



Annex to 2010 Association of Bay  
Area Governments  
Local Hazard Mitigation Plan  
*Taming Natural Disasters*

City of Cloverdale

## Table of Contents

Introduction .....	2
The Regional Planning Process .....	2
The Local Planning Process .....	3
<i>Review and Incorporation of Existing Information</i> .....	3
<i>Process for Updating Plan Sections</i> .....	3
<i>Public Meetings</i> .....	4
Hazards Assessment .....	4
Past Occurrences of Disasters (natural and human-induced) .....	5
Risk Assessment .....	6
<i>Urban Land Exposure</i> .....	6
<i>Infrastructure Exposure</i> .....	7
<i>Exposure of City-Owned Buildings, Plus Critical Healthcare Facilities and     Schools</i> .....	8
<i>Repetitive Loss Properties</i> .....	9
<i>Other risks</i> .....	9
National Flood Insurance Program .....	10
Mitigation Goals and Objectives .....	11
Mitigation Activities and Priorities .....	12
<i>Evaluation of Progress from 2007 Plan</i> .....	12
<i>Future Mitigation Actions and Priorities</i> .....	12
<i>Existing and Existing-Underfunded Mitigation Strategy Programs</i> .....	14
Incorporation into Existing Planning Mechanisms .....	32
Plan Update Process .....	33
Mitigation Plan Point of Contact .....	34
Exhibit A - Jurisdiction Boundary Map .....	35
Exhibit B - Public Meeting and Posting .....	36
Exhibit C - City of Cloverdale 2010 Mitigation Strategy Spreadsheet .....	37

## Introduction

The City of Cloverdale is located at the northern end of the picturesque Alexander Valley where the Mayacamas Mountains meet the Coast Range. The Russian River flows through the center of the Valley, and the developed portion of the City is located on the valley floor west of the Russian River and east of the Coast Range. Cloverdale is at the extreme north end of Sonoma County, located approximately 67 miles southeast of the town of Mendocino, 34 miles northwest of Santa Rosa, and 25 miles south of Ukiah. Exhibit 1 shows the City's location relative to other cities, highways, geographical features, and Sonoma County boundaries.

According to the most recent census, the City had a population of 8,618 in the year 2010<sup>1</sup>. The City's general fund budget in FY 2011/12 is \$5.1M and the total number of employees, represented as full-time equivalent positions, is 41 full-time equivalents. While the City provides local police services, the Cloverdale Fire Protection District provides fire services by employing four full-time fire personnel and 28 volunteers. The fire station was funded through a cooperative agreement between the Fire District and the Cloverdale Community Development Agency (a redevelopment agency).

## The Regional Planning Process

This process of preparing this plan was familiar to the City of Cloverdale. The City has a Safety Element to its General Plan that includes a discussion of fire, earthquake, flooding, and landslide hazards. In addition, the City routinely enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, have required mitigation for identified natural hazards. The City's effort has focused on building on these pre-existing programs and identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

The City of Cloverdale has participated with ABAG in preparing the multi-jurisdictional Local Hazard Mitigation Plan by:

- Attending one (1) workshop held in Sonoma County to discuss regional mitigation strategies and priorities;
- Attending one (1) workshop related to building departments and the multi-jurisdictional plan on July 1, 2009.

In addition, the City participated in the development and prepared an Annex to the 2005 multi-jurisdictional Local Hazard Mitigation Plan.

Finally, the City provided information on facilities that are viewed as "critical" to ABAG.

For more information on these meetings and for rosters of attendees, please see Appendix A and H in the ABAG Multi-Jurisdictional Local Hazard Mitigation Plan 2010 (MJ-LHMP).

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<sup>1</sup> For complete Census information, see <http://www.bayareacensus.ca.gov/>.

## **The Local Planning Process**

Key City staff met to identify and prioritize mitigation strategies appropriate for the City. Staff involved in these meetings included the City Manager, Senior Planner, Building Official, City Engineer, and Chief of Police.

At the meeting, staff reviewed the City's general priorities, taking into account the priorities identified in 2005 and the 2010 regional priorities. In addition, staff identified appropriate departments for implementation of strategies, preliminary budgets and potential funding sources for strategies designed as "Existing Under-Funded" and "High" priority.

Typically, each person at the meeting was responsible for communicating existing efforts and thoughts on appropriate future action in their area of expertise. For example, the Building Official and City Engineer were most familiar with the needed mitigation actions for key critical facilities, as well as the status of the requirements for housing, commercial structures, and unreinforced masonry buildings.

### ***Review and Incorporation of Existing Information***

This process involved consideration of both the hazard and risk information developed by ABAG and discussed in the overall multi-jurisdictional Local Hazard Mitigation Plan, as well as the assessments of the age and construction type of structures owned by the City and described on pages 4 through 9. These meetings also discussed the Cloverdale General Plan – Public Health and Safety Element, the Capital Improvement Program, and the City of Cloverdale Emergency Operations Plan already in place at the City, as well how these plans could be best integrated.

### ***Process for Updating Plan Sections***

The City of Cloverdale participated in the 2005 multi-jurisdictional Local Hazard Mitigation Plan, originally adopting that Annex on July 27, 2005. This Annex is an update of the Annex prepared for the 2005 plan. The lead in updating this Annex was taken by the City Engineer, based on feedback obtained from the staff who participated in the mitigation priority setting process.

The Planning Process section has been prepared to reflect the updated Annex. However, the process of assigning priorities was simplified because priorities had already been assigned in 2005.

The Hazard and Risk Assessment section has been updated to incorporate the new mapping compiled by ABAG for the overall multi-jurisdictional Local Hazard Mitigation Plan. The specific information for Cloverdale has also been updated to reflect additional mitigation activities that have occurred in the past five years.

The Mitigation Goals and Priorities section has been expanded to take a more comprehensive approach to mitigation.

The Plan Maintenance and Update section is essentially the same as the 2005 Annex, with the addition of some ideas for improving public participation in the process.

### **Public Meetings**

The City provided two opportunities for the public to comment on the DRAFT mitigation strategies selected by City staff:

1. During public comment at the meeting of the Public Services Subcommittee of the City Council on November 29, 2011. The agenda was posted on the City website at <http://www.cloverdale.net/> and at City Hall. For an excerpt, see Exhibit B.
2. The draft mitigation strategies have been also published for public viewing on the City's website at <http://www.cloverdale.net/>.

No public comments were received in response to the online posting. At the Public Services Subcommittee meeting held on November 29, 2011, there were questions about the City's Flood Damage Prevention Ordinance and the accuracy of the FEMA FIRM maps, for some attendees felt that some property owners may be paying for flood insurance unnecessarily. Staff present explained that lenders typically rely on the FEMA FIRM maps when requiring flood insurance, but it is entirely at the lender's discretion. Staff further explained the process for amending or correcting the FIRM maps through an application to FEMA for a Letter of Map Revision (LOMR). Staff also explained that there would be further opportunity for public comment at the meeting of the City Council on December 14, 2011.

The Cloverdale City Council adopted the plan at their regular meeting on December 14, 2011 via an official Resolution. The mitigation strategies will become an implementation appendix of the Public Health and Safety Element of the Cloverdale General Plan.

The City is committed to improving public participation when this plan is updated in five years. To improve this process, the City will consider writing letters to the editor of local newspapers in its service area to promote wider public knowledge of the process or working with local business and advocacy groups to conduct joint meetings.

### **Hazards Assessment**

The ABAG Multi-Jurisdictional Local Hazard Mitigation Plan, to which this is an annex, lists nine hazards that impact the Bay Area, five related to earthquakes (faulting, shaking, earthquake-induced landslides, liquefaction, and tsunamis) and four related to weather (flooding, landslides, wildfires, and drought). Maps of these hazards and risks are shown on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

As applicants submit development projects for City review and approval, project-specific hazard mapping may be required. In some cases, the City requires specific mitigation measures to

eliminate or mitigate impacts from these hazards. This information has been incorporated into the strategies matrix submitted to ABAG and FEMA.

In general, however, the City of Cloverdale does not face any natural disasters not listed in the ABAG multi-jurisdictional plan and new hazards have been identified by the City of Cloverdale since the original development of this plan in 2005.

While the City of Cloverdale has not undertaken hazard mapping activities since the first Public Health and Safety Element was prepared by the City of Cloverdale. Thus, the City of Cloverdale relies on the mapping on the ABAG website at <http://quake.abag.ca.gov/mitigation/>.

It is the policy of the city, as expressed in its General Plan – Public Health and Safety Element (2009) to “Continue to utilize all available data on geologic hazards and related risks from the appropriate agencies” (Policy PS 1-1) and to “Continue to utilize studies of geologic hazards prepared during the development review process” (Policy PS 1-2).

The City of Cloverdale has reviewed the hazards identified and ranked the hazards based on past disasters and expected future impacts. The conclusion is that earthquakes (particularly shaking, and, to a lesser extent, earthquake-triggered landslides and liquefaction, and wildfire (particularly wildland-urban-interface fire threat) pose the greatest hazard, while flooding (including dam failure), and landslides pose a smaller, although still significant, risk for potential loss. Tsunami inundation is not an issue.

## **Past Occurrences of Disasters (natural and human-induced)**

The Loma Prieta Earthquake of 1989 is an example of the kind of large scale disaster which can strike the Bay Area. It killed 63 persons, injured 3,757, and displaced over 12,000 persons. With over 20,000 homes and businesses damaged and over 1,100 destroyed, this quake caused approximately \$6 Billion of damage. Reconstruction continues some two decades later as the replacement for Oakland-Bay Bridge is still several years from completion. However, that disaster did not impact Cloverdale.

On the other hand, the following disasters have impacted the City:

- Flooding due to the storms of January 1995; and
- Flooding due to the storms of January 1997.

More information on State and Federally declared disasters in Sonoma County and the City of Cloverdale can be found at <http://quake.abag.ca.gov/wp-content/documents/ThePlan-D-2011.pdf>. Examples of disasters declared in Sonoma County since the Loma Prieta earthquake include the January, March, and May 2006 storms, February 1998 El Nino storms, December 1996 to January 1997 storms, and the early December 1990 freeze.

## Risk Assessment

### Urban Land Exposure

The City of Cloverdale examined the hazard exposure of City of Cloverdale urban land based on information in ABAG's website at <http://quake.abag.ca.gov/mitigation/landuse/>. The "2005 Existing Land Use with 2009 Mapping" file was used for this evaluation (in the existing plan, the file used was "Existing Land Use in 2000").

In general, the hazard exposure of the City of Cloverdale is largely minimally changed. In the last 5 years, the ABAG mapping shows 14 fewer acres of urban land, due to improvements in mapping, not due to an actual reduction in urban land. The principal change is in the acres of urban land in the 100-year floodplain over the last 5 years, largely due to improvements in the new FEMA flood maps. However, in the area of the Tarman Track, the City processed a Letter of Map Revision through FEMA. The following table described the exposure of urban land within the City to the various hazards.

<b>Exposure (acres of urban land)</b>			
<b>Hazard</b>	<b>2005</b>	<b>2010</b>	<b>Change</b>
<i>Total Acres of Urban Land</i>	<i>1,571</i>	<i>1,557</i>	<i>-14</i>
Earthquake Faulting (within CGS zone)	0	0	0
Earthquake Shaking (within highest two shaking categories) <sup>1</sup>	1,124	1,139	+15
Earthquake-Induced Landslides (within CGS study zone) <sup>2</sup>	n/a	n/a	n/a
Liquefaction (within moderate, high, or very high liquefaction susceptibility (from USGS mapping)	116	114	+2
Flooding (within 100 year floodplain)	112	155	+43
Flooding (within 500 year floodplain)	0	0	0
Landslides (within areas of existing landslides)	70	70	0
Wildfire (subject to high, very high, or extreme wildfire threat) <sup>3</sup>	143	127	-16
Wildland-Urban Interface Fire Threat	1,017	1,044	+27
Dam Inundation (within inundation zone)	104	106	+2
Sea Level Rise <sup>4</sup>	not applicable		
Tsunamis <sup>5</sup> (within inundation area)	not applicable		
Drought <sup>6</sup>	Not fully assessed	Not fully assessed	n/a

<sup>1</sup> No faults cross the City. However, this high shaking is due, in large part, to the Healdsburg-Rodgers Creek and Maacama faults being nearby.

<sup>2</sup> CGS has not yet evaluated the landslide hazard in this area.

<sup>3</sup> Based on CalFIRE mapping.

<sup>4</sup> The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.

<sup>5</sup> Although tsunami evacuation planning maps were made available inside the San Francisco Bay in 2009, acres of exposed land are not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

<sup>6</sup> Not fully assessed.

## Infrastructure Exposure

The City of Cloverdale also examined the hazard exposure of infrastructure within the jurisdiction based on the information on ABAG's website at:

<http://quake.abag.ca.gov/mitigation/landuse/>. Of the 41 miles of roadway in the City of Cloverdale, the following are exposed to the various hazards analyzed. No fixed transit lines are located in the City. (Note that the numbers of miles of water supply pipelines and sewer lines are similar to miles of roadway, but not identical. Miles of pipeline is reduced due to improvements in data.) Again, shaking and wildland-urban-interface fire threat are the most significant exposures. However, WUI fire threat is not significant for pipelines because they are underground.

Exposure (miles of infrastructure)						
Hazard	Roadway		Pipelines		Rail	
	2005	2010	2005	2010	2005	2010
<i>Total miles of Infrastructure</i>	41	45	35	28	1	2
Earthquake Shaking (within highest two shaking categories)	34	37	29	24	1	1
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	1	1	0	0	1	1
Liquefaction Hazard (within CGS study zone) <sup>1</sup>	n/a	n/a	n/a	n/a	n/a	n/a
Earthquake-Induced Landslides (within CGS study zone) <sup>2</sup>	n/a	n/a	n/a	n/a	n/a	n/a
Earthquake Faulting (within CGS zone)	0	0	0	0	0	0
Flooding (within 100 year floodplain)	3	2	1	1	0	1
Flooding (within 500 year floodplain)	0	0	0	0	0	0
Landslides (within areas of existing landslides)	1	1	1	0	0	0
Wildfires (subject to high, very high, or extreme wildfire threat)	1	0	1	0	0	0
Wildland-Urban Interface Fire Threat	28	32	27	23	0	0
Dam Inundation (within inundation zone)	1	1	0	0	0	0
Sea Level Rise <sup>3</sup>	not applicable					
Tsunamis <sup>4</sup>	not applicable					
Drought <sup>5</sup>	not applicable					

<sup>1</sup> CGS has not completed mapping in the Cloverdale area.

<sup>2</sup> CGS has not completed mapping in the Cloverdale area.

<sup>3</sup> The sea level rise map is not a hazard map. It is not appropriate to assess infrastructure exposure to sea level rise.

<sup>4</sup> Although tsunami evacuation planning maps were made available inside the San Francisco Bay in 2009, acres of exposed land are not an appropriate analysis for this hazard. It should be noted that this map is not a hazard map and should be used for evacuation planning purposes only. The inundation line represents the highest inundation at any particular location from a suite of tsunami sources. It is not representative of any single tsunami.

<sup>5</sup> Drought is not a hazard for roadways.

## Exposure of City-Owned Buildings, Plus Critical Healthcare Facilities and Schools

Finally, the City examined the hazard exposure of critical health care facilities and schools located within the City of Cloverdale, and City-owned buildings based on the information on ABAG's website at <http://quake.abag.ca.gov/mitigation/pickcrit2010.html>. The City of Cloverdale provided a list of the critical facilities it owns to ABAG. ABAG provided a detailed assessment of the hazard exposure of each of its facilities. The following table shows the numbers of facilities exposed to the various hazards analyzed. Note that changes in exposure between 2005 and 2010 are due, in part, to improved hazard mapping. Again, earthquake shaking and wildland-urban-interface fire threat are most significant.

Hazard	Exposure (number of facility types)							
	Health Care Facilities		Schools		City-Owned critical facilities		Locally owned bridges and interchanges	
	2005	2010	2005	2010	2005	2010	2005	2010
<i>Total Number of Facilities</i>	2	2	4	8	36	9	1	1
Earthquake Shaking (within highest two shaking categories)	2	2	4	8	22	6	0	1
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility)	0	0	0	0	4	2	0	0
Liquefaction Hazard (within CGS study zone) <sup>1</sup>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Earthquake-Induced Landslides (within CGS study zone) <sup>2</sup>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Earthquake Faulting (within CGS zone)	0	0	0	0	0	0	0	0
Flooding (within 100 year floodplain)	0	0	0	0	4	0	0	0
Flooding (within 500 year floodplain)	0	0	0	0	0	0	0	0
Landslides (within areas of existing landslides)	0	0	0	0	2	0	0	0
Wildfires (subject to high, very high, or extreme wildfire threat)	0	0	0	0	4	0	0	0
Wildland-Urban Interface Fire Threat	2	2	4	8	18	5	1	1
Dam Inundation	0	0	0	0	4	2	0	0
Sea Level Rise (exposed to 16in sea level rise) <sup>3</sup>	-	0	-	0	-	0	-	0

<sup>1</sup> CGS has not yet evaluated the Cloverdale area.

<sup>2</sup> CGS has not yet evaluated the Cloverdale area.

<sup>3</sup> Sea level rise data was not available in 2005

Exposure (number of facility types)								
Hazard	Health Care Facilities		Schools		City-Owned critical facilities		Locally owned bridges and interchanges	
	2005	2010	2005	2010	2005	2010	2005	2010
Sea Level Rise (exposed to 55in sea level rise) <sup>4</sup>	-	0	-	0	-	0	-	0
Tsunamis <sup>5</sup> (within inundation area)	-	0	-	0	-	0	-	0
Drought <sup>6</sup>	-	-	-	-	-	-	-	-

<sup>4</sup> Sea level rise data was not available in 2005

<sup>5</sup> Tsunami data was not available in 2005.

<sup>6</sup> Drought will not affect locally owned facilities directly.

### ***Repetitive Loss Properties***

In spite of the areas of the City located in flood-prone areas, there are no repetitive loss properties in the City based on the information at <http://quake.abag.ca.gov/mitigation/pickflood.html>. Thus, the City also had no repetitive loss property that was outside the flood plain.

### ***Other risks***

The City plans to continue to work with ABAG to improve the risk assessment information being compiled by ABAG, including assessing the overall status of unreinforced masonry building and soft-story building inventory and retrofit efforts.

The City identified one unreinforced masonry building. The City has a policy to use the Uniform Code for Building Conservation to retrofit this building. However, the policy does not require mandatory retrofit unless the owner applies for a change of occupancy permit. Since this has not occurred, the building has not yet been retrofitted.

Soft-story buildings are not considered a significant hazard. Of the 3,480 housing units in the City, 2,554 are detached single-family homes, and another 304 are in single-family attached or duplexes (based on the 2010 Census). A total of 411 units are in buildings containing four or more units, 12% of the housing stock. Because Cloverdale is not a dense urban city, few, if any, of these buildings have parking underneath the residential units. While Cloverdale has not conducted a formal soft-story inventory, there is only one likely soft-story building in the city housing less than 20 units.

The City contains 177 mobile homes, based on the 2010 Census, or 5% of the housing stock. However, the City currently has no program to encouraging retrofitting of these structures.

The City plans to continue to work with ABAG to develop specific information about the kind and level of damage to buildings, infrastructure, and critical facilities which might result from any of the hazards previously noted.

## National Flood Insurance Program

The City of Cloverdale has participated in the National Flood Insurance Program (NFIP) since 1985. The provisions of the program are contained in Chapter 15.20 “Flood Damage Prevention” of the Municipal Code as adopted in Ord. 428-88 § 1.1, 1988.

The City of Cloverdale has effectively implemented the NFIP since the community joined in the program. New development continues to meet the required standards identified in the ordinance and municipal code sections. The biggest hurdle for the City in effectively implementing the NFIP is ensuring that the current FEMA flood hazard map information is up-to-date and accurate.

The City of Cloverdale has an established policy to ensure compliance with NFIP, as specified in that Municipal Code Chapter. Sections in the Chapter include:

- 15.20.010 Statutory authority.
- 15.20.020 Findings.
- 15.20.030 Purpose of provisions.
- 15.20.040 Methods of reducing flood losses.
- 15.20.050 Definitions.
- 15.20.060 Lands to which this chapter applies.
- 15.20.070 Basis for establishing areas of special flood hazard.
- 15.20.080 Compliance—Violation.
- 15.20.090 Abrogation and greater restrictions.
- 15.20.100 Interpretation of provisions.
- 15.20.110 Warning and disclaimer of liability.
- 15.20.120 Floodplain administrator designated.
- 15.20.130 Floodplain administrator—Duties.
- 15.20.140 Development permit—Application—Contents.
- 15.20.150 Standards of construction.
- 15.20.160 Standards for utilities.
- 15.20.170 Standards for subdivisions.
- 15.20.180 Standards for manufactured homes.
- 15.20.190 Floodways.
- 15.20.200 Mudslide-prone areas—Permit review.
- 15.20.210 Flood-related, erosion-prone areas—Permit required.
- 15.20.220 Variances—Considerations.
- 15.20.230 Variances—Issuance criteria.

In the area of the Tarman Track, the City processed a Letter of Map Revision through FEMA.

While the City is near the Russian River, the majority of the City is located well above the river and is not impacted when the river floods. Past flooding has been sporadic and due to flooding of local creeks, not the river. It is not limited to any particular area, as shown by the lack of any repetitive flood losses.

Currently, the City does not participate in the Community Rating System. This decision is primarily due to the lack of staff to oversee and implement the program.

## Mitigation Goals and Objectives

The goal of the ABAG MJ-LHMP is to maintain and enhance a disaster-resistant region by reducing the potential for loss of life, property damage, and environmental degradation from natural disasters, while accelerating economic recovery from those disasters. This goal is unchanged from the 2005 plan and continues to be the goal of the City of Cloverdale in designing its mitigation program.

Additional, the City has specific goals related to hazards that are contained in its General Plan – Public Health and Safety Element (2009), including:

PS 1 – Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides, and other geologic hazards.

PS 2 – Prevent unnecessary exposure of people and property to risks of damage or injury from flooding.

PS 3 – Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.

PS 4 – While maintaining the autonomy granted to it pursuant to state zoning laws, implement state and county requirements for the storage, transport, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans.

PS 5 – Reduce damage to life and property from natural hazards to the greatest extent possible.

PS 6 – Ensure that City emergency procedures are adequate in the event of potential natural or man-made disaster.

PS 7 – Provide appropriate regulations for land use and airport operations to ensure that the safety of airport operations and personnel and the general public and adjacent structures are protected.

PS 8 – Provide for public health facilities in the community.

As a participant in the ABAG multi-jurisdictional planning process, City of Cloverdale staff helped in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The mitigation strategies list was reviewed by several City staff including the City Manager, Senior Planner, Building Official, City Engineer, and Chief of Police.

The tentative decision on priority was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound, and not harmful to the environment or our heritage.

Over time, we are committed to developing better hazard and risk information to use in making those trade-offs. We are not trying to create a disaster-proof region, but a disaster-resistant one. In addition, several of the strategies are existing City programs.

These draft priorities were submitted to the City Manager for review. The draft priorities were then provided to the public for review on November 29, 2011 and through the City's website. The final strategies (as shown in the attached Table) will become an Implementation Appendix to the City's General Plan Public Health and Safety Element.

## **Mitigation Activities and Priorities**

### ***Evaluation of Progress from 2005 Plan Annex***

In 2005, mitigation actions and priorities were identified. In particular, the following two strategies are significant.

GOVT-a-2 - Retrofit or replace critical facilities that are shown to be vulnerable to damage in natural disasters.

Responsible Agency – Cloverdale City Engineer

Action – Completed design and construction of the Cloverdale Fire Station

Status – The Cloverdale Fire Protection District moved into its new fire station in February 2010. The construction of this new station was many years in the making and is now the cornerstone of fire protection in Northern Sonoma County. This station is a state of the art facility which incorporates an emergency operations center for the community of Cloverdale in the event of a major disaster. The fire station was funded through a cooperative agreement between the Fire District and the City of Cloverdale to provide for the safety of its citizens for many years into the future. The total cost of the new facility was \$6.7 M, of which the City's redevelopment agency funded \$6.3.

INFR-b-3 - Include "areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture" in the list of criteria used for determining a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).

Responsible Agency – Cloverdale City Engineer

Action – On-going, incorporated in pipe replacement schedule

Status – In progress; in the past 5 years, the City has replaced a few miles of sewer and water pipelines.

### ***Future Mitigation Actions and Priorities***

As a participant in the 2010 ABAG multi-jurisdictional planning process, the staff of City of Cloverdale helped in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The decision on priority for the City was made based on a variety of criteria, not simply on an economic cost-benefit analysis. These criteria include being technically and administratively feasible, politically acceptable, socially appropriate, legal, economically sound, and not harmful to the environment or our heritage.

Representatives from multiple departments then met to review progress on the City of Cloverdale's 2005 strategies, to identify and prioritize additional mitigation strategies to update the list.

These draft priorities were submitted to City Manager for review. The priorities were adopted by the City Council on December 14, 2011.

The City hazard mitigation team also prioritized specific mitigation tasks for the next 5 years. This list includes implementation process, funding strategy, responsible agency, and approximate time frame.

Based on the hazard exposure information described above, the principal effort for the next five years will be associated with retrofitting and replacing key critical facilities, as well as with encouraging the retrofit of privately-owned hazardous buildings, and fall under mitigation strategy GOVT-a-2 with a priority of "Existing Program." Specifically, the following activities have been identified:

GOVT-a-2 - Retrofit or replace critical facilities that are shown to be vulnerable to damage in natural disasters.

Responsible Agency – Cloverdale City Engineer, and Police Department, and redevelopment agency

Action – Design and complete retrofit or construct a new Police building subject to the availability of funding.

Comments – The existing building was assessed in 2003 and has some significant structural issues that can best be addressed with a new or retrofitted building.

Status – Design on-going. Construction or retrofit planned during the next five years, but dependent on adequate funding from the redevelopment agency or Capital Improvements Fund. While construction is planned for next the five years, construction may be delayed if redevelopment funds are not available.

GOVT-b-3 and GOVT-b-4 - Establish a goal for the resumption of local government services that may vary from function to function. Develop a continuity of operations plan that includes back-up storage of vital records, such as plans and back-up procedures to pay employees and vendors if normal finance department operations are disrupted, as well as other essential electronic files.

Responsible Agency –Police Department

Action – Update the Emergency Operations Plan with an emphasis on continuity of operations.

Comments – The update is considered critical in making emergency operations run more smoothly and to ensure community disaster recovery.

Status – Currently underfunded, but funds are being sought.

## ***Existing and Existing-Underfunded Mitigation Strategy Programs***

The City has many on-going mitigation programs that help create a more disaster-resistant region. The following list highlights those programs identified as *Existing Programs* in the mitigation strategy spreadsheet.

### ***Economy***

- Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for commercial and industrial properties with regard to seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act). (ECON-a-1) - City of Cloverdale Building
- Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available. (ECON-b-1) - City of Cloverdale Building; Ordinance 657-2007
- Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by SEAOC for the 2012 IEBC. (ECON-b-2) - City of Cloverdale Building; Ordinance 657-2007
- Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure. (ECON-c-1) - City of Cloverdale Building
- As required by State law, require private owners to inform all existing tenants that they may need to be prepared to work elsewhere following an earthquake even if the building has been retrofitted, because it has probably been retrofitted to a life-safety standard, not to a standard that will allow occupancy following major earthquakes. (ECON-c-4) - City of Cloverdale Building
- Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings. (ECON-d-2) - City of Cloverdale Building; Ordinance 657-2007; adopted California Building Code.
- Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies. (ECON-e-1) - City of Cloverdale Planning
- Require that new privately-owned business and office buildings in high fire hazard areas be constructed of fire-resistant building materials and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability. (ECON-e-3) - City of Cloverdale Building

- Adopt and amend as needed updated versions of the *California Building and Fire Codes* so that optimal fire-protection standards are used in construction and renovation projects of private buildings. (ECON-e-4) - City of Cloverdale Building; Ordinance 657-2007
- Create a mechanism to enforce provisions of the *California Building and Fire Codes* and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing privately-owned buildings by making installation a condition of (a) finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property. (ECON-e-5) - City of Cloverdale Building; Ordinance 657-2007
- Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard. (ECON-e-12) - City of Cloverdale Public Works and Engineering
- Balance the needs for private commercial and industrial development against the risk from potential flood-related hazards. (ECON-f-2) - City of Cloverdale Engineering and Planning
- Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities. (ECON-f-3) - City of Cloverdale Engineering and Planning; Resolution No. 18-2004
- Provide sandbags and plastic sheeting to private businesses in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request. (ECON-f-4) - City of Cloverdale Public Works Department; Best Management Practices
- Provide information to private business on locations for obtaining sandbags and deliver those sandbags to those various locations throughout a city and/or county. (ECON-f-5) - City of Cloverdale Public Works Department; Best Management Practices
- Apply floodplain management regulations for private development in the floodplain and floodway. (ECON-f-6) - City of Cloverdale Engineering and Planning; Municipal Code Chapter 15-20, Flood Damage Prevention (Ordinance 428-88)
- Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey *Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California*, American Society of Civil Engineers (ASCE) report *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, and the California Board for Geologists and Geophysicists *Guidelines for Engineering Geologic Reports*. Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance. (ECON-g-1) - City of Cloverdale Engineering and Building; Ordinance 657-2007
- Continue to require that all new privately-owned commercial and industrial buildings be constructed in compliance with requirements of the most recently adopted version of the *California Building Code*. (ECON-h-1) - City of Cloverdale Building; Ordinance 657-2007

- Conduct appropriate employee training and support continued education to ensure enforcement of construction standards for private development. (ECON-h-2) - City of Cloverdale Building
- Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See <http://quake.abag.ca.gov/recovery/info-repair-ord.html>. (ECON-i-5) - City of Cloverdale Building; Ordinance 657-2007
- Provide information to private business owners and their employees on the availability of interactive hazard maps on ABAG's web site. (ECON-j-1) - City of Cloverdale Engineering and Planning
- Make use of the materials developed by others (such as found on ABAG's web site at <http://quake.abag.ca.gov/business>) to increase mitigation activities related to earthquakes by groups other than your own agency. ABAG plans to continue to improve the quality of those materials over time. (ECON-j-7) - City of Cloverdale Engineering and Planning

### ***Environment***

- Continue to enforce State-mandated requirements, such as the *California Environmental Quality Act*, to ensure that mitigation activities for hazards, such as seismic retrofits and vegetation clearance programs for fire threat, are conducted in a way that reduces environmental degradation such as air quality impacts, noise during construction, and loss of sensitive habitats and species, while respecting the community value of historic preservation. (ENVI-a-1) - City of Cloverdale Engineering, Planning, and Building Departments; State Law.
- Encourage joint meetings of security and operations personnel at major private employers to develop innovative ways for these personnel to work together to increase safety and security. (ENVI-a-2) - City of Cloverdale Engineering, Planning, and Building Departments
- Continue to enforce and/or comply with State-mandated requirements, such as the *California Environmental Quality Act* and environmental regulations to ensure that urban development is conducted in a way to minimize air pollution. For example, air pollution levels can lead to global warming, and then to drought, increased vegetation susceptibility to disease (such as pine bark beetle infestations), and associated increased fire hazard. (ENVI-a-3) - City of Cloverdale Planning Department; State Law
- Balance the need for the smooth flow of storm waters versus the need to maintain wildlife habitat by developing and implementing a comprehensive Streambed Vegetation Management Plan that ensures the efficacy of flood control efforts, mitigates wildfires and maintains the viability of living rivers. (ENVI-a-5) - City of Cloverdale Engineering and Public Works; Best Management Practices
- Comply with applicable performance standards of any *National Pollutant Discharge Elimination System* municipal stormwater permit that seeks to manage increases in stormwater run-off flows from new development and redevelopment construction projects. (ENVI-a-6) - City of Cloverdale Engineering; State Stormwater NPDES MS4 Phase II Renewal.

- Enforce and/or comply with the grading, erosion, and sedimentation requirements by prohibiting the discharge of concentrated stormwater flows by other than approved methods that seek to minimize associated pollution. (ENVI-a-7) - City of Cloverdale Engineering
- Provide information on hazardous waste disposal and/or drop off locations. (ENVI-a-10) - City of Cloverdale Administration and City/County JPA Solid Waste Agreement
- Stay informed of scientific information compiled by regional and state sources on the subject of rising sea levels and global warming, especially on additional actions that local governments can take to mitigate this hazard including special design and engineering of government-owned facilities in low-lying areas, such as wastewater treatment plants, ports, and airports. (ENVI-b-1) - City of Cloverdale Planning and Engineering

### ***Government***

- Clarify to workers in critical facilities and emergency personnel, as well as to elected officials and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake. (GOVT-a-3) - City of Cloverdale Building and Engineering.
- Ensure that new government-owned facilities comply with and are subject to the same or more stringent regulations as imposed on privately-owned development. (GOVT-a-10) - City of Cloverdale Building and Engineering.
- Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling government-owned facilities. (GOVT-a-11) - City of Cloverdale Building. Municipal Code Title 15 (Ord. 676-2010).
- Prior to acquisition of property to be used as a critical facility, conduct a study to ensure the absence of significant structural hazards and hazards associated with the building site. (GOVT-a-12) - City of Cloverdale and Building and Engineering.
- Ensure that any regulations imposed on private-owned businesses related to repair and reconstruction (see Economy Section) are enforced and imposed on local government's own buildings and structures. (GOVT-a-13) - City of Cloverdale Building.
- Establish a framework and process for pre-event planning for post-event recovery that specifies roles, priorities, and responsibilities of various departments within the local government organization, and that outlines a structure and process for policy-making involving elected officials and appointed advisory committees. (GOVT-b-1) - City of Cloverdale Administration and Police; Emergency Operations Plan.
- Establish a goal for the resumption of local government services that may vary from function to function. (GOVT-b-3) - City of Cloverdale Administration and Police.
- Develop a plan for short-term and intermediate-term sheltering of your employees. (GOVT-c-1) - City of Cloverdale Administration, Police, and Public Works.
- Encourage your employees to have a family disaster plan. (GOVT-c-2) - City of Cloverdale Administration.
- Periodically assess the need for new or relocated fire or police stations and other emergency facilities. (GOVT-c-4) - City of Cloverdale Administration and Police.

- Periodically assess the need for changes in staffing levels, as well as for additional or updated supplies, equipment, technologies, and in-service training classes. (GOVT-c-5) - City of Cloverdale Administration and Police.
- Maintain and update as necessary the local government's Standardized Emergency Management System (SEMS) Plan and the National Incident Management System (NIMS) Plan, and submit an appropriate NIMSCAST report. (GOVT-c-12) - City of Cloverdale Police.
- Continue to participate not only in general mutual-aid agreements, but also in agreements with adjoining jurisdictions for cooperative response to fires, floods, earthquakes, and other disasters. (GOVT-c-13) - City of Cloverdale Administration and Police; Sonoma Operational Unit JPA.
- Regulate and enforce the location and design of street-address numbers on buildings and minimize the naming of short streets (that are actually driveways) to single homes. (GOVT-c-16) - City of Cloverdale Planning.
- Monitor weather during times of high fire risk using, for example, weather stations tied into police and fire dispatch centers. (GOVT-c-17) - City of Cloverdale Police; Cloverdale Community Fire Protection District.
- Promote information sharing among overlapping and neighboring local governments, including cities, counties, and special districts, as well as utilities. (GOVT-d-1) - City of Cloverdale Administration, Police, and Public Works.
- Recognize that emergency services is more than the coordination of police and fire response; it also includes planning activities with providers of water, food, energy, transportation, financial, information, and public health services. (GOVT-d-2) - City of Cloverdale Administration, Building, Engineering, Police, Planning, and Public Works; Emergency Operations Plan.
- As new flood-control projects are completed, request that FEMA revise its flood-insurance rate maps and digital Geographic Information System (GIS) data to reflect flood risks as accurately as possible. (GOVT-d-4) - City of Cloverdale Engineering.
- Participate in FEMA's National Flood Insurance Program. (GOVT-d-5) - City of Cloverdale Engineering.
- Encourage staff to participate in efforts by professional organizations to mitigate earthquake and landslide disaster losses, such as the efforts of the Northern California Chapter of the Earthquake Engineering Research Institute, the East Bay-Peninsula Chapter of the International Code Council, the Structural Engineers Association of Northern California, and the American Society of Grading Officials. (GOVT-d-8) - City of Cloverdale Engineering and Building.
- Cooperate with researchers working on government-funded projects to refine information on hazards, for example, by expediting the permit and approval process for installation of seismic arrays, gravity survey instruments, borehole drilling, fault trenching, landslide mapping, flood modeling, and/or damage data collection. (GOVT-d-10) - City of Cloverdale Engineering and Building.

### ***Health***

- Ensure that you know the Metropolitan Medical Response System (MMRS) cities in your area. Fremont, Oakland, San Francisco, and San Jose (plus Sacramento and Stockton) are the MMRS cities in or near the Bay Area. MMRS cities are provided with additional

federal funds for organizing, equipping, and training groups of local fire, rescue, medical, and other emergency management personnel to respond to a mass casualty event. (The coordination among public health, medical, emergency management, coroner, EMS, fire, and law enforcement is a model for all cities and counties.) (HEAL-c-2) - City of Cloverdale Administration and Police

- Know that National Disaster Medical System (NDMS) uniformed or non-uniformed personnel are within one-to-four hours of your community. These federal resources include veterinary, mortuary, and medical personnel. Teams in or near the Bay Area are headquartered in the cities of Santa Clara and Sacramento. (HEAL-c-3) - City of Cloverdale Administration and Police

### *Housing*

- Assist in ensuring adequate hazard disclosure by working with real estate agents to improve enforcement of real estate disclosure requirements for residential properties with regard to seven official natural hazard zones: 1) Special Flood Hazard Areas (designated by FEMA), 2) Areas of Potential Flooding from dam failure inundation, 3) Very High Fire Hazard Severity Zones, 4) Wildland Fire Zones, 5) Earthquake Fault Zones (designated under the Alquist-Priolo Earthquake Fault Zoning Act), and the 6) Liquefaction and Landslide Hazard Zones (designated under the Seismic Hazard Mapping Act). (HSNG-a-1) - City of Cloverdale Building and Planning
- Develop a plan for short-term sheltering of residents of your community in conjunction with the American Red Cross. (HSNG-a-3) - City of Cloverdale Police; Cloverdale Community Fire Protection District
- Require engineered plan sets for seismic retrofitting of heavy two-story homes with living areas over garages, as well as for split level homes (that is, homes not covered by Plan Set A), until standard plan sets and construction details become available. (HSNG-b-2) - City of Cloverdale Building.
- Require engineered plan sets for seismic retrofitting of homes on steep hillsides (because these homes are not covered by Plan Set A). (HSNG-b-3) - City of Cloverdale Building; Ordinance 657-2007.
- Encourage local government building inspectors to take classes on a periodic basis (such as the FEMA-developed training classes offered by ABAG) on retrofitting of single-family homes, including application of Plan Set A. (HSNG-b-4) - City of Cloverdale Building.
- Require engineered plan sets for voluntary or mandatory soft-story seismic retrofits by private owners until a standard plan set and construction details become available. (HSNG-c-1) - City of Cloverdale Building; Ordinance 676-2010.
- Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory soft-story building retrofits for use in city/county building department regulations. In addition, allow use of changes to that standard recommended by SEAOC for the 2012 IEBC. (HSNG-c-2) - City of Cloverdale Building; Ordinance 676-2010 adopted 2010 California Building Code.
- Continue to actively implement existing State law that requires cities and counties to maintain lists of the addresses of unreinforced masonry buildings and inform private property owners that they own this type of hazardous structure. (HSNG-d-1) - City of Cloverdale Engineering and Building Departments.

- Adopt the 2009 International Existing Building Code or the latest applicable standard for the design of voluntary or mandatory retrofit of privately-owned seismically vulnerable buildings. (HSNG-e-3) - City of Cloverdale Building; Ordinance 676-2010 adopted 2010 California Building Code.
- Continue to require that all new housing be constructed in compliance with requirements of the most recently adopted version of the *California Building Code*. (HSNG-f-1) - City of Cloverdale Building; Ordinance 676-2010.
- Conduct appropriate employee training and support continued education to ensure enforcement of building codes and construction standards, as well as identification of typical design inadequacies of housing and recommended improvements. (HSNG-f-2) – City of Cloverdale Building.
- Increase efforts to reduce hazards in existing private development in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat through improving engineering design and vegetation management for mitigation, appropriate code enforcement, and public education on defensible space mitigation strategies. (HSNG-g-1) - City of Cloverdale Planning.
- Require that new homes in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat be constructed of fire-resistant building materials (including roofing and exterior walls) and incorporate fire-resistant design features (such as minimal use of eaves, internal corners, and open first floors) to increase structural survivability and reduce ignitability. Note - See Structural Fire Prevention Field Guide for Mitigation of Wildfires at <http://osfm.fire.ca.gov/structural.html>. (HSNG- g-3) – City of Cloverdale Building. Ordinance 676-2010.
- Consider fire safety, evacuation, and emergency vehicle access when reviewing proposals to add secondary units or additional residential units in wildland-urban-interface fire-threatened communities or in areas exposed to high-to-extreme fire threat. (HSNG- g-5) – City of Cloverdale Building, Engineering, and Planning.
- Adopt and amend as needed updated versions of the *California Building and Fire Codes* so that optimal fire-protection standards are used in construction and renovation projects of private buildings. (HSNG-g-6) – City of Cloverdale Building. Ordinance 676-2010.
- Create a mechanism to enforce provisions of the *California Building and Fire Codes* and other local codes that require the installation of smoke detectors and fire-extinguishing systems on existing residential buildings by making installation a condition of (a) finalizing a permit for any work valued at over a fixed amount and/or (b) on any building over 75 feet in height, and/or (b) as a condition for the transfer of property. (HSNG-g-7) – City of Cloverdale Building. Ordinance 676-2010.
- Require fire sprinklers in new homes located more than 1.5 miles or a 5-minute response time from a fire station or in an identified high hazard wildland-urban-interface wildfire area. (HSNG-g-12) – City of Cloverdale Building. Ordinance 676-2010.
- Require fire sprinklers in all new or substantially remodeled multifamily housing, regardless of distance from a fire station. (HSNG-g-13) – City of Cloverdale Building. Ordinance 676-2010.
- Require sprinklers in all mixed use development to protect residential uses from fires started in non-residential areas. (HSNG-g-14) – City of Cloverdale Building. Ordinance 676-2010.

- Create a mechanism to require the bracing of water heaters and flexible couplings on gas appliances, and/or (as specified under "**b. Single-family homes vulnerable to earthquakes**" above) the bolting of homes to their foundations and strengthening of cripple walls to reduce fire ignitions due to earthquakes. (HSNG-g-18) – City of Cloverdale Building. Ordinance 676-2010.
- Balance the housing needs of residents against the risk from potential flood-related hazards. (HSNG-h-2) – City of Cloverdale Engineering and Planning. National Flood Insurance Program Compliance.
- Ensure that new private development pays its fair share of improvements to the storm drainage system necessary to accommodate increased flows from the development, or does not increase runoff by draining water to pervious areas or detention facilities. (HSNG-h-3) – City of Cloverdale Engineering and Building. Ordinance 680-2011 and Resolution Number 18-2004.
- Provide sandbags and plastic sheeting to residents in anticipation of rainstorms, and deliver those materials to vulnerable populations upon request. (HSNG-h-4) – City of Cloverdale Public Works Department. Best Management Practices.
- Provide public information on locations for obtaining sandbags and/or deliver those sandbags to those various locations throughout a city and/or county prior to and/or during the rainy season. (HSNG-h-5) – City of Cloverdale Public Works Department. Best Management Practices.
- Apply floodplain management regulations for private development in the floodplain and floodway. (HSNG-h-6) - – City of Cloverdale Public Works Department. Ordinance 428-88.
- Ensure that new subdivisions are designed to reduce or eliminate flood damage by requiring lots and rights-of-way be laid out for the provision of approved sewer and drainage facilities, providing on-site detention facilities whenever practicable. (HSNG-h-7) – City of Cloverdale Engineering and Planning.
- Encourage owners of properties in a floodplain to consider purchasing flood insurance. For example, point out that most homeowners' insurance policies do not cover a property for flood damage. (HSNG-h-10) – City of Cloverdale Engineering and Building Departments.
- Increase efforts to reduce landslides and erosion in existing and future development by improving appropriate code enforcement and use of applicable standards for private property, such as those appearing in the California Building Code, California Geological Survey *Special Report 117 – Guidelines for Evaluating and Mitigating Seismic Hazards in California*, American Society of Civil Engineers (ASCE) report *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, and the California Board for Geologists and Geophysicists *Guidelines for Engineering Geologic Reports*. Such standards should cover excavation, fill placement, cut-fill transitions, slope stability, drainage and erosion control, slope setbacks, expansive soils, collapsible soils, environmental issues, geological and geotechnical investigations, grading plans and specifications, protection of adjacent properties, and review and permit issuance. (HSNG-i-1) – City of Cloverdale Engineering and Building Departments. Resolution Number 36-2004.

- Develop and enforce a repair and reconstruction ordinance to ensure that damaged buildings are repaired in an appropriate and timely manner and retrofitted concurrently. This repair and reconstruction ordinance should apply to all public and private buildings, and also apply to repair of all damage, regardless of cause. See <http://quake.abag.ca.gov/recovery/info-repair-ord.html>. (HSNG-j-1) – City of Cloverdale Building. Ordinance 676-2010.
- Provide information to residents of your community on the availability of interactive hazard maps showing your community on ABAG’s web site. (HSNG-k-1) – City of Cloverdale Planning, Engineering, and Building.
- Make use of the materials on the ABAG web site at <http://quake.abag.ca.gov/fixit> and other web sites to increase residential mitigation activities related to earthquakes. (ABAG plans to continue to improve the quality of those materials over time.) (HSNG-k-12) – City of Cloverdale Planning, Engineering, and Building.
- Distribute appropriate materials related to disaster mitigation and preparedness to residents. Appropriate materials are (1) culturally appropriate and (2) suitable for special needs populations. For example, such materials are available on the <http://www.preparenow.org> website and from non-governmental organizations that work with these communities on an on-going basis. (HSNG-k-16) – City of Cloverdale Planning, Engineering, and Building.

### ***Infrastructure***

- Encourage the cooperation of utility system providers and cities, counties, and special districts, and PG&E to develop strong and effective mitigation strategies for infrastructure systems and facilities. (INFR-a-3) - City of Cloverdale Administration and Engineering
- Support and encourage efforts of other (lifeline infrastructure) agencies as they plan for and arrange financing for seismic retrofits and other disaster mitigation strategies. (For example, a city might pass a resolution in support of a transit agency’s retrofit program.) (INFR-a-5) - City of Cloverdale Administration and Engineering.
- Engage in, support, and/or encourage research by others (such as USGS, universities, or Pacific Earthquake Engineering Research Center-PEER) on measures to further strengthen transportation, water, sewer, and power systems so that they are less vulnerable to damage in disasters. (INFR-a-7) - City of Cloverdale Engineering
- Encourage communication between State Emergency Management Agency (CalEMA), FEMA, and utilities related to emergencies occurring outside of the Bay Area that can affect service delivery in the region. (INFR-a-14) - City of Cloverdale Administration and Engineering
- Coordinate with other critical infrastructure facilities to establish plans for delivery of water and wastewater treatment chemicals. (INFR-a-19) - City of Cloverdale Public Works
- Include “areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture” in the list of criteria used for determining a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history). (INFR-b-3) - City of Cloverdale Engineering and Public Works

- Comply with all applicable building and fire codes, as well as other regulations (such as state requirements for fault, landslide, and liquefaction investigations in particular mapped areas) when constructing or significantly remodeling infrastructure facilities. (INFR-b-8) - City of Cloverdale Engineering, Building, and Planning; Ordinance 676-2010; 2010 California Building Code
- Clarify to workers in critical facilities and emergency personnel, as well as to elected officials and the public, the extent to which the facilities are expected to perform only at a life safety level (allowing for the safe evacuation of personnel) or are expected to remain functional following an earthquake. (INFR-b-9) - City of Cloverdale Administration and Engineering
- For new development, ensure all dead-end segments of public roads in high hazard areas have at least a “T” intersection turn-around sufficient for typical wildland fire equipment. (INFR-c-4) - City of Cloverdale Engineering, Building, and Planning; Design and Construction Standards
- For new development, enforce minimum road width of 20 feet with an additional 10-foot clearance on each shoulder on all driveways and road segments greater than 50 feet in length in wildfire hazard areas. (INFR-c-5) - City of Cloverdale Engineering, Building, and Planning; Design and Construction Standards
- Require that development in high fire hazard areas provide adequate access roads (with width and vertical clearance that meet the minimum standards of the *Fire Code* or relevant local ordinance), onsite fire protection systems, evacuation signage, and fire breaks. (INFR-c-6) - City of Cloverdale Engineering, Building, and Planning; Design and Construction Standards and Ordinance 657-2007
- Ensure adequate fire equipment road or fire road access to developed and open space areas. (INFR-c-7) - City of Cloverdale Engineering, Building, and Planning; Design and Construction Standards.
- Assist, support, and/or encourage the U.S. Army Corp of Engineers, various Flood Control and Water Conservation Districts, and other responsible agencies to locate and maintain funding for the development of flood control projects that have high cost-benefit ratios (such as through the writing of letters of support and/or passing resolutions in support of these efforts). (INFR-d-4) - City of Cloverdale Administration and Engineering.
- Ensure that utility systems in new developments are constructed in ways that reduce or eliminate flood damage. (INFR-d-13) - City of Cloverdale Engineering and Planning; Design and Construction Standards.
- Work for better cooperation among the patchwork of agencies managing flood control issues. (INFR-d-16) - City of Cloverdale Administration and Engineering.
- Include “areas subject to ground failure” in the list of criteria used for determining a replacement schedule (along with importance, age, type of construction material, size, condition, and maintenance or repair history) for pipelines. (INFR-e-1) - City of Cloverdale Engineering and Public Works.
- Establish requirements in zoning ordinances to address hillside development constraints in areas of steep slopes that are likely to lead to excessive road maintenance or where roads will be difficult to maintain during winter storms due to landsliding. (INFR-e-2) - City of Cloverdale Planning.

## *Land Use*

- Require preparation of site-specific geologic or geotechnical reports for development and redevelopment proposals in areas subject to earthquake-induced landslides or liquefaction as mandated by the State Seismic Hazard Mapping Act in selected portions of the Bay Area where these maps have been completed, and condition project approval on the incorporation of necessary mitigation measures related to site remediation, structure and foundation design, and/or avoidance. (LAND-a-2) - City of Cloverdale Planning and Building.
- Recognizing that some faults may be a hazard for surface rupture, even though they do not meet the strict criteria imposed by the Alquist-Priolo Earthquake Fault Zoning Act, identify and require geologic reports in areas adjacent to locally-significant faults. (LAND-a-3) - City of Cloverdale Planning
- Recognizing that the California Geological Survey has not completed earthquake-induced landslide and liquefaction mapping for much of the Bay Area, identify and require geologic reports in areas mapped by others as having significant liquefaction or landslide hazards. (LAND-a-6) - City of Cloverdale Planning
- Support and/or facilitate efforts by the California Geological Survey to complete the earthquake-induced landslide and liquefaction mapping for the Bay Area. (LAND-a-7) - City of Cloverdale Planning and Engineering
- Require that local government reviews of geologic and engineering studies are conducted by appropriately trained and credentialed personnel. (LAND-a-8) - City of Cloverdale Engineering
- Review new development proposals to ensure that they incorporate required and appropriate fire-mitigation measures, including adequate provisions for occupant evacuation and access by emergency response personnel and equipment. (LAND-b-1) - City of Cloverdale Planning, Engineering, and Building; Cloverdale Community Fire Protection District
- Establish and enforce requirements for new development so that site-specific designs and source-control techniques are used to manage peak stormwater runoff flows and impacts from increased runoff volumes. (LAND-c-1) - City of Cloverdale Engineering; Municipal Code Section 1520 Flood Damage Prevention.
- Incorporate FEMA guidelines and suggested activities into local government plans and procedures for managing flood hazards. (LAND-c-2) - City of Cloverdale Engineering; Municipal Code Section 1520 Flood Damage Prevention.
- Provide an institutional mechanism to ensure that development proposals adjacent to floodways and in floodplains are referred to flood control districts and wastewater agencies for review and comment (consistent with the NPDES program). (LAND-c-3) - City of Cloverdale Engineering; Municipal Code Section 1520 Flood Damage Prevention.
- Establish and enforce regulations concerning new construction (and major improvements to existing structures) within flood zones in order to be in compliance with federal requirements and, thus, be a participant in the Community Rating System of the *National Flood Insurance Program*. (LAND-c-4) - City of Cloverdale Engineering; Municipal Code Section 1520 Flood Damage Prevention. However, the City is not enrolled in the Community Rating System.

- Establish and enforce provisions (under subdivision ordinances or other means) that geotechnical and soil-hazard investigations be conducted and filed to prevent grading from creating unstable slopes, and that any necessary corrective actions be taken prior to development approval. (LAND-d-1) - City of Cloverdale Engineering, Building, and Planning; Subdivision Ordinance (Municipal Code Title 17).
- Require that local government reviews of these investigations are conducted by appropriately trained and credentialed personnel. (LAND-d-2) - City of Cloverdale Engineering, Building, and Planning; Standard procedure.
- Establish and enforce grading, erosion, and sedimentation ordinances by requiring, under certain conditions, grading permits and plans to control erosion and sedimentation prior to development approval. (LAND-d-3) - City of Cloverdale Engineering, Building, and Planning; Standard procedure.
- Establish and enforce provisions under the creek protection, storm water management, and discharge control ordinances designed to control erosion and sedimentation. (LAND-d-4) - City of Cloverdale Engineering, Building, and Planning; City design standards.
- Establish requirements in zoning ordinances to address hillside development constraints, especially in areas of existing landslides. (LAND-d-5) - City of Cloverdale Engineering, Building, and Planning; City General Plan.
- For new development, require a buffer zone between residential properties and landslide or wildfire hazard areas. (LAND-e-1) - City of Cloverdale Planning
- Discourage, add additional mitigation strategies, or prevent new construction or major remodels on slopes greater than a set percentage, such as 15%, due to landslide or wildfire hazard concerns. (LAND-e-2) - City of Cloverdale Planning
- Prioritize retrofit of infrastructure that serves urban areas (or urban services areas) over constructing new infrastructure to serve outlying areas. (LAND-f-1) - City of Cloverdale Planning. CIP and Utility Master Plans.
- Strive to provide and preserve existing buffers between development and existing users of large amounts of hazardous materials, such as major industry, due to the potential for catastrophic releases or fires due to an earthquake, accident, or terrorism. (Flooding might also result in release or spread of these materials; however, it is unlikely.) In areas where buffers do not exist or cannot be created, provide alternative mitigation. (LAND-f-5) - City of Cloverdale Planning

The following are on-going programs that are currently underfunded or partially funded by other agencies. It is the City's priority to search for, and find, additional funding to sustain these on-going programs over time.

### ***Economy***

- Create incentives for private owners of historic or architecturally significant commercial and industrial buildings to undertake mitigation to levels that will minimize the likelihood that these buildings will need to be demolished after a disaster, particularly if those alterations conform to the federal Secretary of the Interior's *Guidelines for Rehabilitation*. (ECON-a-2) – City of Cloverdale Administration and Building.
- Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural

analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory (rather than voluntary) retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings. (ECON-c-2) – City of Cloverdale Building.

- Require private owners to inform all existing tenants (and prospective tenants prior to signing a lease agreement) that they work in an unreinforced masonry building and the standard to which it may have been retrofitted. (ECON-c-3) – City of Cloverdale Building.
- Inventory non-ductile concrete, tilt-up concrete, and other privately-owned structurally vulnerable buildings. (ECON-d-1) – City of Cloverdale Building.
- Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies. (ECON-g-2) – City of Cloverdale Engineering and Building.
- Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures. (ECON-i-6) – City of Cloverdale Building;
- Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging private businesses' employees to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines. (ECON-j-2) – City of Cloverdale Police; Cloverdale Community Fire Protection District.
- Encourage private businesses and laboratories handling hazardous materials or pathogens increase security to a level high enough to create a deterrent to crime and terrorism, including active implementation of “cradle-to-grave” tracking systems. (ECON-j-10) – City of Cloverdale Police.

### ***Environment***

- Develop and implement a program to control invasive and exotic species that contribute to fire and flooding hazards (such as eucalyptus, cattails, and cordgrass). This program could include vegetation removal, thinning, or replacement in hazard areas where there is a direct threat to structures. (ENVI-a-12) - City of Cloverdale Public Works Department; Best Management Practices.
- Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices. (ENVI-a-13) - City of Cloverdale Public Works Department; Municipal Code 8.20, Obstruction of Water Courses.
- Inventory global warming emissions in your own local government's operations and in the community, set reduction targets and create an action plan. (ENVI-b-2) - City of Cloverdale Planning.
- Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities. (ENVI-b-3) - City of Cloverdale Planning.

- Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit. (ENVI-b-4) - City of Cloverdale Planning.
- Increase the use of clean, alternative energy by, for example, investing in “green tags”, advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology. (ENVI-b-5) - City of Cloverdale Planning and Public Works.
- Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money. (ENVI-b-6) – City of Cloverdale Administration, Building, and Engineering.
- Purchase only Energy Star equipment and appliances for local government use. (ENVI-b-7) - City of Cloverdale Public Works.
- Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system. (ENVI-b-8) - City of Cloverdale Building and Planning. Municipal Code 15.17, Green Building Standards.
- Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel. (ENVI-b-9) - City of Cloverdale Public Works.
- Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production. (ENVI-b-10) - City of Cloverdale Engineering and Public Works.
- Increase recycling rates in local government operations and in the community. (ENVI-b-11) - City of Cloverdale Administration; City/County JPA Solid Waste Agreement.
- Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2. (ENVI-b-12) - City of Cloverdale Planning and Public Works.
- Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution. (ENVI-b-13) - City of Cloverdale Administration and Planning.

### ***Government***

- Assess the vulnerability of critical facilities (such as city halls, fire stations, operations and communications headquarters, community service centers, seaports, and airports) to damage in natural disasters and make recommendations for appropriate mitigation. (GOVT-a-1) - City of Cloverdale Building and Engineering.
- Retrofit or replace critical facilities that are shown to be vulnerable to damage in natural disasters. (GOVT-a-2) - City of Cloverdale Building and Engineering.
- Conduct comprehensive programs to identify and mitigate problems with facility contents, architectural components, and equipment that will prevent critical buildings from being functional after major natural disasters. Such contents and equipment includes computers and servers, phones, files, and other tools used by staff to conduct daily business. (GOVT-a-4) - City of Cloverdale Building and Engineering.
- Prepare a basic Recovery Plan that outlines the major issues and tasks that are likely to be the key elements of community recovery, as well as integrate this planning into response planning (such as with continuity of operations plans). (GOVT-b-2) - City of Cloverdale Administration, Police, and Public Works.
- Develop a continuity of operations plan that includes back-up storage of vital records, such as plans and back-up procedures to pay employees and vendors if normal finance

department operations are disrupted, as well as other essential electronic files. (GOVT-b-4) - City of Cloverdale Administration.

- Plan for the emergency relocation of government-owned facilities critical to recovery, as well as any facilities with known structural deficiencies or in hazardous areas. (GOVT-b-5) - City of Cloverdale Administration, Police, and Public Works.
- Offer CERT/NERT-type training to your employees. (GOVT-c-3) - City of Cloverdale Police; Cloverdale Community Fire Protection District.
- Ensure that fire, police, and other emergency personnel have adequate radios, breathing apparatuses, protective gear, and other equipment to respond to a major disaster. (GOVT-c-6) - City of Cloverdale Police and Public Works.
- Participate in developing and maintaining a system of interoperable communications for first responders from cities, counties, special districts, state, and federal agencies. (GOVT-c-7) - City of Cloverdale Police and Public Works.
- Harden emergency response communications, including, for example, building redundant capacity into public safety alerting and/or answering points, replacing or hardening microwave and simulcast systems, adding digital encryption for programmable radios, and ensuring a plug-and-play capability for amateur radio. (GOVT-c-8) – City of Cloverdale Police and Public Works.
- Maintain the local government’s emergency operations center in a fully functional state of readiness. (GOVT-c-10) – Cloverdale Community Fire Protection District is responsible for the EOC.
- Expand or participate in expanding traditional disaster exercises involving city and county emergency personnel to include airport and port personnel, transit and infrastructure providers, hospitals, schools, park districts, and major employers. (GOVT-c-11) - City of Cloverdale Administration, Building, Engineering, Planning, Police, and Public Works.
- Install alert and warning systems for rapid evacuation or shelter-in-place. Such systems include outdoor sirens and/or reverse-911 calling systems. (GOVT-c-14) - City of Cloverdale Police.
- Conduct periodic tests of the alerting and warning system. (GOVT-c-15) - City of Cloverdale Police.
- Support and encourage planning and identification of facilities for the coordination of distribution of water, food, blankets, and other supplies, coordinating this effort with the American Red Cross. (GOVT-c-25) - City of Cloverdale Administration and Police.
- Participate in multi-agency efforts to mitigate fire threat, such as the Hills Emergency Forum (in the East Bay), various FireSafe Council programs, and city-utility task forces. Such participation increases a jurisdiction's competitiveness in obtaining grants. (GOVT-d-6) - City of Cloverdale Administration, Police, and Public Works.
- Conduct and/or promote attendance at local or regional hazard conferences and workshops for elected officials and staff to educate them on the critical need for programs in mitigating earthquake, wildfire, flood, and landslide hazards. (GOVT-d-9) - City of Cloverdale Engineering and Building.

### ***Housing***

- Utilize or recommend adoption of a retrofit standard that includes standard plan sets and construction details for voluntary bolting of homes to their foundations and bracing of

outside walls of crawl spaces (“cripple” walls), such as Plan Set A developed by a committee representing the East Bay-Peninsula-Monterey Chapters of the International Code Council (ICC), California Building Officials (CALBO), the Structural Engineers Association of Northern California (SEAONC), the Northern California Chapter of the Earthquake Engineering Research Institute (EERI-NC), and ABAG’s Earthquake Program. (HSNG-b-1) - City of Cloverdale Building.

- Conduct an inventory of privately-owned existing or suspected soft-story residential structures as a first step in establishing voluntary or mandatory programs for retrofitting these buildings (HSNG-c-4) - City of Cloverdale Building.
- Accelerate retrofitting of privately-owned unreinforced masonry structures that have not been retrofitted, for example, by (a) actively working with owners to obtain structural analyses of their buildings, (b) helping owners obtain retrofit funding, (c) adopting a mandatory versus voluntary, retrofit program, and/or (d) applying penalties to owners who show inadequate efforts to upgrade these buildings. (HSNG-d-2) - City of Cloverdale Building.
- Work to ensure a reliable source of water for fire suppression in rural-residential areas through the cooperative efforts of water districts, fire districts, and residents. (HSNG-g-8) - City of Cloverdale Engineering and Public Works.
- Expand vegetation management programs in wildland-urban- interface fire-threatened communities or in areas exposed to high-to-extreme fire threat to more effectively manage the fuel load through roadside collection and chipping, mechanical fuel reduction equipment, selected harvesting, use of goats or other organic methods of fuel reduction, and selected use of controlled burning. (HSNG-g-9) - City of Cloverdale Public Works Department; Cloverdale Community Fire Protection District.
- Ensure that city/county-initiated fire-preventive vegetation-management techniques and practices for creek sides and high-slope areas do not contribute to the landslide and erosion hazard. For example, vegetation in these sensitive areas could be thinned, rather than removed, or replanted with less flammable materials. When thinning, the non-native species should be removed first. Other options would be to use structural mitigation, rather than vegetation management in the most sensitive areas. (HSNG-g-17) - City of Cloverdale Public Works Department.
- Increase efforts to reduce landslides and erosion in existing and future private development through continuing education of design professionals on mitigation strategies. (HSNG-i-2) - City of Cloverdale Engineering and Building.
- Establish preservation-sensitive measures for the repair and reoccupancy of historically significant privately-owned structures, including requirements for temporary shoring or stabilization where needed, arrangements for consulting with preservationists, and expedited permit procedures for suitable repair or rebuilding of historically or architecturally valuable structures. (HSNG-j-2) - City of Cloverdale Building.
- Develop printed materials, utilize existing materials (such as developed by FEMA and the American Red Cross), conduct workshops, and/or provide outreach encouraging residents to have family disaster plans that include drop-cover-hold earthquake drills, fire and storm evacuation procedures, and shelter-in-place emergency guidelines. (HSNG-k-2) - City of Cloverdale Police; Cloverdale Community Fire Protection District.

## ***Infrastructure***

- Assess the vulnerability of critical facilities owned by infrastructure operators subject to damage in natural disasters or security threats, including fuel tanks and facilities owned outside of the Bay Area that can impact service delivery within the region. **Note** - Infrastructure agencies, departments, and districts are those that operate transportation and utility facilities and networks. (INFR-a-1) - City of Cloverdale Public Works and Engineering.
- Encourage the cooperation of utility system providers and cities, counties, and special districts, and PG&E to develop strong and effective mitigation strategies for infrastructure systems and facilities. (INFR-a-4) - City of Cloverdale Public Works and Engineering.
- Develop a plan for speeding the repair and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies, such as those available through the Water /Wastewater Agency Response Network (WARN). Communicate that plan to local governments and critical facility operators. (INFR-a-6) - City of Cloverdale Public Works and Engineering.
- Pre-position emergency power generation capacity (or have rental/lease agreements for these generators) in critical buildings of cities, counties, and special districts to maintain continuity of government and services. (INFR-a-8) - City of Cloverdale Public Works and Engineering.
- Minimize the likelihood that power interruptions will adversely impact lifeline utility systems or critical facilities by ensuring that they have adequate back-up power. (INFR-a-11) - City of Cloverdale Public Works and Engineering.
- Encourage replacing above ground electric and phone wires and other structures with underground facilities, and use the planning-approval process to ensure that all new phone and electrical utility lines are installed underground. (INFR-a-12) - City of Cloverdale Engineering and Planning.
- Develop (with the participation of paratransit providers, emergency responders, and public health professionals) plans and procedures for paratransit system response and recovery from disasters. (INFR-a-18) - City of Cloverdale Police.
- Establish plans for delivery of fuel to critical infrastructure providers. (INFR-a-20) - City of Cloverdale Public Works.
- As an infrastructure operator, designate a back-up Emergency Operations Center with redundant communications systems. (INFR-a-21) - City of Cloverdale Police.
- Expedite the funding and retrofit of seismically-deficient city- and county-owned bridges and road structures by working with Caltrans and other appropriate governmental agencies. (INFR-b-1) - City of Cloverdale Engineering.
- Establish a higher priority for funding seismic retrofit of existing transportation and infrastructure systems (such as BART) than for expansion of those systems. (INFR-b-2) - City of Cloverdale Administration and Engineering.
- Install specially-engineered pipelines in areas subject to faulting, liquefaction, earthquake-induced landsliding, or other earthquake hazard. (INFR-b-4) - City of Cloverdale Public Works and Engineering.

- Replace or retrofit water-retention structures that are determined to be structurally deficient, including levees, dams, reservoirs and tanks. (INFR-b-5) - City of Cloverdale Public Works and Engineering.
- Install portable facilities (such as hoses, pumps, emergency generators, or other equipment) to allow pipelines to bypass failure zones such as fault rupture areas, areas of liquefaction, and other ground failure areas (using a priority scheme if funds are not available for installation at all needed locations). (INFR-b-6) - City of Cloverdale Public Works.
- Install earthquake-resistant connections when pipes enter and exit bridges and work with bridge owners to encourage retrofit of these structures. (INFR-b-7) - City of Cloverdale Public Works and Engineering.
- Ensure a reliable source of water for fire suppression (meeting acceptable standards for minimum volume and duration of flow) for existing and new development. (INFR-c-1) - City of Cloverdale Public Works and Engineering.
- Develop a coordinated approach between fire jurisdictions and water supply agencies to identify needed improvements to the water distribution system, initially focusing on areas of highest wildfire hazard (including wildfire threat areas and in wildland-urban-interface areas). (INFR-c-2) - City of Cloverdale Public Works and Engineering; Cloverdale Community Fire Protection District.
- Maintain fire roads and/or public right-of-way roads and keep them passable at all times. (INFR-c-8) - City of Cloverdale Public Works.
- Conduct a watershed analysis of runoff and drainage systems to predict areas of insufficient capacity in the storm drain and natural creek system. (INFR-d-1) - City of Cloverdale Engineering. Update Storm Drain Master Plan.
- Develop procedures for performing a watershed analysis to examine the impact of development on flooding potential downstream, including communities outside of the jurisdiction of proposed projects. (INFR-d-2) - City of Cloverdale Engineering.
- Conduct a watershed analysis at least once every ten years unless there is a major development in the watershed or a major change in the Land Use Element of the General Plan of the cities or counties within the watershed. (INFR-d-3) - City of Cloverdale Engineering.
- Pursue funding for the design and construction of storm drainage projects to protect vulnerable properties, including property acquisitions, upstream storage such as detention basins, and channel widening with the associated right-of-way acquisitions, relocations, and environmental mitigations. (INFR-d-5) - City of Cloverdale Administration and Engineering.
- Continue to repair and make structural improvements to storm drains, pipelines, and/or channels to enable them to perform to their design capacity in handling water flows as part of regular maintenance activities. (This strategy has the secondary benefit of addressing fuel, chemical, and cleaning product issues.) (INFR-d-6) - City of Cloverdale Engineering and Public Works.
- Continue maintenance efforts to keep storm drains and creeks free of obstructions, while retaining vegetation in the channel (as appropriate) to allow for the free flow of water. (INFR-d-7) - City of Cloverdale Public Works.
- Enforce provisions under creek protection, stormwater management, and discharge control ordinances designed to keep watercourses free of obstructions and to protect

drainage facilities to conform with the Regional Water Quality Control Board's Best Management Practices. (INFR-d-8) - City of Cloverdale Engineering, Planning, and Public Works.

- Identify critical locally-owned bridges affected by flooding and either elevate them to increase stream flow and maintain critical ingress and egress routes or modify the channel to achieve equivalent objectives. (INFR-d-11) - City of Cloverdale Engineering.
- Provide or support the mechanism to expedite the repair or replacement of levees that are vulnerable to collapse from earthquake-induced shaking or liquefaction, rodents, and other concerns, particularly those protecting critical infrastructure. (INFR-d-12) - City of Cloverdale Engineering.
- Determine whether or not wastewater treatment plants are protected from floods, and if not, investigate the use of flood-control berms to not only protect from stream or river flooding, but also increase plant security. (INFR-d-14) - City of Cloverdale Engineering and Public Works.
- Work cooperatively with water agencies, flood control districts, Caltrans, and local transportation agencies to determine appropriate performance criteria for watershed analysis. (INFR-d-15) - City of Cloverdale Engineering. SCWA and RRWA.
- Improve monitoring of creek and watercourse flows to predict potential for flooding downstream by working cooperatively with land owners and the cities and counties in the watershed. (INFR-d-17) - City of Cloverdale Engineering and Public Works; Resolution No. 58-2004 – Russian River Watershed MOU.

### ***Land Use***

- Work to retrofit homes in older urban neighborhoods to provide safe housing close to job centers. (LAND-f-2) - City of Cloverdale Planning; General Plan.
- Work to retrofit older downtown areas and redevelopment districts to protect architectural diversity and promote disaster-resistance. (LAND-f-3) - City of Cloverdale Planning; General Plan.
- Work with non-profits and through other mechanisms to protect as open space those areas susceptible to extreme hazards (such as through land acquisition, zoning, and designation as priority conservation areas). (LAND-f-4) - City of Cloverdale Administration and Planning.

## **Incorporation into Existing Planning Mechanisms**

The City has several planning mechanisms which include:

- ◆ General Plan Public Health and Safety element
- ◆ Capital Improvement Program
- ◆ Emergency Operations Plan
- ◆ Climate Action Plan developed in cooperation with the Cities for Climate Protection

The City has a Public Health and Safety Element in its General Plan that includes a discussion of fire, earthquake, flooding, and landslide hazards. This plan will be adopted as an implementation appendix to the Public Health and Safety Element. In addition, the City enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires

mitigation for identified natural hazards. The City has used these pre-existing programs as a basis for identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

Implementation measures identified by the City as a high priority will be incorporated into the City's Capital Improvement Program planning process. This will be dependent on securing funding for projects and programs, as the City is currently facing serious financial stress. However, the City's Capital Improvement Program routinely includes public improvements which address public health and safety. The Local Annex will be used during the preparation of the CIP to ensure that to the extent practicable mitigation activities are implemented.

The Local Annex will be adopted as an implementation appendix of the Public Health and Safety Element and effectively becomes integrated into the General Plan. The strategies identified in this plan may result in minimal changes to the General Plan, which can be integrated when that plan is updated.

## Plan Update Process

As required Disaster Mitigation Act of 2000, the City of Cloverdale will update this plan annex at least once every five years, by participating in a multi-agency effort with ABAG and other agencies to develop a multi-jurisdictional plan.

The City Engineer's Office will ensure that *monitoring* of this Annex will occur. The plan will be monitored on an on-going basis. However, the major disasters affecting our City, legal changes, notices from ABAG as the lead agency in this process, and other triggers will be used. For example, if a structural engineering evaluation shows that a major risk exists at more or more facilities based on data collected from a future earthquake, the priority associated with upgrading those facilities will be re-evaluated. Finally, the Annex will be a discussion item on the agenda of the meeting of Department leaders at least once a year in April. At that meeting, the department heads will focus on evaluating the Annex in light of technological and political changes during the past year or other significant events. The Department leaders will be responsible for determining if the plan should be updated.

During the 2005-2010 period, monitoring of this Annex and mitigation safety goals occurred by the City Engineer's Office. In addition, the goals of this plan were supplemented and leveraged by the Building Division and Fire Departments.

The City is committed to reviewing and updating this plan annex at least once every five years, as required by the Disaster Mitigation Act of 2000. The City Manager or his designee will contact ABAG four years after this plan is approved to ensure that ABAG plans to undertake the plan update process. If so, the County again plans to participate in the multi-jurisdictional plan. If ABAG is unwilling or unable to act as the lead agency in the multi-jurisdictional effort, other agencies will be contacted, including the Sonoma County's Office of Emergency Services. Counties should then work together to identify another regional forum for developing a multi-jurisdictional plan.

The City of Cloverdale is committed to public participation. All City Council meetings are open to the public and the public is invited to comment on items on the Council Agenda. The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics. The City is committed to improving public participation in the update process over the next five years. To improve this process, the City will consider writing letters to the editor of local newspapers in its service area to promote wider public knowledge of the issues related to disaster mitigation and the planning process.

### **Mitigation Plan Point of Contact**

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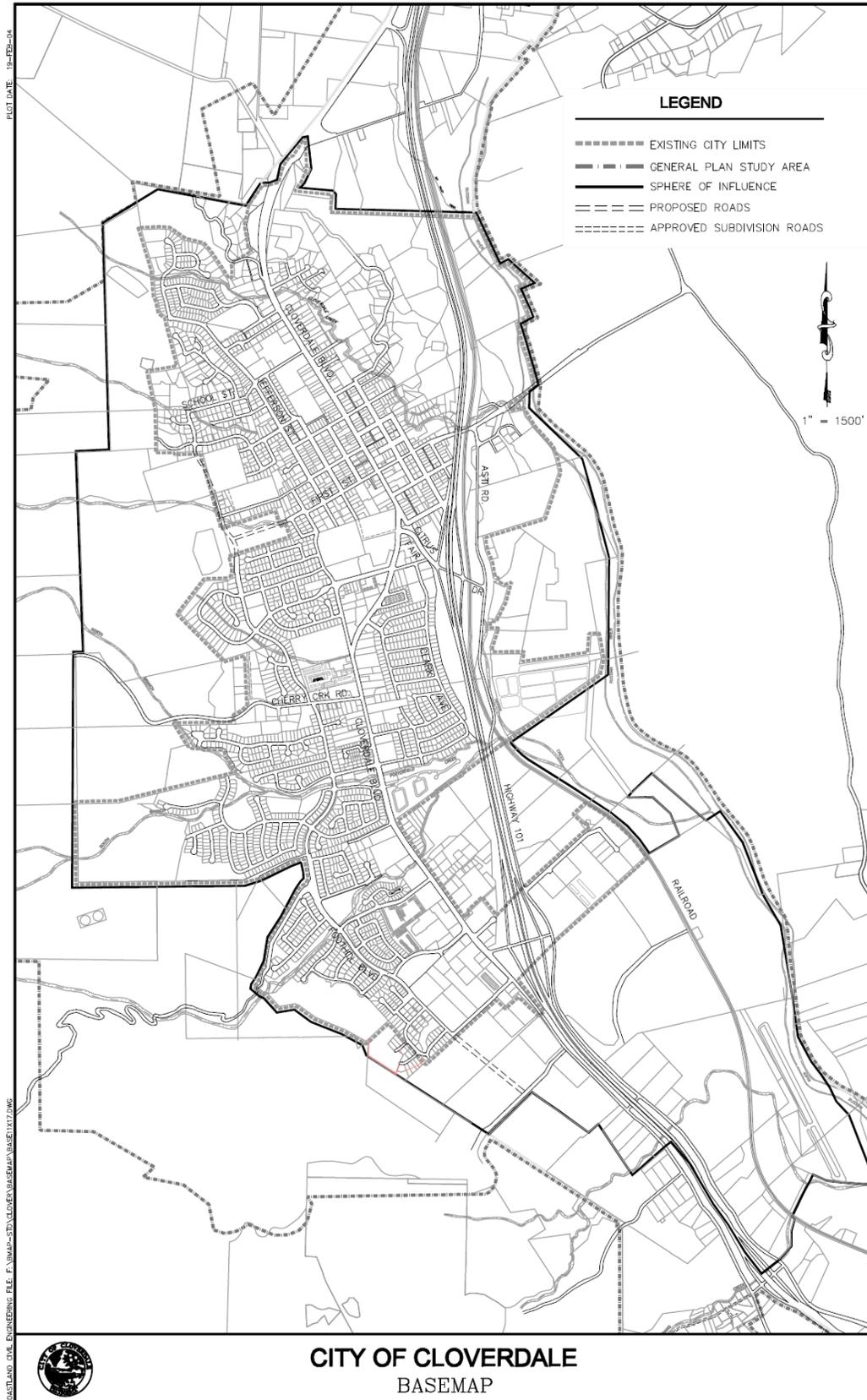
Title: City Manager / City Clerk

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Email: nregor@ci.cloverdale.ca.us

# Exhibit A - Jurisdiction Boundary Map



## **Exhibit B - Public Meeting and Posting**

Excerpt of website posting at <http://www.cloverdale.net/CivicAlerts.aspx?AID=74>:  
Posted on: November 21, 2011

### **Local Hazard Mitigation Plan**

The City of Cloverdale, working in conjunction with the Association of Bay Area Governments, has prepared an update to its adopted Local Hazard Mitigation Plan (LHMP). Originally adopted in 2005, the LHMP provides an organized approach to mitigating damage from natural disasters in order to significantly reduce life loss and injuries, minimize damage to structures and property, minimize disruption of essential services and human activities, and protect the environment. The federal Disaster Mitigation Act of 2000 requires all cities, counties and special districts to adopt a LHMP to be eligible to receive disaster mitigation funding from the Federal Emergency Management Agency (FEMA). To assist local governments in meeting this requirement, ABAG has prepared a multi-jurisdictional LHMP for the nine-county San Francisco Bay Area; the City has prepared this update, as an annex to the regional plan, to address our specific community needs and priorities.

The City is soliciting public comments on the draft LHMP prior to submittal to FEMA. The draft LHMP is available for review at City Hall located at 124 N. Cloverdale Boulevard, Cloverdale and on the City's website at [www.cloverdale.net](http://www.cloverdale.net). The draft LHMP will be considered at the next Public Services Subcommittee meeting on Tuesday, November 29, 2011 at 10:30 a.m. at City Hall.

## Exhibit C - City of Cloverdale 2010 Mitigation Strategy Spreadsheet

[Available on LHMP CD or at <http://www.abag.ca.gov/bayarea/eqmaps/mitigation/strategy.html>]