



City of Avenal

COMMUNITY PROFILE

Avenal is the smallest city in Kings County and is governed by a five-member City Council that includes the Mayor and Mayor Pro Tem.

Geography and Climate

Avenal is situated 180 miles north of Los Angeles and 200 miles south of San Francisco and Sacramento—“Half the way from the Bay to L.A.” It is located in the southwestern portion of Kings County between State Route 33 and Interstate 5. Most of the developed part of the city is located in the Kettleman Plain between the Kettleman Hills to the northeast and the Kreyenhagen Hills to the southwest. The amount of land area in Avenal is approximately 19 square miles and the city’s elevation is 800 feet above sea level. Annual precipitation is about 10 inches with most of the rain falling between November and April. Average high temperature in the winter is 64°F and in the summer is 98°F.

History

The city of Avenal was named by Spanish soldiers and explorers. “Avena” means oats or oat field in Spanish. The city area was originally covered with wild oats “waist high” that looked like golden silk and covered the Kettleman Plains. Early American settlers arrived in the Kettleman Hills during the 1850s to raise cattle and to farm. It was oil, however, that brought most of the people to Avenal. In 1929, Standard Oil surveyed the current site of Avenal and built the town.

During the late 1940s, the decline of oil and gas production caused Avenal’s economy to weaken and many stores and houses were vacated. During the 1970s, the completion of the California Aqueduct brought in needed water, and the completion of Interstate 5 brought new business opportunities. Following incorporation in 1979, the city attracted a state prison in 1987 and later annexed the Interstate 269/Interstate 5 interchange, zoning the area for commercial and industrial development and stimulating the local economy.

Economy

Avenal is home to one of California’s state prisons, which is the largest employer in the city with over 1,000 employees and approximately 4,500 inmates. Other major employers are Paramount Farms (600 employees) and Reef Sunset Unified School District (306 employees) (Kings County Economic Development Corporation 2012).

Over 25% of families in Avenal live below the poverty level. Avenal is challenged with an unemployment rate of 25%. Approximately 80% of Avenal’s population is Hispanic with strong connections to farm labor. The primary industry within a five-mile radius of Avenal is agriculture. Many other industries are directly or indirectly dependent upon agriculture such as construction, manufacturing, transportation, wholesale, and retail. Therefore, the vast majority of Avenal’s economy is directly or indirectly related to agriculture.

Population

The estimated 2012 population of Avenal was 15,505. This includes the prison population and represents a 10 percent increase over the population at the time of the 2000 U.S. Census (California Department of Finance 2010). Avenal’s population is 36 percent white, 13 percent black or African American, and 47 percent “some other race.” Census data indicates that 66 percent of Avenal’s population is of Hispanic origin (U.S. Census Bureau 2010).

Hazard Identification and Profiles

Avenal’s planning team identified hazards that affect the city and developed hazard profiles based upon the countywide risk assessment and past events and their impacts. Definitions for the rankings used can be found in Element B: Hazard Identification and Risk Assessment.

City of Avenal—Hazard Profiles

Hazard	Probability of Occurrence	Potential Magnitude/ Geographic Extent	Significance
Dam Failure	Unlikely	Negligible	Low
Drought	Occasional	Critical	Medium
Earthquake	Occasional	Critical	High
Extreme Heat	Highly Likely	Limited	Medium
Flood	Likely	Critical	Medium
Fog	Highly Likely	Limited	Medium
Freeze	Occasional	Limited	Low
Landslide	Occasional	Critical	Low-Medium
Soil Hazards: Expansive Liquefaction Erosion	Occasional	Limited	Low
Tornado	Unlikely	Negligible	Low
Wildfire	Occasional	Limited	Low

Vulnerability Assessment

The vulnerability assessment analyzes the population, property, and other assets at risk to natural hazards. This section lists Avenal’s assets at risk to natural hazards, including critical facilities and infrastructure; historic, cultural, and natural resources; and economic assets. It discusses the impacts that occurred in past events and vulnerability to specific hazards ranked of medium or high significance.

Asset Inventory

The table that follows lists the critical facilities and other community assets identified by Avenal’s planning team as important to protect in the event of a disaster.

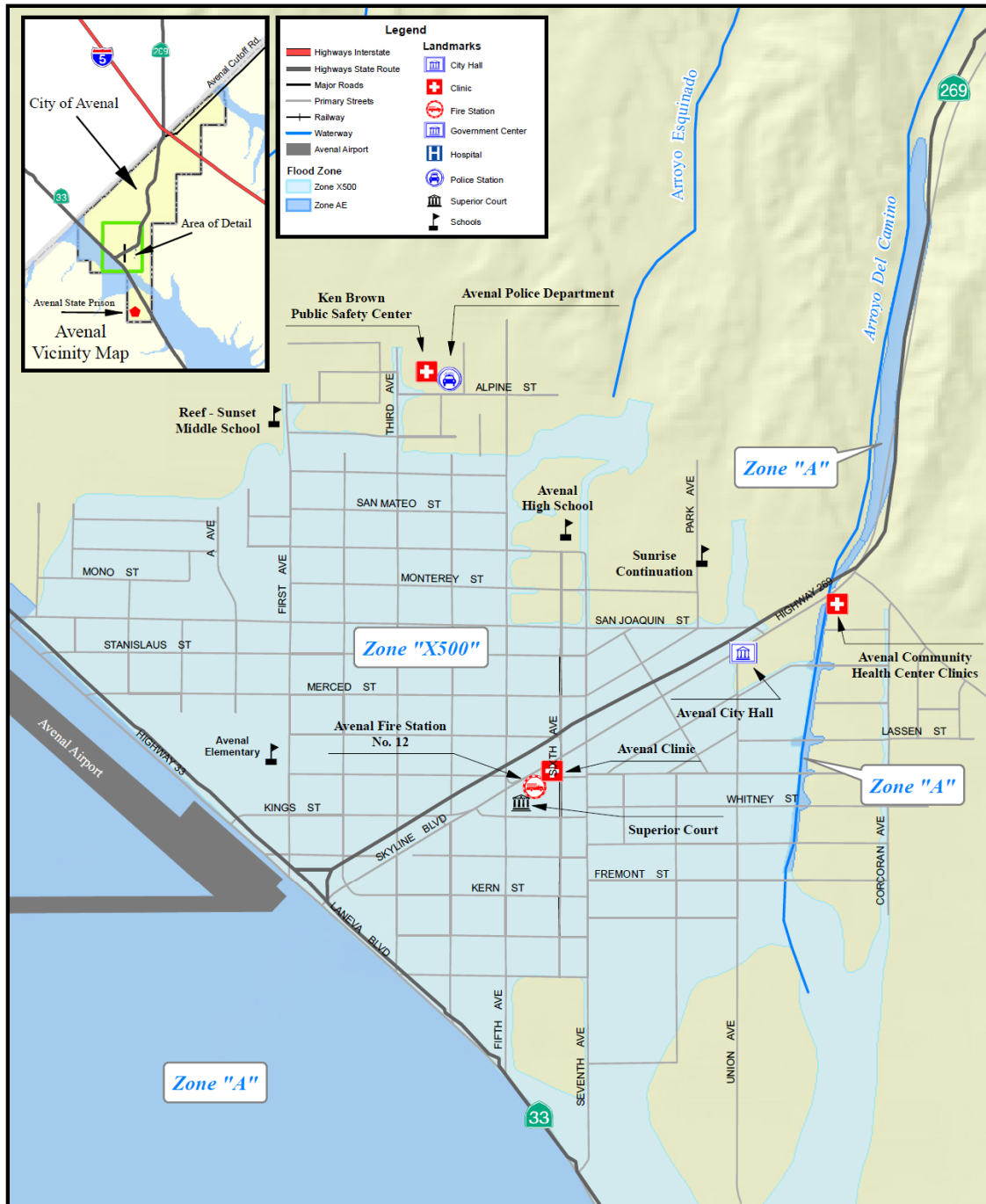
City of Avenal—Critical Facilities and other Community Assets

Facility	Replacement Value	Occupancy/Capacity
City Hall	\$820,000	20
City corporate yard/equipment	\$791,000	50+
Avenal Police Department - Avenal Emergency Operations Center (primary)	\$2,500,000	19+
Kings County Fire Station No. 12 - Avenal Emergency Operations Center (secondary)		
Water treatment plants (2)	\$5,200,000	5.2 MGD
Wastewater treatment plant	\$8,200,000	2 MGD
Water storage tanks	\$6,000,000	
12-inch and 18-inch water transmission lines	\$16,000,000	16 miles of lines
Pacific Gas & Electric high pressure lines		
Chevron/JP Oil oil/gas production fields		
California Aqueduct		
Medical clinics (2)		
Avenal Senior Center		100+
Avenal Child Development Center	\$1,600,000	80+

There was a hospital in Avenal, but it has been closed due to problems with asbestos. The nearest hospitals are in Coalinga and in Hanford. There are two medical clinics in Avenal. There are several designated shelters in Avenal for use in an emergency event including the Veterans Hall, the Recreation Center, two High School gyms and three school cafeterias.

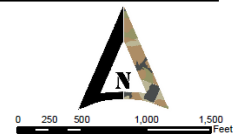
The Avenal State Prison has a capacity of 7,600 plus support staff. The prison population amounts to almost half of the city’s population. The prison population skews the census data for Avenal, making it difficult to summarize social vulnerability issues. Education and outreach efforts, as well as emergency response planning, will need to address the needs of low-income residents and the large Spanish-speaking population. In past emergencies, volunteers have organized spontaneously to help those with mobility issues.

Avenal Flood Hazards



Print Date : October 30, 2012
Data Sources: Kings County, Cal EMA

Kings County
Multi-Hazard Mitigation Plan
Avenal Flood Hazard



ESTIMATING POTENTIAL LOSSES

The table below shows Avenal's total exposure to hazards in terms of population and the number and values of structures. Kings County Assessor's data was used to calculate the improved value of parcels. GIS was used to quantify the number and value of structures in the 100-year (Zone A) and 500-year (X-500) flood hazard areas and in very high wildfire hazard areas. More information on how these estimates were calculated can be found in the Vulnerability Assessment section Element B.

City of Avenal—Exposure to Hazards

Avenal	Population	Structures	Value
Total Exposure (Earthquake)	15,505	1,754	\$128,111,815
Flood: Zone A		5	\$98,033
Flood: X-500		1,393	\$80,716,733
Wildfire: Very High Threat		35	\$637,272

Impacts of past events and vulnerability to specific hazards are summarized below.

Drought

Avenal differs from the other communities in Kings County in that it is reliant on surface water from the California Aqueduct and the Central Valley Project for drinking water. The 1987-1992 drought created a water shortage that led to a temporary building moratorium in the city. The drought also resulted in the city adopting a water conservation ordinance, which is described further in the Capability Assessment section below. The Central Valley Project Improvement Act of 1992 mandates changes in management of the Central Valley Project, particularly for the protection, restoration, and enhancement of fish and wildlife. Avenal has been affected by the Act through diversions and changes mandating no new water contracts until fish and wildlife goals are achieved and no contract renewals until completion of a programmatic environmental impact statement. These changes affect agriculture users before municipal users. Drought events can also reduce the quality of water in the aqueduct and lead to increased treatment costs.

Earthquake

The earthquake hazard in Avenal is more severe than in the other cities in the county. The known faults, historic epicenters, and potential for ground shaking in and near Kings County is shown on the map in Element B. HAZUS-MH, FEMA's loss estimation software, predicts that there will be a loss of potable water in an earthquake event in Kings County. Avenal's transmission lines for its water source are vulnerable to ground shaking and seismically-induced landslides. The water source itself, the California Aqueduct, also may be vulnerable to damage during a seismic event.

Fortunately, soils in Avenal are not mapped as prone to liquefaction, though both the Kettleman Hills and Kreyenhagen Hills are prone to landslides. Members of Avenal's

planning team recall that buildings shook in the Coalinga earthquake (1983) and more recently in an earthquake that occurred in 2004/2005. In early September 2012, there were two Coalinga Earthquakes that caused intense shaking and subsequent water system damage.

There are several buildings of concern in an earthquake event. The planning team identified the following:

- Avenal City Hall
- Peck's Department Store (unreinforced masonry construction)
- Veterans' Hall
- Avenal Historical Museum

The number of unreinforced masonry buildings in the city is between five and eight. California's Unreinforced Masonry Law, SB 547, passed in 1986 requires that these buildings in Seismic Zone 4 are inventoried and retrofitted in every jurisdiction. Communities must adopt a loss reduction program and report progress to the Seismic Safety Commission. There is a moderate amount of manufactured housing in different parts of Avenal; this building type is also more vulnerable.

Extreme Heat

Extreme heat is highly likely to occur on an annual basis in Avenal. An extreme heat event in summer 2006 and recently in 2012 caused increased energy costs and danger to outdoor workers. The city does provide information on overheating and safety to city workers through the Avenal Police Department who is also responsible for the Office of Emergency Services in Avenal.

Flood

No critical facilities are located in the mapped 100-year flood hazard area in Avenal, except for part of Highway 33. Much of the city is located in the 500-year floodplain, which is primarily affected by sheet flow flooding. Facilities located here include the fire station, medical clinic, superior court, and Avenal Elementary School.

Two water main lines, one 18-inch and one 12-inch, carry water from the California Aqueduct to the city through the Kettleman Hills, which are prone to slope failure and erosion during heavy rains that cause flooding. The landslide-prone areas are not inside the city limits and other types of development do not occur there; therefore, landslide is not addressed as a separate hazard. There are approximately 16 miles of water transmission lines, mainly outside the city limits. There is history of problems with these water lines during hazard events. In a rain event in March 1995, the 18-inch main line broke due to slope failure around the water line cutting off the potable water supply to Avenal for 12 days. Water had to be brought in and schools and roads were closed for a short time. Businesses were also without water resulting in economic impacts. FEMA and the California Office of Emergency Services at the time, now Cal EMA provided Public Assistance funds for

the disaster. The same line broke again on January 5, 1998, near the Old Skyline Road. Although the area of failure has been reinforced, it is likely that a similar event could occur on other parts of the line in the future.

The city has restructured most culverts in the last 10 years using general funds designated for streets and stormwater drainage. Flooding remains a problem at the intersection of Seventh Avenue and Highway 33; however this is an issue that needs to be addressed by the California Department of Transportation. Runoff from the Arroyo del Camino is conveyed through the city by means of channel, culverts, and storm drains. The channel exists for approximately one-half miles between the city limit and Fremont Street. Downstream of Fremont Street, the discharge can result in sheet flow flooding. Discharges from the watershed areas west of Arroyo del Camino concentrate along Highway 33 at the southwest limit of the city.

Wildfire

Wildfire is a greater threat to Avenal than other areas of Kings County. The Skyline fire in 1996 burned over 20,000 acres east of Avenal along the west side of Interstate 5 and north of Highway 41. The fire burned close to 36th Avenue on the north side of town. There are not a significant number of homes along the city limits in the wildland-urban interface. The Kings County Fire Department provides fire protection services to the city. In the last five years the largest wildfire was less than 1000 acres in the near vicinity, largely due to the fast burning but light fuels that typify the hills immediately around Avenal.

Other Hazards

Fog is not as common in Avenal as the rest of the county but does occur heading into the city and out of the city and can result in traffic accidents. There are expansive soils in the area that can cause problems with foundations. The city has been able to address this issue through recommending certain building practices where these soils exist.

Future Development Trends

From 2006-2012 growth has been largely flat, for the entire decade population growth in Avenal averaged about 1.9 percent per year. Growth has been slow but steady. One area of development is located south of the city, where there is often some flooding during wet periods. While this area is not in the mapped in the flood hazard area, the city is requiring developers to address potential flood problems through enforcing the Flood Damage Prevention Ordinance.

City of Avenal—Change in Population and Housing Units, 2000-2010

2000 Population	2010 Population	Percent Change	2000 Housing Units	2010 Housing Units	Percent Change
14,674	15,505	10.4%	2,061	2,251	9.2%

CAPABILITY ASSESSMENT

Capabilities are the programs and polices currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The assessment is divided into five sections: regulatory, administrative and technical, fiscal, outreach and partnerships, and other mitigation efforts.

Regulatory Capability

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

City of Avenal—Regulatory and Planning Capabilities

Regulatory Tool	Yes/No	Comments
General plan	Yes	Adopted August 11, 2005
Zoning ordinance	Yes	
Subdivision ordinance	Yes	
Site plan review requirements	Yes	
Growth management ordinance	No	
Floodplain ordinance	Yes	Flood Damage Prevention Ordinance 1995
Other special purpose ordinance (stormwater, steep slope, wildfire)	No	Water Conservation Ordinance
Building code	Yes	Version: Uniform Building Code 1998
Fire department ISO rating	Yes	Rating: 4. Kings County Fire Department
Erosion or sediment control program	No	
Stormwater management program	Yes	Stormwater Pollution Prevention Plan
Capital improvements plan	Yes	Minimal capital improvements funding for small projects
Economic development plan	No	
Local emergency operations plan	Yes	2008, will be updated in 2013

Avenal General Plan, 2005 – The city’s general plan was updated in 2005, including the safety element. The Safety Element establishes objectives and policies and standards to

ensure that there is an adequate, coordinated, and expedient response to public safety concerns. It addresses emergencies, fire protection, flooding, and public safety.

Flood Damage Prevention Ordinance, 1995 - The flood damage prevention ordinance adopted in 1995 establishes areas of special flood hazard identified by FEMA in the 1988 flood insurance rate map (FIRM) and flood insurance study. However, FEMA completed an updated FIRM and flood insurance map in 2000. New digital FIRMs (DFIRMs) for all of Kings County are completed.

Administrative and Technical Capability

The table that follows identifies the personnel resources responsible for activities related to mitigation and loss prevention in Avenal. A summary of technical resources follows.

City of Avenal—Personnel Capabilities

Personnel Resources	Department/Position
Planner/Engineer with knowledge of land development/land management practices	Community Development Director
Engineer/Professional trained in construction practices related to buildings and/or infrastructure	City Engineer
Full time building official	Building Department/ Public Works Director is also Building Official/Code Enforcement Officer
Floodplain Manager	Community Development Director
Emergency Manager	Police Chief
Grant writer	Community Development Director
Other	Public Works Department/One position is 50 percent water conservation officer and 50 percent code enforcement

Avenal does not have GIS capabilities within in the city staff. However, the city contracts with the Kings County Planning Agency to receive assistance with geographic data needs and mapping.

Fiscal Capability

The following table identifies financial tools or resources that the city could potentially use to help fund mitigation activities. There are currently no specific funding sources for hazard mitigation.

City of Avenal—Available Financial Tools and Resources

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

Outreach and Partnerships

Avenal is a member of the California Rural Water Association, an affiliate of the National Rural Water Association, a non-profit organization of rural water and wastewater systems that provides training, technical assistance, and representation to public water and wastewater utilities. The city also supports the Kings County Water Education Commission, which provides water education programs for schools. The city provides information on overheating and safety to city workers as required by their risk management insurance. The Kings County Office of Emergency Management does all-hazards public outreach and education for the public.

Other Mitigation Efforts

Avenal has an ongoing inspection program for the city’s water lines for early detection and prevention of problems due to slope failure and other damage to lines. Other mitigation projects have reduced the vulnerability of the water system to seismic events and flooding, such as the following:

- Installed check valve at pipeline failure valve at Tank No. 3 site.
- Replaced valve and installed seismic deflection joint at Tank No. 4 site.
- Reinforced slopes in area around 12-inch and 18-inch water main lines located along Old Skyline Road.
- Avenal is currently working on ensuring a constant flow of water into the community; this project should be completed in July of 2013.

GOALS AND OBJECTIVES

The City of Avenal adopts the hazard mitigation goals and objectives developed by the Planning Team in Element C.

MITIGATION ACTIONS

The Planning Team for the City of Avenal identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how the action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and timeline also are described.

2012 MITIGATION ACTIONS

Mitigation Action: Avenal #1—Housing Rehabilitation Program

Current Status: This project will be carried over from 2007 as it is not complete and ongoing.

Action:	Continue and enhance housing rehabilitation program.
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	Avenal has many homes that are old and have health and safety issues and are not earthquake safe. The city has received funding from Community Development Block Grants, HOME, and Cal Home Program to rehabilitate homes. Most homes are torn down and reconstructed to current codes.
Ideas for Implementation:	
Responsible Office:	Avenal Department of Community Development
Partners:	
Potential Funding:	Community Development Block Grants, HOME, and Cal Home Program grants
Cost Estimate:	In the past, the city has spent approximately \$1.5 million each year.
Benefits: (Losses Avoided)	Serves multiple objectives. Reduces risk to people and property from earthquakes and replaces substandard housing conditions.
Timeline:	Ongoing
Completed by:	Department of Community Development, Director

Mitigation Action: City of Avenal Project #2—Emergency Power System for the Emergency Operations Center at the Ken Brown Public Safety Center.

Action:	Purchase, Install, test and utilize a 200 KW Propane/Natural Gas powered emergency Generator system for the Emergency Operations Center.
Jurisdiction:	City of Avenal
Priority:	High
Issue/Background:	The City of Avenal Public safety Center has limited emergency power for its dispatch center. This project would expand that power system to power the EOC and the EMS administrative offices. The Public safety Center is responsible for the day management of emergency dispatch for all the City’s public safety agencies as well as the day-to-day coordination of fire, law and EMS mutual aid. During a disaster the Centers role expands to serve as the Emergency Operations Center (EOC). As such it is responsible for coordinating information and resources for City as well as serving as a node of the operational area’s mutual aid system. It currently has no emergency power, which means that a power outage no matter what the source greatly inhibits the EOC and EMS agency’s ability to perform either its day-to-day mission or its functions during a natural disaster.
Ideas for Implementation:	This is a major project requiring substantial funding beyond the City’s normal budgetary processes. This project could be implemented either as a grant project, a project under the homeland security grant programs or as a local fund raising effort.
Responsible Office:	Avenal OES/Police Department
Partners:	Kings County OEM
Potential Funding:	SHSGP Grant Program, Hazard Mitigation Grant Program, and potentially the EOC Grant Program
Cost Estimate:	\$350,000 for the complete 200KW system including generator, fuel tanks, automatic transfer switches, pad and labor
Benefits: (Losses Avoided)	Emergency power system will ensure the EOC can stay on line independent of commercial power. This will allow them to continue their lifesaving mission of resource dispatch and control during any disaster that disrupts local commercial power, brownouts or rolling blackouts.
Timeline:	Desired completed by the end of calendar year 2014.
Completed by:	Avenal OES/Police Department

Mitigation Action: Avenal #3—Vulnerability of Water Distribution System

Current Status: This project will be carried over from 2007 as it is not complete and ongoing.

Action:	Reduce vulnerability of water distribution system
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	There are two water transmission lines that supply water to the city and Avenal State Prison (one 18-inch line and one 12-inch line). In the past, the city has encountered water leaks and movement due to earthquakes that lead to slope failure. The water leaks are due to aging of the main lines.
Ideas for Implementation:	Continue to search for funding to replace the 12-inch main line which is at least 38 years old. Engineer and replace existing valves at tank sites with earthquake valves to protect the water supply. Continue to monitor both the existing lines and document critical areas.
Responsible Office:	Avenal Public Works Department
Partners:	
Potential Funding:	Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and other state and federal loan and grant programs
Cost Estimate:	For 12-inch line, \$1 million per mile for 7 miles total.
Benefits: (Losses Avoided)	Improves availability of water supply for residents and businesses during emergencies and helps ensure against property losses due to fires.
Timeline:	Ongoing; replace 12-inch line within five to seven years
Completed by:	Department of Community Development, Director

Mitigation Action: Avenal #4—Loss Reduction Program for URM Buildings

Current Status: This project will be carried over from 2007 as it was not completed due to lack of staffing resources and internal funding to carry out the project.

Action:	Establish a loss reduction program for unreinforced masonry (URM) buildings in compliance with the California URM Law of 1986.
Jurisdiction:	Avenal
Priority:	High
Issue/Background:	<p>Most unreinforced masonry (URM) buildings possess features that can threaten lives during earthquakes. In response to the danger posed by the great number of potentially hazardous buildings in California, in 1986 the state legislature enacted the unreinforced masonry building law (Chapter 250, Statutes of 1986: SF547 [Alquist]; Government Code Section 8875 et seq.), commonly known as the "URM Law." The law is aimed at mitigating the hazards posed by URM buildings and applies to all jurisdictions in California's Seismic Hazard Zone 4, the region of highest earthquake activity in the nation, in which Avenal is located.</p> <p>Current city staff members estimate that there are five to eight URM buildings in Avenal. According to the 2006 Status of the Unreinforced Masonry Building Report of the California Seismic Safety Commission, Avenal has not reported a loss reduction program for URM buildings.</p>
Ideas for Implementation:	Seek approval from the City Council for developing and implementing a loss reduction program to comply with the URM Law. Inventory existing URM buildings in the city. Develop a loss reduction program, such as one of the types described in the 2006 Status of the Unreinforced Masonry Building Report. This may include letters to owners of URM buildings, signage on the front of URM buildings notifying the public of the earthquake hazard, or other types of measures. The city will report its program and future progress to the California Seismic Safety Commission.
Responsible Office:	Avenal City Manager
Partners:	California Seismic Safety Commission, Avenal City Council, Avenal Department of Public Works
Potential Funding:	In-kind, Avenal General Fund
Cost Estimate:	Staff time
Benefits: (Losses Avoided)	Increase awareness of the public and owners of URM buildings about potentially hazardous buildings. Reduce future losses in earthquake events.
Timeline:	Six months
Completed by:	City of Avenal, City Manager