Natural Hazard Mitigation Plan

for the

City of Rancho Santa Margarita

Table of Contents

Acknowledgements

The Rancho Santa Margarita Hazard Mitigation Committee acknowledges the County of Orange Hazard Mitigation Plan Task Force and the California Office of Emergency Services State Multi-Hazard Mitigation Plan Writing Team, who contributed to the compilation of this Hazard Mitigation Plan. The Rancho Santa Margarita Hazard Mitigation Plan Committee used data from these bodies in writing this plan.

The Rancho Santa Margarita Hazard Mitigation Committee is made up of the following participants:

Kathleen Haton	Director of Development Services
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Part 1

Introduction and Purpose

The City of Rancho Santa Margarita is required to adopt a Multi- Hazard Mitigation Plan and to have this plan approved by the Federal Emergency Management Agency to be eligible for federal hazard mitigation funding. The overall intent of this Plan is to reduce or prevent injury and damage from natural hazards in the city. The Plan identifies current mitigation activities, policies and programs, as well as mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.

The Plan reflects the city's cultural, societal, economic and environmental values, while also acknowledging the numerous regulatory and compliance issues facing government. It is intended to set the tone for the implementation of hazard mitigation practices that will build a safe and resilient community.

The Plan serves as a strategic planning tool for use by the City of Rancho Santa Margarita in its efforts to identify and mitigate the future impacts of natural hazard events. The Plan represents the city's commitment to reduce risks from natural hazards and serves as a guide for decision makers as they commit resources to reduce the effects of natural hazards.

The Plan is an evolving document that will be reviewed and updated regularly to reflect changing conditions and new information and additional planning and mitigation activities.

The Plan:

- Documents citywide mitigation planning and hazard mitigation systems implemented by the city, and
- Integrates existing mitigation planning activities into the plan, and
- Describes strategies and priorities for future mitigation activities, and
- Meets state and federal statutory and regulatory requirements.

Integration with Existing Planning Documents

The hazard mitigation planning process provides an opportunity to incorporate existing planning documents into the Hazard Mitigation Plan. The vision for this Plan is to both integrate and enhance City planning efforts. Where specific hazards are not dealt with in other documents, this Plan presents original research and analysis. Documents used in the development of the Rancho Santa Margarita Hazard Mitigation Plan include:

- Rancho Santa Margarita General Plan;
- Rancho Santa Margarita Emergency Operations Plan;
- Rancho Santa Margarita Zoning Ordinance;
- Rancho Santa Margarita Planned Community Text;
- Dove Canyon Planned Community Text;
- Rancho Trabuco Planned Community Text; and
- Robinson Ranch Planned Community Text.

Rancho Santa Margarita General Plan

The Rancho Santa Margarita General Plan provides the foundation for continued physical enhancement of Rancho Santa Margarita while also addressing the challenges presented by growth. The General Plan establishes solid policies and programs directed at managing growth, enhancing quality of life and livability, and achieving sustainability in Rancho Santa Margarita. The General Plan contains a Safety Element that provided a strong basis for the development of the Hazard Mitigation Plan. The Safety Element identifies and addresses those features or characteristics existing in or near the City that represent a potential hazard to the community's citizens, sites, structures, public facilities and infrastructure. The Safety Element establishes policies to minimize danger to residents, workers, and visitors, while identifying actions needed to manage crisis situations such as earthquakes, fires and floods and contains policies and programs to regulate existing and proposed development in hazard-prone areas. Continuing education of City officials and citizens about emergency preparedness is also addressed.

Public participation played a prominent role in the development of the City's General Plan. Because the General Plan reflects community goals, citizen input was essential in identifying issues and formulating those goals. Public participation in the General Plan preparation process occurred through the following methods:

- Three community workshops were held involving city staff, consultants and the public. Community members were invited to the workshops to discuss their visions for the future of the City, to review land use, circulation and housing policies and alternatives, and to comment on a preliminary draft of the plan;
- The City posted updates on it's website to provide current information on the plan and summaries of the public meetings and progress of the program;
- A newsletter was prepared and distributed to residents with a description of the General Plan and it's contents;
- Non-profit housing and community service agencies, utilities and public service providers were consulted to provide information regarding current services and service needs within the community; and
- The public was able to review the draft plan and address decision makers regarding the General Plan at five Joint Planning Commission/City Council Study Sessions prior to the adoption of the plan.

Rancho Santa Margarita Emergency Operations Plan

The Rancho Santa Margarita Emergency Operations Plan is designed to provide the framework for responding to emergencies and disasters. The goal of this plan is to outline a strategy to prepare for, respond to, and recover from an emergency or disaster that affects the City.

Rancho Santa Margarita Zoning Code
The Rancho Santa Margarita Zoning Code is established to serve the public health, safety and general welfare; implement the General Plan; and provide the economic and social advantages resulting from an orderly planned use of land and resources.

The Planned Community Texts
The four Planned Community Texts were developed prior to City incorporation to provide the regulatory framework for the implementation of the Planned Community as a comprehensive and cohesive development. The texts were designed to encourage the effective use of the natural topography and open space by preserving many of the most prominent and distinctive geological features while blending the urban development into the natural topography through the use of sensitive site design. The documents provide for the development of the planned communities as coordinated, comprehensive projects in order to take advantage of the superior human environment that results from large-scale urban planning. The texts combine provisions for the opportunity to propose innovative community design concepts and site planning, consistent with orderly development and protection of sensitive and natural resources.

Federal Requirements

This Plan meets the requirements for a Local Mitigation Plan under Interim Final Rule 44 CFR 201.6, published by FEMA on February 28, 2002. Adoption of the Plan by Rancho Santa Margarita and approval by FEMA qualifies the City to obtain federal assistance for hazard mitigation.

The Planning Process

Hazard mitigation planning is a process built on assessments of past and present information and engages multiple partners to anticipate future hazards and provide meaningful strategies to address possible impacts and identified needs.

The hazard mitigation planning process involves:

- Organizing resources;
- Seeking input;
- Assessing risks;
- Developing mitigation strategies, goals, and priorities;
- Adopting a plan;
- Implementing the plan;
- Monitoring progress; and
- Revising the plan as necessary.

The Hazard Mitigation Committee

The Rancho Santa Margarita City Manager established the Hazard Mitigation Committee to guide the planning process and draft the Hazard Mitigation Plan. The Hazard Mitigation Committee is comprised of staff from the Planning Department (now Development Services

Department), Public Works and Engineering Department and Public Safety representatives having primary responsibility for hazard mitigation activities.

The primary role of the Hazard Mitigation Committee is to:

- Ensure that the Plan meets FEMA requirements and is approved by FEMA,
- Coordinate the continued development of the Plan, including coordination of organizations and local agencies;
- Administer FEMA hazard mitigation grant programs; and
- Provide ample opportunity for public involvement in the development of the Plan.

The City's Planning Department served as the lead agency in preparing the Plan, with members of the committee drafting portions of the Plan and all committee members reviewing and revising the Plan as it was developed. The Hazard Mitigation Committee met every two weeks during the development process between May 2004 and January 2005. The Committee was essential in the development of this document and will play a key role in ensuring that the Plan is maintained and updated. The City has also added an Emergency Management Coordinator to its staff, who also joins the Hazard Mitigation Committee and will play a primary role in maintaining, revising and implementing the Plan.

Public Involvement

The process for public involvement in the hazard mitigation planning process included:

- Recommendation of the draft plan by the Hazard Mitigation Committee;
- Public Notices announcing community workshop sessions;
- Posting notices of the community workshop sessions on the city website;
- Posting the draft plan on the city website for comment;
- Review of the proposed plan by a professional consultant; and
- Holding a public city council meeting for adoption of the plan.

The Hazard Mitigation Committee invited citizens to join the planning process to facilitate open involvement, including opportunities for the public, interested agencies, businesses and private organizations to comment on the Plan at all stages of its formation.

The Hazard Mitigation Committee hosted public workshop sessions on the Plan in the Rancho Santa Margarita City Council Chambers on July 15, 2004 and September 2, 2004. The purpose of these meetings was to present hazard and vulnerability information and to gather stakeholder input.

The first public participation workshop was held on July 15, 2004, in the City Council Chambers. Each of the homeowners associations and maintenance associations were invited to attend, including:

- Merit Property Management SAMLARC Association (Santa Margarita Landscaping and Recreation Corporation), which represents approximately 13,000 households within the City;
- Dove Canyon Villageway Property Management;
- Rancho Cielo – Rinevol Company, Inc.;

- SAMCORP (Santa Margarita Corporation), Accell Property Management, which represents approximately 90% of Rancho Santa Margarita business and retail properties;
- Robinson Ranch BHE Property Management Corporation;
- Trabuco Highlands Progressive Community Management; and
- Walden Total Property Management

This workshop was announced in the July 5, 2004 edition of the Orange County Register. One representative from SAMLARC, the master residential homeowner's association for a majority of the city, and one member of the public attended this workshop and provided comments.

The second public participation workshop was held on September 2, 2004 in the City Council Chambers and again each of the homeowner's associations and maintenance associations was invited by mail to attend this workshop. This workshop was also publicized in the August 23, 2004 edition of the Orange County Register. The same public participants attended this workshop to again provide comments.

Also the City of Rancho Santa Margarita hired an Emergency Management and Public Safety Consultant, Jaime Becerra of Strategic Solutions Group, to review the draft plan and provide comments and recommendations to further refine and develop the final plan.

The Hazard Mitigation Committee posted the draft plan on the city website and invited reviewers to submit comments to the Hazard Mitigation Committee chairman.

Finally, the Hazard Mitigation Plan was presented before the Rancho Santa Margarita City Council's public meeting on February 23, 2005 in the City Council Chambers. A public notice was published in the February 13, 2005 edition of the Orange County Register. There were no public comments at this meeting.

Timeline of Plan Development

The timeline for the development of the Hazard Mitigation Plan is as follows:

Activity	Date
Establish Committee and Develop Tools	May-June 2004
Hold Public Participation Workshops	July 15, 2004 September 2, 2004
Prepare Final Draft Plan	September 2004- January 2005
Public City Council Meeting for Adoption of the Plan	February 2005
Submit Plan to the State of California and FEMA	February 2005
Approval of Plan by the State of California	July 2006
FEMA Request for Revision of the Plan	September 2006
Plan Revision in Accordance with FEMA Comments	October 2006-September 2007
Re-Submission of the Plan for FEMA Review	September 2007

Adoption by City Council

The Rancho Santa Margarita Natural Hazard Mitigation Plan is a comprehensive description of the City's commitment to reduce or eliminate the impacts of disasters. This Plan is coordinated and maintained by the Hazard Mitigation Committee but is the culmination of input and recommendations from numerous stakeholders.
The Rancho Santa Margarita City Council is responsible for adopting the Hazard Mitigation Plan. Once the Plan has been adopted, the Hazard Mitigation Committee Chair will be responsible for submitting it to the State Hazard Mitigation Officer at the Governor's Office of Emergency Services. The Governor's Office of Emergency Services will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, Rancho Santa Margarita will gain eligibility for Hazard Mitigation Grant Program funds.

In adopting this Plan, the City agrees to comply with all applicable state and federal statutes and regulations and will update the plan at least every five years. The Plan will be amended to reflect new or revised state and federal statutes and regulations. Future amendments will also reflect changes to City organization or policy as appropriate.

Part 2

City Profile

History of the Area

Where schools, shopping centers and residential neighborhoods now stand, Native Americans once lived. On July 23, 1769, they were visited by a Spanish expedition under Captain Gaspar de Portola, who camped near the site of Tijeras Creek Golf Course in Rancho Santa Margarita.

On July 24, the expedition headed inland to avoid the many streams and swamps in the area. They found a large plateau area and camped that night on its western edge by a canyon, which the Franciscans named San Francisco Solano. This was on the eastern side of Trabuco Creek about three miles downstream from the present site of Trabuco Oaks. While camped here on July 24-25, one of the soldiers lost his *trabuco*, or musket, a most valuable possession to any soldier. To mark this loss, the stream was named Trabuco. The name has been associated with the mesa, the canyon, and the entire area ever since.

The Spaniards founded Mission San Juan Capistrano in 1776, and ruled the region until 1821, when California became part of Mexico. The Mexican governors carved the area around the mission into three large ranchos: Rancho Trabuco, Rancho Mission Viejo, and Rancho Santa Margarita.

James L. Flood and his partner Jerome O'Neill purchased the combined ranchos in 1882. The huge estate was run as a working ranch into the 1920s. In 1940, the ranch was divided, with the Flood family taking the lower portion, in today's San Diego County, with the upper portion retained by the O'Neill family. In 1942 the Navy annexed the Flood family's portion of the ranch for use as Camp Joseph H. Pendleton. In 1944 the Department of Defense acquired 1,800 acres of land in present day Rancho Santa Margarita to be used by the Navy as an aircraft bombing and gunnery practice range in connection with the El Toro Marine Corps Air Station. The land was used for this purpose until 1956 when it was reverted to grazing farmland.

In 1948, the O'Neill family donated 278 acres of canyon bottomland to the County of Orange for park purposes. The O'Neill family donated an additional 120 acres of parkland in 1963, the same year they founded the Mission Viejo Company and drew up plans for a master-planned community of the same name.

The Formation and Development of Rancho Santa Margarita

By the 1960s, a rural cluster of homes had been present in Trabuco Canyon for decades. The area's first tract developed homes didn't arrive until late in the decade in what would become Coto de Caza, which started out as a hunting and fishing resort. The area remained fairly remote until 1986, when the first homes in the new master planned community of Rancho Santa Margarita were sold. The economic boom of the 1980s also fueled home construction

in nearby Dove Canyon, Robinson Ranch, Wagon Wheel and a handful of smaller developments. The area became better linked to the rest of the county in 1992, when extensions of Oso, Antonio and Alicia Parkways were completed.

In 1989, the people of the community of Rancho Santa Margarita established a Community Civic Association (CCA) for the purpose of providing a political voice for the community. The CCA, later known as the Rancho Margarita Civic Association (and still later as the Civic Council), briefly explored self-governance, but it was in 1995 that the RSM Cityhood Committee, a separate community organization, began the official drive for cityhood. Rancho Santa Margarita was planned to be an "Urban Village", offering the best of two worlds: all of the elements and advantages of a small city plus the quality of life of a small village.

In November 1999, area voters opted to incorporate the Rancho Santa Margarita Planned Community and the neighboring Robinson Ranch, Dove Canyon, Rancho Cielo, Trabuco Highlands and Walden Communities. The newly formed City of Rancho Santa Margarita incorporated on January 1, 2000, and became the 33rd city in the County of Orange.

Climate

Temperatures in the City of Rancho Santa Margarita range from 40 degrees in the winter months to 93 degrees in the summer months. However, the temperatures can vary over a wider range, especially when the Santa Ana winds blow, bringing higher temperatures and very low humidity. Temperatures rarely exceed 100 degrees in the summer months (June – September) and rarely drop below 30 degrees in the winter months (November – March).

Rainfall in the City averages 12 inches of rain per year. Recorded history of rainfall in the County of Orange shows rainfall amounts ranging from no rain at all in some years to higher than 12 inches of rain per year.

Further, rainfall in Rancho Santa Margarita tends to fall in large amounts during irregular and often heavy storms, as opposed to a pattern of storm systems.

Minerals and Soils

The City of Rancho Santa Margarita is located in the southern portion of the Los Angeles Basin, within the Peninsular Ranges of southern California. This area is best exemplified by the series of faults associated with the San Andreas fault system, including the Newport-Inglewood faults in Los Angeles Basin, the Elsinore fault system, and by the Santa Ana Mountains, and the Puente, San Joaquin and Coyote Hills.

Topographically, the City consists of a series of low hills along the western drainages, rising to ridges of moderate to steep relief in the northern part of the City and areas east of the City. Elevations in the City range from approximately 200 feet above mean sea level (AMSL) in the southern areas to 800 feet AMSL near the northeastern areas.

The bedrock units that occur in the City, from oldest to youngest include, tonalite bedrock, Ladd Formation, Williams Formation, Santiago Peak volcanics, Topanga Formation, Santiago Formation, Vaqueros Formation, and Sespe Formation.

Most of Rancho Santa Margarita is underlain by sedimentary units (both bedrock and alluvium) that are composed primarily of granular soils (silty sand, sand, and gravel). Such units are typically in the low to moderately-low range for expansion potential. However, every sedimentary unit in the area contains layers of fine-grained soils that are typically in the moderate to highly expansive range. The areas most susceptible to expansive soils are located along the western boundary of the City.

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. Most ground subsidence is man-induced and is usually associated with the extraction of oil, gas or ground water from below the ground surface in valleys filled with recent alluvium. No regional subsidence as a result of either groundwater pumping or oil extraction has been reported for the Santa Margarita area.

Population and Demographics

Several communities in Orange County, particularly in the South County, experienced substantial population growth during the last ten years. While the population in the County of Orange grew by about 18 percent between 1990 and 2000, some developing areas such as Rancho Santa Margarita experienced more rapid population growth.

According to the 1990 Census, Rancho Santa Margarita had a population of approximately 11,390. During the ensuing decade, the population increased fourfold, to a total of 47,214. Compared to the County, Rancho Santa Margarita experienced a very high level of growth.

People of different cultural backgrounds may have different preferences for living arrangements, correlating to such factors as household size, location choice, and need for different types for housing. The majority (87 percent) of the residents in Rancho Santa Margarita identified themselves as non-Hispanic. Whites comprised the majority (74 percent) of the total population.

The racial and ethnic composition in Rancho Santa Margarita differed markedly from that of the County; Hispanics comprised a greater percentage of the population at 31 percent in the County compared to 13 percent in Rancho Santa Margarita. Additionally, Asians comprised a smaller portion of the Rancho Santa Margarita population at about 8 percent, compared to 14 percent in the County.

In 2000, Rancho Santa Margarita had a younger population on average than the County of Orange, with a median age of 31.9 years compared to the County median age of 33.3 years. Rancho Santa Margarita had a larger percentage of its population under the age of 19 and a larger percentage of the population between the ages of 35 to 44 than did the County. This, along with the fact that Rancho Santa Margarita had a large percentage of family households (76.4 percent compared to 71.4 percent in the County) indicates that the community has a

large percentage of young family households with children. More than 51 percent of the family households in Rancho Santa Margarita include children under the age of 18, compared to 37 percent of the family households in Orange County. Additionally, during the past ten years the average household size in Rancho Santa Margarita increased from 2.62 persons per household to 2.90 persons per household.

Housing

The 2000 Census reported that Rancho Santa Margarita contained 16,515 housing units. The majority (54 percent) of the housing stock in the City in 2000 was single-family detached units, with single-family attached units comprising 24 percent of the housing stock, and multi-family units accounting for 22 percent. As a comparison, single-family detached and attached units also comprised the majority (64 percent) of the units in the County in 2000. There are no mobile homes in Rancho Santa Margarita.

Residential growth during the 1990s was tremendous, with approximately 10,000 housing units developed in Rancho Santa Margarita between 1990 and 2000. Despite such growth, residential vacancies are limited. The 2000 Census reports a 0.5 percent homeowner vacancy rate and a 3.0 percent rental vacancy rate within the City, for an overall vacancy rate of 1.6 percent.

The accepted standard for major housing rehabilitation needs is after 30 years. Rancho Santa Margarita has a new housing stock, with a majority (69 percent) of the housing supply built since 1990. A negligible number of housing units were built in Rancho Santa Margarita prior to 1980.

Rehabilitation of the housing supply will not be a major issue in the community for about 15 to 20 years. However, the entire housing stock will age at the same rate. Unless ongoing maintenance is performed, the City may face a significant housing rehabilitation need in the future.

Current Development Trends

Rancho Santa Margarita' population and housing growth over the past 10 years is high compared to other areas of Orange County. Between the 1990 census and the 2000 census, the population increased from 11,390 to 47,214 and the number of housing units increased from 4,915 to 16,515. Residential Land Use Designations cover approximately 1,660 acres in Rancho Santa Margarita while commercial, industrial and community facility designations occupy another 613 acres. The remaining 4,872 acres are designated for parks, open space and golf course land uses.

Over half of the residential acreage is designated as Low Density and is found throughout the City with concentrations in the east and northwest. The balance of the residential land use designations are Low-Medium Density Residential, Medium Density Residential and High Density Residential and are found mostly in the north-central portion of the City with small pockets in the northwest and south.

Commercial land uses are concentrated in the center of Rancho Santa Margarita northeast of the Foothill Transportation Corridor and Industrial uses are located south of the Foothill Transportation Corridor.

In spite of the rapid growth in Rancho Santa Margarita, future development in the area is limited to approximately 261 acres and an estimated 612 housing units located northeast of City limits, according to the General Plan. No major housing developments are anticipated because all undeveloped areas are designated as open space.

Part 3

Risk Assessment

Federal regulations require that states undertake a risk assessment of the hazards and vulnerabilities that affect them as part of the hazard mitigation planning process to provide a factual basis for developing a mitigation strategy. The risk assessment process helps to prioritize jurisdictions and geographic areas to receive funding and technical assistance for conducting more detailed local risk and vulnerability assessments.

This risk assessment focuses on a number of different hazards, which were included because:

- They have historically caused significant human and/or monetary losses;
- Past events have led to the development of hazard mitigation recommendations; and
- They have the potential to cause significant human and/or monetary losses in the future.

Also identified are hazard events that have occurred in the past. Table 3-1 lists all California Natural Disasters affecting Orange County between 1950 and 2003, although none were centered in Rancho Santa Margarita.

Hazard Analysis

The Rancho Santa Margarita Hazard Mitigation Committee conducted an exercise to determine the City's probability and danger factors for each type of hazard. Each type of hazard was ranked for probability from one (unlikely) to three (likely) and for danger from one (low risk) to three (high risk). The probability ranking and danger ranking were then multiplied to determine the disaster rating for each hazard type. Table 3-2 identifies the probabilities and danger factors in Rancho Santa Margarita.

It was determined that the hazards that are most applicable to the City of Rancho Santa Margarita are:

- Earthquake
- Fire
- Flood/Storm
- Landslides
- Drought
- Dam Failure
- Vector Issues

Identifying Earthquake Hazards

The sudden sliding of one part of the earth's crust past another part releases the vast store of elastic energy in the rocks as an earthquake. The resulting fracture is known as a fault, while the sliding movement of earth on either side of a fault is called fault rupture. Fault rupture begins below the ground surface at the earthquake hypocenter, typically between three and ten miles below the ground surface in California. If an earthquake is large enough, the fault

rupture will actually travel all the way to the ground surface, wreaking havoc on structures built across its path.

The constant motion of the plates causes stress in the brittle upper crust of the earth. These tectonic stresses build as the rocks are gradually deformed. The rock deformation, or strain, is stored in the rocks as elastic strain energy. When the strength of the rock is exceeded, rupture occurs along a fault. The rocks on opposite sides of the fault slide past each other as they spring back into a relaxed position. The strain energy is released partly as heat and partly as elastic waves called seismic waves. The passage of these seismic waves produces the ground shaking in earthquakes.

Faults are more likely to have future earthquakes on them if they have more rapid rates of movement, have had recent earthquakes along them, experience greater total displacements, and are aligned so that movement can relieve the accumulating tectonic stresses. In general, the longer the time period between earthquakes on a specific fault segment (recurrence interval), the larger the earthquake. The State of California, under the guidelines of the Alquist-Priolo Earthquake Fault Zoning Act of 1972 classifies faults according to the following criteria:

- *Active:* faults showing proven displacement of the ground surface within about the last 11,000 years; and
- *Potentially Active*: faults showing evidence of movement within the last 1.6 million years (modified to 750,000 years by the U.S. Geological Survey).

Although there are probably still some unrecognized active faults, nearly all the movement between the two plates, and therefore the majority of the seismic hazards, are on the well-known active faults. Figure 3-1 identifies the known earthquake faults in Rancho Santa Margarita, none of which are known to be active.

Fissuring, settlement, and permanent horizontal and vertical shifting of the ground often accompany large earthquakes. Although not as pervasive or as costly as the shaking itself, these ground failures can significantly increase damage and under certain circumstances can be the dominant cause of damage. Because of their geographic extent, network infrastructures such as water, power, communication, and transportation lines are particularly vulnerable to ground failures.

In addition to the primary fault rupture that occurs right along a fault during an earthquake, the ground many miles away can also fail during the intense shaking. One common type of failure occurs when soft, water-saturated soil settles, causing the water to eject sediment particles as it works its way to the ground surface. This phenomenon, known as liquefaction, turns the soil into a fluid, causing it to lose the ability to support buildings and other structures. Areas susceptible to liquefaction include places where sandy sediments have been deposited by rivers along their course or by wave action along beaches. Areas in the City found to be prone to liquefaction are identified in Figure 3-2.

Under certain conditions, strong ground shaking can cause the densification of soils, resulting in local or regional settlement of the ground surface. During strong shaking, soil grains become more tightly packed due to the collapse of voids and pore spaces, resulting in a reduction of the thickness of the soil column. This type of ground failure typically occurs in loose granular, cohesionless soils, and can occur in either wet or dry conditions. Unconsolidated young alluvial deposits are especially susceptible to this hazard.

Artificial fills may also experience seismically induced settlement. Damage to structures typically occurs as a result of local differential settlements.

Landslides are the result of the down-slope movement of unstable hillside materials under the influence of weathering and gravity over time. Strength of rock and soil, steepness of slope, and weight of the hillside material all play an important role in the stability of hillside areas. Weathering and absorption of water can weaken slopes, while the added weight of saturated materials or overlying construction can increase the chances of slope failure. Sudden failure can be triggered by heavy rainfall, excavation of weak slopes, and earthquake shaking, among other factors. Landslide hazard areas in Rancho Santa Margarita are identified in Figure 3-3.

All jurisdictions in California are subject to the effects of damaging earthquakes. Earthquakes are considered a threat to the City of Rancho Santa Margarita due to the highly active seismic region and the proximity of fault zones, which could influence the entire southern coastal portion of the State. However, no major earthquake has caused substantial damage to the community.

An earthquake along one of the faults in the vicinity, either known or unknown, could cause a number of casualties and extensive property damage. The effects of such a quake could be aggravated by aftershocks and secondary effects such as fires, landslides, dam failure, liquefaction and other threats to public health, safety and welfare. The potential direct and indirect consequences of a major earthquake can easily exceed the resources of the City and would require a high level of self-help, coordination and cooperation.

No active faults are known to pass through Rancho Santa Margarita. The closest active faults are the Elsinore-Glen Ivy fault (10.1 miles away), the Chino fault (11.1 miles away), and the Newport Inglewood fault (14.4 miles away). The occurrence of surface rupture on these segments would not be expected to produce fault surface rupture within the City. The two known local faults, Aliso and the Cristianitos, are thought to be inactive. These faults are shown on Figure 3-1. An earthquake on either of these two faults would be particularly damaging to residential buildings, particularly those of older wooden or unreinforced masonry construction, or to mobile homes, although the City currently has no mobile homes.

Other buildings that do not typically perform well in earthquakes are soft-story buildings. These have a story (typically the first floor) that lacks adequate strength or toughness due to insufficient shear walls. Two common types of soft-story buildings are: 1) commercial buildings with large window openings used for display purposes on the first floor, and 2) construction built above first floor garages.

Identifying Fire Hazards

This threat summary addresses the threat of a major fire, which threatens large numbers of people, many properties, and may pose a significant impact on the environment. The topography, vegetation and development patterns of Rancho Santa Margarita make the City highly susceptible to fire hazards. Major fires include, but are not limited to, forest fires, structural fires, or explosions.

Wildland fires have occurred within Orange County, particularly in the fall of the year, ranging from small, localized fires to disastrous fires covering thousands of acres. The most severe fire protection problem in the unincorporated areas is wildland fire during Santa Ana wind conditions. Figure 3-4 identifies the wildfire hazard areas in or near Rancho Santa Margarita.

Reasons for control difficulty associated with wildland fires are:

- *Adverse weather conditions, such as excessive wind and heat*
- *Large quantities of combustible fuel*
- *Inaccessible terrain*
- *Nonexistent or very limited water supply*
- *Large fire frontage requiring disbursement of fire forces*

The Orange County Fire Authority actively enforces codes and ordinances to ensure that a reasonable degree of fire safety exists in facilities and occupancies to minimize the threat to life and property. This activity is ongoing and conducted daily. Comprehensive pre-emergency planning, fire protection engineering and training programs are currently in place and are designed to ensure the Fire Authority's ability to meet future service demands. As a result, Rancho Santa Margarita has not experienced major property damage due to wildfires.

There are a number of natural conditions that might increase the possibility of wildland fires. Three such conditions are weather elements, the topography of the area and the type and condition of wildland vegetation.

The major objective of wildland fire defense planning is to prevent wildland fires from starting and, if unsuccessful, to minimize the damage to natural resources and structures. Some of the more successful programs currently in effect which contribute to the success of wildland fire prevention activities are:

- *Closure of public access to land in hazardous fire areas*
- *Uniform Building Code prohibition of combustible roof covering materials*
- *Construction and maintenance of community and private fuel modification zones*
- *Vegetative Management Program (controlled burning)*
- *Weed Abatement Program*
- *Fire Prevention Education Programs*
- *Fireworks Patrols (Education and enforcement, signage at city limits)*

In an effort to alleviate fire dangers near urban development interfaces, the construction of a fuel modification zone (firebreak, fuel break, or greenbelt) has been required. The continued application of this method does have drawbacks, and therefore is not the only acceptable solution. In addition to the associated impacts created by some fuel break installations, there are usual impacts on wildlife, unique vegetation, and in some cases, to the watershed cover as deep-rooted chaparral species are replaced by shallow-rooted grasses. Fuel breaks are costly to install, require expensive maintenance to ensure their success during a wildfire, and offer protection primarily to those structures with direct exposure to the wildland. This inequity in protection versus installation/maintenance costs represents a very important point with respect to the natural resource/urban development interface conflict. Fire prevention measures to reduce the level of risk to the structures with wildland exposure must be developed within the design of the residential development, rather than in the natural resource.

Urban fire is a threat to property and life in Orange County. As the number of structural features increase, so does the incidence of fire. Certain development patterns pose more difficult fire problems. These include multi-story, wood frame, high-density apartment developments; multi-story research developments; large continuous developed areas with combustible roofing materials and facilities that use and/or store hazardous materials. Features of structural conditions that affect fire control include: type and use of structure, area of building, number of stories, roof covering and exposures to the building. The Uniform Building Code regulates these features and requires certain built-in fire protection devices when maximum allowable uses or heights are exceeded, or the building use presents a life or property protection problem.

The City is marked by open space, residential, retail and light industrial land uses. Achieving a balanced mix of land uses in the City is a major theme of the city's General Plan.

Identifying Flood Hazards

The City of Rancho Santa Margarita is subject to atmospheric events and severe weather conditions that could threaten public safety, including weather patterns leading to flooding and other storm damage. Flooding is a natural attribute of any stream and is influenced by the intensity and distribution of rainfall. Areas within the City have been identified as being subject to a 100-year flood and a 500-year flood and are identified in Figure 3-5.

According to the Division of Mines and Geology, slope instability is a concern in the San Juan Capistrano Quadrangle, which encompasses most of the City. Areas underlain by shale and siltstone are more prone to landslides when compared to other bedrock geology, and the Capistrano, Monterey and Topanga Formations, prevalent throughout hillside areas in the City, are most prone to slow-developing, slump-type failure.

Slope stability is dependent on a number of interrelated factors such as rock type and degree of porousness and slope characteristics. In addition to geologic processes, climatic conditions, man-induced topographical alterations and earthquakes also trigger failure to unstable slopes. Slope stability hazards in the City relate to the undeveloped hillside areas,

as grading activities and soil remediation techniques are used to mitigate these hazards prior to development.

Planning for the natural disasters of floods/storms is based on information available through programs administered by the Federal Emergency Management Agency. The City of Rancho Santa Margarita is a participant in the National Flood Insurance Administration Program and flood-prone areas of Rancho Santa Margarita have been delineated on Flood Insurance Rate Maps.

Identifying Drought Hazards

The City of Rancho Santa Margarita receives 99 percent of its water supply from the Metropolitan Water District of Southern California. The water comes from the Colorado River and Northern California. The Colorado River Aqueduct brings water from the Colorado River to Lake Mathews in Riverside County. The 242-mile aqueduct includes five pumping plants, which lift the water a total of 1,671 feet, plus three storage reservoirs and 306 miles of high-voltage power lines. The State Water Project brings us water from Northern California, through the largest aqueduct system in the world. It includes six power plants, 662 miles of aqueducts, and 17 pumping plants that lift the water a total of 3,500 feet. Water from both systems is cleaned and tested at the Diemer Filtration Plant in Yorba Linda to make sure it meets federal drinking water standards. Then it is piped to the Santa Margarita Water District and the Trabuco Canyon Water District.

The seasonal variation between wet and dry seasons drives the hydrologic patterns seen in Southern California. Historically, many of the region's streams were intermittent, drying up in the summer. Perennial streams and rivers were fed either by groundwater or snowmelt. Floods and drought cycles occur regularly in the southern California area, and are influenced by the cyclical El Niño and La Niña events.

The City has never been faced with severe drought situations since its incorporation. However, in 1991, due to multiple years of below average rainfall in Northern California and the Colorado River Watershed, the Santa Margarita Water District was required to reduce water importation from the Metropolitan Water District.

Drought conditions could have moderate impacts on the water supply provided to Rancho Santa Margarita. Additionally, any drought affecting Northern California and/or the Colorado River could have impacts on the water supply for Rancho Santa Margarita.

Identifying Dam Failure Hazards

The City of Rancho Santa Margarita has three dams located at three small reservoirs and are located in the Dove Canyon Planned Community. See Figure 3-6. No major dam is located upstream from the City of Rancho Santa Margarita; however, several large detention basins and reservoirs are located near the City. The Upper Oso reservoir is located to the northwest of the City and Lake Mission Viejo is located to the southwest. Other, smaller flood control improvements, such as canals, culverts, levees, and retention basins may crack and suffer

some structural damage during an earthquake, especially in areas prone to ground failure. These facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next winter storm season, however the City has not experienced dam failure.

Seismically induced inundation can also occur if strong ground shaking causes structural damage to aboveground water tanks. Several reservoir sites are within the planning area and are owned and operated by either the Trabuco Canyon Water District or Santa Margarita Water District.

The Orange County Flood Control District (OCFCD) is the agency responsible for the regional drainage facilities while the City controls local facilities. The City has a Drainage Master Plan that addresses the storm drain system that serves the community. Given the highly developed nature of the City, no more planned upgrades are included in the Drainage Master Plan.

Identifying Vector Hazards

The Orange County Vector Control District routinely conducts field surveys to determine the presence of vector-borne disease. The diseases of prime concern are those carried by mosquitoes, fleas, ticks, and rodents. Surveillance and detection programs are designed around each of these vectors. When a vector-borne disease is detected by routine surveillance activities, the risk options are evaluated by vector control management. If it is determined that a risk to the public exists, local and state health agencies are informed, including the public. Rancho Santa Margarita has not experienced a vector disaster.

The district routinely surveys for several pest-carried diseases that have been in the county for some time. These include the following:

- **Mosquito-Borne Diseases** – The primary concern with mosquito-borne disease is the transmission of encephalitis virus to humans. Since encephalitis viruses are known to be carried by certain wild birds, the District samples blood from the birds in key locations throughout the County. The District also closely monitors local mosquito population numbers by simultaneously searching for blood meals from a vertebrate host.
- **Plague** – Plague is a natural occurring bacterial disease associated with wild rodents and fleas. Plague has demonstrated some sporadic historical occurrence in the uplands along the Santa Ana River adjoining San Bernardino and Riverside Counties. Plague is typically associated with ground squirrels and pack rats, and very rarely with rodents like roof rats.
- **Hantavirus** – Hantavirus is a recently discovered viral pathogen found in rodents that affects humans by attacking the lungs and producing an often-fatal pneumonia. The virus is inhaled as an aerosol originating from contaminated fecal pellets and urine. The particular strain of Hantavirus encountered locally is the Sin Nombre Virus (SNV) associated naturally with deer mice and rarely pack rats.
- **Lyme Disease** – Lyme Disease is carried by ticks and is caused by a single-celled bacterial parasite called a spirochete. The disease can become very debilitating if not treated shortly after infection. Because the risk of spirochete transmission is probably

cyclic, the District continues to regularly collect and test Pacific Black-Legged Ticks and other tick species.

Critical Facilities

The Hazard Mitigation Committee determined which facilities in the City are considered critical in the event of a hazard and mapped each facility. Table 3-3 lists the Critical Facilities in Rancho Santa Margarita.

The Hazard Mitigation Committee determined which critical facilities and all other structures are the most vulnerable and estimated the potential loss in the event of a hazard. The loss estimates do not include land value or the contents of the structures and utilities. Where individual structures could be identified, the assessed value has been determined by the County of Orange Tax Assessor. Please note that the following figures are only estimates. The amount of damage from a hazard event will vary from these figures depending on the extent and nature of the hazard.

Potential Loss Due to Earthquake

Earthquake vulnerability is primarily based upon the built environment. Urban areas in high hazard zones tend to be the most vulnerable, while uninhabited areas generally are less vulnerable. Damage due to ground shaking produces over 98 percent of all building losses in typical earthquakes. Addressing the vulnerability of structures as a result of an earthquake and the potential costs is a challenge faced by the City.

According to the 2000 Census, 97.9 percent of the housing units in Rancho Santa Margarita were built after 1979, when significant improvements to lateral force requirements began to be enforced throughout the state. 68.6 percent of the City's housing units were built after 1990 when even more stringent building codes were adopted.

Because there are no active faults located within the City limits, any damaging earthquake event is likely to occur along a fault miles away. Therefore estimating the potential loss from the initial ground shaking is difficult to determine (related earthquake hazards such as liquefaction and landslides are addressed in the next section). An estimate of a 1% loss of structures is a high calculation due to the recent development of Rancho Santa Margarita and the lack of active faults in the City. Based on the 2000 Census the medium home value in Rancho Santa Margarita is $280,700, and there are 16,515 housing units in the City. Therefore the potential loss to 1% of the housing units is $46,357,605 (16,515 units X $280,700 X 1%). Because there is no median value for commercial buildings in Rancho Santa Margarita, and the number of citywide commercial buildings has not been determined, a commercial loss estimate is not available at this time.

Potential Loss Due to Liquefaction

Liquefaction is a geologic process that causes various types of ground failure. Three general conditions need to be met for liquefaction to occur: (1) strong ground shaking of relatively

long duration, (2) loose, or unconsolidated, recently deposited sediments consisting primarily of silty sand and sand, and (3) water saturated sediments within about 50 feet of the surface. Most of the lowlands in the Santa Margarita area have a high liquefaction potential because shallow ground water, within 50 feet of the ground surface, has been reported historically.

Those portions of the planning area that may be susceptible to seismically induced settlement are generally the floodplains and larger drainages that are underlain by late Quaternary alluvial sediments (similar to the liquefaction-susceptible areas). These include areas in Trabuco Canyon, Live Oak Canyon and especially the flatter areas along these drainages. Also included are the areas along Tijeras Canyon. Sites near the base of natural hills (valley margins) may be particularly vulnerable.

There are 239 residential structures located in liquefaction hazard areas, 13 commercial buildings, including the following Critical Facilities: four bridges, two water facilities, an electrical substation, a reservoir and a water tank. The potential loss to 100% of the residential units in the hazard area is $67,087,300 (239 structures X $280,700) and the potential loss to all 13 commercial buildings is $34,931,823. A value assessment of the Critical Facilities is not available at this time.

Potential Loss Due to Landslides

Landslides are the result of the down-slope movement of unstable hillside materials under the influence of weathering and gravity over time. There is the potential for tremendous loss due to landslide hazards in Rancho Santa Margarita due to a combination of geologic conditions. The hilly and mountainous areas within the planning area are underlain by soft sedimentary bedrock. Numerous landslides have been mapped in the eastern half of the City and these sediments have the potential to fail (by landslide) during an earthquake. Figure 3-3 maps the landslide hazard areas and indicates that there are 3,641 residential structures and 11 commercial buildings that could be affected, in addition to 23 critical facilities. The potential loss to 100% of the residential units in the hazard area is $10,220,287,000 (3,641 structures X $280,700). Each commercial building in the hazard area was identified and an improvement value was determined via the County of Orange Assessors Office. The potential loss to 100% of the commercial buildings in the landslide hazard area is $45,785,889. One of the Critical Facilities located in the hazard area is identified in the commercial building assessment. Of the remaining Critical Facilities located in the landslide hazard area, the County of Orange Assessors Office could not provide a value assessment.

Potential Loss Due to Fire

Rancho Santa Margarita is subject to both wild and urban fires. Weather, topography and vegetation type all affect the intensity of fires. Given the large portion of land that remains as open space including rugged topography with highly flammable native vegetation, wildland fires are a significant risk. Figure 3-4 shows the various levels of potential fire risks to the City. Extreme fire severity zones are located in the northwest, west and northeast area of the City.

It was determined that 25 commercial buildings, 954 residential structures and 16 critical facilities are located within the high and very high wildfire hazard areas. The potential loss

to 100% of the residential units in the hazard area is $267,787,800 (954 units X $280,700). The commercial buildings located in the fire hazard area have an assessed value of $41,001,257. As assessed value is not available for the Critical Facilities located in the wildfire hazard areas.

Potential Loss Due to Flood

The unpredictable seasonal range in rainfall that is typical of coastal southern California, coupled with geographic and geologic conditions, makes Orange County extremely vulnerable to flooding during the winter storm season. Three main north to south draining stream systems drain the planning area. Trabuco Creek and Tijeras Canyon drain the northern and western areas of the City while Dove Canyon drains the southeastern side.

The City participates in the National Flood Insurance Program (NFIP). The latest Flood Insurance Rate Maps (FIRMs), prepared by the Federal Emergency Management Agency (FEMA), showing potential flood zones are dated February 18, 2004. The FEMA 100-year and 500-year map for the City is shown on Figure 3-5. This outlines the area of potential flooding within Rancho Santa Margarita.

As can be seen from Figure 3-5, the only major potential flooding problems for the City are located along the Arroyo Trabuco Creek and Tijeras Canyon Creek areas. Along the Trabuco Creek a dense growth of trees and brush are located in the main channel, which may raise flood levels considerably. If flooding were to occur, it would be difficult to predict and plan for because rainfall in the area is extremely variable. Floods that would impact the City would be typically of short duration, with high peak volumes and high velocity. This is due to the arid to semi-arid nature of the area. When a major storm moves in, water collects rapidly and runs off quickly due to the rapid descent of the mountains into Trabuco Creek, Tijeras and Dove Canyon. Consequently, resultant flows are of the flash-flood type, generally having sharp peaks and short durations. Although some severe floods have impacted the area in the past, flooding damage in this area has generally been lower than in other areas of Orange County because of its relatively undeveloped state in the upper watershed areas.

Two structures are located within the 100-year or 500-year flood zones: the Santa Margarita Parkway Bridge and the 241 Toll Road Bridge, both over Trabuco Creek. While the bridge supports are located in the canyon, the street level is over 75 feet above the flood plain. The 241 Toll Road Bridge is owned and maintained by the State of California and the City of Rancho Santa Margarita maintains the Santa Margarita Parkway Bridge. Staff is unable to determine assessed value of the bridges, however replacement is estimated to cost millions of dollars. Destruction of either bridge would be catastrophic due to severe limitation of access to and from the City.

Potential Loss Due to Dam Failure

Because no major dam is located upstream from Rancho Santa Margarita the potential loss from dam failure is limited to the Dove Canyon Planned Community where the Dove Canyon

Reservoir and two smaller reservoirs are located. The reservoirs are situated upstream from one another and a break in the dam at the top reservoir would result in spillage into the middle reservoir and a break in the middle reservoir would result in spillage into the Dove Canyon Reservoir. Due to the topography of Dove Canyon and the pattern of development, the only improvement downstream from the Dove Canyon Reservoir is the Dove Canyon Golf Club. Figure 3-6 shows the topography of Dove Canyon near the reservoir.

The potential total loss to the Golf Club as a result of a failure in the Dove Canyon Dam is $9,001,619.

Potential Loss Due to Drought

Because Rancho Santa Margarita is not an agricultural producing City, the potential loss due to drought is difficult to ascertain as past dry seasons have not had a measurable effect. Multiple years of below average rainfall would require the Santa Margarita Water District and Trabuco Canyon Water District to reduce water importation from the Metropolitan Water District. While this would affect residential property owners as well as commercial businesses, the actual loss cannot be quantified.

Potential Loss Due to Vector Issues

A disaster due to Vector issues would not result in property damage, but would result in human costs in the form of illness. Because of this, no monetary value can be placed on a potential vector disaster.

Part 4

Mitigation Strategy

This hazard mitigation strategy for Rancho Santa Margarita describes actions that are guided by a vision of a safe and resilient City. The community has developed and grown in the dynamic environment of flood, fire, earthquake, and other natural events. Because of a continually increasing demand for limited hazard mitigation resources, the City must continually improve its approach to hazard mitigation. This Plan describes a strategic approach to mitigation that integrates current laws, policies, and programs.

As detailed in Chapter 1 of this Plan, this mitigation strategy, including the vision, mission, goals, and objectives, was developed with extensive input from and coordination with stakeholders, businesses, non-profit organizations, and the public. As objectives and goals are attained, these same participants will be included in the development of new goals and objectives through a review and approval process with the Rancho Santa Margarita Hazard Mitigation Committee.

This strategy identifies goals; provides a summary of current laws, policies, and programs that address achieving the goals; and lists the goals, objectives, and initiatives from other plans that have been integrated into this Plan. The strategy also explains current priorities and how those priorities relate to the goals.

Hazard Mitigation Goals and Objectives

The City of Rancho Santa Margarita sets forth the following goals and objectives related to overall hazard mitigation:

1. To protect the general population from natural hazards.
2. To avoid damages to Rancho Santa Margarita's critical facilities, public infrastructure, and private property.
3. To reduce the potential impact of natural disasters on the environment.
4. To promote hazard mitigation measures as an integrated policy.

Goal 1: To protect the general population from natural hazards

A large number of Rancho Santa Margarita's citizens are concentrated in areas where hazard risk is high. Wildland urban interface areas have been attractive for residential development that can result in dangerous confrontations with wildland fires. The hilly topography of the City leaves many at risk from liquefaction or landslide as a result of a large earthquake.

Regardless of where citizens live and work, protecting their safety is one of the City's primary responsibilities. Many laws have public safety of our citizens as their primary concern. Protecting lives is also the basis for emergency planning, response, and mitigation activities.

Consistent with one of the main responsibilities of local government, the primary goal of this Hazard Mitigation Plan is the protection of the people of Rancho Santa Margarita.

Goal 2: To avoid damages to Rancho Santa Margarita's critical facilities, public infrastructure, and private property

The strengthening of building, mechanical, and fire codes is critical to the protection of property and life and the reduction of seismic risk, fire and flood hazards. These codes help decision makers to design and construct buildings that resist the forces of nature and ensure safety. Land use laws assist with this effort by striving to keep buildings and development out of the most hazardous areas. It is essential that mitigation planning be incorporated into all land use planning activities at the local level. This includes integrating mitigation efforts.

Natural hazards can disrupt critical infrastructure of the City, as well as private property. Transportation routes, utilities, government facilities, hospitals, etc., are essential to the City's ability to provide assistance to citizens. Hazard mitigation activities will assist in protecting property by making critical facilities, homes, businesses and infrastructure more resilient to natural hazards.

Goal 3: To reduce the potential impact of natural disasters on the environment

Many residents choose to live in Rancho Santa Margarita based on the quality of the natural environment. It is one of the duties of local government to conserve it. Natural disasters not only destroy the man-made environment, but they can also adversely affect the physical environment, from landslides to fires to flooding. Natural hazard mitigation functions can be utilized to preserve, rehabilitate and enhance natural systems.

Goal 4: To promote hazard mitigation measures as an integrated policy

Most mitigation policies have been developed over time in response to disasters, but exist nonetheless. As the community evolves, the need for comprehensive hazard mitigation is becoming more imperative. Planning and education are the best steps toward increased awareness and integration.

Hazard mitigation planning efforts are significant steps in broadening the understanding of the importance of mitigation that can be beneficial in reducing the severity of natural disasters.

Multi-Hazard Mitigation Measures

The City of Rancho Santa Margarita is a new city incorporated on January 1, 2000 and developed as a planned community. A large majority of all buildings and structures in the City were constructed within approximately the last twenty years under modern building codes, fire codes, seismic safety standards and land use planning regulations. As a result,

Rancho Santa Margarita is currently up to date with many of these mitigation measures, and the future obligation of the City is to ensure that it remains so.

The following measures are activities that include two or more of the natural hazards identified in the Plan. Measures 1 through 4 establish the regulatory and policy framework and tools needed to implement the plan and are the first priorities. Measures 5 and 6 represent the public outreach to fulfill the plan and represent the next priority. Actions within each measure are listed in the desired order of completion, although circumstances may result in some actions progressing faster than others.

Measure 1: Develop inventories of at-risk building and infrastructure and prioritize mitigation projects

Actions:

- Identify critical facilities at risk from natural hazards.
- Identify alternative facilities in the event of damage to identified critical facilities.
- Identify enhancements to at-risk facilities and implement projects needed to reduce the risks.

Measure 2: Integrate the goals of the Hazard Mitigation Plan into appropriate City regulatory documents.

Actions:

- Incorporate the Hazard Mitigation Plan into the Rancho Santa Margarita General Plan.
- Incorporate the Hazard Mitigation Plan into Building and Safety Department Codes and policies.
- Incorporate the Hazard Mitigation Plan into future capital improvement plans.

Measure 3: Identify and pursue funding to develop local mitigation activities.

Actions:

- Allocate resources to mitigation activities.
- Develop incentives for businesses and residents to participate in mitigation activities.
- Educate individuals and businesses.

Measure 4: Establish a formal role for the Hazard Mitigation Committee to implement and monitor mitigation measures.

Actions:

- Develop a schedule for a full review of the Hazard Mitigation Plan.
- Establish clear roles for participants, and meet regularly to evaluate mitigation measures.
- Monitor hazard mitigation activities.
- Allow training for Hazard Mitigation Plan Committee members to remain current on hazard mitigation techniques.

Measure 5: Develop and enhance public education programs that strive to mitigate natural hazard events.

Actions:

- Publish the Hazard Mitigation Plan and post it on the City's website to make it available to the public.
- Develop brief Hazard Mitigation reading materials for handout at City Hall.
- Conduct natural hazard awareness programs in local schools and the community center.
- Update the Plan every five years and include public participation workshops.

Measure 6: Develop public and private partnerships for ongoing hazard mitigation programs.

Actions:

- Monitor and report County of Orange mitigation activities.
- Identify organizations in Rancho Santa Margarita that have hazard mitigation programs and encourage organizations without hazard mitigation programs to adopt them.
- Include private organizations within Rancho Santa Margarita in hazard mitigation activities.

Specific Hazard Mitigation Measures

The following measures are designed to mitigate specific hazards identified in the Natural Hazard Mitigation Plan. Hazards are listed in the order of priority determined by the Hazard Analysis exercise conducted by the HMC and displayed in Table 3-2. Measures and the actions within those measures are listed in the desired order of completion, although circumstances may result in some actions progressing faster than others.

Earthquake

Earthquake Measure 1: Update seismic data and incorporate into development policy.

Action:

- Require geo-technical and geological reports addressing seismic hazards for all subdivisions.

Earthquake Measure 2: Reduce the risk posed by existing seismically vulnerable public and private buildings.

Actions:

- Identify and prioritize all buildings that do not meet current seismic standards.
- Encourage owners of non-retrofitted structures to upgrade them to meet current seismic standards.
- Identify funding sources for structural and nonstructural retrofitting.

Earthquake Measure 3: Educate and inform the public on earthquake mitigation measures.

Actions:

- Develop educational approaches and tools in seismic hazard mitigation including earthquake fundamentals, seismic hazards identification, safety information about potentially hazardous building contents, workplace safety, emergency plans, and risk assessment techniques and tools for those responsible for facilities operation and management.
- Inform public and private facility managers about securing bookcases, cabinets, light fixtures and other objects that could cause injury.
- Provide information to homeowners about efficient residential mitigation techniques.

Earthquake Measure 4: Reduce the risk posed by future buildings.

Action:

- Require new construction to conform to the most recent seismic safety standards.

Earthquake Measure 5: Reduce the potential damage to public and private utility systems.

Actions:

- Monitor, through the development planning process, the need to upgrade vulnerable systems to ensure their continued operability.

Fire

Fire Measure 1: Educate and inform the public on fire mitigation measures.

Actions:

- Provide hazard maps to identify locations vulnerable to wildland fires.
- Encourage fire inspections in residences by the Orange County Fire Authority to increase awareness about fires and fire prevention.
- Partner with the Orange County Fire Authority to perform outreach programs at local fire stations to discuss wildfire mitigation.
- Partner with the Orange County Fire Authority to encourage mitigation measures and provide education programs.

Fire Measure 2: Reduce the potential damage to public and private structures due to fire.

Actions:

- Restrict new development in fire hazard areas.
- Encourage homeowners to construct fire resistant roofs in areas adjacent to fire hazard areas.
- Maintain access roads for emergency response.
- Develop passable access routes for emergency response where none exist.

Flood/Storm

Flood Measure 1: Reduce the potential damage to public and private structures due to flooding.

Actions:

- Provide hazard maps to identify flood hazard locations.
- Restrict future development in flood hazard areas.

Flood Measure 2: Partner with State and County Government to develop flood-warning systems.

Actions:

- Evaluate the need for stream gauges.
- Distribute information to the public regarding floods.

Landslide/Liquefaction (This threat is likely to occur as a result of or simultaneously with the earthquake, fire or flood/storm hazards.)

Landslide/Liquefaction Measure 1: Reduce the potential damage to public and private structures due to landslide.

Action:

- Require new construction to conform to the most recent building standards for development in landslide hazard areas.

Landslide/Liquefaction Measure 2: Educate and inform the public about landslide hazards.

Actions:

- Provide hazard maps to identify locations vulnerable to landslide.
- Emphasize economic risk to property owners about the danger of building on landslide areas.

Drought

Drought Measure 1: Reduce water consumption and promote water conservation efforts.

Actions:

- Monitor drought conditions or water conservation warnings issued by state agencies or the regional water districts.
- Publicize and distribute to the public announcements or warnings concerning water conservation needs.
- Ensure compliance with water conservation measures through code enforcement and/or law enforcement personnel.
- Coordinate with regional water districts to identify and promote other means to reduce water consumption.

Dam Failure

Dam Failure Measure 1: Reduce the potential damage to public and private structures due to dam failure.

Actions:

- Restrict new development in dam inundation areas.
- Work with state agencies and property owners to monitor the structural integrity of local dams.

Vector Issues

Vector Measure 1: Educate and inform the public about vector issues.

Actions:

- Partner with the County of Orange to implement education programs regarding vector issues.
- Coordinate with local hospitals, clinics and medical groups to distribute information about the effects and transmission of diseases.

Part 5

Local Capability Assessment

Table 5-1 outlines the existing plans and programs that assist in hazard mitigation, the responsible party, changes needed and comments.

Table 5-1

Agency	Program/Plan	Changes Needed	Comments
Rancho Santa Margarita Building and Safety Department	Universal Building Code (UBC)	None	Prescribes constructions regulations and maintenance of buildings and structures.
Rancho Santa Margarita Emergency Management Organization	Emergency Operations Plan	None	Designed to provide the framework for responding to emergencies and disasters.
Rancho Santa Margarita Development Services Department	General Plan	None	Establishes policies directed at managing growth, enhancing quality of life, and achieving sustainability in Rancho Santa Margarita
Rancho Santa Margarita Development Services Department	Zoning Code	None	Established to serve the public health, safety and general welfare; implement the General Plan; and regulates land use and resources.
County of Orange	County of Orange Municipal Code	None	Dedicated to Public Facilities, Public Morals, Safety and Welfare, Property Maintenance, Health and Sanitation and Animal Regulations, Business and Special Licenses, Highway, Bridges and Rights-of-Way; Vehicles; and Water Quality.
Orange County Health Care Agency	Disease Control & Epidemiology	None	Works to prevent the occurrence of communicable diseases.
Orange County Health Care Agency	Smallpox and Pandemic Influenza Preparedness and Response Plan	None	Response plan for mass vaccinations

Part 6

Monitoring, Evaluating and Updating the Hazard Mitigation Plan

The Rancho Santa Margarita Hazard Mitigation Plan will be monitored and evaluated on an annual basis to determine the effectiveness of programs and to reflect changes in City plans or programs that may affect mitigation priorities. The Rancho Santa Margarita Emergency Management Coordinator will be responsible for contacting the Hazard Mitigation Committee members and organizing the annual meeting. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The committee will review the goals and action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the Plan to determine if this information should be updated, or modified, given any new available data.

Mitigation measures will be prioritized by the Hazard Mitigation Committee based on analysis of potential hazards and updated annually prior to a public meeting before the City Council. The committee will use cost/benefit analysis to identify these mitigation measures. This approach will be used to determine whether a mitigation action item is worth undertaking in order to avoid a potential disaster.

The Hazard Mitigation Committee will assign the duty of updating the plan to one or more of the committee members. The designated committee members will have three months to make appropriate changes to the Plan before submitting it to the Committee for review, and presenting it to the Rancho Santa Margarita City Council. The Hazard Mitigation Committee will also be responsible for notifying all holders of the plan when changes have been made. Annual updates will be incorporated into the plan, and every five years the updated plan will be submitted to the State Hazard Mitigation Officer and the Federal Emergency Management Agency for review.

Incorporating Mitigation into Existing Planning Mechanisms

Rancho Santa Margarita addresses statewide planning goals and legislative requirements through its General Plan, Capital Improvement Plans, and Building and Safety Codes. The City will have the opportunity to implement recommended mitigation action items through existing programs and procedures.

The Rancho Santa Margarita Building Department is responsible for administering the Building & Safety Codes. Building Officials should work with the Hazard Mitigation Committee to review and monitor Building & Safety Codes to ensure that life-safety criteria are met for new construction.

The goals of the Hazard Mitigation Plan may be achieved through activities recommended in the County's Capital Improvement Projects (CIP). Various departments develop plans and review them on an annual basis. Upon annual review of the Hazard Mitigation Plan, the committee will work with City departments to identify areas where action items are consistent with CIP planning goals and integrate them where appropriate. Prior to the first annual review of the Hazard Mitigation Plan, the recommendations listed above will be incorporated into the process of existing planning mechanisms. The annual meetings of the Hazard Mitigation Committee will provide an opportunity for members to report back on the progress made on the integration of mitigation planning elements into planning documents and procedures.

Continued Public Involvement

Rancho Santa Margarita is dedicated to involving the public directly in review and updates of the Hazard Mitigation Plan. The Hazard Mitigation Committee is responsible for the annual review and update of the plan.

The public will also have the opportunity to provide feedback about the Plan. Copies of the Plan will be catalogued and kept at City Hall. In addition, the plan will be posted on the City's website, www.cityofrsm.org. This site will also contain an email address and phone number to which people can direct their comments and concerns.

A public meeting will also be held before City Council when any recommended changes are made by the Hazard Mitigation Committee. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the Plan. Also, at any time interested citizens can contact the Rancho Santa Margarita Development Services Department or Emergency Management Coordinator with questions or comments.

Table 3-1
Declared Orange County Natural Disasters (1950-2003)

Type of Event	Date	Location	Comments
Flood	1950	Statewide	$32,183,00 damage Statewide
Flood	1958	Statewide	$24,000,000 damage Statewide
Flood	1963	Coastal Orange County & Los Angeles	$500,000 damage in two counties
Fire	1967	Southern California	$11,345,000 damage in four counties
Flood	1969	Statewide	$300,000,000 damage Statewide
Agricultural	1972	Southern California	Disease affecting poultry
Landslide	1978	Laguna Beach	$16,595,000 damage
Flood	1980	Southern California	Storms affected seven counties
Fire	1980	Southern California	$64,795,200 damage in four counties
Fire	1982	Orange County & Redondo Beach	$50,877,040 damage
Storm/Flood	1982	Statewide	$523,617,032 damage
Fire	1982	Southern California	$19,277,102 damage in three counties
Earthquake	1987	Los Angeles & Orange	$358,052,144 damage in two counties
Storm	1988	Southern California	Affected coastal areas
Economic	1989	Orange	Mediterranean Fruit Fly
Storm	1992	Southern California	$123,240,531 damage in five counties
Flood	1992	Statewide	$600,000,000 damage
Fire	1993	Southern California	$1,000,000,000 damage in six counties
Earthquake	1994	Los Angeles, Ventura & Orange	$40,000,000,000 damage in three counties
Storm	1995	Statewide	$741,000,000 damage
Storm/Flood	1995	Statewide	$1,100,000,000 damage
Fire	1996	Southern California	$40,000,000 damage in three counties
Flood	1998	Statewide	$550,000,000 damage

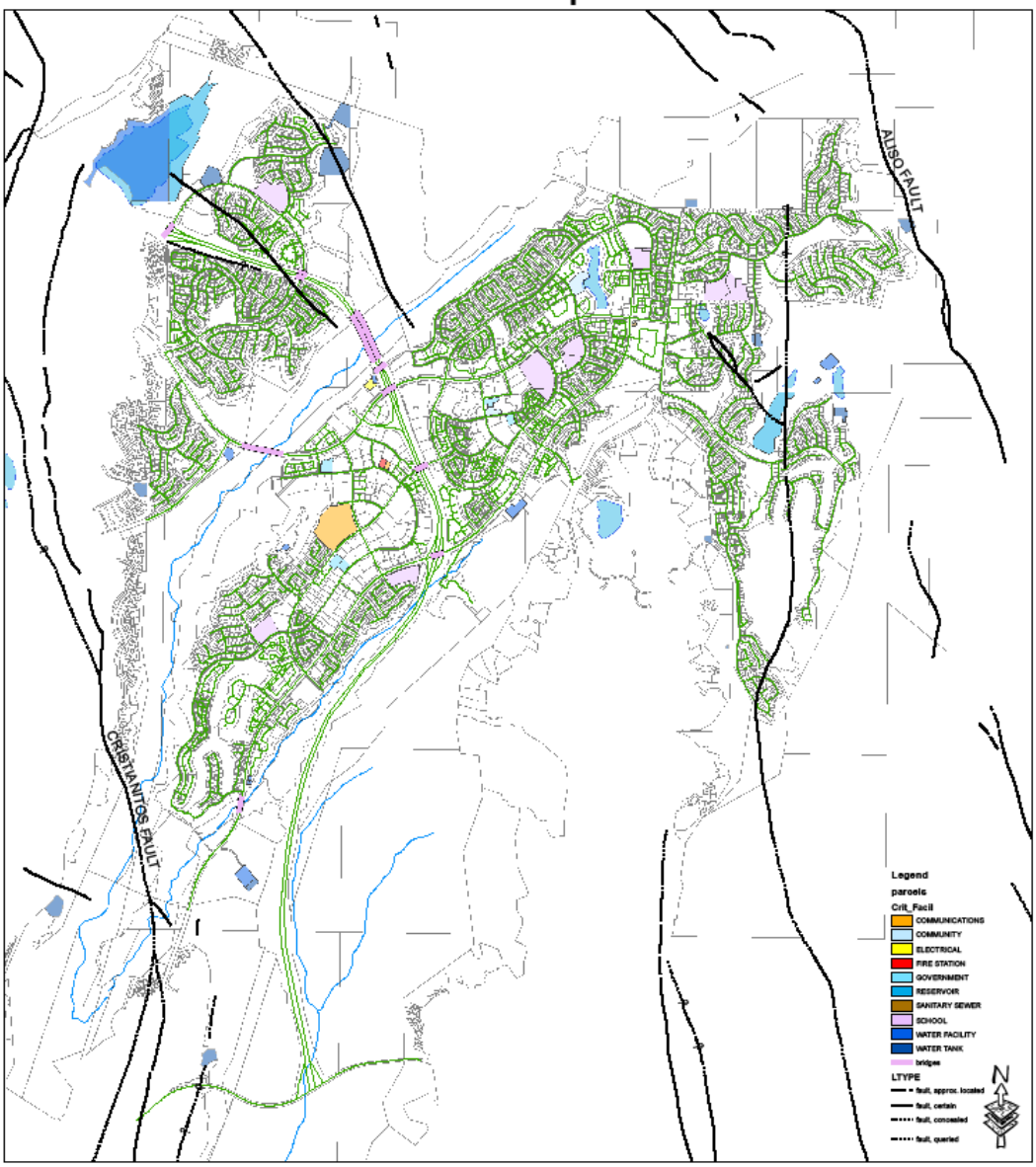
Table 3-2
Probabilities and Danger Factors

DISASTER THREAT	PROBABILITY OF OCCURRENCE			**DANGER FACTOR**			DISASTER RATING (Probability X Danger)
	Likely (3)	Possible (2)	Unlikely (1)	High (3)	Average (2)	Low (1)	
Earthquake	3			3			9
Fire	3			3			9
Flood/Storm	3				2		6
Landslide		2		3			6
Drought		2				1	2
Dam Failure			1			1	1
Vector Issues			1			1	1

Table 3-3
Critical Facilities List

Name	Type	Location
RSM City Hall	Government	22112 El Paseo
RSM Post Office	Government	29851 Aventura
RSM Library	Government	30902 La promesa
RSM Postal Annex	Government	29862 Ave. de las Banderas
OCFA Station 45	Fire Station	30131 Aventura
Cox Cable	Communications	29947 Ave. de las Banderas
Pac Bell Central Switch	Communications	30161 Aventura
Santa Margarita Substation	Electrical	30031 Santa Margarita Parkway
Intergenerational Center	Community	22232 El Paseo
RSM Beach Club	Community	21472 Ave. de las Fundadores
Arroyo Vista Elem.	Public School	23371 Arroyo Vista
Tijeras Creek Elem.	Public School	23072 Ave. Empresa
Cielo Vista Elem.	Public School	21811 Ave. de las Fundadores
Melinda Heights Elem.	Public School	21001 Rancho Trabuco
Robinson Elem.	Public School	21400 Lindsay
Trabuco Mesa Elem.	Public School	21301 Ave. de las Flores
RSM Intermediate	Public School	21931 Alma Aldea
Banderas Bridge	Transportation	Ave. de las Banderas/241 Toll Road
Santa Margarita Bridge (1)	Transportation	Santa Margarita Pkwy/Trabuco Creek
Santa Margarita Bridge (2)	Transportation	Santa Margarita Pkwy/241 Toll Road
241 Toll Road Bridge	Transportation	241 Toll Road/Trabuco Creek
Melinda Road Bridge	Transportation	Melinda Road/241 Toll Road
Los Alisos Bridge	Transportation	Los Alisos/241 Toll Road
Antonio Parkway Bridge (1)	Transportation	Antonio Parkway/Tijeras Creek
Antonio Parkway Bridge (2)	Transportation	Antonio Parkway/241 Toll Road
241 Toll Road/Tijeras Creek	Transportation	241 Toll Road/Tijeras Creek
Canada Chiquita Bridge	Transportation	Canada Chiquita Road/241 Toll Road
Pedestrian Bridge	Transportation	241 Toll Road N of Santa Margarita Pkwy
Plano Lift Station	Sanitary Sewer	24152 Antonio Parkway
Trabuco Lift Station	Sanitary Sewer	22352 Alicia Parkway
Rancho Trabuco Reservoir	Reservoir	NE of Celeste & Altisima
Trabuco Ridge Reservoirs (2)	Reservoir	South of Celeste & Altisima
Star Reservoir	Reservoir	NE of Via del Lago & Via del Nido
Foothill Reservoir	Reservoir	NE of Antonio & Bienvenidos
Island Pasture Reservoir	Reservoir	NE of Camino Altura
South County Reservoir	Reservoir	So. End of Antonio Pkwy
Dove Canyon Reservoir	Reservoir	No. of Field Point
Mesa Pump Station	Water Facility	21662 Antonio Parkway
Altisima Pump Station	Water Facility	NW Corner of Altisima & Los Alisos
Trabuco Pump Station	Water Facility	22352 Alicia Parkway
Island Pump Station	Water Facility	NW Corner of Santa Margarita Pkwy & 241
Foothill Pump Station	Water Facility	SE Corner of Antonio Pkwy & Bienvenidos
Island Pasture Pump Station	Water Facility	North of Camino Altura
Antonio Pump Station	Water Facility	Antonio Pkwy north of Tijeras
Robinson Ranch Pump Station	Water Facility	21397 Heritage Drive
Plano Trabuco Pump Station	Water Facility	Plano Trabuco Road & Joshua Drive

Figure 3-1
Earthquake



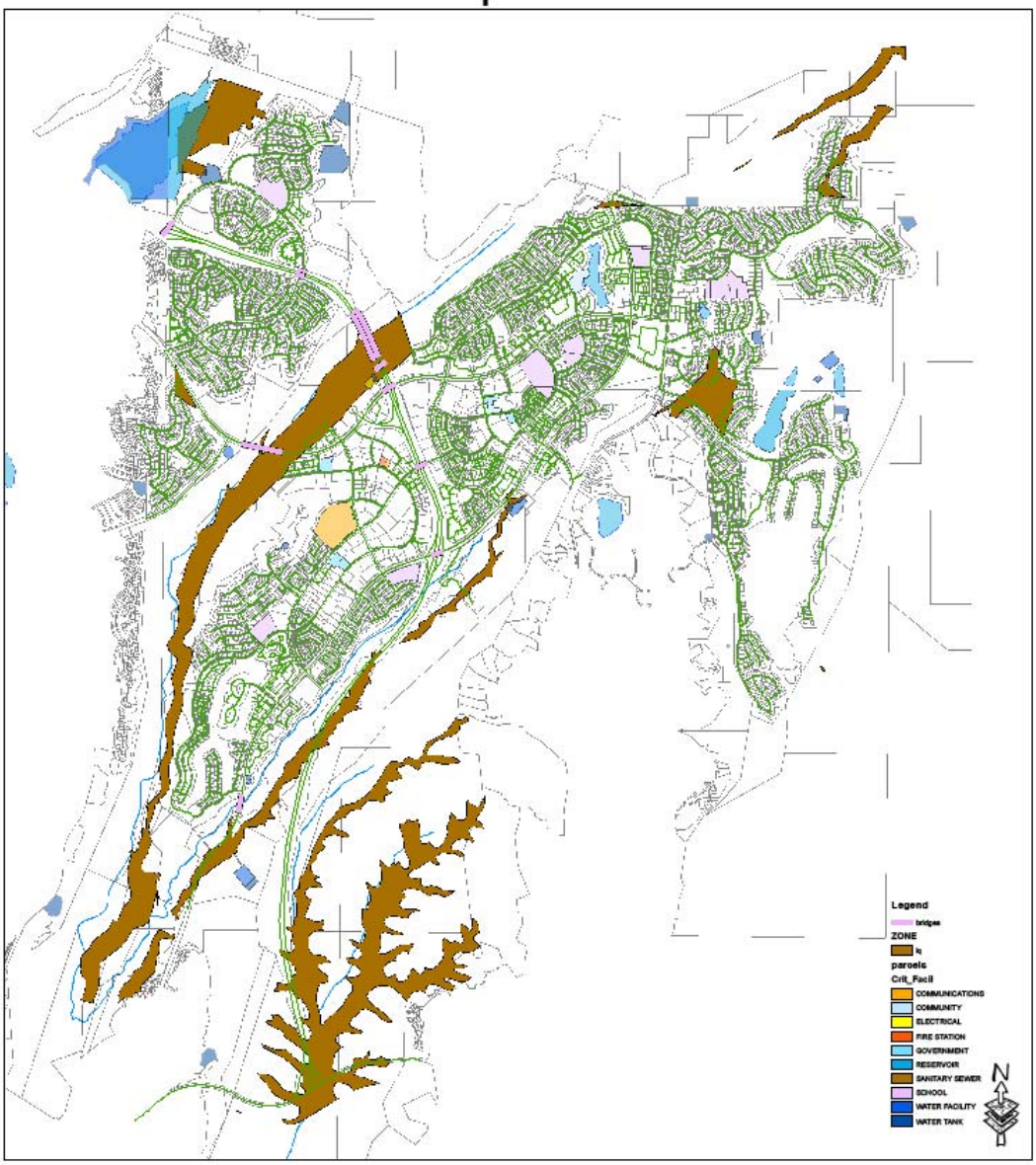
No active faults are known to pass through Rancho Santa Margarita. The closest active faults are the Elsinore-Glen Ivy fault (10.1 miles away), the Chino fault (11.1 miles away), and the Newport Inglewood fault (14.4 miles away). The occurrence of surface rupture on these segments would not be expected to produce fault surface rupture within the City.

The two known local faults, Aliso and the Cristianitos, are thought to be inactive. An earthquake on either of these two faults would be particularly damaging to residential buildings, particularly those of wood or reinforced masonry construction, and to mobile homes. Other buildings that do not typically perform well in earthquakes are soft-story buildings. These have a story (typically the first floor) that lacks adequate strength or toughness due to too few shear walls. Two types of softstory buildings are common: 1) buildings with large window openings used for display purposes on the first floor, and 2) buildings housing the garage on the first floor.

0 1,375 2,750 5,500 8,250 11,000
Feet

Produced by
City of Rancho Santa Margarita
October 22, 2004

Figure 3-2
Liquefaction

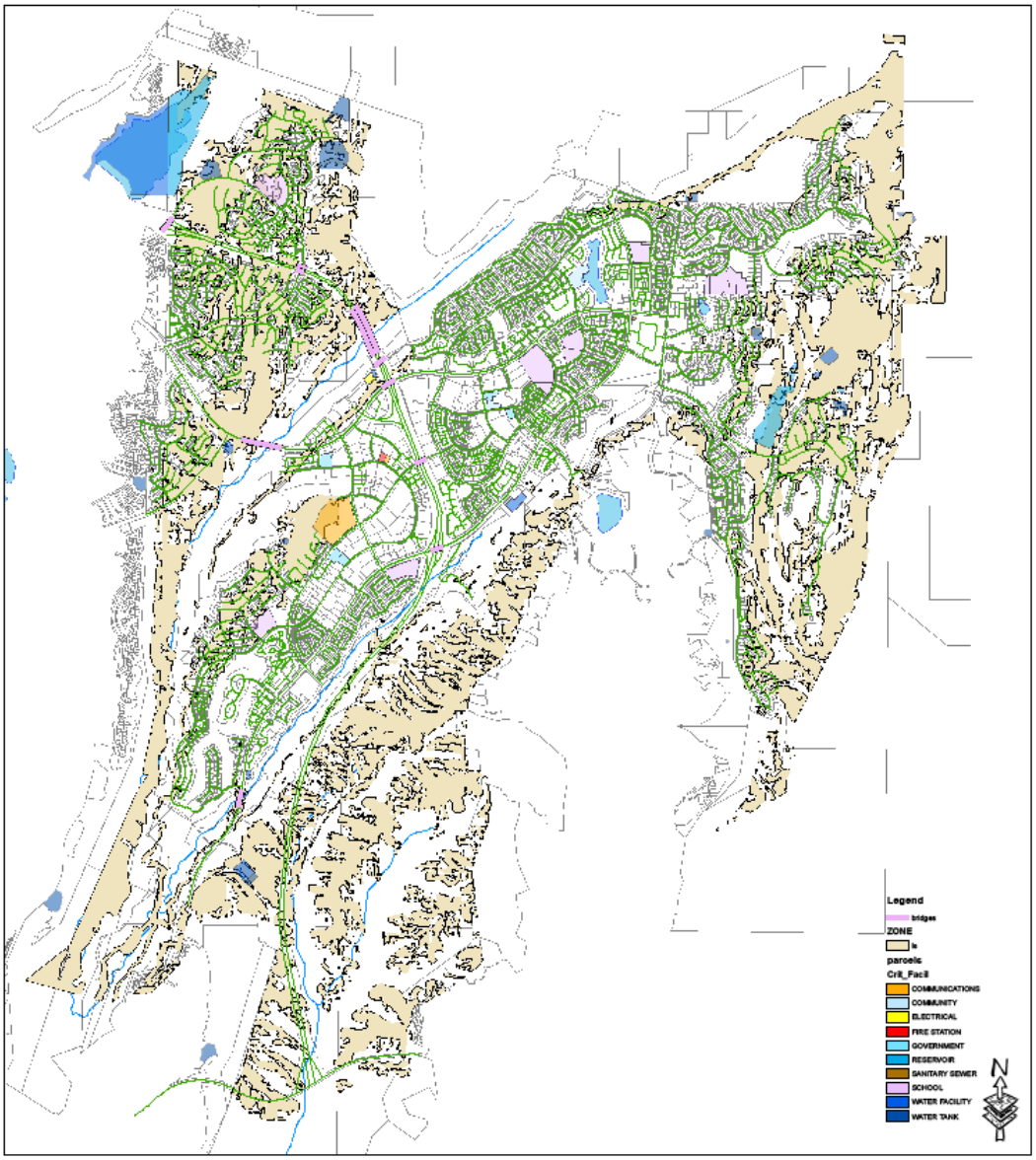


There are 9 critical facilities located within liquefaction zones. These facilities can be broken down into the following categories:

4 Bridges
2 Water Facility
1 Electrical Substation
1 Reservoir
1 Water Tank

Produced by
City of Rancho Santa Margarita
December 14, 2004

Figure 3-3
Landslides

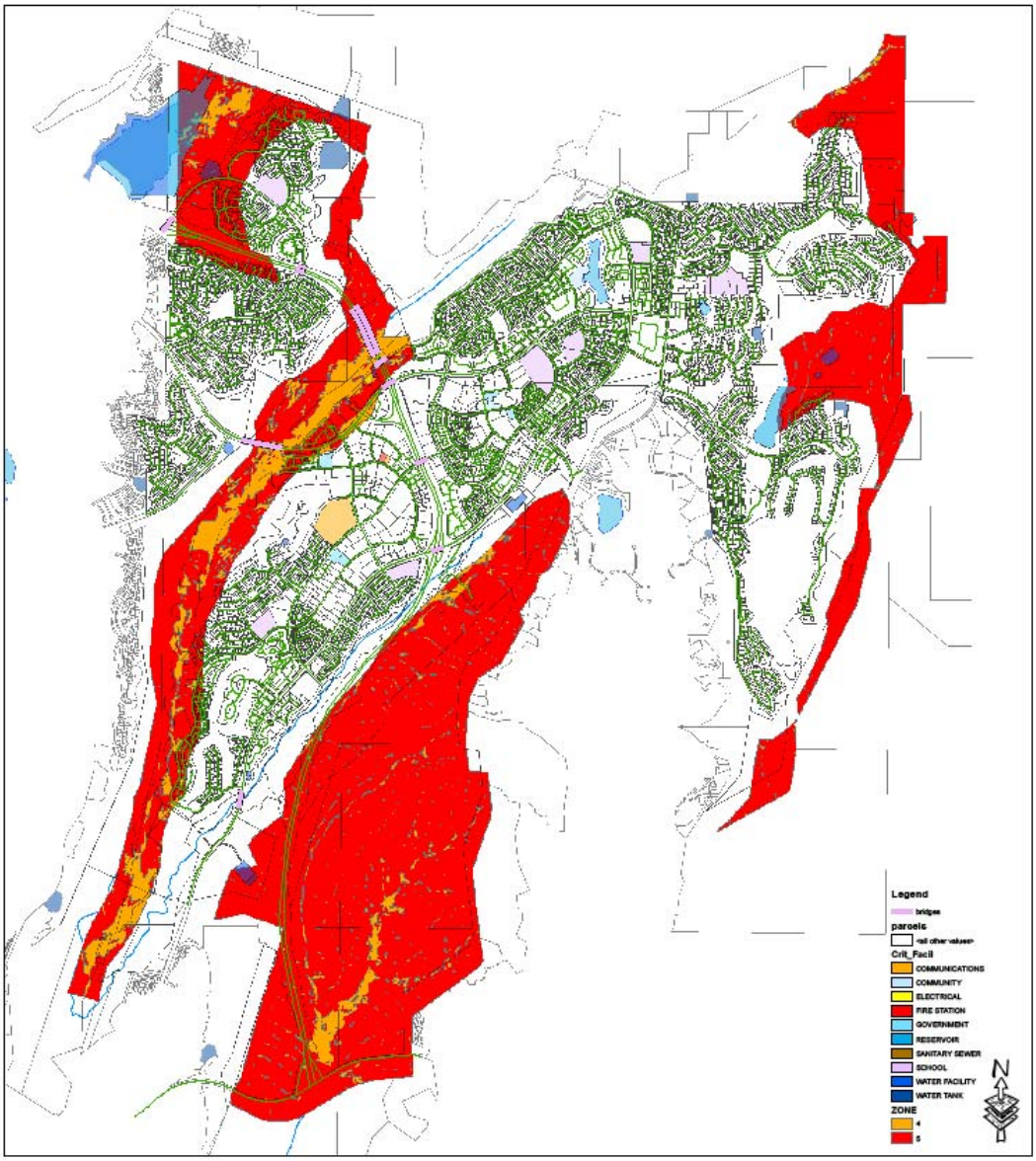


There are 23 critical facilities located within landslide zones. These facilities can be broken down into the following categories:

9 Water Tanks
3 Water Facilities
4 Reservoirs
4 Bridges
1 School
1 Communications Facility
1 Electrical Substation

Produced by
City of Rancho Santa Margarita
December 14, 2004

Figure 3-4
Fire

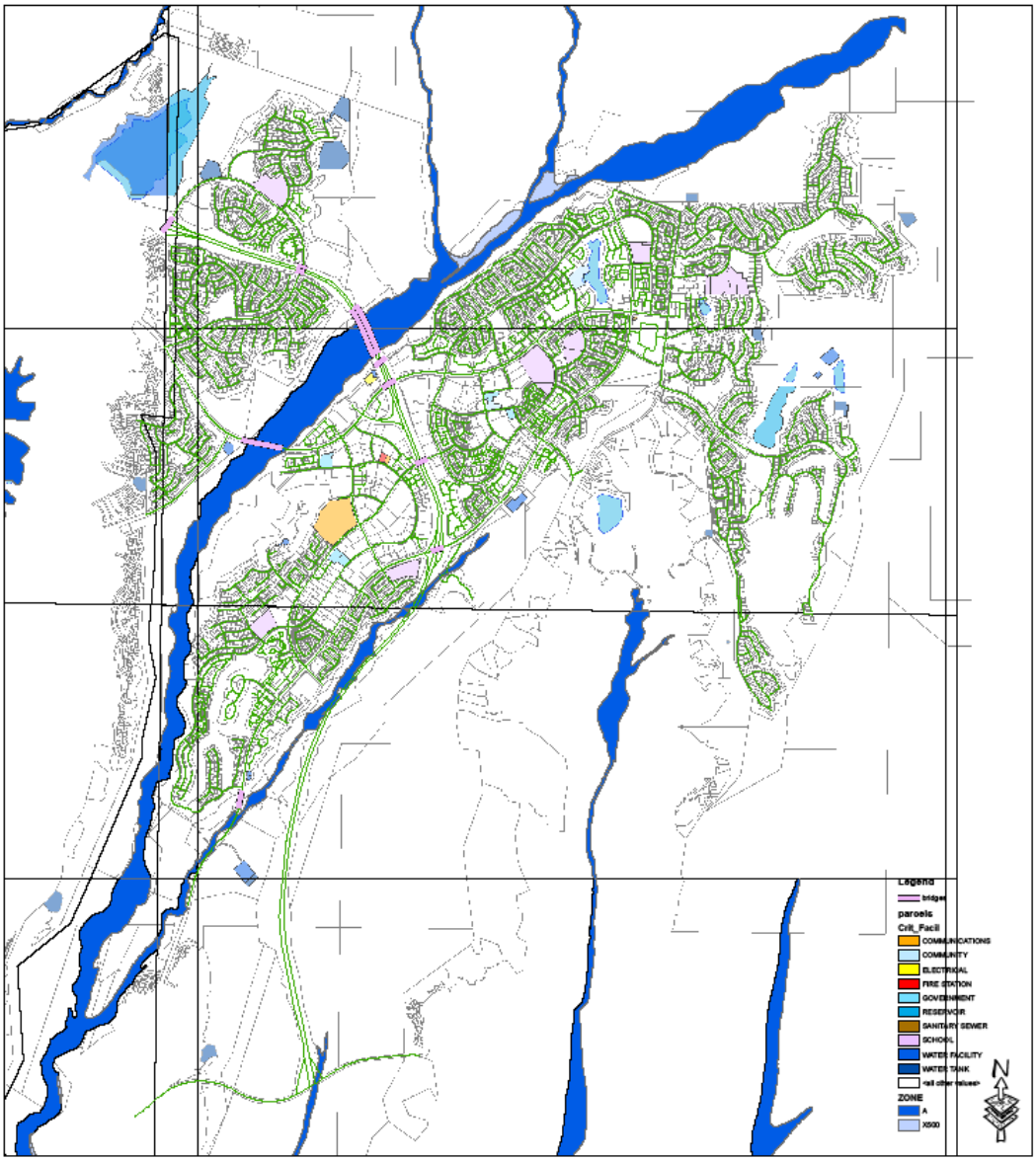


There are 16 critical facilities located within high and very high wildfire hazard areas. These facilities can be broken down into the following categories:

5 Bridges
4 Water Facilities
3 Reservoirs
3 Water Tanks
1 Electric Substation

Produced by
City of Rancho Santa Margarita
December 14, 2004

Figure 3-5
Flood



There are five bridges located within the flood plain that have support columns which could be affected in the result of a flood. However, unless the bridge structures were damaged, the roadway surface would not be affected by flood.

0 1,400 2,800 5,600 8,400 11,200
Feet

Produced by
City of Rancho Santa Margarita
January 11, 2005

Figure 3-6
Dam Locations