

# 8 Safety

## Introduction

The Safety Element addresses natural and manmade environmental hazards that might occur in Rancho Mirage and surrounding areas. It provides information, goals, policies, and programs to protect the general health, safety, and welfare of the community from seismic, geological, flood, hydrology, and hazardous and toxic materials events. The assessment of and planning for these hazards and the constraints that manage them is the primary purpose of the Safety Element. The policies and programs of this element should also be coordinated with the Public Services and Facilities Element, which includes a discussion of emergency services and facilities and the City's Emergency Preparedness Plan.

## Geotechnical Hazards

### Purpose

Rancho Mirage and the SOI are located in an area subject to substantial seismic and geological hazards such as strong ground shaking, seismic-induced settlement, seismic-induced landslides, collapsible and expansive soils, ground subsidence, and wind-blown sand hazards. These seismic and geological hazards can affect the structural integrity of buildings and utilities and, in turn, cause severe property damage and potential loss of life.

The purpose of the Geotechnical Hazards section, in the following pages, is to provide information, goals, policies, and programs to protect the general health, safety, and welfare of the residents of Rancho Mirage relative to seismic and other geotechnical hazards. It also serves to educate the community about seismic and related geologic hazards.

### Background

#### Major Fault Hazards in the Rancho Mirage Area

Rancho Mirage is located in an area with numerous active faults. At least two active faults lie close to Rancho Mirage's northern edge and SOI, but are north of I-10 and outside of the City's

jurisdictional boundaries. These are the Banning fault and the Garnet Hill fault. Both fault zones are capable of causing damage to Rancho Mirage. Other faults in the region, such as the San Andreas, San Jacinto, and San Geronio Pass faults, also have the potential to produce strong seismic shaking in Rancho Mirage. Ground shaking during an earthquake is the most significant seismic hazard that will impact Rancho Mirage. Exhibit 21 shows the faults surrounding the city.

The most important piece of legislation related to seismic hazards is the Alquist-Priolo Earthquake Fault Zoning Act, which prohibits locating structures for human occupancy across active fault lines until geotechnical investigations determine that a prospective site is safe for habitation. The Act also requires cities to disclose to the general public areas that are subject to seismic hazards, by means of maps and other appropriate materials.

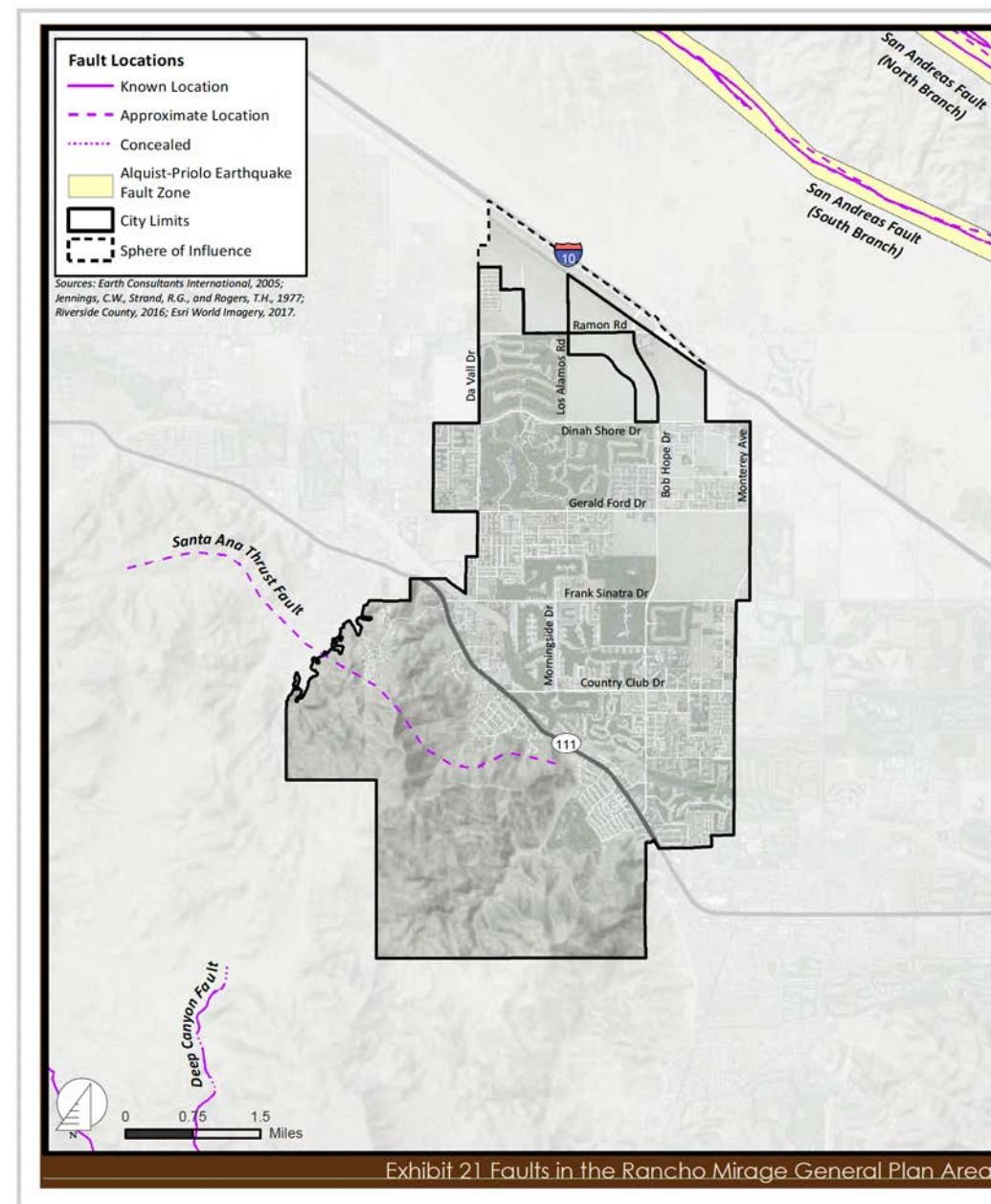
An effective seismic hazard reduction program should include the identification and mapping of geologic and seismic hazards, the enforcement of building and fire codes, and the expedient retrofitting and rehabilitation of weak structures. Programs should also be developed to help residents provide for themselves and their families in the aftermath of an earthquake.

#### Other Seismically Induced Hazards

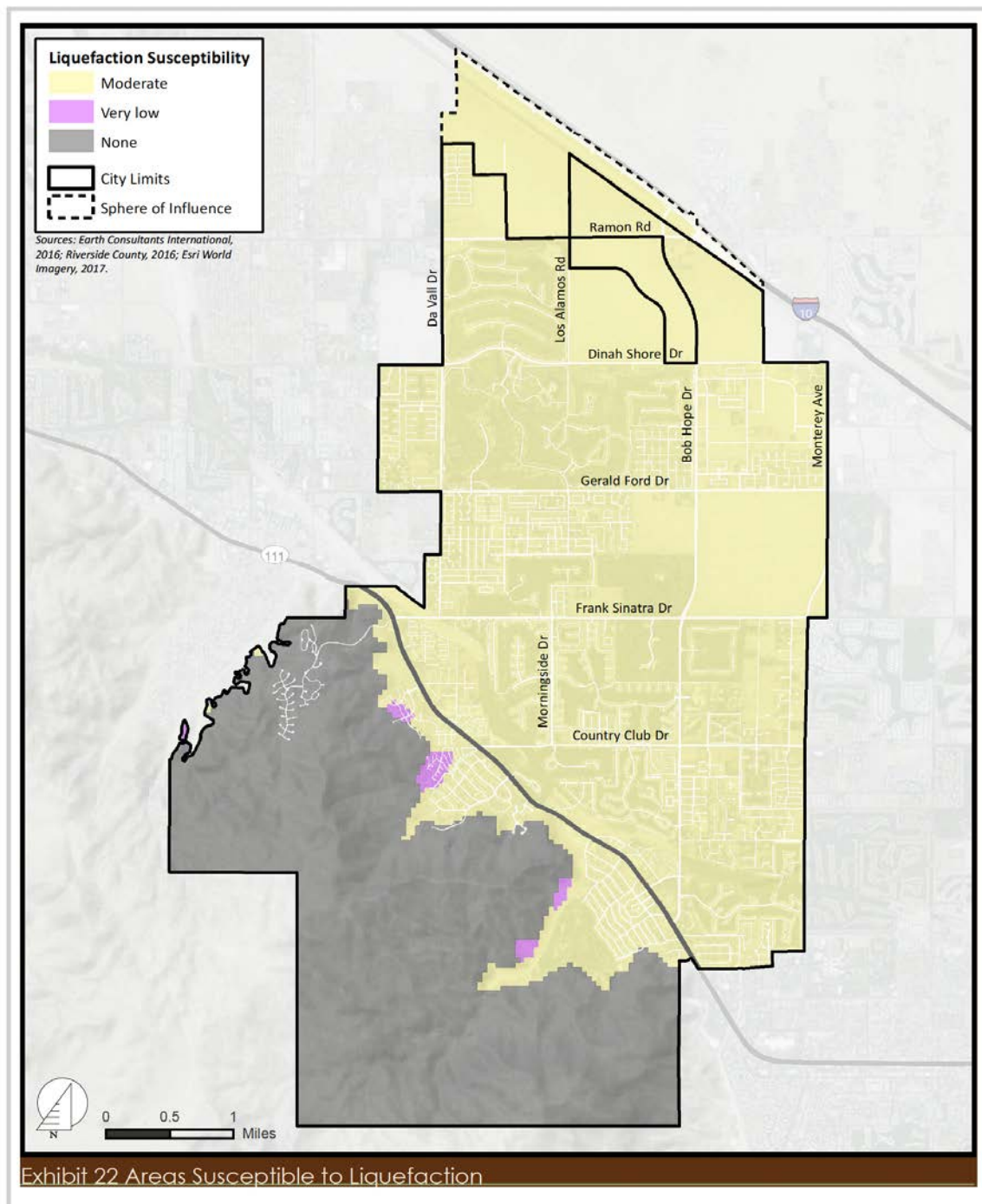
In addition to direct effects such as ground rupture and ground acceleration, other seismically induced and geological hazards can injure people and damage structures. These hazards include liquefaction, dynamic settlement, landslides, and inundation.

#### Liquefaction

Liquefaction may occur when loose, unconsolidated, saturated, sandy soils are subjected to ground vibrations during a seismic event. This occurs in areas where the groundwater table is within 50 feet of the ground surface and when seismic events occur that generate a Modified Mercalli Intensity value of seven or greater.



## 2017 General Plan



Significant ground shaking can suddenly increase water pressure in the pores between soil particles and cause soils to lose cohesion and to “liquefy.” Effects include a loss of bearing strength, ground oscillations, and lateral spreading and slumping. This hazard is considered low in the Rancho Mirage area, principally because the approximate depth to groundwater is greater than 50 feet.

Liquefaction may occur in or adjacent to the Whitewater River if the near-surface alluvial sediments become saturated as a result of precipitation or the recent input of surface water from the adjacent mountains. However, water percolates rapidly through alluvial materials, so the likelihood of an earthquake occurring while these sediments are saturated in the upper 50 feet is very low. Areas of liquefaction susceptibility are shown in Exhibit 22.

#### Dynamic Settlement

Under some circumstances, strong ground shaking can cause densification or compaction of soils resulting in local or regional settlement of the ground surface. This can result in local differential settlement and damage to foundations and structures, as well as damage to water and sewer lines. This potential is affected by the intensity and duration of ground shaking and the relative density of the subsurface soils.

Windblown sands and other recently deposited sediments are typically loose and, therefore, potentially subject to seismically induced settlement. In the planning area, development on the valley floor or on wind or stream deposited sediment should include site-specific subsurface geotechnical investigations that address this potential seismic hazard. Proper excavation, compaction, and foundation design can address some of the seismic settlement potential. Seismically induced settlement susceptibility is shown in Exhibit 23.

#### Landslides

Exhibit 24 shows how seismically induced landslides and rock falls can be expected to occur in the southern portion of Rancho Mirage in and adjacent to the slopes of the Santa Rosa Mountains. With several faults in the area, there is a high potential for seismically induced rock falls and landslides to occur in Rancho Mirage. Fractures and landslides are likely to occur in the Indio Hills area, in the ocotillo conglomerate. Intense ground shaking can be expected at the top of Edom Hill as a result of the local topographical features, thereby intensifying the seismic shaking.

Scattered rock falls could occur in the Santa Rosa Mountains, in areas where the bedrock is intensely fractured or jointed. Sections of Highway 111 adjacent to the Santa Rosa Mountains could be blocked by fallen rock debris immediately following an earthquake, which would hinder rescue and evacuation operations. Rock falls could also impact developments adjacent to mountain slopes, especially those at the mouth of Magnesia Springs and Bradley Canyons. Throughout Rancho Mirage, manufactured slopes of significant height could also be susceptible to failure if not engineered to resist seismically induced failure.

#### Inundation

Seismic events can cause failure of water tanks, reservoirs, retention basins, recharge basins, and other water storage structures, especially in areas susceptible to ground failure. There are several storage tanks in Rancho Mirage that could be subject to damage in an earthquake. Damage to these tanks could hinder efforts to suppress fires and could greatly limit supply and availability of potable water after a major earthquake. Only limited opportunities for seismically induced inundation downgrade of stormwater retention basins currently exist in Rancho Mirage. As there are few stormwater retention basins in Rancho Mirage and its vicinity, this hazard is substantially reduced, if not eliminated. The design engineering of future major detention/retention facilities will need to focus on the seismic hazards of the area when planning for and constructing these facilities.

#### Geologic Hazards

The physiographic and geologic histories of the Rancho Mirage area are important in that to a great extent they control the geologic hazards, as well as the natural resources, in Rancho Mirage. These hazards include collapsible soils, ground subsidence, wind erosion, and wind-blown sand. For example, wind-blown sand erosion poses a significant hazard across the Coachella Valley due to funneling of fierce winds by the steep mountain barriers. Locations at the base of the mountains are more sheltered from this hazard, but areas in and adjacent to the mountains are more likely to be impacted by rock falls and unstable slopes. Regional tectonic subsidence along the valley floor, concurrent with uplift of the adjacent mountains, is responsible to a great extent for the rapid deposition of poorly consolidated alluvium that is susceptible to consolidation and/or collapse. On the other hand, the deep alluvium-filled basin, which is bounded by relatively impermeable rock and faults, provides a natural underground reservoir (aquifer) for groundwater, one of Rancho Mirage’s primary sources of domestic water. The extraction of water from these aquifers may cause the ground to settle or sink.



**Collapsible Soils**

The composition of soils in the area is an important factor of the geological conditions in Rancho Mirage. The potential for soils to collapse or expand can cause damage to structures. Soil collapse typically occurs in recently (Holocene) de- posited sediments laid down by wind or water. When saturated, collapsible soils undergo a rearrangement of their grains and a loss of cohesion or cementation, resulting in a substantial and rapid settlement even under relatively low loads. The alluvial and aeolian sediments in the planning area are prone to collapse, and this propensity should be evaluated on a site-specific basis as part of geotechnical studies for development. Mitigation can be accomplished through a variety of design and construction methods.

**Ground Subsidence**

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. Several regions of subsidence have been documented in Riverside County – all of them in deep, alluvium-filled valleys. In most cases, subsidence was at- tributed to declining groundwater levels. Regional subsidence from groundwater withdrawal is a potential hazard that the City can proactively mitigate by supporting the proper management of the groundwater supplies, creating water conservation programs, encouraging water recycling, and educating the public. With the expected increases in population, overdraft of the aquifers underlying the Coachella Valley will be one of the most serious challenges in maintaining the region’s environmental quality.

**Wind Erosion and Wind-Blown Sand**

Most of Rancho Mirage is highly susceptible to wind erosion. The geomorphology of the Coachella Valley, its extreme aridity, and the marine air masses funneled from the west through the San Gorgonio Pass conspire to create strong and persistent winds in the valley. These strong winds have been blowing and redistributing sand deposits in the area for thousands of years. Lands disturbed by flooding, grading, or agricultural activities, therefore, are subject to significant erosive forces that suspend fine dust and transport sand over great distances.

**Richter Scale**

**EARTHQUAKES ARE TYPICALLY DEFINED BY THEIR MAGNITUDE AS MEASURED ON THE RICHTER SCALE. EACH WHOLE NUMBER STEP IN MAGNITUDE ON THE SCALE REPRESENTS A TENFOLD INCREASE IN THE AMPLITUDE OF THE WAVES ON A SEISMOGRAM AND ABOUT A 31-FOLD INCREASE IN ENERGY RELEASED. AS AN EXAMPLE, A 7.5 MAGNITUDE EARTHQUAKE IS 31 TIMES MORE POWERFUL THAN A 6.5 MAGNITUDE QUAKE.**

**Mercalli Scale**

**THE MODIFIED MERCALLI INTENSITY SCALE IS A MORE USEFUL MEASURE OF THE DAMAGE POTENTIAL OF EARTHQUAKES, AND IS BASED UPON PEOPLE’S REACTIONS TO A QUAKE, OBSERVED DAMAGE TO STRUCTURES, AND OTHER PHYSICAL EFFECTS.**

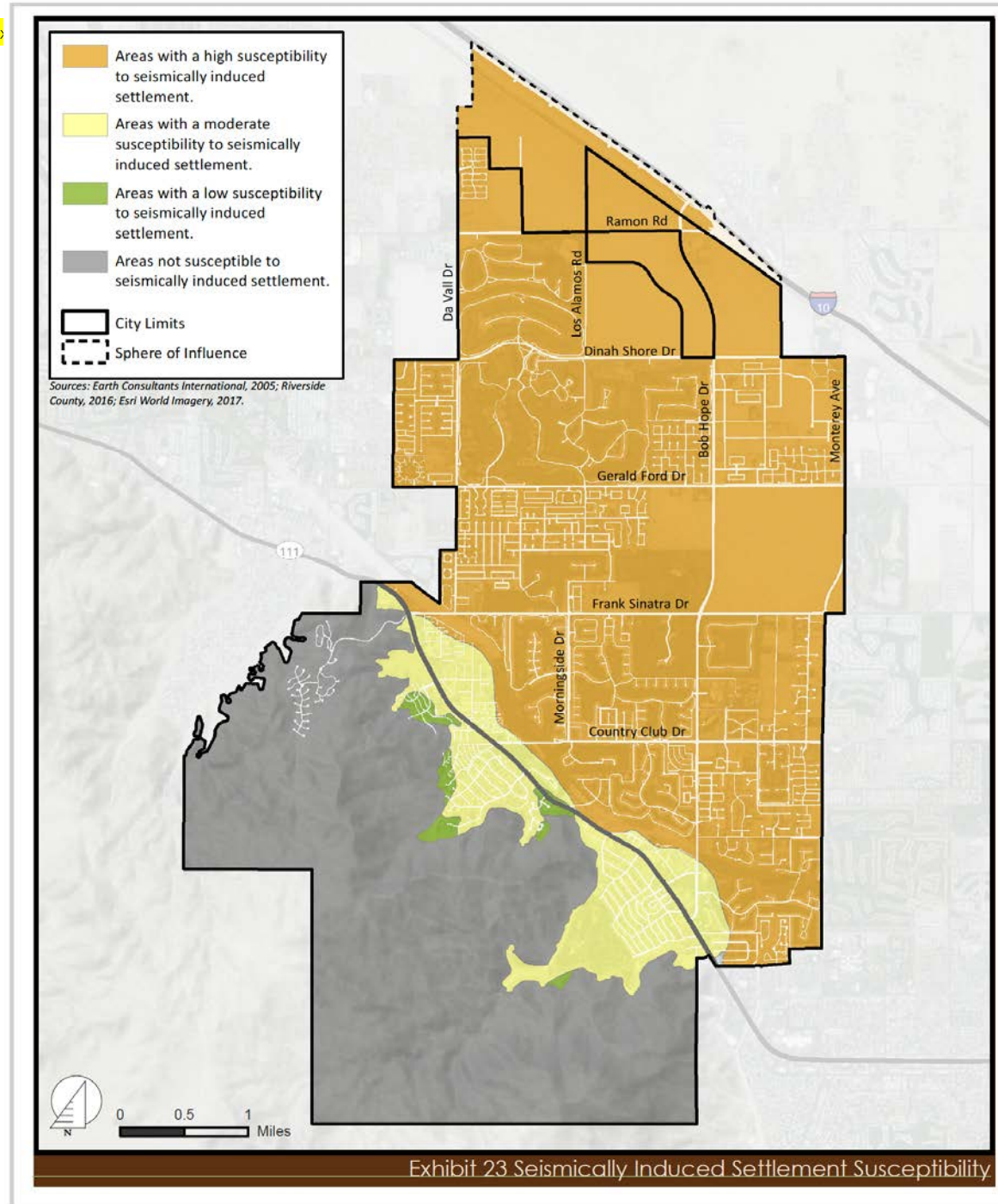
**THERE ARE TWELVE LEVELS OF INTENSITY IN THIS SCALE, RANGING FROM I (TREMOR NOT FELT) TO VII (HEAVY DAMAGE TO POORLY BUILT STRUCTURES) TO XII (DAMAGE IS NEAR TOTAL).**

In addition to damaging vehicles, structures, and other improvements, blowing sand collects on streets, in driveways, and in other areas where it must be removed at considerable expense. The presence of dust particles in the air is also a source of major health problems, as atmospheric dust causes respiratory discomfort and may carry pathogens that cause eye infections and skin disorders. Dust storms reduce highway and air traffic visibility. Exhibit 25 shows the wind erosion hazard zones occurring in Rancho Mirage and the SOI.

Mitigation measures currently used in Rancho Mirage focus on the application of the Coachella Valley PM10 State Implementation Plan. Some other physical measures used in the area include hedges, walls, and other barriers to wind. Water is typically sprayed at construction sites to reduce dust in the air by weighing down the soil.

Development projects and individual structures can be designed to protect occupants and property from the damage of blowing sand. Vegetation covers, such as a desert hydroseed mix, can reduce wind erosion of the topsoil, but these efforts are only partially effective in mitigating the wind erosion hazard. Furthermore, grass requires intense watering to thrive, and in an area where water is such a vital commodity, the need for water preservation needs to be weighed against the need to control airborne dust.

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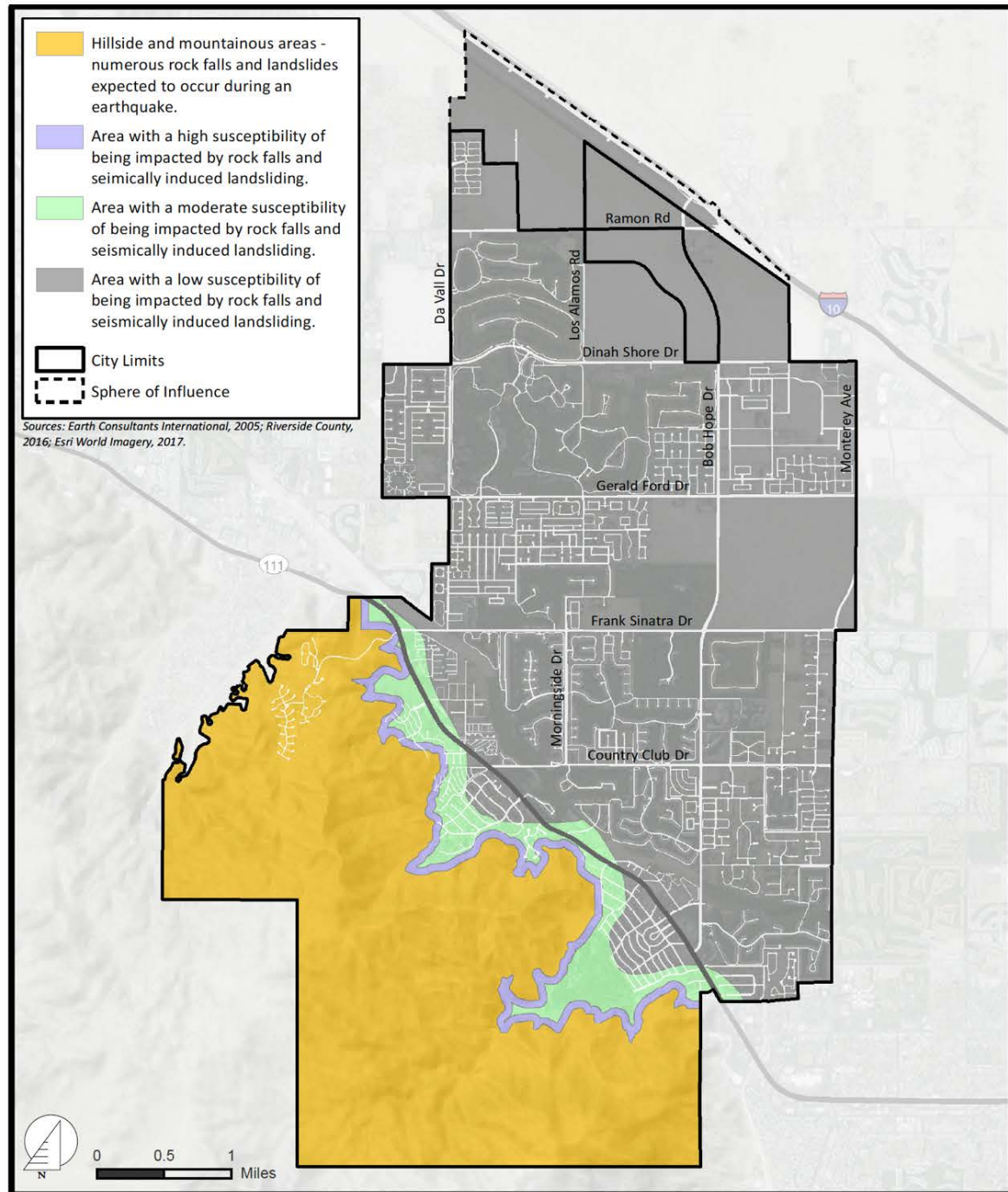


Exhibit 24 Seismically Induced Rock Falls and Landslide Susceptibility

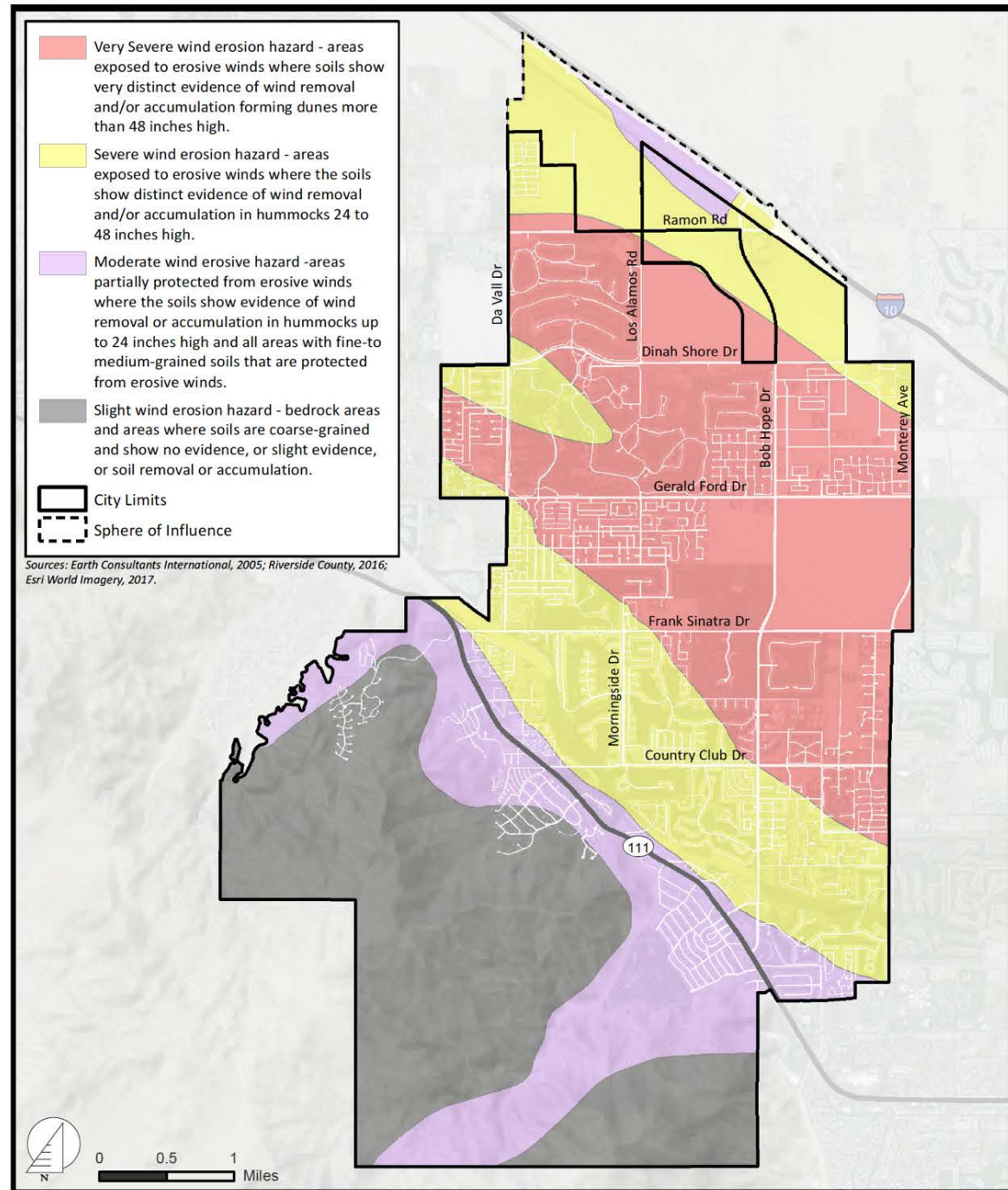


Exhibit 25 Wind Erosion Hazard

### Open Space for Public Health and Safety

An important function of open space is its use as a buffer to separate people and buildings from hazards that could cause injury, damage, or death. Open space for public health and safety includes areas requiring special management or regulation because of hazardous or special conditions such as earth- quake fault zones, unstable soil or slope areas, flood plains, watersheds, areas presenting high fire risks, areas required for the protection of water quality and water reservoirs, and areas required for the protection and enhancement of air quality. Al though these lands remain open to mitigate potential hazardous situations, they have potential for other uses. Land along fault lines can be retained in its natural condition as a wildlife corridor, and flood control facilities may be usable for natural open space, wildlife habitat, and recreation.

OPEN SPACE FOR PUBLIC HEALTH AND SAFETY GOALS, POLICIES, AND PROGRAMS

The development review process performed by the City must assure that proposals are thoroughly evaluated with regard to seismic and geological safety, that all necessary special studies are conducted and reviewed, and that comprehensive mitigation measures are developed and implemented. Developing a groundwater management and water conservation program and encouraging the use of recycled water will be important in mitigating ground subsidence. The City should also work with state, regional, and county agencies to establish and maintain an up to date database on seismic geological conditions in the region, legislation affecting the City’s regulatory responsibilities, and changing technical assessments that refine or re-characterize the seismic hazards affecting the region.

**GOAL SAFE 1**

A community that plans for and is protected from the effects of seismic and geological hazards.

**POLICY SAFE 1.1**

The City shall consult and cooperate with surrounding communities and applicable state and federal agencies to improve and update information on regional seismic and geological conditions.

**PROGRAM SAFE 1.1A**

Coordinate with the California Division of Mines and Geology and the United States Geological Survey to establish and maintain maps illustrating the location of seismic and geological hazard zones occurring in Rancho Mirage's boundaries and the SOL.

**PROGRAM SAFE 1.1B**

Coordinate with the National Earthquake Hazard Reduction Program of the Federal Emergency Management Agency to identify earthquake risks and available mitigation techniques.

**POLICY SAFE 1.2**

The City shall establish ordinances and guidelines to reduce the hazards from wind-blown sand and dust.

**PROGRAM SAFE 1.2A**

Coordinate with the SCQAMD and other local agencies to develop and maintain appropriate large particulate (PM10) mitigation practices.

**POLICY SAFE 1.3**

The City shall require the removal or rehabilitation of hazardous or substandard structures that may collapse in the event of an earthquake.

**POLICY SAFE 1.4**

The City shall cooperate and coordinate with public and quasi-public agencies to assure seismically strengthened or relocated facilities and other appropriate measures to safeguard water, electricity, natural gas, and other transmission and distribution systems.

**PROGRAM SAFE 1.4A**

Encourage and cooperate with Caltrans to stabilize susceptible slopes and strengthen bridges, elevated roadways and other structures along state highways, which may be subject to failure during major seismic events, thereby isolating portions of the community from emergency aid and assistance.

**POLICY SAFE 1.5**

The City shall play an active role in the development or distribution of earthquake preparedness information and materials to residents and local businesses.

**PROGRAM SAFE 1.5A**

Confer and cooperate with local utility companies, the CVWD, the Palm Springs Unified School District, police and fire departments, and others to coordinate public education regarding appropriate action before, during, and after earthquakes and other disasters.

**PROGRAM SAFE 1.5B**

Keep the City’s public awareness programs on natural disaster management and emergency preparedness up-to-date on current hazards and issues.

**POLICY SAFE 1.6**

New septic tank leach fields, seepage pits, drainage facilities and heavily irrigated areas shall be located away from foundations and other structural supports to minimize the creation of a localized collapse of soils and associated hazards.

**POLICY SAFE 1.7**

Developers of projects in areas identified as being subject to a rockfall or landslide hazard shall prepare detailed geotechnical analysis, including site response to seismic events, and require mitigation measures that reduce associated hazards to insignificant levels.

**PROGRAM SAFE 1.7A**

Require design of engineered slopes to resist earthquake-induced failure.

**PROGRAM SAFE 1.7B**

Require design of lifelines (e.g., roadways, utilities, rail- roads) that cross a fault to resist the occurrence of a fault rupture.

**POLICY SAFE 1.8**

The City shall encourage the incorporation of wind barriers, architectural design or features, and drought resistant ground coverage in new development site designs to mitigate the impacts from erosion and wind-blown sand.

**POLICY SAFE 1.9**

Where appropriate, hazard zones (earthquake fault lines, floodways and floodplains, steep or unstable slopes, etc.) shall be designated as open space, and incorporated into the General Plan land use map.

## Flooding and Hydrology Hazards

### Purpose

Rancho Mirage and surrounding areas, like most of southern California, are subject to unpredictable seasonal rainfall. Most years, the scant winter rains are barely sufficient to turn the hills green for a few weeks, but every few years the region is subjected to periods of intense and sustained precipitation that result in flooding. The potential for flooding is a safety concern that the City continues to address. It is the intention of the City to plan and implement the phased development of flood control facilities, both project-specific and citywide. Provisions for open space and multiple uses, wildlife, and pedestrian and equestrian corridors in major drainages are also planned.

### Background

#### Desert Conditions and Flood Hazards

Rancho Mirage and the Coachella Valley enjoy a subtropical desert climate. Mean annual rainfall is very low on the desert floor, ranging from four to six inches per year. On average, nearby Mount San Jacinto experiences of 25.3 inches of rainfall annually. High intensity thunderstorms and tropical storms can occur suddenly, however, creating flood hazards. Although the ground may be generally dry at the beginning of a storm, sufficient amounts and intensities of rainfall can saturate the desert surface and substantially reduce percolation, pushing the water farther downstream. Development also increases runoff by creating large areas of impervious surface. Furthermore, increased runoff upstream can be a significant contributor to downstream damage.

Areas of potential flooding are generally associated with the Whitewater River and its tributaries, mountain canyons, and their alluvial fans, as well as runoff associated with the Indio Hills drainage (including Edom Hill). Exhibit 26 identifies areas subject to flooding both along the Whitewater River drainage and along the fan area between I-10 and the Indio Hills (identified as the I-10 Wash). The 100-year flood zone for the Whitewater River is generally confined to the channel of the river and its tributaries, although at the bottom of Magnesia

Spring Canyon, the 100-year flood limits extend to several of the residential streets in the area. The 500-year flood limits cover a large residential and commercial section of Rancho Mirage and extend across Highway 111.

#### 100-year Floodplain

**LAND SUBJECT TO FLOODING IN A 100-YEAR FLOOD OR A FLOOD ELEVATION THAT HAS A 1% CHANCE OF BEING EQUALED OR EXCEEDED EACH YEAR**

#### 500-year Floodplain

**LAND THAT HAS THE POTENTIAL TO BE FLOODED IN A STORM WITH A 0.2% CHANCE OF OCCURRING EVERY YEAR**

Although the City's SOI does not extend north of I-10, there is a potential for substantial flooding in the wash north of I-10. Flooding in this area is generally shallow, between one and three feet deep, but the floodwaters move at relatively high velocities with the potential to do considerable damage. According to maps issued by the Federal Emergency Management Agency (FEMA) maps, the velocity of the floodwaters in this area varies between five and seven feet per second.

FEMA also reports that most of the streams in the Rancho Mirage area have the potential to carry large amounts of debris. This increases the volume of peak discharges, and when flows reach the valley, the debris is deposited, compounding the flooding problem. Debris has the potential to fill or plug structures designed to collect and convey runoff, forcing floodwaters into the adjacent areas. Rapidly moving flows heavily laden with debris are also extremely dangerous.

Increased urbanization of the northern portions of the Coachella Valley can and will result in increased amounts of runoff during large storms. Local agencies have realized that unless adequate flood control measures are implemented, this increased runoff can damage improvements and endanger life.

The CVWD is the primary agency responsible for the management of regional drainage in the vicinity of Rancho Mirage, including rivers, major streams and their tributaries, and areas of significant sheet flooding. CVWD is empowered with broad management functions, including flood control planning and construction of drainage improvements for regional flood control facilities, as well as watershed and watercourse protection related to those facilities. A small portion of Rancho Mirage lies within the Riverside County Flood Control District boundary, which encompasses Sections 4 and 9 along the border between Rancho Mirage and Cathedral City.

#### Land Use Planning as a Flood Control Strategy

Proper land use planning is one of the most effective and direct methods of controlling flooding and limiting threats to lives and property. Consistent with other primary goals of the community, land use planning can call for the preservation of natural vegetation in the foothills and mountains that function as natural watersheds for local drainage and groundwater recharge and can affect the volume of stormwater and debris that reaches downstream facilities.

#### Benchmark Storms

**BENCHMARK STORMS ARE USED BY THE ARMY CORPS OF ENGINEERS TO CALCULATE FLOOD POTENTIAL. THEY INCLUDE THE STORM OF SEPTEMBER 24, 1939 IN THE COACHELLA VALLEY DESERT REGION. THIS INTENSE STORM GENERATED 6.45 INCHES OF RAIN IN 6 HOURS.**

**TROPICAL STORM KATHLEEN GENERATED VERY HEAVY GENERAL RAINFALL FROM SEPTEMBER 9 TO 11, 1976, GENERATED A HIGH LEVEL OF STORM RUNOFF, WITH RANCHO MIRAGE RECEIVING 3 INCHES AND THE SURROUNDING HILLS AND MOUNTAINS RECEIVING AS MUCH AS 14 INCHES.**

Land use planning can also limit the exposure of people and improvements to storm hazards and damage. Restrictions on the type and location of structures in the vicinity of major drainages in the community can greatly reduce potential damage. Within the limits of improved and unimproved 100-year floodplains, development should be severely limited and regulated, with the prohibition of the construction of structures for human habitation. To promote sound land use and floodplain development, FEMA provides Flood Insurance Rate Maps for local and regional planners and civil engineers. These maps provide more detailed

flood hazard map information, including the boundaries of the 100-year and 500-year flood zones.

The City's Floodplain Management Ordinance (Municipal Code Chapter 15.28) provides flood hazard reduction measures including standards of construction, standards for utilities, subdivisions, manufactured homes and recreational vehicles. In flood zones subject to sheet flooding, development approvals should be conditioned to assure protection of improvements from flood damage. Protection measures may include raising the finished floor level above the flood depth projected for the surrounding area and providing protection against scouring. Until such time as flood protection that removes areas from severe threats of flooding is provided, development in these areas should be carefully regulated.

#### National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) implements the federal Clean Water Act and was adopted in 1990. It requires the development, adoption, and implementation of plans and programs for stormwater management, which among other things must effectively prohibit non stormwater discharge into the storm drain and require controls to reduce the discharge of pollutants from stormwater systems to designated Waters of the United States.

Riverside County municipalities and agencies, including the City of Rancho Mirage, Riverside Flood Control and Water Conservation District, and CVWD, have joined to develop and implement the 2001-2006 Stormwater Management Plan as part of NPDES permitting requirements. This plan was designed to manage and control stormwater runoff to the maximum extent practical.

One of the primary strategies to comply with the provisions of NPDES is the use of onsite stormwater retention or detention basins in any new developments of one acre or larger. These facilities have long been required by the City and may in some instances include artificial wetlands that use a biologically active zone to break down potential pollutants before they can contaminate surface runoff or reach the water table through percolation. These intercept structures will also be important in capturing sand and sediment before it is discharged into drainage facilities.



**FLOODING AND HYDROLOGY HAZARDS SAFETY GOALS, POLICIES, AND PROGRAMS**

The principal and direct implementation of the goals, policies, and programs in this section will occur through the use and enforcement of FEMA’s National Flood Insurance Plan (NFIP) guidelines and mitigation measures, NPDES requirements, and the application of CVWD’s regional plans and policies. These measures and their improvements help control and confine the areawide drainage pattern to more discreet and focused routes where it can be better managed. Proper implementation may also reveal locations of new facilities that could complement land use patterns, provide cost effective flood control alternatives, and maximize opportunities for multiple uses, including enhanced groundwater recharge.

The NFIP flood plain maps and guidelines will also set critical parameters for future development along areas subject to areawide flooding. This section will also be implemented through the development guidelines and regulations of the Rancho Mirage zoning, grading, and subdivision ordinances.

**GOAL SAFE 2**

Protection of lives, property, and essential facilities from flooding and other hydrologic hazards in Rancho Mirage.

**POLICY SAFE 2.1**

The City shall ensure that updated and effective master drainage plans are implemented in a timely fashion for the near and long-term protection of the community and its residents.

**PROGRAM SAFE 2.1A**

Proactively participate with the CVWD and the Riverside County Flood Control District in the development and updating of Rancho Mirage Regional master drainage plans, providing land use and other relevant data and information.

**POLICY SAFE 2.2**

The City shall provide drainage controls and improvements that enhance local conditions and are consistent with and complement the Master Drainage Plans.

**PROGRAM SAFE 2.2A**

Establish and/or update local regulations and guidelines to direct the management of runoff and provide for local drainage facilities that tie into and maximize the effective use of regional drainage facilities.

**PROGRAM SAFE 2.2B**

Adopt or update local drainage policies and development standards that reduce the rate of runoff from developed lands, consistent with capacities of public facilities and local and regional management plans, while providing opportunities for open space enhancement and multiple uses.

**PROGRAM SAFE 2.2C**

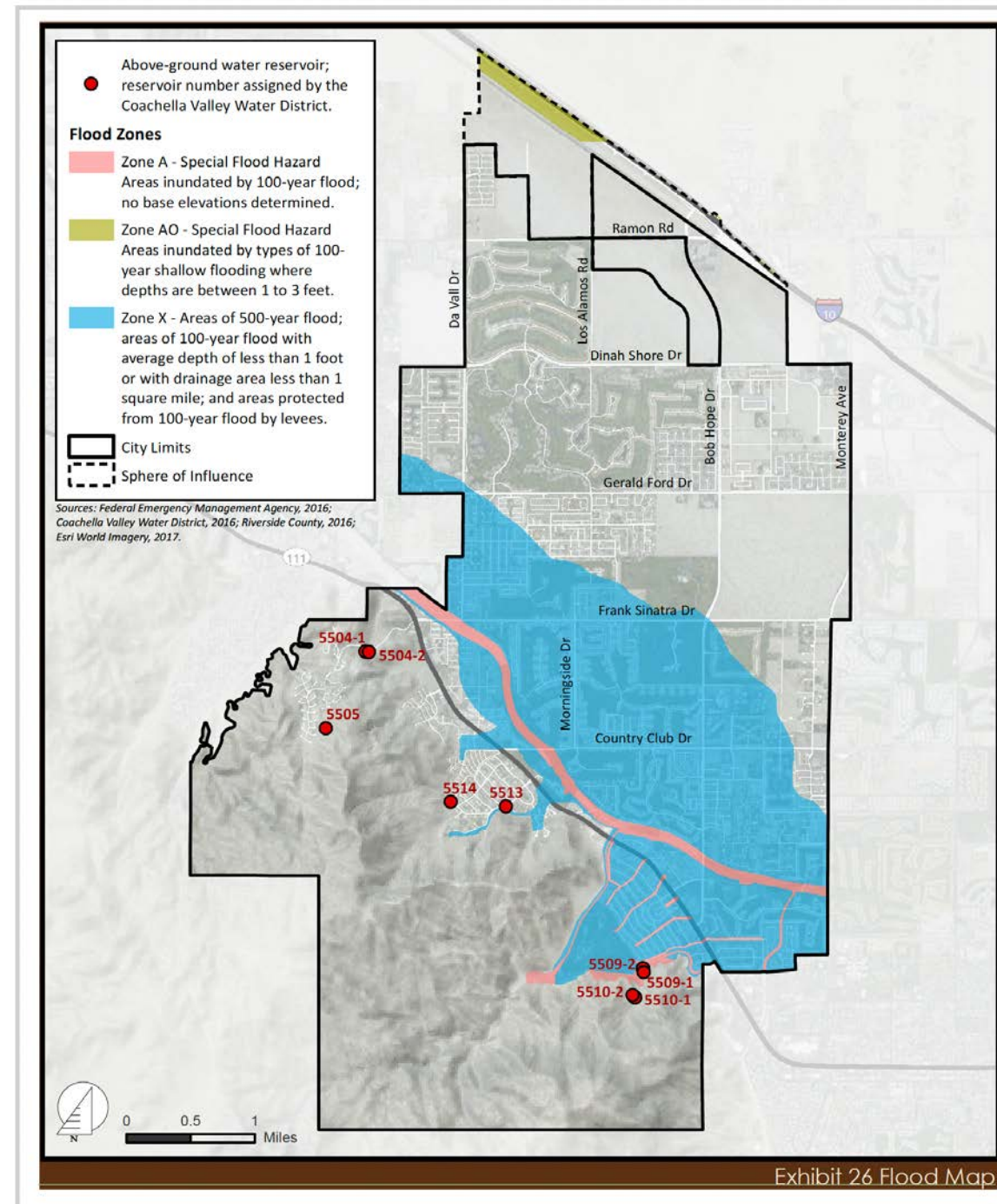
Confer and consult with the CVWD and Caltrans to assure adequate all weather crossings/facilities at appropriate locations along Highway 111 and I-10, especially those serving as emergency evacuation/access routes.

**PROGRAM SAFE 2.2D**

Ensure that emergency evacuation routes are constructed to appropriate all-weather standards.

**POLICY SAFE 2.3**

The City shall provide direction and guidelines for the development of onsite stormwater retention/detention facilities consistent with local and regional drainage plans and community design standards.



### PROGRAM SAFE 2.3A

Establish and enforce regulations and guidelines for the development and maintenance of project-specific onsite retention/detention basins that implement the NPDES program, enhance groundwater recharge, complement regional flood control facilities, and address applicable community design policies.

### POLICY SAFE 2.4

The City shall cooperate with FEMA, when necessary, to amend Flood Insurance Rate Maps for areas in the city boundaries and SOI.

### POLICY SAFE 2.5

Design major drainage facilities, including debris basins and flood control washes and channels, to balance their enhancement as wildlife habitat and community open space amenities with the functional requirements of these facilities.

### PROGRAM SAFE 2.5A

Work closely with the CVWD to assure that design opportunities for enhanced open space and recreation amenities, including habitat enhancement and hiking and equestrian trails, are fully explored and incorporated when designing and constructing channels, debris and detention basins, and other major drainage facilities, to the greatest extent practical.

### POLICY SAFE 2.6

The City shall establish Area Drainage Plans or Benefit Assessment Districts for purposes of funding needed drainage improvements, especially where defined tributary areas of the community are concerned.

### POLICY SAFE 2.7

Development proposals located in areas that are subject to flooding shall be evaluated to minimize the exposure of life and property to potential flood risks. All development proposed on

lands of one acre or larger shall be designed such that all stormwater to the level of a 100-year frequency storm, worst case of the 3, 6, 12, or 24-hour duration, shall be retained onsite.

### POLICY SAFE 2.8

Locate new essential public facilities outside of flood hazard zones, including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities.

## Fire Hazards

### Purpose

The Fire Hazards section identifies existing fire hazards in or near Rancho Mirage and describes the regulatory environment established to safely manage these hazards. The intention of the Fire Hazard section is to reinforce the City's concern and planning for the protection of all Rancho Mirage residents. The section sets forth goals, policies, and programs that will help assure an effective management of fire hazards in Rancho Mirage, and guard the general health, safety, and welfare of the community from possible impacts associated with fire hazards. This section was reviewed to incorporate the advice included in the Office of Planning and Research's most recent publication of "Fire Hazard Planning, General Plan Technical Advice Series" (May 2015).

### Background

Fires can occur in urban environments as well as unpopulated areas that may contain brush or grassland. The central and northern portions of Rancho Mirage are urbanized with few remaining vacant lands. The remaining southern area of Rancho Mirage is in an undeveloped mountain and hillside reserve. These two area types include two fire hazard categories that are of interest to Rancho Mirage and its SOI: vegetation fires and urban or structural fires. With large portions of Rancho Mirage's boundaries adjoining uninhabited mountain and hillside reserve areas that are rated as high fire threats, the potential for wildfires is high. The urban areas in Rancho Mirage also face common fire hazards.

## Wildland Fire Hazards

Large areas of southern California are particularly susceptible to wildfire due to the region's weather, topography, and native vegetation. The typically mild, wet winters characteristic of the region's Mediterranean climate result in an annual growth of grasses and plants that dry out during the hot summer months. This dry vegetation provides fuel for wildfires in the autumn, when the area is intermittently impacted by Santa Ana conditions, including the hot, dry winds that blow across the region in the late fall. These winds often fan and help spread the fires.

The undeveloped areas in Rancho Mirage are characterized by steep topographic gradients that are generally conducive to spreading wildfires. Furthermore, the area's hot, dry summer and autumn weather is ideal for generating the dry vegetation that fuels most wildfires. Fortunately, the only recorded historical wildfire near the planning area is the Dry Falls fire that occurred in August 1980 to the southeast of Rancho Mirage. The reason that most of the undeveloped areas of Rancho Mirage have not been impacted by wildland fire is that most of the rugged terrain is so steep, rocky, and dry that few plants thrive in the area. As a result, the amount of fuel available for wildland fires is very limited, and the distance between stands of vegetation is too great for fires to spread easily. In the developed areas of Rancho Mirage, the landscape vegetation is carefully maintained and watered regularly, creating conditions that limit the possibility for vegetation fires to ignite and spread.

The California Department of Forestry and Fire Protection (CalFire) ranks fire hazard of wildland areas of the state using four main criteria: fuels, weather, assets at risk, and level of service. Although Very High Fire Hazard Severity Zones (VHFHSZ) are mapped in the Rancho Mirage area, the historical record indicates that the wildland fire hazard in Rancho Mirage is relatively low. CalFire has mapped several fire hazard zones in Rancho Mirage and the SOI, shown in Exhibit 27.

There are no state responsibility areas (SRAs) in the City of Rancho Mirage. The only Very High Fire Hazard Severity Zone in Local

[Responsibility Area \(LRA\)](#) within the City is in the southern end of urban areas. The VHFHSZ consists of part of a single-family residence (70000 Thunderbird Mesa Drive) and undeveloped land. The undeveloped portion is designated as Mountain Reserve per the Land Use Map and will not be developed in the future.

## Urban and Structural Fires

To quantify the structural fire risk in a community it is necessary for the local fire departments to evaluate all occupancies based upon their product type, size, construction type, built-in protection (such as internal fire sprinkler systems), and risk (high-occupancy versus low-occupancy) to determine if they can control a fire if it occurs in the types of structures identified. In newer residential areas where construction includes fire-resistant materials and internal fire sprinklers, most structural fires can be confined to the building or property of origin. In older residential areas where the building materials may not be fire-rated and the structures are not fitted with fire sprinklers, there is a higher probability of a structural fire impacting adjacent structures. With the varied type and age of structures in Rancho Mirage, structural fire risk is divided into four categories:

- › High Probability/High Consequences (e.g., multi-family dwellings, high-occupancy hotels and resorts, single-family residential homes in the older sections of Rancho Mirage, hazardous materials occupancies, and large shopping centers)
- › Low Probability/High Consequences (e.g., hospitals and other medical facilities, mid-size shopping malls, industrial occupancies, office complexes, and upscale homes in the hills or mountains, in or adjacent to high to very high fire threat areas)
- › High Probability/Low Consequences (e.g., older detached single-family dwellings with properly maintained landscaping)
- › Low Probability/Low Consequences (e.g., newer detached single-family dwellings and small office buildings with properly maintained landscaping).

Most buildings and structures in the City are not in or adjoining a mountainous area or lands covered by forest, brush or grass or other flammable material. Therefore, no mandatory clearance



around the structures applies per Public Resources Code Section 4291. Those buildings or structures immediately adjoining the mountainous areas in the south of the City would need to provide clearance as required by law. Within the City, there is only one development (70000 Thunderbird Mesa Drive) partially located in a Very High Fire Hazard Severity Zone, and the only evacuation route would be via Thunderbird Mesa Drive downhill to Highway 111.

The City maintains roadway standards that are detailed in the Circulation Element of this General Plan, which include minimum road widths to ensure accessibility [for emergency vehicles and crew](#) under various conditions.

[Fire services for the City of Rancho Mirage are provided through a cooperative agreement with the State of California \(Cal-Fire\) and Riverside County. Cal-Fire/Riverside County Fire Department is an all risk, full service fire department and has two fire stations located strategically throughout Rancho Mirage to provide highly effective protection. Fire Station 69 serves North Rancho Mirage at 71751 Gerald Ford Drive, and Fire Station 50 serves South Rancho Mirage at 70801 Highway 111. Additionally, the City participates in the regional cooperative agreement and benefits from resources responding from other nearby stations, ensuring that peak loads and major incidents are handled promptly. There are no gaps in the City for emergency service, and all areas including the VHFHSZ have adequate access to fire and emergency services.](#)

Peak Water Demand and Supply

The availability of water is critical to effective fire suppression. The CVWD provides water services to Rancho Mirage and has a total groundwater storage capacity of 30 million acre-feet (one acre-foot equals 325,850 gallons) in the Indio Subbasin. The City and its SOI maintains a peak summer daily water demand of 41 mgd (approximately 126 acre-feet). CalFire has general water flow requirements of 1,500 gallons per minute (gpm) for new development and 3,000 gpm for new commercial development. **Table 36** lists fire suppression water flow requirements by land use.

TABLE 36 WATER FLOW REQUIREMENTS FOR FIRE PROTECTION

LAND USE	WATER FLOW
Agriculture / Open Space	1,000 gpm for 2 hours
Single-family Residential	1,500 gpm for 2 hours
Multi-family Residential / High Density	2,500 gpm for 2 hours
Commercial / Industrial	3,000 gpm for 3 hours
Source: California Department of Forestry and Fire Protection 2004	

According to Insurance Services Office, Inc., the fire suppression system rating for Rancho Mirage is Class 3. This includes fire dispatch (operators, alarm dispatch circuits, telephone lines available), fire department (equipment available, personnel, training, distribution of companies), and water supply (adequacy, condition, number and installation of fire hydrants). The rating scale is from 1 to 10 with the worst rating being a Class 10 and the best rating a Class 1. CalFire has a five-year plan that outlines fire hazards and risks, cost effectiveness, and present and future fire protection needs.

Emergency Preparedness

The purpose of emergency preparedness is to protect the health, safety, and welfare of the general public before, during, and after natural and human emergencies. These emergencies include flooding, high winds, earthquakes, hazardous material accidents, wild- fire, and other natural and man-made events. The City maintains a multi-hazard functional plan, that addresses the planned response to extraordinary emergency situations associated with natural or human caused disasters, technological incidents, and nuclear defense operations. Additionally, the City and Eisenhower Medical Center have partnered to establish an Emergency Operations Center at Sunnylands.

The City adopted an update to its Local Hazard Mitigation Plan (LHMP) in 2018. The City's LHMP is integrated into Riverside County's LHMP as an annex to ensure a unified and coordinated effort by all cities within the County in the event of a disaster.

County of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan

The City participates in the [Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan](#) (LHMP). The County's LHMP was most recently updated and adopted by the County of Riverside in 2018, and approved by FEMA that same year. The 2018 plan updated the 2012 plan, and according to the text in the document itself, carries the very same purpose, which is to create a safer community. The goals and objectives, along with any mitigation strategies that are listed in the County's LHMP and which may be relevant in Rancho Mirage, shall be considered appurtenant to the Goals, Policies, and Programs in this General Plan.

In addition to emergency services provided by the Riverside County Fire Department, the California Department of Forestry, and the Sheriff's Department, the American Red Cross provides a wide range of emergency response support services in Rancho Mirage, ranging from a single residential fire to community-wide disasters.

Evacuation Routes

The availability of evacuation routes is critical in times of emergencies. Rancho Mirage's location in the Coachella Valley allows for two main evacuation routes (I-10 and Highway 111) along with primary and minor arterial streets serving as secondary routes. Since earthquakes, floods, fires, or other disasters may render certain routes impassible, specific evacuation routes may need to be designated during an emergency.

FIRE HAZARDS GOALS, POLICIES, AND PROGRAMS

GOAL SAFE 3

Protection of the lives and property of residents, business owners, and visitors from structural and wildland fires.

GOAL SAFE 4

Emergency preparedness and response programs that provide for fast and effective response to daily emergencies and major catastrophes.

POLICY SAFE 4.1

The City shall minimize the exposure of residents, business owners, and visitors to the impacts of structural and wildland fires.

PROGRAM SAFE 4.1A

Maintain a weed abatement program to ensure clearing of dry brush areas. [The Public Works Department and Code Compliance Division shall monitor public and private roads clearance. Coordinate with the Fire Department to assess the need of community fire breaks and devise a plan for long-term maintenance, where necessary.](#)

POLICY SAFE 4.2

The City shall conduct long-range fire safety planning, including enforcement of stringent building, fire, subdivision and other Municipal Code standards, improved infrastructure, and mutual aid agreements with other public agencies and the private sector.

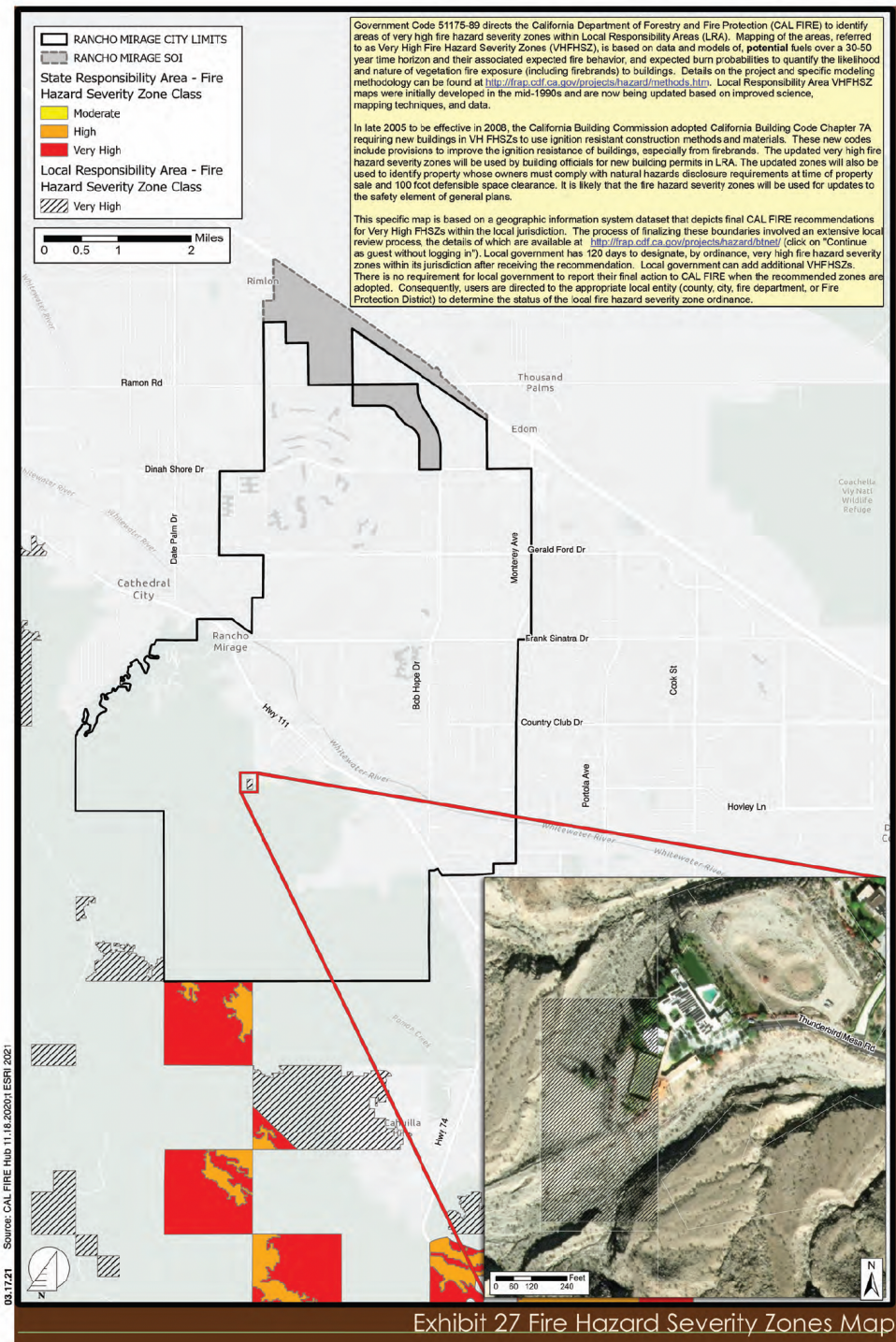
PROGRAM SAFE 4.2A

Require properties [within or adjacent to Very High Fire Hazard Severity Zones](#) to comply with Riverside County Fire Department Wildfire Safety Recommendations for fuel modification plans and defensible space. [Coordinate with the Fire Department to reach out to property owners and achieve compliance on the recommendations and additional requirements, including visible home address and street signage.](#)

PROGRAM SAFE 4.2B

Evaluate the adequacy of access routes to and from hazard areas relative to the degree of development or use (e.g., road width, road type, length of dead-end roads, etc.). [The Code Compliance Division shall identify and track properties that are not in conformance with contemporary fire safe standards adopted by the City, especially of road standards and vegetative hazard, and achieve conformance through a mitigation plan with the property owners.](#)

Deleted: y  
Deleted: Threat



PROGRAM SAFE 4.2C

Maintain the City's emergency plan, including an inventory and evaluation of all local and regional emergency resources.

PROGRAM SAFE 4.2D

The City shall consider the development and identification of citywide evacuation routes.

PROGRAM SAFE 4.2E

Require redevelopment in Very High Fire Hazard Severity Zones (VHFHSZ) to comply with the latest California Building Standards Code (Title 24), including the California Fire Code (Part 9). Coordinate with the Fire Department on evaluation of rebuilding after a large fire and require additional fire safe measures where necessary.

POLICY SAFE 4.3

The City shall support area-wide mutual aid agreements and communication links with Riverside County authorities and other participating jurisdictions.

PROGRAM SAFE 4.3A

The City shall adhere to the guidelines set forth in the County of Riverside Multi-Jurisdictional Hazard Mitigation Plan.

POLICY SAFE 4.4

The City shall ensure adequate provision of public information to residents and businesses on actions to minimize damage and facilitate recovery from a natural disaster. Prioritize at-risk populations such as those within or near fire hazard zones.

PROGRAM SAFE 4.4A

Coordinate with public agencies and non-profit organizations to promote emergency preparedness and response training such as the Riverside County Community Emergency Response Team

(CERT) program and the Coachella Valley Disaster Preparedness Network (CVDPN) training and resources.

**Hazardous and Toxic Materials**

**Purpose**

The Hazardous and Toxic Materials section identifies existing hazardous and toxic material locations in the community and describes the regulatory environment established to safely manage these materials. The intent of the section is to reinforce the City's concern and planning for the protection of all Rancho Mirage residents and visitors from adverse impacts due to the presence of hazardous and toxic materials. The section sets forth goals, policies, and programs that will help assure an effective response to and protection from the use, storage, or transport of hazardous and toxic materials in Rancho Mirage.

**Background**

A wide variety of products, chemical and purified chemical compounds, and elements that are considered hazardous or toxic are used in households, commercial businesses, and industrial operations and processes. They range through home and pool related chlorine products, chemical fertilizers, herbicides and pesticides, stored fuels and waste oil, chemical solvents and lubricants, and a variety of medical materials. The improper use and management of hazardous materials can pose a significant potential threat to the community and its environment.

**Community Hazardous Wastes Risks**

There are only a few identified hazardous/toxic material generators in Rancho Mirage. These are associated with commercial, quasi industrial, and medical operations, which have the potential to be connected to accidental spills, purposeful illegal dumping, air emission, and other uncontrolled discharges into the environment. All are considered "small quantity generators," and some of those identified in Rancho Mirage include the Eisenhower Medical Center and Desert Orthopedic Center.



Eisenhower Medical Center (EMC) is a “small quantity generator” of hazardous medical wastes associated with various procedures and treatments provided at the facility. Management and disposal of these materials is primarily the responsibility of the U.S. Environmental Protection Agency, with additional regulatory responsibility given to the California Office of Health Planning and Development and the Riverside County Department of Health. EMC has developed and implemented both a Medical Waste Management Plan and a Hazardous Materials Management Program, which set forth policies, programs, and procedures for handling, storage, use, and disposal of these materials. Wastes are stored in controlled conditions onsite and removed every 90 days, with storage typically limited to less than 100 gallons each 90 days.

Additionally, there are other sites that have been or should be monitored. These include other waste generating medical clinics and facilities, gasoline service stations, equipment and fuel storage yards, and waste haulers.

The U.S. EPA requires all service stations to retrofit or replace underground storage tanks with double walled construction. All sites in Rancho Mirage have achieved compliance with this rule.

A sanitary landfill was operated on a 57-acre site located in the southwest quarter of Section 11 in the City’s SOI, south of the Southern Pacific Railroad lines. This landfill was operated by the Cathedral City Sanitary District between 1955 and 1967 using the then standard “burn and bury” technique. From 1983 to the end of 1988, the easterly 40 acres of the site were used as a domestic sewage disposal field.

### Hazardous Waste Management Plans

Per the Environmental Protection Agency of the state of California (CalEPA), Californians are protected from hazardous waste and materials by a Unified Program that ensures consistency throughout the state in regard to administrative requirements, permits, inspections and enforcement. CalEPA oversees the program as a whole, and certifies 83 local government agencies known as Certified Unified Program Agencies (CUPA) to implement the hazardous waste and materials standards set by five different state agencies.<sup>1</sup>

The Riverside County Environmental Health Hazardous Materials Branch is the sole overseeing agency for hazardous waste generation throughout the county. The purpose of the hazardous waste program is to ensure that hazardous wastes will be properly managed and disposed of in order to protect both people and environment.<sup>2</sup>

The City has the opportunity to coordinate with appropriate county, state, and federal agencies in the identification of hazardous material sites and the active regulation of their timely cleanup. Management strategies may include establishing and maintaining information on these sites, periodic monitoring facilities, and operations that produce, utilize, or store hazardous materials in Rancho Mirage. Involvement in multi-agency monitoring of illegal dumping in Rancho Mirage, conferring in the regulation of underground storage tanks and septic systems, and regulating the transport of hazardous materials through the community is also appropriate. The City hazardous waste management policies for the General Plan are essentially an extension of the County’s policies and procedures.

Several sources provide information concerning hazardous waste sites in Rancho Mirage. The California Regional Water Quality Control Board and the CVWD maintain information concerning contaminated wells and groundwater. The state and federal

environmental protection agencies and the state Department of Health also supply information concerning specific hazardous waste sites and their locations.

### Hazardous Materials Response

Hazardous and toxic materials pose a threat to public safety if not properly regulated. CalEPA designated the Riverside County Department of Environmental Health Hazardous Materials Branch as the CUPA for Riverside County. The role of the CUPA is to assure consolidation, consistency and coordination of the hazardous materials programs in the county. The CUPA also oversees the two participating agencies (the City of Corona Fire Department and the Riverside County Fire Department) that implement hazardous materials programs in the county.

The Riverside County Department of Environmental Health, Hazardous Materials Branch is responsible for overseeing the six hazardous materials programs in the county. This agency is responsible for inspecting facilities that handle hazardous materials, generate hazardous waste, treat hazardous waste, own/operate underground storage tanks, own/operate aboveground petroleum storage tanks, or handle other materials subject to the California Accidental Release Program. In addition, the branch maintains an emergency response team that handles hazardous materials and other environmental health emergencies 24 hours a day, 7 days a week.<sup>3</sup>

### Hazardous And Toxic Materials Goals, Policies, And Programs

The City has the responsibility to coordinate with the appropriate agencies in the identification of hazardous material sites and the active regulation of their timely cleanup. This section’s programs of oversight and management between responsible agencies can most efficiently be implemented through regular consultation with

the RWQCB and the County Health Department and by updating information on hazardous material sites and monitoring facilities that utilize or produce hazardous materials in Rancho Mirage. The City should also remain current regarding the monitoring and regulating of underground storage tanks and septic systems and regulating the transport of hazardous materials through Rancho Mirage.

### GOAL SAFE 5

The continued safety of Rancho Mirage residents and visitors through the regulation of the manufacture, transport, use, and disposal of toxic and hazardous materials.

### POLICY SAFE 5.1

The City shall regulate, to the extent empowered, the delivery, use, and storage of hazardous materials in city limits and the SOI.

#### PROGRAM SAFE 5.1A

The City shall compile and maintain an inventory of all hazardous waste sites in Rancho Mirage and surrounding jurisdictions.

#### PROGRAM SAFE 5.1B

The City shall develop a permitting process for the establishment of facilities that manufacture, store, use, or dispose of hazardous and toxic materials in the community or adjacent areas, should it be determined that the need for such a use be realized.

### POLICY SAFE 5.2

The City shall require and facilitate the safe and responsible disposal and cleanup of all hazardous/toxic waste and waste sites in Rancho Mirage and the SOI.

#### PROGRAM SAFE 5.2A

<sup>1</sup> Certified Unified Program Agencies  
<sup>2</sup> Riverside County Environmental

<sup>3</sup> All information regarding hazardous materials was obtained from the Riverside Department of Environmental Health at [www.rivcoeh.org/hazmat](http://www.rivcoeh.org/hazmat)

The City shall coordinate with the appropriate state and federal agencies to activate procedures for the cleanup of existing and future hazardous and toxic waste sites.

PROGRAM SAFE 5.2B

The City shall prepare and/or disseminate information and instructive education program materials for residents, including direction on the identification and proper management and disposal of household hazardous waste.

PROGRAM SAFE 5.2C

To the extent empowered, the City shall prohibit the disposal of automotive and household hazardous and toxic materials in landfills.

PROGRAM SAFE 5.2D

The City shall coordinate with Burrtec and other appropriate public and quasi-public agencies to sponsor and develop drop off locations for hazardous or toxic household products for all Rancho Mirage residents.

PROGRAM SAFE 5.2E

The City shall coordinate with appropriate agencies to identify the locations and monitor the use of all underground fuel storage tanks located in city limits with the potential to release hazardous or toxic materials into the environment.

POLICY SAFE 5.3

The City shall coordinate with the Fire and Sheriff's Department to develop a system for roadway management and for alerting emergency and medical facilities to the impending transport of hazardous and toxic materials.

PROGRAM SAFE 5.3A

The City shall coordinate with appropriate departments and agencies to establish transportation management and contingency

emergency procedures and training programs for police, fire, medical, and other organizations that would be involved in an airborne release or ground spill of hazardous and toxic materials or waste.

PROGRAM SAFE 5.3B

Follow the response procedures as outlined by the Riverside County Department of Environmental Health in the event of hazardous materials emergency.

POLICY SAFE 5.4

The City shall coordinate with the Regional Water Quality Control Board and the CVWD to monitor and regulate the use and phased removal of subsurface sewage disposal systems.

PROGRAM SAFE 5.4A

Through the subdivision and development review process, the City shall require, to the greatest extent practical, the connection of new development to the sewage collection system of the CVWD.

PROGRAM SAFE 5.4B

The City shall cooperate with the appropriate agencies to help assure that all subsurface sewage disposal systems, upon completion of their use, are properly removed from service.

POLICY SAFE 5.5

The City shall actively oppose any plan or attempt to establish hazardous and toxic waste dumps/landfills or hazardous industrial processes with the potential to adversely affect Rancho Mirage or the SOI.

PROGRAM SAFE 5.5A

The City shall coordinate with CVAG and its member cities to actively organize against and oppose any County, state, federal, or private effort to build or operate hazardous or toxic waste dumps/landfills or to operate hazardous industrial processes,

which cannot be mitigated and have the potential to adversely affect Rancho Mirage or the SOI.

**Climate Change**

**Purpose**

Climate change is already affecting California cities, as seen by the rise in sea levels, average temperatures, and extreme hot days. These climate driven changes have many consequences that affect California's health and prosperity such as the increased frequency of wildfires, pressure on water supplies, shifts in growing seasons, and the increase in populations that will be exposure to intense heat waves.

Rancho Mirage recognizes that understanding its vulnerability and planning for the increased effects of climate change is crucial to the livelihood and safety of its residents. This Climate Change section provides a brief overlook of the leading climate factors that affect Rancho Mirage and its vulnerability to each. The intent of this section is to reinforce the City's concern for the protection of all Rancho Mirage residents and visitors from the adverse impacts of climate change and to set forth goals, policies, and programs that will help the City to adapt to these changes.

**Background**

As discussed in the Conservation and Open Space Element, Rancho Mirage is already subject to extreme temperatures and aridity, and the intensity of these conditions will only increase with climate change. The three major climate factors that will impact Rancho Mirage in the future are temperature, precipitation, and wildfire risk.

**Temperature**

**Average Temperature**

Overall temperatures are expected to rise throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F. Rancho Mirage has already experienced a 2.0°F increase compared to the end of the last century (i.e., 1961-1990). This change in temperature is projected to increase to 3.0°F by 2040. Currently, the average

annual temperature for Rancho Mirage is approximately 74°F. The temperature can drop into the low 30's in the winter and can exceed 120°F in the summer.

**Extreme Heat Days**

The most serious threats to the public health of Californians will stem primarily from the increased frequency of extreme conditions, principally more frequent extreme heat days, and more frequent, intense, and longer heat waves. An extreme heat day is typically defined as a day in April through October where the maximum temperature exceeds the 98th historical percentile of maximum temperatures, based on daily temperature data between 1961 and 1990. A heat wave is defined as five or more consecutive extreme heat days. An increase in heat waves may increase the risk of directly related conditions such as heat stroke and dehydration. An extreme heat day for Rancho Mirage is when the temperature exceeds 114°F.<sup>43</sup> Even though the number of heat days varies from year-to-year, the average is projected to increase in the future (Exhibit 28). As the number of heat days per year steadily increases over time, Rancho Mirage must be prepared to protect its resident's health and safety.

**Precipitation**

Changes in precipitation patterns will affect public health primarily through extreme events such as floods, droughts and wildfires. In addition, higher temperatures combined with changes in precipitation patterns create conditions that are more conducive to the occurrence and spread of infectious diseases. On average, the projections show little change in total annual precipitation in California. Furthermore, precipitation projections do not show a consistent trend during the next century. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized.

Rancho Mirage has had an average rainfall of 5.74 inches over the last 30 years, which is 85 percent less than the average nationwide, and 77 percent less than the average in California.

<sup>4</sup> Cal-Adapt



Average rainfall in Rancho Mirage is predicted to decline to approximately four inches per year by 2040. This decrease in annual precipitation is not expected to have a significant impact on Rancho Mirage, due to the limited amount of water they already receive.

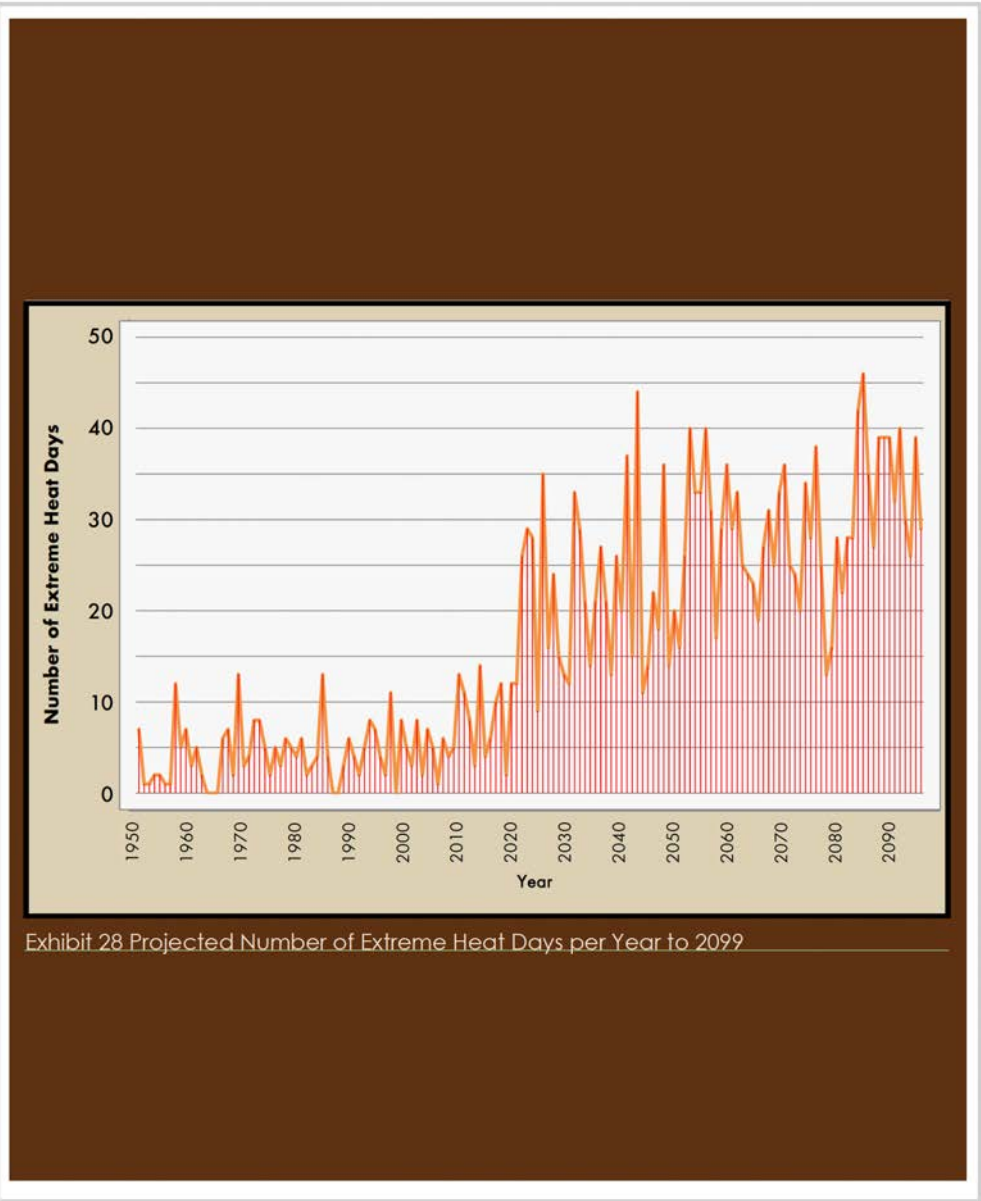


Exhibit 28 Projected Number of Extreme Heat Days per Year to 2099

**Wildfire Risk**

Decreased precipitation and drought also result in increased frequency and duration of wildfires, another significant risk to public health. Wildfire frequency and intensity is expected to grow as temperatures increase and vegetation dries due to longer dry seasons, especially in mountainous areas. In addition to the associated direct risk of fatalities, wildfires can lead to immediate and long-term adverse public health problems due to exposure to smoke. Smoke from wildfires is a mixture of carbon dioxide, water vapor, carbon monoxide, hydrocarbons and other organic chemicals, nitrogen oxides, trace metals, and fine particulate matter from burning trees, plants, and built structures. During wildfires, large populations can be exposed to a complex mixture of pollutant gases and particles, which can have both acute and chronic health impacts. Smoke can irritate the eyes, harm the respiratory system, and worsen chronic heart and lung disease, including asthma. People with existing cardiopulmonary diseases are generally at the greatest risk from smoke inhalation, with age being a complicating risk factor for the exposed population.

Further details regarding wildfire in Rancho Mirage are described in Fire Hazards above.

Climate Change Goals, Policies, And Programs

The City has the responsibility to coordinate with state, regional, and County agencies to establish and maintain an up to date database on climate change conditions in the region, legislation affecting the City’s regulatory responsibilities, and changing technical assessments that refine or re-characterize the climate change impacts affecting the region. The City should also monitor the effectiveness of its adaptation strategies. The City’s development review process must assure that development proposals are thoroughly evaluated with regard to climate change and that comprehensive mitigation measures are developed and implemented. The City will need to take a proactive role to assure

the public is safe by informing them about severity of climate change impacts and what resources are available to them to mitigate these impacts.

**GOAL SAFE 6**

Maintenance of Rancho Mirage as a safe place with a high-quality of life for its residents, businesses, and visitors in the face of climate change.

**POLICY SAFE 6.1**

The City shall identify and periodically reassess local climate change vulnerabilities.

PROGRAM SAFE 6.1A

Conduct a climate change vulnerability assessment of vulnerable populations, structures, and functions.

PROGRAM SAFE 6.1B

Review the findings of the climate change vulnerability assessment with relevant City departments to ensure that vulnerable community populations, structures, and functions are understood and that appropriate actions are taken to protect these vulnerabilities.

**POLICY SAFE 6.2**

The City shall develop adaptation measures that address the climate change impacts on Rancho Mirage’s residents, businesses, and visitors.

PROGRAM SAFE 6.2A

Develop a heat response plan that includes identification of cooling centers and promotion of urban heat mitigation strategies.

PROGRAM SAFE 6.2B

Improve wildfire prevention through regulations of new development, establish and/or maintain cooperative fire

agreements, and increase vegetation management efforts to reduce wildfire potential.

PROGRAM SAFE 6.2C

Incorporate newly identified adaptation measures into planning documents, including the Hazard Inventory and Hazard Mitigation Plan, as appropriate.

POLICY SAFE 6.3

The City shall support initiatives, legislation, and actions to respond to climate change and consider potential climate change impacts in planning and decision making processes.

PROGRAM SAFE 6.3A

Coordinate adaptation planning with other planning, including future General Plan/ land use code updates.

POLICY SAFE 6.4

The City shall work with local organizations to raise awareness about climate change impacts.

PROGRAM SAFE 6.4A

Collaborate with community-based organizations (e.g., health care providers, public health advocates, fire prevention organizations) to disseminate public preparedness and emergency response information related to climate change.

CalFIRE personnel fight a blaze in nearby Palm Desert Pic



Safety Element

