



CITY OF CANYON LAKE

GENERAL PLAN SAFETY ELEMENT





CITY OF CANYON LAKE

SAFETY ELEMENT

ADOPTED BY CITY COUNCIL ON

CITY OF CANYON LAKE

SAFETY ELEMENT

REVISED 2022

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I. EXECUTIVE SUMMARY

A. CONDITIONS IN CANYON LAKE AND FOCUS OF THE SAFETY ELEMENT

Canyon Lake has several factors that could detrimentally impact overall community safety. The City is located in a seismically active region of southern California surrounded by hillsides and canyons prone to wildfire and geologic hazards. To compound matters, the impact of a changing climate is likely to intensify many of these risks. Drier and hotter weather will likely increase fire risk and potentially impact future water supplies. Wetter and more intense winter storms could cause flooding and erosion in parts of the City that have never experienced these conditions before. This Safety Element focuses on identifying these safety risks and identifying policies, goals, and implementation actions to address and prepare for them. The Safety Element also strives to align with other general plan elements, as required by state law, including (1) Housing, (2) Land Use, (3) Circulation, (4) Open Space, (5) Conservation, and (6) Noise. Canyon Lake has also participated in the Riverside County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), allowing federal grant funding eligibility to mitigate many of the natural hazards identified in the City.



Canyon Lake City Hall

B. PURPOSE OF THE SAFETY ELEMENT

The Safety Element is one of seven mandatory elements of the General Plan. Its primary purpose is to identify potential risks that could endanger the community's public health, safety, and welfare. Periodic updates of the Safety Element ensure that goals and policies are relevant and responsive to community needs. California Government Code Section 65302(g)(1) identifies the following list of safety risks that, at a minimum, be examined in each Safety Element:



- seismically induced surface rupture*
- ground shaking*
- ground failure*
- flooding*
- tsunami
- seiche*
- dam failure*
- slope instability leading to mudslides and landslides*
- subsidence
- liquefaction areas*
- other seismic hazards
- wildland and urban fires*
- climate change*

Items denoted by an * are potential hazards relevant to the City of Canyon Lake

The Safety Element must also geographically identify each safety risk by location, evaluate the potential consequences and establish goals, policies, and objectives to protect the community.

C. MOVING FORWARD

The City of Canyon Lake reaffirms the importance of protecting the community from potential natural hazard risks. The City's location and history with hazards make it likely that Canyon Lake will experience risks from seismic, flooding, and wildfire events in the future. The City can also expect some of these risks to worsen as climate change exacerbates hazard effects. With this in mind, the Safety Element, in conjunction with the MJHMP, is the best avenue to understand and address natural hazard risks within the community.

II. INTRODUCTION

A. PURPOSE STATEMENT

The purpose of the Safety Element is to provide the public, decision-makers and City staff a guide to set policy that will help create a community that is minimally at risk from natural hazards, and that responds quickly, effectively, and efficiently to such hazards. This involves designing, developing, and maintaining neighborhoods and commercial areas as safe places to live, shop, work, and interact. It also involves developing and maintaining essential facilities that remain fully functional following a disaster. This Element identifies a variety of disaster preparedness, response, and recovery goals, policies, and programs that can be used to reduce loss of life, injury, damage to private property and infrastructure, and economic losses and social dislocation, and in the process promote resilience throughout the City of Canyon Lake.



B. RELATIONSHIP TO STATE LAW

Canyon Lake City Council recognizes that a safe environment is required for building and maintaining a sustainable and prosperous City. While the City cannot prevent many of these hazards from occurring, it can set forth policies that can help reduce or minimize their effects or reduce exposure to them. This Safety Element sets forth policies designed to minimize threats from natural and human-caused hazards.

Section 65302 of the State of California Government Code identifies seven mandatory elements in a General Plan, including Safety. Section 65302 (g) defines the hazards that need to be identified and addressed.

These include:

- 1) Seismic hazards, including strong ground shaking, surface fault rupture, and seismically induced ground failure, such as liquefaction and slope failures;
- 2) Geologic hazards, including slope instability due to non-seismic causes, and subsidence;
- 3) Flood hazards, including storm-induced flooding, inundation resulting from the failure of water reservoirs, dams, and levees, and areas vulnerable to flooding after wildfires; and
- 4) Fire hazards, including both wildland fires and structure fires in the urban area.

Also included within this Element are the management of hazardous materials, emergency services, and policies for dealing with disaster preparedness, response, and recovery.

C. ELEMENT ORGANIZATION

This Element is organized to be consistent with the other General Plan Elements. The goals, policies, and implementation programs provide declarative statements setting forth the City's approach to safety-related issues. A definition of these key terms is provided below.

Goal: A general statement of the desired community outcome. It is denoted as Goal S-X in this Element.

Policy: Policies are actions that a community will undertake to meet the goals. They are denoted as Policy S-X.X in this Element.



Implementation Actions: This is a list of recommended programs and future actions necessary to achieve element goals and policies; they are denoted using the Policy numbering plus a lower case letter (a,b,c) in this Element. A consolidated summary of these Implementation Actions is provided in Section IV.

D. CONSISTENCY WITH OTHER ELEMENTS

The Safety Element is written in conjunction with and is designed to support the other elements of the General Plan, most notably the Conservation, Open Space, Land Use, and Circulation Elements. The Land Use Element limits the range of land uses allowed in hazardous areas to reduce the number of people, buildings, and infrastructure exposed to risk. The Conservation and Open Space Elements identify and preserve natural open space meant to protect sensitive environments and preserve natural amenities in the City. The Circulation Element provides minimum road standards that help protect motorists and pedestrians.

Land Use

The Land Use Element is particularly responsive to natural hazards. Understanding the natural and human-made hazards that threaten a community can help reduce the possibility of disaster by avoiding the designation of sensitive land uses in hazard-prone areas. Several goals within the Land Use Element focus on protecting and enhancing the community as part of the development and entitlement process. Key policies and strategies about safety include the following:

Land Use Policy (LUP-1) - requires development projects to be assessed based on meeting community infrastructure needs and population capacity.

Land Use Strategy (LUS-2) - requires coordination with adjacent public agencies, special districts, and other service providers to ensure necessary and desirable public facilities and services that are responsive to changing needs and values and are provided in such a way as to limit conflict or duplication.

Circulation

Coordination between the Circulation Element and the Safety Element is an important component of comprehensive planning. The Circulation Element can influence public health and safety by addressing traffic congestion on roads designated as evacuation routes during emergencies and



redefining truck routes to avoid residential and other heavily populated areas. A key strategy within the Circulation Element (CES-4) that applies to the Safety Element identifies the need to investigate alternative circulation connections to areas adjacent to the City to support emergency response, evacuation, and service delivery.

Housing

The Housing Element is more closely associated with land use and incorporates many safety considerations into its goals and objectives. Building practices and codes addressed in the Housing Element contribute to community safety by improving the built environment's resiliency to natural and human-caused hazards. Additionally, the Housing Element can help identify vulnerable populations and inform the Safety Element to ensure proper protections.

Open Space

The Open Space Element focuses on public and private investments in recreation, natural resource, and open space areas within the City. Within the Element, the goals, policies, and strategies address protection and enhancements of private recreation assets (parks), open space areas, and ways to preserve these resources for future generations. Progressive open space management techniques can help mitigate wildfire and landslide hazards, reducing the need for additional city services.

Conservation

The Conservation Element protects and preserves community resources (water, minerals, plant, and animal life). The element goals, policies, and strategies address energy conservation, recycling, water conservation, and mineral resource use and extraction.

Noise

The Noise Element is a comprehensive program to identify and temper environmental factors that potentially threaten community health and safety. This Element contains policies and strategies to regulate existing and proposed development located in the City. Guidance and regulations in this Element are intended to protect residents from excessive noise and ensure uses within the City do not produce excessive noise conditions causing harm and impacting the quality of life.



E. CONSISTENCY WITH LOCAL HAZARD MITIGATION PLAN

The Local Hazard Mitigation Plan (LHMP) serves three primary purposes: it provides a comprehensive analysis of the natural and human-caused hazards that threaten the City, with a focus on mitigation; it keeps the City of Canyon Lake eligible to receive additional federal and state funding to assist with emergency response and recovery (as permitted by the Federal Disaster Mitigation Act of 2000 and California Government Code Sections 8685.9 and 65302.6), and it complements the efforts undertaken by the Safety Element. The LHMP complies with all requirements set forth under the federal Disaster Mitigation Act of 2000 and received approval from the Federal Emergency Management Agency (FEMA) in 2018. Sections of the Safety Element are supplemented by the LHMP, incorporated by reference in this Element, as allowed by California Government Code Section 65302(g).

F. REGULATORY ENVIRONMENT

California Government Code 65302(g)(1–9)

California Government Code Section 65302(g) (1–9) establishes the legislative framework for California's safety elements. This framework consolidates the requirements from relevant federal and state agencies, ensuring that all cities are compliant with the numerous statutory mandates. These mandates include:

- Protecting against significant risks related to earthquakes, tsunamis, seiches, dam failure, landslides, subsidence, flooding, and fires as applicable;
- Including maps of known seismic and other geologic hazards;
- Addressing evacuation routes, military installations, peak-load water supply requirements, and minimum road widths and clearances around structures as related to fire and geologic hazards, where applicable;
- Identifying areas subject to flooding and wildfires;
- Avoiding locating critical facilities within areas of high risk;
- Assessing the community's vulnerability to climate change; and



- Including adaptation and resilience goals, policies, objectives, and implementation measures.

California Government Code Sections 8685.9 and 65302.6

California Government Code Section 8685.9 (*also known as* Assembly Bill 2140 or AB 2140) limits California's share of disaster relief funds paid out to local governments to 75 percent of the funds not paid for by federal disaster relief efforts. However, if the jurisdiction has adopted a valid hazard mitigation plan consistent with the Disaster Mitigation Act of 2000 and has incorporated the hazard mitigation plan into the jurisdiction's General Plan, the State may cover more than 75 percent of the remaining disaster relief costs. All cities and counties in California must prepare a General Plan, including a Safety Element that addresses various hazard conditions and other public safety issues. The Safety Element may be a stand-alone chapter or incorporated into another section, whichever the community prefers. California Government Code Section 65302.6 indicates that a community may adopt an LHMP into its Safety Element if the LHMP meets applicable state requirements. Adoption allows communities to use the LHMP to satisfy state requirements for Safety Elements. The General Plan is an overarching long-term plan for community growth and development; incorporating the LHMP creates a stronger mechanism for implementing the LHMP.

California Government Code 65302 (g) 3 adopted through SB 1241 (2012)

California Government Code Section 65302 (g) 3 requires the Safety Element to identify and update mapping, information, and goals and policies to address wildfire hazards. As part of this requirement, any jurisdiction that includes State Responsibility Areas or Very High Fire Hazard Severity Zones (VHFHSZ), as defined by the California Board of Forestry and Fire Protection (Board), is required to transmit the updated Element to the Board for review and approval. The City has VHFHSZs located within its boundary triggering this requirement.

California Government Code 65302 (g) 4 adopted through SB 379 (2015)

California Government Code Section 65302 (g) 4 requires the Safety Element to address potential impacts of climate change and develop potential strategies to adapt/mitigate these hazards. Analysis of these possible effects should rely on a jurisdiction's Local Hazard Mitigation Plan or an analysis that includes data and analysis from the State of California's Cal-Adapt website.



California Government Code 65302 (g) 5 adopted through SB 99 (2019)

California Government Code Section 65302 (g) 5 requires the Safety Element to identify evacuation constraints associated with residential developments, specifically focused on areas served by a single roadway.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) was created in 1968 to help communities adopt more effective floodplain management programs and regulations. The Federal Emergency Management Agency is responsible for implementing the NFIP and approves the floodplain management plans for participating cities and counties. Canyon Lake participates in the NFIP and uses Title 15, Chapter 4 of the Canyon Lake Municipal Code to administer flood management regulations throughout the City.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code [PRC], Chapter 7.5, Section 2621-2699.6) was intended to reduce the risks associated with surface faults and requires that the designated State Geologist to identify and map "Earthquake Fault Zones" around known active faults. Per PRC Section 2623 a, cities and counties shall require a geologic report defining and delineating any hazard of surface fault rupture before the approval of a project. If the jurisdiction finds no undue hazard of that kind exists, the geologic report on the hazard may be waived, with the State Geologist's approval. For a list of project types, please refer to PRC Section 2621.6. No Alquist-Priolo Earthquake Fault Zones run through Canyon Lake; therefore, it is not a topic of concern addressed in this document.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (California Public Resources Code, Chapter 7.8, Section 2690-2699.6) created a statewide seismic hazard mapping and technical advisory program in 1990 to help cities and counties more effectively address the effects of geologic and seismic hazards caused by earthquakes. Under PRC 2697, cities and counties shall require a geotechnical report defining and delineating any seismic hazard before approving a project



located in a seismic hazard zone. If the jurisdiction finds that no undue hazard of this kind exists based on information resulting from studies conducted on sites near the project and of similar soil composition to the project site, the geotechnical report may be waived. After a report has been approved or a waiver granted, subsequent geotechnical reports shall not be required, provided that new geologic datum, or data, warranting further investigation is not recorded. Each jurisdiction shall submit one copy of each approved geotechnical report, including the mitigation measures to be taken, if any, to the State Geologist within 30 days of its approval of the report. For a list of project types, please refer to PRC Section 2693.

Cortese List

Government Code Section 65962.5 (typically referred to as the "Cortese List") identifies sites that require additional oversight during the local permitting process as well as compliance with the California Environmental Quality Act (CEQA). The list is generally a compilation of properties and businesses that generate, store, and/or have been impacted by the presence of hazardous materials/wastes. Many properties identified on this list may be undergoing corrective action, cleanup, or abandoned and in need of these activities. Sites within a city may contain hazardous materials requiring oversight from the Department of Toxic Substances Control and Regional Water Quality Control Board.



III. POTENTIAL HAZARDS / TRENDS

A. SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards are traditionally addressed together because they both involve the movement of the Earth's surface. Although some geologic events (landslide, subsidence, erosion, etc.) can and do happen independently, the primary catalyst for their occurrence is often a seismic event, commonly referred to as an earthquake. This section identifies four common seismic and geologic hazards that threaten Canyon Lake and establishes policies and procedures to protect the community when an event occurs. The following discusses the seismic and geologic hazards found within or adjacent to the City of Canyon Lake.

Seismic Hazards

Southern California is prone to earthquakes, which occur frequently. Canyon Lake lies in a seismically active area in Southern California. The community sits close to several active faults, including three major Alquist-Priolo Special Study Zones (Elsinore, San Andreas, and San Jacinto) and multiple Riverside County seismic hazard zones. Seismic activity results differ according to several variables, including but not limited to epicenter location, intensity, type of event, and the geology of the area.

Fault

The break or fracture between moving blocks of rock is called a fault, and such differential movement produces a fault rupture. Few faults are simple, planar breaks in the earth. They more often consist of smaller strands with a similar orientation and sense of movement. A strand is mappable as a single, continuous feature. Sometimes geologists group strands into segments, which are believed capable of rupturing together during a single earthquake. The more extensive the fault, the bigger the earthquake it can produce. Therefore, multi-strand fault ruptures produce larger earthquakes.

Active faults are defined as those that have had surface displacement within the Holocene time (approximately the last 11,000 years). The existence of cliffs can recognize such displacement in alluvium, terraces, offset stream courses, the alignment of depressions, sag ponds, fault troughs and saddles, and the existence of markedly linear steep mountain fronts.



Regional fault locations are illustrated in **Exhibit SF-1**. The most significant active faults in the vicinity of the City of Canyon Lake include:

Elsinore Fault Zone: The fault zone includes the Elsinore, Wildomar, and Wolf Valley Faults in this area. The Elsinore Fault is a right-slip fault and is thought to be the same age as the San Jacinto, which came into existence in the late Pliocene epoch approximately five million years ago. The Wildomar and Elsinore faults are particularly important due to their proximity to the City. The Wildomar fault is located approximately 4 miles from the City; the Elsinore faults are 5 miles outside the City to the west of I-15. This fault system can generate an earthquake magnitude over Richter Magnitude (M) 6.0.

San Jacinto Fault Zone: This fault zone sits approximately 15 miles northeast of the City. The San Jacinto fault is a right-slip fault dating its existence since the late Pliocene epoch, about five million years ago. The fault has a maximum credible earthquake potential of M 7.5.

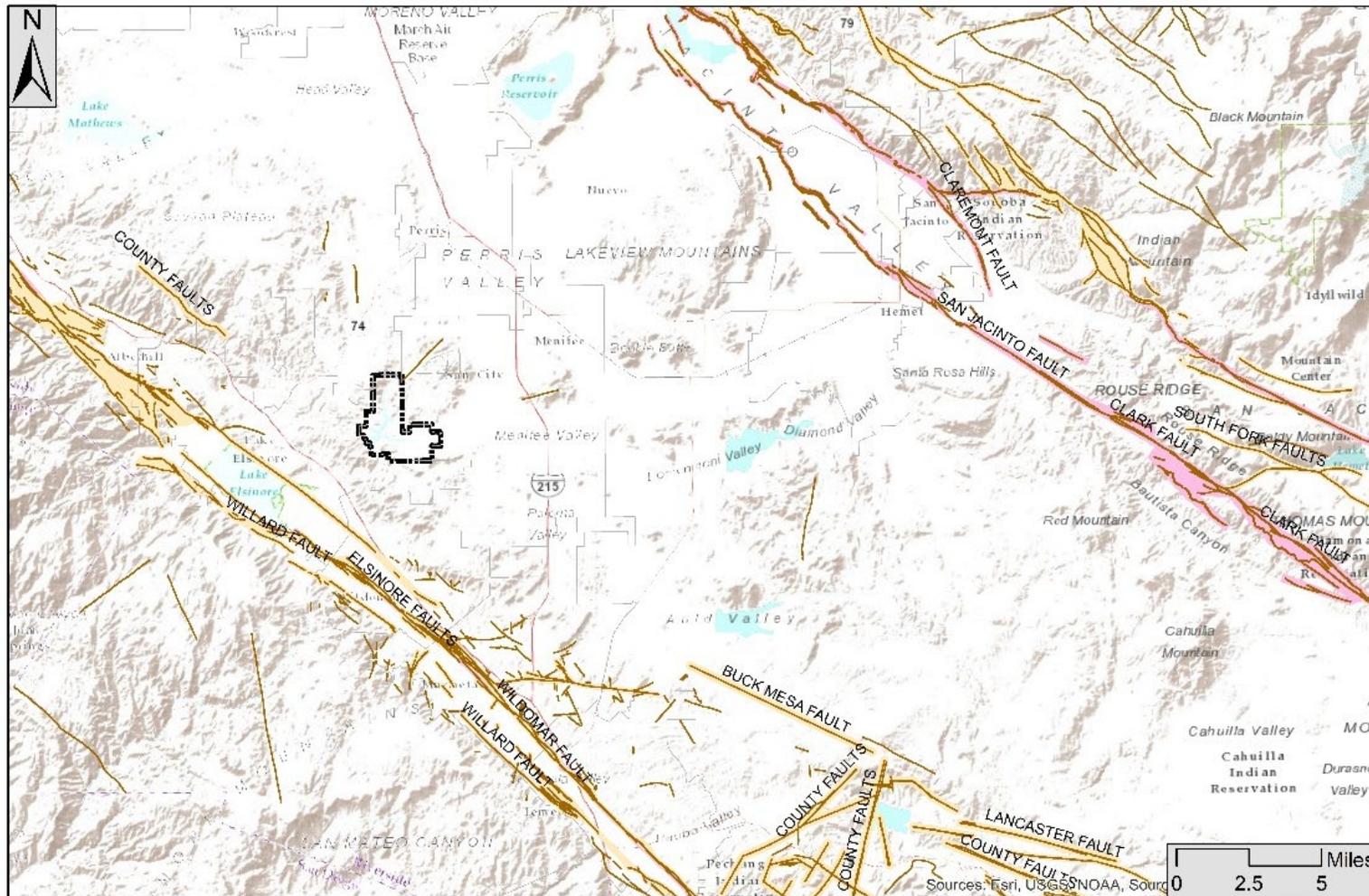
San Andreas Fault Zone: This fault zone, located approximately 35 miles northeast of the study area, is the dominant fault zone in California. The San Andreas began faulting in the late Miocene era, with the current fault trace forming during the Pliocene era. The fault functions as a strike-slip fault and is considered a major transform fault. The maximum credible earthquake from this fault zone could be more than M 8.25.

There are no known active or potentially active earthquake faults within the City. The nearest major faults are the Elsinore fault, approximately 5 miles west of the City, and the San Jacinto Fault, about 15 miles northeast of the City.

The risk of ground rupture-related damage during an earthquake is minimal due to the absence of faults within the City. However, like much of the region, the potential for structural damage and loss of life due to intensive ground shaking is considerable due to the combination of proximate active faults and the area's nature.



Exhibit SF-1 Fault Map



Canyon Lake Safety Element Update

- Alquist Priolo Special Study Zones
- Riverside County Fault Zones
- Canyon Lake City Limits





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The City is predominantly composed of single-family dwellings and low-density commercial and recreational uses, which are at a lower risk of damage due to earthquakes than more densely populated or urbanized areas that contain taller/larger structures.

Surface Fault Rupture

Fault rupture refers to offset of the ground surface along a rupturing fault during an earthquake. Structures that straddle a rupturing fault can experience significant damage. Thus, the Alquist-Priolo Earthquake Fault Zoning Act prohibits the construction of new habitable structures on top of an active fault and requires geologic studies to locate and evaluate whether the fault has moved in the Holocene. The State geologist has identified several active faults in California for which these studies are required. The State of California zones no faults within the Canyon Lake area. The closest zoned faults include the Elsinore Fault located 5 miles west of the City and the San Jacinto Fault located 15 miles northeast of the City. Both of these faults are potential sources of strong ground shaking and surface fault rupture. In addition, the County of Riverside has identified several faults within County-designated Special Study Zones, requiring the same level of investigation as State-designated zones. While numerous zones are delineated within the region, no fault zones are located within the City, requiring this type of investigation.

Seismic Shaking

Seismic shaking is recognized by earthquake movement releasing energy in the form of seismic waves which travel through the earth itself. These waves radiate out from the quake epicenter and are expressed as a shaking motion at the surface. Earthquakes are typically classified by the amount of damage reported or how strong and how far the shaking was felt. The intensity of seismic shaking is usually measured with the Modified Mercalli Intensity (MMI) scale based on the amount of observed damage. Seismic shaking may also be measured using the more widely known moment magnitude scale (MMS, denoted as M_w or sometimes M), which measures the amount of energy the earthquake releases. The MMS begins at 1.0 and increases the more energy is released. This scale is based on a logarithmic scale, meaning that the difference in energy between two measurements is substantially greater than the difference between the measurements themselves. According to the third Uniform California Earthquake Rupture Forecast (UCERF3) there is a 60% probability of a 6.7M or greater earthquake striking Southern California in the next 30 years. For the three closest faults to the City the following probabilities apply for an earthquake greater than 6.7M:



- San Andreas Fault: ~20% | approximately 30 miles northeast of the City
- San Jacinto Fault: ~6% | approximately 15 miles east of the City
- Elsinore Fault: ~3% | less than 5 miles west of the City.

Ground shaking is the most likely harmful event in the planning area due to seismic activity and presents the greatest potential for property damage.

Liquefaction

Liquefaction is a phenomenon that occurs when intense vibrations from an earthquake cause saturated soil to lose stability and act more like a liquid than a solid. This action typically occurs in the uppermost 50 feet of the ground surface, in areas where fine- to medium-grained sandy to silty soils and shallow groundwater occur together. The shaking during a moderate to strong earthquake causes the saturated sediments to behave like a liquid or semi-viscous substance, with total or substantial loss of shear strength. This can cause buildings to topple or sink, pools and underground storage tanks to pop out of the ground, and roads and pipelines to fail due to lateral spreading. Lateral spreading, a type of liquefaction-induced failure, is the lateral displacement of surficial blocks of soil atop a liquefied layer. Lateral spreads are often described as shallow landslides, with failure typically occurring on gentle slopes with the mass of soil moving down-slope toward a cut slope or free faces such as a river channel or canal. Other types of liquefaction-related ground failures include flow failures, ground oscillations, and ground lurching. Building foundations and other heavy structures can sink under liquefaction conditions, causing great damage.

Areas underlain by young, unconsolidated sediments where shallow groundwater has been reported historically are shown on **Exhibit SF-2**. Geotechnical studies to assess the liquefaction-susceptibility in these areas may be appropriate prior to the development of projects and critical facilities.

Geologic Hazards

Although seismic events, such as earthquakes, often trigger geologic hazards, other geologic hazards may also be a concern for the City. Located in the Gavilan and Sedco Hills east of the Santa Ana Mountains, the City is underlain by Mesozoic-Paleozoic metamorphic and granitic rock and alluvial soils of varying depths (200-2000 feet). Topography within the City consists of



moderately undulating foothills to rugged foothills and several canyons. Soils within the City vary from sandy/gravelly loams to loams and bedrock. While these soils are generally capable of supporting development, specific analysis of engineering properties will be required to ensure new development/redevelopment activities are constructed properly and meet state and local requirements.

Subsidence

Land subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. Most ground subsidence is human-induced, typically as a result of fluid (water or oil) extraction by pumping. Ground-surface effects related to regional subsidence can include earth fissures, sinkholes or depressions, and disruption of surface drainage. Damage is generally restricted to structures sensitive to slight changes in elevations, such as canals, levees, underground pipelines, and drainage courses; however, significant subsidence can result in damage to wells, buildings, roads, railroads, and other improvements. Subsidence due to groundwater overdraft can also result in the permanent loss of aquifer storage capacity. The occurrence of subsidence is usually more pronounced in clay soils due to dehydration and subsequent compaction. According to the USGS, known subsidence locations are identified within the City of Lake Elsinore¹ to the west. Due to this proximity, consideration should be given to this potential hazard where development occurs on lots that share similar conditions as the areas that have experienced this hazard.

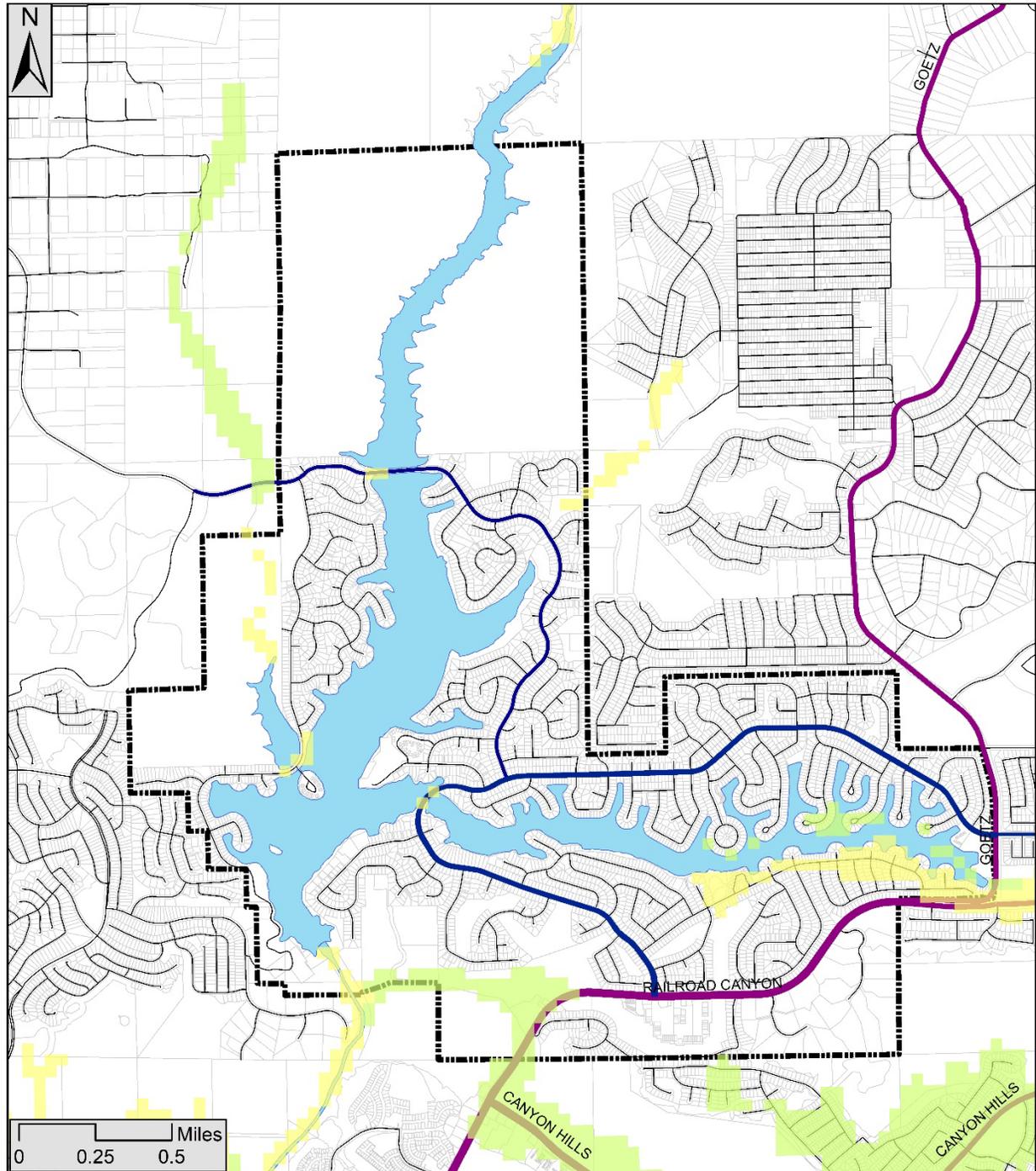
Slope Instability

Slope failures occur in various forms, and there is usually a distinction between gross failures and surficial failures. Gross failures include deep-seated or relatively thick slide masses, such as landslides, whereas surficial failures can range from minor soil slips to destructive mud or debris flows. Failures can occur on natural or engineered slopes. Landslides are movements of relatively large landmasses, either as nearly intact bedrock blocks or as jumbled mixes of bedrock blocks, fragments, debris, and soils. Some of the most important factors in slope instability include slope height, slope steepness, shear strength, the orientation of weak layers in the underlying geologic unit,

¹ https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html



Exhibit SF-2 Liquefaction Susceptibility



Canyon Lake Safety Element Update

- Liquefaction Susceptibility**
- Low Susceptibility (Green)
- Moderate Susceptibility (Yellow)
- Potential Evacuation Routes (Blue line)
- Resilient IE - Evacuation Routes (Purple line)
- Canyon Lake City Limits (Dashed black line)





and pore water pressures. Joints and shears, which weaken the rock fabric, allow penetration of water, leading to deeper weathering of the rock, increased pore pressures, increased plasticity of weak clays, and increased weight of the landmass. For engineering earth materials, these factors are combined in calculations to determine if a slope meets a minimum safety standard. The generally accepted standard is a factor of safety of 1.5 or greater (where 1.0 is equilibrium, and less than 1.0 is failure). Natural slopes, graded slopes, or graded/natural slope combinations must meet these minimum engineering standards where they impact planned homes, subdivisions, or other types of developments.

Surficial failures typically occur in drainage swales and in the thick colluvial sediments and deeply weathered bedrock near the base of steep slopes. Surficial failures happen most often during particularly heavy and/or prolonged rainfall. The most common types of surficial instability include slope creep, soil slip, debris flows, and rockfalls. Debris flows are the most dangerous and destructive of all types of slope failure. A debris flow (also called mudflow, mudslide, and debris avalanche) is a rapidly moving slurry of water, mud, rock, vegetation, and debris. Larger debris flows are capable of moving trees, large boulders, and even cars. Watersheds that have recently burned typically yield greater amounts of soil and debris than those that have not burned.

Rockfalls are free-falling to tumbling masses of bedrock that have broken off steep canyon walls or cliffs. The debris from repeated rockfalls typically collects at the base of extremely steep slopes in cone-shaped accumulations of angular rock fragments called *talus*. Rockfalls can happen wherever fractured rock slopes are over steepened by stream erosion or man's activities. Large boulders that perch precariously on slopes pose a rockfall hazard to areas adjacent to and below these slopes. Rockfalls can occur suddenly and without warning but are more likely to occur in response to earthquake-induced ground shaking, during periods of intense rainfall, or as a result of human activities, such as grading and blasting.

Canyon Lake has an undulating topography and slopes composed of granite bedrock materials leading to the lake's edge. The likelihood of slope failure in these geologic units is remote, although the potential still exists. Many sites within the City have modified natural hillside areas from engineered slope modifications, drainage improvements, and the introduction of non-native vegetation. These modifications can have adverse impacts on slope stability. Changes to City



slopes can improve water drainage from hillside areas and reduce erosion; however, introducing non-native vegetation and modified drainage patterns could induce slope failure.

Portions of the City are considered susceptible to landslide hazards. **Exhibit SF-3** identifies the Deep-Seated Landslide Susceptibility developed by the California Geological Survey. Much of the City is located within areas of high susceptibility, which is predominantly undeveloped due to the steep topography located within. Most of the developed portions of the City are located in areas of moderate to high landslide susceptibility, which involved some form of mitigation to comply with the City's Hillside Ordinance. This ordinance intends to preserve the aesthetics and scenic views of the hillsides, protect the safety of people and property, and ensure strict building and planning regulations to reduce the potential for slope instability.

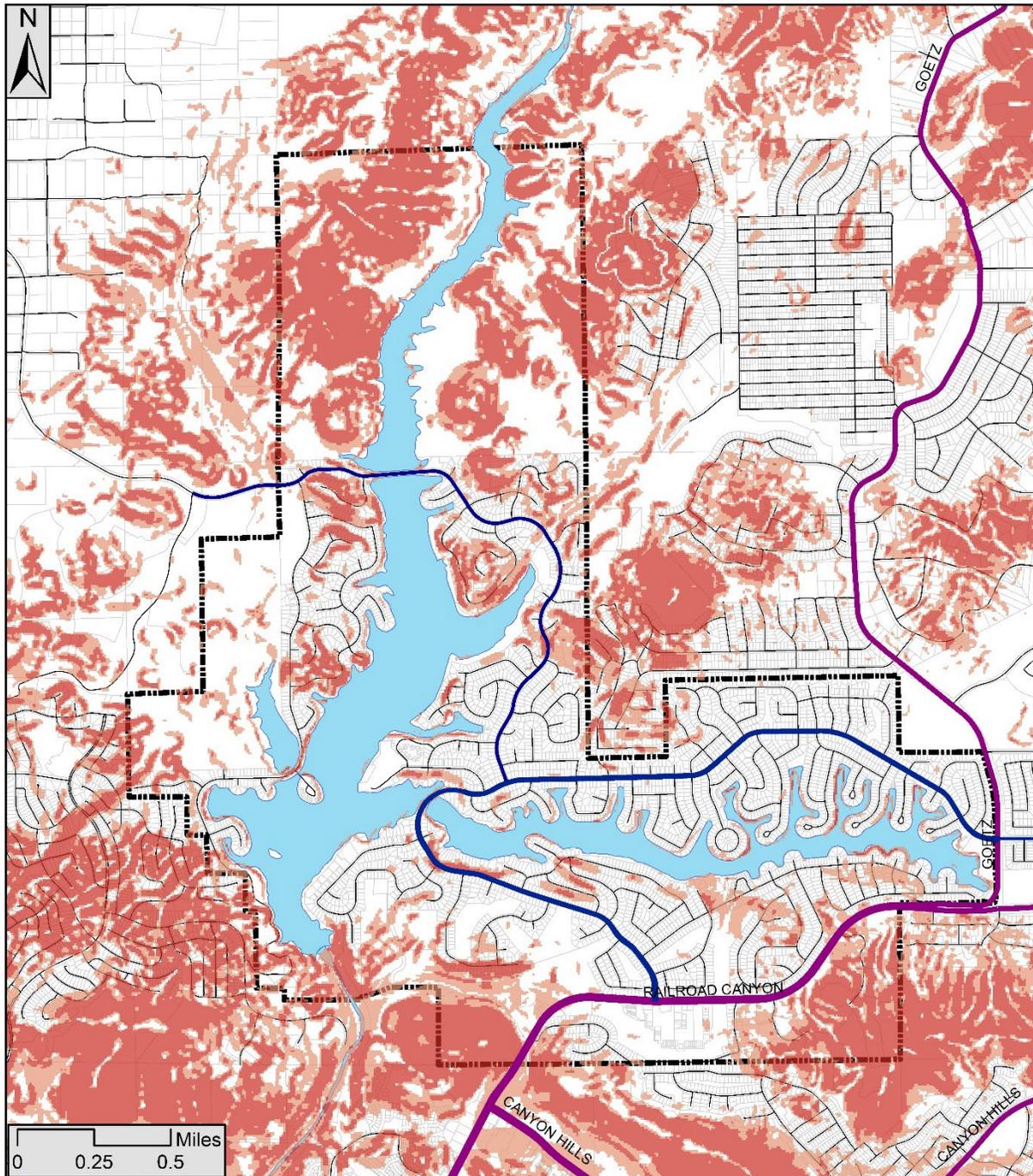
GOAL SF-1: A COMMUNITY THAT HAS MITIGATED RISKS FROM SEISMIC AND GEOLOGIC HAZARDS.

Policies/ Implementation Actions

SF-1.1	Minimize injury, loss of life, property damage, and economic and social disruption caused by seismic shaking and other earthquake-induced hazards, and by geologic hazards such as slope instability, compressible and collapsible soils, and subsidence.
SF-1.2	New habitable structures shall be designed and built per the most recent California Building Code.
SF-1.3	Require liquefaction assessment studies for all projects proposed in areas identified as potentially susceptible to liquefaction.
SF-1.4	Encourage utility service providers to continue upgrading their facilities and infrastructure throughout the City to improve earthquake survivability.
SF-1.5	Participate with other agencies to ensure adequate medical care facilities are available to serve existing and future populations.
SF-1.5a	Initiate and/or participate in regional efforts to ensure that the local medical care facilities will remain functional after a sizeable regional earthquake and provide emergency medical care to all residents and workers who need medical attention following a disaster. Based on these results, collaborate with neighboring cities and the Southern California Association of Governments to identify those areas with insufficient medical coverage and engage medical service providers to consider establishing new medical care facilities in those areas, as needed.
SF-1.6	Properties located near earthquake faults must adhere to the requirements of the Alquist-Priolo Earthquake Fault Zoning Act. If and when the California Geological Survey issues a Seismic Hazards Zonation Map, the City will adopt this map as a replacement for the Seismic Hazards Map.
SF-1.7	Require adherence to hillside development standards that consider slope factors, soils instability, and geotechnical issues within designated hillside and ridgeline development ordinance.



Exhibit SF-3 Landslide Susceptibility



Canyon Lake Safety Element Update

- Potential Evacuation Routes
 - Resilient IE - Evacuation Routes
 - Canyon Lake City Limits
- | Landslide Susceptibility | |
|--------------------------|--------|
| | Low |
| | Medium |
| | High |





B. FLOODING HAZARDS

Flooding

Floods are natural and reoccurring events that generally do not pose a hazard when they occur in an undeveloped area. When floods interact with the built environment, typically in the form of structures built within drainages prone to flooding, they become hazardous. Like most of Southern California, Canyon Lake is subject to unpredictable seasonal rainfall. Every few years, the region is subjected to periods of intense and sustained precipitation that can create flooding in parts of the City, most notably in the form of the lake being over-filled, impacting road access and properties.

Drainage throughout the City is conveyed via surface streets and storm drains throughout the City, ultimately most of which drains into the lake. All roadways aside from Railroad Canyon Road, Sorrel Lane, and Blackhorse Drive (currently public rights of way) are currently owned and maintained by the Canyon Lake Property Owners Association. Prior incidents of flooding have impacted roadways, as seen in Figure 1.



Figure 1 - Intermittent Flooding

Railroad Canyon Reservoir is of regional significance in southwest Riverside County. It modifies the flow of the San Jacinto River and is the primary source of drinking water for a number of communities in the region, including the City of Canyon Lake. The lake acts as a collection location for the local watershed and provides flood control measures for the nearby San Jacinto River and Salt Creek outfalls, as well as other intermittent streams and drainage courses in the



area. So when these water courses experience sustained precipitation, the resulting increase in water drains into the lake. Elsinore Valley Municipal Water District (EVMWD) is the current owner/operator of Railroad Canyon Reservoir and dam, which has a storage capacity (at an elevation of 1,380 feet above msl), approximately 11,000 acre-feet. The Canyon Lake Property Owner's Association (POA) currently has surface use rights that require the minimum water level remain at 1,372 feet in the reservoir at all times. The high water flood retention for the reservoir in the event of a 100-year flood is 1,397.5 feet. Water discharged from Canyon Lake dam drains via the unimproved San Jacinto River to Lake Elsinore, located approximately 3.2 miles downstream from the dam.

FEMA Flood Mapping

The Federal Emergency Management Agency (FEMA) is mandated by the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 to evaluate flood hazards. Flood Insurance Rate Maps (FIRMs) prepared by FEMA illustrate the extent of flood hazards in a flood-prone community. These maps delineate Special Flood Hazard Areas (SFHAs), typically identified as the 100-year flood zone, which has a one (1) percent chance of inundation in any given year. This base flood has a 26% chance of occurring during a 30-year period, the length of most home mortgages. In addition, areas within the 500-year floodplain (0.2% chance of inundation) are also mapped by FEMA; however, they do not require the same level of regulatory compliance as the 100-year flood zone.

The base flood is a regulatory standard used by the National Flood Insurance Program (NFIP) as the basis for insurance requirements nationwide. The Flood Disaster Protection Act requires owners of all structures in identified SFHAs to purchase and maintain flood insurance as a condition of receiving Federal or federally related financial assistance, such as mortgage loans from federally insured lending institutions. FEMA uses the concept of a "floodway" (river channel or watercourse that must be kept free of encroachment to discharge the base flood without cumulatively increasing the water surface elevation above a certain height) as the basis for floodplain management. Without analyses indicating that the proposed development will not increase downstream flood levels, communities are responsible for prohibiting encroachments into a designated floodway.



Exhibit SF-4 identifies that most of the developed portions in the City are outside the 500-year floodplain (Zone X), while a few areas along the lakefront are located within the 100 and 500-year flood zone. A number of structures have been constructed in the 100 and 500-year flood zones at various times during the development of the community and may sustain damage should an 100-year or greater storm occur. Owners of structures within the 100-year flood zone are required to purchase and maintain flood insurance as a condition of receiving a federally backed mortgage. In contrast, property owners/residents outside the 100-year flood zone *should* consider purchasing flood insurance in areas subjected to recurrent flooding.

Dam Inundation

Dam inundation occurs when a structure that impounds water catastrophically fails, releasing water. Releases like these are typically assumed to occur in conjunction with another event like an earthquake or erosion event associated with intense precipitation. The possibility of dam breach exists for any dam when excessive hydraulic forces or combinations of seismic and hydraulic forces acting on the dam.

The Railroad Canyon Dam is located within the City, and given its construction and proper maintenance and management, failure would be unlikely. Should the dam breach, the areas affected by the resulting flood are located west of the dam in the City of Lake Elsinore. The majority of the City is situated in the inundation zones of Perris Lake and Diamond Valley Lake Dams (**Exhibit SF-5**). The Diamond Valley Lake dam inundation area affects most of the northern portions of the City, whereas the Perris Lake dam inundation areas are generally restricted to properties located along the lake shoreline. In the event of dam failure from either of these dams, the City's designated evacuation routes and disaster preparedness measures will help residents and businesses get to safety.



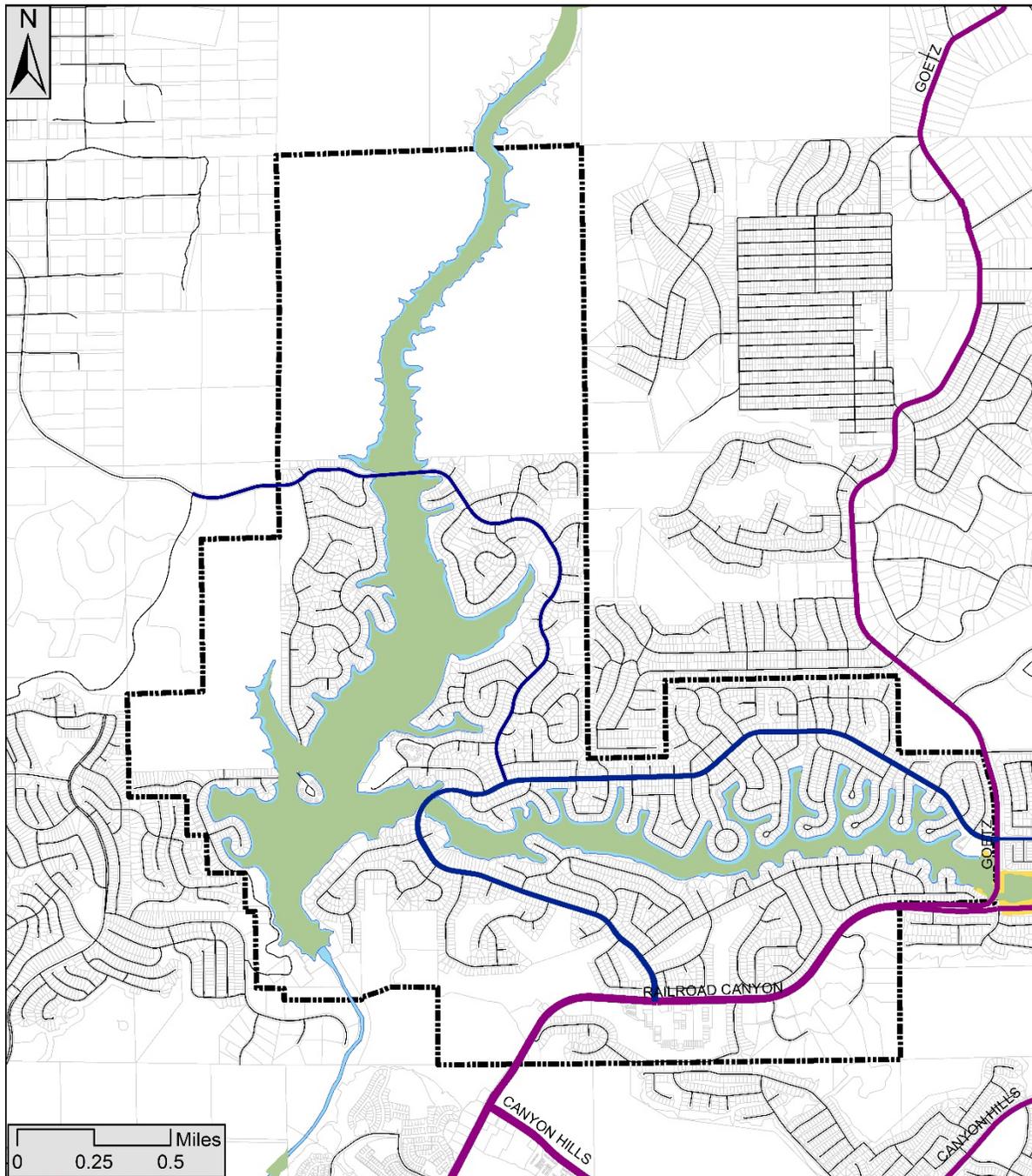
GOAL SF-2: A COMMUNITY RESILIENT TO FLOODING AND INUNDATION HAZARDS.

Policies

SF-2.1	Minimize injury, loss of life, property damage, and economic and social disruption caused by flooding and inundation hazards.
SF-2.2	Monitor and periodically evaluate the community flood protection and evacuation plans to assist persons and property owners and protect properties from 100-year flood threats and dam inundation.
SF-2.3	Mitigate flooding hazards of new development or expansion of existing projects within the FEMA 100-year/500-year Floodplain areas.
SF-2.4	Require new development within the 100-year flood plain or repetitive loss properties as identified by FEMA, to conduct hydrological studies, to assess the potential impacts the new development will have on the flooding and sedimentation potential of existing development downstream and implement appropriate mitigation measures to reduce this impact to an acceptable level.
SF-2.5	Participate in the National Flood Insurance Program and encourage all owners of properties located within the 100-year floodplain (Zones A and AO), and repetitive loss properties in Zone X, to purchase and keep flood insurance for those properties.
SF-2.6	Prohibit new facilities that use or store hazardous materials in quantities that would place them in the State's TRI or SQG databases from being located in the flood zone (Zones A, AO, and X), unless all standards of elevation, anchoring, and floodproofing have been implemented.
SF-2.7	Require all essential and critical facilities in or within 200 feet of Flood Zones A, AO, and X, to develop disaster response and evacuation plans that address the actions that will be taken in the event of flooding.
SF-2.8	Regulate development in drainages, especially in Flood Zones A and AE, according to FEMA regulations.
SF-2.9	Encourage uses that can withstand periodic inundation in the floodplains, such as parks, nature trails, equestrian parks, golf courses, or other recreational facilities.
Essential and Critical Facilities include facilities owned by the City or necessary for the City to function during or after a hazard event. Typical facilities include City Hall, fire stations, parks, community centers, and infrastructure improvements (water, sewer, storm drains, etc.)	



Exhibit SF-4 Flood Hazard Zones



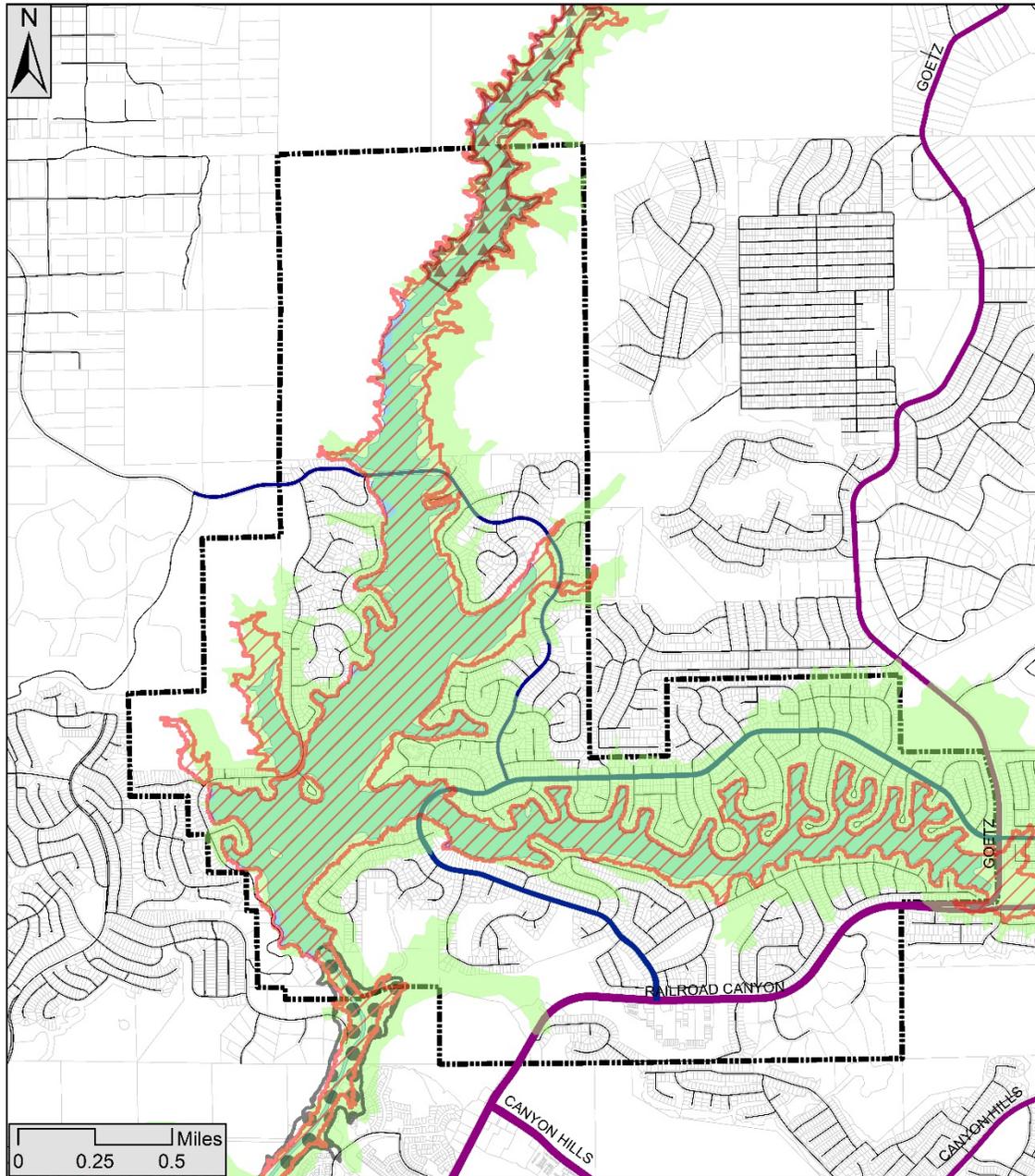
Canyon Lake Safety Element Update

- | | |
|----------------------------------|--------------------------------|
| Potential Evacuation Routes | FEMA Flood Hazard Zones |
| Resilient IE - Evacuation Routes | 100 Year Flood Zone |
| Canyon Lake City Limits | 500 Year Flood Zone |





Exhibit SF-5: Dam Inundation Map



Canyon Lake Safety Element Update

- Potential Evacuation Routes
- Resilient IE - Evacuation Routes
- ▭ Canyon Lake City Limits
- ▨ Perris
- ▨ Railroad Canyon
- ▨ Lake Hemet
- Diamond Valley Lake Inundation*



* Mapping includes all inundation zones in one layer to show potential impacts from failure of any of the dams.



C. FIRE HAZARDS

Wildfires are a necessary part of the natural ecosystem in southern California, but they become a hazard when they extend out of control into developed areas, with a resultant loss of property, and sometimes, unfortunately, injuries or loss of life. Wildfire risk in the United States has increased in the last few decades with the increasing amount of development and activity occurring within the wildland-urban interface (WUI). Various vegetation types are located within the City, including riparian habitats along the lake and river, sage scrub within the hillside areas, succulents, trees, and grasses. During dry seasons, these vegetation types can become fire-prone.

Wildland Fires

Wildland fires occur mainly in undeveloped areas where dry vegetation is plentiful. Wildland fires are an important element of ecosystem management; however, the proximity of these incidents to developed areas creates challenges for proper fuels management and risk reduction activities for many communities throughout the state. The City has experienced a variety of historic wildfire incidents which occurred between 1955 and 2012 with a majority of the incidents occurring outside the City limits within undeveloped areas at the time of occurrence (**Exhibit SF-6**).

According to the Fire and Resource Assessment Program (FRAP) within the California Department of Forestry and Fire Protection (Cal Fire), portions of the City are within Very High Fire Hazard Severity zones (**Exhibit SF-7**). These zones identify areas that are most prone to future wildfire occurrences based on vegetation types, topography, and past wildfire incidence. The primary areas of concern are the undeveloped hillsides in and adjacent to the City. California State law requires disclosure of properties located within a very high fire hazard severity zone or State responsibility area in real estate transactions to reduce the potential for uninformed homeowners landscaping or modifying structures and increased wildfire risk in the process. The remaining portions of the City are located within moderate to high fire hazard severity zones.

Of the fire-prone areas within the City, the Bureau of Land Management (BLM) land in the north and west portions of the City are most susceptible to wildland fires due to offroad vehicles' unauthorized use of these areas, campfires, and hikers. Ignition of wildfires could occur from these uses and ignite brush and other combustible materials in the area. This threat greatly increases during the dry summer months and during strong Santa Ana wind events. To ensure



adequate protection from wildland fires, the Riverside County Fire Department supports fire response activities that have transferred over to the City's newly established fire department on January 1, 2022. The Canyon Lake Fire Department is responsible for fire response activities in these areas, as well as oversight of development activities along the WUI, and adherence to wildfire requirements. A key concern for the fire department is the height of new buildings proposed within the City. Future developments proposing buildings taller than two stories may require the purchase of new equipment to better respond to incidents.

Urban Fires

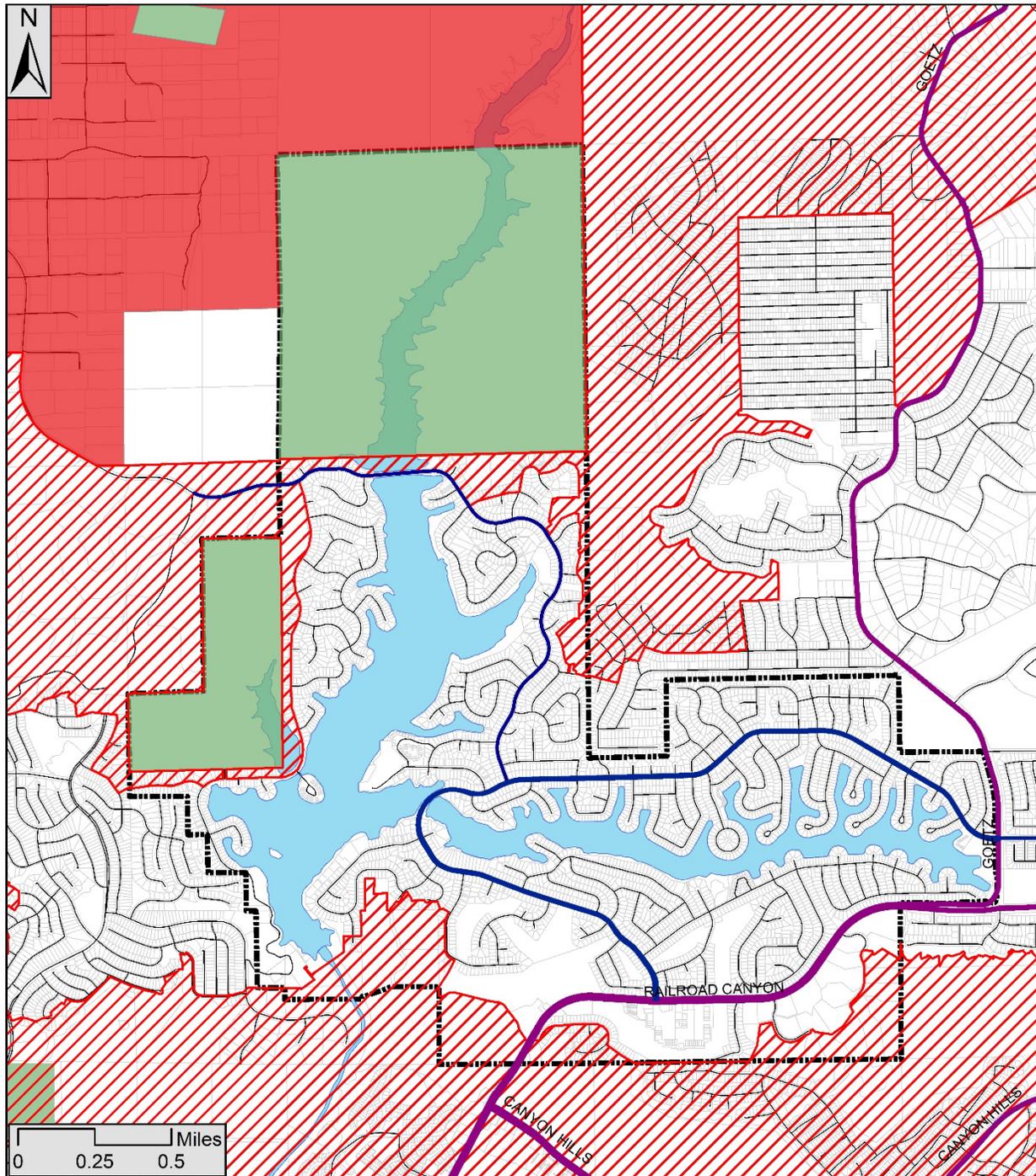
Urban fires are fires originating within or involving structures within a developed location. Historically structure fires in the City have represented less than two percent of annual emergency calls. In conjunction with the Fire Department, the City Building and Safety Department enforce the fire prevention standards contained in the California Building Code, Fire Code, and Emergency Operations Plan as they review building plans and conduct inspection enforcement. These codes and plans require adequate structure clearances and additional measures to prevent fires in the community. In addition to these activities, the Fire Department will play a key role in providing educational materials to businesses and residents to better protect themselves from fire hazards.

Fires Caused by Earthquake

Large earthquakes occurring near Canyon Lake, either along the Elsinore, San Jacinto, or San Andreas faults, can potentially cause damage to the City's infrastructure (water, sewer, storm drain) and critical facilities (City Hall, fire stations). Loss of any facilities or capabilities (i.e., reduction in water availability) can result in secondary damage to City structures if fire response personnel cannot effectively respond to incidents or suffer a delay. Structure fires caused by an earthquake are typically the result of electrical malfunctions, gas leaks, or toppled-over heat or flame sources. If coinciding at multiple locations, they could affect fire department response, especially if their buildings and equipment have been damaged.



Exhibit SF-6: Fire Hazard Severity Zones Map



Canyon Lake Safety Element Update

- Potential Evacuation Routes
- Resilient IE - Evacuation Routes
- Canyon Lake City Limits
- Very High Fire Hazard Severity Zone (LRA)
- State Responsibility Area
- Federal Responsibility Area





GOAL SF-3: A COMMUNITY ADAPTED TO CURRENT AND FUTURE FIRE CONDITIONS

Policies/ Implementation Actions

SF-3.1	Reduce the risk of death, injury, property damage, and economic loss due to vegetation and structure fires.
SF-3.2	Ensure vegetation management reduces fire potential on private and public lands, especially those adjacent to community use areas.
SF-3.3	Avoid building within the Very High Fire Hazard Severity Zones, where feasible and require adherence to California Building Code Chapter 7a requirements when building in these areas occurs. Existing dwellings shall comply with Chapter 7a requirements when major remodels and/or additions are proposed.
SF-3.4	Incorporate safe fire design into new development and ensure all development is constructed per the most recent California Fire Code, as adopted within the City's Municipal Code.
SF-3.5	All development projects within the VHFHSZ must prepare a Fire Protection Plan (FPP) to reduce or eliminate fire threats. FPPs shall be consistent with the following guidance: A Fire Protection Plan (FPP) approved by the fire code official is required for all new development within the Very High Fire Hazard Severity Zones (VHFHSZ). FPPs are required to include mitigation strategies that consider location, topography, geology, flammable vegetation, sensitive habitats/species, and climate of the proposed site. FPPs must address water supply, access, building ignition, and fire resistance, fire protection systems and equipment, proper street signage, defensible space, vegetation management, and long-term maintenance. All required FPPs must be consistent with the requirements of the California Building and Residential Codes, the California Fire Code as adopted by the City of Canyon Lake, and the City of Canyon Lake Municipal Code.
SF-3.6	Undertake inspections of parcels throughout the City as necessary, and direct property owners to comply with vegetation management (fuel modification/space) and fire inspection standards.
SF-3.7	Regularly re-evaluate specific fire hazard areas and adopt reasonable safety standards covering such elements as fuel modification around homes, adequacy of existing and future water supplies, fire flow tests, fire hydrants, routes or throughways for fire equipment access, clarity of addresses and street signs, and long-term maintenance.
SF-3.8	Ensure fire, police, and emergency personnel, equipment, and services adequately meet the needs and serve all areas of the City.
SF-3.9	Work to ensure residents and businesses can be effectively notified of wildfire threats and incidents.
SF-3.9a	Evaluate alert and warning systems (consistent with the California Public Alert and Warning System Plan) that can be used to warn residents of an approaching wildfire and to provide evacuation instructions.
SF-3.9b	Expand alert and warning activities using social media and other strategies that meet Canyon Lake residents' needs and desires.
SF-3.10	Coordinate with the Elsinore Valley Municipal Water District and Eastern Municipal Water District on future water supply needs and existing water infrastructure constraints and deficiencies that could affect their ability to meet fire flow requirements
SF-3.11	Refine and enforce a fire safety program for the community that considers emergency medical responses, wildland interface conditions, long-term vegetation management activities (along public and private roads), and hazards mitigation/management.



SF-3.11a	Conduct a feasibility study to determine if community fire breaks can be implemented, the locations for these fire breaks, and determine the appropriate size, orientation, and responsibility for creation and long term maintenance.
SF-3.12	Ensure existing non-conforming structures address deficiencies and update requirements when new development approvals/entitlements are sought.
SF-3.12a	Adopt regulations concerning the installation of fire protection devices in existing structures within Canyon Lake.
SF-3.12b	Ensure owners of non-sprinklered high-occupancy structures retrofit their buildings to include internal sprinklers, as state law requires.
SF-3.13	All new development, redevelopment, and major remodels within the VHFHSZ will provide at least two points of ingress/egress, except for existing single-family residential lots.
SF-3.14	Ensure the roadway network within the VHFHSZ meets current and anticipated future evacuation needs.
SF-3.15	If roadway constraints exist, identify alternative means of evacuation and sheltering to protect property and life safety.

D. HAZARDOUS MATERIALS AND WASTES

Hazardous materials are used every day in industrial, commercial, medical, and residential applications. The primary concern associated with a hazardous materials release is the public's short- and/or long-term effects from exposure to these substances. According to the Environmental Protection Agency (EPA) and California Department of Toxic Substances Control (DTSC), no hazardous material waste/disposal sites are located within the City. There are no businesses that generate, use, or store hazardous materials.

The primary potential sources for hazardous materials release exposure are Railroad Canyon Road, a major transportation route connecting to Interstate 15 and Interstate 215 via Newport Road. Vehicles transporting hazardous materials along this route could impact the community if a release occurs. If a hazardous materials spill is reported, the City's fire department will coordinate with other agencies (California Highway Patrol, Caltrans, Riverside County Sheriff, and Riverside County Fire Department, and surrounding jurisdictions).

All businesses that handle more than a specified amount of hazardous or extremely hazardous materials must submit a Hazardous Materials Business Plan to the local Certified Unified Program Agency (CUPA). The local CUPA is the Riverside County Environmental Health Department in Canyon Lake. Leaking underground storage tanks (LUSTs) are the primary cause of groundwater contamination by gasoline compounds and solvents. The State Water Resources Control Board (SWRCB) is the lead regulatory agency in developing regulations and policies for underground



storage tanks. The City currently has one reported LUST case with a status of Open-Remediation, located at 24610 Railroad Canyon Road.



Hazardous materials are also used in residential applications: paints, thinners, bleach, ammonia, Drano, and other similar products, in addition to motor oil, batteries, and spent fluorescent light bulbs, to mention a few. If not disposed of properly, such substances can impact the environment—the City of Canyon Lake contracts with CR&R Waste & Recycling Services for trash collection and recycling needs. CR&R does not handle household hazardous waste. The nearest household hazardous waste facility is the Lake Elsinore Regional Permanent HHW Collection Facility, approximately 5 miles west of the City.

GOAL SF-4: A COMMUNITY WHERE HAZARDOUS MATERIALS INCIDENTS AND RELEASES ARE AVOIDED OR MITIGATED.

Policies

SF-4.1	Require commercial and industrial uses to develop and maintain business plans that address storage, transport, use, and disposal of hazardous materials according to State law.
SF-4.2	Enforce disclosure laws that require all users, generators, and transporters of hazardous materials and wastes to identify the materials they store, use or transport, and notify the appropriate City, County, State, and Federal agencies of a change in quantity or type of materials.
SF-4.3	Ensure that the City of Canyon Lake Fire Department can continue to respond safely and effectively to a hazardous materials incident in the City.
SF-4.4	Ensure that sensitive receptor facilities (schools, medical facilities, child care centers, or other facilities with special evacuation needs) located adjacent to truck routes develop emergency response plans for potentially hazardous material release events.
SF-4.5	Reduce or eliminate the use of hazardous materials by using non-toxic, safer alternatives that do not pose a threat to the environment or buying and using only the smallest amount of a hazardous substance needed.
SF-4.6	Prohibit proposed new facilities that will be involved in the production, use, storage, transport, or disposal of hazardous materials within the 100-year floodplain or near existing land uses; such activities may adversely impact adjacent residents.
SF-4.7	Require an analysis for the presence of other related hazardous chemicals, lead-based paints or products, mercury, and asbestos-containing materials (ACMs) when buildings or other structures, asphalt or concrete-paved surface areas are being demolished. Require proper precautions in handling hazardous chemicals, lead-based paints or products, mercury, or ACMs identified during demolition activities and require the contaminants to be remediated to comply with California environmental regulations and policies.



A. EMERGENCY RESPONSE / PUBLIC SAFETY

Canyon Lake Police Department

Police protection for the Canyon Lake Police Department is provided through a contract with the Riverside County Sheriff's Department. Service is provided from the Perris station located at 137 N. Perris Blvd, Perris, and Sheriff's Department personnel are provided at a satellite office located at Canyon Lake City Hall at 31516 Railroad Canyon Road, Canyon Lake. Police services are dispatched from the main headquarters in Perris, but the satellite office is centrally located in the City for efficient response.

The Perris station uses Crime Prevention programs to enhance community awareness and teach vital skills in working with law enforcement. The Community Service Officers are members of the California Crime Prevention Officers' Association (CCPOA), which provides training and networking of law enforcement personnel, public officials, community planners, educators, and business owners to come together and share a common goal of crime prevention.

Canyon Lake Fire Department

The City of Canyon Lake Fire Department provides fire protection and services, which initiated operation on January 1, 2022. The Department operates out of Fire Station No. 60 located at 28730 Vacation Drive. As a new department, the City has also entered into Mutual Aid/Automatic Aid agreements with surrounding jurisdictions (Menifee and Lake Elsinore) and Riverside County to support additional station response needs. Aid would most likely be provided out of Station No. 5 located at 28971 Goetz Road and Station No. 94 located at 22770 Railroad Canyon Road located in Menifee and Lake Elsinore, respectively. Fire Station No. 60 is staffed full-time, 24 hours, 7 days a week, to respond to incidents Citywide.

The Fire Department constantly monitors fire hazards in the City and has ongoing programs for public education and investigating and mitigating hazardous situations. Such hazards include emergency response calls, vegetation and structure fires, vehicle accidents, public assistance, and false alarms. The fire stations are staffed by administration, fire fighters, and paramedic personnel.



Fire protection planning is a key consideration in new developments, and major remodels in Canyon Lake. For all discretionary applications and most administrative applications will be reviewed by the Fire Department to address code requirements and recommendations. Developments within Canyon Lake are required to comply with all applicable City and State fire codes to reduce the potential threat from fires igniting and spreading, allow for effective evacuation of occupants, and provide safe access for first responders to extinguish the fire. The Fire Department also enhances fire safety in the community by coordinating education programs designed to increase community involvement.

Disaster Preparedness

A disaster is a sudden and dramatic emergency. When a disaster occurs, the threatened jurisdiction strives to 1) protect its residents to the greatest extent possible, 2) care for victims, and 3) restore essential services as soon as possible. A jurisdiction needs to respond quickly, dynamically, and as effectively as possible to do this. This requires preparation at all levels, from the Federal government (for large-scale disasters) to individual neighborhoods, families, and businesses.

The City of Canyon Lake Emergency Preparedness Committee is a group of volunteers who prepare the City for any disaster. Volunteer residents staff this Committee, which has representatives from Community Clubs, the Property Owners Association, the City, and Riverside County Fire. The Committee also has liaisons with the American Red Cross, FEMA, and local merchants for emergency supplies. Committee volunteers are trained in CPR, Advanced First Aid, Search and Rescue, and Damage Assessment. These volunteers oversee and support activities within the Emergency Operations Center, Casualty Collection Centers, Care, and Shelter facilities, and conduct neighborhood damage assessments.

Issues pertaining to emergency response, disaster preparedness, and disaster recovery require assessing the hazards, identifying functions and resources to handle short-term and long-term response, and developing recovery procedures. As part of the City's emergency preparedness planning, emergency notifications are conducted using the CodeRED Emergency Notification System to call all residents who have signed up and deliver a recorded message.

The City of Canyon Lake has an Emergency Operation Plan (EOP) that incorporates and coordinates all the facilities and personnel of the City into an efficient organization capable of



responding effectively to any emergency. The City's EOP is an extension of the State Emergency Plan and is reviewed and exercised periodically and revised as necessary to meet changing conditions. The City has two Emergency Operations Centers (EOC) located at City Hall and Fire Station Number 60, which play a central role in managing and directing various emergency response activities by City Departments and other agencies.

Recovery

When disaster strikes, many communities are faced with challenges associated with post-disaster recovery. This could include re-establishing essential services, reconstructing damaged or destroyed structures, and enhancements to reduce future threats. Recovery is an opportunity to improve a community's resilience, making it easier to adapt to changing hazards in the future. Examples include avoiding reconstruction in hazard-prone areas or improving infrastructure in areas to reduce hazard impacts (flooding, wildfire, etc.). Having a recovery plan in place can help with reconstruction's decision-making process, improve communication with other levels of government involved in the disaster response phase, and incorporate hazard mitigation into recovery efforts.

Evacuation/Emergency Routes

Evacuation refers to the movement of people that are at risk of being impacted by a disaster to a safer location, using routes that do not pose a significant danger to the evacuees. Thus, both the destination and the route need to be scrutinized, preferably before the evacuation orders are issued. This involves deciding which of the potential temporary shelters in the City be opened, based on the shelters' locations relative to the impending disaster and their ease of accessibility from the safest identified routes.

The Canyon Lake Police Department typically serves as the lead organization in carrying out evacuations, supported by the Fire Department, as appropriate. The Public Works department typically assists in identifying the best evacuation routes and barricading the evacuated areas. Evacuation routes are usually established once the disaster has taken place.



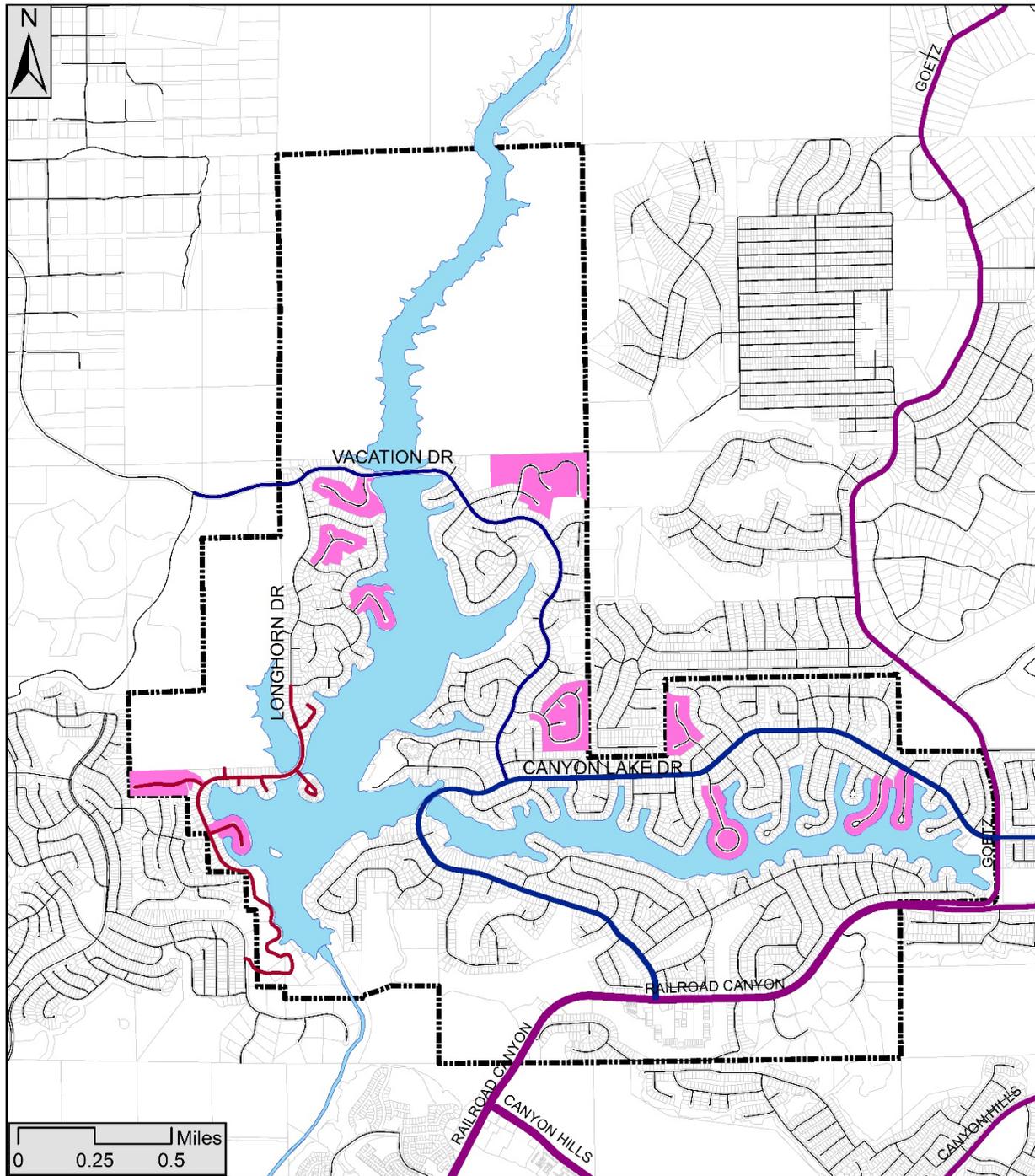
The Resilient IE Toolkit² prepared by the Western Riverside Council of Governments identified primary evacuation routes for the City, which include Railroad Canyon Road and Goetz Road. These two routes connect the City to the rest of the region. In addition, internal roadways within the City that could accommodate evacuation include Greenwald Avenue (Vacation Drive) and Canyon Lake Drive. These routes are identified in **Exhibit SF-8** along with areas of the City where potential evacuation may be hindered due to limited access (single ingress/egress) conditions. Evacuation route use is dependent on the specifics of the hazard incident:

- Earthquakes occur suddenly and generally without warning. Evacuation may be necessary post-disaster if the ground shaking causes significant damage to structures or a secondary event like the failure of a water reservoir or the release of hazardous materials from a ruptured tank/container. Post-earthquake fires may also require the evacuation of certain areas, but these are generally localized areas with a limited number of affected individuals. Evacuation route use will depend on which areas are at risk from secondary hazard events.
- Fires in the Canyon Lake area have historically occurred in the foothills and undeveloped areas of the City. If prevailing winds push fires into the more developed portions of the City, then areas/neighborhoods threatened may require evacuation. In general, evacuees would be directed to take roads leading away from the threatened areas and out of the City.
- Localized flooding due to storms typically occur at low points or where floodwaters can become obstructed. The appropriate evacuation routes to use during flooding events depend on the locations where flooding is occurring. Evacuation may be isolated to low areas within the City and involve relocation to higher elevations until flooding has subsided.
- Hazardous materials releases would most likely originate from a location that stores or uses these materials or spill release on the highway or roadways. These incidents will generally require the evacuation of a relatively small area, generally within a 1- to 2-mile radius of the release. Designation of evacuation routes would be conducted by the Police Department based on an assessment of the leak location, prevailing wind directions, traffic flow, and emergency shelter locations, if necessary for the event.

² <https://wrcog.us/285/Resilient-IE>



Exhibit SF-8: Evacuation Routes/ Constraints



Canyon Lake Safety Element Update

- Constrained Evacuation Routes
- Potential Evacuation Routes
- Resilient IE - Evacuation Routes
- Limited Ingress/Egress Neighborhoods
- Canyon Lake City Limits





Peak-load Water Supply

Two water districts serve the City of Canyon Lake; Elsinore Valley Municipal Water District (EVMWD) serves most of the City, and the Eastern Municipal Water District (EMWD) serves a few hundred homes in the northeast portion of the City. The lake in the City is owned by EVMWD, which is used as the primary water supply for the City and EVMWD customers throughout the service area.

Two water storage tanks currently serve Canyon Lake, with a total storage of 2.0 MG (million gallons). The Canyon Lake Pump Station pumps water from the base loop zone to the two storage tanks in the Canyon Lake area. The Canyon Lake Water Treatment Plant has a maximum capacity of 9 MGD (millions of gallons per day). According to the EMWD, the Canyon Lake area has an average daily demand of 2.10 MGD and a maximum projected daily demand of 4.20 MGD. Together with the pump station and the water treatment, the storage tanks are adequate to provide the daily water-supply demand in the Canyon Lake area. The projected overall 2020 water demand for the entire EVMWD service area is estimated at 23,000 acre-feet per year (afy). This demand is projected to increase to over 40,000 afy, which is below the project water supplies of 55,000 afy anticipated by EVMWD. Based on the EVMWD Urban Water Management Plan, the City of Canyon Lake is projected to have adequate existing and future water supplies through 2045.

Road Minimum Widths and Turnouts

Minimum road widths and turnouts are essential for designing a safe environment ensuring emergency vehicles have access to all areas within the City. The City of Canyon Lake requires that all road widths and turnouts comply with the minimum street standards within the municipal code. This allows emergency vehicles access to all areas within the City. The City's Engineering and Public Works Department is responsible for implementing and ensuring public roads are designed to these standards and updating them appropriately. Updates to the State's Fire Safe Regulations may require future updates to the City's municipal code.



Clearance around Structures

Clearances around structures help create a defensible space – this includes brush clearance to ensure a clear line of sight around a structure. This clearance also allows Fire and Sherriff's Department personnel adequate access and protection of structures.

Emergency Shelters

Loss of function or habitability of buildings may displace residents requiring them to seek temporary shelter. Potential shelter locations in Canyon Lake include parks, senior centers, and churches. Canyon Lake Community Church is the City's designated shelter (located at 30515 Railroad Canyon Road); however, during an emergency, the City will identify the appropriate shelter location if this site is unavailable or unable to accommodate evacuees. The City's Emergency Preparedness Committee oversees and assists with Shelter and Care activities for the City.

GOAL SF-5: A COMMUNITY THAT MEETS EXISTING AND FUTURE EMERGENCY SERVICE NEEDS.

Policies/ Implementation Actions

SF-5.1	Maintain a high level of emergency response capability.
SF-5.1a	Ensure annual budgeting cycles account for current and future emergency service needs.
SF-5.1b	Periodically update the City's priorities for future emergency service needs in the City.
SF-5.1c	Continue to involve the Fire and Police Departments in the development review process to ensure that new development adequately addresses service levels, security concerns, and safety.

GOAL SF-6: A COMMUNITY READY TO RESPOND AND EFFECTIVELY RECOVER FROM DISASTERS.

Policies/ Implementation Actions

SF-6.1	Plan for emergency response and recovery from natural hazard events (flooding, fires, and earthquakes) and human-caused hazards that could impact the community.
SF-6.2	Continue to work with local emergency management agencies to maintain and update the City's Emergency Operations Plan (EOP).
SF-6.3	Maintain and update the City's Local Hazard Mitigation Plan every five years to sustain access to FEMA grant funding sources.
SF-6.4	Maintain and update the emergency response organization, including all City departments, the Riverside County Sheriff Departments, local quasi-governmental



	agencies, private businesses, citizens, and other community partners involved in emergency relief and/or community-wide services.
SF-6.5	Maintain mutual aid agreements with neighboring cities (Menifee, Lake Elsinore) and the Riverside County Operational Area.
SF-6.6	Participate in regional and local emergency exercises.
SF-6.7	Ensure critical facilities and special needs populations are prepared for future hazard events.
SF-6.7a	Maintain a critical facilities inventory that includes key city facilities, assisted living/dependent care facilities, high occupancy facilities, and other key locations of concern.
SF-6.7b	Ensure to the fullest possible extent that, in the event of a major disaster, critical facilities in the City's inventory (SF-6.7a) remain functional after a hazard event.
SF-6.8	Incorporate into the City's critical facilities inventory (SF-6.7a) information regarding population demands (such as mobility issues), construction type, location relative to a high hazard area, or other factors requiring special response needs during a disaster.
SF-6.9	Continue to train all City employees on their roles and responsibilities in times of disasters and local emergencies.
SF-6.10	Support the development of local preparedness plans, trainings, and multi-jurisdictional cooperation and communication for emergencies consistent with regional, state (SEMS), and Federal standards, guidelines and/or recommendations (NIMS).
SF-6.11	Review the potential emergency shelter locations for humans and animals and develop agreements, as needed, with the owners and operators of those facilities.
SF-6.12	Assist residents and businesses to understand their risks within the community and the means to mitigate these risks effectively.
SF-6.12a	Offer educational programs for residents and businesses regarding preparedness activities, evacuation routes, and mitigation actions/strategies to take before, during, and after an emergency to improve community resilience.
SF-6.12b	Involve the public in the development of emergency response plans, mitigation resources, and risk reduction activities.

GOAL SF-7: A CITY THAT CAN EFFECTIVELY RESPOND AND EVACUATE DURING HAZARD EVENTS.

Policies/ Implementation Actions

SF-7.1	Coordinate with the County of Riverside regarding transportation network constraints and improvements.
SF-7.2	Coordinate with agencies to prioritize roadway and storm drain infrastructure retrofitting and enhancement projects along primary evacuation routes.
SF-7.3	Ensure all new development and redevelopment projects provide adequate ingress/egress for emergency access and evacuation.
SF-7.4	Identify and construct additional evacuation routes in areas of high hazard concern or limited mobility, where feasible.



SF-7.5	Ensure the City's transportation network allows for effective emergency response and evacuation activities
SF-7.5a	Develop evacuation standards and metrics for constrained neighborhoods and alternative evacuation plans, where necessary.
SF-7.5b	Monitor changes to hazard conditions and vulnerabilities to ensure the accessibility or viability of evacuation routes in the future.
SF-7.5c	Develop an implementation program that identifies areas of the City with limited ingress/egress, limited circulation capacity, and/or critical infrastructure that could impact evacuation efforts and conduct exercises to better accommodate future evacuation events.
SF-7.5d	Develop an education and outreach program on the potential evacuation scenarios and the activities that residents and businesses can do to better prepare for these potential events.
SF-7.5e	Develop an alternative evacuation plan for residents with access to boats that can transport people to safety.

B. CLIMATE ADAPTATION

Although climate change is not itself a hazard, variations in environmental conditions can impact some of the natural hazards affecting Canyon Lake. Projections of future conditions include increased temperatures, increased extreme heat days, changes in precipitation, more prolonged droughts, and changes in the size and frequency of wildfire incidents. **Table SF-1** identifies the current/historical conditions and projected future conditions within Canyon Lake associated with climate change.

Increasing temperatures associated with climate change can act as a hazard multiplier. By the end of the century, annual mean temperatures are projected to increase between six and nine degrees, impacting city residents and businesses. These increases are also anticipated to increase the number of extreme heat days from 4 days per year to 24 days. These potential temperature increases may impact residents living in poorly insulated structures or structures that do not meet current code requirements.

Table SF-1 – Potential Climate Change Effects for Canyon Lake

	Historic (1961-1990)	Future (2070-2099)
Annual Mean Temperature	79.5° F	85.6 to 88.4° F
Extreme Heat Days	4 days per year	24 days per year
Annual Mean Precipitation	11.9 inches	12.1 to 13.3 inches
Annual Average Area Burned	36.8 acres	0.0 to 32.1 acres

Source: <https://cal-adapt.org/>



While temperatures are anticipated to increase in the coming decades, climate change projections also suggest that annual mean precipitation may stay the same or slightly increase. While a minimal increase is projected, it is anticipated that future rain events may be more intense than what is currently experienced within the City, increasing flooding within the City. With changes in future precipitation, it is expected that changes to local vegetation may occur, which could impact drainage and increase the need for wildfire management activities.

Increased rainfall could increase the amount of flooding within the community or introduce flooding into areas that have not experienced flooding in the past. With greater and more intense precipitation, the City could also experience an increase in landslides/mudslides. Extreme precipitation events could de-stabilize hillsides and drainages, resulting in more landslides/mudslides and/or erosion along with stream courses, impacting neighboring properties/structures.

With future temperature increases, coupled with relatively similar precipitation amounts experienced today, future wildfire impact is projected to decrease by the end of the century. This projection is based on the overall reduction in small and moderate precipitation events and an increase in large or extreme events, suggesting that vegetation growth will experience an overall reduction. A reduction in vegetation could reduce future wildfire vulnerability due to reduced fuels. The City currently experiences an annual average of 36.8 acres burned, which is projected to decrease to between 0.0 and 32.1 acres by the end of the century.



GOAL SF-8: ENSURE CITY SERVICES AND OPERATIONS CAN ADAPT TO CHANGING CLIMATIC CONDITIONS.

Policies/ Implementation Actions

SF-8.1	Enhance design requirements and standards for City assets to accommodate increased frequency and intensity of extreme weather events (heat, wind, rain).
SF-8.2	Ensure vulnerable populations and facilities can adapt to future extreme hazards and events.
SF-8.2a	Identify vulnerable populations within Canyon Lake that extreme hazards and events could impact.
SF-8.2b	Retrofit critical facilities to accommodate changing climatic conditions associated with extreme weather.
SF-8.3	Enhance roadway standards to accommodate increases in the frequency and intensity of extreme weather events (heat, rain, wind).
SF-8.4	Promote water conservation and enhanced water efficiency to reduce future water demands within Canyon Lake.
SF-8.4a	Conduct a feasibility study for a water efficiency retrofit incentive program with future sustainable funding sources.
SF-8.5	Monitor emergency response calls for service and track increases associated with extreme weather-related incidents.
SF-8.6	Develop new facilities or retrofit existing facilities to accommodate sheltering needs during a power failure or extreme weather events.
SF-8.7	Coordinate with service providers (medical, hospitality, etc.) to ensure community needs can be met during hazard events requiring evacuation and shelter.
SF-8.8	Track and monitor health indicators, in conjunction with other agencies, for changes associated with climate change.
SF-8.9	Coordinate with utility providers on new construction and retrofit of infrastructure vulnerable to climate change-related effects.



IV. IMPLEMENTATION PROGRAMS / ACTIONS

SEISMIC AND GEOLOGIC HAZARDS

SF-1.5a – Initiate and/or participate in regional efforts to ensure that the local medical care facilities will remain functional after a large regional earthquake and can provide emergency medical care to all residents and workers that need medical attention following a disaster. Based on these results, collaborate with neighboring cities and the Southern California Association of Governments to identify those areas with insufficient medical coverage and engage medical service providers to consider establishing new medical care facilities in those areas, as needed.

FIRE HAZARDS

SF-3.9a – Evaluate alert and warning systems (consistent with the California Public Alert and Warning System Plan) that can be used to warn residents of an approaching wildfire and to provide evacuation instructions.

SF-3.9b – Expand alert and warning activities using social media and other strategies that meet Canyon Lake resident needs and desires.

SF-3.12a – Adopt regulations concerning the installation of fire protection devices in existing structures within Canyon Lake.

SF-3.12b – Ensure owners of non-sprinklered high-occupancy structures retrofit their buildings to include internal sprinklers, as state law requires.

EMERGENCY SERVICES / PUBLIC SAFETY

SF-5.1a – Ensure annual budgeting cycles account for current and future emergency service needs.

SF-5.1b – Periodically update the City's priorities for future emergency service needs in the city.

SF-5.1c – Continue to involve the Fire and Police Departments in the development review process to ensure that new development adequately addresses service levels, security concerns, and safety.

SF-6.7a – Maintain a critical facilities inventory that includes key city facilities, assisted living/dependent care facilities, high occupancy facilities, and other key locations of concern.



SF-6.7b – Ensure to the fullest possible extent that, in the event of a major disaster, critical facilities in the City's inventory (SF-6.6a) remain functional after a hazard event.

SF-6.12a – Offer readily-available educational information from local, state, and federal sources for residents and businesses regarding preparedness activities, evacuation routes, and mitigation actions/strategies to take before, during, and after an emergency.

SF-6.12b – Involve the public in developing emergency response plans, mitigation resources, and risk reduction activities.

SF-7.5a - Develop evacuation standards and metrics for constrained neighborhoods and alternative evacuation plans, where necessary.

SF-7.5b - Monitor changes to hazard conditions and vulnerabilities to ensure the accessibility or viability of evacuation routes in the future.

SF-7.5c - Develop an implementation program that identifies areas of the City with limited ingress/egress, limited circulation capacity, and/or critical infrastructure that could impact evacuation efforts and conduct exercises to better accommodate future evacuation events.

SF-7.5d - Develop an education and outreach program on the potential evacuation scenarios and the activities that residents and businesses can do to better prepare for these potential events.

SF-7.5e - Develop an alternative evacuation plan for residents with access to boats that can transport people to safety.

CLIMATE ADAPTATION

SF-8.2a – Identify vulnerable populations within Canyon Lake that extreme hazards and events could impact.

SF-8.2b – Retrofit critical facilities to accommodate changing climatic conditions associated with extreme weather.

SF-8.4a – Conduct a feasibility study for a water efficiency retrofit incentive program with future sustainable funding sources.