |                | Yes             |        |
| Erosion/Sediment Control Program             |                | No              |        |
| Stormwater Management Program                |                | Yes             |        |
| National Flood Insurance Program Participant | Yes            | Yes             | No     |
| Other                                        |                |                 |        |

#### ***Alamosa County***

The *Alamosa County Master Plan (revised 2008)* identifies broad-based development goals and develops a coordinated program of public and private actions necessary to achieve those goals. The Master Plan is intended to guide development by evaluating physical elements such as housing, transportation, open space and recreation, infrastructure, and community facilities, along with socio-economic development based on input from county residents. Goals and policies in the Master Plan that support hazard mitigation are listed in the following table.

**Table 4-32: Alamosa County Master Plan Policies**

|                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Goal 6.3:</b> The complex patchwork of public and private lands needs to be carefully managed with attention to all of the interests involved and in such a way that fiscal efficiencies are achieved with regard to infrastructure provisions and wildfire issues. |
| <b>Policy 6.3.2:</b> In the wildland interface, access along existing public routes is maintained and new routes are created as appropriate and where needed.                                                                                                          |
| <b>Policy 6.3.3:</b> Fire and fuels management in the wildland interface is of key importance in order to protect wildlands from human-caused fires and to protect private property from fires occurring on wildlands.                                                 |
| <b>Goal 8.5:</b> Alamosa will pursue land use policies that minimize issues and consequences associated with natural hazards                                                                                                                                           |
| <b>Policy 8.5.1:</b> Generally, development will be discouraged in known natural hazard areas and encouraged in areas with the fewest natural hazards.                                                                                                                 |
| <b>Policy 8.5.2:</b> Conservation of natural hazard areas as open space in future subdivisions will generally be supported.                                                                                                                                            |
| <b>Policy 8.5.3:</b> Proposed development in any area that is a known and mapped a natural hazard area, may be required to engage additional analysis prior to approval.                                                                                               |
| <b>Policy 8.5.4:</b> Projects will be encouraged to utilize the natural features of the land and not engage in undue vegetation removal or earth moving that would cause slope instability, excessive scarring or contribute flood danger.                             |
| <b>Policy 8.5.5:</b> In high or extreme wildfire hazard areas in the wildland interface, the County will work to suggest and integrate fuels reduction projects into federal land management planning and operations.                                                  |

### ***Town of Hooper***

The Town of Hooper amended their zoning code as recently as 2009. Their zoning code was developed to promote coordinated and sound development, and to protect the health, safety, welfare, and morals of current and future inhabitants of the Town. More specifically, Section 1-4(c) reads “ . . . the promotion of safety from fire, floodwaters and other dangers . . . ”

### **Administrative and Technical Capabilities**

Table 4-33 identifies the personnel responsible for activities related to mitigation and loss prevention in Alamosa County and other jurisdictions.

**Table 4-33: Administrative and Technical Capabilities**

| <b>Administrative/ Technical Resources</b>                                                    | <b>Alamosa County</b>      | <b>City of Alamosa</b> | <b>Town of Hooper</b> |
|-----------------------------------------------------------------------------------------------|----------------------------|------------------------|-----------------------|
| Planner/ Engineer with knowledge of land development practices                                | Yes, Land Use Department   | No                     | No                    |
| Engineer/ Professional trained in construction practices related to buildings/ infrastructure | No                         | Yes, Public Works      | No                    |
| Planner/ Engineer/ Scientists with understanding of natural hazards                           | No                         | No                     | No                    |
| GIS capabilities                                                                              | Yes, SLV GIS/GPS Authority | Yes, Public Works      | No                    |
| Full-time building official                                                                   | Yes, Land Use Department   | Yes, Public Works      | No                    |
| Floodplain administrator                                                                      | Yes, Land Use Department   | Yes, Public Works      | No                    |
| Emergency manager                                                                             | Yes                        | Yes, City Manager      | No                    |
| Grant writer                                                                                  |                            | No                     | No                    |
| Warning Systems/ Services                                                                     |                            | Yes, Regional 911      | No                    |

## Fiscal Mitigation Capabilities

Identifies financial tools or resources that communities could potentially use to help fund mitigation activities.

**Table 4-34: Fiscal Mitigation Capabilities**

| <b>Financial Resources</b>                       | <b>Alamosa County</b> | <b>City of Alamosa</b> | <b>Hooper</b> |
|--------------------------------------------------|-----------------------|------------------------|---------------|
| Community Development Block Grants               | Yes                   | Yes                    |               |
| Capital improvements project funding             | Yes                   | Yes                    | Yes           |
| Authority to levy taxes for specific purposes    | Yes                   | Yes                    | Yes           |
| Fees for water, sewer, gas, or electric services | No                    | Yes                    |               |
| Impact fees for new development                  | Yes                   | No                     | No            |
| Incur debt through general obligation bonds      | Yes                   | Yes                    |               |
| Incur debt through special tax bonds             | Yes                   | Yes                    |               |
| Withhold spending in hazard-prone areas          |                       | Yes                    |               |

## Mitigation Outreach and Partnerships

The participating jurisdictions noted the following existing outreach programs they participate in related to risk reduction:

- Zapata Subdivision HOA fuels reduction program
- Fire Safety training at schools – City of Alamosa
- Water Conservation education through flyers and PSAs.



[Page intentionally left blank to facilitate 2-sided printing]





# 5. Mitigation Strategy

## FEMA Requirement

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This chapter describes the mitigation strategy developed by the Alamosa County Hazard Mitigation Planning Team (Planning Team) based on the risk assessment described in Chapter 1. The Planning Team developed goals and mitigation actions as follows:

- **Goals** are general guidelines that explain what the Plan means to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are meant to be achieved over the long term and typically consist of broad policy statements.
- **Mitigation Actions** are specific actions that implement the objective and provide clear direction towards fulfilling the goals.

## 5.1 Plan Goals

## FEMA Requirement

4 CFR Requirement §201.6(c)(3)(i): [The mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The Planning Team reviewed the results of the risk assessment and the goals and objectives in the Colorado State Natural Hazard Mitigation Plan at their second meeting on October 2009. The Planning Team developed goals that support the comprehensive range of mitigation action types needed to reduce vulnerability (described further in Section 5.2) and are consistent with the Colorado State Hazard Mitigation Plan. After reviewing and revising samples presented by the consultant, the Planning Team came to consensus on the Plan goals presented in Table 5-1.

**Table 5-1: Alamosa County Multi-Hazard Mitigation Plan Goals**

| Goals                                                                                                            |
|------------------------------------------------------------------------------------------------------------------|
| 1. Reduce the loss of life and personal injury caused by natural hazards                                         |
| 2. Reduce damage to critical facilities, personal property, and other community assets caused by natural hazards |
| 3. Minimize economic losses associated with natural hazards                                                      |

## 5.2 Identification of Mitigation Action Alternatives

### FEMA Requirement

4 CFR Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include] a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. [The mitigation strategy] must also address the jurisdictions' participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

At their meeting on October 2009, the Planning Team discussed the six categories of mitigation actions shown in Table 5-2.

**Table 5-2: Categories of Mitigation Actions**

| Category                       | Definition                                                                                                                                  |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Prevention                     | Administrative or regulatory actions or processes that influence the way land and buildings are developed and built                         |
| Property Protection            | Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area |
| Structural                     | Actions that involve the construction of structures to reduce the impact of hazard                                                          |
| Natural Resource Protection    | Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems                            |
| Emergency Services             | Actions that ensure the continuity of emergency services                                                                                    |
| Public Education and Awareness | Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them        |

Source: National Flood Insurance Program Community Rating System

The Planning Team discussed and refined a list of action alternatives for each hazard identified in the Risk Assessment. The participants developed mitigation actions by hazard type based on the probability and magnitude of the hazards as discussed in the Risk Assessment. The materials used during this process can be found in Appendix C: Mitigation Action Evaluation.

### Continued Compliance with National Flood Insurance Program

Two jurisdictions—Alamosa County and the City of Alamosa—currently participate in the National Flood Insurance Program (NFIP). The Town of Hooper does not have any known floodplains and does not participate in the NFIP. Alamosa County and

the City of Alamosa will continue participation in and compliance with the NFIP. Specific activities that the jurisdictions will undertake to continue compliance include the following:

- Attend NFIP training workshops sponsored by the state
- Update floodplain regulations throughout the county
- Work with FEMA to update county DFIRMs

### 5.3 Prioritization and Implementation of Mitigation Actions

#### FEMA Requirement

44 CFR Requirement §201.6(c)(3)(iii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

The Planning Team then analyzed and prioritized the mitigation actions utilizing the approved criteria for prioritizing, known as the STAPLE/E method, which assesses the social, technical, administrative, political, legal, economic, and environmental implications of each action. Each identified action was analyzed and ranked using the criteria defined in Figure 5-1.

**Figure 5-1: Criteria for Prioritization**



| STAPLE/E Method        |                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>S</b> ocial         | Community acceptance<br>Effects on population                                                                                            |
| <b>T</b> echnical      | Technical feasibility<br>Long-term solutions<br>Secondary Impacts                                                                        |
| <b>A</b> dministrative | Staffing<br>Funding allocation<br>Maintenance/operations                                                                                 |
| <b>P</b> olitical      | Political support<br>Local champion<br>Public support                                                                                    |
| <b>L</b> egal          | Local, state, and federal authority<br>Potential legal challenge                                                                         |
| <b>E</b> conomic       | Benefit/cost of action<br>Contributes to other economic goals<br>Outside funding required<br>FEMA Benefit-Cost Analysis                  |
| <b>E</b> nvironmental  | Effect on local flora and fauna<br>Consistent with community<br>environmental goals<br>Consistent with local, state, and<br>federal laws |

Source: FEMA, *Local Multi-Hazard Mitigation Planning Guidance*, 1 July 2008.

### FEMA Requirement

44 CFR Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval for credit of the plan.

The Planning Team ranked the mitigation actions, high, medium, or low, based on the county's goals. The mitigation action matrix on the following page indicates the general order of priority. The Planning Team developed and submitted a mitigation action implementation plan for each of the actions. The mitigation action implementation plans identified the following characteristics for each action or project:

- Action Title
- Jurisdiction
- Responsible Party
- Timeline
- Cost Estimate

Table 5-3 summarizes the prioritized mitigation actions for all participating jurisdictions. Further detail is provided in the implementation action sheets included in Appendix C: Mitigation Action Evaluation.

Table 5-3: Mitigation Action Matrix

| No.                    | Mitigation Action Description                                                                                         | Hazard              | Responsible Agency                            | Goals Addressed |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------|-----------------|
| <b>Alamosa County</b>  |                                                                                                                       |                     |                                               |                 |
| 1                      | Update floodplain regulations throughout the county                                                                   | Flood               | Land Use Administrator                        | 1,2,3           |
| 2                      | Update/Adopt County DFIRMs                                                                                            | Flood/Levee Failure | Land Use Administrator                        | 1,2,3           |
| 3                      | Implement the Rio Grande Restoration Plan                                                                             | Flood               | San Luis Valley Water Conservancy District    | 2,3             |
| 4                      | Facilitate construction of power line redundancy                                                                      | All Hazards         | Land Use Administrator                        | 1,3             |
| 5                      | Increase public awareness for severe weather                                                                          | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| 6                      | Increase shelter capacity throughout the county (coordinate with the Red Cross)                                       | All Hazards         | American Red Cross                            | 1,3             |
| 7                      | Prepare a Drought Preparedness Action Guide                                                                           | Drought             | Alamosa County OEM                            | 2,3             |
| 8                      | Revise land use regulations to include earthquake and wildfire mitigation                                             | Earthquake/Wildfire | Land Use Administrator                        | 1,2,3           |
| 9                      | Develop accessibility/evacuation routes for Zapata subdivision (planning phase)                                       | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| 10                     | Continue to improve involvement in the NFIP and improve classification rating for the Community Rating System (NFIP). | Flood               | Land Use Administrator                        | 2,3             |
| 11                     | Study Base Flood Elevation (BFE) mapping opportunities                                                                | Flood               | Alamosa County OEM                            | 1,2,3           |
| 12                     | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper)                                  | All Hazards         | Alamosa County OEM                            | 1               |
| 13                     | Incorporate student population into mitigation studies, actions, and/or planning                                      | All Hazards         | Alamosa County OEM                            | 1,2,3           |
| <b>City of Alamosa</b> |                                                                                                                       |                     |                                               |                 |
| 1                      | Address issues raised in the US Army Corps of Engineers Study Continuing Eligibility Inspection (CEI) 9/15/2008       | Levee Failure       | City of Alamosa, Public Works                 | 1,2,3           |
| 2                      | Continue to improve involvement in the NFIP and improve classification rating for the Community Rating System (NFIP). | Flood               | Land Use Administrator and/or City of Alamosa | 2,3             |

| No.                                            | Mitigation Action Description                                                        | Hazard              | Responsible Agency                                                                       | Goals Addressed |
|------------------------------------------------|--------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------|-----------------|
| 3                                              | Study Base Flood Elevation (BFE) mapping opportunities                               | Flood               | Alamosa County<br>OEM and/or City of Alamosa                                             | 1,2,3           |
| 4                                              | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper) | All Hazards         | Alamosa County<br>OEM and/or City of Alamosa                                             | 1               |
| 5                                              | Incorporate student population into mitigation studies, actions, and/or planning     | All Hazards         | Alamosa County<br>OEM and/or City of Alamosa                                             | 1,2,3           |
| 6                                              | Revise land use regulations to include earthquake and wildfire mitigation            | Earthquake/Wildfire | Land Use Administrator<br>and/or City of Alamosa                                         | 1,2,3           |
| 7                                              | Facilitate construction of power line redundancy                                     | All Hazards         | Land Use Administrator<br>and/or City of Alamosa                                         | 1,3             |
| 8                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County<br>OEM and/or City of Alamosa                                             | 1,2,3           |
| <b>Town of Hooper</b>                          |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Conduct study and develop plan for shelters and vulnerable populations (esp. Hooper) | All Hazards         | Alamosa County<br>OEM and/or Town of Hooper                                              | 1               |
| 2                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County<br>OEM and/or Town of Hooper                                              | 1,2,3           |
| <b>Alamosa County Fire Protection District</b> |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Develop accessibility/evacuation routes for Zapata subdivision (planning phase)      | All Hazards         | Alamosa County<br>OEM and/or Fire Protection District                                    | 1,2,3           |
| 2                                              | Increase public awareness for severe weather                                         | All Hazards         | Alamosa County<br>OEM and/or Fire Protection District                                    | 1,2,3           |
| <b>Rio Grande Water Conservation District</b>  |                                                                                      |                     |                                                                                          |                 |
| 1                                              | Implement the Rio Grande Restoration Plan                                            | Flood               | San Luis Valley Water Conservancy District and/or Rio Grande Water Conservation District | 2,3             |
| 2                                              | Prepare a Drought Preparedness Action Guide                                          | Drought             | Alamosa County<br>OEM and/or Rio Grande Water Conservation District                      | 2,3             |

# 6. Plan Maintenance

This chapter provides a formal process to ensure that the Alamosa County Multi-Hazard Mitigation Plan will remain an active and relevant document. The Plan maintenance process includes a method and schedule for all participating jurisdictions to participate in the process of monitoring, evaluating, and updating the Plan. This chapter also discusses the incorporation of this Plan into existing planning mechanisms and continued public involvement.

## 6.1 Monitoring, Evaluating, and Updating the Plan

---

### **FEMA Requirement**

44 CFR Requirement §201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

### **Plan Monitoring and Evaluating**

The Alamosa County Hazard Mitigation Planning Team (Planning Team) discussed and approved the Plan maintenance procedures described in this chapter in March 2010. It was decided then that the Alamosa County Emergency Manager (Emergency Manager) will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and update the Plan. Each participating jurisdiction will be responsible for implementing their specific mitigation actions and reporting on the status of these actions to the Emergency Manager.

Throughout the year, the Emergency Manager will monitor the progress of mitigation efforts through site visits, phone calls and emails with the agencies responsible for mitigation actions. The Planning Team agrees to meet semi-annually to evaluate the implementation of the Multi-Hazard Mitigation Plan and discuss the ongoing monitoring of the Plan. The Emergency Manager will schedule these meetings and invite members of the Planning Team to attend.

The purpose of the meetings will be the following:

- Report on usefulness of the Plan for each jurisdiction and their progress on mitigation actions
- Report on any input received from the public
- Discuss hazard events and observations
- Report on how the Plan has been incorporated into other planning mechanisms
- Discuss mitigation issues and ideas

- Work to secure funding and identify multi-objective, cost-share, and other opportunities for partnerships
- Discuss how to keep the attention of community leaders and the public on hazard mitigation problems and opportunities
- Discuss new sources for data to improve future updates
- Make recommendations on specific updates to the Plan

The Emergency Manager will email a Mitigation Project Progress Report (included in Appendix D) to each agency responsible for actions in the Plan two weeks prior to the scheduled meetings. These progress reports serve as criteria by which the mitigation strategy may be evaluated. During the meeting, the group will review and discuss their progress and how they have utilized the Plan.

Once a year, the Emergency Manager will also email a Mitigation Plan Annual Review Questionnaire (included in Appendix D) to the Planning Team and will summarize these reports into an annual Mitigation Plan Progress Report, which will be provided to the governing bodies of each participating jurisdiction. After considering the findings of the submitted progress reports, the governing bodies and/or the Planning Team may request that the implementing department or agency meet to discuss project conditions.

### **Regional Mitigation Project Maintenance**

The identified champions for each of the regional mitigation actions make up the San Luis Valley Regional Hazard Mitigation Committee [Name not official]. This group will utilize a similar process as outlined above for reviewing progress. A committee leader (or oversight agency) has not yet been established, and will be the first order of business to attend to. The leader (or oversight agency) of this committee will email regional mitigation project progress report to the other committee members for semi-annual meetings. The leader (or oversight agency) will also produce an annual Regional Mitigation Project Progress Report, and submit this report to the Emergency Managers for the participating counties, members of the regional action teams, and other interested stakeholders.

### **Plan Update Process**

The Alamosa County Emergency Manager will initiate the five-year Plan update process at least 18 months before the Plan expires to ensure that the current Plan does not expire before the updated Plan is approved. The schedule will be sufficient to allow for the contracting for technical or professional services (if necessary); state and FEMA reviews; revisions, if necessary, based on FEMA review comments; and the adoption procedures of the participating jurisdictions. The Emergency Manager will coordinate the participation of the jurisdictions. The updated Plan will meet FEMA's requirements and do the following:

- Consider changes in vulnerability due to action implementation
- Document areas where mitigation actions were or were not effective
- Incorporate new data or studies on hazards and risks
- Incorporate new capabilities or changes in capabilities
- Incorporate growth and development-related changes to inventories
- Incorporate new action recommendations or changes in action prioritization



The Planning Team will also meet after a disaster to focus on the following items:

- Identify potential mitigation projects, particularly those eligible for mitigation grant programs if available
- Evaluate effectiveness of existing mitigation projects
- Reassess hazard profiles and vulnerability

Updating of the Plan will be by written changes and submissions incorporated by the Planning Team and as approved by the Alamosa County Board of Commissioners and the governing boards of the participating jurisdictions.

### 6.2 Incorporation into Existing Planning Mechanisms

---

#### **FEMA Requirement**

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

The Emergency Manager, with support and guidance provided by the Planning Committee, will work with the responsible agencies to incorporate this Plan into the following existing planning mechanisms:

- Alamosa County Comprehensive Plan
- Alamosa County Emergency Operations Plan
- Master plans of the other participating jurisdictions
- Zoning, subdivision, and floodplain ordinances
- Capital improvement plans and county and municipal budgets
- Other plans and policies outlined in the capability assessment

Additionally, relevant priority actions of the Alamosa County Comprehensive Plan and development review process may be incorporated into future updates of the hazard mitigation Plan, as appropriate. The process for incorporation of Plan elements into existing planning mechanisms will be according to the rules and regulations of the governing jurisdiction. Typically, the Emergency Manager will meet with and support the staff of the department responsible for drafting the Plan document or conducting the planning program to ensure the relevant elements of this Plan are taken into consideration.

### 6.3 Continued Public Involvement

---

#### **FEMA Requirement**

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The Planning Team is committed to identifying additional opportunities to raise community awareness about the Plan and mitigation efforts in Alamosa County. The Plan will be posted on the webpage of the Alamosa County website at <http://www.alamosacounty.org>. The website will contain an e-mail address and phone number to which people can direct their comments or concerns.

The Emergency Manager will present an update of the Plan's progress at a regularly scheduled meeting of the Alamosa County Board of County Commissioners on an annual basis following the Plan progress meeting of the Planning Team. This meeting will be open to the public and notice will be provided according to Alamosa County regulations. The Emergency Manager will extend invitations to governing boards of participating jurisdictions to attend this meeting two weeks prior.

The Emergency Manager and other members of the Planning Team will also identify opportunities to raise community awareness about the Plan and the hazards that affect the participating jurisdictions. This effort could include attendance and provision of materials at county, municipal, and school-sponsored events, activities of the fire protection districts, through the Red Cross, and public mailings.

Any public comments received about the Plan will be collected by the Emergency Manager and included in the Annual Plan Progress Report. During the Plan update process, the Emergency Manager will develop a schedule for the public to submit comments to be considered for incorporation into the Plan, as appropriate. All public comments will be attached as an appendix to Plans that are submitted for approval by the State and FEMA.

# 7. Regional Annex

**“Strength is derived from unity. The range of our collective vision is far greater when individual insights become one.”** — *Andrew Carnegie*

Alamosa County was one among five counties in the San Luis Valley preparing multi-hazard mitigation plans concurrently. In addition to the individual county Plans, the Emergency Managers and other stakeholders met collectively to strategize for regional mitigation efforts in the San Luis Valley. This chapter summarizes those efforts and documents the results of the regional mitigation workshop held on January 12, 2010.

The meeting was open to the public, and the list of invitees was extensive, ranging from local elected officials and state and federal departments, to non-profit groups and individual citizens. The meeting was advertised in several newspapers (online and print) throughout the valley. Materials advertising this meeting are included in Appendix B: Planning Process Documentation.

The first half of the meeting involved a brief Powerpoint® presentation providing an overview of the hazard mitigation planning process, outlining the purpose and benefits of regional mitigation planning, and defining “regional” for the purposes of regional planning in the valley.

## **Why take a Regional Approach?**

- Hazards don’t respect political boundaries
- Cooperation allows counties to stretch resources
- Communities can implement more of their actions
- Counties can tap into neighbors expertise/lessons learned

## **What is Regional?**

- Political Boundaries
- Physical Geography
- Cultural Heritage
- Demographic
- Others...?

For the San Luis Valley, “Regional” was defined as **mitigation actions/efforts involving more than one county.**

The Emergency Managers presented their list of prioritized mitigation actions to the group. All of the individual county actions were placed on boards and separated by county.



Todd Wright presented the Rio Grande County list of mitigation actions to those present at the regional workshop on January 12, 2010.

From this list, the group collectively grouped the actions that were similar or accomplished similar objectives through an interactive discussion. Those with an obvious regional advantage were given careful consideration and discussion. The actions that did not present regional collaborative opportunity were placed “below the line” on the boards, yet remain as valid actions for the respective individual county lists.



The individual actions were grouped into similar categories that had an obvious advantage for regional efforts.

As a group, these categories were further generalized as follows:

- Drought Action Plan
- Floodplain
- Wildfire Prevention
- Public Awareness/Education
- Power Redundancy
- Codes and Regulatory Measures

These categories were defined as regional breakout groups and people were urged to join a breakout group that fit their general interest, political agenda, or where they could provide specific expertise for accomplishing a regional task in that category.



The floodplain breakout group was hard at work defining regional solutions for floodplain management.

Each breakout group was charged with assigning a dedicated regional mitigation champion, assigning roles to additional team members, developing a regional mitigation action addressing the breakout topic, and outlining an implementation strategy that defines the estimated timeframe for completion, a breakdown of tasks, and estimated costs. This was accomplished by filling out regional mitigation worksheets, which are included in Appendix C. Each regional champion was given a binder that included several materials from references and resources, list of contact information, and guidance documents for developing mitigation strategies and implementing them.

### Role of the Champion

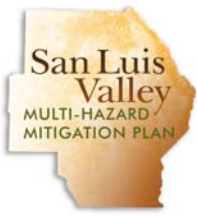
- Delegate individual tasks to other team members, where possible
- Maintain regular contact with other team members through meetings or conference call
- Ensure implementation of regional mitigation action(s) within designated timeframe
- Provide status updates to applicable agencies (Emergency Managers, BOCC, Regional Planning Commission, City Council, Regional Mitigation Oversight Committee (not yet created))
- Solicit input from professionals and citizens regarding regional mitigation effort
- Monitor and assist with implementation and updates to the Plan



### **Role of the Team Members**

- Participate in scheduled meetings or conference calls
- Report to the team champion on a regular basis (to be defined by champion)
- Provide data and information to champion as necessary
- Provide status updates to applicable agencies and departments locally
- Solicit input from professionals and citizens regarding regional mitigation effort
- Monitor and assist with implementation and updates to the Plan

Through regional collaboration, the San Luis Valley is taking advantage of shared resources, regional expertise, and preventing duplication of efforts to ensure that communities in the valley continue building resiliency to natural disasters.



[Page intentionally left blank to facilitate 2-sided printing]



# Appendix A – Plan Review Crosswalk



# Appendix B – Planning Process Documentation

## CONTENTS:

1. Project kickoff meeting agenda
2. Project kickoff meeting minutes
3. Project kickoff meeting sign-in sheet
4. Planning team meeting no. 1 minutes
5. Planning team meeting no. 1 sign-in sheet
6. Participating jurisdiction information sheet
7. Planning team meeting no. 2 agenda
8. Planning team meeting no. 2 minutes
9. Planning team meeting no. 2 sign-in sheet
10. San Luis Valley County Commissioners Association agenda (Regional Commissioners Group)
11. Alamosa County Commissioners meeting agenda
12. City of Alamosa Planning Commission agenda
13. City of Alamosa Planning Commission minutes
14. Informational update for city/county officials
15. Valley Courier notification of process and meetings
16. Valley Courier notification of Alamosa County Planning Commission meeting
17. Valley Courier notification of Alamosa City Council meeting
18. Valley Courier article/notification of process and upcoming meetings
19. Mineral County Miner online notification of regional workshop (email attachment)
20. Sample invitation letter from Alamosa EM for regional workshop
21. Email invitation sent by contractor for regional workshop
22. Regional mitigation workshop agenda
23. Regional mitigation workshop sign-in sheet
24. Public outreach informational flyer/questionnaire
25. Public outreach tri-fold brochure for distribution by county
26. Screen capture of draft risk assessments available for review online 10/1/09
27. Screen capture from informational flyer on SLV GIS/GPS site online 10/1/09
28. Screen capture of proposed mitigation actions on SLV GIS/GPS site online [approx. 11/1/09]
29. Screen capture of draft MHMPs available for online review March 2010
30. Valley Courier notification of public review period for draft plan



# Appendix C – Mitigation Action Evaluation

## CONTENTS:

1. Developing the Mitigation Strategy information sheet
2. Mitigation action prioritization worksheet
3. Alamosa County potential list of mitigation actions
4. Compiled list of potential mitigation actions for hazard mitigation plans
5. Risk Assessment problem statements
6. Alamosa County mitigation action table
7. Alamosa County mitigation actions – prioritized
8. Regional mitigation strategy worksheets



# Appendix D – Plan Maintenance Forms

## CONTENTS:

1. Mitigation action progress worksheet
2. Mitigation plan annual review questionnaire





# Appendix E - References

## CONTENTS:

1. Defined Acronyms
2. San Luis Valley key contacts list
3. Hazard mitigation web resources

# ALAMOSA CITY COUNCIL COUNCIL COMMUNICATION

---

**Subject/Title:**

Public Hearing and Second Reading, Ordinance No. 13-2016, An Ordinance Amending Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* to Allow for the Setting of the Nature and Amount of Court Costs By Resolution and Providing for Implementation of a Surcharge to be Utilized for the Operational Expense of the Police Department as Needed on Municipal Court Convictions (With the Exception of Parking Tickets and Dog Violations) Within the Jurisdiction of the City of Alamosa.

**Recommended Action:**

That Council conduct a public hearing and unless information is presented to the contrary, approve Ordinance No. 13-2016, amending Section 13-56 of the *Code of Ordinances of Alamosa, Colorado*.

**Background:**

Over time it is necessary to compare court costs and fees to other municipalities and be sure we are capturing all costs and fees. The procedure that has been desired is to adopt such fees by resolution. This ordinance will amend Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* to allow this change.

After reviewing our current costs and fees, we fall in line with most municipalities and are correctly assessing the right amount in fees. However, there are various municipalities throughout the State of Colorado that assess a surcharge that directly impacts the municipal police department. This ordinance amends Sec. 13-56 to allows costs to be assessed upon conviction of municipal offenses on every defendant who pleads guilty, nolo contendere, or who enters a plea agreement, or who after trial, is found guilty of a violation of the Code of Ordinances of Alamosa, Colorado, and includes any law enforcement surcharges.

The proposed ordinance has been discussed among the Municipal Judge, City Clerk/Court Administrator, Chief of Police, City Attorney, Finance Director, and City Manager and all are in favor of this ordinance. This concept was discussed with City Council at a Municipal Court work session on February 24, 2016.

**Issue Before the Council:**

Does Council wish to approve Ordinance No. 13-2016?

**Alternatives:**

Council may approve Ordinance No. 13-2016 on second reading with or without amendment; or not accept the ordinance with or without further guidance to staff.

**Fiscal Impact:**

The implementation of the surcharge will generate approximately \$5,000 in funds.

**Legal Opinion:**

The City Attorney will be present at the public hearing if needed.

**Conclusion:**

The proposed ordinance establishes a concise and consistent practice for staff when costs are needing amendment and the implementation of the surcharge fee will reflect an appropriate penalty to the defendant as well as help to cover the costs associated with the enforcement of the law.

**ATTACHMENTS:**

| Description             | Type      |
|-------------------------|-----------|
| ▣ Ordinance No. 13-2016 | Ordinance |

## ORDINANCE NO. 13-2016

### **AN ORDINANCE AMENDING SECTION 13-56 OF THE CODE OF ORDINANCES OF ALAMOSA, COLORADO TO ALLOW FOR THE SETTING OF THE NATURE AND AMOUNT OF COURT COSTS BY RESOLUTION AND PROVIDING FOR IMPLEMENTATION OF A SURCHARGE TO BE UTILIZED FOR THE OPERATIONAL EXPENSE OF THE POLICE DEPARTMENT AS NEEDED ON MUNICIPAL COURT CONVICTIONS (WITH THE EXCEPTION OF PARKING TICKETS AND DOG VIOLATIONS) WITHIN THE JURISDICTION OF THE CITY OF ALAMOSA.**

**WHEREAS;** Chapter 13, Article III, at Section 13-56 of the *Code of Ordinances of Alamosa, Colorado* provides for the court to assess certain costs against every defendant convicted of an offense or found to be in violation of any municipal ordinance in municipal court, and sets forth the amount or range in amount of such costs; and

**WHEREAS;** the municipal governing body is authorized by C.R.S. 13-10-113(3) to assess costs to any defendant who pleads guilty, nolo contendere, or who enters a plea agreement, or who after trial, is found guilty, and

**WHEREAS,** the costs to be assessed should apply not only to defendants convicted of an offense but also to defendants who plead guilty, nolo contendere, or who enter a plea agreement; and

**WHEREAS,** the nature of the costs to be assessed and the amount of costs to be assessed must vary from time to time in response to changing economic and other circumstances, and such change is more appropriately addressed by resolution, rather than ordinance; and

**WHEREAS,** Resolution 03, 2011 was passed on the 19<sup>th</sup> day of January 2011 which states: Municipal Court costs and fees are established from time to time, generally in conjunction with adoption of the *schedule of Fines for Violations of the Code of Ordinances of Alamosa, Colorado*; and

**WHEREAS;** Various Municipalities throughout the State of Colorado assess a surcharge for purposes related to operation of the Municipal Police Department, and

**WHEREAS,** the State of Colorado allows such surcharges pursuant to C.R.S: 24-4.2-109; and

**WHEREAS,** it is necessary and desirable to offset, in part, the increased law enforcement expenses caused by and attributable to persons who have violated the *Code of Ordinances of Alamosa* by assessing a surcharge on any defendant who pleads guilty, nolo contendere, or who enters a plea agreement, or who after trial, is found guilty of a violation of the *Code of Ordinances of Alamosa, Colorado*;

**NOW THEREFORE, BE IT HEREBY ORDAINED** by the City Council of the City of Alamosa, Colorado as follows:

Section 1. Amendment of Sec. 13-56. Section 13-56 of the Alamosa Code of Ordinances is amended to read in its entirety as follows:

**Sec. 13-56. - Costs to be assessed upon conviction of municipal offenses.**  
Every defendant who pleads guilty, nolo contendere, or who enters a plea

agreement, or who after trial, is found guilty of a violation of the Code of Ordinances of Alamosa, Colorado, shall be assessed costs, including any law enforcement surcharges, by the court, which costs may not be abated or suspended, except for a reasonable time within which to pay the same. The costs to be assessed and the amounts thereof shall be set by resolution of the City Council, and may be amended and adjusted from time to time by resolution adopted by the City Council.

Section 2. Repealer. All acts, orders, ordinances, resolutions, or portions thereof in conflict with the sections adopted in this Ordinance, are hereby repealed to the extent of such conflict.

Section 3. Recording and Authentication. This ordinance, immediately upon its passage, shall be authenticated by the signatures of the Mayor and City Clerk, recorded in the City book of Ordinances kept for that purpose, and published according to law. This ordinance is not intended to be codified into the Code of Ordinances of the City of Alamosa.

Section 4. Publication and Effective Date. This ordinance shall take effect ten (10) days after publication following final passage. Publication both before and after final passage shall be by the title of this ordinance, which Council determines constitutes a sufficient summary of the ordinance, together with the statement that the full text of the ordinance is available for public inspection and acquisition on the City's website and in the office of the City Clerk.

Section 5. Declaration of Public Interest. This ordinance is necessary to preserve the peace, health, safety, welfare, and to serve the best interest of the citizens of the City of Alamosa, Colorado.

INTRODUCED, READ AND APPROVED on first reading the 15<sup>th</sup> day of June, 2016, and published as provided by law with notice of a public hearing to be held for consideration of the adoption of said ordinance on the 6<sup>th</sup> day of July, 2016, at 7:00 p.m., or as soon thereafter as the matter may be heard, or on such subsequent date to which the public hearing or Council consideration may be continued.

APPROVED, AND ADOPTED after public hearing the 6<sup>th</sup> day of July, 2016.

CITY OF ALAMOSA

By \_\_\_\_\_  
Josef P. Lucero, Mayor

ATTEST:

\_\_\_\_\_  
Holly Martinez, City Clerk