ANNEX A
CITY OF ARVADA ANNEX

1.1 Community Profile

1.1.1 History

The City of Arvada is a Home Rule Municipality located in Jefferson and Adams counties in the Denver Metropolitan Area of the U.S. State of Colorado.

The first documented discovery of gold in the Rocky Mountain region occurred on June 22, 1850, when Lewis Ralston, a Georgia prospector headed for the California gold fields, dipped his sluice pan into a small stream near its mouth at Clear Creek. Ralston found about 1/4 ounce (6 g) of gold, then worth about five dollars. Ralston's companions named the stream Ralston's Creek in his honor, but they all left the next morning, drawn by the lure of the California gold fields.

During the Pike's Peak Gold Rush in 1858, Ralston brought another group of prospectors back to the site of his first discovery. The placer gold in the area soon played out, but hard rock deposits of gold were found in the mountains to the west. Some of the miners abandoned their search for gold and returned to farm the rich bottom land along Ralston Creek and Clear Creek. They found an eager market for their crops among other gold seekers. The Territory of Colorado was formed on February 28, 1861, and the farms in the valley expanded to feed the growing population of the region.

In 1870, the Colorado Central Railroad laid tracks through the area on its route from Golden to link up with the Kansas Pacific Railroad and the Denver Pacific Railroad at Jersey Junction, 3 miles north of Denver. On December 1, 1870, Benjamin F. Wadsworth and Louis A. Reno platted the Ralston Point townsite along the railroad. To avoid confusion with other communities along Ralston Creek, Ralston Point was soon renamed Arvada in honor of Hiram Arvada Haskin. Benjamin Wadsworth became the first postmaster of Arvada. Colorado was granted statehood on August 1, 1876, and the Town of Arvada was formally incorporated on August 14, 1904. A vibrant agricultural community, Arvada claimed the title "Celery Capital of the World."

Arvada grew rapidly during the latter half of the 20th century as a suburb of nearby Denver, the state capital. Arvada became a Statutory City on October 31, 1951, and a Home Rule Municipality on July 23, 1963. By the end of the millennium, the population of Arvada exceeded 100,000.

1.1.2 Population

The U. S Census Bureau's estimated 2007 population of Arvada was 103,459. Select Census 2000 demographic and social characteristics for Arvada are shown in Table 1.

Table 1. Arvada's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	49.0
Female (%)	51.0
Under 5 Years (%)	6.4
65 Years and Over (%)	10.7
Race/Ethnicity (one race)	
White (%)	91.0
Hispanic or Latino (Of Any Race) (%)	9.8
Other	
Average Household Size	2.60
High School Graduate or Higher (%)	90.9

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Arvada's labor force was educational, health, and social services (15.2%); professional, scientific, management, administrative and waste management services (11.9%); and retail trade (11.9%). Select economic characteristics for Arvada from the 2000 Census are shown in Table 2.

Table 2. Arvada's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	3.5%
Individuals below Poverty Level, 1999	5.2%
Median Home Value	$174,800
Median Household Income, 1999	$55,541
Per Capita Income, 1999	$24,679
Population in Labor Force	56,727
Unemployment (%)*	2.6%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Arvada using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete. Each participating jurisdiction was in support of the main hazard summary identified in the base plan; however the hazard summary for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. This helps to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County. Table 3 summarizes the City of Arvada's hazards based on input provided in the Data Collection Guide issued in 2009.

The Data Collection Guide provides a table similar to Table 3 with all the hazards listed that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities unique to the jurisdiction. The City of Arvada's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member relative to the City of Arvada.

Once completed, the data was input into Table 3 to reflect the most significant hazards for the City of Arvada. They are drought, extreme temperatures, flood, hailstorm, tornado, wildfire, and windstorm. The hazard significance listed is based on City of Arvada HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (refer to Chapter 4 of the base plan). The risk assessment was a more detailed qualitative analysis with better available data that varied According to the vulnerability assessment in Chapter 4, Arvada has a higher vulnerability factor to dam failure than any other community in Jefferson County, primarily due to the population numbers downstream of high and significant hazard dams.

Table 3. City of Arvada – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Avalanche	Unlikely	Limited	Negligible	Low	
Dam Failure	Occasional	Significant	Limited	Low	EOP
Drought	Occasional	Significant	Limited	Medium	
Earthquake	Unlikely	Extensive	Negligible	Low	EOP
Erosion and Deposition	Unlikely	Significant	Negligible	Low	
Expansive Soils	Unlikely	Limited	Negligible	Low	
Extreme Temperatures	Occasional	Extensive	Limited	Medium	
Flood	Unlikely	Limited	Limited	Medium	EOP
Hailstorm	Unlikely	Extensive	Negligible	Medium	EOP

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Landslide, Debris flow, Rockfall	Unlikely	Limited	Negligible	Low	
Lightning	Highly	Extensive	Negligible	Low	EOP
Severe Winter Storms	Occasional	Significant	Negligible	Low	
Subsidence	Unlikely	Limited	Negligible	Low	
Tornado	Unlikely	Extensive	Limited	Medium	EOP
Wildfire	Likely	Significant	Negligible	Medium	EOP
Windstorm	Likely	Extensive	Negligible	Medium	EOP

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the City of Arvada noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

March 2003 Blizzard

A very moist, intense and slow moving Pacific storm system made its way across the four corners area and into southeastern Colorado from March 17th to the 19th, allowing for a deep easterly upslope flow to form along the Front Range. Up to three feet of wet snow accumulated Arvada. The heavy wet snow caused roofs of homes and businesses to collapse across the Urban Corridor. The snow also downed trees, branches and power lines. Power outages struck homeowners for approximately 24-hours in some parts of the city. Some roads were impassable for up to 48-hours. The City of Arvada was given FEMA reimbursement for snow removal operations in the amount of $81,022.48.

December 2006 Blizzards

Back to back blizzards struck the city a week apart in late December of 2006. The first blizzard, on December 20, struck as a result of a slow moving low pressure system that moved from the Desert Southwest into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. One to two feet of snow were recorded. On December 28, another slow moving storm system moved from the Desert Southwest and into the Texas Panhandle. As it did, a deep easterly upslope flow occurred along the Front Range, with blizzard conditions developing over portions of the Northeast Plains of Colorado, mainly south of Interstate 76. The heaviest snow fell along east facing slopes of the Front Range with storm totals up to 2 1/2 feet in the North Central Mountains and Front Range Foothills. Some roads in Arvada were impassable for up to 48 hours. The City of Arvada was given FEMA reimbursement for snow removal operations in the amount of $135,759.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas. For a discussion of the methodology used to develop the loss estimates refer to Section 4.3 of the Base Plan.

Flood

According to the vulnerability assessment conducted using HAZUS-MH, Arvada has one of the higher potentials for economic loss and displaced populations (5,016) and at-risk buildings (438) from flooding in the County. Note that this is based on computer modeling that may not reflect specific mitigation activities. The extent of flooding in Arvada is represented in Figure 1. Details on the types of structures are provided in Table 5, showing the numbers of residential and commercial buildings impacted by flooding, and the anticipated percent of damage. According to the analysis the most at risk structures are primarily residential. According to City of Arvada some of these at-risk structures are mobile home parks.

According to the analysis of critical facilities Arvada has one school in the 100 year floodplain. There is another school in the 500 year floodplain, and one hazardous materials facility. See Section 4.3 for more details.

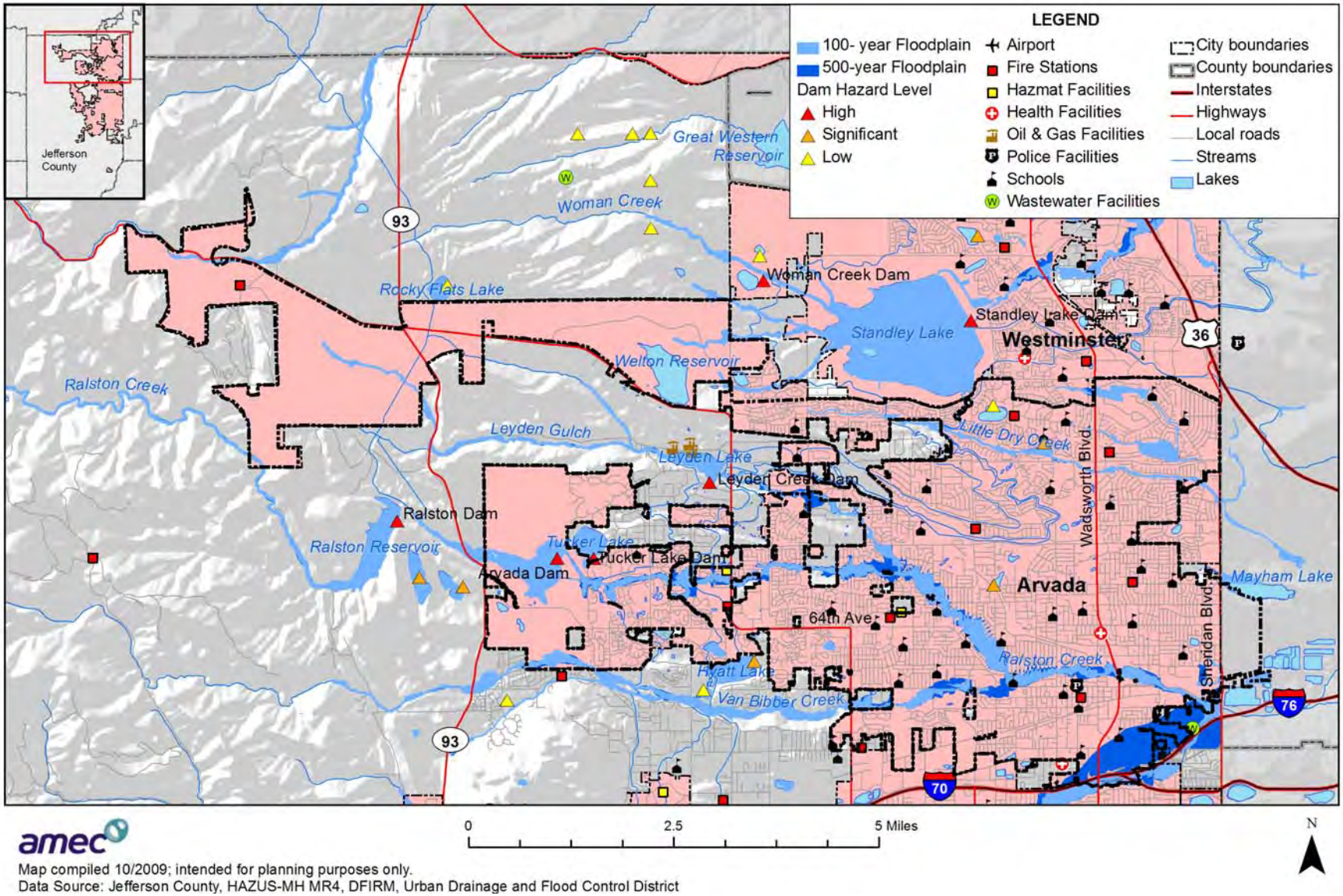
Table 4. City of Arvada 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Arvada	46,001,000	49,344,000	1,338,000	137,000	12,000	559,000	32,000	97,423,000

Table 5. City of Arvada Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**TOTAL**
Arvada	0	14	55	0	292	0	17	0	55	0	5	0	**438**

Figure 1. City of Arvada Flood Hazard Map



amec

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County, HAZUS-MH MR4, DFIRM, Urban Drainage and Flood Control District

Dam Failure

According to the vulnerability assessment in Chapter 4 Arvada has more risk to dam failure than any other community in Jefferson County. See discussion the in Section 4.3 in the Base Plan.

Geologic Hazards

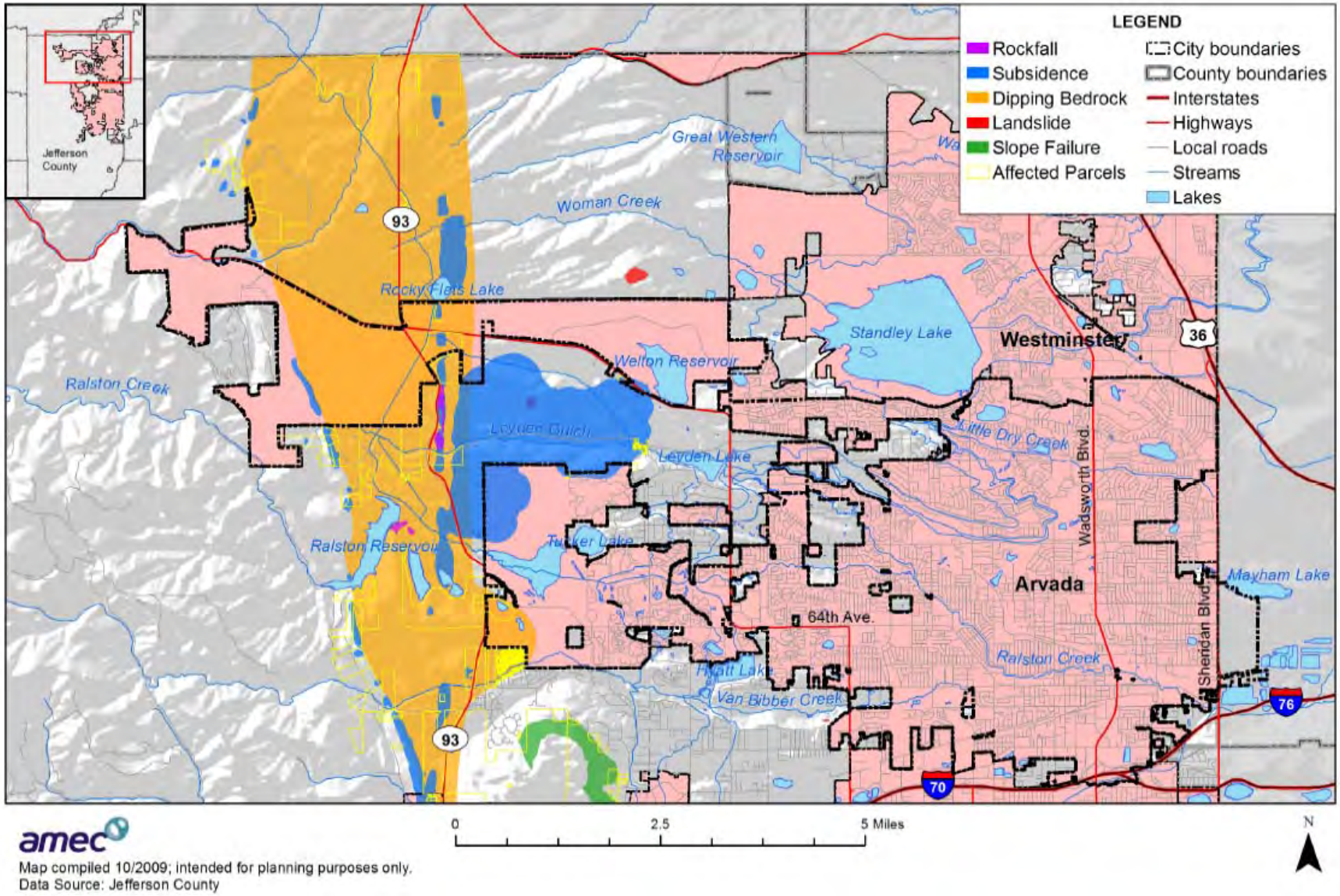
Arvada has limited exposure to geologic hazards including subsidence, swelling soils, and dipping bedrock. Most of these areas are presently undeveloped and on the western limits of the City. See the map in Figure 1. Specific structures at risk from specific geologic hazards are detailed in Table 6. Methodology for this table can be found in Section 4.3.4 Estimating Potential Losses.

Table 6. City of Arvada Geologic Hazards Risk

Geologic Hazard	Occupancy Type	Count of Improved Parcels	Improvement Value	Contents Value
Subsidence	Commercial	1	$1,373,000	$1,373,000
Subsidence	Residential	3	$994,800	$497,400
Total		**4**	**$2,367,800**	**$1,870,400**

Source: Jefferson County

Figure 2. City of Arvada Geologic Hazards Map



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Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County

Wildfire

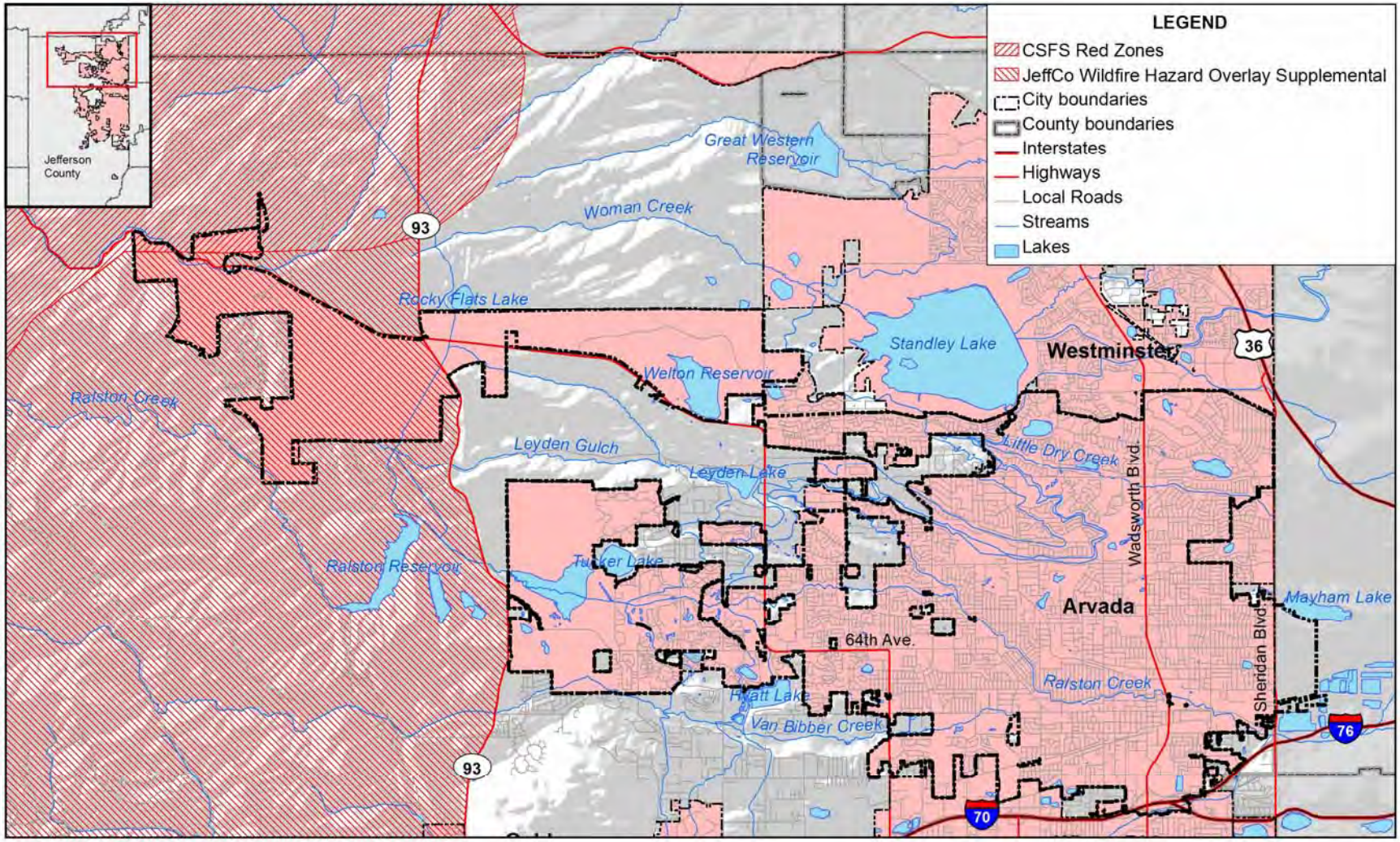
While not a foothills community, Arvada does have risk to wildfires, particularly grass fires on the western edge of the City. One home was burned by a grassfire in northwest Arvada in 2009, sparked by a train on the Union Pacific railroad.

According to the GIS based analysis of wildfire in Section 4.3 the City has 9 structures in Red Zones and Jefferson County Wildfire Hazard Overlay Zone with a total value of $2.2 million, and an estimated population of 19 in that zone. The structure counts and values by structure type are provided in the following table. Additionally, the analysis indicates that a fire station is located in this zone: Coal Creek Canyon Station 3.

Table 7. City of Arvada Wildfire Risk by Structure Type

City	Occupancy	Structure Count	Structure Value	Contents Value
Arvada	commercial	1	$ 56,800	$56,800
	residential	8	$4,309,256	$2,154,628
Total		**9**	**$4,366,056**	**$2,211,428**

Figure 3. City of Arvada Wildfire Hazard Map



amec

Map compiled 2/2010; intended for planning purposes only.
Data Source: Jefferson County, CO State Forest Service

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, earthquake, lightning, tornado and windstorm the entire building inventory and population in the City is potentially exposed. That is the reason for the asset inventory provided in section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 8 represents an inventory of property in Arvada based on the Jefferson County Assessor's data as of June 2009.

Table 8. City of Arvada's Property Inventory

Property Type	Structure Count	Building Values ($)*	Contents Values ($)**	Total Values ($)
Residential	33,342	$5,567,075,252	$2,783,537,626	$8,350,612,878
Commercial	1,207	$1,526,517,849	$1,526,517,849	$3,053,035,698
Government	8	$1,327,357	$1,327,357	$2,654,714
Total	**34,557**	**$7,094,920,458**	**$4,311,382,832**	**$11,406,303,290**

Source: Jefferson County Assessors Office
*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.
**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 9 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 9. Summary of Arvada's Critical Facilities in GIS

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Arvada City Hall 8101 Ralston Rd, Arvada, CO 80002	VF		Approx 400	City, PW, and Police administration; EOC
Arvada Center for Performing Arts 6901 Wadsworth Blvd, Arvada, CO 80003	VF		Up to 5000	Mass Casualty

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Arvada Fleet Maint. 6701 Indiana St., Arvada, CO 80007	VF		Approx 100	Arvada fleet facilities,; alternate EOC
Ralston WTP, 18975 W. 66th Ave., Arvada, CO 80007	EI		Approx 4	Water treatment plant
Hill Petroleum, 6291 Ralston Rd, Arvada, CO 80002	HM		Unknown	Hazardous materials
Industrial Chemical Corp., 4631 W, 58th Ave., Arvada, CO 80002	HM		Unknown	Hazardous materials
Railroad Bridge, 56th & Wadsworth, Arvada, CO 80002	EI			Railroad bridge
Railroad Lines, Arvada, CO	EI			Railroad lines
Olde Town Arvada, Arvada, CO 80002	VF		Up to 2500	City business center
Schools – see Jefferson County Schools submittal				
Fire Protection District Headquarters	EI	$3.2 million		
Fire Station 1	EI	$2 million		
Fire Station 2	EI	$2 million		
Fire Station 3	EI	$2 million		
Fire Station 4	EI	$2 million		
Fire Station 5	EI	$2 million		
Fire Station 6	EI	$4 million		
Fire Station 7	EI	$2 million		
Fire Station 8	EI	$2 million		
Training/Maintenance	EI	$9 million		
Special Needs Facilities – refer to Jefferson County				

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Many of the facilities listed above are also in GIS databases provided by the City of Arvada and Jefferson County. Critical facility counts and types are shown in Table 10 and on the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 10. Summary of Arvada's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	59
Dams	4
Fire Stations	8
Hazmat Facilities	1

Critical Facility Type	Facility Count
Health Facilities	1
Police Facilities	1
Schools	34
Total	**108**

Source: City of Arvada, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Arvada to disaster also involves an inventory of the natural, historical, 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 so 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

The City of Arvada has an outstanding parks and recreation system, and over 2,175 acres of open space within the Planning Area boundaries, over 70 neighborhood parks, nine regional parks and open space areas, and vast protected areas of open space owned by Jefferson County, and cities of Boulder, Denver, and Westminster adjacent to the Planning Area boundaries. For information about natural resources in Jefferson County, which includes Arvada, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

Table 11 lists the properties in Arvada that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

Table 11. City of Arvada's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Arvada Downtown	5580-5773 Wadsworth Blvd., 7207-7612 Grandview Ave., 755 Grant Pl., 5690 Yukon St., and 7314-7510 W. 57th Ave.	7/15/1998
Arvada Flour Mill	5580 Wadsworth Blvd.	4/24/1975
Churches Ranch	17999 W. 60th Ave	7/23/1998
Reno Park Addition Historic District	7799-7899 W. 57th Ave., 7801-7906 Grandview Ave., 7800 & 7884 Ralston Rd., 5603-5720 Yarrow St., 5701-5723 Yukon St., & 5604-5723 Zephyr St.	9/29/1999
Russell-Graves House	5605 Yukon St.	5/9/1983
Stocke, Walter Addition Historic District	6701-7014 Grandview Ave., 5708-7006 Ralston Rd., 5712-5724 Reed St. & 5705-5726 Saulsbury St.	9/24/1999
Enterprise Grange No. 15	7203 Simms St.	State Register 8/11/1999
Ralston Gold Discovery Site (Gold Strike Park)	56th Ave. & Fenton St.	State Register 12/13/1995

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There is currently 1 Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the City of Arvada.

Table 12. Architecturally Significant Buildings in Arvada

Property	Address
William Graves House	5250 Marshall St, Arvada Co

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.

1.4 Growth and Development Trends

Table 13 illustrates how Arvada has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Arvada is undergoing steady growth. Table 14 shows Arvada's estimated population changes through 2020.

Table 13. City of Arvada's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
102,153	106,327	4.1%	39,733	43,891	10.5%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

Table 14. City of Arvada's Population Projections Through 2030

2000 Population	2010 Population	% change 2000-2010	2020 Population	% change 2010-2020	2030 Population	% change 2020-2030
102,153	112,575	10.2%	125,050	10.2%	136,400	10.2%

Source: City of Arvada Comprehensive Plan

The City is undergoing residential and commercial development in western and northwestern Arvada. Some of this development may be near or within dam failure inundation zones. Also the proposed growth in the Candelas development near highways 93 and 72 is an area subject to high winds and brush fires and has mapped areas of subsidence and dipping bedrock.

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Arvada's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 15 lists planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Arvada.

Table 15. City of Arvada's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	Yes	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Growth management ordinance	Yes	Limited Building Permits
Floodplain ordinance	Yes	
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Storm Water, EOP
Building code	Yes	
Fire department ISO rating		
Erosion or sediment control program	Yes	
Stormwater management program	Yes	
Site plan review requirements	Yes	
Capital improvements plan	Yes	
Economic development plan	Yes	
Local emergency operations plan	Yes	
Other special plans	No	
Flood insurance study or other engineering study for streams	Yes	
Elevation certificates (for floodplain development)	Yes	

Table 16 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Arvada.

Table 16. City of Arvada's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Public Works	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works	
Personnel skilled in GIS	Yes	Public Works	
Full time building official	Yes	Community Development	
Floodplain manager	Yes	Public Works	
Emergency manager	Yes	Police Dept	
Grant writer	Yes	Finance Dept	
Other personnel	Yes	Whole City Full	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Public Works	

Personnel Resources	Yes/No	Department/Position	Comments
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Police Communication Center	R 911 and cable override

Table 17 identifies financial tools or resources that Arvada could potentially use to help fund mitigation activities.

Table 17. City of Arvada's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	N	
Incur debt through private activities	N	
Withhold spending in hazard-prone areas		

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The City of Arvada joined the National Flood Insurance Program (NFIP) on December 31, 1974 and the Community Rating System (CRS) on October 1, 1991. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of October 2009, Arvada had a CRS class rating of 6 (one a scale of 1-10, 1 being the best). This rating provides a 20 percent discount for policyholders within a special flood hazard area (SFHA) and a 10 percent discount for those outside of an SFHA.

NFIP insurance data indicates that as of November 30, 2009, there were 521 policies in force in Arvada, resulting in $106,760,600 of insurance in force. In Arvada, there have been 50 historical claims for flood losses totaling $38,289.33. There were no repetitive or severe repetitive loss structures.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Arvada activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

City of Arvada Comprehensive Plan

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subjects matter related to services, issues, and geographic areas within Arvada. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

The following excerpts are goals and related polices that are relevant to this hazard mitigation plan.

Community Design

- Goal D-2 Identify places and community assets that are unique and important to the community and work to preserve them.
  - D-2.1 Historic Resources Preservation Arvada will preserve its designated historic districts and resources.

Parks, Recreation, Trails, and Open Space

- Goal P-1 Provide strategically placed parks, recreation centers, a well-connected trail system, and preserved open space to serve Arvada residents and visitors.
  - P-1.1 Parks and Open Space Master Plan: The Parks and Open Space Master Plan is part of the Comprehensive Plan. The City will continue to implement the Parks and Open Space Master Plan, as updated periodically.
  - P-1.2 Distributed Parks and Facilities: The City will equitably distribute and provide convenient access to parks, outdoor recreational facilities, and trails throughout the City. In addition, the City will address enhancing the provision of parks and open space to underserved areas of the City.

- P-1.3 Well-Maintained System of Parks and Open Space: The City will maintain parks, trails, and open space areas at a high level of quality that is appropriate for the type of use and nature of the facility.
- P-1.4 Adequate Funding: The City will work to develop an adequate level of funding for planning, acquiring, developing, enhancing, and maintaining parks, trails, and open space.

- Goal P-3 Conserve and maintain important open space lands in and around Arvada to help define the character of the community.
  - P-3.1 Expanded and Maintained Open Space: The City will continue to expand and maintain the open space system. Open space will consist of park preserves, natural areas, and special resource areas as defined in the Parks, Trails and Open Space Master Plan.

- Goal P-4 Develop parks, trails, and outdoor recreational facilities in an environmentally sensitive manner to help protect and enhance the natural environment.
  - P-4.1 Include Natural Features in Parks: The City will develop new and existing parks and open space lands that include a wide range of natural features.
  - P-4.2 Natural and **Drought-Tolerant** Landscape: The City will promote and educate the public about the use of xeriscape and "natural" landscaping for new parks. The City will also use drought-tolerant landscape materials and convert non-drought tolerant landscape turf wherever possible.

- Goal P-5 Develop a safe and comprehensive multi-purpose trail system.
  - P-5.1 Connecting Trails: Arvada will have a network of trails connecting residential areas. New developments will provide a connecting trail system that creates easy accessibility to schools, parks, shopping areas, and employment centers in all directions, as defined in the Master Plan and as depicted on the Major Bicycle and Trails Corridor map.
  - P-5.2 Safe Bicycle Paths: Arvada will improve the safety and connectedness of its bicycle paths.
  - P-5.3 Preserve Access to Water Bodies: The City will encourage new developments to preserve public access to major water bodies.
  - P-5.4 Provide Equestrian Trails: Trails will include equestrian opportunities where appropriate.

City Services and Facilities

- Goal S-4 Ensure an adequate water supply and superior water quality to meet the needs of current and future residents and businesses.
  - S-4.1 Water Storage: The City will continue to explore opportunities to expand water storage.
  - S-4.2 City Water Conservation: The City will continue to promote water conservation.

- S-4.3 Water Conservation in New Developments: The City will encourage and require, where appropriate, new developments to incorporate water saving measures, such as using xeriscape (drought-tolerant) landscape.
- S-4.4 High Water Quality: The City will continue to monitor water quality levels and ensure high water quality.

Resource Conservation and Environment

- Goal R-1 Conserve natural resources.
  - R-1.1 Conservation Education: The City will educate the public about energy and water conservation.
  - R-1.2 Demonstration Projects: The City will use demonstration projects to encourage energy and water conservation and will incorporate energy and watersaving methods in public projects.
  - R.1.3 Sustainable Building Design: The City will encourage the development of buildings utilizing materials and design that reduces energy and resource consumption and impacts on the environment.

- Goal R-2 Strive to minimize the impact of new development on natural areas to allow continued co-habitation of people and wildlife.
  - R-2.1 Buffers and Setbacks: The City will require new developments to provide buffers for creeks, waterbodies, existing wetlands, riparian areas, and wildlife corridors to retain water quality and environmental integrity.
  - R-2.2 Energy and Water-Saving Measures: The City will encourage new developments to incorporate energy-efficient materials and design and water-saving measures.

- Goal R-3 Promote improved water quality in stream corridors.
  - R-3.1 Water Quality Features: The City will require water quality features in new developments to minimize degradation of stream water quality.
  - R-3.2 Water Quality Education: The City will educate the public about how they can assist water quality efforts.
  - R-3.3 Best Management Practices for **Stormwater** Conveyance: The city will protect water quality through implementation of Best Management Practices in the design of stormwater conveyance and detention facilities.

- Goal R-4 Improve flood control.
  - R-4.1 **Flood** Control Program: The City will continue to improve flood control and drainage program to remove properties from the 100-year floodplain.

Municipal Code

Article 6.13: Floodplain Management

This Section 6.13 is intended to provide the means and the guidelines to promote the public health, safety, and general welfare, to minimize public and private losses in areas subject to flood hazards, and to promote wise use of the Floodplain. This Section has been established with the following purposes intended:

- To reduce the hazards of flood to human life, health and property;
- To protect floodplain occupants from a flood which is or may be caused by their own, or other land use;
- To protect the public from the burden of avoidable financial expenditures for flood control and relief;
- To protect the storage capacity of floodplains and to assure retention of sufficient floodway areas;
- To protect the hydraulic characteristics of the small watercourses, including gulches, sloughs and artificial water channels used for conveying flood waters; and
- To protect individuals from purchasing floodplain lands for purposes which are not, in fact, suitable.

In order to accomplish its purposes, this Section includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to public life, health or property due to flood waters or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
- Restricting uses which are particularly susceptible to flood damage;
- Requiring permitted floodplain uses, including public facilities which serve such uses, to be protected against floods by flood-proofing and providing general flood protection at the time of initial construction or reconstruction;
- Regulating the manner in which a structure, may be constructed in floodplain areas;
- Regulating the method of construction of water supply and sanitation systems so as to prevent disease, contamination and unsanitary conditions;
- Delineating and describing areas that could be inundated by floods;
- Regulating the method of construction and pattern of development within all uses in the floodplain;
- Regulating the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel flood waters;
- Regulating or prohibiting filling, grading, development, dredging and unnecessary encroachments which may increase flood damage or prevent water carrying capacity;
- Encouraging uses such as greenbelt, open space, agricultural, recreation facilities and riding trails in floodplain areas.

6.13.6. Flood zone district regulations.

The Flood Zone District represents the area that is inundated in the 100-year flood that may serve as a temporary storage area for the flood waters and that lies landward of the floodway.

- *Special Provisions*.
  - No fill, structure, deposit or other floodplain uses shall be permitted that adversely affects the efficiency of any channels or floodways of any tributaries to the main stream or river; drainage ditches; or any other drainage facilities or systems.
  - Residential Construction.
    - New construction and substantial improvement of any residential structure within or moved into the Flood Zone District, shall have the lowest floor (including basement), constructed at or above a point two (2) feet above the base flood elevation, or, if within Flood Zone AO, at or above a point two (2) feet above the depth number specified in feet on the Official Floodplain Maps (the depth number shall be at least two (2) feet if it is not specified on the maps). A residential structure shall be any structure which is designed for human habitation.
    - Within Zones AH and AO in the Flood Zone District, adequate drainage paths shall be constructed around structures on slopes to guide flood waters around and away from proposed structures.
  - Nonresidential Construction. New construction and substantial improvements of any commercial, industrial, or other nonresidential structure within or moved into the Flood Zone District shall either:
    - Have the lowest floor (including basement) constructed at or above the Flood Protection Elevation, or if within Flood Zone AO, at or above the depth number specified in feet on the Official Floodplain Maps (at least two feet if no depth number is specified); or
    - Together with attendant utility and sanitary facilities shall:
      - Be flood-proofed to or above the Flood Protection Elevation;
      - Be flood-proofed below the base flood elevation such that the structure is watertight with walls substantially impermeable to the passage of water;
      - Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
      - Be certified by a Colorado registered professional engineer that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this paragraph. Such certifications shall be provided to the Floodplain Administrator as set forth in § 2.5.2.D.1 (Obtain and Maintain Floodplain Information).
  - Manufactured Homes.
    - Manufactured homes shall be anchored in accordance with § 6.13.4.A (Anchoring).
    - All manufactured homes that are placed or substantially improved on a site:
      - Outside of a manufactured home park or subdivision;
      - In a new manufactured home park or subdivision;

        - In an expansion to an existing manufactured home park or subdivision; or
        - In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood; shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is constructed at or above a point two (2) feet above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.
    - All manufactured homes that are placed or substantially improved on sites in existing manufactured home parks or subdivisions that are not subject to the provisions in subsection b. above, shall be elevated so that either:
        - The lowest floor of the manufactured home is constructed at or above a point two (2) feet above the base flood elevation; or
        - The manufactured home chassis is supported by reinforced piers or other foundation elements that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.
    - Any manufactured home park or manufactured home subdivision within the limits of the Flood Regulatory District shall file an evacuation plan with the appropriate Disaster Preparedness Authority indicating alternate vehicular access and escape routes.
  - All recreational vehicles shall either:
    - Be on the site for fewer than 180 consecutive days;
    - Be fully licensed and ready for highway use; or
    - Meet the permit requirements and elevation and anchoring requirements for resisting hydrostatic forces.
  - The storage or processing of materials that are buoyant, flammable, explosive, or in times of flooding, could be injurious to human, animal or plant life, shall be at or above a point two (2) feet above the base flood elevation for a particular area, or adequately flood-proofed in accordance with provisions in this Section.
  - Building plans for any project or construction within the Flood Zone District must be submitted to the Floodplain Administrator, for approval, in accordance with § 3.16 (Floodplain Development Permit), to insure that said project or construction will not adversely affect the Flood Regulatory District.
  - Any structure permitted in the Flood Zone District pursuant to this Section shall be firmly anchored to prevent the structure or building from floating away thus threatening to further restrict bridge openings and other restricted sections of the stream or river.
- *Permitted Uses*. Any uses permitted by the underlying Zoning District, in conformance with the preceding Special Provisions, may be permitted by the Floodplain Administrator, subject to the following conditions:

- If the Floodplain Administrator disallows a requested use through a Floodplain Development Permit, that is permitted in the underlying Zoning district, the applicant may follow the procedures outlined in §3.21 (Floodplain Variance) or §3.2.3 (Appeals).
- The Floodplain Administrator may also require the applicant to follow procedure outlined in §3.16 (Floodplain Development Permit) for certain uses in the Flood Zone District when said action appears to be in the public interest, and where the health, safety, and welfare of the public may be in question.

Other Regulations

- **Article 6.4 Open Space** – This section of the municipal code addresses the character and design of those portions of the Standard Zoning Districts, PUD Zoning Districts, the CC Subdistricts, and the NC Subdistricts that are not occupied by platted lots or streets and that are reserved for parks, trails, landscaping, and open space uses. This section spells out how future development shall be organized to include, protect, or enhance open space to the greatest possible extent.
- **Article 6.12 Stormwater Drainage and Erosion Control** – This section of municipal code spells out the design criteria for mitigating soil erosion and storm drainage facilities.
- **Article 6.18 Construction Mitigation Standards** – This section of municipal code details the steps required to mitigate erosion, siltation, and dust during periods of construction. It also details how and what construction materials must be recycled.
- **Article 7 Subdivision Regulations and Improvements** - These regulations are enacted for the purposes of promoting the health, safety, convenience, order, prosperity, and welfare of the present and future inhabitants of the City of Arvada; for adequate and convenient open spaces for traffic, utilities, access of fire fighting apparatus, recreation, light, air, and solar access; and for the avoidance of congestion of population, and other public requirements. This section also includes criteria for expansion or inclusion of public parks and trails for new or expanded development.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

***2001 Parks, Trails, and Open Space Master Plan* (Master Plan)** - The Master Plan is intended to guide development of the parks, trails, and the open space system through the next decade. The mission is to "provide a high quality parks, trails, and open space system for citizens of the Arvada area." The Master Plan defines policies and projects for the next ten years. The Parks, Trails, and Open Space Master Plan is a functional plan that covers the entire City. Arvada has many trail systems and parks in flood hazard areas, which is an appropriate and wise use of floodplain land. Examples of this are the Ralston Creek and Van Bibber Creek bike trails and neighborhood parks located along these drainages.

The City never had a formal open space plan before the 2001 Master Plan. This Master Plan identifies key areas to preserve as open space and establishes a classification system that can be used to designate parcels according to their preservation method, environmental sensitivity, and level of facility development for public use. It shows 3,800 acres of conceptual future open space for Arvada that is focused around drainage ways, water bodies, prominent ridges, expansions to existing open spaces, and wildlife habitat areas.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Arvada Police Department Strategic Plan (Strategic Plan) (2003-2007) - The Arvada Police Department Strategic Plan assists the Police Department with accomplishing its mission, which is: "to provide high quality police service in an objective and professional manner." The Strategic Plan is for police service for the entire Arvada community. It includes a vision statement and a series of goals and targets.

Arvada Fire Protection District Strategic Plan - The Arvada Fire Protection District Strategic Plan is developed to provide the guidance and vision for the current and future delivery of essential emergency services to the Fire District's coverage area. This responsibility is accomplished through an aggressive program of diverse training and a continual commitment to customer care.

- Post-Flood Recovery Assistance Plan - City of Arvada, Colorado
- Ice and Snow Removal Plan
- Ralston Reservoir and Upper and Lower Long Lake Dams Emergency Preparedness Plan (Denver Water Department)
- Emergency Operations Plan: Utilities Department, Water Supply Annex

The Fire Protection District is in process of developing a CERT program

Post-Flood Recovery Assistance Plan – The City is in the process of updating this plan, which outlines short and long-term recovery roles and responsibilities in the event of a flood. The opportunities for pre and post-flood mitigation are also discussed.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

- Van Bibber Flood Control Project

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

The City of Arvada's public information is provided by the Assistant to the City Manager for Public Information (City PIO). This position is the interface between the city and all media sources as well as being the director of Arvada's public television network, KATV Arvada (Channel 8). The City PIO also maintains public information on the city's web site, www.arvada.org. Postings at this site can also be sent as tweets on Twitter and postings on Face Book. The City PIO is also a member of the Emergency Service Public Information Officers Colorado (ESPIOC).

Hazard awareness information is provided in the monthly Arvada Report that is distributed to every mailing address in Arvada. Also, the city's Emergency Management Coordinator (EMC) provides public outreach to citizens with hazard awareness and preparedness information and presentations. Hazard awareness information is also posted on the city web site.

Ongoing public outreach through:

- water bill flyers;
- city web site (Arvada.org);
- public education outreach on emergency planning, hazard awareness, and preparedness;
- Flood Protection Handbook for citizens
- Notices sent each year by UDFCD to properties in the 100-yr flood plain. Article each year appears in the Arvada Report.
- employee safety training through Risk Management

1.6 Mitigation Actions

This section outlines the mitigation action plan. The action plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects

will be tracked as a measure of demonstrated progress on meeting the plan's goals. Arvada had the choice to continue to be a participant in the update of the Denver Regional Council of Governments (DRCOG) Natural Hazard Mitigation Plan or develop a separate more detailed Jefferson County specific multi-jurisdictional mitigation plan. Arvada chose to separate out from the DRCOG Regional Plan and utilize the planning opportunity with the intent of developing this more robust and specific plan.

Existing and planned mitigation actions from the 2003 DRCOG Regional Mitigation Plan were reviewed for Arvada, and are contained in Table 18. The actions were very general categories of mitigation actions rather than specific actions. The DRCOG plan grouped the categories by the same list used by the NFIP Community Rating System noted in Section 5.2 of the main plan. The majority of the action items identified for Arvada were the continuation of ongoing capabilities, such as maintaining and updating building codes, floodplain regulations, stormwater management, erosion and sediment control, best management practices, etc. During the 2009-2010 development of this plan several of the existing actions related to ongoing capabilities for Arvada were deleted from the mitigation action plan and captured in each Section 1.5 of this Annex, which is also organized by CRS mitigation category. Thus the actions identified in Section 5.3 of the main plan, and explained in greater detail in Section 1.6.1 of this plan, represent new actions or those actions further refined from the DRCOG plan. Examples of this include the DRCOG "Floodplain Development Regulations" action, which is now refined to include: "Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program.

Table 18. DRCOG 2003 Mitigation Action Status Table – Arvada

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred , Ongoing	Comments
Prevention:		
Adopt or Revise Building Code	Deleted	Ongoing see capability assessment
Planning And Zoning: Land Development Regulations	Deleted	Ongoing see capability assessment
Open Space Preservation	Deleted	Ongoing see capability assessment
Floodplain Development Regulations	Ongoing	replaced by NFIP compliance action
Storm Water Management	Completed	Stormwater Utility formed in 2002
Wildland Fuel Management	Completed	
Property Protection:		
Building Inspection and Modification	Deleted	Removed ; part of day to day activities
Insurance	Deleted	Addressed in NFIP compliance action
Natural Resource Protection:		
Wetlands Protection	Deleted	Ongoing, see capability assessment

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred , Ongoing	Comments
Erosion and Sedimentation Control	Deleted	Addressed in development regulations
Best Management Practices	Deleted	Removed as too generic to track, see capability assessment
Emergency Services:		
Flood Warning Systems	Completed	Participates with Urban Drainage and Flood Control District warning system
Flood Response	Deleted	Addressed in Emergency Operations Plan; Removed to keep plan's focus on mitigation
Critical Facilities Protection	Deleted	No critical facilities in the 100-yr flood plain.
Health and Safety Maintenance	Deleted	Part of ongoing department activities; Removed to keep plan's focus on mitigation
Structural Projects:		
Reservoirs	Deleted	No new reservoirs planned
Channel Modifications	Completed	Van Bibber Flood Control project
Structural design standards	Deleted	Ongoing, see capability assessment
Public Information:		
Map Information	Deferred	Replaced by RWIS action
Outreach Projects	Ongoing	Part of CRS program activities; See NFIP action
Real Estate Disclosure	Ongoing	Notices sent each year by UDFCD to properties in the 100-yrflood plain. Article each year appears in the *Arvada Report; See NFIP actiont*
Library/ Environmental Education	Completed/Ongoing	Multiple outreaches to meet the city's Stormwater Permit requirements. Stormwater quality kiosk in Arvada Nature Center.
Technical Assistance	Deleted	Removed, too generic to track

1.6.1 New Mitigation Actions for the City of Arvada

The following actions were developed and prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Environmental Damage Protection

Issue/Background: Areas in the northwest and western portions of Arvada are made up of open space, lakes and recreational attributes. These areas are exposed to high winds and blowing

snow and precipitation. While wind shields and sandbags are deployed by Arvada Traffic and Transportation Division of Public Works - Maintenance during adverse weather to these key areas, engineered infrastructure investments are necessary for long term solutions. Without a permanent barrier solution to shield properties and roadways, Arvada and Jefferson County residents living along this Front Range area as well as the traveling public, will continue to be affected by the rapidly changing weather conditions. This project mitigates impacts from windstorms and winter storms.

Other Alternatives: Maintenance is currently using snow/wind shields and sandbags as a short term solution.

Responsible Office: City of Arvada – Traffic and Transportation Division of Public Works

Priority (High, Medium, Low): Medium

Cost Estimate: Unknown. The City would need an engineered study on potential alternatives with the highest benefit to cost ratio for consideration.

Benefits (Avoided Losses): Reduction in soil erosion, transportation accidents, stranded travelers needing shelter during blizzard conditions and road closure, enhanced protection for railway transportation.

Potential Funding: Unknown.

Schedule: Unknown.

2. Road Weather Information System (RWIS)

Issue/Background: To reduce congestion and enhance roadway operational safety, the City of Arvada is interested in placing data stations on high volume arterials that are most vulnerable to adverse weather conditions and traffic collisions. Data Stations, similar to those operated by CDOT, will provide Street Maintenance and the Transportation Division with information pertaining to traffic flow, pavement condition, and weather temperatures to better manage City resources and communicate with roadway travelers. Each station will be equipped with the following elements:

- *Traffic Cameras*: will be used to visually verify traffic incidents, debris/blocked roadways, and pavement surface.
- *Maintenance Decision Support System (MDSS)*: will be used to notify plow trucks of pavement conditions and determine amount of resources necessary to mitigate ice and snow.
- *Traffic Data Collection Device*: used to calculate volumes, speed, and lane occupancy that can be mapped and communicated to the traveling public.
- *Communication Device*: fiber or radio connection to TMC and Street Maint.

- *Power*: photovoltaic equipment and batteries, or metered electric power.

Other Alternatives: Unknown.

Responsible Office: City of Arvada – Traffic and Transportation Division of Public Works

Priority (High, Medium, Low): High

Cost Estimate: $50,000 X 5 (Stations: W 86th Pkwy, W 58th Ave, Kipling Pkwy, W 64th Ave, and W 72nd Ave corridors).

Benefits (Avoided Losses): The City of Arvada manages 1,500 miles of pavement surface. The selected arterial corridors have an AADT higher than 9,000 vehicles and connect Arvada collector streets (neighborhoods) to State Highways in northwest metro area. The City can enhance roadway operations and improve regional trips by monitoring traffic and weather data to reduce the impact of incidents and weather related delays.

Project Benefits*

1) *Data Analysis*: the computerized system will extensively collect traffic data, allowing City Staff to measure volumes, speeds, and develop traffic models. Traffic Operations and Street Maintenance would share real-time data to monitor road conditions during adverse weather.
2) *Maintenance Operations*: based on pavement and weather information, Snow Dispatch would direct maintenance crews to respond more effectively to trouble areas for snow and ice removal, lessening pollutant emissions and energy consumption.
3) *Traffic Operation*: early response to collisions and adverse weather will result in travel-time savings and increased traffic flow. Monitoring roadways will allow the traffic team to implement safety and operational adjustments, maximizing person throughput for greater roadway efficiency.

* DRCOG measurement format will be used to calculate: travel-time savings (hours/day), fuel economy (gal/day), emission reductions (lb/day), and user savings (dollars/day).

Potential Funding: Unknown.

Schedule: Unknown.

3. Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program

Hazards Addressed: Flood

Issue/Background: The City of Arvada participates in the National Flood Insurance Program. The city also participates in the Community Rating System and is a CRS Class 5. This project restates the commitment of the City of Arvada to implement sound floodplain management

practices, as stated in the floodplain ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers will remain current on NFIP policies, and are encouraged to attend appropriate training and consider achieving Certified Floodplain Manager (CFM) status. Currently three staff members have their CFM.

Other activities that could be included in this effort are:

- Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance;
- Suggest changes to improve enforcement of and compliance with regulations and programs;
- Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;
- Utilize recently completed Digital Flood Insurance Rate maps in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of floodplain permits;
- Promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Urban Drainage and Flood Control District, and Colorado Water Conservation Board.
- Notices sent each year by UDFCD to properties in the 100-yearr flood plain. Article each year appears in the Arvada Report
- Evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents

Other Alternatives: No action

Responsible Office: Engineering Division

Priority (High, Medium, Low):

Cost Estimate: Low

Potential Funding: Covered in existing budget

Benefits (avoided losses): Reduced property loss from floods and continued availability of flood insurance for residents; as a CRS participant residents will have lowered flood insurance rates.

Schedule: Ongoing

ANNEX B CITY OF EDGEWATER ANNEX

1.1 Community Profile

1.1.1 History

In 1861, Thomas Sloan decided to dig a well on his land in the Colorado Territory. Sloan came to Arapahoe County (now Denver County) with aspirations of farming. The spot he chose was about two miles west of the growing settlement of Denver where he proceeded to dig a well for the irrigation of his farm and tapped into a warm water spring. Overnight his well filled and continued flowing until nearly 200 acres were flooded and the resulting lake became known as Sloan's Lake, the name it bears today.

Ruth Wiberg recounts in Rediscovering Northwest Denver, "Word of the gushing well spread to the fledgling town of Denver. People rode out on horseback to see the phenomenon of farmer Sloan's well and talked as they watched the water spread." George F. Turner, an old stage driver for the C.O.C. & P.P.E., states in the Denver Post (October 20, 1908) that the lake's formation occurred between June 1861 (when he left the area) and early 1863 (when he returned). E J. Stanton a reputable engineer drove by the Sloan farm and viewed the formation of the lake. Further verification of the lake was by Mayor Sopris and Alderman Gove. They stated they had been out to the lake and saw the well was overflowing.

The area just west of Sloan's Lake soon became known as "Edgewater" due to its close proximity to the lake. At the time, however, there was nothing in the Edgewater area but a few fishing shacks. According to the Western History Department of the Denver Public Library, the county line between Jefferson and Arapahoe Counties (later to become Denver County) became known as Sheridan Boulevard and was developed as a route to Fort Sheridan, which subsequently became known as Fort Logan.

In 1887 President Cleveland signed a bill to provide a military post on a tract of land in the Denver area. Eleven sites were approved for the consideration of General Sheridan. The preference of Denverites was a section of land adjacent to Sloan's Lake as it was pointed out it would be easier to "keep away the saloons and other nuisances" if the camp was close to Denver. General Sheridan and his party came to Denver and spent four days touring proposed tracts. His selection was the Johnson Tract, located about eight and half miles from Union Station. At this time the post was officially labeled "Camp Near the City of Denver", later called Sheridan Post or Fort Sheridan. On April 8, 1889 the post was officially named Fort Logan, which it remains to this day.

Edgewater incorporated as a City on August 17, 1901.

1.1.2 Population

The U. S Census Bureau's estimated 2000 population of Edgewater was 5,445. Select Census 2000 demographic and social characteristics for Edgewater are shown in Table 1. The City of Edgewater has a senior citizen complex at Edgewater Plaza. The percentage of senior, disabled, and/or low income residents within the city is high.

Table 1. Edgewater's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	50.0
Female (%)	50.0
Under 5 Years (%)	8.3
65 Years and Over (%)	10.0
Race/Ethnicity (one race)	
White (%)	74.9
Hispanic or Latino (Of Any Race) (%)	35.6
Other	
Average Household Size	2.34
High School Graduate or Higher (%)	79.3

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Edgewater's labor force were: educational, health, and social services (15.3%); construction (12.0%); and retail trade (12.1%). Select economic characteristics for Edgewater from the 2000 Census are shown in Table 2.

Table 2. Edgewater's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	8.1%
Individuals below Poverty Level, 1999	10.2%
Median Home Value	$132,700
Median Household Income, 1999	$35,023
Per Capita Income, 1999	$19,166
Population in Labor Force	2,962
Unemployment (%)*	3.0%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Edgewater using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the City of Edgewater's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The City of Edgewater's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member.

This matrix reflects that the most significant hazards for the City of Edgewater is flood. Other hazards of medium significance for the City of Edgewater include dam failure, earthquake, extreme heat, severe winter storms, and tornado. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity. On the County level, these vulnerabilities were calculated with quantitative data as well.

Table 3. City of Edgewater – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/ Source)
Avalanche	Unlikely	Extensive	Negligible	Low	N
Dam Failure	Occasional	Extensive	Catastrophic	Medium	N
Drought	Occasional	Extensive	Negligible	Low	N
Earthquake	Unlikely	Extensive	Critical	Medium	N
Erosion and Deposition	Likely	Extensive	Limited	Low	N
Expansive Soils	Unlikely	Extensive	Negligible	Low	N
Extreme Temperatures	Occasional	Extensive	Critical	Medium	N
Flood	Highly Likely	Extensive	Critical	High	N
Hailstorm	Likely	Extensive	Negligible	Low	N
Landslide, Debris flow, Rockfall	Unlikely	Extensive	Negligible	Low	N
Lightning	Unlikely	Extensive	Negligible	Low	N
Severe Winter Storms	Likely	Extensive	Limited	Medium	N
Subsidence	Unlikely	Extensive	Negligible	Low	N

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/ Source)
Tornado	Occasional	Extensive	Negligible	Medium	N
Wildfire	Unlikely	Extensive	Negligible	Low	N
Windstorm	Occasional	Extensive	Limited	Low	N

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the City of Edgewater noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

1974 Flood

The Edgewater Four Score History Book records the events of the 1974 flood that struck Edgewater. Extensive flooding struck the city, with the worst damage at 20th and Harlan. 2 deaths were reported as a result of this flood.

1999 Flood

Flooding and flash flooding problems developed over portions of the Urban Corridor as slow moving thunderstorms dumped anywhere from 2 to 3.5 inches of rainfall in approximately 3 hours. The 1700 block of Sheridan was extensively flooded. Power outages were reported. No injuries or deaths occurred in Edgewater.

March 2003 Blizzard

A very moist, intense and slow moving Pacific storm system made its way across the four corners area and into southeastern Colorado from March 17th to the 19th, allowing for a deep easterly upslope flow to form along the Front Range. Up to three feet of snow fell. The heavy

wet snow caused roofs of homes and businesses to collapse across the Urban Corridor. The snow also downed trees, branches and power lines. Up to 135,000 people lost power at some point during the storms and it took several days, in some areas, to restore power. Most businesses were completely shut down for several days during the busy holiday season. In fact, there was a near shutdown of the entire city for several days.

December 2006 Blizzards

Back to back blizzards struck the city a week apart in late December of 2006. The first blizzard, on December 20, struck as a result of a slow moving low pressure system that moved from the Desert Southwest into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. One to two feet of snow were recorded. On December 28, another slow moving storm system moved from the Desert Southwest and into the Texas Panhandle. As it did, a deep easterly upslope flow occurred along the Front Range, with blizzard conditions developing over portions of the Northeast Plains of Colorado, mainly south of Interstate 76. The heaviest snow fell along east facing slopes with storm totals up to 2 1/2 feet in the North Central Mountains and Front Range Foothills.

October 1994 Hailstorm

A band of hail struck Edgewater on October 1, 1994. 1.5″diameter hail struck the entire City. Extensive damage was done to automobiles and homes in the Edgewater area. This storm caused $225 million in damages in Edgewater and the surrounding area. This was the third most costly storm in Colorado history.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

According to the vulnerability assessment conducted using HAZUS-MH, Edgewater has potential for economic loss from flooding. Note that this is based on computer modeling that may not reflect specific mitigation activities. Displaced populations, found in Table 4.30 in Section 4.3.4 Estimating Potential Losses, from flooding are estimated at 222, and 16 buildings are estimated to be at risk. The extent of flooding in Edgewater is represented in Figure 1. Detail on the types of structures is provided in Table 5, showing the numbers of residential and commercial buildings impacted by flooding, and the anticipated percent of damage. According to the analysis Edgewater has a mix of residential and commercial structures potentially at-risk.

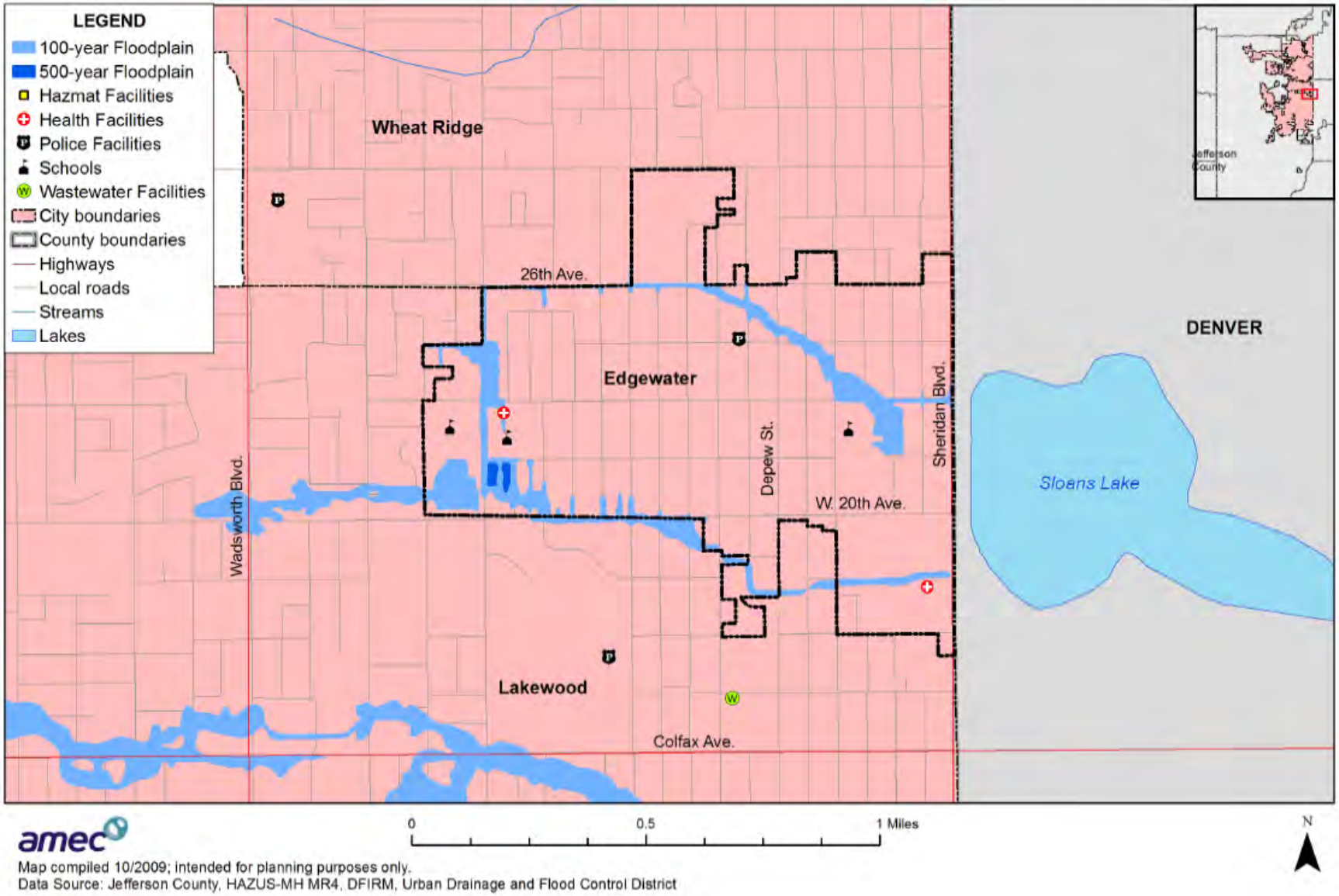
Table 4. City of Edgewater 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Edgewater	1,634,000	2,661,000	16,000	9,000	9,000	48,000	1,000	4,493,000

Table 5. City of Edgewater Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	TOTAL
Edgewater	0	2	1	0	13	0	0	0	0	0	0	0	**16**

Figure 1. City of Edgewater Flood Hazard



Wildfire

There is no wildfire risk in Edgewater.

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado, and windstorm the entire building inventory and population in the City is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 6 represents an inventory of property in Edgewater based on the Jefferson County Assessor's data as of June 2009.

Table 6. City of Edgewater's Property Inventory

Property Type	Structure Count	Building Values ($)*	Contents Values ($)**	Total Values ($)
Residential	1,344	$159,016,939	$79,508,470	$238,525,409
Commercial	106	$108,817,331	$108,817,331	$217,634,662
Total	**1,450**	**$267,834,270.00**	**$188,325,801.00**	**$456,160,071.00**

Source: Jefferson County Assessor
*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.
**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 7 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 7. City of Edgewater's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Edgewater PD	EI/EF	$700,000	20	
Edgewater PD Investigations	EI/EF	$1,000,000	15	
Edgewater FD	EI/EF	$700,000	15	

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Edgewater Public Works	EI/EF	$400,000	10	
Jefferson High School	VF/HPLF	$5,000,000	1000	
Edgewater Elementary	VF/HPLF	$5,000,000	700	
Lumberg Elementary	VF/HPLF	$5,000,000	700	
Edgewater Plaza	VF/HPLF	$15,000,000	500	
Little Hearts. Daycare	VF/HPLF	$200,000	40	
Lightway at Sloans Daycare	VF/HPLF	$200,000	25	
Edgewater Marketplace	VF/HPLF, EA	$20,000,000	1500	Flooding
Edgewater Heritage Center	HA	$750,000	100	

*EI: Essential Infrastructure; EF: Essential Facilities; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Many of the facilities listed above are also in GIS databases provided by the City of Edgewater and Jefferson County. Critical facility counts and types are shown in Table 8 and in the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 8. Summary of Edgewater's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	2
Fire Station	1
Health Facility	2
Police Facility	1
Schools	3
Total	**9**

Source: Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Edgewater to disaster also involves inventory of the natural, historical, 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 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

The City of Edgewater operates four community parks throughout Edgewater. Citizen's Park is a five acre multi-use park located eastern portion of the city. Amenities located in Citizen's Park include a ball field, picnic pavilion, horse-shoe courts and a small playground. Walker Branch Park is a 13-acre park located on the southern border of Edgewater. This park is shared with the City of Lakewood. Memorial Park is a small pocket park approximately a quarter of an acre in size with picnic areas. Heritage Center Park is located to the north of the Heritage Center. For information about natural resources in Jefferson County, which includes Edgewater, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

There are no properties in Edgewater that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the City of Edgewater.

The City of Edgewater currently has 2 designated historic structures located in the City. A structure may be designated for preservation if it has historical, architectural, or geographical importance to the community. Table 9 lists Edgewater's designated historic landmarks.

Table 9. Additional Historic Landmarks in Edgewater

Property	Address
Orum House	2444 Depew Street
Edgewater Heritage Center	W. 25th and Chase Street

Source: City of Edgewater

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.

1.4 Growth and Development Trends

Table 10 illustrates how Edgewater has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Edgewater is undergoing little to no growth.

Table 10. City of Edgewater's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
5,445	5,260	-3.4%	2,424	2,474	2.1%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Edgewater's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 11 lists planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Edgewater.

Table 11. City of Edgewater's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	N	Ongoing
Zoning ordinance	Y	
Subdivision ordinance	N	
Growth management ordinance	N	
Floodplain ordinance	Y	
Other special purpose ordinance (stormwater, steep slope, wildfire)	N	
Building code	Y	
Fire department ISO rating	Y	
Erosion or sediment control program	N	
Stormwater management program	Y	

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Site plan review requirements	N	Ongoing
Capital improvements plan	N	Ongoing
Economic development plan	N	Ongoing
Local emergency operations plan	N	Police Department has a disaster plan
Other special plans	N	
Flood insurance study or other engineering study for streams	Y	6/17/2003
Elevation certificates (for floodplain development)	N	
Other	N	

Table 12 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Edgewater.

Table 12. City of Edgewater's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Y	Contract Labor, RG Consulting	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Contract Labor, RG Consulting	
Planner/engineer/scientist with an understanding of natural hazards	Y	Contract Labor, RG Consulting	
Personnel skilled in GIS	N		
Full time building official	N		
Floodplain manager	N		
Emergency manager	N		
Grant writer	Y		
Other personnel	N		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	N		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Y		
Other	N		
Planner/engineer with knowledge of land development/land management practices	Y	Contract Labor, RG Consulting	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Contract Labor, RG Consulting	

Table 13 identifies financial tools or resources that Edgewater could potentially use to help fund mitigation activities.

Table 13. City of Edgewater's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	N	
Withhold spending in hazard-prone areas	N	

1.5.2 Additional Capabilities

- Prior pandemic preparedness (Police Department)
- Police Department has done disaster plans/planning

1.5.3 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The City of Edgewater joined the National Flood Insurance Program (NFIP) on August 15, 1989. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The Community Rating System CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of October 2009, Edgewater does not participate in the CRS.

NFIP insurance data indicates that as of November 30, 2009, there were 35 policies in force in Edgewater, resulting in $7,722,100 of insurance in force. In Edgewater, there have been 23 historical claims for flood losses totaling $51,637. There are no repetitive or severe repetitive loss structures as defined by the NFIP.

1.6 Mitigation Actions

Edgewater has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program

Hazards Addressed: Flood

Issue/Background: The City of Edgewater participates in the National Flood Insurance Program. This project restates the commitment of City of Edgewater to implement sound floodplain management practices, as stated in the flood damage prevention ordinance. This includes ongoing activities such as enforcing local floodplain development regulations. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date.

Other Alternatives: No action

Responsible Office: City Engineer's Office

Priority (High, Medium, Low): High

Cost Estimate: Low

Potential Funding: Covered in existing budget

Benefits (avoided losses): Reduced property loss from floods, continued availability of flood insurance for residents.

Schedule: Ongoing

2. Coordinate Management with the Urban Drainage Flood Control District on the Storm Water Drainage Detention Basins

Hazards Addressed: Flood

Issue/Background: The City of Edgewater has, over the past 20 years, mitigated flooding by a drainage project that includes holding areas for water and a drainage canal. This is part of a larger project run by the Urban Drainage and Flood Control District.

Other Alternatives: No action.

Responsible Office: City Engineer's Office

Priority (High, Medium, Low): High

Cost Estimate: Low

Potential Funding: Covered in existing budget.

Benefits (Losses Avoided): Reduced property loss from floods.

Schedule: Ongoing

3. Continued Validation of Flood Response Protocol Identified in the NIMS Compliant Emergency Operations Plan of 2007 through Practical Training and Exercises Design.

Hazards Addressed: Flood

Issue/Background: The city also adopted a NIMS compliant emergency operations plan in 2007 that specifically addresses the City's response to flooding.

Other Alternatives: No action.

Responsible Office: City Engineer's Office

Priority (High, Medium, Low): High

Cost Estimate: Low

Potential Funding: Covered in existing budget.

Benefits (Losses Avoided): Reduced property loss from floods.

Schedule: Ongoing

CITY OF GOLDEN ANNEX

1.1 Community Profile

1.1.1 History

Established as a gold rush town, Golden quickly became a leading economic and political center of the region, being a center of trade between the gold fields and the east, a crossroads and gateway of important roads leading to the mountains, and a center of area industry. By the close of 1860, Golden City had been popularly elected the seat of Jefferson County and was the capital of the provisional Jefferson Territory. While the town lost much of its populace and leading citizenry during the American Civil War for several reasons ranging from military to economic, Golden became capital of the federally recognized Colorado Territory in 1862, continuing as such until 1867. Golden became the "Lowell of the West", a regional center of trade and industry that boasted at certain points in time three flour mills, five smelters, the first railroad into the Colorado mountains, the Coors Brewery, brick works, the only paper mill west of Missouri, clay and coal mines, and more. During the 1870s it became home to three institutions of higher education, the Colorado University Schools of which the Colorado School of Mines remains today. Golden was also home to an opera house and seven churches including Colorado's third (Methodist) church, oldest Baptist church, likely oldest Christian (Disciples of Christ) church, and first Swedish immigrant (Lutheran) church. The town was home to sizable populations of German, Swedish, Italian and Chinese immigrants; five immigrants became mayors of Golden.

Until the early 20th, century Golden maintained a small town population of around 2,500 people. Several industries faded or were destroyed by tragic events, but others flourished to continue Golden's industrial legacy including its brewing, brickmaking, clay mining and porcelain industries. Golden became even more connected through mass transit, with two trolley lines extending to Denver, while the movie theater gradually took the place of the opera house for downtown entertainment. Downtown revitalization efforts began in the 1920s with its first streetscape and ornamental lighting project and urban renewal on its north and east, anchored by new senior high and grade schools. The historic cultural tension between the city's north and south sides gradually eased, and the town successfully endured additional major economic depressions including the Silver Crash of 1893 and the Great Depression. The School of Mines gained a worldwide academic reputation, Coors rapidly came to the forefront of the national and international brewing and ceramics industries, and the city modernized with a recreation center, paved streets and more.

After World War II Golden boomed, rapidly gaining population, size and economy. In 1959 the town nearly tripled in geographic size overnight when it annexed large properties to the south including the new Magic Mountain theme park, one of the earliest entertainment attractions of its kind. A number of new subdivisions were built and public infrastructure was modernized

including new buildings for the senior high school, city hall, recreation center, library, museum and central fire and police stations. Also built were new downtown anchors including department stores and grocery stores, several new church buildings, new county offices, and the Horizon Plan which transformed the School of Mines. The oil crash and near simultaneous failure of several downtown anchors placed its central business district into recession by the 1980s, and the downtown was revitalized again through various initiatives including its second streetscaping project in 1992. In 1993 the old Golden High School building was converted into the American Mountaineering Center making Golden a premier research and education hub for mountaineering. The Coors Brewery had become the largest single site brewery in the world, its Porcelain subsidiary among the foremost of its kind in the world, and Golden became home to the National Renewable Energy Laboratory. Today Golden has a population of over 17,000 people and is home to more people and businesses of national and international influence than ever before, yet maintains a small town historic identity.

1.1.2 Population

The U. S Census Bureau's estimated 2000 population of Golden was 17,159. Select Census 2000 demographic and social characteristics for Golden are shown in Table 1.

Table 1. Golden's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	54.6
Female (%)	45.4
Under 5 Years (%)	5.7
65 Years and Over (%)	8.0
Race/Ethnicity (one race)	
White (%)	90.7
Hispanic or Latino (Of Any Race) (%)	6.6
Other	
Average Household Size	2.31
High School Graduate or Higher (%)	46.3

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Golden's labor force were educational, health, and social services (19.5%); professional, scientific, management, administrative, and waste management services (17.1%); and retail trade (10.2%). Select economic characteristics for Golden from the 2000 Census are shown in Table 2.

Table 2. Golden's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	3.5%
Individuals below Poverty Level, 1999	11.3%
Median Home Value	$198,300
Median Household Income, 1999	$49,115
Per Capita Income, 1999	$25,257
Population in Labor Force	9,882
Unemployment (%)*	2.7%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Golden using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the City of Golden's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to Golden. The City of Golden's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. The hazard significance listed here is based on City of Golden HMPC member input and the risk assessment developed during the planning process (refer to Chapter 4 of the base plan).

This matrix reflects that the most significant hazards for the City of Golden area flood, severe winter storms, wildfire, and windstorm. Other hazards of concern for the City of Golden include dam failure and hailstorm. The City also has areas of landslide and rockfall hazards, as well as subsidence and heaving bedrock. The Golden fault runs along the base foothills just west of town. The City's proximity to the basalt cliffs of North and South Table Mountain makes certain neighborhoods prone to rockfall hazards. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 3. City of Golden – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Avalanche	Unlikely	Limited	Negligible	Low	
Dam Failure	Unlikely	Limited	Limited	Medium	Paper/GIS
Drought	Occasional	Extensive	Limited	Low	
Earthquake	Occasional	Extensive	Limited	Low	USGS
Erosion and Deposition	Likely	Limited	Negligible	Low	
Expansive Soils	Likely	Extensive	Negligible	Low	Paper
Extreme Temperatures	Unlikely	Extensive	Negligible	Low	
Flood	Occasional	Limited	Catastrophic	High	Paper/GIS
Hailstorm	Likely	Extensive	Limited	Medium	
Landslide, Debris flow, Rockfall	Likely	Limited	Limited	Low	
Lightning	Highly Likely	Limited	Negligible	Low	
Severe Winter Storms	Highly Likely	Extensive	Limited	High	Paper
Subsidence	Unlikely	Limited	Negligible	Low	Paper
Tornado	Unlikely	Significant	Catastrophic	Low	
Wildfire	Likely	Significant	Limited	High	Paper
Windstorm	Highly Likely	Extensive	Limited	High	

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

The City of Golden was provided a Data Collection Guide, to note specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction.

1896 Flood – A flood, profiled in the base plan, struck the towns of Morrison, Golden, and Mt. Vernon. The *Golden Globe* reported "*Great cloud bursts came down from Mt. Lookout, Mt. Zion, North Table Mountain and from the steeps that enclose Tucker's Gulch. What is a cloud burst? you ask. It is a quick release by two clouds meeting, of every drop of water they contain, as sudden as if they had been emptied from a pail. Imagine a volume of water perhaps twenty feet high hundreds of feet long, and wide, suddenly emptied on a mountain slope. To those who saw the rush of waters, the sight will forever remain. Over the crest of North Table Mountain the water poured as it pours over Niagara Falls. Down the slopes of the mountains came the great wave looking like a giant roll of white mist, rolling boulders that weighed tons, as if they were spools of thread. The mighty roar as these huge monsters hurried down after their victims, was a sound besides which the roar of the Niagara Falls was dwarfed. Every reader of the newspapers knows the rest. It was awful, majestic, unreasoning and unpitying power before which human strength and human ingenuity was as a straw before the cyclone*."

On Tucker Gulch where the western houses of Garden Street stand today Laura Edwards, 34 and a mother of two small children, had gone out to milk the cows at the family's barn, and had no chance to escape. Downstream Andrew and Anna Johnson, a Swedish immigrant couple in their early 70s, had sat down to supper at their little cottage overlooking the gulch just back of the Treffeisen Building at the northeast corner of 10th and Ford. They too never had a chance. The photo in Figure 1 from shortly after showed no sign any house had ever been there where 3 maps had shown it before, one from earlier that same year.

Figure 1. The destruction of the 1896 Flood at 10th Street and Tucker Gulch

Source: Golden Pioneer Museum

Elsewhere in Golden Clear Creek took out the Ford Street Bridge had inundated many houses on lower 11th Street, after it had already twisted apart miles of railroad track in the canyon

upstream. Between it and the waters of Tucker Gulch diverted by the Glass Works down Washington Avenue Golden's first building, the Boston Building at today's Parfet Park, was dislodged. From here the immense storm wreaked havoc upon the South Platte, Arkansas and Rio Grande rivers, where it caused more flooding and destruction in Denver and elsewhere but fortunately claimed no more lives. At Golden the flooding continued a second day, but all escaped that too.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

According to the vulnerability assessment conducted using HAZUS-MH, Golden has one of the higher potentials for economic loss from flooding in the County. Clear Creek flows through downtown Golden, but there is also risk from smaller drainages that cross the City. Note that this is based on computer modeling that may not reflect specific mitigation activities. Displaced populations, found in Table 4.30 in Section 4.3.4 Estimating Potential Losses, from flooding are estimated at 504, and 69 buildings are estimated to be at risk. The extent of flooding in Golden is represented in Figure 2. Detail on the types of structures is provided in Table 5, showing the numbers of residential and commercial buildings impacted by flooding, and the anticipated percent of damage. According to the analysis Golden has a mix of residential and commercial structures potentially at-risk.

Analysis of flood prone critical facilities indicates that the Golden Police Department, one school (Golden Senior), and one hazardous materials facility (Trigen-Nations Energy CO.) are in the floodplain. Golden also has one "scour critical" bridge located on W 50th Avenue.

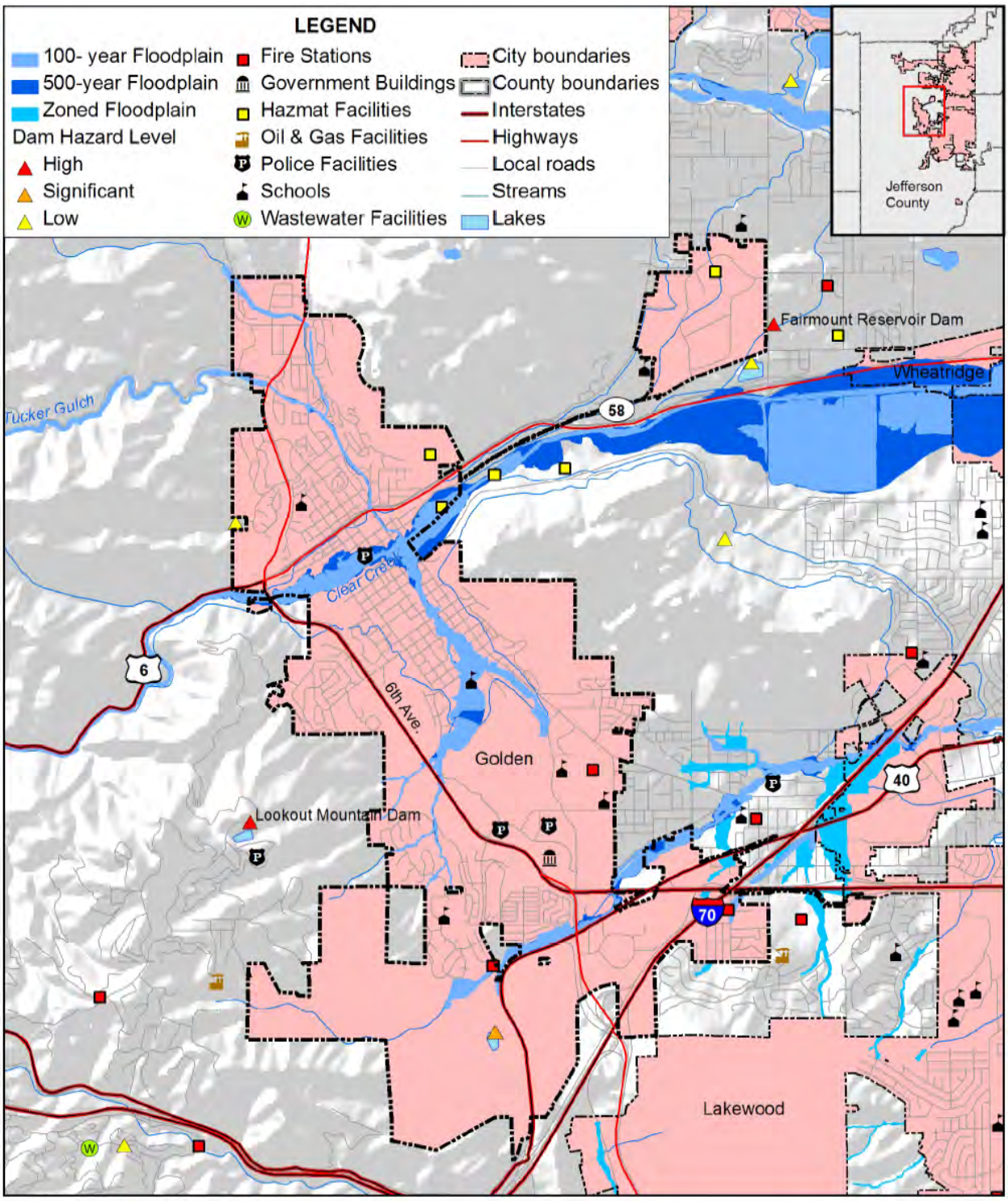
Table 4. Golden 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Golden	34,645,000	61,948,000	692,000	52,000	139,000	418,000	31,000	98,507,000

Table 5. Golden Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	TOTAL
Golden	0	25	3	0	30	0	1	0	7	0	3	0	**69**

Figure 2. City of Golden Flood Hazard Map



amec

0 1 2 Miles

N

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County, HAZUS-MH MR4, DFIRM, Urban Drainage and Flood Control District

Dam Failure

According to the vulnerability assessment in Chapter 4 Golden has one class I or High Hazard dam (Lookout Mountain Dam). See discussion in Section 4.2.3 in the Base Plan.

Geologic Hazards

Golden has some exposure to geologic hazards including subsidence, swelling soils, and dipping bedrock. Some of these areas are presently undeveloped and on the western limits of the City. Rockfall areas are around the slopes of North and South Table Mountains which have some residential development potentially at risk. See the map in Figure 3. Specific structures at risk from specific geologic hazards are detailed in Table 6. Methodology for this table can be found in Section 4.3.4 Estimating Potential Losses.

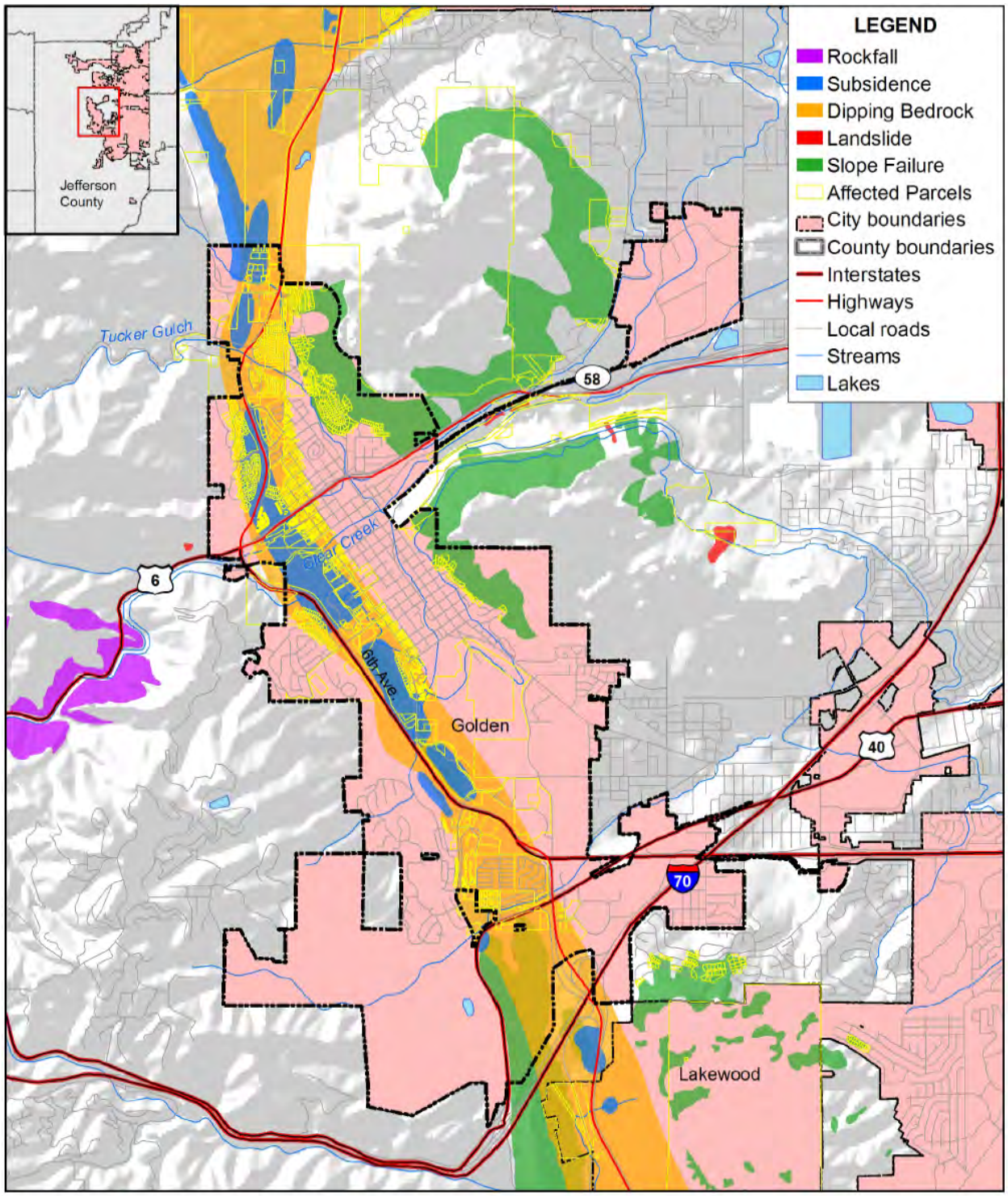
Table 6. City of Golden Geologic Hazards Risk

Geologic Hazard	Occupancy Type	Count of Improved Parcels	Improvement Value	Contents Value
Slope Failure	Commercial	8	$36,094,700	$36,094,700
Slope Failure	Residential	341	$116,517,200	$58,258,600
Subsidence	Commercial	49	$119,443,100	$119,443,100
Subsidence	Residential	364	$101,857,700	$50,928,850
Total		**762**	**$373,912,700**	**$264,725,250**

Source: Jefferson County

Golden's proximity to the Golden Fault as a potential, though unlikely, earthquake source make it more vulnerable to earthquake damage. Golden's downtown historic district has a number of un-reinforced masonry buildings that are particularly vulnerable to earthquake shaking.

Figure 3. City of Golden Geologic Hazards Map



amec

0 1 2 Miles

N

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County

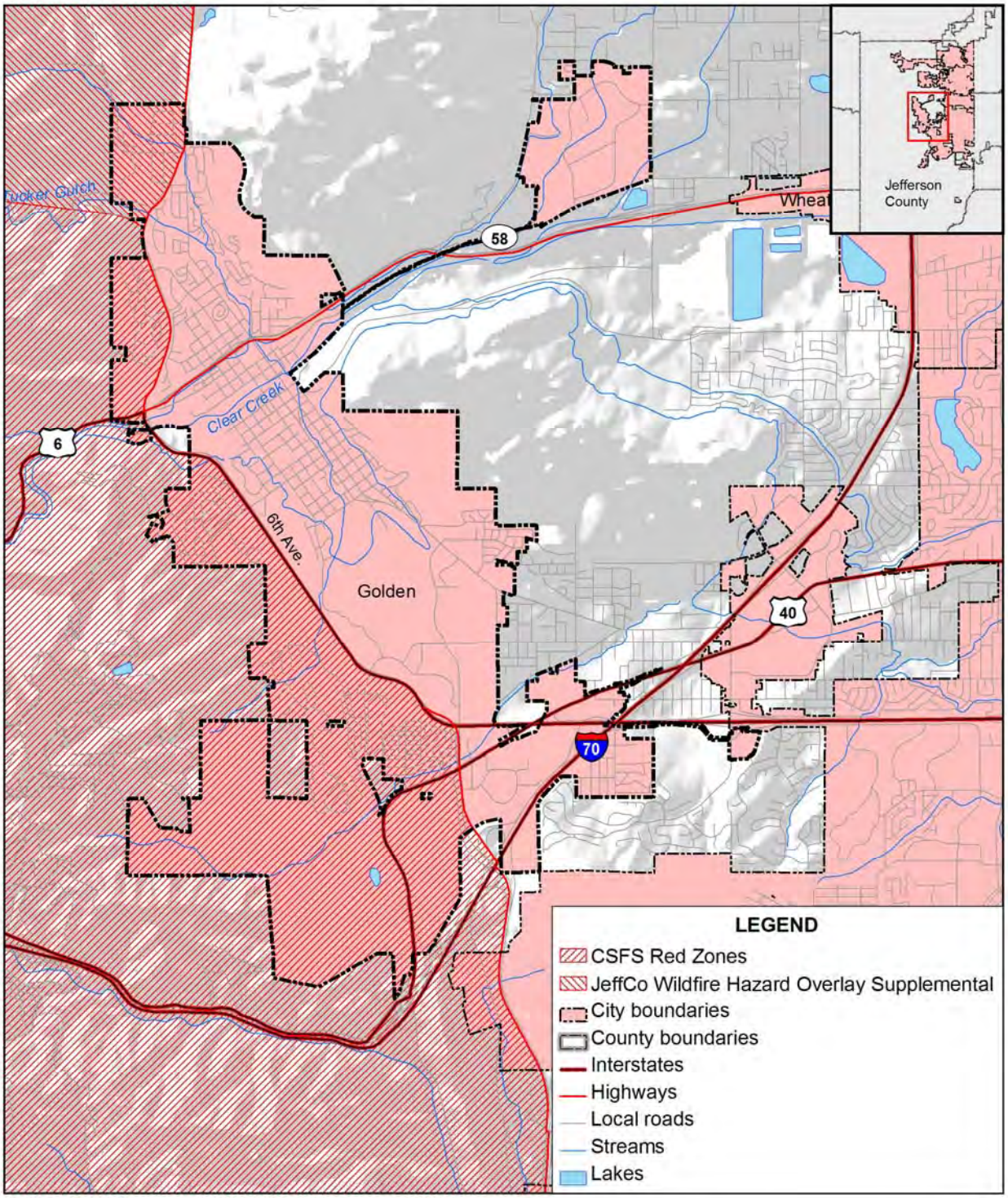
Wildfire

With its location at the Rocky Mountain foothills, Golden does have risk to wildfires, both from grass fires on the open spaces at the western edge of the City and along the flanks of the Table mountains, and from forest fires in the foothills. According to the GIS based analysis of wildfire in Section 4.3 the City has 1,494 structures in Red Zones and Jefferson County Wildfire Hazard Overlay Zone with a structure value of $497 million, and an estimated population of 3,404 in that zone. The structure counts and values by structure type are provided in the following table. Most of the structures are residential. Additionally, the analysis indicates that a fire station and school are located in this zone: Golden Fire Station 4 and Shelton Elementary.

Table 7. City of Golden Wildfire Risk by Structure Count

City	Occupancy	Structure Count	Structure Value	Contents Value
Golden	commercial	93	$94,493,400	$94,493,400
	residential	1,401	$ 403,488,400	$201,744,200
Total		**1,494**	**$497,981,800**	**$296,237,600**

Figure 4. City of Golden Wildfire Hazard Map



amec

Map compiled 3/2010; intended for planning purposes only.
Data Source: Jefferson County, CO State Forest Service

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado, and windstorm, the entire building inventory and population in the City is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory. Golden's location at the base of the foothills makes it more prone to high wind events than most other communities in this plan.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 8 represents an inventory of property in Golden based on the Jefferson County Assessor's data as of June 2009.

Table 8. Golden's Property Inventory

Property Type	Parcel Count	Building Value ($)*	Contents Values ($)**	Total Values ($)
Residential	4,348	$1,093,124,400	$546,562,200	$1,639,686,600
Commercial	595	$1,305,376,284	$1,305,376,284	$2,610,752,568
Government	1	$59,340	$59,340	$118,680
Total	**4,944**	**$2,398,560,024**	**$1,851,997,824**	**$4,250,557,848**

Source: Jefferson County Assessor's Office

*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.

**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 9 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 9. Golden's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
City Hall	EI	$3.72 million	≅ 225	Flooding
Police Department	EI		≅ 150	Flooding
Fire Department Station1	EI	$2.75 million	Varies	Flooding
Station 2, 1201 Ulysses St	EI	$73,000	Minimal	

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
Station 3, 16023 W. 5th Ave	EI	$56,500	Minimal	
Station 4, 151 Heritage Rd	EI	$778,000	Varies	
Xcel Energy Substation	EI/VF	Unknown	Unknown	Fire, explosion
Rooney Road Hazardous Materials Facility	HM	Unknown	Unknown	Fire, explosion, contamination
Bulk Oil Storage	VF	Unknown	Unknown	Fire, explosion, contamination; flooding
Mitchell Elementary School, 200 Rubey Dr.	VF	Unknown	≅ 600	
Shelton Elementary School, 420 Crawford St.	VF	Unknown	≅ 500	
Bell Middle School	VF	Unknown	≅ 650	
Golden High School, 70124th St.	VF	Unknown	≅ 1800	Flooding
The Johnson Program, 1200 Johnson Rd.	VF	Unknown	≅ 100	
Cogwheel Kids Preschool, 610 22nd St	VF	Unknown	≅ 50	
Discover Child Care Center, 17602 W. 14th Ave	VF	Unknown	≅ 150	
Golden Independent School, 1280 Golden Cir.	VF	Unknown	≅ 50	
Kindercare Learning Center, 107 N. Rubey Dr.	VF	Unknown	≅ 160	
South Table Mountain Preschool, 17701 W. 16th Ave.	VF	Unknown	≅ 80	
Free Horizon Montessori Charter School, 581 Conference Place	VF	Unknown	≅ 300	
Cradle to Crayons Learning Center, 18301 W. Colfax Ave	VF	Unknown	≅ 50	
US Post Office 17451 S Golden Rd.	VF	Unknown	Unknown	
US Post Office, 619 12th St.	VF	Unknown	Unknown	Flooding
Wells Fargo Service Company, 1220 Ford St.	VF	Unknown	Unknown	Flooding
Panorama Medical, 660 Golden Ridge Rd.	VF	Unknown	Unknown	
Coors	VF	Unknown	Multiple Buildings	Flooding
Colorado School of Mines	VF	Unknown	Multiple Buildings	Flooding
Water Treatment Plant	EI/VF	$1.47 million	Unknown	Flooding
Pylons at Lookout Mountain Road	NA	Unknown	None	
Golden Arch	NA	Unknown	None	Flooding
12th Street Historic District	NA	Unknown	Multiple Buildings	Flooding
822 12th St. Astor House	NA	$847,000	Unknown	Flooding
805 13th St. Quaintance Block	NA	Unknown	Unknown	Flooding

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
809 15th St. Foothills Art Center (First Presbyterian Church of Golden)	NA	Unknown	Unknown	
509 18th St. James Cuyler Miller House	NA	Unknown	Residential	
1301 Arapahoe St. Colorado National Guard Armory	NA	Unknown	Multi-Residential	Flooding
714 Cheyenne St. Oscar Barber House/Montessori School of Golden	NA/VF	Unknown	≅ 100	Flooding
Heritage Road (Magic Mountain Archeological Site)	NA	Unknown	None	
622 Water St. Peery House	NA	Unknown	Residential	Flooding
6th Avenue	EI	Unknown	None	
I-70	EI	Unknown	None	
Highway 58	EI	Unknown	None	Flooding
C-470	EI	Unknown	None	
Burlington Northern Sante Fe Railroad	EI	Unknown	None	Flooding
Jefferson County Government Complex	EI/VF	Unknown	Multiple Buildings	
Planning/Public Works	EI	$1.76 million		Flooding
Public Works – Shops	EI	$12 Million	Multiple Buildings	Main concern is wildfire
Clear Creek Corridor – Threatened plant species: Ute Ladies Tresses Orchid	NA	Unknown	None	Flooding, wildfire
Clear Creek History Park	NA	$368,600		Exterior area Flooding

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Many of the facilities listed above are also in GIS databases provided by the City of Golden and Jefferson County. Critical facility counts and types are shown in Table 10 and in the map in Figure 2. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 10. Summary of Golden's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	22
Dams	1
Fire Stations	3
Government Buildings	1
Hazmat Facilities	3
Police Facilities	3
Schools	5

Critical Facility Type	Facility Count
Total	**38**

Source: City of Golden, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Golden to disaster also involves inventorying the natural, historical, 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 so 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

Within or adjacent to the City of Golden, there are a total of 30 sites that are parks, open space, recreation centers, or other recreation areas totaling approximately 5,179.40 acres. Of these, nine sites are neighborhood parks (57.1 acres), four sites are pocket parks (8.4 acres), and four park sites are community parks (149.9 acres), three of which are classified as sports complexes. The community parks also serve as neighborhood parks for residents living nearby, which is generally considered within a 0.5-mile radius. There are also three special purpose parks (6.8 acres), one natural area (0.5 acre), and six regional open space areas (4,738 acres). On the outskirts of the City are many Jefferson County Open Space parks, as well as North and South Table Mountain. For information about natural resources in Jefferson County, which includes Golden, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

Table 11 lists the properties in Golden that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

Table 11. Golden's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Astor House Hotel	822 12th St.	03/01/1973
Barnes--Peery House	622 Water St.	10/12/2001
Calvary Episcopal Church	1300 Arapahoe St.	03/03/1995

Property	Address	Date Listed
Colorado National Guard Armory	1301 Arapahoe St.	12/18/1978
Coors, Herman, House	1817 Arapahoe St.	10/17/1997
First Presbyterian Church of Golden--Unger House	809 15th St.	03/14/1991
Golden High School	710 10th St.	03/14/1997
Lariat Trail Scenic Mountain Drive	Lookout Mountain Rd. S of US 6 to Golden Reservoir	11/15/1990
Lookout Mountain Park	987 1/2 Lookout Mountain Rd.	11/15/1990
Loveland Building and Coors Building	1122 and 1120 Washington Ave.	05/16/1996
Magic Mountain Site	Heritage Square	08/21/1980
Quaintance Block	805 13th St.	03/25/1994
Oscar Barber House	714 Cheyenne St.	State Register 7/13/1994
Golden Welcome Arch	1100 block of Washington Ave.	State Register 6/14/2000,

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently 36 Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the vicinity of the City of Golden, however there are none inside the City limits (all of these are located at Rocky Flats).

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.

1.4 Growth and Development Trends

Table 12 illustrates how Golden has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Golden is undergoing moderate growth.

Table 12. City of Golden's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
17,159	17,701	3.2%	7,146	7,759	8.6%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/; U.S. Census Bureau

Some of the growth in Golden in the mid to late 1990's occurred on the northwestern edge of the City, near the Golden fault and adjacent to a mitigated landslide area at the junction of Highways 93 and 6. Other commercial growth has occurred in east Golden with the development of Colorado Mills Mall in the late 1990's. There is potential for flooding in this area of the City.

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Golden's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 13 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Golden.

Table 13. City of Golden's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	Yes	Available through the Planning Department
Zoning ordinance	Yes	Title 18, Chapter 40, Golden Municipal Code: http://www.cityofgolden.net/Code.asp?CodeID=717
Subdivision ordinance	Yes	Title 17, Golden Municipal Code: http://www.cityofgolden.net/Code.asp?CodeID=642
Growth management ordinance	Yes	Title 18, Chapter 70, Golden Municipal Code: http://www.cityofgolden.net/Code.asp?CodeID=728
Floodplain ordinance	Yes	Title 15, Chapter 08, Section 240 Golden Municipal Code establishes flood hazard areas; 15.08.085, 15.08.120 and15.08.235 support other flood regulations: http://www.cityofgolden.net/Code.asp?CodeID=1318
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Title 13, Chapter 30 Golden Municipal Code for stormwater: http://www.cityofgolden.net/Code.asp?CodeID=1318 Title 15, Chapter 18, Section 050 for slope/grading: http://www.cityofgolden.net/Code.asp?CodeID=1325
Building code	Yes	Title 15, Golden Municipal Code: http://www.cityofgolden.net/Code.asp?CodeID=1316
Fire department ISO rating	Yes	The Fire department Has an ISO rating of 4
Erosion or sediment control program	Yes	Title 18, Chapter 40, Section 100, Golden Municipal Code: http://www.cityofgolden.net/CodePrint.asp?CodeID=1600 and Site Inspection Forms for Erosion and Sediment Control measures (attached)
Stormwater management program	Yes	Stormwater Management Program and Stormwater Maintenance

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
		plan
Site plan review requirements	Yes	Title 18, Chapter 40, Golden Municipal Code: http://www.cityofgolden.net/Code.asp?CodeID=706
Capital improvements plan	Yes	
Economic development plan	No	Last adopted plan was 1997. Out of date and not in use
Local emergency operations plan	Yes	This plan is currently under revision
Flood insurance study or other engineering study for streams	Yes	Flood plain studies of all drainage basins greater than 1 square mile, as well as Arapaho Gulch. We also have FEMA mapping of all drainages greater than one square mile. Study information can be found at http://www.udfcd.org/downloads/down_pub_mdp.htm (reference Clear Creek and Golden)
Elevation certificates(for floodplain development)	Yes	
Dam Failure Plans	Yes	For the three regulatory dams we operate. Plans are available through Public Works and City Hall but cannot be used as an attachment to any plan.

Table 14 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Golden.

Table 14. City of Golden's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	Planning/City Planner	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Public Works/City Engineer Public Works/Civil Engineer	
Planner/engineer/scientist with an understanding of natural hazards	Yes	Public Works/Environmental Manager	
Personnel skilled in GIS	Yes	Public Works/GIS Coordinator	
Full-time building official	Yes	Public Works/Chief Building Official	
Floodplain manager	Yes	Chief Executive Office or his/her appointed designee	Certified
Emergency manager	Yes	Fire Department/Fire Chief	
Grant writer	No	N/A	
Other personnel			
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc)	Yes	Public Works/GIS Coordinator	There are flood plains, hazardous slopes, subsidence areas and expansive soils

Personnel Resources	Yes/No	Department/Position	Comments
Warning systems/services (Reverse 9-11, cable override, outdoor warning signals)	Yes	Police Department/ Communications & Records Manager	Target Notification System only (reverse 911)

Table 15 identifies financial tools or resources that Golden could potentially use to help fund mitigation activities.

Table 15. City of Golden's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	Only if hazard mitigation relates to the purpose of the block grant.
Capital improvements project funding	Yes	Only if hazard mitigation is deemed a capital improvement
Authority to levy taxes for specific purposes	Yes	Would need to be approved by the voters
Fees for water, sewer, gas, or electric services	Yes	The City only has fees for water and sewer. The hazard mitigation would need to be related to those services.
Impact fees for new development	Yes	Our impact fees are water, sewer, school land, and park land (unless the developer donates the appropriate amount of land). The fees can be used only if the hazard mitigation is related to those areas.
Incur debt through general obligation bonds	Yes	Requires voter approval
Incur debt through special tax bonds	Yes	Requires voter approval
Incur debt through private activities	Yes	Requires City Council approval
Withhold spending in hazard-prone areas	Yes	A political decision, but it can be done.
Other – Available General Fund resources	Yes	

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The City of Golden joined the National Flood Insurance Program (NFIP) on May 15, 1985, and the Community Rating System (CRS) on October 1, 1996. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of October 2009, Golden had a CRS class rating of 9 (one a scale of 1-10, 1

being the best). This rating provides a 5 percent discount for policyholders within a special flood hazard area (SFHA) and a 5 percent discount for those outside of an SFHA.

NFIP insurance data indicates that as of November 30, 2009, there were 87 policies in force in Golden, resulting in $23,436,300 of insurance in force. In Golden, there have been 13 historical claims for flood losses totaling $5,693.43. At the time this plan was developed there were no repetitive or severe repetitive loss structures as defined by the NFIP.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Golden activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

City of Golden Comprehensive Plan (2003)

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals, policies, and strategies and actions contained within the plan cover a broad range of subjects matter related to services, issues, and geographic areas within Golden. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

The following goals policies, and strategies and actions are most relevant to hazard mitigation.

Goals	Policy Direction	Strategies and Actions
Land use		
Support zoning designations that maintain a wide variety of uses.	Ensure planning decisions that will promote the stability of zoning districts and designations.	Continue use of Stringent criteria governing zoning changes.
	Consider the zoning of newly annexed land in relationship to adjacent development.	Undertake strategic zoning changes through City initiation when necessary.
Continue to enhance Golden's character through strategic preservation of open space.	Actively pursue open space preservation as vital to the character of Golden.	Purchase and maintain open space to facilitate the preservation of natural areas with unique characteristics.
	Seek to create a blended network of open space, natural areas, recreation areas, parks, trails, and streetscapes.	Create and regularly update maps illustrating existing and potential open space acquisitions.

		When possible, plan drainageways as urban trail corridors for multiple uses; conveyance of runoff, utilities, access roads, trails, wetlands, wildfire, trees, vegetation, and recreational uses.
Create buffers around the City through open-space preservation.	Work with other government entities and non-profits to preserve lands of common interest.	Pursue open space purchases, donations, and conservations easements by the City, Jefferson County, and other entities.
Provide parks and natural areas within the City through open space acquisitions.	Use parks and natural areas to provide recreational opportunities and density breaks that benefit the people of Golden.	Engage the neighborhood in the planning and management of local parks.
Limit or avoid potential problems caused by development in hazard areas.	Reduce or eliminate inappropriate development in hazard areas in order to minimize potential harm.	Define and protect geologic and environmentally sensitive areas. Update and distribute maps of geologically and environmentally sensitive areas; use the maps during initial stages of project planning.
Public Investment		
Provide public services in a high quality and cost effective manner.	Acknowledge the issue of full service provision and consider factors regarding decisions about fire, police, water, and sewer service to those areas currently served by outside entities. Create and implement long-range plans and emergency strategies both of which support maintenance and upgrades for staff and equipment.	Develop appropriate performance and efficiency measures for each city department.
Make adjustments in City services as appropriate to meet the changing needs of citizens and the developing economy. These adjustments include both long-term changes and responses to emergencies.	Regularly review and change City services and performance measures as needed to meet citizen demand and expectations within City funding limitations.	Periodically assess service through surveys and meetings to determine satisfaction, funding, and priorities. If a service is desired by a significant number of citizens but not provided, the City will assess and consider providing the service.
Anticipate future growth patterns and plan the infrastructure and services to best respond to these needs.	Utilize strategic planning as the process for programming and funding new infrastructure and service needs. Charge for services provided to municipal areas by entities other than the City of Golden at rates commensurate with actual cost.	Ensure that new development pays its proportional share of the costs of new infrastructure and services.
Environment		
Environmental impacts of growth and development will be mitigated to the extent possible.	Manage growth and development so as to minimize adverse environmental impacts.	Major new developments will require an assessment and disclosure of the environmental impacts. Encourage developers to use low water plantings.

		Encourage energy efficient building techniques in all types of construction.
Control the creation and adverse effects of pollution.	Address environmental issues related to negative impacts both locally and in a broad context. These include: Water Quality Air quality Heat, noise, odor Visual elements Electromagnetic Radiation	Monitor air and water quality, noise, and soils in designated areas. Control environmental impacts not covered by county, state or federal regulations, or when such standards are deemed to be inadequate. Coordination and cooperation with Jefferson County, regional, state, and federal agencies. Increase public education concerning the cause and control of pollution and what residents can do to help minimize pollution.
Conservation of natural resources will be a part of all City projects.	Implement conservation programs including energy, water, habitat areas, and urban forests. Encourage the use of natural, low-water plantings whenever feasible. Encourage recycling by City departments and City residents. Encourage reduced use of natural Resources.	Make available pertinent educational materials concerning conservation to the citizens of Golden, primarily through the Web, workshops, and the Golden Informer. Continue to sell natural, low-water plantings. Encourage partnerships to facilitate alternative energy source development. Implement a recycling program for City departments. Ensure that City projects address energy and water conservation, habitat areas, and urban forests.
Achieve energy efficiency and water conservation in new construction.	Encourage builders to use “green” building design.	Develop a “resource efficiency review or audit” for new construction.
Regional Issues		
Actively participate in regional decisions concerning water, air, noise and transportation	Actively seek partnerships and cooperation in regional issues.	Play an active participatory role in the Denver Regional Council of Governments (DRCOG), Regional Air Quality Commission (RAQC), the Colorado Department of Transportation (CDOT), the Metro Mayors Conference, and other forums that deal with regional issues
Monitor land use policy decisions of surrounding communities to help ensure they have a positive impact on the City.	Take an active role in the decision process of neighboring communities on matters before them that influence the economy and/or quality of life in the City.	Maintain active and cooperative partnerships with neighboring communities. Identify potential annexation areas and through Intergovernmental Agreements (IGA’s) protect the City’s ability to protect and control its

boundaries.

Municipal Code

IBC Section 109.3.3 (Lowest floor elevation) is amended to read as follows:

In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, an elevation certification of the lowest floor, including basement, prepared and sealed by a registered design professional shall be submitted to the building official. (Ord. 1754 § 1, 2006).

Article 15.08.235 Section 1612.2: Floodplain Management

One foot above the elevation of the "design flood," including wave height, relative to the datum specified on the community's legally designated flood hazard map. In areas designated as Zone AO, the design flood elevation shall be the elevation of the highest existing grade of the building's perimeter plus one foot above the depth number (in feet) specified on the flood hazard map. In areas designated as Zone AO where a depth number is not specified on the map, the depth number shall be taken as being equal to 3 feet (610 mm). (Ord. 1754 § 1, 2006).

IBC Section 1612.3 (Establishment of flood hazard areas) is amended as follows.

To establish flood hazard areas, the governing body shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled "The Flood Insurance Study for City of Golden," dated May 15,1985, as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section. (Ord. 1754 § 1, 2006).

IBC Section 1805.10 (Design for designated dipping bedrock area) is enacted as follows:

Foundations to be installed in the designated dipping bedrock area, as identified by the Jefferson County Colorado "Designated Dipping Bedrock Area" map dated October 20, 1999, shall be designed by a registered design professional in accordance with accepted engineering practices and procedures so as to mitigate the potential adverse effects of such dipping bedrock on structures. Such foundations shall be installed in compliance with the design professional's specifications, requirements and recommendations, including surface and subsurface drainage systems. (Ord. 1754 § 1, 2006).

Other

Section 17 Subdivisions – The Subdivision Ordinance of the City of Golden, Colorado is adopted to:

- Protect and provide for the health, safety, and general welfare of the City of Golden;
- Promote the orderly growth of the city in concert with the comprehensive master plan;
- Provide adequate and effective public utility systems;
- Provide for the proper distribution of population and supportive land uses;
- Provide for the proper design and construction of the transportation system consistent with the adopted Thoroughfare Plan;
- Establish standards for design and set forth the procedures for the subdivision and resubdivision of land in property relation to the type of land use and population to be served;
- Ensure the use of proper legal descriptions, surveying, and monument of subdivided land.

This Subdivision Ordinance is to be enforced and interpreted in concert with the zoning ordinance of the City of Golden and other applicable regulations, ordinances, codes and rules. All plats and plans submitted shall be in a form which satisfies this ordinance, the zoning ordinance, and all other applicable ordinances and regulations. (Ord. 1152, 1992; Ord. 676 § 2 (l-3), l973).

Section 18 Planning and Zoning - These regulations are enacted for the purposes of promoting the health, safety, convenience, order, prosperity, and welfare of the present and future inhabitants of the City of Golden through growth management; for adequate and convenient open spaces for traffic, utilities, access of fire fighting apparatus, recreation, light, air, and solar access; and for the avoidance of congestion of population, and other public requirements. This section also includes criteria for expansion or inclusion of public parks and trails for new or expanded development.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

2008 City of Golden Parks and Recreation Department Master Plan – The City of Golden Parks and Recreation Master Plan is a guiding document used by elected and appointed officials to determine potential actions. The Master Plan documents, classifies, and inventories the parks, trails, and recreation facilities currently owned and maintained by the City of Golden Parks and Recreation Department. The Master Plan also lays out standards for future developments' inclusion of open space and public recreation areas.

2003 City of Golden Bicycle Master Plan - The bicycle master plan describes the City's vision for bicycle route development. It will serve as a 10-year plan, which will help guide the city in developing a citywide bicycle system that also links to surrounding areas bicycle systems.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Snow removal - The Street Division is responsible for snow and ice control maintenance of approximately 230 lane miles of asphalt pavement. All city streets are maintained during each storm as required. Snow and ice control services are provided for community safety purposes first and for convenience secondarily. The snow and ice control plan is revised annually.

Fire plans - The City of Golden has a Community Wildfire Protection Plan (CWPP) last updated in 2007. The CWPP was developed for the City of Golden with guidance and support from Jefferson County Division of Emergency Management, Colorado State Forest Service and the United States Forest Service. This CWPP supplements the Jefferson County Annual Operation Plan and the Jefferson County Fire Plan. Initial response to all fire and medical and associated emergencies is the responsibility of the City of Golden.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

Replacement of the Lena Gulch culvert under Heritage Road. The old 60-inch diameter metal pipe was significantly undersized—it would not pass even the "5-year storm" and thus the potential for even a modest rainfall event to overtop Heritage Road was very real. The undersized pipe was replaced with an 8-foot by 8-foot concrete box culvert, which will safely pass flows from the "100-year storm." This will reduce flood impacts on the upstream property owner and help protect Heritage Road from overtopping during small rain events.

Figure 5. Lena Gulch pipe under Heritage Road almost at capacity

Figure 6. New box culvert and erosion protection in Lena Gulch at Heritage Road

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

The City's Communication Manager is responsible for all aspects of the City's public communications activities and operations, including strategic and crisis communications, public

relations, marketing, audio-visual production, publications production and event planning. The Communications Manager directs and develops programs to increase citizen understanding of municipal operations and that deliver effective two-way communications, including citizen, media relations, public relations, marketing, intergovernmental and interdepartmental relations. The Communications Manager serves as advisor to the City Manager, Council and staff in developing and fostering successful relationships with the community, media and other governments via effective day-to-day communications.

1.6 Mitigation Actions

Golden has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Emergency Operations Plan Development

Issue/Background: Current City of Golden Emergency Operations Plan (EOP) is out of date and is not functionally responsive to current emergency operations requirements.

Other Alternatives:

- Do Nothing- Not acceptable
- Internal staffing lacks availability, skills, and experience to complete quality project.

Responsible Office: City of Golden City Manager's Office

Priority (High, Medium, Low): High

Cost Estimate: $50,000 external consultant costs; internal staffing costs to be determined.

Benefits (Losses Avoided): Identify disaster specific actions and develop specific procedures, training, and exercises.

Potential Funding:

Schedule: 12 months – January 1, 2010 through December 31, 2010.

2. Winter Weather Citizen Shelter Facility Identification and Readiness

Issue/Background: When the Golden area experiences severe winter weather, the surrounding highways such as I-70, C-470, Highway 93, and Highway 58 often are impassable and are completely shut down. With I-70 being the major East/West highway for the Denver Metro area and the State of Colorado, severe winter weather causes large numbers of travelers to be stranded in the Golden area and they require warm and safe shelter facilities with appropriate

accommodations. In addition, it is also possible that local Golden citizens could also be stranded or unable to occupy their normal residential shelters or employees are unable to return to their home location. Winter weather shelter facilities need to be identified and plans put in place to ensure they are opened up and appropriate staffing and accommodations are available to support stranded citizens in the event of severe winter weather. The plan needs to confirm availability of appropriate facilities and get permission agreements in place, obtain and update current contact information and procedures for key-holder response, provide for keeping street access open, provide for appropriate accommodations (cots, blankets, water, etc.) s, provide for appropriate security, EMS, safety, and communications.

Other Alternatives: No action.

Responsible Office: Golden Police Department

Priority: High

Cost Estimate: Staff time

Benefits (Losses Avoided): The benefits of this project will be to have adequate citizen emergency shelter facilities that are readily available and geographically distributed within the City of Golden in the event of significant severe winter weather. This will potentially save lives or injury to stranded citizens who otherwise would be left exposed to severe weather elements

Potential Funding: Existing budget.

Schedule: Within the next 2 years.

3. Kenney's Run Culvert Improvements

Issue/Background: Between 24th and 23rd, the existing drainage channel has an 823 cubic feet per second (cfs) capacity. This is very undersized compared to the 100-year 1,550 cfs calculated by Urban Drainage.

Other Alternatives: No action.

Responsible Office: Department of Public Works

Priority: High

Cost Estimate: $760,000 – $1,308,000

Benefits (Losses Avoided): Reduced danger of flooding to homes and businesses in the area.

Potential Funding: To be determined.

Schedule: Within the next 2 years.

4. Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program

Hazards Addressed: Flood

Issue/Background: The City of Golden participates in the National Flood Insurance Program. The City also participates in the Community Rating System and is a CRS Class 9. This project restates the commitment of the City of Golden to implement sound floodplain management practices, as stated in the flood damage prevention ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers will remain current on NFIP policies. The City of Golden's City Engineer and Civil Engineer are both Certified Floodplain Managers (CFMs) in good standing with the Association of State Floodplain Managers. The City also distributes the enclosed brochure each Spring to all properties in the floodplain.

Other activities that could be included in this effort are:

- Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance;
- Suggest changes to improve enforcement of and compliance with regulations and programs;
- Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;
- Utilize recently completed Digital Flood Insurance Rate maps in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of floodplain permits;
- Promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Urban Drainage and Flood Control District, and Colorado Water Conservation Board.
- Evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents

Other Alternatives: No action

Responsible Office:

City of Golden Public Works
Vince Auriemma, Certified Floodplain Manager
1445 10th Street
Golden, CO 80401

Priority (High, Medium, Low): Medium

Cost Estimate: Low

Potential Funding: Covered in existing budget

Benefits (avoided losses): Reduced property loss from floods, continued availability of flood insurance for residents; as a CRS participant residents will have lowered flood insurance rates.

Schedule: Ongoing

ANNEX D CITY OF LAKEWOOD ANNEX

1.1 Community Profile

1.1.1 History

The City of Lakewood is located in eastern Jefferson County and is the most populous city in the County.

Earliest settlement of the community that is now Lakewood occurred just prior to 1860 as a result of gold-seekers. Notable early developments still standing include the Stone House at South Garrison and Estes streets, and the Rooney Ranch at West Alameda Avenue and C-470.

In the late 1800s, there were a few subsistence farms, small dairies and orchards. Families slowly settled into the area. Entrepreneurs began to build businesses to serve the new residents and those traveling through the area. The highest concentration of commercial and residential uses occurred along the West Colfax Avenue and Wadsworth Boulevard corridors. In 1890, Jefferson County had a population of 8,450. At that time, the City of Denver had about 100,000 residents.

The name Lakewood was commonly used long before the City was incorporated in 1969. The first known use of the name was when the Loveland and Welch families created the Lakewood Subdivision in 1899. The Jefferson County Board of Commissioners awarded the Loveland and Welch families the right to build and operate a railroad on east-west streets, through the Lakewood Subdivision, from what is now Sheridan Boulevard to the City of Golden. The Denver, Lakewood and Golden Railroad was formed. The railroad right of way was established toward the end of the 19th century. The expansion of the railroad and development of a network of irrigation ditches made it possible for farms and businesses to prosper.

Roadway improvements set the stage for continued growth in the early to mid-20th century. By 1939, businesses and neighborhoods were linked by a thousand miles of county roads. In 1941, 6,000 workers labored eight months to open the Remington Arms Company, an ammunition factory on what is now the Denver Federal Center at Kipling Street and West Alameda Avenue. As workers and their families moved into the area, demand increased for housing, schools and services.

During the 1950s, people began to move to Jefferson County for its rural character. The county had more horses per person than any other county in the United States. One of the largest growth spurts in county history occurred during this time when the population increased by 130 percent from 1950 to 1960.

Several issues led to Lakewood seeking incorporation, most significantly was public safety. Busing to Denver public schools and possible annexation into Denver were additional concerns for residents in the late 1960s. There were several attempts at incorporation. These efforts were successful in 1969. At a population of 70,000, Lakewood was the largest municipal incorporation in the nation at the time.

Since 1970, Lakewood has doubled in population and is currently the 4th most populous city in Colorado and the 2nd most populous Denver suburb. Lakewood also houses the prestigious Lakewood High School, ranked number one in the state by Newsweek, and the only International Baccalaureate School in Jefferson County. Lakewood is also home to Colorado Christian University.

1.1.2 Population

The U. S Census Bureau's estimated 2007 population of Lakewood was 143,157. Select Census 2000 demographic and social characteristics for Lakewood are shown in Table 1.

Table 1. Lakewood's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	49.4
Female (%)	50.6
Under 5 Years (%)	6.1
65 Years and Over (%)	12.1
Race/Ethnicity (one race)	
White (%)	87.2
Hispanic or Latino (Of Any Race) (%)	14.5
Other	
Average Household Size	2.32
High School Graduate or Higher (%)	89.3

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Lakewood's labor force were educational, health, and social services (15.7%); professional, scientific, management, administrative, and waste management services (13.2%); and retail trade (12.1%). Select economic characteristics for Lakewood from the 2000 Census are shown in Table 2.

Table 2. Lakewood's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	4.8%
Individuals below Poverty Level, 1999	7.1%
Median Home Value	$174,900
Median Household Income, 1999	$48,109
Per Capita Income, 1999	$25,575
Population in Labor Force	81,904
Unemployment (%)*	2.4%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Lakewood using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the City of Lakewood's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The City of Lakewood's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member and the risk assessment developed during the planning process (refer to Chapter 4 of the base plan).

This matrix reflects that the hazards of medium significance to the City of Lakewood area dam failure, flood, lightning, severe winter storms, and tornado. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 3. City of Lakewood – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Avalanche	Unlikely	Limited	Negligible	Low	
Dam Failure	Occasional	Significant	Limited	Medium	
Drought	Occasional	Limited	Limited	Low	
Earthquake	Occasional	Limited	Limited	Low	
Erosion and Deposition	Likely	Limited	Negligible	Low	
Expansive Soils	Likely	Significant	Negligible	Low	

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/Source)
Extreme Temperatures	Occasional	Limited	Negligible	Low	
Flood	Likely	Significant	Limited	Medium	
Hailstorm	Likely	Limited	Limited	Low	
Landslide, Debris flow, Rockfall	Likely	Limited	Negligible	Low	
Lightning	Likely	Limited	Negligible	Medium	
Severe Winter Storms	Highly Likely	Extensive	Limited	Medium	
Subsidence	Likely	Limited	Negligible	Low	
Tornado	Occasional	Limited	Limited	Medium	
Wildfire	Occasional	Limited	Negligible	Low	
Windstorm	Highly Likely	Extensive	Negligible	Low	

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the City of Lakewood noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

1979 Dam Failure

On March 17, 1979, the fabridam of the Maple Grove Dam was punctured by an unknown, sharp object. It was determined to be most likely due to vandalism. Vandals using knives sliced open the 30-foot long dam allowing a relatively small but certainly unexpected flood to occur. The peak flow immediately below the reservoir was about 750 cubic feet per second (cfs) and caused some residential basement flooding and first floor damage to some commercial buildings.

Buildings in the area of 27th and Youngfield suffered the most damage. The fabridam spillway was replaced in 2004 with a more vandal resistant structure.

December 2008 Snow Storm

A Pacific storm system coupled with upslope winds produced heavy snow in and near the foothills of Boulder, Jefferson, and Douglas Counties, and along the Palmer Divide. In the Front Range Foothills, storm totals included 12″ in Lakewood. Heavy drifting was reported. Many roofs in Lakewood suffered damage. Businesses were forced to close, resulting in a loss of retail revenue for businesses and tax revenue for the city. Lakewood was granted state/federal reimbursement for snow removal costs in the amount of $100,289.

Green Mountain Fire

On August 4, 2008 at approximately 2:30 pm the City of Lakewood experienced a large grass land fire on Green Mountain. Fire crews from West Metro Fire District along with other fire departments in Jefferson County provided fire suppression resources to fight the fire. The fire consumed 388 acres and was declared controlled on August 8, 2008.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas. For a discussion of the methodology used to develop the loss estimates refer to Section 4.3 of the Base Plan.

Flood

According to the vulnerability assessment conducted using HAZUS-MH, Lakewood has one of the higher potentials for economic loss and displaced populations (4,503) from flooding in the County. Note that this is based on computer modeling that may not reflect specific mitigation activities. Lakewood Gulch, Lena Gulch, and other drainages off of Green Mountain have been a source of flood problems. A history of flooding on these gulches can be found in Section 4.2.9 Floods in the main plan. The extent of flooding in Lakewood is represented in Figure 1. Detail on the types of structures is provided in Table 4, showing the numbers of residential and commercial buildings impacted by flooding, and the anticipated percent of damage. According to the analysis, the most at risk structures are primarily residential. The analysis of critical facilities did not indicate any facilities at risk. At the time this plan was developed there were 22 repetitive loss claims, as defined by the NFIP and data from the City of Lakewood, on 8 properties (6 of which are single family residential and 2 of which are non-residential). Of these 8 properties, the last claim for repetitive loss was in 1998. Most of the claims were made during the 1980's. According to the City Engineering Department, the currently planned Regional Transportation Districts' (RTD) "FasTracks" improvements will eliminate flooding problems for

majority of these properties. Once improvements are made, a Letter of Map Revision will be released. The exact location of these structures cannot be listed due to Privacy Act restrictions.

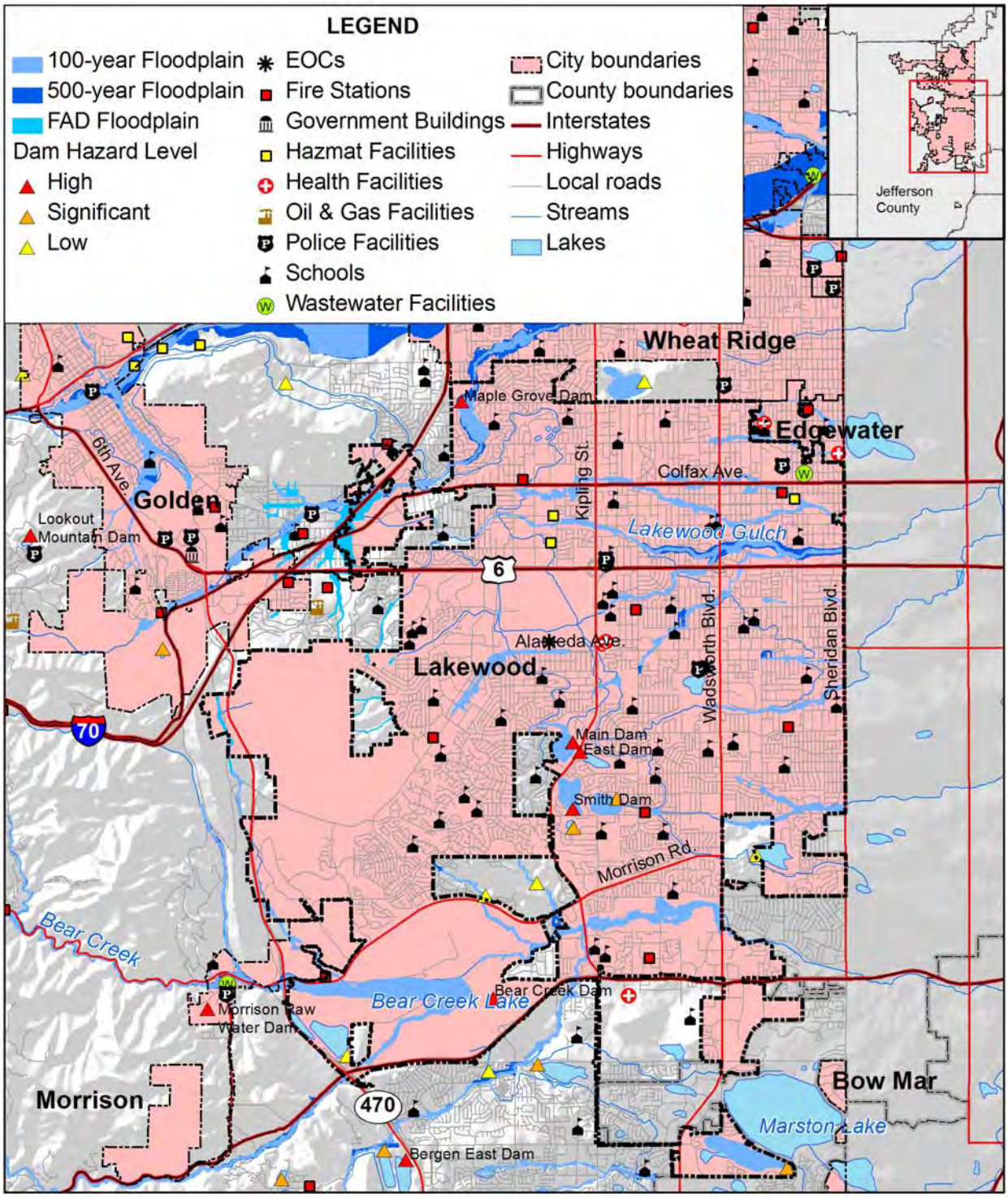
Table 4. Lakewood 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Lakewood	50,933,000	72,158,000	1,745,000	136,000	325,000	1,885,000	61,000	128,737,000

Table 5. Lakewood Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	TOTAL
Lakewood	1	66	32	0	152	0	9	0	50	0	12	2	**324**

Figure 1. City of Lakewood Flood Hazards and Critical Facilities Map



amec

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County, HAZUS-MH MR4, DFIRM, Urban Drainage and Flood Control District

Dam Failure

According to the vulnerability assessment in Chapter 4 Lakewood has four class I dams and five class II dams that could impact the City. See discussion the in Section 4.3 in the Base Plan.

Geologic Hazards

Lakewood has exposure to geologic hazards including subsidence, swelling soils, and dipping bedrock. Most of these areas are presently undeveloped and on the western limits of the City, near Green Mountain and around Bear Creek State Park. See the map in Figure 2. Specific structures at risk from specific geologic hazards are detailed in Table 6. Methodology for this table can be found in Section 4.3.4 Estimating Potential Losses. The City would like to include a more detailed analysis of potentially active faults in future updates to this plan.

Table 6. City of Lakewood Geologic Hazards Risk

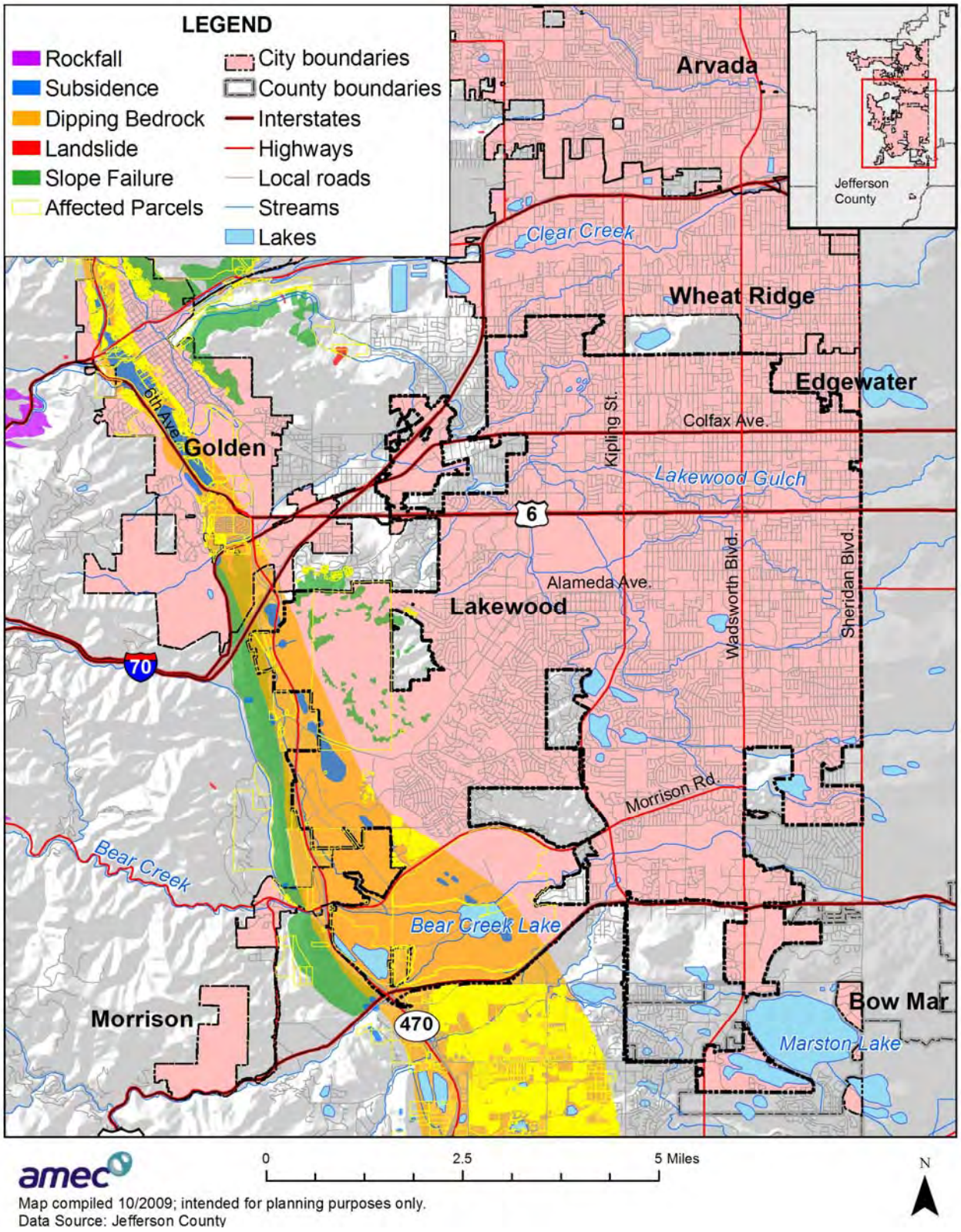
Geologic Hazard	Occupancy Type	Count of Improved Parcels	Improvement Value ($)*	Contents Value ($)**
Slope Failure	Commercial	3	$1,658,010	$1,658,010
Slope Failure	Residential	19	$4,935,300	$2,467,650
Subsidence	Commercial	3	$114,110	$114,110
Subsidence	Residential	5	$2,195,800	$1,097,900
Total		**30**	**$8,903,220.00**	**$5,337,670.00**

Source: Jefferson County Assessors Office

*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.

**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

Figure 2. City of Lakewood Geologic Hazards Map



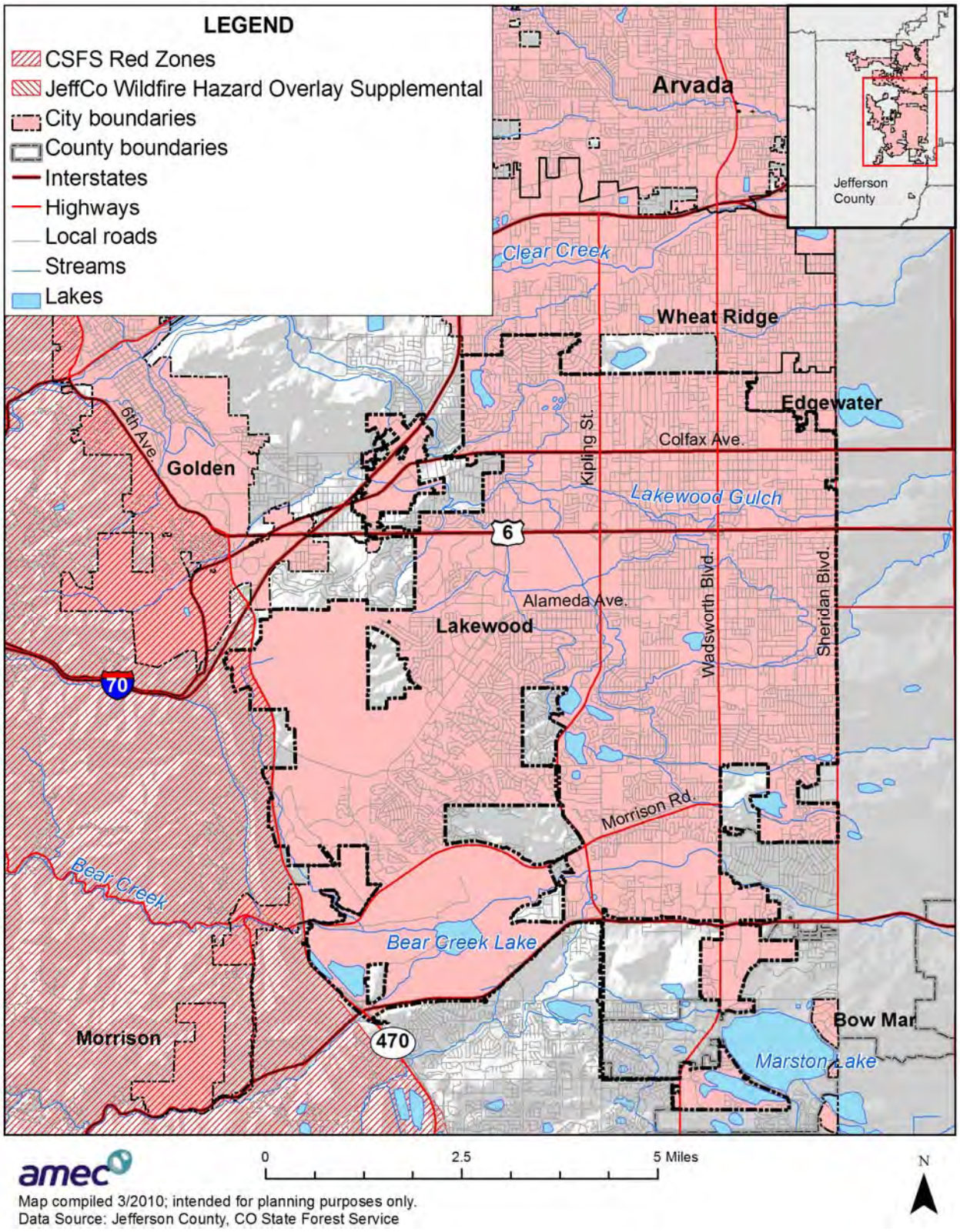
Wildfire

While not a foothills community, Lakewood does have risk of wildfires, particularly grass fires on the western edge of the City around Green Mountain and Bear Creek Reservoir. According to the GIS based analysis of wildfire in Section 4.3 the City has 6 commercial structures in a Red Zone & Jefferson County Wildfire Hazard Overlay Zone with a structure value of $1.1 million. The structure counts and values by structure type are provided in the following table. This table does not reflect the several hundred residential structures that border the Green Mountain Open Space that are potentially at risk to grass fires.

Table 7. City of Lakewood Wildfire Risk by Structure Type

City	Occupancy	Structure Count	Structure Value	Contents Value
Lakewood	commercial	6	$1,144,800	$1,144,800

Figure 3. City of Lakewood Wildfire Hazard Map



Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, earthquake, lightning, tornado and windstorm the entire building inventory and population in the City is potentially exposed. That is the reason for the asset inventory provided in Section 1.3 below. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

Additional Vulnerability Issues

The City of Lakewood has a large population of citizens who would fall into the "Special Needs Category". Existing plans are currently being revised and updated to better help address this vulnerability.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 8 represents an inventory of property in Lakewood based on the Jefferson County Assessor's data as of June.

Table 8. Lakewood's Property Inventory

Property Type	Parcel Count	Land Values ($)*	Improved Values ($)**	Total Values ($)
Residential	40,675	$6,787,794,945	$3,393,897,473	$10,181,692,418
Commercial	2,384	$3,637,318,159	$3,637,318,159	$7,274,636,318
Government	2	$158,590	$158,590	$317,180
Religious	1	$950,500	$950,500	$1,901,000
Total	**43,062**	**$10,426,222,194**	**$7,032,324,722**	**$17,458,546,916**

Source: Jefferson County Assessor's Office

*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.

**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 9 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 9. Summary of Lakewood's Critical Facilities in GIS

Name of Asset	Type	Address	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Lakewood Municipal Center	EI				
Lakewood Police Admin	EI				
Police Dispatch Center	EI				
City Shops	EI				
Fleet Maintenance Center	EI				
Emergency Operations Center	EI	$600,000			
West Metro Fire Admin	EI				
West Metro Fire Station	EI				
Green Mtn. Radio Tower	EI				
Police Vehicles	EI				
Fire Vehicles	EI				
Public Works Vehicles	EI				
Moffat Water Treatment	EI				
Suburban Propane	HM				
Denver Federal Center	VF				
Consolidated Mutual Water	EI				
East Reservoir	VF				
Main Reservoir	VF				
Smith Reservoir	VF				
Bear Creek Reservoir	VF				
Harriman Dam	VF				
Kendrick Dam	VF				
6'" Avenue	EI				
Belmar Shopping Center	VF				
Mills Shopping Center	VF				
Lakewood City Commons	VF				
Allison Care Center	VF			93	
Atria Inn at Lakewood	VF			274	
Bethany Healthplex	VF			170	
Braun Way	VF			8	
Brighton Gardens of Lakewood	VF			45	
Cambridge Care Center	VF			100	
Catherines Quality of Life Homes Inc. 4	VF			7	
Catherines Quality of Life Homes Inc. II	VF			8	

Name of Asset	Type	Address	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Cedars Healthcare Center	VF			120	
Cedar House	VF			7	
Companion Care	VF			10	
Dakotah Quarters	VF			4	
Distinctive Care, LLC	VF			12	
Eaton Terrace II	VF			74	
Evergreen Terrace Care Ctr.	VF			57	
Fountainhead Care Homes	VF			14	
Glen Ayr Health Center	VF			75	
Grand Oaks Care Center	VF			120	
Grandville Assisted Living	VF			120	
Haf House/RTF	VF			8	
Harmony Pointe Nursing Center	VF			100	
Heritage Club at Lakewood Assisted Living	VF			132	
Homestead at Lakewood	VF			36	
Hospice of Saint John	VF			42	
Independence House	VF			8	
Just for Seniors Living Ctr.	VF			24	
Lakewood Meridian Health Ctr.	VF			59	
Learning Services – Bear Creek	VF			21	
Learning Services – Glen Dee	VF			8	
Majestic Heights	VF			6	
Mapleton Care Center	VF			90	
Nelson	VF			8	
Rosewood	VF			8	
Sierra Healthcare Community				83	
Teller Place/RTF				15	
Vern's Vigilant Care Home				8	
Villa Manor Care Center				240	
Western Hills Health Care Center				140	
William B. Forward				6	

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Many of the facilities listed above are also in GIS databases provided by the City of Lakewood and Jefferson County. Critical facility counts and types are shown in Table 10 and in the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 10. Summary of Lakewood's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	48
Dams	10
EOC	2
Fire Stations	7
Hazmat Facilities	3
Health Facilities	2
Police Facilities	4
Schools	42
Wastewater Facilities	1
Total	119

Source: City of Lakewood, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Lakewood to disaster also involves inventorying the natural, historical, 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 so 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

Natural resources of importance in Lakewood include the Main Reservoir, Smith Reservoir, East Reservoir, Hayden Green Mountain Park, Bear Creek Lake Park, Charles Whitlock Recreation Center, Lakewood Park, Green Mountain Recreation Center, Addenbrooke Park, O'Kane Park, Carmody Recreation Center and Park, Belmar Park, Crown Hill Park, Kendrick Lake Park, and the Bear Creek Greenbelt. For information about natural resources in Jefferson County, which includes Lakewood, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

Table 11 lists the properties in Lakewood that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

Table 11. Lakewood's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Building 710, Defense Civil Preparedness Agency, Region 6 Operations Center	Denver Federal Center	3/20/2000
Davies' Chuck Wagon Diner	9495 W. Colfax Ave.	7/20/1997
Hill Section, Golden Hill Cemetery	12000 W. Colfax Ave.	7/31/1995
Jewish Consuptives' Relief Society	6401 W Colfax Ave.	6/26/1980
Office of Civil Defense Emergency Operations Center	Denver Federal Center	12/16/1999
Peterson House	797 S. Wadsworth	9/10/1981
Schnell Farm	3113 S. Wadsworth	2/14/1997
Stone House	2900 S Estes Street	5/1/1975
Denver & Intermountain Interurban No. 25	Denver Federal Center, W. Alameda Ave. and S. Kipling St.	State Register 12/10/1997
Howell House	1575 Kipling St.	State Register 9/11/1996
Washington Heights School	6375 W. First Ave.	State Register 7/13/1994

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently 17 Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the vicinity of the City of Lakewood, but only the Peterson House (see Table 11) lies within the City limits.

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.

1.4 Growth and Development Trends

Table 12 illustrates how Lakewood has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Lakewood is undergoing little to no growth. Table 13 shows Lakewood's estimated population changes through 2020.

Table 12. Lakewood's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
144,126	143,109	-0.8%	62,422	65,797	5.4%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

Table 13. City of Lakewood Population Projections Through 2020

2000 Population	2010 Population	% change 2000-2010	2020 Population	% change 2010-2020
144,126	148,161	2.8%	152,310	2.8%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

Future growth for the City of Lakewood will be concentrated around the following:

- The addition of St. Anthony Hospital in 2010.
- The addition of light rail in the City.
- Future development in Rooney Valley.

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Lakewood's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 14 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Lakewood.

Table 14. Lakewood's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Master plan	Y	Comprehensive Plan
Zoning ordinance	Y	Lakewood.org
Subdivision ordinance	Y	Title 16 of Municipal Code
Growth management ordinance	Y	Lakewood.org
Floodplain ordinance	Y	Title 17 of Municipal Code

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Site plan review requirements	Y	Title 17 of Municipal Code
Other special purpose ordinance (stormwater, steep slope, wildfire)	Y	Stormwater
BCEGS Rating	N	
Building code	Y	Title 14 of Municipal Code
Fire department ISO rating	Y	Lakewood.org
Erosion or sediment control program	Y	Lakewood.org
Stormwater management program	Y	Lakewood.org
Capital improvements plan	Y	Lakewood.org
Economic development plan	Y	Lakewood.org
Local emergency operations plan	Y	Contact Brian Nielsen
Other special plans	N	
Flood insurance study or other engineering study for streams	Y	2003 Flood Insurance Study
Elevation certificates	Y	Lakewood.org

Table 15 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Lakewood.

Table 15. Lakewood's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Y	Planning and Public Works	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Planning and Public Works City Engineer	
Planner/engineer/scientist with an understanding of natural hazards	Y	Environmental Services Division	
Personnel skilled in GIS	Y	IT Department - Software Services Division	
Full-time building official	Y	Planning and Public Works	
Floodplain manager	Y	Chief Executive Office or his/her appointed designee	
Emergency manager	Y	Public Works	
Grant writer	Y	City Managers Office	
GIS Data – Hazard areas	Y	IT Department - Software Services Division	
GIS Data – Critical facilities	Y	IT Department - Software Services Division	

Personnel Resources	Yes/No	Department/Position	Comments
GIS Data – Building footprints	Y	IT Department - Software Services Division	
GIS Data – Land use	Y	IT Department - Software Services Division	
GIS Data – Links to assessor's data	Y	IT Department - Software Services Division	
Warning systems/services (Reverse 9-11, cable override, outdoor warning signals)	Y	Environmental Services Division	Reverse 911, outdoor sirens, KOA Radio 850 AM

Table 16 identifies financial tools or resources that Lakewood could potentially use to help fund mitigation activities.

Table 16. Lakewood's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	N	
Incur debt through private activities	N	
Withhold spending in hazard-prone areas		

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The City of Lakewood joined the National Flood Insurance Program (NFIP) on December 31, 1974, and the Community Rating System (CRS) on October 1, 1991. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood protection above the minimum NFIP requirements. As of October 2009, Lakewood had a CRS class rating of 6 (one a scale of 1-10, 1 being the best). This rating provides a 20 percent discount for policyholders

within a special flood hazard area (SFHA) and a 10 percent discount for those outside of an SFHA.

NFIP insurance data indicates that as of November 30, 2009, there were 428 policies in force in Lakewood, resulting in $96,384,300 of insurance in force. In Lakewood, there have been 117 historical claims for flood losses totaling $382,031. At the time this plan was developed there were 21 repetitive or severe repetitive loss structures as defined by the NFIP.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Lakewood activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

City of Lakewood Comprehensive Plan

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subject matter related to services, issues, and geographic areas within Lakewood. Combined, these elements serve to drive future policy decisions to preserve vital community attributes and service levels and manage growth.

The following goals and related polices that are relevant to this hazard mitigation plan are excerpted here:

- **Goal: Preserve the Historical, Cultural, Architectural, and Geographical Resources and Heritage of the Lakewood Community.**
  - **Policies**:
  - Support preservation of historic structures, places, and records, including citizen recollections of local history.
  - Encourage designation of eligible property by the Lakewood Landmark Preservation Committee.
  - Respect the unique and diverse characteristics of Lakewood's neighborhoods.
  - Support preservation of characteristics significant to historic development in commercial areas.

- Encourage developments that respect and incorporate natural features of a site into their design.
- Protect significant views of the mountains, other landmarks and downtown Denver.

- **Goal: Foster and Advance Regional Cooperation Regarding Planning Issues.**
  - **Policies**:
  - Use existing framework for intergovernmental cooperation and honor intergovernmental agreements.
  - Participate actively in regional planning efforts.
  - Promote communication with other jurisdictions.
  - Assume leadership when collaborating with other agencies and jurisdictions.
  - Coordinate with other agencies, adjacent jurisdictions and affected agencies when reviewing development proposals near the City's borders.
  - Ensure notification of and encourage involvement by all appropriate parties during consideration of land use proposals.

- **Goal: Promote Community Stewardship of Natural and Man-Made Resources and Environments within the Following**:
  - *Environment And Ecosystems*;
    - **Policies**:
    - Preserve, expand and restore natural habitats for wildlife and plants native to the region such as those at Hayden-Green Mountain Park, Bear Creek Lake Park, Bear Creek Greenbelt, and other similar locations. Consider connections between natural habitats and ecosystems in the planning and design of new developments, redevelopments, and City infrastructure.
    - Respect and preserve wildlife habitat and movement corridors, watersheds, open space, and other natural areas when planning, designing and building new projects.

  - *Community Development*;
    - **Policies**:
    - Conserve open lands by encouraging mixed-use infill developments and construction methods that minimize the disturbance of land.
    - Conserve available water supplies and improve water quality through the following:
      - Encourage the use of drought tolerant landscaping and native vegetation in all new development in the City, including infill projects.
      - Adopt policies requiring the use of drought tolerant landscaping and native vegetation in all City owned parks and facilities.
      - Encourage building techniques and designs that make efficient use of water, including reclamation of water for landscape irrigation.

- Promote the development of sustainable communities and activity centers where shopping, jobs, recreation and schools are accessible by multiple modes of transportation, thereby creating opportunities for people to live where they work.
- Promote increased energy efficiency, including the use of renewable ambient sources such as solar, wind and biomass energy, in the design of communities and in the construction of buildings and patterns of development.
- Plan and design communities to promote convenient mass transit, including light rail and other alternatives to single occupant vehicles.

- **Goal: Plan and Guide the City's Development within Well Defined Urban Growth Boundaries.**
  - **Policies**:
  - Approve new developments only if adequate public services, such as water, sewer, streets, emergency services, parks, recreation, schools, police, and fire are available or will be made available contemporaneously with new development.
  - Maintain a system of appropriate fees to compensate for the impacts of development on services and capital facilities.
  - Review the City's planning of capital improvements and services, balancing costs and competing needs on a citywide basis.

- **Goal: Develop Comprehensive Open Space Systems in Lakewood that Integrate Public and Private Parks, Open Space, Trails, and Recreational Facilities.**
  - **Policies**:
  - Strive for an interconnected parks and recreation system that is distributed throughout the urban area and neighboring jurisdictions.
  - Raise the level of awareness and appreciation for the value of Lakewood's public and private open space system.
  - Plan for park, trail and recreation amenities that benefit Lakewood residents and serve as an attraction to tourists and other regional users.
  - Seek to develop partnerships between the City, other governmental organizations, and the private sector for the protection and preservation of an open space system.
  - Ensure development provides and maintains access to public open land areas, where appropriate.

- **Goal: Integrate Usable Parks, Open Space, Trail Systems, and Recreational Opportunities into Development and Redevelopment Projects.**
  - **Policies**:
  - Provide incentives to encourage private participation in open space designation within new development and redevelopment projects.
  - Encourage and assist efforts by private landowners to integrate natural areas into their sites to protect, restore, or enhance privately owned natural areas.
  - Explore public/private partnership opportunities in facilities development.

– Encourage all new development and redevelopment containing a floodplain to incorporate the floodplain into the open space network where appropriate.

Municipal Code

Title 17, Article 14: Floodplain Management

Legislative Intent.

The intention of this Article is:

- To permit only that development within the flood plain which is appropriate in light of the probability of flood damage.
- That the regulations in this Article shall apply to all property located in the flood plains, as indicated in the Official Flood Studies for the City of Lakewood, as adopted by this Article and filed with the City Clerk.
- That these regulations combine with and qualify with the Zoning Ordinance regulations.
- That any use not permitted by the primary zone shall not be permitted in the flood plain and any use as permitted by the primary zone shall be permitted in the flood plain only upon meeting conditions and any requirements as prescribed by this Article.

Flood Plain Regulations.

Unless modified by other parts of this Ordinance, the following general Flood Plain Regulations shall be in force:

(1) (a) In areas of shallow indeterminate flooding, all new construction and substantial improvements of nonresidential and residential structures shall have the lowest floor, including basement, elevated to one foot (1') above the crown of the nearest street. (b) As an alternative for nonresidential structures only, the structure, including utility and sanitary facilities, can be completely flood-proofed to the level mentioned above. The walls and basement floor shall be completely waterproofed and they shall be built to withstand lateral and uplift water pressure.

(2) (a) In flood plain areas in which the 100-year flood elevations are known, all new construction and substantial improvements of residential and nonresidential structures shall have the lowest floor, including basement, elevated one foot (1') above the 100-year flood level as indicated in the Official Flood Studies. (b) As an alternative for nonresidential structures only, the structure, including utility and sanitary facilities, can be completely flood-proofed one foot (1') above the level of the 100-year flood as indicated in the Official Flood Studies. The walls and basement floor shall be completely waterproofed and they shall be built to withstand lateral and uplift water pressure.

(3) When flood-proofing is used for nonresidential structures, a registered professional engineer or licensed architect shall certify that the flood-proofing methods are adequate to withstand the

flood pressures, velocities, impact and uplift forces, and other factors caused by the 100-year flood. A record of this certification shall be maintained on file with the building permit by the Building Official. The elevation to which the structure is flood-proofed (based on sea level) shall be attached to the certification.

(4) All new individual manufactured homes, new manufactured home parks, expansions of existing mobile home parks, and mobile home parks where the repair, reconstruction or improvements of the streets, utilities and pads equal or exceed fifty (50) percent of their value before the repair, reconstruction or improvement was commenced, are to be placed or substantially improved and be elevated on a permanent foundation such that the lower floor of the manufactured home is one foot (1') above the 100-year flood elevations as indicated in the Official Flood Studies, provide adequate surface drainage, be securely anchored to an adequately anchored foundation system in accordance with this Ordinance, and access for a hauler be provided. When mobile homes are put on pilings, the lot must be large enough to have steps up to the mobile home. The pilings must be reinforced if they are more than six feet (6') high and they must be placed in stable soil on ten-foot (10') centers or less.

(5) Individual building permits shall be required for the placement of any manufactured homes anywhere in the flood plain.

(6) (a) All manufactured homes placed after the effective date of these regulations in the 100-year flood plain shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to use of over-the-top or frame ties to ground anchors. There shall be top ties at each corner with one (1) mid-point tie on each side of manufactured homes shorter than fifty feet (50'). Longer manufactured homes shall have two (2) ties at intermediate points on each side. (b) All parts of the anchoring system shall have a strength of 4,800 pounds. Additions to manufactured homes shall be anchored in the same way.

(7) Recreational Vehicles shall either (a) be on the site for fewer than 180 consecutive days, (b) be fully licensed and ready for highway use, or (c) meet the permit requirements and elevation and anchoring requirements for manufactured homes. (As amended by O-2002-32.)

(8) All land development proposals shall follow the guidelines for drainage studies outlined in the Engineering Regulations, Construction Specifications, and Design Standards adopted by the City Council of Lakewood, Colorado.

(9) The City of Lakewood will review all proposed development in the flood plain to verify appropriate permits have been obtained and to ensure compliance with Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 USC 1334.

(10) The City of Lakewood will: (a) Require flood plain construction permits for all new development and other activities such as filling, paving and dredging in the flood plain. (b)

Require building permits for structures in the flood plain according to the adopted building code and this Article. (c) Review all building permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a flood hazard area, all new construction and substantial improvements (including the placement of prefabricated buildings and mobile homes) shall be: (1) designed or modified and adequately anchored to prevent flotation, collapse, or lateral movement of the structure, resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (2) be constructed with materials and utility equipment resistant to flood damage, (3) be constructed by methods and practices that minimize flood damage, and (4) constructed with electrical, heating, ventilation, plumbing and air-conditioning equipment and other service facilities designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding. (d) Require every builder or developer to submit a statement from a registered land surveyor listing the lowest floor (including basement) of new and substantially improved structures. (e) Require that for all new construction and substantial improvements, fully enclosed areas below the lowest floor that are subject to flooding shall: (1) have the interior grade elevation that is below base flood elevation no lower than two feet below the lowest adjacent exterior grade, (As amended by O-2002-32.) (2) have the height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the foundation wall, not exceed four feet at any point, (As amended by O-2002-32.) (3) have an adequate drainage system that allows floodwaters to drain from the interior area of the crawlspace following a flood, (As amended by O-2002-32.) (4) be anchored to prevent flotation, collapse, or lateral movement of the structure and be capable of resisting the hydrostatic and hydrodynamic loads, (As amended by O-2002-32.) (5) be constructed with materials and utility equipment resistant to flood damage, (As amended by O-2002-32.) (6) be constructed using methods and practices that minimize flood damage, (As amended by O-2002-32.) (7) be constructed with electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding, and (As amended by O-2002-32.) (8) Be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or licensed architect or must meet or exceed the following minimum criteria: (a) A minimum of two (2) openings having a total net area of not less than one (1) square inch for every square foot of enclosed area subject to flooding shall be provided. (b) The bottom of all openings shall be no higher than one foot above the exterior grade. (As amended by O-2002-32.) (c) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters. (f) Review subdivision proposals and other proposed new development (including proposals for manufactured home parks and subdivisions) to determine whether such proposals will be reasonably safe from flooding. The proposals shall include base flood level data submitted with subdivision proposals and other proposed developments greater than fifty (50) lots or five (5) acres whichever is less. If a subdivision proposal or other proposed new development is in a flood hazard area, any such proposals shall be reviewed to assure that: (1) all such proposals are consistent with the need to

minimize flood damage within the flood hazard area, (2) all public utilities and facilities, such as sewer, gas, electrical and water systems are located and constructed to minimize or eliminate flood damage, and (3) adequate drainage is provided to reduce exposure to flood hazards. (g) Require within flood hazard areas: (1) new and replacement water supply systems to be designed to minimize or eliminate infiltration of flood waters into the systems, (2) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters, (3) on-site waste disposal systems to be located to avoid impairment to them or contamination from them during flooding, and (4) cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the water surface elevation of the base flood more than six inches (6") at any point. (As amended by O-2002-32.)

Other Regulations

Title 13 Water and Sewers – This section of municipal code spells out the authority of the City of Lakewood to regulate water quality, and to operate and maintain sewer and water systems. It also includes a subsection relating to stormwater runoff and quality in Lakewood. Regulations regarding avoidance of erosion during land development are also included in this subsection, as are regulations regarding will drilling for personal use.

Title 17 Zoning - Pursuant to statutory authority, this Ordinance is enacted for the following purposes:

- To promote the health, safety, order, convenience, prosperity and welfare of the present and future inhabitants of the City of Lakewood.
- To lessen the impact of traffic and congestion in the streets and roads, to secure safety from fire and other dangers, and to provide adequate sun, light and air.
- To provide for the classification of land uses and the distribution of land development within and utilization of those land uses.
- To avoid undue congestion of population, to facilitate the adequate provision of transportation, water, schools, sewerage, and other public requirements and to promote energy conservation.
- To accomplish the purposes of the City's Comprehensive Plan and of the zoning maps adopted herein.
- To promote vehicle and pedestrian safety.
- To enhance the appearance of the City, promote good civic design and arrangement, protect the value of property and conserve the value of buildings.
- To preserve open space and prevent the overcrowding of land.
- To protect property from adverse influences of adjacent property where differing zone districts abut.
- To provide planned and orderly use of land within the City.
- To update and modernize the previously adopted zoning ordinance of the City.

Other Plans

Neighborhood Plans - A neighborhood plan is a policy document that provides guidance to city officials and city staff regarding decisions in a neighborhood and serves as a tool to enhance the character and quality of a neighborhood. To date, neighborhood plans have been adopted for nine neighborhoods, including the neighborhoods of Addenbrooke/Belmar Park (2008), Edgewood (1997), Eiber (2001), Jefferson Gardens (1995), Lasley (2001), Molholm/Two Creeks (1996), Morse Park (2005), North Alameda (1998), and South Alameda (2002).

Federal Center Comprehensive Plan Amendment - In August 2008, the Lakewood Planning Commission adopted and Lakewood City Council approved the Federal Center Comprehensive Plan Amendment. The Lakewood Comprehensive Plan did not address the Federal Center property, as it was not part of the City of Lakewood when the Comprehensive Plan was developed and adopted in 2003. The Denver Federal Center property was annexed into the City in 2007.

The long term master plan is organized around an open space system located at the center of the Federal Center site. This alternative includes up to approximately 3.6 million square feet of new development, 1,400 residential units and 230 acres - approximately 36 percent of the site - designated as open space.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

Lakewood is currently developing an Open Space Master Plan however it will not be completed for several months. Inventories of assets and mapping will be completed during the creation of this plan.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

The following relevant annexes have been incorporated into the City of Lakewood's Emergency Preparedness Plan:

- City Wide Snow and Ice Response Plan
- City Wide Flood Plan
- City Wide Severe Winter Storm Plan
- Dam Failure Plans for:
  - East Reservoir

- Main Reservoir
- Smith Reservoir
- Maple Grove Reservoir
- Bear Creek Reservoir

The Police Department was a grant recipient for a Buffer Zone Protection Planning Grant in 2002.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

- Bear Creek Reservoir was built by the Army Corp of Engineers to provide flood protection for Lakewood, Sheridan, Englewood, Denver, and areas downstream of Denver.

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

Routine - Public announcements via Channel 8, Looking at Lakewood, and educational brochures on:

- Flood Hazard
- Recycling
- Homeland Defense
- Emergency Preparedness

1.6 Mitigation Actions

This section outlines the mitigation action plan. The action plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals. Lakewood had the choice to continue to be a participant in the update of the Denver Regional Council of Governments (DRCOG) Natural Hazard Mitigation Plan or develop a separate more detailed Jefferson County specific multi-jurisdictional mitigation plan. Lakewood chose to separate out from the DRCOG Regional Plan and utilize the planning opportunity with the intent of developing this more robust and specific plan.

Existing and planned mitigation actions from the 2003 DRCOG Regional Mitigation Plan were reviewed for Lakewood, and are contained in Table 17. The actions were very general categories of mitigation actions rather than specific actions. The DRCOG plan grouped the categories by the same list used by the NFIP Community Rating System noted previously in Section 5.2 of the main plan. The majority of the action items identified for these jurisdictions were the continuation of ongoing capabilities, such as maintaining and updating building codes, floodplain regulations, stormwater management, erosion and sediment control, best management practices, etc. During the 2009-2010 development of this plan several of the existing actions related to ongoing capabilities for Lakewood were deleted from the mitigation action plan and captured in Section 1.5 of this Annex, which is also organized by CRS mitigation category. Thus the actions identified in section 5.3 of the main plan, and explained in greater detail in Section 1.6.1 of this plan, represent new actions or those actions further refined from the DRCOG plan. Examples of this include the DRCOG "Floodplain Development Regulations" action, which is now refined to include: "Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program.

Table 17. DRCOG 2003 Mitigation Action Status Table – Lakewood

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred (ongoing)	Comments
Prevention:		
Adopt or Revise Building Code	Deleted	Ongoing see capability assessment
Planning And Zoning: Land Development Regulations	Deleted	Ongoing see capability assessment
Open Space Preservation	Deleted	Ongoing see capability assessment
Floodplain Development Regulations	Ongoing	replaced by NFIP compliance action
Storm Water Management	Ongoing	See capability assessment, NFIP action
Wildland Fuel Management	Deleted	No traditional WUI areas
Property Protection:		
Building Inspection and Modification	Deleted	Too generic
Insurance	Deleted	Addressed in NFIP compliance action
Natural Resource Protection:		
Wetlands Protection	Deleted	Ongoing, see capability assessment
Erosion and Sedimentation Control	Deleted	Addressed in development regulations
Best Management Practices	Deleted	Ongoing, see capability assessment
Emergency Services:		
Flood Warning Systems	Completed	Participates with Urban Drainage and Flood Control District warning system

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred (ongoing)	Comments
Flood Response	Deleted	Addressed in Emergency Operations Plan; Removed to keep plan's focus on mitigation
Critical Facilities Protection	Deleted	Too generic; specific activities will be noted
Health and Safety Maintenance	Deleted	Part of ongoing department activities; Removed to keep plan's focus on mitigation
Structural Projects:		
Reservoirs	Deleted	No new reservoirs planned
Channel Modifications	Completed	Stormwater drainage improvements
Structural design standards	Deleted	Ongoing, see capability assessment
Public Information:		
Map Information	Deleted	Action too generic to track.
Outreach Projects	Ongoing	Part of CRS program activities; See NFIP action
Real Estate Disclosure	Completed	
Library/ Environmental Education	Ongoing	Part of CRS program, see NFIP action
Technical Assistance	Deleted	Ongoing; too generic

1.6.1 New Mitigation Actions for the City of Lakewood

The following actions were developed and prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Burying Power Lines to Green Mountain Repeater Site

Issue/Background: Currently the Cities of Lakewood and Wheat Ridge, together with West Metro Fire Protection District, utilize an 800 MHz radio repeater on the top of Green Mountain. The radio repeater site and associated equipment are critical for each of the aforementioned agency's equipment. The repeater and associated radio and antenna are connected to an "old" above ground power line that is highly vulnerable to extended power interruptions due to high winds, snow accumulations, tornadoes, and lightning. The repeater site does have a 100 Kw generator and associated 390 gallon fuel tank that can provide emergency back up power for up to 84 hours if everything works as designed. However, in the event of a severe winter storm or other natural hazard, access to the top of the mountain can be extremely hazardous and/ or impossible making emergency fueling operations impossible during inclement weather conditions.

Other Alternatives: As an alternative, a new or improved access road could be constructed to ensure all weather access to the radio repeater sit. However, such road construction would be very expensive and would not be supported by a large number of open space groups.

Responsible Office: Lakewood Office of Emergency Management

Priority (High, Medium, Low): High

Cost Estimate: $150,000

Benefits (Avoided Losses): Reduce the possibility of power outages to critical asset that serves several jurisdictions.

Potential Funding: Grant

Schedule: Depending on available funding.

2. Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program

Hazards Addressed: Flood

Issue/Background: The City of Lakewood participates in the National Flood Insurance Program. The City also participates in the Community Rating System and is a CRS Class 6. This project restates the commitment of City of Lakewood to implement sound floodplain management practices, as stated in the flood damage prevention ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers remain current on NFIP policies, and are encouraged to attend appropriate training.

Other activities that could be included in this effort are:

- Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance;
- Suggest changes to improve enforcement of and compliance with regulations and programs;
- Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;
- Utilize recently completed Digital Flood Insurance Rate Maps (DFIRM) in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of floodplain permits. Continue to work with Urban Drainage and Flood Control District and Jefferson County to update and adopt DFIRM.

- Promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Urban Drainage and Flood Control District, and Colorado Water Conservation Board, and FEMA/NFIP.
- Evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents, work with the City of Lakewood Stormwater utility to obtain funding to complete projects that can mitigate flood hazard areas.
- Address the eight repetitive loss properties within the City of Lakewood. The City has made note of these problems and continues to address the flooding issues as capital improvement funds allow and as future development/redevelopment necessitates.

Other Alternatives: No action

Responsible Office: Lakewood Department of Planning and Public Works

Priority (High, Medium, Low): Medium

Cost Estimate: Low

Potential Funding: Covered in existing budget

Benefits (avoided losses): Reduced property loss from floods, continued availability of flood insurance for residents; as a CRS participant residents will have lowered flood insurance rates.

Schedule: Ongoing

ANNEX E CITY OF WHEAT RIDGE ANNEX

1.1 Community Profile

1.1.1 History

Wheat Ridge was founded as a community in 1859. During that year, a small group of farmers, some coming to Colorado in search of gold and silver, founded a rural village in this location. By the late 1800s, fertile soils and plentiful water led to the development of a small farming community. Up until World War II, Wheat Ridge was a major supplier of fresh produce to the greater Denver area. However, during the 1940s and 1950s as the city evolved, carnation production became a major growth industry. For a time, Wheat Ridge was the largest producer of carnations throughout the world. Although commercial wheat production is a thing of the past, the ridges upon which much of this agricultural activity occurred remain, providing expansive views of the Front Range. Additionally, several carnation greenhouses remain in the northwest metropolitan area. Each August, the city celebrates this heritage with the Carnation Festival. Started in 1970, the festival draws thousands of people to this premier civic event. The city was fully incorporated in 1969 as a statutory city when it was faced with annexation by surrounding cities. In 2009, the City celebrated its 40th birthday.

Today Wheat Ridge is home to approximately 31,000 residents – making it one the smallest cities in the Denver metropolitan area. The City is an inner-ring suburb that affords residents with many of the conveniences of urban living, though the community still retains its small town character with a strong sense of community. Its slow growth, compared to adjacent suburbs, and even slight population decline since 2000, offer stark contrast to the region's significant population growth over recent years. Residents enjoy easy access to I-70 and downtown Denver. The City is well known for its nationally recognized park and trail system and lush tree canopy. Wheat Ridge is a community with deep roots and short commutes.

1.1.2 Population

The U. S Census Bureau's estimated 2008 population of Wheat Ridge was 29,583. The City of Wheat Ridge has their own estimate of population – 30,929. Select Census 2000, as well as City of Wheat Ridge estimated demographic and social characteristics are shown in Table 1.

Table 1. Wheat Ridge's Demographic and Social Characteristics

Characteristic	U. S. Census Estimate	Wheat Ridge Estimate
Gender/Age		
Male (%)	47.3	47.7
Female (%)	52.7	52.3
Under 5 Years (%)	6.1	5.2

Characteristic	U. S. Census Estimate	Wheat Ridge Estimate
65 Years and Over (%)	19.0	21.9
Race/Ethnicity (one race)		
White (%)	89.2	83.7
Hispanic or Latino (Of Any Race) (%)	13.5	20.2
Other		
Average Household Size	2.20	2.19
High School Graduate or Higher (%)	85.6	85.4

Source: U.S. Census Bureau, 2000, www.census.gov/; City of Wheat Ridge

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Wheat Ridge's labor force were: educational, health, and social services (16.0%); professional, scientific, management, administrative, and waste management services (12.6%); and retail trade (12.6%). Select economic characteristics for Wheat Ridge from the 2000 Census, as well as estimates from the City of Wheat Ridge, are shown in Table 2.

Table 2. Wheat Ridge's Economic Characteristics

Characteristic	U.S. Census Estimate	Wheat Ridge Estimate
Families below Poverty Level, 1999	5.9%	5.9%
Individuals below Poverty Level, 1999	8.9%	8.9%
Median Home Value	$167,800	$167,800
Median Household Income, 1999	$38,983	$48,193
Per Capita Income, 1999	$22,636	$27,892
Population in Labor Force	17,228	16,217
Unemployment (%)*	2.9%	4.5%

Source: U.S. Census Bureau (2000), www.census.gov/; City of Wheat Ridge

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Wheat Ridge using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the City of Wheat Ridge's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The City of Wheat Ridge's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member.

This matrix reflects that the most significant hazards for the City of Wheat Ridge are flood, dam failure, and tornado. The City of Wheat Ridge has identified the following as medium significance hazards: severe winter storms and wildfire. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 3. City of Wheat Ridge – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Hazard Map? (Paper/GIS/ Source)
Avalanche	Unlikely	Negligible	Negligible	Low	Paper/DRCOG
Dam Failure	Occasional	Limited	Critical	High	GIS/FHAD
Drought	Likely	Extensive	Limited	Low	No
Earthquake	Unlikely	Extensive	Limited	Low	No
Erosion and Deposition	Highly Likely	Limited	Negligible	Low	No
Expansive Soils	Likely	Limited	Negligible	Low	Paper/SCS
Extreme Temperatures	Highly Likely	Extensive	Negligible	Low	No
Flood	Occasional	Significant	Critical	High	GIS/FHAD
Hailstorm	Likely	Extensive	Limited	Medium	Paper/DRCOG
Landslide, Debris flow, Rockfall	Unlikely	Limited	Negligible	Low	Paper/DRCOG
Lightning	Likely	Limited	Negligible	Low	Paper/DRCOG
Severe Winter Storms	Highly Likely	Extensive	Limited	Medium	No
Subsidence	Unlikely	Limited	Negligible	Low	No
Tornado	Likely	Significant	Catastrophic	High	Paper/DRCOG
Wildfire	Occasional	Significant	Limited	Medium	Paper/DRCOG
Windstorm	Likely	Extensive	Limited	Medium	Paper/DRCOG

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the City of Wheat Ridge noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

July 2009 Hail/Wind Storm

A severe thunderstorm produced damaging winds, large hail and very heavy rain across the western and southern suburbs of Denver. Widespread damage was observed in the City of Wheat Ridge. The intense straightline winds were the result of a wet microburst which downed hundreds of trees and snapped power poles. Winds gusts to 80 mph were reported along with nickel to golfball size hail. The combination of wind and hail produced widespread damage to homes and vehicles. Many Wheat Ridge residents were left without power. Minor injuries were reported from broken glass during the storm, but no one was hospitalized. The City suffered an estimated $600,000 in damage to City property.

1979 Dam Failure

On March 17, 1979, the fabridam was punctured by an unknown, sharp object. It was determined to be most likely due to vandalism. Vandalism of fabridam spillway for the Maple Grove Dam caused an unscheduled release of 100 acre-ft of water from the Maple Grove Reservoir in about 3 hours. Flooding occurred from the Dam south of 32nd Avenue to the confluence with Clear Creek. The fabridam spillway was replaced in 2004 with a more vandal resistant structure.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

According to the vulnerability assessment conducted using HAZUS-MH, Wheat Ridge has one of the higher potentials for economic loss from flooding in the County. Clear Creek flows through Wheat Ridge, and there is also risk from Lena Gulch that crosses the City. Note that this is based on computer modeling that may not reflect specific mitigation activities. Displaced populations, found in Table 4.30 in Section 4.3.4 Estimating Potential Losses, from flooding are estimated at 1,749 and 208 buildings are estimated to be at risk. The extent of flooding in Wheat Ridge is represented in Figure 1. Detail on the types of structures is provided in Table 5, showing the numbers of residential and commercial buildings impacted by flooding, and the

anticipated percent of damage. According to the analysis Wheat Ridge has a mix of residential and commercial structures potentially at-risk.

Analysis of flood prone critical facilities indicates that the Wheat Ridge Fire Station 2 is in the 500 year floodplain.

Table 4. Wheat Ridge 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Wheat Ridge	22,937,000	33,839,000	989,000	68,000	104,000	278,000	21,000	59,081,000

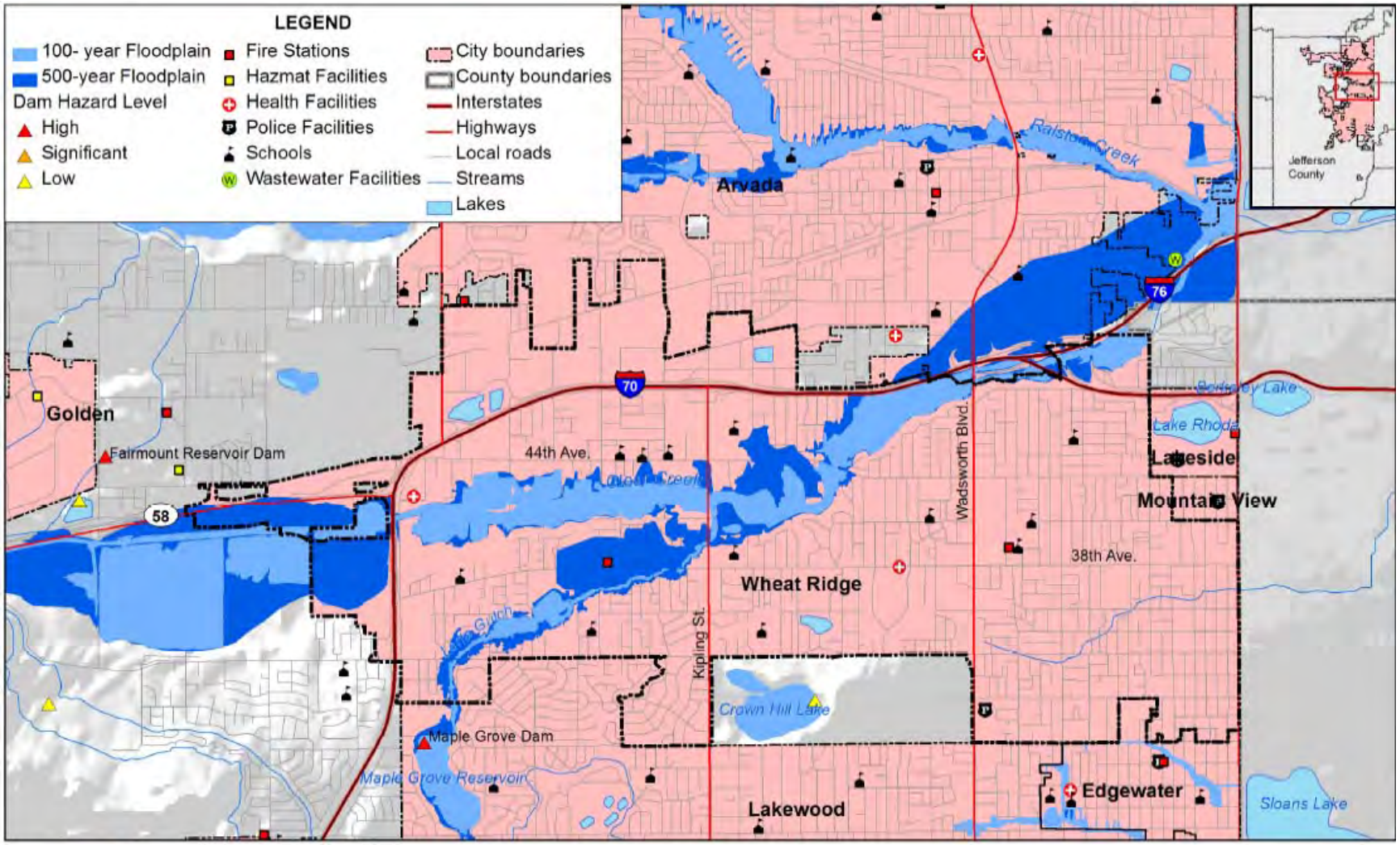
Source: HAZUS-MH MR 4

Table 5. Wheat Ridge Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	TOTAL
Wheat Ridge	0	29	25	2	120	0	6	0	20	0	6	0	**208**

Source: HAZUS-MH MR 4

Figure 1. City of Wheat Ridge Flood Hazard Map



amec

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County, HAZUS-MH MR4, DFIRM, Urban Drainage and Flood Control District

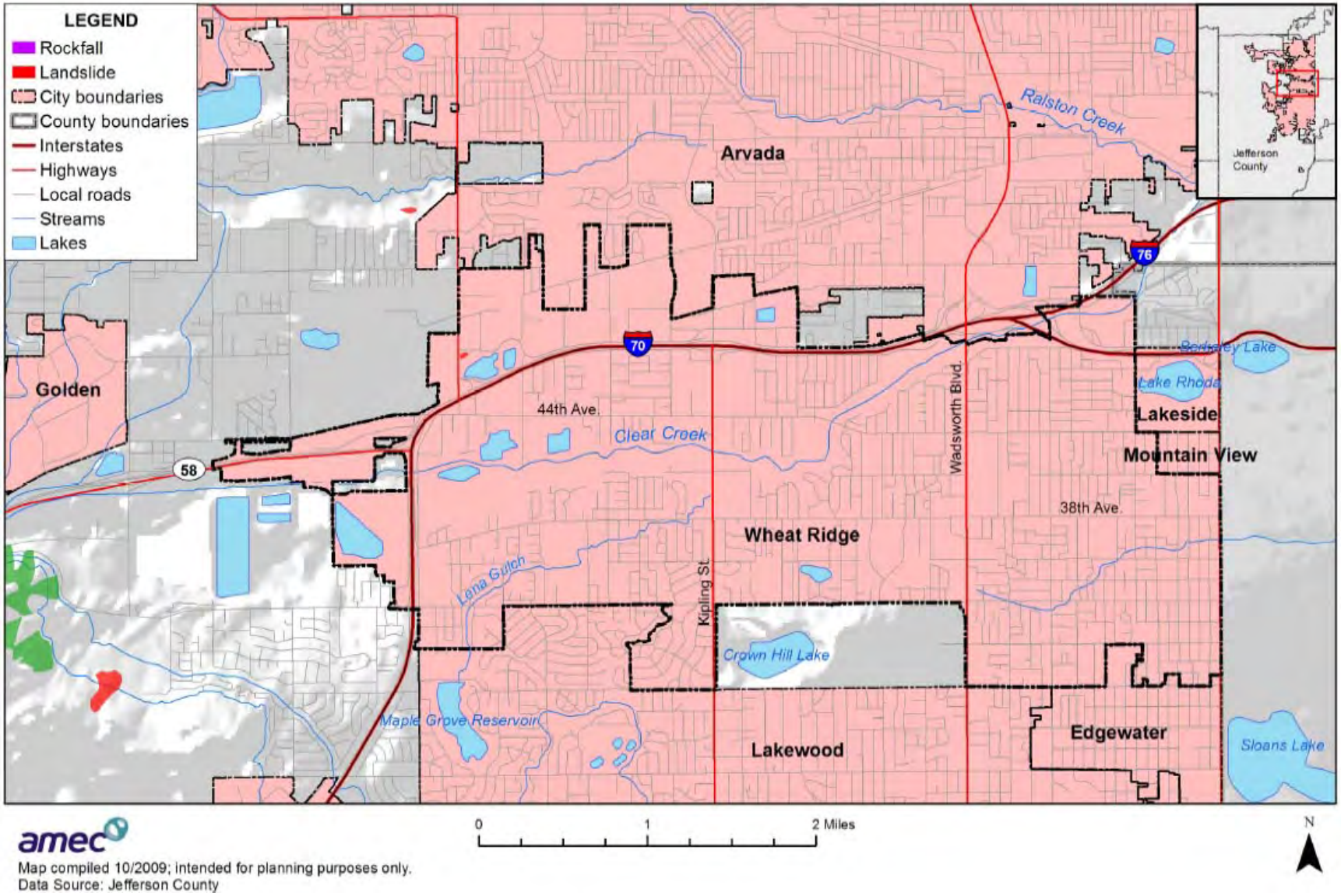
Dam Failure

According to the vulnerability assessment in Chapter 4 Wheat Ridge has one class I or High Hazard dam (Maple Grove Dam). The Fairmount Reservoir Dam, a High Hazard Dam, is located immediately to the west of the City of Wheat Ridge. See discussion the in Section 4.3 in the Base Plan.

Geologic Hazards

Wheat Ridge has some exposure to geologic hazards including landslide. There is a small area of landslide risk in the northwest corner of the City, between Mt. Olivet Cemetery and Ward Road Pond. See the map in Figure 2. Wheat Ridge's proximity to the Golden Fault as a potential, though unlikely, earthquake source make it more vulnerable to earthquake damage.

Figure 2. City of Wheat Ridge Geologic Hazards Map



Wildfire

There are no areas of the City of Wheat Ridge that fall within the Red Zone or Jefferson County Wildfire Hazard Overlay Zone.

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado and windstorm the entire building inventory and population in the City is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

Vulnerable Populations

The City of Wheat Ridge does have certain populations that would be considered to be "at risk" during hazards. These include:

- The City has a large elderly population with over 20% of our residents that are 65 or older.
- The City has a large disabled population with over 18% of our residents that are disabled.
- The City has several areas that qualify as low income with over 60% of the City having less than 80% of median income.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 6 represents an inventory of property in Wheat Ridge based on the Jefferson County Assessor's data as of June 2009.

Table 6. Wheat Ridge's Property Inventory

Property Type	Structure Count	Building Values ($)*	Contents Values ($)**	Total Values ($)
Residential	8,949	$1,343,182,187	$671,591,094	$2,014,773,281
Commercial	1,126	$911,487,213	$911,487,213	$1,822,974,426
Total	**10,075**	**$2,254,669,400**	**$1,583,078,307**	**$3,837,747,707**

Source: Jefferson County Assessor's Office
*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.
**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 7 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 7. Wheat Ridge's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Exempla Lutheran Medical Campus	EI		400 beds	Tornado
Wheat Ridge Medical Offices - Kaiser	EI			Tornado
City Hall – Police	EI			Tornado
Wheat Ridge Fire Station #1	EI			Tornado
Wheat Ridge Fire Station #2	EI			Tornado
Maintenance Facility	EI			Tornado
Maple Grove Reservoir	VF		550 AF	Flood, Dam Failure
Wheat Ridge High School	VF		1,275	Tornado
Everitt Middle School	VF		487	Tornado
Wheat Ridge Middle School	VF		366	Tornado
Prospect Valley Elementary School	VF		476	Tornado
Stevens Elementary School	VF		411	Tornado
Wilmore-Davis Elementary School	VF		283	Tornado
Pennington Elementary School	VF		277	Tornado
Kullerstand Elementary School	VF		267	Tornado
Martensen Elementary School	VF		252	Tornado
Compass Montessori Charter School	VF		661	Tornado
Saint Peter & Paul Catholic School	VF		351	Tornado
Beth Eden Baptist School	VF		233	Tornado
Foothills Academy	VF		190	Tornado
Wheat Ridge Christian Academy	VF		45	Tornado
Norma Anderson	VF		113	Tornado

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Preschool				
Kids in Action Preschool	VF		80	Tornado
Alpine Valley Preschool	VF		27	Tornado
Mountain Vista Health Center	VF		168 Beds	Tornado
Highland West Apartments	VF		120 Beds	Tornado
Sandalwood Manor	VF		85 Beds	Tornado
Wheat Ridge Manor Nursing Home	VF		81 Beds	Tornado
Christopher House	VF		76 Beds	Tornado
Vista Village Assisted Living	VF		54 Beds	Tornado
Wheat Ridge Assisted Living	VF		46 Beds	Tornado
Spring Ridge Park	VF		37 Beds	Tornado
Wide Horizon	VF		37 Beds	Tornado
Verandas Assisted Living at Wheat Ridge	VF		48 Beds	Tornado
21 Other Nursing Homes	VF		178 Beds	Tornado
Interstate 70	VF		135,000 ADT	Winter Weather
State Highway 95 (Sheridan Boulevard)	VF		35,000 ADT	Winter Weather
State Highway 121 (Wadsworth Boulevard)	VF		50,000 ADT	Flood, Winter Weather
State Highway 391 (Kipling Street)	VF		50,000 ADT	Flood, Winter Weather
State Highway 72 (Ward Road)	VF		35,000 ADT	Winter Weather
State Highway 58	VF		26,000 ADT	Winter Weather
Kipling Bridge over Clear Creek	VF		50,000 ADT	Flood, Winter Weather
Wadsworth Bridge over Clear Creek	VF		50,000 ADT	Flood, Winter Weather
44th Avenue Bridge over Clear Creek	VF		14,000 ADT	Flood, Winter Weather
Youngfield Avenue Bridge over Clear Creek	VF		25,000 ADT	Flood, Winter Weather
Interstate 70 Bridge over Clear Creek	VF		85,000 ADT	Flood, Winter Weather
BNSF Railroad	VF			Winter Weather
Emergency Warning System	VF		NA	Hailstorm, Tornado, Windstorm
Clear Creek Greenbelt	NA		250 Acres	Drought, Erosion, Flood, Hailstorm, Lightning,

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
				Tornado, Wildfire
Spiranthes Diluvialis (Ute Ladies-Tresses Orchid)	NA		<20 Acres	Drought, Flood, Hailstorm, Wildfire
Mycenastrum Corium (Earth Star Fungus)	NA		< 1 Acre	Drought, Flood, Wildfire
Wetlands	NA		100 Acres	Drought, Flood, Hailstorm, Wildfire
Baugh House	NA			Tornado
Sod House	NA			Tornado
Richards-Hart Estate	NA		75	Tornado

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

Many of the facilities listed above are also in GIS databases provided by the City of Wheat Ridge and Jefferson County. Critical facility counts and types are shown in Table 8 and in the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 8. Summary of Wheat Ridge's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	34
Fire Stations	2
Health Facilities	2
Police Facilities	1
Schools	12
Total	**51**

Source: City of Wheat Ridge, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Wheat Ridge to disaster also involves inventorying the natural, historical, 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 so 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

Natural resources of importance in Wheat Ridge include the 42 sites that are parks, open space, recreation centers, or areas of visual green space totaling approximately 430 acres. Of this, 7 sites are neighborhood parks (49.20 acres) and 7 sites are pocket parks (8.0 acres). Two park sites in the city are community parks (66.0 acres). These two community parks also serve as neighborhood parks for residents living nearby, which is generally considered within a 0.5-mile radius. There is also 1 dedicated sports complex in the city (16.0 acres), 1 natural area (9.0 acres), 1 open space area (250.0 acres), and 17 areas of visual green space (0.87 acre). For information about natural resources in Jefferson County, which includes Wheat Ridge, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

Table 9 lists the properties in Wheat Ridge that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

Table 9. Wheat Ridge's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Pioneer Sod House	4610 Robb St	03/14/1973
Richards Mansion	5349 W 27th Ave	9/15/1977
Wheat Ridge Post Office	4610 Robb Street	State Register 8/12/1992

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the City of Wheat Ridge.

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.

1.4 Growth and Development Trends

Table 10 illustrates how Wheat Ridge has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Wheat Ridge is losing population but

small growth in housing units continues. Table 11 shows Wheat Ridge's estimated population changes through 2013.

Table 10. Wheat Ridge's Change in Population and Housing Units, 2000-2008

2000 Population	2008 Population Estimate	Estimated Percent Change 2000-2008	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2008
32,193	30,928	-5.7%	14,882	15,140	1.7%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog; City of Wheat Ridge/

Table 11. City of Wheat Ridge Population Projections Through 2013

2008 Population	2013 Population	% change 2010-2013
30,928	29,974	-3.1%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/; City of Wheat Ridge

Most of the City is already developed; however, much of the developed areas are older and are slowly undergoing redevelopment. All redevelopments are complying with our current codes, so the regulations are being followed in the identified hazard areas, i.e. floodplains. The only area available for new growth is on the west side of the City. Again, any developments in this area will also comply with the current codes, including those regulating identified hazard areas.

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Wheat Ridge's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 12 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, and indicates those that are in place in Wheat Ridge.

Table 12. Wheat Ridge's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	Y	www.ci.wheatridge.co.us

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Zoning ordinance	Y	www.ci.wheatridge.co.us
Subdivision ordinance	Y	www.ci.wheatridge.co.us
Growth management ordinance	Y	DRCOG
Floodplain ordinance	Y	www.ci.wheatridge.co.us
Other special purpose ordinance (stormwater, steep slope, wildfire)	Y	Stormwater, www.ci.wheatridge.co.us
Building code	Y	www.ci.wheatridge.co.us
Fire department ISO rating	Y	Community Development
Erosion or sediment control program	Y	www.ci.wheatridge.co.us
Stormwater management program	Y	www.ci.wheatridge.co.us
Capital improvements plan	Y	www.ci.wheatridge.co.us
Economic development plan	Y	www.ci.wheatridge.co.us
Local emergency operations plan	Y	Administrative Services
Other special plans	Y	Police Department
Flood insurance study or other engineering study for streams	Y	Wildfire, www.ci.wheatridge.co.us
Elevation certificates	Y	www.ci.wheatridge.co.us

Table 13 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Wheat Ridge.

Table 13. Wheat Ridge's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Y	Community Development/Planning Division Staff	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Community Development/Building Division Staff	
Planner/engineer/scientist with an understanding of natural hazards	Y	Public Works/Engineering Division Staff	
Personnel skilled in GIS	Y	Administrative/GIS Specialist	
Full-time building official	Y	Community Development/Chief Building Official	
Floodplain manager	Y	Public Works/Director of Public Works	
Emergency manager	Y	Police Department/Chief of Police	
Grant writer	N		
Other Personnel	Y	Parks/Open Space Personnel	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Administrative/GIS Specialist	

Personnel Resources	Yes/No	Department/Position	Comments
Warning systems/services (Reverse 9-11, cable override, outdoor warning signals)	Y	Police Department/Communications Manager	

Table 14 identifies financial tools or resources that Wheat Ridge could potentially use to help fund mitigation activities.

Table 14. Wheat Ridge's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	Y	
Withhold spending in hazard-prone areas	N	

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The City of Wheat Ridge joined the National Flood Insurance Program (NFIP) on May 26, 1972 and the Community Rating System (CRS) on October 1, 1991. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of October 2009, Wheat Ridge had a CRS class rating of 7 (one a scale of 1-10, 1 being the best). This rating provides a 15 percent discount for policyholders within a special flood hazard area (SFHA) and a 5 percent discount for those outside of an SFHA. The City is currently working to raise its rating to at least a Class 6 and may reach a Class 5.

NFIP insurance data indicates that as of November 30, 2009, there were 190 policies in force in Wheat Ridge, resulting in $39,192,100 of insurance in force. In Wheat Ridge, there have been 38 historical claims for flood losses totaling $90,141. At the time this plan was developed there were no repetitive or severe repetitive loss structures as defined by the NFIP.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Wheat Ridge activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

2009 City of Wheat Ridge Comprehensive Plan

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subjects matter related to services, issues, and geographic areas within Wheat Ridge. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth. The goals and policies were defined in the original 2000 Plan, and remained unchanged in the Plan Addendums. The Plan Addendums each focus on new or changing development in Wheat Ridge.

The following goals and related polices that are relevant to this hazard mitigation plan are excerpted here:

- **Goal CS 2 – Continue investment in parks, recreation, and open space**. Wheat Ridge will maintain and continue to invest in providing quality parks, open space, and recreation facilities that are accessible to all neighborhoods and residents, using the Parks and Recreation Master Plan to guide investment and locations.
  - **CS 2.1 – Parks, Recreation and Open Space**. The City, in coordination with Jefferson County, Jefferson County Schools, and other organizations will continue to maintain and enhance parks, recreation, and open space offerings and facilities.

- **Goal CS 4 – Continue coordination with fire districts and utility providers to maintain quality service.** The City will continue to coordinate with utilities and fire districts to maintain quality levels of service to existing customers and provide new services to areas where future growth will occur.
  - **CS 4.1 – Utility and Service Districts**. The City will continue to coordinate development and redevelopment activities with utility providers and service districts.

- **Goal SF 2 – Protect and preserve natural assets**. Wheat Ridge will protect and conserve its natural, scenic, and environmental assets including the urban tree canopy, Wheat Ridge Greenbelt, Lena Gulch, and other drainage ways.
  - **SF 2.1 – Natural Resource Stewardship**. The City will continue to work with Jefferson County to provide stewardship of unique and sensitive natural resources and areas.

Wheat Ridge Weed Management Program (2003)- The Wheat Ridge Parks and Recreation Department uses integrated pest management, a decision-making process that selects, integrates, and implements control methods to prevent or manage noxious weeds. The Weed Management Plan focuses on long-term prevention or suppression of undesirable species while reducing the impact that control techniques may have on the environment, human health, and non-target species. The Weed Management Plan is an integral part of the Wheat Ridge Open Space Management Plan.

Municipal Code

Section 26, Article 8: Floodplain Management

The city council hereby finds it in the public interest, and in the furtherance of the public health, safety and welfare, that the following objectives be fulfilled:

- To promote the public health, safety and general welfare, to minimize flood losses in areas subject to flood hazards, and to promote wise use of the "Flood Regulatory District" by:
  - Prohibiting certain uses which are dangerous to life or property in time of flood.
  - Restricting uses which would be hazardous to the public health in time of flood.
  - Restricting uses which are so particularly susceptible to flood damage, so as to alleviate hardship and reduce demands for public expenditures for relief and protection.
  - Restricting permitted Flood Regulatory District uses, including public facilities which serve such uses, to be protected against floods by providing floodproofing and general flood protection at the time of initial construction.
- To protect occupants of the Flood Regulatory District from a flood which is or may be caused by their own, or other, land use and which is or may be undertaken without full realization of the danger through:
  - Regulating the manner in which structures designed for human occupancy may be constructed so as to prevent danger to human life within such structures.
  - Regulating the method of construction of water supply and sanitation systems so as to prevent disease, contamination and unsanitary conditions.
  - Delineating and describing areas that could be inundated by floods so as to protect individuals from purchasing lands for purposes which are not in fact suitable.
  - Ensuring that potential buyers are notified that property is in an area of special flood hazard.
  - Ensuring that those who occupy the areas of special flood hazards assume responsibility for their actions.

- To protect the public from the burden of extraordinary financial expenditures for flood control and relief.
  - Regulating all uses within the Flood Regulatory District so as to produce a method of construction and a pattern of development which will minimize the probability of damage to property and loss of life or injury to the inhabitants of the flood hazard areas.
  - Minimizing the need for rescue and relief efforts associated with flooding which are generally undertaken at the expense of the general public.
  - Minimizing prolonged business interruptions.
  - Minimizing damage to public facilities and utilities, such as water and gas mains; electric, telephone and sewer lines; streets and bridges located in areas of special flood hazard.
  - Helping maintain a stable tax base by providing for sound use and development of areas of special flood hazard so as to minimize future flood-blight areas.
  - Participating in the National Flood Insurance Program to assist property owners in obtaining adequate insurance coverage.
- To protect the hydraulic characteristics and storage capacity of the Flood Regulatory District and small watercourses, including the gulches, sloughs and artificial water channels, used for conveying floodwaters so as to promote retention of sufficient floodway area to convey flood flows which can reasonably be expected to occur by:
  - Regulating filling, dumping, dredging and alteration of channels by deepening, widening or relocating, so as to maintain natural storage capacity and slow flow characteristics.
  - Prohibiting unnecessary encroachments.
  - Encouraging uses such as agriculture, open space, recreation, greenbelt, riding trails and parking.
  - Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.
  - Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards or which result in damaging increases in erosion or in flood heights or velocities.
  - Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.

(Ord. No. 2001-1215, § 1, 2-26-01)

Other Ordinances

Article 26 Zoning and Development - The intent and purpose of the zoning code of the City of Wheat Ridge is to encourage the most appropriate use of land throughout the city to ensure a logical growth of the various physical elements of the city; to lessen congestion in the streets and to facilitate the adequate provision of transportation within and through the city; to secure safety from fire, panic and other dangers; to provide adequate light and air to the residents, structures and properties within the city; to improve housing standards; to conserve property values; to

facilitate adequate provision for water, sewage, schools, parks and other public improvements; to protect against poor or inadequate drainage or flood conditions and poor geologic conditions; and in general to promote the health, safety and welfare of the citizens and residents of the City of Wheat Ridge. It is further the intent of this zoning code to preserve the right of citizens to participate in the making of decisions which affect their properties while preserving, to the maximum lawful extent, the legislative and quasi-judicial discretion of the elected representatives of the City of Wheat Ridge.

Property Protection

Property protection activities are usually undertaken by property owners on a building-by-building or parcel basis.

The City has done several floodplain mitigation projects along Lena Gulch and recently purchased two properties for a future project. The City is also exploring FEMA grant opportunities for projects along Clear Creek.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

City of Wheat Ridge Open Space Management Plan (2002) – The purpose of the City of Wheat Ridge Open Space Management Plan is to establish a framework for setting priorities and provide specific management direction for natural, scenic and recreational resources within the Wheat Ridge Greenbelt, Lewis Meadows, and future open space acquisitions. Implementation of the Plan will assist the Wheat Ridge Parks and Recreation Department in its efforts to preserve and enhance these areas for present and future generations. This Plan supplements numerous studies that have been completed through 2001 on Wheat Ridge open space. Relevant information from these municipal and county plans and environmental reports has been reviewed and incorporated into this Plan. The Weed Management and Wildfire Management Plans are integral to the Open Space Management Plan.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

The City is in the middle of a multi-year program to install an Emergency Warning System with sirens that are capable of both tone and voice warnings. Most of the floodplain areas of the City are currently covered by the EWS.

City of Wheat Ridge Wildfire Management Plan (2003) – As its foundation, the Wildfire Management Plan emphasizes working with adjacent landowners, land managers, and local agencies to reduce the potential effects of wildfire on human life, private property, and the natural resources of Wheat Ridge's Open Space. The Wildfire Management Plan is an integral part of the Wheat Ridge Open Space Management Plan.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

The City and UDFCD have several proposed channelization projects that have been conceptually designed in the Major Drainageway Planning – Phase B Conceptual Preliminary Design Reports that were completed in 2007 and 2008 for Lena Gulch and Clear Creek. The goal of these projects is to reduce the number of properties within the 100-year floodplain. FEMA grant funding for these projects will be pursued. Previous projects along Lena Gulch have already removed some properties from the 100-year floodplain.

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

The City typically hosts an annual Open House event which is available to all residents. The Public Works Department sponsors several tables with floodplain and stormwater information. The Public Works Department has also hosted a separate floodplain open house for the past two years with invitations being sent to all properties within the 100 year floodplain.

Public information boards are also included at major parks that include emergency information and other public health issues, i.e. animal diseases, wildfire, floods, etc.

The City also utilizes its website, Channel 8, and quarterly newsletter to broadcast emergency information and public health concerns.

1.6 Mitigation Actions

This section outlines the mitigation action plan. The action plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals. Wheat Ridge had the choice to continue to be a participant in the update of the Denver Regional Council of Governments (DRCOG) Natural Hazard Mitigation Plan or develop a separate more detailed

Jefferson County specific multi-jurisdictional mitigation plan. Wheat Ridge chose to separate out from the DRCOG Regional Plan and utilize the planning opportunity with the intent of developing this more robust and specific plan.

Existing and planned mitigation actions from the 2003 DRCOG Regional Mitigation Plan were reviewed for Wheat Ridge, and are contained in Table 15. The actions were very general categories of mitigation actions rather than specific actions. The DRCOG plan grouped the categories by the same list used by the NFIP Community Rating System noted previously in Section 5.2 of the main plan. The majority of the action items identified for these jurisdictions were the continuation of ongoing capabilities, such as maintaining and updating building codes, floodplain regulations, stormwater management, erosion and sediment control, best management practices, etc. During the 2009-2010 development of this plan several of the existing actions related to ongoing capabilities for Wheat Ridge were deleted from the mitigation action plan and captured in Section 1.5 of this Annex, which is also organized by CRS mitigation category. Thus the actions identified in section 5.3 of the main plan, and explained in greater detail in Section 1.6.1 of this plan, represent new actions or those actions further refined from the DRCOG plan. Examples of this include the DRCOG "Floodplain Development Regulations" action, which is now refined to include: "Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program.

Table 15. City of Wheat Ridge Mitigation Progress Table from the 2003 DRCOG Plan

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred , Ongoing	Comments
Prevention:		
Adopt or Revise Building Code	Deleted	Ongoing see capability assessment
Planning And Zoning: Land Development Regulations	Deleted	Ongoing see capability assessment
Open Space Preservation	Deleted	Ongoing see capability assessment
Floodplain Development Regulations	Deleted	replaced by NFIP/CRS/CIP/Stormwater Utility action
Storm Water Management	Ongoing	Ongoing, see capability assessment and action related to Stormwater Program and Maintenance Operations
Develop inventories of at-risk structures to prioritize mitigation projects	Ongoing	Critical facilities inventoried as part of 2010 update. Locations have been identified through mapping. No other work has been completed.
Wildland Fuel Management	Ongoing	Ongoing, see capability assessment and new action item related to the Open Space Wildfire Management Plan

Local Mitigation Measures/ Action Strategies	Status: Completed, Deleted, Deferred , Ongoing	Comments
Property Protection:		
Building Inspection and Modification	Deleted	Removed ; part of day to day activities
Relocation	Deleted	Category, not specific action
Acquisition	Deleted	Category, not specific action
Building Elevation	Deleted	Category, not specific action
Floodproofing	Deleted	Category, not specific action
Sewer Backup Protection	Deleted	Too generic to track
Insurance	Deleted	Addressed in NFIP compliance action
Natural Resource Protection:		
Erosion and Sedimentation Control	Deleted	Addressed in development regulations
Best Management Practices	Deleted	Removed as too generic to track, see capability assessment
Emergency Services:		
Flood Warning Systems	Completed	Participates with Urban Drainage and Flood Control District warning system; see capability assessment
Flood Response	Deleted	Addressed in Emergency Operations Plan; Removed to keep plan's focus on mitigation; See above
Critical Facilities Protection	Deleted	Other than identification, no work has been completed.
Protection of infrastructure needed for emergency response capability (EOC)	Deleted	No work done.
Health and Safety Maintenance	Deleted	Part of ongoing department activities; Removed to keep plan's focus on mitigation
Structural Projects:		none identified in 2003
Public Information:		
Map Information	Deleted	Removed, too generic to track
Outreach Projects	Ongoing	Part of CRS program activities; See capability assessment; See Channel 8/Website updates project
Real Estate Disclosure	Ongoing	
Library/ Environmental Education	Ongoing	Resources available in Community Development library and at the Wheat Ridge Branch of the Jeffco Library.
Technical Assistance	Deleted	Removed, too generic to track

1.6.1 New Mitigation Actions for the City of Wheat Ridge

The following actions were identified and prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Lena Gulch Channelization

Issue/Background: 15 houses along Lena Gulch between Simms and Tabor Streets were shown within the 100-year floodplain on the 2007 FHAD. 2 properties have already been purchased with the houses and other improvements being removed. Other property is already owned by City. Improve up to 1,000 feet of channel to fully convey the 100-year event. Completely removes the remaining 13 houses from the 100-year floodplain.

Other Alternatives: Purchase remaining 13 properties for a cost of over $5 million.

Responsible Office: Public Works

Priority (High, Medium, Low): High – Dam Failure and Flood

Cost Estimate: $2.4 million, estimated in 2007 Major Drainageway Planning – Phase B, $0.8 million spent in 2008 and 2009 on purchase and demolition of the two properties, so $1.6 million remaining.

Benefits (Avoided Losses): $3.5 million estimated in 2007 Major Drainageway Planning – Phase B.

Potential Funding: FEMA Grant, UDFCD and City share in local match

Schedule: Not currently in 5-Year CIP due to uncertainty of obtaining FEMA grant

2. Emergency Warning System

Issue/Background: The City has a large amount of open space and other areas that cannot receive warnings from current technology, i.e. reverse 911. A total of 15 sirens will be located throughout the City with both wailing and voice broadcast capabilities. Phase 1, with 6 sirens, was completed in early 2009. Phase 2, with 5 sirens, will also be completed in 2009. Funding for Phase 3, with 4 sirens, will be sought in 2010.

Other Alternatives: Use other less effective forms of communication to try to broadcast warnings.

Responsible Office: Public Works and Police

Priority (High, Medium, Low): High – Dam Failure, Flood, Hailstorm, Lightning, Tornado, Windstorm, and Wildfire

Cost Estimate: $325,000 for all phases, $125,000 spent in 2009, $100,000 remaining for 2009, $100,000 estimated for 2010.

Benefits (Avoided Losses): Potential loss of life or injury and property damage.

Potential Funding: Jefferson County Emergency Communications Authority

Schedule: Pending funding, finish project in 2010.

3. Channel 8/Website Updates

Issue/Background: Some hazards do not pose an immediate risk, but have longer range durations. Therefore, they do require immediate notification, but rather need to have information available to help cope with the ongoing nature of the hazard. Notices, information, and links other websites can be posted to keep current information available.

Other Alternatives: Rely on other sources to provide information.

Responsible Office: Administration Services

Priority (High, Medium, Low): Medium – Drought, Extreme Temperatures, and Winter Weather

Cost Estimate: Ongoing operation.

Benefits (Avoided Losses): Potential loss of life or injury and property damage.

Potential Funding: City General Fund

Schedule: Ongoing.

4. Emergency Operations Plan

Issue/Background: The City's plan was updated in 2009 to provide general guidelines and principles for planning, managing, and coordinating the overall response and recovery activities of Wheat Ridge government before, during, and after major emergency and disaster events. It delineates the roles and responsibilities of City departments, outside agencies, and volunteer organizations which are expected to contribute to the protection of people and property.

Other Alternatives: Rely on other sources to provide procedures.

Responsible Office: Police

Priority (High, Medium, Low): High – Dam Failure, Earthquake, Flood, Hailstorm, Tornado, Wildfire, Windstorm, and Winter Weather

Cost Estimate: Ongoing operation.

Benefits (Avoided Losses): Potential loss of life or injury and property damage.

Potential Funding: City General Fund

Schedule: Ongoing. Formal update every 5 years.

5. NFIP/CRS/CIP/Stormwater Utility

Issue/Background: The City has a large number of properties that are either in the floodplain or in areas with substandard drainage conveyance. The City is a member of the NFIP and participates in the CRS in order to minimize flood losses over time. In addition, the City will be pursuing FEMA grants for at least one floodplain mitigation project to additional properties from the floodplain. The City uses it's current CIP to fund drainage improvement projects and is attempting enact a stormwater utility to provide additional funding.

Other Alternatives: Rely on other sources to provide funding.

Responsible Office: Community Development/Public Works

Priority (High, Medium, Low): High – Dam Failure and Flood

Cost Estimate: Ongoing operation.

Benefits (Avoided Losses): Potential loss of life or injury and property damage.

Potential Funding: City General Fund

Schedule: Ongoing.

6. Stormwater Program and Maintenance Operations

Issue/Background: The City's Stormwater Program is in place to regulate public and private construction activities that could cause erosion. In addition, Public Works Operations has a program to clean out any accumulated sediment and repair a portion of the public storm sewer system each year. The amount that is done is dependent upon available funds.

Other Alternatives: None, the stormwater program is required by our State Permit.

Responsible Office: Public Works

Priority (High, Medium, Low): Medium – Erosion/Deposition

Cost Estimate: Ongoing operation.

Benefits (Avoided Losses) Potential environmental or public infrastructure damage.

Potential Funding: City General Fund

Schedule: Ongoing.

7. City of Wheat Ridge Open Space Wildfire Management Plan

Issue/Background: The purpose of this plan is to outline basic considerations and constraints and provide guidelines for wildfire management planning within the Wheat Ridge Greenbelt and Lewis Meadows.

Other Alternatives: Use regional plans to manage open space.

Responsible Office: Parks and Recreation

Priority (High, Medium, Low): High – Wildire

Cost Estimate Ongoing operation.

Benefits (Avoided Losses): Potential environmental or public infrastructure damage.

Potential Funding: City General Fund

Schedule: Ongoing.

8. Education and Ordinance's regarding the mitigation of tree's as hazards in Natural Disaster

Issue/Background: Trees of certain types, such as cottonwoods, are susceptible to damage during severe weather events and can cause damage to property, disrupt power, and are a danger to the public. Untrimmed trees of many types also become a hazard to life and property during severe weather events. Implementing or changing City Ordinances that address types of trees to be planted by property owners as well as the care and proper trimming of trees would alleviate loss of power, damage and injury during a severe weather event. A public education program using printed media and cable television programs would be used to inform the public on these issues and encourage compliance.

Other Alternatives: Use only printed media to inform the public.

Responsible Office: Parks and Recreation Department and Police

Priority (High, Medium, Low): High – Flood, Hailstorm, Lightning, Tornado, and Windstorm

Cost Estimate: $2,500 for cable program development and developing, printing, and distributing printed media.

Benefits (Avoided Losses): Potential loss of life or injury, loss of public utility service and property damage.

Potential Funding: City Budget or grants

Schedule: Pending funding, finish project in 2011.

ANNEX F TOWN OF LAKESIDE ANNEX

1.1 Community Profile

1.1.1 History

The Town of Lakeside is a Statutory Town in Jefferson County, Colorado, northwest of, and adjacent to, the City and County of Denver. The population was 20 at the 2000 census, making Lakeside the second least populous incorporated town in the State of Colorado.

The town's namesake lake is Lake Rhoda, which covers 20% of its total area. A year after its incorporation on November 12, 1907, the Lakeside Amusement Park, nicknamed "White City", opened on the eastern shores. Both town and park were founded by a syndicate led by prominent Denver brewer Adolph Zang, who endeavored to build the resort just across the county line from Denver, and incorporate to move beyond the reach of questionable Denver liquor laws. Also in town on the southern shore is Lakeside Mall, built in 1956. The amusement park, shopping mall, and lake occupy almost all the tiny municipality. Residences are limited to a handful of houses on the west side of Sheridan Boulevard, across the street from Denver.

1.1.2 Population

The U. S Census Bureau's estimated 2007 population of Lakeside was 20. Select Census 2000 demographic and social characteristics for Lakeside are shown in Table 1.

Table 1. Lakeside's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	70
Female (%)	30
Under 5 Years (%)	5
65 Years and Over (%)	20
Race/Ethnicity (one race)	
White (%)	100
Hispanic or Latino (Of Any Race) (%)	20
Other	
Average Household Size	2.22
High School Graduate or Higher (%)	100

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Lakeside's labor force were: retail trade (37.5%); educational, health, and social services (25%); and construction (25%). Select economic characteristics for Lakeside from the 2000 Census are shown in Table 2.

Table 2. Lakeside's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	66.7%
Individuals below Poverty Level, 1999	44.4%
Median Home Value	N/A
Median Household Income, 1999	$34,375
Per Capita Income, 1999	$16,639
Population in Labor Force	10
Unemployment (%)*	12.5%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the City of Lakeside using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the Town of Lakeside's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The City of Lakeside's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member.

This matrix reflects that the City of Lakeside is most vulnerable to tornados. The City of Lakeside has a medium vulnerability to earthquake, hailstorm, and severe winter storms; and a lower vulnerability to the other identified hazards. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity. On the County level, these vulnerabilities were calculated with quantitative data as well.

Table 3. Town of Lakeside – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Occasional	Limited	Negligible	Low
Earthquake	Unlikely	Extensive	Critical	Medium
Erosion and Deposition	Unlikely	Limited	Negligible	Low
Expansive Soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Occasional	Limited	Negligible	Low
Flood	Unlikely	Limited	Negligible	Low
Hailstorm	Likely	Significant	Negligible	Medium
Landslide, Debris flow, Rockfall	Unlikely	Limited	Negligible	Low
Lightning	Likely	Limited	Negligible	Low
Severe Winter Storms	Highly likely	Extensive	Negligible	Medium
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Unlikely	Significant	Critical	High
Wildfire	Unlikely	Limited	Negligible	Low
Windstorm	Likely	Extensive	Limited	Low

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the Town of Lakeside noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

March 2009 Winter Storm

A winter storm brought heavy snow to much of the region as a potent low pressure system dropped out of the Pacific Northwest, and tracked through the Four Corners region and into Southeast Colorado. As a result, significant snowfall occurred across most of North-Central and Northeast Colorado. The heaviest snowfall occurred in and near the Front Range Foothills and Palmer Divide as a deep east to northeasterly upslope flow developed. Over a foot of snow fell in Lakeside. 2 injuries were reported, and 20-25 vehicles were damaged from minor to complete. Businesses were closed, causing a loss of revenue for retailers and loss of tax revenue for the Town. Schools were closed, and minor damages were suffered by local roads.

Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

According to the HAZUS-MH flood loss estimate, the Town of Lakeside is at low risk to a 100-year flood. It is important to note, however, that the structure value loss table (Table 4) shows $162,000 in structure damage, while the structure count loss table (Table 5) shows 0 structures damaged in the town. HAZUS-MH flood loss is calculated at the census block level and in this case, the floodplain intersected a small portion of a census block; structure value loss was minimal and structure count loss was rounded down to 0. Displaced populations, found in Table 4.30 in Section 4.3.4 Estimating Potential Losses, from flooding are estimated at 0, and no buildings are estimated to be at risk. The extent of flooding in Lakeside is represented in Figure 1.

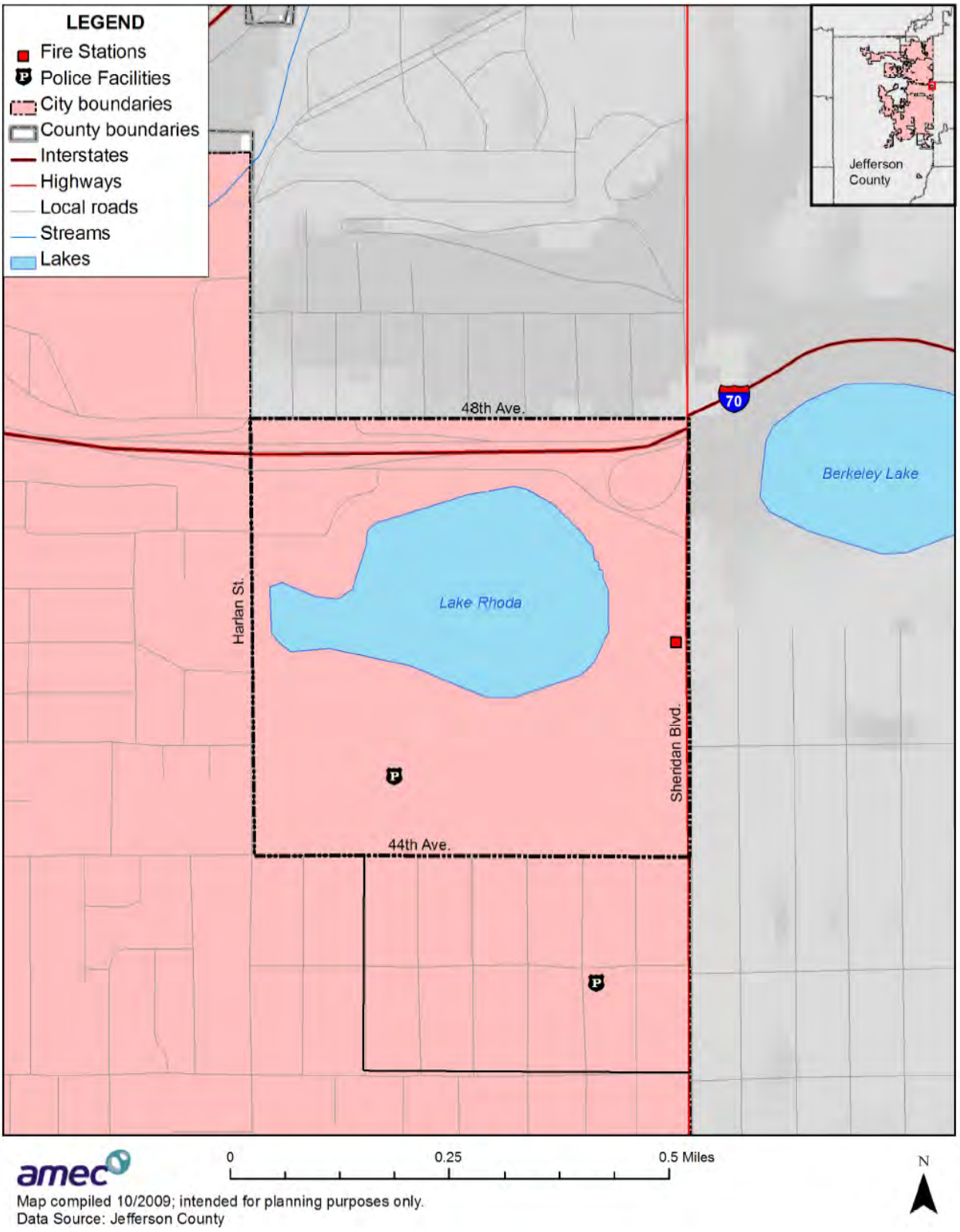
Table 4. Lakeside 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Lakeside	162,000	486,000	18,000	0	2,000	3,000	0	681,000

Table 5. Lakeside Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	RES	COMM	TOTAL
Lakeside	0	0	0	0	0	0	0	0	0	0	0	0	**0**

Figure 1. Town of Lakeside Flood Hazard Map



Wildfire

There is no wildfire risk in the Town of Lakeside.

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado and windstorm the entire building inventory and population in the Town is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

Additional Vulnerabilities

- There is one business that deals with special needs persons. They may be present from time to time.
- The residences are all lower income, older homes or mobile homes
- The main part of the town is being developed into a new retail shopping center which will bring thousands into the town on a daily basis. This could be serious problems in bad weather conditions

1.3 Asset Inventory

1.3.1 Property Inventory

Table 6 represents an inventory of property in Lakeside based on the Jefferson County Assessor's data as of June 2009.

Table 6. Lakeside's Property Inventory

Property Type	Structure Count	Building Values ($)*	Contents Values ($)**	Total Values ($)
Commercial	8	$12,448,200	$12,448,200	$24,896,400
Total	**8**	**$12,448,200.00**	**$12,448,200.00**	**$24,896,400.00**

Source: Jefferson County Assessor's Office
*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.
**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 7 is a detailed inventory of assets identified by the City's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 7. Lakeside's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
Town Offices, Police Dept.	EI	$500,000	50	
Police & Fire Garage	EI	$100,000	50	
Lakeside Amusement Park	VF	5 million	2500	Earthquake, wind, hail, lightning
Heritage College	VF	1 million	200	Earthquake, winter snow storm

Many of the facilities listed above are also in GIS databases provided by the Town of Lakeside and Jefferson County. Critical facility counts and types are shown in Table 8 and in the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 8. Summary of Lakeside's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	1
Fire Stations	1
Police Facility	1
Total	**3**

Source: Town of Lakeside, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Lakeside to disaster also involves inventorying the natural, historical, 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 so 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

For information about natural resources in Jefferson County, which includes Lakeside, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

There are no properties in Lakeside that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the Town of Lakeside.

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.

1.4 Growth and Development Trends

Table 9 illustrates how Lakeside has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Lakeside is undergoing little to no growth.

Table 9. Lakeside's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
20	20	0%	9	9	0%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Lakeside's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 10 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Lakeside.

Table 10. Lakeside's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Master plan	No	
Zoning ordinance	No	
Subdivision ordinance	No	
Growth management ordinance	No	
Floodplain ordinance	No	
Site plan review requirements	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	
BCEGS Rating	No	
Building code	No	
Fire department ISO rating	No	
Erosion or sediment control program	Yes	
Stormwater management program	No	
Capital improvements plan	No	possible
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	No	
Flood insurance study or other engineering study for streams	No	
Elevation certificates	No	

Table 11 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Lakeside.

Table 11. Lakeside's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Yes	contracted	As needed
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	contracted	As needed
Planner/engineer/scientist with an understanding of natural hazards	Unknown		
Personnel skilled in GIS	No		
Full time building official	No		
Floodplain manager	Unknown		

Personnel Resources	Yes/No	Department/Position	Comments
Emergency manager	Yes	Commander with Police	
Grant writer	No		
Other personnel	?		
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Unknown		
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	Yes	JCSO Dispatch	Reverse 9-1-1

Table 12 identifies financial tools or resources that Lakeside could potentially use to help fund mitigation activities.

Table 12. Lakeside's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Unknown	
Capital improvements project funding	Unknown	
Authority to levy taxes for specific purposes	Unknown	Possible
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	Unknown	
Incur debt through general obligation bonds	Unknown	
Incur debt through special tax bonds	Unknown	
Incur debt through private activities	Unknown	Possible
Withhold spending in hazard-prone areas	Unknown	

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The Town of Lakeside does not participate in the National Flood Insurance Program (NFIP). The Town has not been mapped by the NFIP thus participation is optional. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds.

1.6 Mitigation Actions

The Town of Lakeside, in reviewing potential mitigation actions for the Jefferson County Multi-Jurisdictional Hazard Mitigation Plan, has determined, at this time, there are no actions identified within the boundaries of the Town of Lakeside that are necessary to pursue. The Town will

revisit potential mitigation actions should a natural hazard event occur, there is a change in status of the Town, or during the planning process for the next scheduled plan update.

ANNEX G TOWN OF MORRISON ANNEX

1.1 Community Profile

1.1.1 History

The area around Morrison began to be settled in 1860 and was originally known as Mt. Morrison. The settlement had a population of between two and twenty five people who were mainly located near the confluence of Mount Vernon and Bear Creeks. The area grew quickly after the Civil War and became a center for coal mining, rock quarries, timbering, and other mineral extraction services that were needed to meet the construction and building needs of the growing Denver area. By 1880 the population in and around Morrison had grown to 75.

The physical setting of the town is dominated by two creeks and spectacular land forms associated with hogbacks and sandstone formations which separate Morrison from the Great Plains to the east. In the late 1800s and early 1900s, the close proximity to Denver and the beauty of the area started to attract tourists from Denver. At the time, the Denver South Park and Pacific Railroad later named the Colorado and Southern Railway connected Mt. Morrison to downtown Denver. Transporting visitors to the activities and sights around Morrison, as well as moving freight, coal, stone, lumber, cement, and gypsum back to the burgeoning City of Denver. At its peak in 1913, the Colorado and Southern Railway ran four daily roundtrips to and from Morrison.

Bear Creek flows through the center of downtown Morrison. It provides water for Denver, Englewood, and Morrison, as well as towns upstream, and has been a primary attraction for residents and visitors alike. It has also been the source of much destruction. A wide bench carved by Bear Creek near the hogback first attracted George Morrison's attention as a potential townsite. The creek also provided a passable route to move people and supplies into the goldfields to the west.

As was common with many of Colorado's early mountain communities, Morrison's population declined sharply at the turn of the 20th Century. Morrison was incorporated in 1906 and by 1910 the Town's population had dropped to 250. As road and highway connections to Morrison were constructed to accommodate automobile and truck traffic, rail services declined and scheduled rail service ended in 1925. Rail services were abandoned following a series of disastrous floods in the 1930s. Morrison's population grew slowly from 1910 to the 1980s when it topped out at just over 500. Morrison is unique in terms of population change since World War II. While most Front Range and foothills communities have mushroomed in growth, the Town's population numbers have declined to approximately 425, and have remained relatively unchanged for over a quarter of a century.

1.1.2 Population

The U. S Census Bureau's estimated 2007 population of Morrison was 430. Select Census 2000 demographic and social characteristics for Morrison are shown in Table 1. Population statistics are influenced by the large number of town residents who live in the Bear Creek Nursing Home.

Table 1. Morrison's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	39.3
Female (%)	60.7
Under 5 Years (%)	1.6
65 Years and Over (%)	43.7
Race/Ethnicity (one race)	
White (%)	98.8
Hispanic or Latino (Of Any Race) (%)	1.9
Other	
Average Household Size	2.18
High School Graduate or Higher (%)	79.3

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Morrison's labor force were educational, health, and social services (23.6%); construction (20.3); and professional, scientific, management, administrative, and waste management services (13.2%). Select economic characteristics for Morrison from the 2000 Census are shown in Table 2.

Table 2. Morrison's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	4.9%
Individuals below Poverty Level, 1999	5.5%
Median Home Value	$277,900
Median Household Income, 1999	$53.348
Per Capita Income, 1999	$24,347
Population in Labor Force	186
Unemployment (%)*	1.0%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the Town of Morrison using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the Town of Morrison's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The Town of Morrison's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member.

This matrix reflects that the Town of Morrison is most vulnerable to flood, severe winter storms, and windstorm. The Town of Morrison has a medium vulnerability to hailstorm and wildfire; and a lower vulnerability to avalanche, dam and levee failure, drought, earthquake, erosion, expansive soil, extreme heat, fog, landslide/debris flow/rockfall, lightning, subsidence, tornado, and volcano. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 3. Town of Morrison – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Limited	Medium
Drought	Likely	Extensive	Negligible	Low
Earthquake	Unlikely	Extensive	Negligible	Medium
Erosion and Deposition	Occasional	Limited	Negligible	Low
Expansive Soils	Unknown	Limited	Negligible	Low
Extreme Temperatures	Unlikely	Extensive	Negligible	Low
Flood	Likely	Significant	Catastrophic	High
Hailstorm	Likely	Extensive	Negligible	Medium
Landslide, Debris flow, Rockfall	Likely	Limited	Negligible	Low
Lightning	Likely	Limited	Negligible	Medium
Severe Winter Storms	Likely	Extensive	Negligible	High
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Occasional	Extensive	Limited	Low
Wildfire	Likely	Significant	Negligible	Medium

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Windstorm	Likely	Extensive	Limited	Low to Medium

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the Town of Morrison noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

1896 Flooding

A cloudburst in Bear Creek Canyon brought a solid wall of water through the Town of Morrison. The flood was 200 feet wide and 15 feet deep. It caused over $6 million in damages (1999 dollars). 27 people lost their lives. Most of those who lost their lives were Denverites camping in the canyon. All bridges across Bear Creek were washed away, trees were uprooted, and long stretches of railroad track were washed out. This flood was one of the most deadly floods in Colorado history.

Multiple Floods -20th Century

There have been multiple major floods during the 20th century on both the Bear and Mount Vernon Creek. These floods have caused extensive damage to property and infrastructure. Roads and bridges were damaged. Significant losses were suffered by local residents and businesses. Multiple deaths and injuries were reported. The Town had been subject to severe and repetitive floods. See the flood hazard profile in the Base Plan for descriptions of these events

2006 Winter Storm Blizzard

A slow moving low pressure system moved from the Desert Southwest and into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast

Plains of Colorado. Strong winds and heavy snow brought blizzard conditions to the Interstate 25 Corridor, from the Wyoming state line south to Colorado Springs. Storm totals generally ranged from 2 to 4 feet in and near the Front Range Foothills and Palmer Divide. Schools in Morrison were closed, and businesses in the town suspended their business to dig out from the storm, causing a loss of business and sales tax revenue. The Town of Morrison was given aid in the amount of $8,000 to offset snow removal costs.

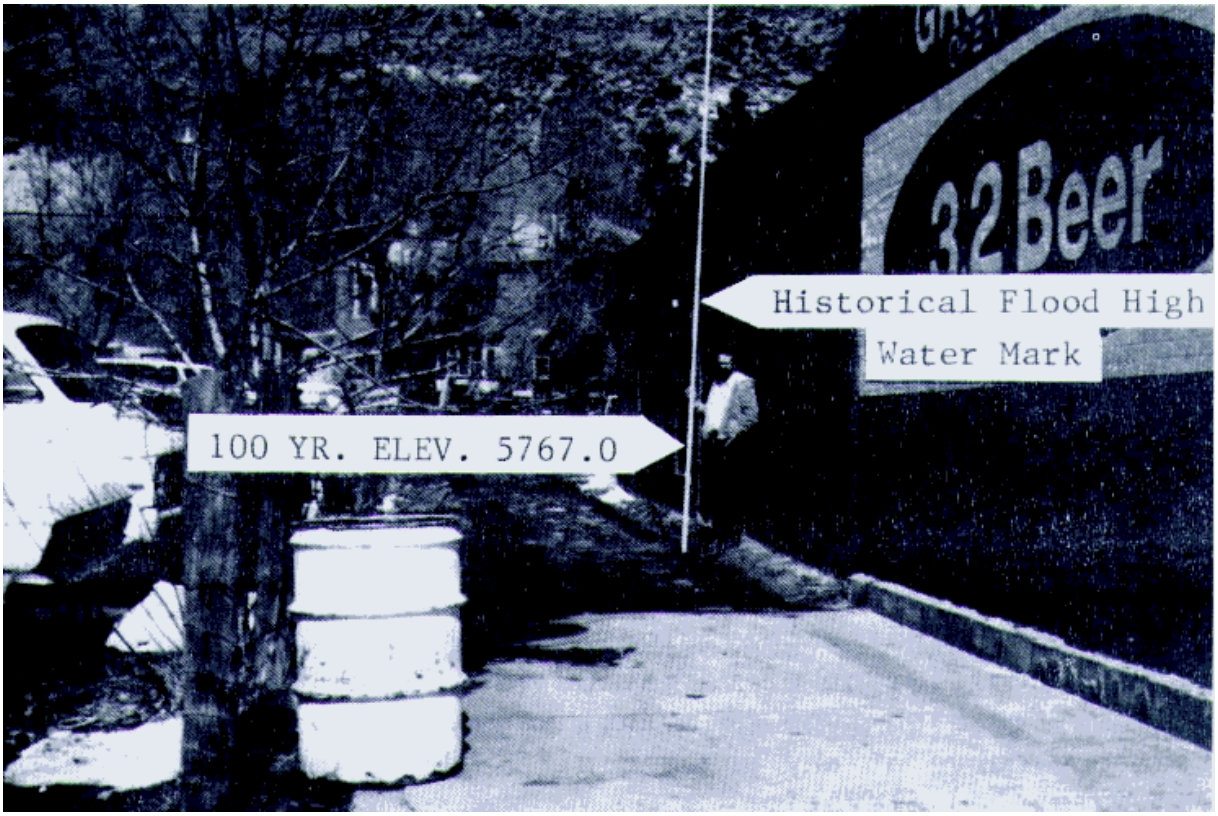
Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

Morrison has the highest flood risk in the planning area in terms of the potential for loss of life and severe damage to the downtown area. Morrison town shops are located adjacent to Bear Creek in a flood zone. Equipment necessary for flood recovery is stored in these shops. Relocation to safer location would protect equipment from damage/loss due to flash flooding. Figure 1 depicts Bear Creek flood levels on wall of store in Morrison between Market Street and Mount Vernon Street downstream of the Mount Vernon Creek confluence with Bear Creek. The "Historic High Water Mark" depicts the level of the September 2, 1938 flood that peaked around 7 p.m.

Figure 1. 1938 Flood High Water Mark between Market Street and Mount Vernon Street



According to the vulnerability assessment conducted using HAZUS-MH, Morrison has one of the higher potentials for economic loss from flooding in the County. Bear Creek flows through downtown Morrison, but there is also risk from smaller drainages that cross the City including Mt Vernon Gulch. Note that this is based on computer modeling that may not reflect specific mitigation activities. Displaced populations from flooding are estimated at 66, and 12 buildings are estimated to be at risk. The extent of flooding in Morrison is represented in Figure 2. Detail on the types of structures is provided in Table 5, showing the numbers of residential and commercial buildings impacted by flooding, and the anticipated percent of damage. According to the analysis the commercial structures in Morrison's downtown are most at-risk.

Analysis of flood prone critical facilities indicates that the there are no critical facilities in the floodplain.

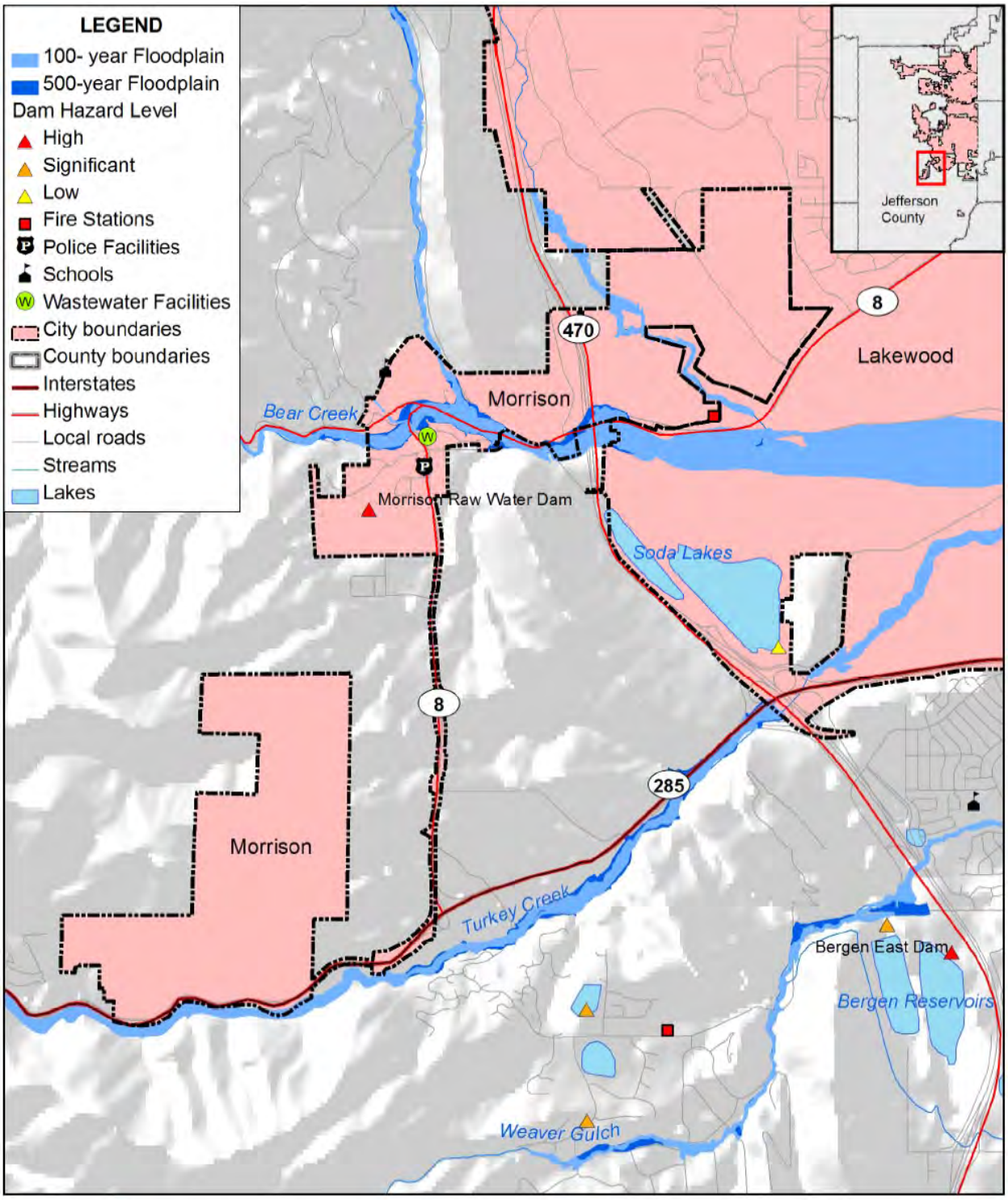
Table 4. Morrison 100-Year Flood Loss Potential

City	Cost Building Damage ($)	Cost Contents Damage ($)	Inventory Loss ($)	Relocation Loss ($)	Capital Related Loss ($)	Wages Loss ($)	Rental Income Loss ($)	Total Loss ($)
Morrison	1,904,000	2,077,000	40,000	2,000	12,000	26,000	3,000	4,124,000

Table 5. Morrison Residential & Commercial Buildings by Damage Percentage

	1-10%		11-20%		21-30%		31-40%		41-50%		Substantial		
CITY	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**RES**	**COMM**	**TOTAL**
Morrison	0	12	0	0	0	0	0	0	0	0	0	0	**12**

Figure 2. Town of Morrison Flood Hazard



amec

0 0.5 1 Miles

N

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County, HAZUS-MH MR4, DFIRM, Urban Drainage and Flood Control District

Dam Failure

According to the vulnerability assessment in Chapter 4 Morrison has one class I or High Hazard dam (Morrison Raw Water Dam). See discussion the in Section 4.3 in the Base Plan.

Geologic Hazards

Morrison has some exposure to geologic hazards including subsidence, dipping bedrock, landslide, and slope failure. These hazard areas affect the eastern and central portions of the Town of Morrison. See the map in Figure 3. Specific structures at risk from specific geologic hazards are detailed in Table 6. Methodology for this table can be found in Section 4.3.4 Estimating Potential Losses.

Table 6. Town of Morrison Geologic Hazards Risk

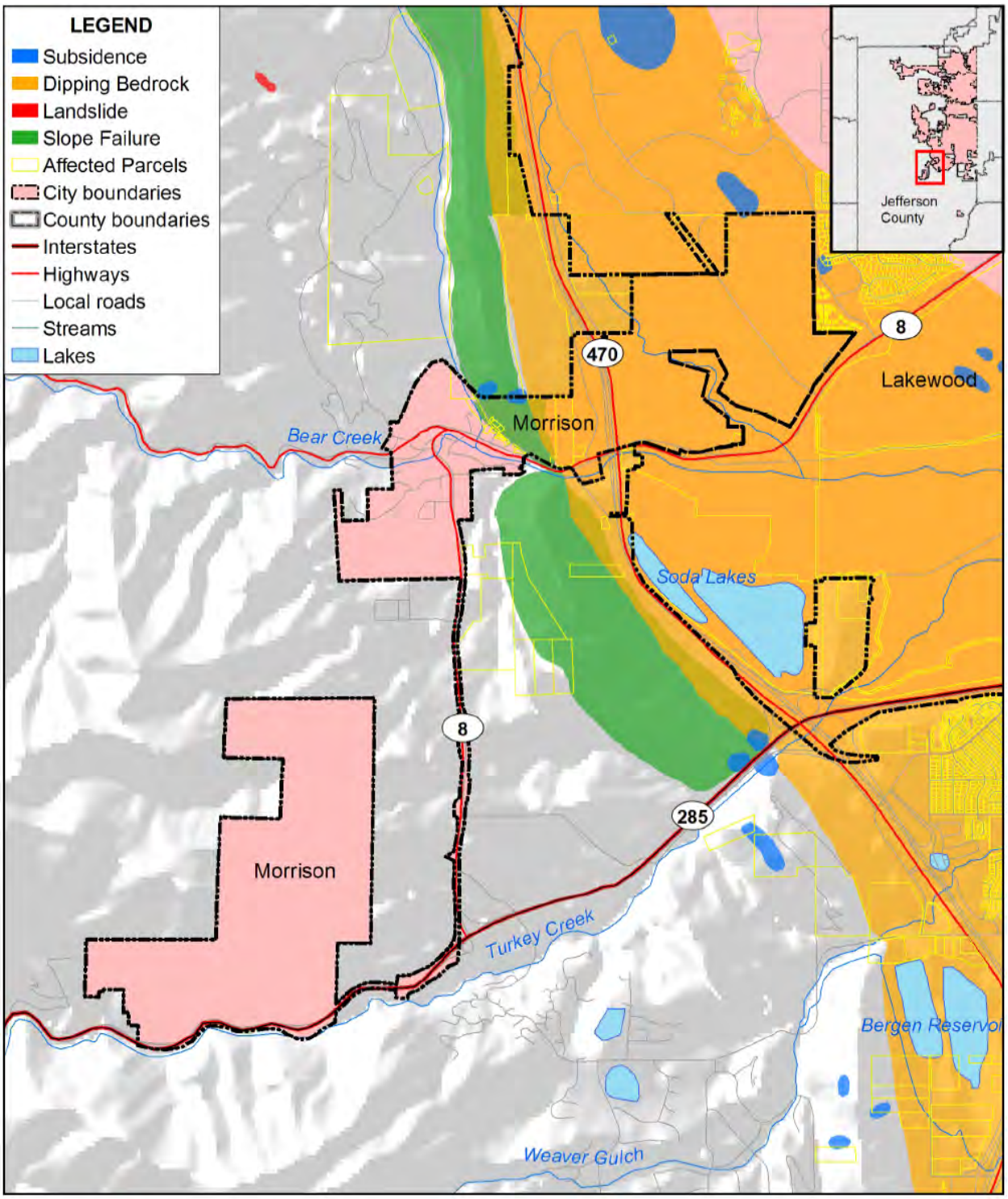
Geologic Hazard	Occupancy Type	Count of Improved Parcels	Improvement Value	Contents Value
Subsidence	Commercial	8	$1,376,000	$1,376,000
Subsidence	Residential	7	$675,700	$337,850
Total		**15**	**$2,051,700**	**$1,713,850**

Source: Jefferson County

According to Geological Society of America report the town's water treatment plant has been affected landslide in the past, but this has been mitigated.

Morrison's proximity to the Golden Fault as a potential, though unlikely, earthquake source make it more vulnerable to earthquake damage. Morrison's downtown historic district has a number of un-reinforced masonry buildings that are particularly vulnerable to earthquake shaking.

Figure 3. Town of Morrison Geologic Hazards Map



amec

0 0.5 1 Miles

N

Map compiled 10/2009; intended for planning purposes only.
Data Source: Jefferson County

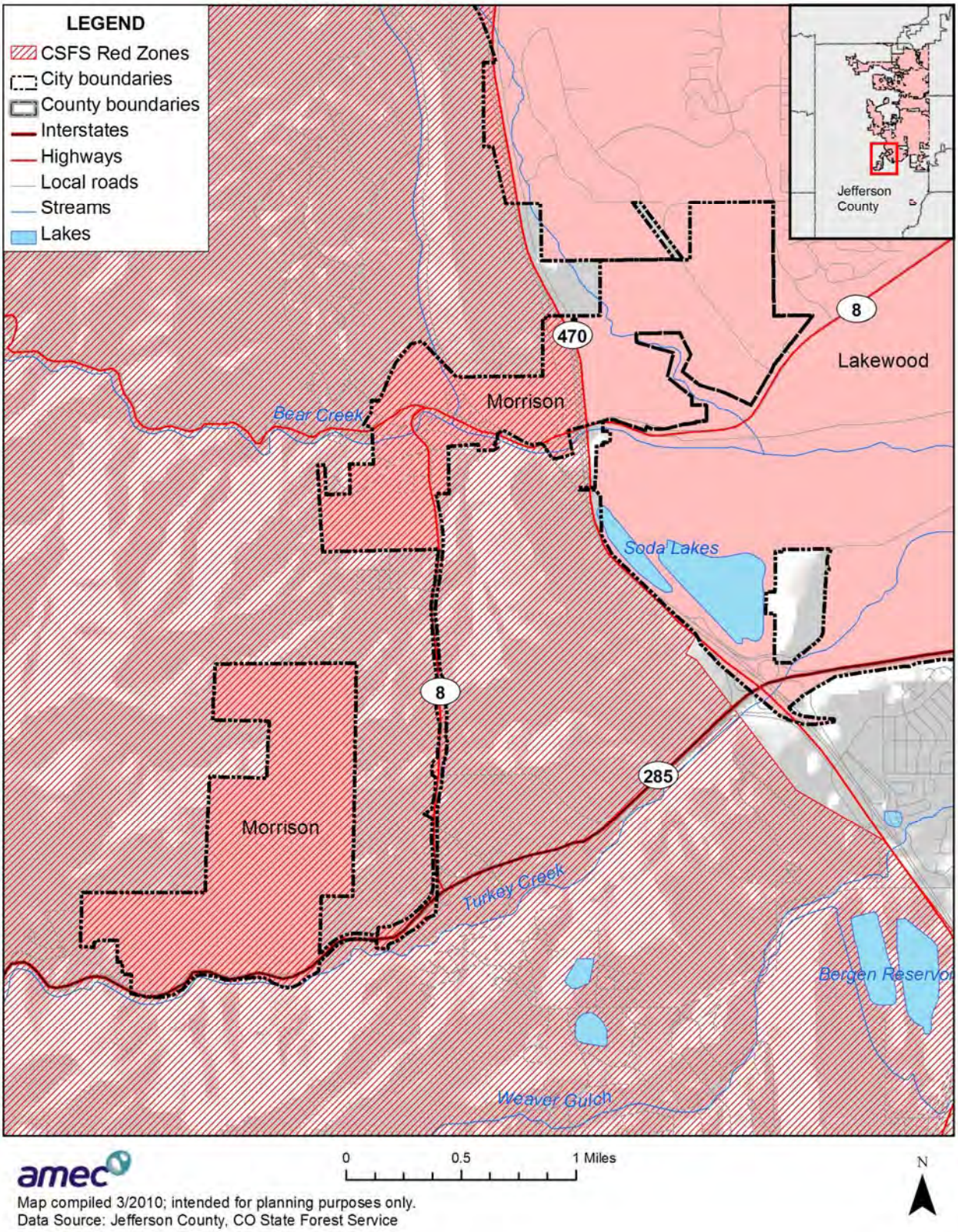
Wildfire

With its location at the Rocky Mountain foothills Morrison does have risk to wildfires, both from grass fires on the open spaces at the southeast and northeast edges of the City and along the flanks of the Hogbacks, and from forest fires in the foothills. According to the GIS based analysis of wildfire in Section 4.3 the City has 147 structures in the Red Zone & Jefferson County Wildfire Hazard Overlay Zone with a structure value of $33.7 million, and an estimated population of 262 in that zone. The structure counts and values by structure type are provided in the following table. The Town of Morrison also has two critical facilities located in these zones: the Town of Morrison Wastewater Facility and the Morrison Police Department.

Table 7. Town of Morrison Wildfire Risk by Structure Type

City	Occupancy	Structure Count	Structure Value	Contents Value
Morrison	commercial	39	$12,182,600	$12,182,600
	residential	108	$21,529,500	$10,764,750
Total		**147**	**$33,712,100**	**$22,947,350**

Figure 4. Town of Morrison Wildfire Hazard Map



Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado, and windstorm the entire building inventory and population in the Town is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory. Morrison's location at the base of the foothills makes it more prone to high wind events than other communities in this plan.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 8 represents an inventory of property in Morrison based on the Jefferson County Assessor's data as of June 2009.

Table 8. Morrison's Property Inventory

Property Type	Structure Count	Building Values ($)*	Content Values ($)**	Total Values ($)
Residential	108	$21,529,500	$10,764,750	$32,294,250
Commercial	40	$12,993,700	$12,993,700	$25,987,400
Total	**148**	**$34,523,200**	**$23,758,450**	**$58,281,650**

Source: Jefferson County Assessor's Office

*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.

**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 9 is a detailed inventory of assets identified by the Town's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 9. Morrison's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/ Capacity #	Hazard Specific Info
Historic Business District	VF	Unknown		Loss of sales tax/employment
Town Shops/Equipment	VF	$200,000		Recovery activity – flood
Wastewater Treatment Plant	EI	$3-5 Million		Downstream impacts
3 Town buildings	EI	$200,000		Flood damage
Town Hall/Courthouse	VF	$500,000		Court activities/Large meeting area
Town Water Diversion Structure (Bear Creek)	EI			Drinking Water Supply

Source: Town of Morrison Data Collection Guide

Many of the facilities listed above are also in GIS databases provided by the Town of Morrison and Jefferson County. Critical facility counts and types are shown in Table 10 and in the map in Figure 2. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 10. Summary of Morrison's Critical Facilities in GIS

Critical Facility Type	Facility Count
Bridges	9
Dams	1
Fire Stations	1
Police Facilities	1
Wastewater Facilities	1
Total	**13**

Source: Town of Morrison, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Morrison to disaster also involves inventorying the natural, historical, 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 so 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

Natural resources of importance around the area of Morrison include nearby open space, Red Rocks Park and the Bear Creek corridor. For information about natural resources in Jefferson County, which includes Morrison see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

Table 11 lists the properties in Morrison that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

Table 11. Morrison's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Bear Creek Canyon Scenic Mountain Drive	CO 74 section between Morrison and Idledale	11/15/1990
Bradford House III Archeological Site		04/08/1980
Craig, Katherine, Park	Along US 40/I-70 NW of Morrison	6/30/1995
Fort, The	19192 CO 8	7/14/2006
LoDaisKa Site		9/25/2003
Morrison Historic District	CO 8	09/28/1976
Morrison Schoolhouse	226 Spring St.	09/04/1974
Red Rocks Park District	16351 Co. Rd. 93	05/18/1990
Dinosaur Ridge	West of Morrison	State Register 3/10/1993,

Sources: Directory of Colorado State Register Properties, www.coloradohistory-oahp.org/programareas/register/1503/cty/jf.htm; National Register Information System, www.nr.nps.gov/

It should be noted that the Morrison Historic District incorporates many historic properties. Seventy buildings and sites were listed as part of the District, which encompasses the downtown area and some buildings on the neighboring streets. Some of these structure date to the founding of the town in 1872.

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the Town of Morrison, although there are 19 in the Morrison vicinity.

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.

1.4 Growth and Development Trends

Table 12 illustrates how Morrison has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Morrison is undergoing moderate growth. With the anticipated buildout in Rooney Valley and south of Hwy 8, the town may see a population explosion between 2010 and 2030. Table 13 shows Morrison's estimated population changes through 2030.

Table 12. Morrison's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
430	418	-2.8%	136	139	2.2%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

Table 13. Town of Morrison Population Projections Through 2030

2000 Population	2010 Population	% change 2000-2010	2030 Population*	% change 2010-2030
430	564	31.2%	5,164	915.6%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/, Town of Morrison Comprehensive Plan.
*Population estimate based on total "build-out" (2,300 Central/South Planning Area and 2,300 East Planning Area

Future growth will be east of C470 and north of Hwy 8 and will not present flood issues. Some growth may occur south of the Town. This will present no flood issues.

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Morrison's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 14 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Morrison.

Table 14. Morrison's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Master plan	Y	
Zoning ordinance	Y	
Subdivision ordinance	Y	
Growth management ordinance	Y	
Floodplain ordinance	Y	
Other special purpose ordinance (stormwater, steep slope, wildfire)		Development plan review

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Building code	Y	
Fire department ISO rating		West Metro FPD
Erosion or sediment control program		Development plan
Stormwater management program	Y	New development
Site Plan Review Requirements	Y	
Capital improvements plan	Y	
Economic development plan	Y	In comprehensive plan
Local emergency operations plan		Police protection only
Other special plans		
Flood insurance study or other engineering study for streams		
Elevation certificates	Y	

Source: Town of Morrison

Table 15 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Morrison.

Table 15. Morrison's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	Y	Contracted consultant	
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Y	Contracted consultant	
Planner/engineer/scientist with an understanding of natural hazards	N		
Personnel skilled in GIS	N		
Full-time building official	N	Contract building inspector (as needed)	
Floodplain manager		Contract planner/ engineer	
Emergency manager		Police Chief	
Grant writer	Y	Special Projects Coordinator	
Other personnel		Town Clerk	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)		Utilities Land use	Minimal capacity. Some data available – needs improvement
Warning systems/services (Reverse 9-11, cable override, outdoor warning signals)	Y	Jeffco OEM	A siren/voice message system is expected to be installed.

Source: Town of Morrison

Table 16 identifies financial tools or resources that Morrison could potentially use to help fund mitigation activities.

Table 16. Morrison's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	State program for non entitlements
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	Y	
Withhold spending in hazard-prone areas	Y	No formal policies
Other	CDPHE COAPA	

Source: Town of Morrison

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The Town of Morrison joined the National Flood Insurance Program (NFIP) on December 1, 1982, and the Community Rating System (CRS) on October 1, 1996. The NFIP allows private property owners to purchase affordable flood insurance and enables the community to retain its eligibility to receive certain federally backed monies and disaster relief funds. The CRS is a voluntary program for NFIP-participating communities. It provides flood insurance discounts to policyholders in communities that provide extra measures of flood above the minimum NFIP requirements. As of October 2009, Morrison had a CRS class rating of 9 (one a scale of 1-10, 1 being the best). This rating provides a 5 percent discount for policyholders within a special flood hazard area (SFHA) and a 5 percent discount for those outside of an SFHA.

NFIP insurance data indicates that as of November 30, 2009, there were 11 policies in force in Morrison, resulting in $2,511,600 of insurance in force. In Morrison, there have been 2 historical claims for flood losses totaling $1,231.62. At the time this plan was developed there were no repetitive or severe repetitive loss structures as defined by the NFIP.

Community Rating System Categories

The Community Rating System (CRS) categorizes hazard mitigation activities into six categories. These categories, and applicable Morrison activities, are described below. Note: some of the activities are appropriate to multiple categories. For purposes of simplicity, they are only included in the category deemed most appropriate based on the definitions and examples provided in the *CRS Coordinator's Manual*.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

Town of Morrison Comprehensive Plan (2008)

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subjects matter related to services, issues, and geographic areas within Morrison. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

The following excerpts are goals and related polices that are relevant to this hazard mitigation plan.

- **Goal SA-1**: Preserve significant natural, cultural, and agricultural resources within the planning area and maintain the rural character of Morrison.
  - **Policy SA-1**: Identify and encourage the preservation and enhancement of agricultural lands, scenic view corridors, wildlife habitat, and geologic rock formations.

- **Goal A-1:** Grow with the intention of maintaining Morrison's small town atmosphere.
  - **Policy A2**: Adequate public facilities and services should be available to serve current and future residents in a cost-effective, efficient manner. Development should occur where it can be served by Town infrastructure.

- **Goal D-1**: Create and plan for the future public recreational opportunities for both residents and day visitors to improve tourism and support existing retail businesses.
  - **Policy D-3**: Parks, trails, and open space shall be designed and constructed concurrently with new development. In addition, new parks and trails shall be multi-purpose and enhance the area's quality of life and small town character.

- **Goal D-2**: Preserve, protect, and enhance significant open spaces, natural and wildlife habitat.
  - **Policy D-4**: Protect and enhance significant wildlife habitat, vegetation communities, geologic features, viewsheds, agricultural land, and natural areas.

- **GOAL 1**: Complete the Town reservoir and water treatment improvements in order to take full advantage of the Town's current water rights.
  - **Policy I-1**: Develop a water system capable of providing an adequate year-round water supply in dry years and for future residential and commercial growth by creating storage and treatment facilities.

- **Policy I-3**: Assure that businesses comply with regulations governing water and wastewater usage as well as solid waste storage and disposal.

- **Goal J-1**: Promote the conservation of natural resources and the efficient use of energy while encouraging sustainable development practices.
  - **Policy J-7**: Create and adopt natural hazard regulations in order to guide development.

- **GOAL 1**: Continue to ensure adequate flood, police, fire, and emergency protection for Morrison residents and property by collaborating with other agencies during major events and relocating some Town facilities out of the floodplain.
  - **Policy K-1**: Continue to expand the positive working relationship with Denver's Theatres and Arenas, Bandimere Speedway, the Jefferson County Sheriff's Office, the Colorado State Patrol, the West Metro Fire Protection District, and other entities associated with public safety and emergency response in the area.
  - **Policy K-2**: Continue to participate in the federal flood insurance program and work to maintain and improve its working relationship with the Urban Drainage and Flood Control District.

Municipal Code

Title 10, Chapter 3: Floodplain Management

It is the purpose of this chapter to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health.
- To minimize expenditure of public money for costly flood control projects.
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public.
- To minimize prolonged business interruptions.
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, and streets and bridges located in areas of special flood hazards.
- To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas.
- To ensure that potential buyers are notified that property is in an area of special flood hazard.
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions. (Ord. 321, 5-6-2003)

10-3-7-1: Establishment of Development Permit:

A development permit shall be obtained before construction or development begins within any area of special flood hazard established in subsection 10-3-6B of this chapter. Application for a

development permit shall be made on forms furnished by the town and shall include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevations of the area in question; existing or proposed structures, fill, storage or materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- The proposed elevation, in relation to mean sea level, of the lowest floor (including basement or cellar) of any new or substantially improved structure to be located in zones A1 through A30, AE or AH, or zone A if base flood elevation data are available. Upon completion of the lowest floor, the permittee shall submit to the administrator the as built elevation, certified by a licensed professional engineer or surveyor.
- The proposed elevation, in relation to mean sea level, to which any new or substantially improved nonresidential structure will be floodproofed. Upon completion of the floodproofed portion of the structure, the permittee shall submit to the administrator the as built floodproofed elevation, certified by a professional engineer or surveyor.
- A certificate from a licensed professional engineer or architect that any utility floodproofing will meet the criteria in subsection 10-3-7-5A3 of this chapter.
- A certificate from a licensed professional engineer or architect that any nonresidential floodproofed structure will meet the floodproofing criteria in subsection 10-3-7-5B2, "Nonresidential Construction" (new development), of this chapter.
- A description of the extent to which any watercourse will be altered or relocated as a result of proposed development. Computations by a licensed professional engineer must be submitted that demonstrate that the altered or relocated segment will provide equal or greater conveyance than the original stream segment. The applicant must submit any maps, computations, or other material required by the federal emergency management agency (FEMA) to revise the documents enumerated in subsection 10-3-6B of this chapter when notified by the administrator, and must pay any fees or other costs assessed by FEMA for this purpose. The applicant must also provide assurances that the conveyance capacity of the altered or relocated stream segment will be maintained.
- A technical analysis, by a licensed professional engineer, if required by the administrator, which shows whether proposed development to be located in an area of special flood hazard may result in physical damage to any other property.
- In zone A, when no base flood elevation data are available from other sources, base flood elevation data shall be provided by the permit application for subdivision proposals and other proposed developments (including proposals for manufactured home and recreational vehicle parks and subdivisions) that are greater than either fifty (50) lots or five (5) acres. (Ord. 321, 5-6-2003)

10-3-7-5: Provisions for Flood Hazard Reduction:

- General Standards: In all areas of special flood hazard, the following standards are required:
  - Anchoring:

- All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement to the structure and to withstand hydrodynamic loads.
- All manufactured homes shall be anchored to resist flotation, collapse or lateral movement by providing over the top and frame ties to ground anchors. Specific requirements shall be that:
  - Over the top ties be provided at each of the four (4) corners of the manufactured home, with two (2) additional ties per side at intermediate locations, with manufactured homes less than fifty feet (50') long requiring one additional tie per side;
  - Frame ties to be provided at each corner of the home with five (5) additional ties per side at intermediate points, with manufactured homes less than fifty feet (50') long requiring four (4) additional ties per side;
  - All components of the anchoring system be capable of carrying a force of four thousand eight hundred (4,800) pounds; and
  - Any additions to the manufactured home be similarly anchored.

– Construction Materials And Methods:
  - All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
  - All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.
  - For all new construction and substantial improvements, fully enclosed areas below the lowest floor that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria: 1) a minimum of two (2) openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided; 2) the bottom of all openings shall be no higher than one foot (1') above grade; 3) openings may be equippedwith screens, louvers or other coverings or devices; provided, that they permit the automatic entry and exit of floodwaters.

– Utilities:
  - All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwater into the system;
  - New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharge from the systems into floodwaters; and
  - On site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.
  - Electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities shall be designed and/or located so as to prevent water

from entering or accumulating within the components during conditions of flooding.

- Subdivision Proposals:
  - All subdivision proposals shall be consistent with the need to minimize flood damage;
  - All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage;
  - All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and
  - Base flood elevation data shall be provided for subdivision proposals and other proposed development which contain at least fifty (50) lots or five (5) acres (whichever is less).

- Specific Standards: In all areas of special flood hazard where base flood elevation data has been provided as set forth in subsection 10-3-6B, "Basis For Establishing Areas Of Special Flood Hazard", of this chapter, or subsection 10-3-7-3B, "Use Of Other Base Flood Data", of this chapter, the following provisions are required:
  - Residential Construction:
    - New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to or above base flood elevations.
    - New construction and substantial improvement of any below grade crawl space shall:
      - Have the interior grade elevation that is below base floodelevation no lower than two feet (2') below the lowest adjacent grade;
      - Have the height of the below grade crawl space measured from the interior grade of the crawl space to the top of the foundation wall, not exceed four feet (4') at any point;
      - Have an adequate drainage system that allows floodwaters to drain from the interior area of the crawl space following a flood;
      - Be anchored to prevent flotation, collapse, or lateral movement of the structure and be capable of resisting the hydrostatic and hydrodynamic loads;
      - Be constructed with materials and utility equipment resistant to flood damage;
      - Be constructed using methods and practices that minimize flood damage;
      - Be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
      - Be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for

meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

- A minimum of two (2) openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided;
- The bottom of all openings shall be no higher than one foot (1') above grade;
- Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

– Nonresidential Construction: New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to the level of the base flood elevation; or, together with attendant utility and sanitary facilities, shall:
  - Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
  - Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyance;
  - Provide that a registered professional engineer or architect shall develop and/or review structural design, specifications and plans for construction, and certify that the design and methods of construction are in accordance with the accepted standards of practice for meeting the applicable provisions of this section; and
  - Record such certificate, which shall include the specific elevation (in relation to mean sea level), to which such structures are floodproofed with the official designated by the town under section 10-3-7-2 of this chapter, who shall maintain the certificate.

– Manufactured Homes:
  - All manufactured homes to be placed or substantially improved within zones A1 through A30, AH and AE shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is at or above the base flood elevation and be securely anchored to an adequately anchored foundation system in accordance with the provisions of subsection A1 of this section.
  - The following requirements shall apply to new manufactured home parks and manufactured home subdivisions, expansions to existing manufactured home parks and manufactured home subdivisions, existing manufactured home parks and manufactured home subdivisions where the repair, reconstruction or improvement of the streets, utilities or pads equals or exceeds fifty percent (50%) of value of the streets, utilities or pads before the repair, reconstruction or improvement of the streets, utilities or pads before the repair, reconstruction or improvement has commenced, and to manufactured homes not placed in a manufactured home park or manufactured home subdivision:

        - Stands or lots shall be elevated on compacted fill or on pilings so that the lowest floor of the manufactured home will be at or above the base flood level.
        - Adequate surface drainage and access for a hauler shall be provided.
        - In the instance of elevation on pilings, lots must be large enough to permit steps, piling foundations must be placed in stable soil no more than ten feet (10') apart, and reinforcement must be provided for pilings more than six feet(6') above the ground level.
    - Manufactured homes to be placed in floodways would have to meet the same standards as conventional housing and other development (e.g., their placement would be prohibited unless it could be demonstrated that there would be no increase in base flood elevations in the community).
- Floodways: Located within areas of special flood hazard established in subsection 10-3-6B of this chapter are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:
  - Encroachments, including fill, new construction, substantial improvements and other development are prohibited unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.
  - If subsection C1 of this section is satisfied, all new construction and substantial improvements shall comply with all applicable flood hazards reduction provisions of this section. (Ord. 321, 5-6-2003)

Other Regulations

Title 10, Chapter1: Zoning Regulations

The zoning code is enacted for the purpose of promoting the health, safety, morals, convenience, order, prosperity and welfare of the present and future inhabitants of the town by lessening of congestion in the streets and roads, securing safety from fire and other dangers, providing adequate light and air; the classification of land uses and the distribution of land development and utilization, avoiding undue congestion of population, facilitating the adequate provision of transportation, water, schools, sewer and other public requirements; and by other means in accordance with a master plan and the zoning map adopted herewith.

Title 10, Chapter 5: Land Disturbance Regulations

This section of municipal code governs land development and the possible resultant erosion. The clearing, stripping and grading of land for nonagricultural uses can cause accelerated, localized erosion rates with subsequent deposition and damage to off-site properties and receiving drainageways. Erosion and sedimentation are natural processes whose intensity, when increased by development, can destroy the environmental, aesthetic and economic values of

other properties, streams and lakes. The purpose of a land disturbance permit process is to reduce erosion and sedimentation.

Title 10; Chapter 6 Storm Drainage Regulations

Due to its general terrain and geographical location, the Town is particularly subject to damage from storm waters which, from time to time, overflow from existing water courses and drainage facilities. Presently existing storm drainage facilities, as well as future storm drainage facilities, require continuous operation, maintenance, renewal and replacement. Each owner of a lot or parcel of real property within the Town to the extent that he makes use of, and is served by, the Town's storm drainage facilities by contributing to those facilities storm water runoff beyond that amount (both in terms of peak rates and volumes) of storm water which would occur if that real property were undeveloped in its natural state, should pay for the use and the availability of use of such facilities.

Public Information

Public information activities advise property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of natural resources (e.g., local floodplains). They are usually implemented by a public information office.

- Distribution of flood related info
- Wildfire precaution
- Potable water conservation
- Morrison is working with the Jeffco Emergency Management Office to arrange for installation of an emergency warning alert siren/voice message system in town to provide alerts related to flash flooding, wind related emergencies, haz mat incidents etc. Equipment to be installed at town public work shops and will afford protection to most at risk residential and commercial areas of the town. Activation to be provided by Jeffco Sheriff's Office.

1.6 Mitigation Actions

Morrison has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Emergency warning system

Issue/Background: Morrison is identified by most emergency management organizations as the highest risk community for death by flash flooding in the metro area. The town lacks an adequate warning/alert system targeted at residents and day visitors to the historic business

district. During high seasonal tourism periods day visitor numbers are very high. These periods coincide with peak potential flash flood season.

Other Alternatives: Telephone notification systems can reach home phones but likely would not reach day visitor and commercial businesses.

Responsible Office: Special projects

Priority (High, Medium, Low): High

Cost Estimate: 28,000

Benefits (Avoided Losses): Potential loss of life - 45 persons have been killed by flooding associated with Bear Creek and Mount Vernon Creek since the 1870's.

Potential Funding: 911 surcharge on telephones - Jeffco authority

Schedule: Application pending - October 2009- If funded project will be implemented in late 2009 or early 2010.

2. Relocation of town shops

Issue/Background: Morrison town shops are located adjacent to Bear Creek in a flood zone. Equipment necessary for flood recovery is stored in these shops. Relocation to safer location would protect equipment from damage/loss due to flash flooding.

Other Alternatives: Seasonal outdoor storage of heavy equipment at other locations

Responsible Office: Special projects - Town of Morrison

Priority (High, Medium, Low): High

Cost Estimate: $50,000 plus site acquisition and development costs

Benefits (Avoided Losses): $100,000 equipment costs, $50,000 building cost

Potential Funding: Town general fund, Jefferson County Open Space

Schedule: Indeterminate - listed on town capital improvements 5 year plan

3. Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program

Hazards Addressed: Flood

Issue/Background: The Town of Morrison participates in the National Flood Insurance Program. The Town does not participate in the Community Rating System at this time. The Town implements sound floodplain management practices, as stated in the flood damage prevention ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers will remain current on NFIP policies, and are encouraged to attend appropriate training and consider achieving Certified Floodplain Manager (CFM) status.

Other activities that could be included in this effort are:

- Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance;
- Suggest changes to improve enforcement of and compliance with regulations and programs;
- Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;
- Promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Urban Drainage and Flood Control District, and Colorado Water Conservation Board.
- Evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents

Other Alternatives: No action

Responsible Office: Floodplain Engineer John M. Pflaum, P.E. W.H. Pacific

Priority (High, Medium, Low): Medium

Cost Estimate: Low

Potential Funding: Covered in existing budget

Benefits (avoided losses): Reduced property loss from floods, continued availability of flood insurance for residents.

Schedule: Ongoing

ANNEX H TOWN OF MOUNTAIN VIEW ANNEX

1.1 Community Profile

1.1.1 History

The Town of Mountain View is a Home Rule Municipality located in Jefferson County, Colorado. Mountain View is situated northwest of, and adjacent to, the City and County of Denver. It is surrounded on all four sides by existing municipalities. To the north is the City of Lakeside, to the east is the City and county of Denver, and to the south and west is the City of Wheat Ridge. The town consists of twelve city blocks and is home to 550 residents.

During the gold rush years, the land of the present site of Mountain View was owned by the Yule Family, who subsequently moved to the Crystal River Valley on the Western Slope in Gunnison County.

John Brishen Walker (1847-1930) - In 1879 Walker purchased 1,200 acres of land in the Berkeley area for $1,000. He added to the land until he had 1,600--1,700 acres, which he named Berkeley Farm. Walker and a British investor, Dr. William Bell, grew alfalfa on the farm until the late 1880's. Walker eventually gave 50 acres of his farm, on which is now Lowell Blvd., to the Jesuit College, (now Regis College). Walker later sold the land for $325,000 to a Kansas City syndicate, who put the Denver investment firm of Carleton Ellis and John McDonough in charge of the development of a new suburb--the Berkeley Annex.

Carleton Ellis was active in investments and real estate, and was vice president of the Citizens Bank in Denver. Not much is known about John McDonough. He lived in a spacious home at West 46th Avenue and Perry, in Harkness Heights, a development of his own making. The Berkeley Annex is from Sheridan Blvd. west to Fenton Street and 41st Avenue north to 44th Avenue. Ellis and McDonough platted what became Mountain View, Colorado, as Plat T3S, R69W on December 19, 1888. (The town was located on the Denver International Railroad at one time.)

It is thought the streets in Mountain View acquired their original Spanish and Indian names from Ellis and McDonough. From Sheridan Blvd. west, the streets were named Allita, Veta, Rietta, Bonita, Chipeta and Uintah.

In February 1897 Arapahoe County (now Denver and Adams County) collaborated with Jefferson County to unify the street system. Names of streets became Ames, Benton, Chase, Depew, Eaton and Fenton. These names were chosen to honor American political figures. Numbered avenues in Mountain View had various names (West 41st was B, Dakota or Maple). West 43rd was C, Wyoming or Oak, while 44th Ave. was D.

Mountain View was incorporated in 1904 for water and sewer purposes on the land occupied by the Berkeley Annex subdivision established in 1888, which itself was part of the Berkeley Farm founded by John Brishen Walker in 1879.

1.1.2 Population

The U. S Census Bureau's estimated 2000 population of Mountain View was 569. Select Census 2000 demographic and social characteristics for Mountain View are shown in Table 1.

Table 1. Mountain View's Demographic and Social Characteristics

Characteristic	
Gender/Age	
Male (%)	49.2
Female (%)	50.8
Under 5 Years (%)	6.0
65 Years and Over (%)	14.1
Race/Ethnicity (one race)	
White (%)	92.4
Hispanic or Latino (Of Any Race) (%)	23.7
Other	
Average Household Size	2.09
High School Graduate or Higher (%)	78.4

Source: U.S. Census Bureau, 2000, www.census.gov/

1.1.3 Economy

According to the 2000 Census, the industries that employed most of Mountain View's labor force were: educational, health, and social services (18.1%); construction (15.2%); and retail trade (10.3%). Select economic characteristics for Mountain View from the 2000 Census are shown in Table 2.

Table 2. Mountain View's Economic Characteristics

Characteristic	
Families below Poverty Level, 1999	12.2%
Individuals below Poverty Level, 1999	13.0%
Median Home Value	$125,000
Median Household Income, 1999	$41,364
Per Capita Income, 1999	$21,425
Population in Labor Force	369
Unemployment (%)*	4.3%

Source: U.S. Census Bureau (2000), www.census.gov/

1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the Town of Mountain View using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality to complete. Table 3 summarizes the Town of Mountain View's hazards based on the Data Collection Guide issued in 2009.

The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The Town of Mountain View's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member.

This matrix reflects that the Town of Mountain View is most vulnerable to flood (drainage problems), hailstorm, severe winter storms, tornado, and windstorm. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 3. Town of Mountain View – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Occasional	Limited	Negligible	Low
Drought	Occasional	Extensive	Negligible	Low
Earthquake	Occasional	Limited	Limited	Low
Erosion and Deposition	Unlikely	Limited	Negligible	Low
Expansive Soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Likely	Extensive	Negligible	Low
Flood (Drainage Problems)	Highly Likely	Significant	Limited	Medium
Hailstorm	Likely	Extensive	Negligible	Medium
Landslide, Debris flow, Rockfall	Unlikely	Limited	Negligible	Low
Lightning	Highly Likely	Extensive	Negligible	Low
Severe Winter Storms	Highly Likely	Extensive	Negligible	Medium
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Occasional	Limited	Critical	Medium
Wildfire	Unlikely	Limited	Limited	Low
Windstorm	Likely	Extensive	Limited	Medium

Frequency of Occurrence: Highly Likely: Near 100% probability in next year. Likely: Between 10 and 100% probability in next year or at least one chance in ten years. Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years. Unlikely: Less than 1% probability in next 100 years. **Spatial Extent**: Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area	**Potential Magnitude**: Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged. **Significance**: Low, Medium, High

Previous Hazard Events

Through the Data Collection Guide, the Town of Mountain View noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction. The events noted by this jurisdiction in the Data Collection Guide include:

June 1989 and June 1994 Hailstorms

On June 26, 1989 and June 3, 1994 hail up to 2″ in diameter fell in the Town of Mountain View. Winds accompanied these storms, exacerbating damages to cars and roofs. All roofs in the area had to be reshingled. All trees stripped of leaves. People and businesses had to pay for roofing costs not covered by insurance.

December 2006 Blizzards

Back to back blizzards struck the city a week apart in late December of 2006. The first blizzard, on December 20, struck as a result of a slow moving low pressure system that moved from the Desert Southwest into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. One to two feet of snow were recorded. On December 28th, another slow moving storm system moved from the Desert Southwest and into the Texas Panhandle. As it did, a deep easterly upslope flow occurred along the Front Range, with blizzard conditions developing over portions of the Northeast Plains of Colorado, mainly south of Interstate 76. The heaviest snow fell along east facing slopes with storm totals up to 2 1/2 feet in the North Central Mountains and Front Range Foothills.

Annual Flooding

The Town of Mountain View has almost annual drainage problems. Water from an adjoining City floods into the Town, mostly at street intersections. The magnitude varies with severity of storms. Areas damaged include W 41st Ave from Chase Street to Fenton Street. Most of the damage is light – mostly cleanup of debris. There have been reports of some undercutting of W

41st Avenue. This has caused minor delays to traffic, as well as minor impacts to local businesses.

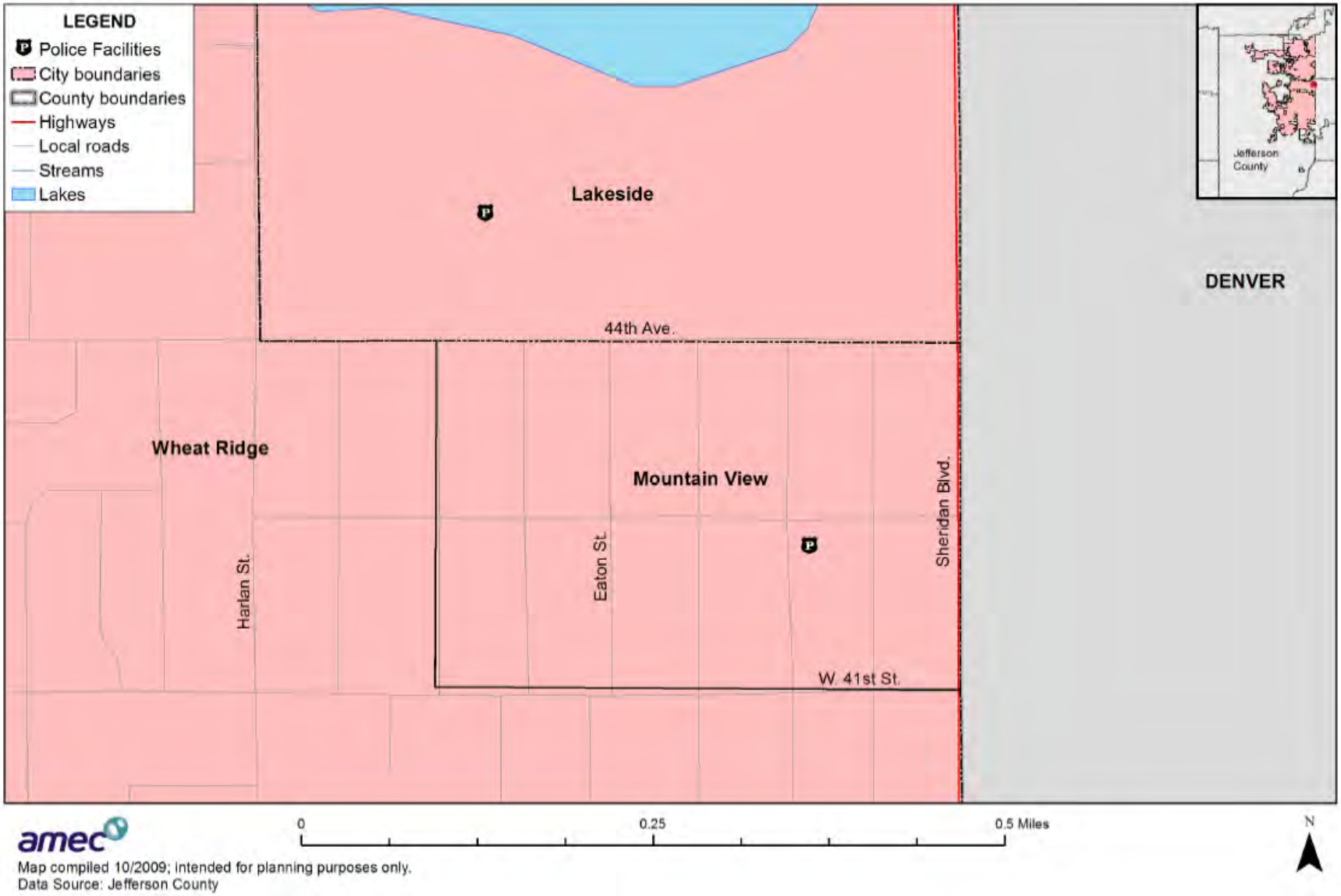
Vulnerability to Specific Hazards

This section details vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County.

Flood

There is no 100 year floodplain in the Town of Mountain View. However, Mountain View experiences stormwater drainage flooding along 41st Ave at Ames, Benton and Chase Streets intersection. During adverse precipitation conditions, pooling at these locations are both hazardous to pedestrians and travelers and can be a real nuisance. The impacts normally come into the town from Wheat Ridge. The Town of Mountain View would like to examine potential mitigation alternatives in coordination with the City of Wheat Ridge.

Figure 1. Town of Mountain View Critical Facilities Map



Wildfire

There is no wildfire hazard in the Town of Mountain View.

Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, lightning, tornado and windstorm the entire building inventory and population in the Town is potentially exposed. That is the reason for the asset inventory provided in Section 1.3. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

1.3 Asset Inventory

1.3.1 Property Inventory

Table 4 represents an inventory of property in Mountain View based on the Jefferson County Assessor's data as of June 2009.

Table 4. Mountain View's Property Inventory

Property Type	Structure Count	Land Values ($)*	Contents Values ($)**	Total Values ($)
Residential	218	$23,431,200	$11,715,600	$35,146,800
Commercial	26	$6,907,600	$6,907,600	$13,815,200
Total	**244**	**$30,338,800**	**$18,623,200**	**$48,962,000**

Source: Jefferson County Assessor's Office
*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.
**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures and 100% for commercial/industrial)

1.3.2 Other Assets

Table 5 is a detailed inventory of assets identified by the Town's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 5. Mountain View's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
W 41st Ave	EI	$300,000	NA	Washout of thoroughfare
Private Dwellings	Frame	$500,000	10 people	Water damage to homes

Many of the facilities listed above are also in GIS databases provided by the Town of Mountain View and Jefferson County. Critical facility counts and types are shown in Table 6 and in the map in Figure 1. Shelters may be in facilities such as schools or recreation centers and are not indicated on the map.

Table 6. Summary of Mountain View's Critical Facilities in GIS

Critical Facility Type	Facility Count
Police Facility	1
Total	1

Source: Town of Mountain View, Jefferson County

1.3.3 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Mountain View to disaster also involves inventorying the natural, historical, 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 so 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

For information about natural resources in Jefferson County, which includes Mountain View, see Section 4.3 Vulnerability Assessment.

Historic and Cultural Resources

There are no properties in Mountain View that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties (for more information about these registers, see Section 4.3 Vulnerability Assessment).

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There are currently no Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) buildings in the Town of Mountain View.

The Town of Mountain View currently has 3 designated historic structures located throughout the Town. A structure may be designated for preservation if it has historical, architectural, or geographical importance to the community. Table 7 lists Mountain View's designated historic landmarks not already mentioned in the previous paragraphs.

Table 7. Additional Historic Landmarks in Mountain View

Property	Address	Year Built
Berkley United Methodist Church	43rd Ave and Sheridan Boulevard	1892
Mountain View School	41st and Chase	1897
Mountain View Town Hall	4176 Benton Street	1948

Source: Town of Mountain View

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.

1.4 Growth and Development Trends

Table 8 illustrates how Mountain View has grown in terms of population and number of housing units between 2000 and 2007. The table illustrates that Mountain View is undergoing minor population loss.

Table 8. Mountain View's Change in Population and Housing Units, 2000-2007

2000 Population	2007 Population Estimate	Estimated Percent Change 2000-2007	2000 # of Housing Units	2007 Estimated # of Housing Units	Estimated Percent Change 2000-2007
569	531	-6.7%	287	287	0%

Source: Colorado Division of Local Government State Demography Office, www.dola.colorado.gov/dlg/demog/

1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Mountain View's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

1.5.1 Mitigation Capabilities Summary

Table 9 lists planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Mountain View.

Table 9. Mountain View's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Master plan	Y	
Zoning ordinance	Y	
Subdivision ordinance	N	
Growth management ordinance	N	
Floodplain ordinance	N	
Other special purpose ordinance (stormwater, steep slope, wildfire)	N	
Building code	Y	1997 UBC
Fire department ISO rating		
Erosion or sediment control program	N	
Stormwater management program	N	
Capital improvements plan	N	
Economic development plan	N	
Local emergency operations plan	Y	
Other special plans	N	
Flood insurance study or other engineering study for streams	N	
Elevation certificates	N	

Table 10 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in Mountain View.

Table 10. Mountain View's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	N		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	N		
Planner/engineer/scientist with an understanding of natural hazards	N		
Personnel skilled in GIS	N		
Full-time building official	N	Use a part-time official	
Floodplain manager	N		
Emergency manager	Y	Police Chief	
Grant writer	N		

Personnel Resources	Yes/No	Department/Position	Comments
Other personnel	Y	Director of Public Works	
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	N		
Warning systems/services (Reverse 9-11, cable override, outdoor warning signals)	Y	Jefferson County	

Table 11 identifies financial tools or resources that Mountain View could potentially use to help fund mitigation activities.

Table 11. Mountain View's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	Y	Within TABOR limits
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	N	Not needed, fully built out
Incur debt through general obligation bonds	N	
Incur debt through special tax bonds	Y	Within TABOR
Incur debt through private activities	N	
Withhold spending in hazard-prone areas	N	

1.5.2 Community Rating System Activities (All Hazards)

National Flood Insurance Program

The Town of Mountain View does not participate in the National Flood Insurance Program (NFIP). The Town is not mapped by the NFIP thus participation is optional.

Other Activities

The Town of Mountain View has a Comprehensive Plan developed in October of 2000. It serves as an official policy guide for decisions regarding the built environment, development and redevelopment within the city limits. It reflects the desires of both the citizens and the community leaders concerning the current and future built environment. It serves as a 20- year vision for the community.

Although Mountain View has received redevelopment pressures, their goals, policies and actions reflect maintaining its "small town feel" mostly concerned with redevelopment, traffic, parking and maintaining and improving the tax base.

Their definition of *Goal* is, a statement of an intended direction or desire, desired ultimate result, or vision of what is to be achieved.

- Policy – a statement of the direction or position to achieve desired goals
  - Action – a specific process used to implement a policy.

The Comprehensive Plan philosophy aligns with the philosophy of the Jefferson County Mitigation Plan process, and excerpts of the plan are highlighted here to show common themes and proactive planning measures.

Land use patterns in Mountain View are similar to most communities. The primary use of land along arterial roads is commercial. Residential is primarily single family with multifamily and two family homes scattered amongst them.

In the plan, goals are identified by category: Community, Land Use, Transportation, and Implementation.

Community

- Goal: Maintain a sense of community within the Town of Mountain View

- Goal: Promote and improve community resources, services, and programs that are available to Mountain View town residents both within the town and from surrounding communities.

- Goal: enhance and preserve park and recreational amenities available to town residents.

Land Use

- Goal: Retain town of Mountain View's "small town feel".
  - Policy: Support development and redevelopment that is similar in scale and design to existing and surrounding development.
  - Policy: Support redevelopment that does not include "cookie cutter" architecture.
    - Action: The Town will establish a review process for commercial and multifamily development.
    - Action: The Town will create a process for lot boundary variations that does not increase the number of dwelling units (paraphrased).

- Goal: Improve and maintain quality and condition of properties in town.
  - Policy: support community clean-up programs.

- Goal: Preserve safe, habitable, affordable housing.

- Goal: Mountain View will strive to be a distinctive, diverse, attractive and safe community.
  - Policy: Mountain View will pursue opportunities to keep the town a safe place to live.

- Action: Mountain View will create design standards which will allow for diverse structures yet retains the scale and basic design features which help Mountain View retain its character.

Commercial Land Use

- Goal: Pursue economic opportunities that are in the best interest of the town and its citizens.
  - Policy: Mountain View will be open to partnerships and Intergovernmental Agreements with surrounding communities, Jefferson County, and public/private economic development groups which enhance and protect the commercial interests of Mountain View.

- Goal: Pursue economic opportunities that are sustainable through time.
  - Policy: Mountain View will not support demolition of existing commercial structures without the developer documenting feasibility and financing for a replacement structure, use and proposed time frame.

- Goal: Pursue redevelopment of existing commercial areas and structures where it is in the best interest of the town and its citizens.
  - Policy: Mountain View will not support redevelopment of commercial to residential, religious, non-profit or lesser commercial without the developer demonstrating no significant loss of tax base.

- Goal: Create a healthy, vibrant, pedestrian friendly commercial area.
  - Policy: Mountain View will create design standards that allow for diverse commercial structures yet creates a similar theme among buildings…

School Site Land Use

- Goal: Preserve existing structure

- Goal: redevelop of the schoolhouse shall not create a traffic or parking hazard on Eaton or Fenton Streets.

Transportation

- Goal: Minimize impacts of potential expansion of 44th Ave and Sheridan Blvd.

- Goal: Keep traffic levels on residential streets low.

- Goal: Support transportation alternatives to the automobile.
  - Policy: Mountain View shall support bus and mass transit service improvements….

Implementation

Mountain View is a part of the Mile High Compact, which agrees to consistently enforce the plan relative to land use issues. The plan also is a basis for sound development in an attempt to provide a prosperous future. It will be re-evaluated periodically for its effectiveness and revised every five (5) years. Amendments may be initiated by the landowner or the town and must be compatible with existing land uses, promote goodness to the public, and not over-burden the towns infrastructure or reduce tax base.

1.6 Mitigation Actions

Mountain View has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Storm Water Drainage

Issue/Background: Storm water drains from the adjoining jurisdiction into the Town on the southern border. This is due to the natural slope of the land which is from south to north at a rate of about 1 foot vertically to 100 ft. horizontally. The water follows the streets and flows across W. 41st Avenue onto the adjoining property. Because the streets in the adjoining city do not match the street pattern in our town this is private property. There is a storm sewer across the street, but the inlets are not placed to intercept the flow. If additional work could be done, the water could be diverted into the storm sewer. This would solve a lot of the problem.

Other Alternatives: This would require a berm system along W41st Avenue. This would be much more expensive. As it would require more contruction and would not do the job as well.

Responsible Office: Public Works

Priority (High, Medium, Low): Low

Cost Estimate: $100,000

Benefits (Avoided Losses): Would lower potential for soil erosion, and this would prevent water pollution.

Potential Funding: Unknown

Schedule: Unknown

ANNEX I SPECIAL DISTRICTS ANNEX

Jefferson County contains many special districts with unique hazards, assets, capabilities, mitigation strategy, and mitigation actions. This annex profiles those districts who have chosen to participate in this plan. Not all districts in Jefferson County chose to participate. Districts participating in this plan include:

- Evergreen Fire Protection District
- Indian Hills Fire Protection District
- North Fork Fire Protection District
- Pleasant View Metropolitan District
- Lookout Mountain Water District

1.1 Evergreen Fire Protection District

1.1.1 Community Profile

The Evergreen Fire Protection District (EFPD), situated approximately 30 miles west of Denver on the eastern slopes of Mount Evans. The elevation of Evergreen is approximately 7,500 feet and the elevation within the fire district ranges from 6,720 to 10,500 feet. As its name implies, Evergreen is a heavily forested region that is dissected by streams and expansive grassy meadows. Evergreen Fire/Rescue (EFR) serves nearly 40,000 residents across EFPD's more than 120 square miles. Subdivision characteristics range from rugged ridge top developments to luxury fairway homes. Commercial development is primarily service oriented and concentrated along primary roadways.

1.1.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the Evergreen Fire Protection District using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide. The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The District's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. Table 1 summarizes the District's hazards based on the Data Collection Guide issued in 2009. This matrix reflects that District's hazards of most significance are fog, hailstorm, lightning, and wildfire. The District's has a medium significance hazards are drought, earthquake, erosion, flood, severe winter storms, and windstorm. The vulnerability established

here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 1. Evergreen Fire Protection District – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Occasional	Significant	Negligible	Low
Dam Failure	Occasional	Limited	Negligible	Low
Drought	Likely	Extensive	Negligible	Low-Medium
Earthquake	Unlikely	Significant	Limited	Medium
Erosion and Deposition	Likely	Significant	Limited	Low-Medium
Expansive Soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Likely	Extensive	Negligible	Low
Flood	Likely	Significant	Limited	Low-Medium
Hailstorm	Highly Likely	Extensive	Limited	Med-High
Landslide, Debris flow, Rockfall	Highly Likely	Significant	Negligible	Low
Lightning	Highly Likely	Extensive	Negligible	Med-High
Severe Winter Storms	Highly Likely	Extensive	Neg-Limit	Low-Med
Subsidence	Occasional	Limited	Negligible	Low
Tornado	Unlikely	Limited	Negligible	Low
Wildfire	Highly Likely	Extensive	Critical	Med-High
Windstorm	Likely	Extensive	Negligible	Med

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Wildfire

A vulnerability assessment for wildfire hazards was performed for the fire protection districts using GIS. See Table 4.43 in Section 4.3 in the base plan for an explanation of the methodology and Section 4.2 for a hazard map with district boundaries. According to this analysis there are 352 residential structures in a moderate or higher wildfire hazard, with a total value of $143 million.

1.1.3 District Assets

Table 2 is a detailed inventory of assets identified by the District's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 2. Evergreen Fire Protection District's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #**	Hazard Specific Info
Admin. Building	EI	Unknown	B	None
Station 1	EI	Unknown	B	None
Station 2	EI	Unknown	B	None
Station 3	EI	Unknown	B	None
Station 4	EI	Unknown	B	None
Station 5	EI	Unknown	B	None
Station 6	EI	Unknown	B	None
Station 7	EI	Unknown	B	None
Station 8	EI	Unknown	B	None
Maintenance	EI	Unknown	S-1	None

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets
** B = Business and S-1 = Moderate Hazard Storage Facility per International Fire Code Occupancy classification.

1.1.4 Growth and Development Trends

Development within the District continues to grow. To achieve a balance between natural and man-made environments, housing recommendations have been related to the natural features of the mountain environment, e.g., ground water and septic suitability constraints, transportation constraints, geologic and flood hazards, slope, meadows, wildlife, vegetation, and scenic views.

When development is proposed, the characteristics of the site are identified and development impacts are evaluated. It is during the development review process that the wildlife and visually sensitive areas are identified, the ability of the roads to carry additional traffic is determined, the water and sanitation concerns are noted, and the availability of services is identified.

The Evergreen Area Community Plan created and identified policies to ensure certain high hazard areas had special regulations. These regulations regard development in:

- Meadows and areas with low screening potential
- Geologic hazard areas
- Flood hazard areas
- Wildfire hazard areas

The Plan also created slope standards, as well as density and location standards.

Minor growth in the form of mostly individual homes here and there, but no subdivision is currently under development. All new homes go through the Jefferson county or Clear Creek county defensible space and hazard mitigation process. For the most part commercial properties are just tenant finishes and re-classifications of occupancies.

1.1.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes the District's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

Mitigation Capabilities Summary

Table 3 identifies financial tools or resources that Evergreen Fire Protection District could potentially use to help fund mitigation activities.

Table 3. Evergreen Fire Protection District's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	N	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	N	
Withhold spending in hazard-prone areas	N	

Additional Mitigation Capabilities

Evergreen Fire Protection District conducts Fire Safety Programs taught to residences/students. Particular programs include: Hands on Fire Extinguisher Training for public and to Middle school students, CPR, Wildfire Awareness, Home fire safety and Senior Safety.

1.1.6 Mitigation Actions

The Evergreen Fire Protection District has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Mitigation Project Title: Educate the Public on Wildfire Mitigation.

Issue/Background: Per the CWPP most of our fire district (123 square miles) has a Extreme or High hazard rating. We would conduct meetings with homeowners associations, public and display booths at Wal-Mart, Home Depot and local grocery stores and hand out flyers, pamphlets, etc. We would also work with a few homeowners in our district on displaying their home to show what has been done for mitigation on their property and take photos, do a video and/or ask a local TV station to do a story on this.

Continuation of wildfire mitigation training for our Community Education person, who will be conducting the public training.

Other Alternatives: None

Responsible Office: Evergreen Fire/Rescue Fire Prevention Section

Priority (High, Medium, Low): Medium to High

Cost Estimate: $6,000 for handouts, pamphlets, banners. $2,000 for training our personnel

Benefits (Avoided Losses): Reduction of homes/property loss due to wildfires17.

Potential Funding: unknown

Schedule: Within 2 years

1.2 Indian Hills Fire Protection District

1.2.1 Community Profile

Indian Hills is a census-designated place (CDP) and a U.S. Post Office in Jefferson County, Colorado. The population was 1,197 at the 2000 census. According to the United States Census Bureau, the CDP has a total area of 4.7 square miles, all of it land.

1.2.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the Indian Hills Fire Protection District using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide. The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The District's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. Table 4 summarizes the hazards for the District based on the Data Collection Guide issued in 2009. This matrix reflects that the Indian Hills Fire Protection District's most significant hazards are hailstorm, lightning, severe winter storms, and wildfire. The District's medium significance hazards are to drought, extreme heat, flood, fog, landslide/debris flow/rockfall, and windstorm. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 4. Indian Hills Fire Protection District – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Likely	Extensive	Limited	Medium
Earthquake	Unlikely	Extensive	Catastrophic	Low
Erosion and Deposition	Occasionally	Significant	Limited	Low
Expansive Soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Likely	Extensive	Limited	Medium
Flood	Occasionally	Limited	Limited	Medium
Hailstorm	Likely	Extensive	Negligible	High
Landslide, Debris flows, Rockfall	Occasionally	Limited	Negligible	Medium
Lightning	Highly Likely	Extensive	Negligible	High
Severe Winter Storms	Highly Likely	Extensive	Limited	High

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Subsidence	Occasionally	Significant	Negligible	Low
Tornado	Unlikely	Extensive	Catastrophic	Low
Wildfire	Highly Likely	Extensive	Catastrophic	High
Windstorm	Likely	Extensive	Limited	Medium

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Wildfire

A vulnerability assessment for wildfire hazards was performed for the fire protection districts using GIS. See Table 4.43 in Section 4.3 in the base plan for an explanation of the methodology and Section 4.2 for a hazard map with district boundaries. According to this analysis there are 51 residential structures in a moderate or higher wildfire hazard, with a total value of $16 million.

1.2.3 District Assets

Table 5 is a detailed inventory of assets identified by the District's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 5. Indian Hills Fire Protection District Assets

Name of Asset	Type	Address	Replacement Value ($)	Occupancy/ Capacity #**	Hazard Specific Vulnerability
Indian Hills Fire One Station	EI	4476 Parmalee Gulch Rd	$2,000,000	B	Fire, wind, flooding, terrorism
Indian Hills Water Department	EI			B	Fire, wind, flooding, terrorism, Hazmat
Parmalee Elementary	VF	4460 Parmalee Gulch Rd			

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets
** B = Business per International Fire Code Occupancy classification.

1.2.4 Growth and Development Trends

Maintaining the mountain community character of Indian Hills is a primary concern of residents. New development, both commercial and residential, needs to be well planned and designed in order to meet the unique and sometimes restrictive environment of the mountains. An issue of particular concern is platting. Many of the areas in Indian Hills were platted in the 1920's and 1930's. These plats created individual lots, many of which are as small as 50′ x 50′ in size. As individual lots, they do not meet current buildable standards for septic/leach fields or setbacks. The consequences of continuing to allow building on these old plats in the mountains are the obvious continued degradation of water supplies, and overcrowding of County and community roads. Features that make Indian Hills unique are its open space, visual resources, historic sites, rural character and abundance of wildlife. New development in Indian Hills needs to take all of these characteristics into consideration in order to plan wisely for the future.

1.2.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes the District's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

Mitigation Capabilities Summary

Table 6 lists planning and land management a tool typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table 6. Indian Hills Fire Protection District's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	Jeffco
Zoning ordinance	No	Jeffco
Subdivision ordinance	No	Jeffco
Growth management ordinance	No	Jeffco
Floodplain ordinance	No	Jeffco
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	Jeffco
Building code	Yes	ranrud@intercanyonfire.org
Fire department ISO rating		officemanager@ihfr.org
Erosion or sediment control program	No	Jeffco
Stormwater management program	No	Jeffco

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
Site plan review requirements	Yes	ranrud@intercanyonfire.org
Capital improvements plan	No	
Economic development plan	No	Jeffco
Local emergency operations plan	No	Jeffco
Other special plans	No	Jeffco
Flood insurance study or other engineering study for streams	No	Jeffco
Elevation certificates (for floodplain development)	No	Jeffco

Table 7 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the District.

Table 7. Indian Hills Fire Protection District's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		Jeffco
Engineer/professional trained in construction practices related to buildings and/or infrastructure	No		Jeffco
Planner/engineer/scientist with an understanding of natural hazards	No		Jeffco
Personnel skilled in GIS	No		Jeffco
Full time building official	No	Part Time Fire Marshall	**ranrud@intercanyonfire.org**
Floodplain manager	No		Jeffco
Emergency manager	No		Jeffco
Grant writer	Yes	Fire Chief	
Other personnel			
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		Jeffco
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		Jeffco

Table 8 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table 8. Indian Hills Fire Protection District's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	N	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	With voter approval
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Jeffco
Incur debt through general obligation bonds	Y	With voter approval
Incur debt through special tax bonds	Y	With voter approval
Incur debt through private activities	N	
Withhold spending in hazard-prone areas	N	

1.2.6 Mitigation Actions

The Indian Hills Fire Protection District has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Mitigation Project Title: Community Emergency Response Team (CERT) Training Program

Issue/Background: FEMA program designed to educate and train citizens of the community to mitigate hazards and respond to local emergencies. CERT is about readiness, people helping people, rescuer safety, and doing the greatest good for the greatest number. CERT is a positive and realistic approach to emergency and disaster situations where citizens will be initially on their own and their actions can make a difference. Through training, citizens learn to manage utilities and put out small fires; open airways, control bleeding, and treat for shock; provide basic medical aid; search for and rescue victims safely; and organize themselves and spontaneous volunteers.

Other Alternatives: None

Responsible Office: Indian Hills Fire / Rescue Chief

Priority (High, Medium, Low): Medium

Cost Estimate: $20.00/ student,

Benefits (Avoided Losses): Citizens based that is trained to assist the community during a major incident or disaster when local emergency responders may be overwhelmed.

Potential Funding: FEMA / regional grants

Schedule: Within 2 years

1.3 North Fork Fire Protection District

1.3.1 Community Profile

North Fork Volunteer Fire Department provides fire suppression, fire prevention services and emergency medical care to the residents and visitors of the North Fork Fire Protection District. The district is approximately 250 square miles in area with close to 2,000 residents.

1.3.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the District using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide. The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The District's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. Table 9 summarizes North Fork's hazards based on the Data Collection Guide issued in 2009. This matrix reflects that the District's hazards of most significance are flood and wildfire. North Fork Fire Protection District's medium significance hazards are dam and levee failure, landslide/debris flow/rockfall, lightning, severe winter storms, and windstorm. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 9. North Fork Fire Protection District – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Occasional	Limited	Catastrophic	Medium
Drought	Likely	Limited	Negligible	Low
Earthquake	Unlikely	Limited	Negligible	Low
Erosion and Deposition	Likely	Limited	Negligible	Low
Expansive soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Occasional	Limited	Negligible	Low
Flood	Likely	Limited	Catastrophic	High
Hailstorm	Occasional	Limited	Negligible	Low
Landslide, Debris flow, Rockfall	Likely	Limited	Limited	Medium
Lightning	Highly Likely	Significant	Negligible	Medium
Severe Winter Storms	Highly Likely	Significant	Limited	Medium

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Unlikely	Limited	Negligible	Low
Wildfire	Highly Likely	Extensive	Catastrophic	High
Windstorm	Likely	Limited	Limited	Medium

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Wildfire

A vulnerability assessment for wildfire hazards was performed for the fire protection districts using GIS. See Table 4.43 in Section 4.3 in the base plan for an explanation of the methodology and Section 4.2 for a hazard map with district boundaries. According to this analysis there are 112 residential structures in a moderate or higher wildfire hazard, with a total value of $19 million.

1.3.3 District Assets

Table 10 is a detailed inventory of assets identified by the District's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 10. North Fork Fire Protection District's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #**	Hazard Specific Info
North Fork Station One	EI	$500,000	B	None
North Fork Station Two	EI	$250,000	B	None
North Fork Station Three	EI	$200,000	B	None

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets
** B = Business per International Fire Code Occupancy classification.

1.3.4 Growth and Development Trends

North Fork Fire Protection District lies to the southwest of Littleton. The District has seen approximately 1/3 or more of its acreage burned by wildfire in the past 10 years. As a result, development in the area is anticipated to grow in the near future.

1.3.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes the District's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

Mitigation Capabilities Summary

North Fork Fire Protection District's Regulatory Mitigation Capabilities include a wildfire ordinance (2003 Urban Interface Fire Code) and a building code (Jefferson County Building Code). The District has a Fire Department ISO rating of 6.

Table 11 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table 11. North Fork Fire Protection District's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Y	Remodel Station 2
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	Voter approval needed
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Incur debt through general obligation bonds	Y	Voter approval needed
Incur debt through special tax bonds	Y	Voter approval needed
Incur debt through private activities	N	
Withhold spending in hazard-prone areas	N	

Additional Capabilities

Public Education Programs: General fire safety programs which include wildland fire mitigation and preparedness.

1.3.6 Mitigation Actions

The North Fork Fire Protection District has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Mitigation Project Title: Recruit & Retain additional Volunteer Firefighters

Issue/Background: The North Fork Fire Department has a current roster of 25 firefighters. Several members are nearing retirement. The District has identified the need to maintain staffing of 25-35 firefighters. The Department covers a large geographic area with small population base. Maintaining adequate staffing level is difficult. The District would like to add 10 additional firefighters.

Other Alternatives: No viable alternatives.

Responsible Office: North Fork Fire Protection District

Priority: High

Cost Estimate: $30,000

Benefits (Avoided Losses): Adequate staffing levels are imperative to insure prompt initial attack in wildland and structural settings.

Potential Funding: Operating budget. Grant funding will also be pursued.

Schedule: Within 3-4 years

1.4 Pleasant View Metropolitan District

1.4.1 Community Profile

Pleasant View Metropolitan District is a census-designated place (CDP) in Jefferson County, Colorado. The District is made up of two separate CDPs: East Pleasant View (CDP) and West Pleasant View (CDP). For purposes of this plan, the two will be treated as one entity. The combined population was 4,301 at the 2000 census.

1.4.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the Pleasant View Metropolitan District using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide. The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The District's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. Table 12 summarizes the District's hazards based on the Data Collection Guide issued in 2009. This matrix reflects that the District's hazard of most significance is flood. The District's medium significance hazards are drought, hailstorm, and severe winter storms. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 12. Pleasant View Metropolitan District – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Likely	Significant	Negligible	Medium
Earthquake	Unlikely	Limited	Negligible	Low
Erosion and Deposition	Unlikely	Limited	Negligible	Low
Expansive Soils	Unlikely	Limited	Negligible	Low
Extreme Temperatures	Occasional	Significant	Negligible	Low
Flood	Occasional	Significant	Limited	High
Hailstorm	Occasional	Significant	Limited	Medium
Landslide, Debris flow, Rockfall	Unlikely	Limited	Negligible	Low
Lightning	Occasional	Limited	Negligible	Low
Severe Winter Storms	Occasional	Significant	Negligible	Medium

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Subsidence	Unlikely	Limited	Negligible	Low
Tornado	Unlikely	Limited	Limited	Low
Wildfire	Likely	Limited	Negligible	Low
Windstorm	Likely	Limited	Negligible	Low

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

1.4.3 District Assets

Table 13 is a detailed inventory of assets identified by the District's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 13. Pleasant View Metropolitan District's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #**	Hazard Specific Info
Pleasant View Fire Department	EI	2.0 mil	B	None

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets
** B = Business per International Fire Code Occupancy classification.

1.4.4 Growth and Development Trends

Pleasant View, as identified by their boundary constriction, is landlocked and is not planning or engaged in any development at this time. However, the building that is going on at National Renewable Energy Laboratory (NREL) currently impacts Pleasant View now and will in the future.

NREL is building to accommodate an expected 3,000 new employees. They are planning a build out extending Moss Street to serve partially as an egress for the additional number of people and vehicles. The Moss Street extension build out will intersect with the District requiring the Fire Protection District to respond to incidents on the newly built out road. The new building construction requires water diversion and stormwater planning. NREL is working with the Jefferson County Planning Department to resolve any water issues. Pleasant View is represented in that planning effort; however, the water that is being diverted will impact Pleasant View's flood risk. To what degree has not been determined.

NREL is also demolishing older properties and building higher occupancy buildings in their place. This adds population to the area, which could also increase risk and vulnerability to wildfire.

1.4.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Pleasant View's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

Mitigation Capabilities Summary

Table 14 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table 14. Pleasant View Metropolitan District's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	Yes	Jefferson County
Zoning ordinance	Yes	Jefferson County
Subdivision ordinance	Yes	Jefferson County
Growth management ordinance	Yes	Jefferson County
Floodplain ordinance	Yes	Jefferson County
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Jefferson County
Building code	Yes	Jefferson County
Fire department ISO rating	Yes	ISO Rating 5
Erosion or sediment control program	No	
Stormwater management program	Yes	Urban Drainage & Flood Dist.
Site plan review requirements		
Capital improvements plan	No	
Economic development plan	No	
Local emergency operations plan	Yes	Jefferson County
Other special plans		
Flood insurance study or other engineering study for streams	Yes	Jefferson County
Elevation certificates (for floodplain development)	Yes	Jefferson County

Table 15 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the District.

Table 15. Pleasant View Metropolitan District's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		Jefferson County
Engineer/professional trained in construction practices related to buildings and/or infrastructure	No		Jefferson County
Planner/engineer/scientist with an understanding of natural hazards	No		Jefferson County
Personnel skilled in GIS	No		Jefferson County
Full time building official	No		Jefferson County
Floodplain manager	No		Jefferson County
Emergency manager	No		Jefferson County
Grant writer	No		Jefferson County
Other personnel	No		Jefferson County
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No		Jefferson County
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No		Jefferson County

Table 16 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table 16. Pleasant View Metropolitan District's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	No	
Capital improvements project funding	No	
Authority to levy taxes for specific purposes	Yes	Voter Approval Needed
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Incur debt through general obligation bonds	Yes	Voter Approval Needed
Incur debt through special tax bonds	Yes	Voter Approval Needed
Incur debt through private activities	No	
Withhold spending in hazard-prone areas	No	

1.4.6 Mitigation Actions

The Pleasant View Metropolitan District has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. Flood mitigation of Lena Gulch through Pleasant View Community Park at Camp George West located at 1220 Kilmer St.

Issue/Background: Pleasant View Metropolitan District is a small community that provided Fire/Rescue and Park/Recreation services to approximately 4600 residents. The District maintains and operates (4) four parks within our community. Two of these parks have Lena Gulch that runs directly through them. Lena Gulch runs through Pleasant View Community Park at Camp George West has had flood mitigation work done on the west side and also further down on the east side. The water flow from the west side of the park has been improved and the issues in that area have been corrected, but once it leaves this area and enters the park property on the west side the water flows is restricted. This causes a back up and potential for flooding of properties down stream. This is a concern to the District because of the potential of loss of life and or property. The District wants to protect our residents from the possible dangers of flooding and be proactive in the process of mitigating this hazard.

Priority: Medium to High

Cost: Unknown

Benefits (avoided losses): Reduced property loss from floods, and continue working on way to improve the flood danger through out our Community.

2. Flood mitigation of Lena Gulch through West Blade Park located at 16780 Mt Vernon Road.

Issue/Background: Pleasant View Metropolitan District is a small community that provided Fire/Rescue and Park/Recreation services to approximately 4600 residents. The District maintains and operates (4) four parks within our community. Two of these parks have Lena Gulch that runs directly through them. Lena Gulch runs through West Blade Park has had flood mitigation work done on the west side and also further down on the east side. The water flow from the west side of the park has been improved and the issues in that area have been corrected, but once it leaves this area and enters the park property on the west side the water flows is restricted. This causes a back up and potential for flooding of properties down stream. This is a concern to the District because of the potential of loss of life and or property. The District wants to protect our residents from the possible dangers of flooding and be proactive in the process of mitigating this hazard.

Priority: Medium to High

Cost: Unknown

Benefits (avoided losses): Reduced property loss from floods, and continue working on way to improve the flood danger through out our Community.

1.5 Lookout Mountain Water District

1.5.1 Community Profile

Lookout Mountain Water District (LMWD) is a Special District as governed by Title 32 of the Colorado Revised Statutes. In terms of a system it is comprised of tap owners and property owners included in the District's boundaries, the Board of Directors, and the contractors and consultants who provide operation and management. The District is managed by a five member board of directors. It has no employees. Operations are handled by a contracted secretary-administrator and a contracted operations manager. Its assets include the land, rights to water within its reservoirs, a treatment facility, and components of the distribution system, such as the main pipeline and meters. Water from LMWD is distributed to about 500 households, governmental agencies and businesses by gravity flows. The District is served treated water through a 14 to 20 inch diameter pipeline owned by LWMD, and several branch lines, variously owned throughout the District's extent.

1.5.2 Hazard Summary

A hazard identification and vulnerability analysis was completed for the LMWD using the same methodology in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide. The Data Collection Guide listed all of the hazards that could impact anywhere in Jefferson County. The purpose of this worksheet was to identify and rank the hazards and vulnerabilities specific to the jurisdiction. The District's planning team members were asked to complete the matrix by ranking each category based on the experience and perspective of each planning team member. Table 12 summarizes the District's hazards based on the Data Collection Guide issued in 2009. This matrix reflects that the District's hazards of most significance are dam failure and flood. The District's medium significance hazards are drought, hailstorm, severe winter storms, and wildfire. The vulnerability established here is a qualitative assumption based on the impacts, geographic extent, probability of future occurrence, and magnitude/severity.

Table 17. Lookout Mountain Water District – Hazard Summaries

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanche	Unlikely	Limited	Limited	Low
Dam Failure	Occasional	Extensive	Limited	High
Drought	Likely	Extensive	Limited	Medium
Earthquake	Occasional	Limited	Limited	Low
Erosion and Deposition	Occasional	Limited	Limited	Low
Expansive Soils	Occasional	Limited	Limited	Low

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Extreme Temperatures	Occasional	Extensive	Limited	Low
Flood	Occasional	Limited	Limited	High
Hailstorm	Highly Likely	Extensive	Negligible	Medium
Landslide, Debris flow, Rockfall	Likely	Limited	Negligible	Low
Lightning	Highly Likely	Significant	Limited	Low
Severe Winter Storms	Highly Likely	Extensive	Limited	Medium
Subsidence	Occasional	Limited	Negligible	Low
Tornado	Occasional	Limited	Critical	Low
Wildfire	Highly Likely	Significant	Limited	Medium
Windstorm	Highly Likely	Significant	Limited	Low

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
Likely: Between 10 and 100% probability in next year or at least one chance in ten years.
Occasional: Between 1 and 10% probability in next year or at least one chance in next 100 years.
Unlikely: Less than 1% probability in next 100 years.

Spatial Extent:
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Potential Magnitude:
Catastrophic: Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50% of property is severely damaged
Critical: Multiple severe injuries, complete shutdown of facilities for at least 2 weeks, more than 25% of property is severely damaged
Limited: Some injuries, complete shutdown of critical facilities for more than one week, more than 10 percent of property is severely damaged
Negligible: Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Significance: Low, Medium, High

Flooding

According to the LMWD, flooding affects the LMWD in elevation ranges from 11,500 feet on Squaw Mountain to 7,200 feet on the eastern extent of the District. The District is hampered in identifying a total of flood-prone areas by repeated cross-drainage topography and diversion points which intersect overland flows. The flood pattern is generally confined from the lower Beaver Brook Dam, along Beaver Brook, until its confluence with Clear Creek, near Tunnel 2 on Highway 6, well north of LWMD.

Dam Failure

LMWD owns and operates 3 storage dams for water supply purposes. Two are located in Clear Creek County, and one is located in Jefferson County. Lookout Mountain Dam is profiled in Table 4.3 in Section 4.3.2. All three of these dams are classified as high hazard dams. Each dams is used for water supply purposes for the District. Each dam has an EAP. The Lookout Mountain Reservoir Dam had a discharge pipe misalignment in 1974. This problem was corrected by sliplining and no further problems have occurred.

1.5.3 District Assets

Table 13 is a detailed inventory of assets identified by the District's planning team. This inventory includes critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.3 Vulnerability Assessment.

Table 18. Lookout Mountain Water District's Assets

Name of Asset	Type	Replacement Value ($)	Occupancy/Capacity #	Hazard Specific Info
Evergreen Fire Substation	EI			
Foothills Fire Rainbow Hills Station	EI			
Foothills Fire Lookout Mountain Station	EI			
Highland Rescue Team Ambulance District Station	EI			
Lookout Mountain Water District Storage Tank	EI		1 million gallons of potable water	
Lookout Mountain Dam	EI			

*EI: Essential Infrastructure; VF: Vulnerable Facilities; HM: Hazardous Materials Facilities; NA: natural assets

1.5.4 Growth and Development Trends

Although the District traverses extensive open space, the District's charter authorized 550 water taps. This restricts possible further growth.

1.5.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment summarizes Lookout Mountain Water District's regulatory mitigation capabilities, administrative and technical mitigation capabilities, and fiscal mitigation capabilities and then discusses these capabilities in further detail along with other mitigation efforts as they pertain to the National Flood Insurance Program's Community Rating System (CRS). Although the CRS is flood-focused, this discussion also incorporates activities related to other hazards into the categories established by the CRS.

Mitigation Capabilities Summary

Table 14 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table 19. Lookout Mountain Water District's Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Yes/No	Comments
General or Comprehensive plan	No	
Zoning ordinance	No	
Subdivision ordinance	No	
Growth management ordinance	No	
Floodplain ordinance	No	
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Dam Safety
Building code	No	
Fire department ISO rating	No	
Erosion or sediment control program	No	
Stormwater management program	No	
Site plan review requirements	No	
Capital improvements plan	No	
Economic development plan	No	
Local emergency operations plan	No	
Other special plans	No	
Flood insurance study or other engineering study for streams	No	
Elevation certificates (for floodplain development)	No	

Table 15 identifies the personnel responsible for mitigation and loss prevention activities as well as related data and systems in the District.

Table 20. Lookout Mountain Water District's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position	Comments
Planner/engineer with knowledge of land development/land management practices	No		
Engineer/professional trained in construction practices related to buildings and/or infrastructure	No		
Planner/engineer/scientist with an understanding of natural hazards	No		
Personnel skilled in GIS	No		
Full time building official	No		
Floodplain manager	No		
Emergency manager	No	Clear Creek County Jefferson County	
Grant writer	No		
Other personnel	No		

GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	No
Warning Systems/Services (Reverse 9-11, cable override, outdoor warning signals)	No

Table 16 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table 21. Lookout Mountain Water District's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	No	
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	Voter Approval Needed
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	No	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	No	
Incur debt through private activities	No	
Withhold spending in hazard-prone areas	No	

Additional Capabilities

Lookout Mountain Water District structures their rates for conservation. Water restrictions are implemented when needed. The District also conducts ongoing conservation outreach for its clients.

1.5.6 Mitigation Actions

Lookout Mountain Water District has not participated in a previous Hazard Mitigation Plan. As such, no deferred mitigation actions will be discussed. The following actions were prioritized using the process found in Section 5.3.1 Prioritization Process.

1. **Replacement of the Aged Section of the Main Pipeline from Clear Creek County and Jefferson County Line East for Approximately ½ Mile.**

Background: Some of the sections of the main pipeline are quite old and were originally constructed of clay pipe. In order to ensure that no losses occur, and that the District will be able to weather periods of little to no precipitation, the main pipeline needs to be updated to modern pipe standards.

Other Alternatives: No action.

Responsible Office: Lookout Mountain Water District

Priority: High

Cost Estimate: To be determined.

Timeline: Within one year

Benefits (losses Avoided): Leaks that are not detectable because of cracks in the aged line will be fixed. This will lead to greater efficiency in the water delivery structure, and will aid the district during times of low reservoir levels.

2. Installation of Meters on Lateral Line Connections that Serve Various Communities

Background: In order to monitor production versus consumption of water in the District, the installation of meters will assist the District in improving and balancing operations.

Other Alternatives: No action.

Responsible Office: Lookout Mountain Water District

Priority: Medium

Cost Estimate: Unknown.

Timeline: Within 1-3 years

Benefits (losses Avoided: Leaks that are not detectable because of cracks in the aged line will be fixed. This will lead to greater efficiency in the water delivery structure, and will aid the district during times of low reservoir levels.

3. Partial Renovation and Improvement to Sections of the Main Pipeline

Background: The infrastructure of LMWD is aging and is in need of updating. Infrastructure costs are quite large, while the District is small, and has very limited opportunities to expand. Annual renovations and improvements will allow the District to increase efficiency over time,

Other Alternatives: No action.

Responsible Office: Lookout Mountain Water District

Priority: Low/Medium

Cost Estimate: Unknown.

Timeline: Annually, dependent on fund availability

Benefits (losses Avoided): Leaks that are not detectable because of cracks in the aged line will be fixed. This will lead to greater efficiency in the water delivery structure, and will aid the district during times of low reservoir levels.

4. Research Funding Opportunities with Neighboring Agencies to Reduce Flooding Potential on Beaver Brook

Background: There is currently flooding potential on Beaver Creek, which is located ½ mile north of the District, as it drains into Clear Creek. This flooding potential could be alleviated through channel modification.

Other Alternatives: No action.

Responsible Office: Lookout Mountain Water District

Priority: Low/Medium

Partners: Clear Creek County

Cost Estimate: Unknown

Timeline: Within 5 years.

Benefits (losses Avoided: There are currently 12 homes in the District that would be in damaged by excessive flow on Beaver Creek. These homes are situated in a narrow, steep section of a channel. Ingress and egress are allowed on only one road, which is a single lane road.

5. Conduct a Leak Detection Survey

Background: A leak detection survey is needed along 48,000 linear feet of the main pipeline and the lateral pipelines served by it. In 2009, the Water Commissioner ordered a payback of 117 acre feet of water that the District consumed over the 2008-2009 winter season, but was not legally entitled to. About 33 acre feet of the 117 acre feet was due to leaks in the distribution pipelines that have been repaired once located (325,851 gallons = 1 acre foot).

Other Alternatives: No action.

Responsible Office: Lookout Mountain Water District

Priority: Low/Medium

Cost Estimate: Unknown.

Timeline: Within 5 years.

Benefits (losses Avoided): The District would maintain higher water levels in each reservoir, keeping more water available in the event of drought.