CHAPTER 6 – WATER RESOURCES BACKGROUND REPORT

View of lake being used for water sports.

Introduction

This report assesses water resources in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan.

Legal Basis and Requirements

Government Code Section 65302(d) states the General Plan shall include a conservation element for the "conservation, development, and utilization of natural resources including water and its hydraulic force, forest, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources."

Terminology

The following is a brief background discussion of water resources terminology.

- **Base Flood:** A flood that occurs once every 100 years on average; used by the Federal Emergency Management Agency to determine flood insurance rate maps.
- **Basin:** A smaller drainage subarea within a watershed.
- **Floodplain:** Any land area susceptible to being inundated by floodwaters from any source.
- **Groundwater Basin:** A groundwater basin is the aboveground area from which water drains to an underground aquifer.
- **Overdraft:** Overdraft is a groundwater condition in which outflows exceed inflows.
- **Recharge:** The replenishment of water into a groundwater basin.
- **Stormwater BMP:** A feature or practice that is considered a 'best management practice' (BMP) to improve the quality of stormwater flows.

- **Watershed:** A watershed is the area or region bounded by a geographical divide and ultimately draining to a particular waterway or body of water.

Regulatory Environment

The City of Lake Elsinore must comply with various Federal, State, and local laws. The following is a list of laws and policies relevant to water resources.

- Federal Emergency Management Agency (FEMA)
- Clean Water Act
  - Section 404
  - Section 402
  - Section 401
- 40 CFR Part 503—Regulations and Sewage Sludge Use and Disposal Rule
- Federal Flood Insurance Program
- Executive Order 11988 (Floodplain Management)
- Porter-Cologne Water Quality Control Act
- The Santa Ana Regional Water Quality Control Board (SARWQCB)
- California Toxics Rule (CTR)
- California Fish and Game Code Section 1600 et seq. (Lake or Streambed Alteration Agreement Program)
- Riverside County General Plan
- Water Quality Control Plan
- Santa Ana River Basin (Basin Plan)
- Santa Ana Watershed Project Authority (SAWPA)
- Elsinore Valley Municipal Water District (EVMWD)
- Lake Elsinore Advanced Pump Storage (LEAPS)
- 2002 Integrated Water Resources Plan (IWRP)
- Lake Elsinore and San Jacinto Watershed Authority

Existing Water Resources Conditions

The following discussion addresses the existing surface and groundwater hydrology, drainage, water quality, and potential flooding conditions. The study area has a typical Mediterranean climate with wet, cool winters, and warm, dry summers. Most of the

rainfall occurs between November and April with an average annual rainfall of 13.7 inches.

Hydrology

Surface Water

Early morning fog at the lake.

The primary surface water features within the project area are Lake Elsinore, the San Jacinto River and Temescal Wash (See Figure 6.1). Railroad Canyon Reservoir releases flows to the San Jacinto River. The San Jacinto River flows into Lake Elsinore, which in turn flows into Temescal Wash during periods of high lake levels. As shown in Figure 6.1 the drainage patterns within the City and SOI can be divided into three basins including the Temescal Area, Lake Elsinore and Santa Margarita.

Lake Elsinore is natural in origin and measures approximately five miles long by two miles wide. The lake varies widely in size in response to hydrologic conditions, ranging from 6,000 acres in very wet years to a dry lakebed in drought years. In an effort to maintain a more constant lake level, a levee was constructed across the lake in 1995 to reduce the size of the water surface and minimize evaporation. The levee also provides flood protection up to an elevation of 1262 feet for the southern end of the lake, an area known as the Back Basin (See Figure 6.1)

Lake Elsinore is fed by three primary sources of water: runoff from local tributaries, direct precipitation inputs to the lake surface, and inflows from the San Jacinto River. The percentage of the total input for each of these sources is 8%, 20% and 72%, respectively, indicating that the San Jacinto River is by far the largest source of water reaching Lake Elsinore. Little groundwater interaction is expected because the lake lies on a relatively impermeable layer of clay soil.

Groundwater

Elsinore Groundwater Basin General Setting

The Elsinore groundwater basin is primarily supplied by infiltration of precipitation in the surrounding watershed. Other sources of inflow include infiltration along the San Jacinto River channel upstream of Lake Elsinore and agricultural and residential return flows. Municipal pumping for potable water is the only major outflow from the Elsinore

groundwater basin. Some additional groundwater pumping is performed as necessary to help maintain the elevation of Lake Elsinore at 1,240 feet above mean sea level.

Depth to Water Table and Groundwater Gradient

The depth to groundwater varies considerably across the project area, ranging from approximately 50 - 60 feet in the northern portion of the basin to approximately 400 - 500 feet in the southern portion. The groundwater gradient naturally follows this variation in depths, flowing from the northwest to the southeast underneath Lake Elsinore. Two faults, Glen Ivy North and Rome Hill, appear to partially block groundwater flow. The average groundwater gradient is approximately 0.016 in the middle of the basin, based on somewhat limited data. This steep gradient is due to the considerable level of groundwater water pumping in the Back Basin.

Groundwater Overdraft

The Elsinore Valley Municipal Water District (EVMWD) Groundwater Management Plan includes a groundwater budget analysis of the Elsinore basin for the period 1990 to 2000. The results of the analysis indicate that the basin experiences an average annual deficit of approximately 1,800-acre ft/yr over the 11-year period studied. Eight of the eleven years analyzed had a deficit, while the remaining three years without a deficit corresponded to above average annual precipitation totals. In addition, water levels in wells in the southern portion of the basin dropped more than 200 feet in the same time period, providing further evidence of a groundwater overdraft condition. Continuing overdraft may lead to ground subsidence as soils compact over long periods of time, although no clear evidence of subsidence has currently been identified around Lake Elsinore.

Flooding

Flood information from the 1990 General Plan was researched and found to be still applicable. Following this summary is an update of the Federal Emergency Management Agency (FEMA) flood mapping information based on a review of the latest maps.

Regional flood control planning and facilities construction are within the jurisdiction of the Riverside County Flood Control District. The district is also responsible for the maintenance and operation of flood control facilities including debris dams, storm channels and storm drains. The district's facilities may be characterized as the "backbone" system of flood control for the region. The City of Lake Elsinore also owns and maintains certain flood control facilities in the City that are generally constructed as part of the drainage plans for individual projects. The city ensures that the construction of these facilities is consistent with the master plans of the Riverside County Flood Control District.

FEMA prepared a study in 1980 and revised it in 1987 that identified the following flooding sources in the city: Arroyo del Toro, Channel H, Elsinore Spillway Channel, Lake Elsinore, Leach Canyon Channel, Lime Street Channel, McVicker Canyon, Ortega Wash, Ortega Channel, Rice Canyon, San Jacinto River, Stovepipe Canyon Creek, Temescal Wash, Wash G, Wash I and Wasson Canyon Creek. The locations of these sources is presented in Figure 6.1

The San Jacinto River is the major watercourse within the city. Runoff during a 100-year flood is contained within the riverbed upstream of Interstate 15. Below that point, 100-year flows presently cause flooding over portions of Railroad Canyon Road. In addition, San Jacinto River inflows to Lake Elsinore cause the lake to rise substantially to an elevation of 1,267 feet, inundating inhabited portions of the lakeshore along the southwest and west sides of the lake. Flooding is exacerbated by the low capacity and high elevation of the Temescal Wash outlet (1,260 feet).

Quiet portion of the lake.

Temescal Wash is a gradually sloped earth ditch with limited capacity. The channel has experienced substantial encroachment from residential and commercial development. The 1980 flood caused the condemnation of more than 100 homes and property damages to residential, commercial and industrial uses in the downtown area. Total damages cost approximately $34 million.

Flooding also occurs from the flow of Wasson Canyon Creek as water flows over Camino del Norte and spreads out due to an irregular flow line and lack of any defined channel banks. Backwater forms behind the railway bridge and extends upstream past the Collier Avenue weir crossing at depths of nearly six feet.

Sheet flow is a flood hazard that exists in developed areas below the mouths of Leach Canyon, McVicker Canyon and Rice Canyon. Fully improved, 100-year design channels have been constructed for Leach Canyon and other washes. However, these facilities do not provide adequate upstream control at the mouth of the canyons. As a result, only the channels pick up a portion of the floodwaters and the remaining runoff is in the form of sheet flooding towards the lake with depths of more than one foot.

Flooding from Rice Canyon results from the failure of an earth berm located at the mouth of the canyon. Failure of the dike allows expansive sheet flooding in a southwest

direction into Lake Elsinore, at depths of less than one foot. Flooding generated in McVicker Canyon results in sheet flow on the alluvial fan below the mouth of the canyon. In the lower reach, these flows combine with those of Leach and Rice Canyon to create an expansive area of shallow sheet flooding on the western side of the lake. The potential of floodwaters carrying debris was determined to be high by FEMA for Channel H, Leach Canyon, Lime Street Channel, Ortega Channel and Rice Canyon.

Flooding problems also exist in the Sedco Hills area, east of Mission Trail. Sheet flooding at low levels during rainy periods occurs in many areas of Sedco Hills, washing out streets and flooding property.

Inundation of property and the potential loss of life due to failure of the Railroad Canyon Dam is a hazard in the Railroad Canyon Road area and the eastern floodplain of the lake. Railroad Canyon Reservoir is located in the Canyon Lake Hills development northeast of the city. The reservoir, constructed in 1927, captures waters of the San Jacinto River, which is the primary drainage course of the San Jacinto Mountains. The capacity of the reservoir is approximately 12,000 acre-feet. The Railroad Canyon dam is a concrete arch dam. The city's subdivision code requires that the boundaries of the inundation hazard area be identified and noted on all final maps prior to approval.

Figure 6.1 shows the current FEMA 100-year floodplain within the City and SOI. As shown in the Figure, the floodplain for Lake Elsinore extends into some areas that are currently developed with urban uses. The floodplain for Temescal Wash, McVicker Canyon and the Ortega Channel also extends into areas characterized by development.

The Riverside County General Plan contains information on potential flooding and dam inundation. According to the Elsinore Area Plan the Temescal Wash, Murrieta Creek, and the San Jacinto River, as well as Lake Elsinore, pose significant flood hazards. Dam failure of the Railroad Canyon Dam at Canyon Lake would cause flooding in the plan area. Figure 10, Flood Hazards of the Elsinore Area Plan includes a depiction of flood hazards in the Elsinore area.

The flood hazard areas identified in the Lake Elsinore Area Plan are covered by the 100-year floodplain information shown on Figure 6.1. The information on flood hazards discussed in the Elsinore Area Plan for the 100-year floodplain do not extend beyond the updated 100year FEMA floodplain boundaries shown in Figure 6.1.

The Lake Elsinore Area Plan also refers to the inundation potential associated with a failure of Railroad Canyon Dam at Canyon Lake. Figure 10 of the Elsinore Area Plan shows Dam Hazard Zones that would occur with failure of the Railroad Canyon Dam. Based on a review of Figure 10 of the Elsinore Area Plan it was concluded that inundation associated with Dam Hazard Zones would not extend beyond the 100-year floodplain shown on Figure 6.1 of this document. The extent of the High Dam Hazard

Zone in the Elsinore Area Plan actually corresponds with the boundary of the 100-year floodplain for both Lake Elsinore and San Jacinto River shown on Figure 6.1.

Plan C: Lake Stabilization and Land Use Plan

A lake stabilization and land use plan was proposed that would dike the lake to reduce the surface area, and maintain the lake at 1240 elevation. There were three alternatives devised, Plans A, B, and C. Plan C was adopted as the best alternative to maintain the lake at a satisfactory level. There were other benefits associated with Plan C including dredging and shaping shallower areas and dredging and cleaning out the bottom of the lake. The Plan was meant to not only prevent future flooding, but to ensure that the lake would have sufficient water during drought years. The Plan called for developing the area surrounding the lake as a water-oriented recreational area. Existing recreational facilities, both public and private, were going to be improved and the floodplain southeast of the lake was proposed as future residential, commercial and recreational development. The benefit to the City of implementing the Plan was to ensure an economic surge as residents and tourists spent money on new retail establishments as well as to stimulate new residential and commercial construction.

In 1977, newly elected park directors began emphasizing other projects and Plan C was neglected. As described in Tom Hudson's history book, *Lake Elsinore Valley: its story 1776-1977*, it became a contentious political issue and the general manager of the park district resigned because he was unhappy about the lack of progress over Plan C. Three park directors were recalled and replaced by new members who promised to implement the project. It is unclear whether park directors picked up Plan C again, but it likely influenced future lake management projects. In the 1980s, the City of Lake Elsinore experienced severe flooding that washed out bridges and roads, demolished structures, and left a wake of debris.

Lake Elsinore Management Project

The Lake Elsinore Management Project is a phased construction program for lake stabilization and associated improvements that was implemented in the late-80s by a joint powers authority called the Lake Elsinore Management Authority. As previously mentioned, the lake has a history of flooding or drought. During flooding years, the cost of flood-related damages has risen to the millions of dollars, and during drought, fish have died and recreational activity has stopped. To avoid fluctuation and to stabilize the lake, the boundaries of the lake were restructured to prevent flooding and reduce evaporation. In addition to the boundary adjustment, other improvements were implemented as part of the project. The following is a list of the complete program as summarized in the 1993 Update of the Lake Elsinore Management Project brochure published by the Lake Elsinore Management Authority:

- Connection Channel: diverts the San Jacinto river flows into the lake.
- Lake Type Inlet: provided material to build the meandering levee.
- Pumping Station: circulates water between the lake and the wetlands area.
- Forty-Eight Inch Conduit: circulates water between the lake and the wetlands to allow fish to migrate back and forth. A floodgate will close when the lake rises above the 1,243' elevation.
- Flood Plain: provides flood storage when the lake and outflow channel cannot absorb major storm flows.
- Linear Riparian Habitat: one-mile linear riparian habitat was created by planting native trees, shrubs, and grasses along a portion of the former bed of the San Jacinto River.
- Wetlands Wells: provides a continuous supply of water for the riparian and wetlands habitats.
- Wetlands Habitat: 356-acre wetlands area was constructed to provide habitat for birds, small mammals, reptiles, and amphibians.
- Fish Habitat: 50-acre fish-breeding habitat was established in the cove between the south end of the operation island and the levee.
- Levee: 17,800' long earthen levee built to elevation 1,265' that reduced the lake to a smaller surface area thereby reducing average evaporation losses and improving water quality.
- Operations Island and Wells: operations island was constructed to protect the wells and provide access for maintenance, and the wells were established to supply water for lake stabilization.
- Olive St., Beecher St., and Cereal St. Wells: constructed to supply supplemental water for municipal and industrial use, and lake stabilization.
- Water Recreation Area: lake stabilization allows for year-round recreational opportunities including boating, fishing, and swimming.
- Overflow Weir: weir will allow excess flood waters that cannot be absorbed by the lake and the outflow channel to flow into the floodplain for storage.

- Outflow Channel: although not officially part of the program, it is an integral part of the managed lake system that allows overflow water to flow from the lake into Temescal Wash, eventually reaching the Santa Ana River.

The benefits of the Lake Elsinore Management Project include conserved water during dry years by reducing evaporation loss and implementing a well system, reduced flood damage, improved water quality by allowing more frequent discharges, improved recreational lake use, and enhanced fish and wildlife habitat. Most of the projects were completed by the early 1990s but certain components, such as lake replenishment, are still on going.

Water Quality

Surface Water Quality

Surface water quality is strongly influenced by local land uses. Pollutant sources in the Lake Elsinore area are historically caused by agricultural uses such as chemicals and fertilizers.

State Water Resources Control Board Impaired Waterbodies

The State Water Resources Control Board (SWRCB), in compliance with Clean Water Act Section 303(d), has prepared a list of impaired water bodies in the State of California (SWRCB 2004). The list includes a priority schedule for the development of total maximum daily loads for each contaminant, or stressor, impacting the water body. On July 25, 2003 United States Environmental Protection Agency (EPA) gave final approval to California's 2002 Section 303(d) List of Water Quality Limited Segments.

Within the City of Lake Elsinore, Lake Elsinore is listed as an impaired waterbody as a part of the SWRCB 303 (d) listing. Pollutants and stressors identified for Lake Elsinore by the SWRCB include:

- High nutrient levels from unknown point sources.
- Organic enrichment/low dissolved oxygen from unknown point source.
- Sedimentation/siltation from local urban runoff and storm sewers.
- Toxicity from an unknown nonpoint sources.

State Watershed Management Initiative

In 2004 the SWRCB and the Regional Boards developed the Watershed Management Initiative (WMI) to address water quality improvements of impaired waterbodies. The SWRCB summarized the mandate of the WMI as follows:

> The water resource protection efforts of the State Water Resources Control Board and the nine Regional Water Quality Control Boards are guided by a five year Strategic Plan (updated in 1997). A key component of the Strategic Plan is a watershed management approach for water sources protection. To protect water resources within a watershed context, point and nonpoint source discharges, ground and surface water interactions, and water quality/water quantity relationships must be considered. To do so presents considerable challenges. The State Board and Regional Boards are responding to these challenges with the Watershed Management Initiative (WMI). The WMI is designed to integrate various surface and ground water regulatory programs while promoting cooperative and collaborative efforts within watersheds. It is also designed to focus limited resources on key issues.

At this time, the following programs are integrated into the Santa Ana Region's WMI process:

- Total Maximum Daily Loads (TMDLs)
- Nonpoint Source Program (NPS)
- Watershed Management
- Monitoring and Assessment
- Core Regulatory (NPDES, Waste Discharge Requirements (WDRs) and Chapter 15 WDRs)
- Water Quality Standards/Basin Planning
- Wetlands
- Groundwater Resource Protection/Clean-up

Fluctuating water levels in Lake Elsinore and algal blooms triggered by excess nutrients have caused significant impairment of the ecology and recreational use of Lake Elsinore. With the help of local stakeholders, a regional monitoring program is being implemented to identify the sources. The data generated is being used in the development of TMDLs programs for Lake Elsinore.

The WMI is divided into General Categories of Watershed Planning, Mapping, Assessment, and Monitoring Project Needs. The following are the general categories addressed by the WMI. Within each category are specific projects or regional objectives:

- Regional Planning, Assessment and Monitoring
- Regional Mapping, GIS and Database Management
- Referenced Sites/Biological Indices
- TMDL development

- TMDL implementation
- Stakeholder Support and Public Outreach
- Wetlands/Riparian/Stream Restoration and Preservation
- Habitat Acquisition and Protection
- Best Management Practices (BMPs), Non-Point Source (NPS) Management Measures (MMs), and Implementation (Focus on Source Control)
- Groundwater Resource Protection.

Specific Watershed Management Initiative Projects for Lake Elsinore and the San Jacinto River Water Quality Improvement

Based on the general categories for planning the WMI also includes specific projects recommended for impaired water bodies within the watershed. The following are several of the specific projects recommended for Lake Elsinore and the San Jacinto River:

- Revise nutrient water quality objectives for Lake Elsinore, Canyon Lake, and San Jacinto River.
- Update model simulations for nutrients, sediments, and pathogens in the San Jacinto River Watershed.
- Conduct monitoring studies to identify sources of toxicity, sediment, and nutrients entering Lake Elsinore, Canyon Lake, and San Jacinto River, leading to the development of multiple TMDLs.
- Monitor and track pesticide, fertilizer, manure application to cropland in San Jacinto River watershed. Implement BMPs to prevent over-application.
- Support efforts of Reclaimed Water Task Force to evaluate use of reclaimed water to stabilize level of Lake Elsinore and reduce impairments of beneficial uses from excessive nutrients.
- Extend regional sewers to Quail Valley and the south shore of Lake Elsinore, and abandon existing septic tank discharges in these areas.
- Provide phosphorus removal treatment for all tertiary effluent proposed to be discharged into Lake Elsinore.
- Conduct dynamic water quality models for Lake Elsinore and Canyon Lake to simulate and predict the impacts of activities in the SJR watershed, and of in-lake treatment technology on the in-lake water quality/beneficial uses.

- Assist septic tank removal program by Elsinore Valley Municipal WD.

Lake Elsinore and San Jacinto Watersheds Authority and the Lake Elsinore Stabilization and Enhancement Project

As part of the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act of 2000 funding (also know as Proposition 13), the Santa Ana Watershed Project Authority (SAWPA) was named as one of the members of a newly formed Joint Powers Authority (JPA) called the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA). Members of LESJWA include Elsinore Valley Municipal Water District, the City of Lake Elsinore, County of Riverside, the City of Canyon Lake and SAWPA.

The LESJWA is the lead agency for the Lake Elsinore Stabilization and Enhancement Project. The enhancement project is necessary because the lake is a, "…eutrophic natural reservoir that exhibits algal blooms, low water clarity, large variations in water level elevation and dissolved oxygen content, fish kills, and high nutrient conditions."

View of lake from hills in Country Club Heights.

Fifteen million dollars was identified in Proposition 13 for LESJWA to implement projects to address goals in the watersheds. SAWPA's role includes providing representation on the LESJWA Board and to provide administration of the Agency. The administrative functions include facilitation of financing projects and programs including Proposition 13 funds and EPA grant funds as well as unidentified federal and state financing, provide administrative support including management, accounting and clerical, and project management as requested by the new JPA.

In addition to the Lake Elsinore Stabilization and Enhancement project, the LESJWA has implemented other projects to improve water quality in the lake. In 2004, recycled water was added to the lake, lake mixing facilities were constructed, striped bass were added, and carp were removed from the lake.

The LESJWA has prepared a Draft EIR on the Lake Elsinore Stabilization and Enhancement project. According to the EIR the objectives of the project are:

- Stabilize the water level of Lake Elsinore, by maintaining the lake elevation within a desirable operating range (minimum of 1,240 feet above mean sea level to a maximum of 1,247 feet above mean sea level).

- Improve lake water quality – reduce algae blooms, increase water clarity, increase dissolved oxygen concentrations throughout the water column, and reduce or eliminate fish kills.

- Enhance Lake Elsinore as a regional aesthetic and recreational resource.

Uninviting view of lake water combined with attractive pair of palm trees.

The proposed project includes the following elements according to the Draft EIR:

- Supplemental water should be added to Lake Elsinore for lake stabilization and enhancement. Sources of supplemental water to stabilize lake water elevations would include recycled water from the EVMWD Regional Water Reclamation Plant and recycled water from the Eastern Municipal Water District.

- Nutrient removal facilities to reduce nutrient concentrations in discharges to the lake from the EVMWD regional plant, including:
  - Installation of facilities at the Regional Plant for chemical removal of phosphorus.
  - Reconfiguration of a portion of existing wetlands in the Lake Elsinore Back Basin into treatment wetlands.

- Subsurface, diffused air in-lake aeration system: The proposed aeration system includes aeration buildings at the north and south sides of the lake, from which piping would extend onto the lake bottom and bubble air into the water column. This subsurface aeration system is envisioned to supplement the surface axial flow pump aeration system already in place in Lake Elsinore.

Lake Elsinore Advanced Pump Storage (LEAPS)

Elsinore Valley Municipal Water District (EVMWD) in conjunction with The Nevada Hydro Company, Inc. is proposing the Lake Elsinore Advanced Pump Storage (LEAPS) and Talega-Escondido/Valley-Serrano (TE/VS) Transmission Line Project. The project proposes a hydroelectric plant using a reservoir that would be built in the hills above Lake Elsinore and a related transmission line connecting Riverside and San Diego counties. The benefits include producing power for 500,000 homes, and providing

sufficient water to stabilize the lake at or above the critical 1240 feet above sea level. The proposed facility will generate electricity from falling water during the day at peak energy levels and in the evening, water will be pumped from Lake Elsinore to the upper reservoir repeating the cycle the following day.

Elements of the LEAPS (EVMWD) project would contribute to improving the water quality of the lake. The project would also assist in stabilizing lake levels. As indicated above, both the SWRCB Watershed Management Initiative and the LESJWA Lake Elsinore Stabilization and Enhancement Project consider stabilization of lake levels critical for improving water quality in the lake.

Groundwater Quality

The EVMWD Groundwater Management Plan includes an analysis of groundwater quality at a group of wells within the Elsinore basin. Several key trends were identified based on wells used in the Groundwater Management Plan:

- TDS (as well as nitrate and sulfate) is generally higher in the area north of the lake and along basin margins than in the area south of the lake.
- Highest concentrations of TDS, sulfate and nitrate are found at the Lincoln Street Well, just northwest of the lake.
- Lowest concentrations of TDS and sulfate are found in the Olive Street Well, southeast of the lake.
- Arsenic concentrations are highest in deeper wells.

Historic agricultural land use could be the source of higher concentrations of TDS, nitrates and sulfates in the area north of the lake. Historic septic system use in the same area likely contributed to nitrate levels. Given that shallow wells in the area have also demonstrated a trend of higher sulfate and nitrate concentrations, loadings appear to be related to historic land use.

A continuing source of groundwater constituents is the group of more than 4,000 septic systems still in use in and around the city. Areas with the highest risk from septic system inputs are north and south of the lake, where groundwater-pumping facilities are located in regions of soils with moderately coarse-grained particles.

Another source of possible contamination is from leaky underground storage tanks (LUSTs) that discharges petroleum products, solvents, or other organic constituents. An example that has become a major problem throughout California is LUSTs containing the gasoline oxygenate known as MTBE (methyl tertiary-butyl ether). According to the

Groundwater Management Plan, MTBE has been detected in the groundwater from four cases of LUSTs in the Elsinore basin since 1998.

Constraints Due to Regulatory Requirements

Floodplain

Federal floodplain regulations will serve as a constraint to development within the City. Federal floodplain regulations require that a community must adopt legally enforceable floodplain management guidelines that meet Federal standards prior to the issuance of flood insurance. These guidelines must require that new buildings be flood-proofed and elevated above the base flood level, must specify a permit program for new construction that evaluates the flood safety of proposed structures, and must assure that any altered waterways will maintain their flood carrying capacities. In addition, flood insurance is typically required for any commercial or privately owned structures within the 100-year floodplain that are mortgaged. Typically these floodplain regulations are addressed at a project design level and are not the subject of General Plan designations.

Overlay Regulations

The County Flood Control and Water Conservation District and City of Lake Elsinore Flood Prone Overlay regulations as detailed in the City of Lake Elsinore's Zoning Ordinance Chapter 17.09 will continue to apply following the General Plan update. The purpose of the Flood Prone Overlay is to control development in areas subject to periodic flooding and associated hazards. In the base district where the district symbol is followed by the letters "FP-1" or "FP-2" additional requirements or restrictions will apply. These regulations will continue to serve as constraints to development within the City and SOI that are located within or adjacent to floodplain areas. The General Plan should address the conditions of the City Flood Prone Overlay District FP-1 and FP-2 districts and avoid siting any urban uses within or near the floodplain.

Clean Water Act

Additional development must follow permit requirements outlined by the Clean Water Act, Section 402, which regulates discharges to surface waters through the National Pollutant Discharge Elimination System program. In addition, discharges related to construction activities require a stormwater pollution prevention plan (SWPPP). These permits are typically integrated with regional state water quality permits obtained for individual projects. As a result, these regulations would not necessarily represent a substantial constraint to implementation of an updated General Plan land use plan.

United States Army Corp of Engineers (ACE)

Any fill or dredged materials discharged into wetlands or within the high-water mark of a stream will require a Section 404 permit. In the process of obtaining a 404 permit the extent of development may be limited by the US Army Corp of Engineers at the project specific level to avoid jurisdictional wetlands. As shown in Figure 6.1, many blue line streams that may constitute jurisdictional wetlands extend throughout the City and SOI. Impacts to smaller drainages that constitute jurisdictional wetlands should be addressed at the project specific level and do not necessarily need to be addressed by General Plan designations. As discussed further in this section preservation of larger wetlands in association with implementation of the MSHCP should be considered at the General Plan level.

Constraints Due to Existing Conditions

Surface Water

The water levels in Lake Elsinore are currently maintained by pumping groundwater and a minor amount of reclaimed water into the lake during times of drought. Municipal water requirements and lake water requirements may conflict in the future as development increases the demand for potable water.

Urban development increases the amount of impervious area within a watershed, in turn increasing peak flows and total runoff volumes. Urban development may also alter historic drainage patterns and modify overall flow regimes, affecting local plant and animal life.

The City lies in an arid region where water is a limited resource. Efficient use of water is necessary to extend this resource as far as possible, including approaches such as xeriscaping and appropriate use of reclaimed water.

Groundwater

The Elsinore groundwater basin is currently in a state of overdraft. Further development and population growth will increase the amount of overdraft if other sources of potable water are not developed. Groundwater depths have dropped by almost 200 feet in the southern portion of the basin since 1990. Greater depths to groundwater increase the cost of pumping. Greater depths also appear to increase the amount of arsenic in the pumped water.

Flooding

The 100-year floodplain along San Jacinto River, Lake Elsinore and Temescal Wash will be inundated during very large floods. Development within these areas should be avoided to minimize costly flood damage during large storm events. Recent flooding in the Temescal Wash area caused damage in the central portion of the City.

The San Jacinto River floodplain could be subject to very large flows if the Railroad Canyon Dam at Canyon Lake (See the location of Canyon Lake on Figure 6.1) failed. Development along the floodplain should be restricted to the limits of inundation defined for the Railroad Canyon Dam dambreak scenario. As discussed above in general the inundation areas for a dam break correspond to the 100-year floodplain boundaries for Lake Elsinore and San Jacinto River shown in Figure 6.1. As a result, if future development is restricted to areas outside the floodplain issues with flooding associated with dam inundation may also be minimized.

The floodplain for Lake Elsinore may represent a substantial constraint to planned development. As shown in Figure 6.1 the floodplain and levee inundation area for Lake Elsinore extends over a large area to the east of the lake. The General Plan shows Specific Plan designation over a portion of the area east of the lake that is located within a floodplain. City records shows that a development called the Eastlake Specific Plan has been approved for this area. The schedule for implementation of this Specific Plan is not known. Substantial changes to the boundaries of the floodplain may be required in association with development of this Specific Plan. All structures and grading associated with implementation of this specific plan will be subject to approval of the Federal Emergency Management Agency (FEMA) and through the local City Floodprone Overlay District.

Surface Water Quality

Lake Elsinore is currently considered an impaired water body by the State. The sources of pollution including high nutrient, organic enrichment/low dissolved oxygen, sedimentation/siltation and toxicity levels include unknown non-point sources. The source of the sedimentation and siltation within the lake is from urban runoff and storm sewers. According to the Santa Ana Water Quality Control Board (SAWQCB), improvement to the water quality in the lake can only be achieved through regional water quality monitoring and restoration programs.

Urban development directly affects surface water quality in several ways. Additional pollutants are introduced to the watershed, such as construction-related sediment and automobile-related hydrocarbons. Urban development increases runoff flows, which in turn increase transport and delivery of constituents, as well as erosion along existing

waterways. The conversion of agricultural land to urban land uses will affect water quality, generally decreasing nutrient load and increasing sediment load.

Implementation of water quality restoration programs for Lake Elsinore required by the State in accordance with the Clean Water Act regulations may involve stormdrain infrastructure and preservation of wetlands that will serve as a constraint to future development. Urban development with the City and SOI will need to incorporate the necessary BMPs into stormdrain infrastructure. Certain BMPs necessary to improve lake water quality levels may include preservation or enhancement of vegetation within major drainages or floodways that extend into the lake.

Groundwater Quality

TDS, nitrates and sulfates already impact groundwater quality. Additional development relying on septic systems instead of a municipal sewer system would further impact groundwater quality.

Opportunities to Enhance Regulatory Requirements

Establishing New Programs

As discussed above, a majority of the regulatory requirements regarding environmental issues such as flooding and surface water quality are addressed at the project specific level and not through General Plan designations. General opportunities to enhance local regulations to address water resources issues include the following:

- Adding a Grading and Erosion Control Ordinance that will reduce sediment impacts associated with construction.
- Establishing a spill prevention and control program that will reduce impacts to surface and groundwater resources.

The Lake Elsinore Advanced Pump Storage (LEAPS)

Although the LEAPS (EVMWD) project is primarily intended to produce electricity, it is also opportunity for the City to improve existing lake levels. The City can work with the EVMWD and The Nevada Hydro Company, Inc. to ensure that the program will work in conjunction with its other lake stabilization programs.

Opportunities to Address Water Resources

Surface and Groundwater Quality

Extensive opportunities exist for the City in conjunction with other local jurisdictions to improve Lake Elsinore water quality in accordance with the objectives of the SWRCB Watershed Management Initiative and the Lake Elsinore and San Jacinto Watershed Authority Lake Elsinore Stabilization Project. A goal of the General Plan should be to improve water quality in the lake through support of the SWRCB Watershed Management Initiative and the Lake Elsinore Stabilization Project.

SWRCB Watershed Management Initiative

As discussed above specific projects have been identified by the SWRCB to improve the water quality of Lake Elsinore. Many of the projects suggested in the WMI for improvement of lake water quality would need to be completed on a Citywide and regional level including:

- Conducting extensive water quality monitoring and modeling.
- Extending regional sewers from Mystic Lake to allow elimination of septic systems in this area.
- Utilize reclaimed water at a regional level to stabilize Lake Elsinore.

The following initiatives of the WMI that could be implemented within the City jurisdictional boundaries and SOI should be discussed as goals or objectives at the General Plan level:

- "Projects that support WARM, WILD, RARE, REC2, water quality beneficial uses within areas subject to Multiple Species Conservation Plans:" Through implementation of the MSHCP the City will preserve natural open space that contains extensive wetlands and natural drainages. Preserving these natural features or buffering development from wetlands and drainage courses through the MSHCP will ensure that further degradation of features that drain into the lake do not occur. The General Plan should identify open space areas that are consistent with those called for by the MSHCP.
- "Preserve existing unimproved waterways, reaches, and tributaries of the San Jacinto River, by protecting their natural condition, by establishing adequate buffers, and by stream restoration": The MSHCP Criteria cells identify areas within and surrounding San Jacinto River for preservation as open space.

- "Provide Phosphorous removal for all tertiary effluent proposed to be discharged into Lake Elsinore" and "Plan and construct desalters and related peripheral facilities including pipelines, in groundwater subbasins impacted by TDS Concentrations resulting from historic resource and land use practices. These efforts could be listed as goals or objectives of the General Plan.

- "Assist septic tank removal program by Elsinore Valley Municipal WD" Removal of existing septic systems could be a goal discussed in the General Plan.

- Utilizing reclaimed water for landscaping will provide an additional source of water other than groundwater.

- Routing stormwater flows to on-site detention and retention facilities can increase recharge to groundwater and improve water quality.

- Investigation of options to bring the groundwater budget into balance will help identify potential methods for reducing reliance on a finite resource.

- Lake Elsinore and San Jacinto Watersheds Authority Lake Elsinore Stabilization and Enhancement Project

The Lake Elsinore Stabilization and Enhancement project is under consideration by the Lake Elsinore and San Jacinto Watersheds Authority. The project will comply with many of the objectives of the SWRCB WMI. Elements of the project that are consistent with the WMI include:

- Removal of phosphorus from EVMWD effluent.

- Use of reclaimed water from the Eastern Municipal Water District to stabilize lake levels.

- Aeration of the lake.

Flooding

Where the General Plan identifies Specific Plans within or adjacent to Floodplain areas opportunities exist to include policies in the Specific Plan that will ensure that alterations to the floodplain and that damage to structures from flooding are minimized.

- Construction of channel improvements may allow conveyance of the 100-year flow without extensive flooding.

- Infrequently inundated floodplain areas could be used for community features that are not sensitive to flooding, such as linear parks or playing fields.

- Directing new development to locations outside of the 100-year floodplain will reduce flood damages and save property owners insurance costs.

Groundwater Quality

The following measures could be discussed as objectives or goals of the General Plan to improve groundwater quality:

- Elimination of as many of the remaining 4,000 septic systems as possible would reduce the rate of infiltration of nitrates to the groundwater system.

- Reduction or treatment of stormwater associated with land use applications that result in the placement of nitrates and sulfates on the ground surface, such as agricultural or industrial practices, would improve groundwater quality.

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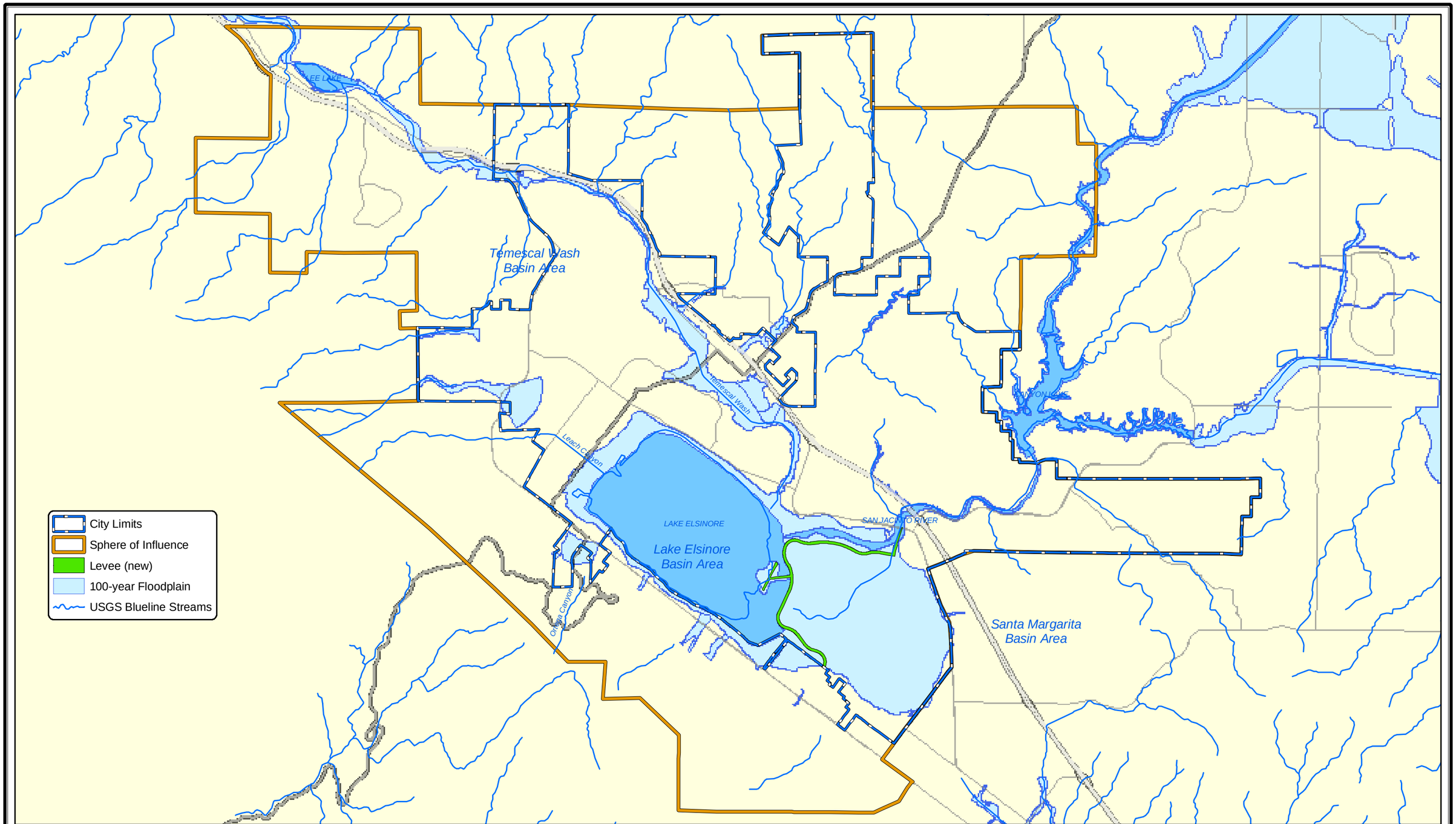

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig6_1hyd

0 6,500 13,000

Feet

Hydrologic Resources
Figure 6.1

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CHAPTER 7 – CULTURAL, HISTORICAL, AND PALEONTOLOGICAL RESOURCES

Introduction

This report assesses cultural, historical, and paleontological resources in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan for the City of Lake Elsinore.

Legal Basis and Requirements

Government Code Section 65302(a) states the General Plan shall include a land use element "that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land."

Terminology

The following is a brief background discussion of cultural, historical, and paleontological resources terminology.

- **Historical Resource:** This is a CEQA term that includes buildings, prehistoric and historical archaeological sites, structures, objects, or districts, each of which may have historical, prehistoric, architectural, archaeological, cultural, or scientific importance, and is eligible for listing or is listed in the California Register of Historical Resources (CRHR). CEQA regulations and guidelines primarily use the term "historical resource" when discussing the full range of cultural resources. Therefore, the terms "historical resource" and "cultural resource" are used interchangeably in this document.

- **Historic Property:** Federal regulation 36 CFR 800 defines this term as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP).

- **Integrity:** Refers to a property's ability to convey its historical significance. There are seven aspects or qualities of integrity: location, design, setting, materials, workmanship, feeling, and association. The importance and

applicability of these qualities depend on the significance of the property and the nature of the character-defining features that convey that significance.

- **Paleontological Resources:** Refers to fossil evidence of past life on earth, such as fossilized remains of vertebrate and invertebrate organisms, fossil tracks and trackways, and plant fossils.

- **Senate Bill 18:** SB 18 was signed into law in September of 2004 with the main provisions taking effect on March 1, 2005. SB 18 requires Cities and Counties to contact, and consult with, California Native American Tribes when adopting or amending the General Plan (GP) or when designating land as Open Space. The purpose of consultation is to protect Native American cultural places that may be impacted by the proposed General Plan adoption, amendment, or Open Space designation.

  Definitions:

  - **California Native American Tribe** – A federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the Native American Heritage Commission (NAHC).

  - **Consultation** – Consultation means the meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and where feasible, seeking agreement. Consultation between government agencies and Native American tribes shall be conducted in a way that is mutually respectful of each party's sovereignty. Consultations shall also recognize the tribe's potential needs for confidentiality with respect to places that have traditional tribal cultural significance (Government Code 65352.4).

- **Substantial Adverse Change in the Significance of a Resource:** The physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired.

Regulatory Environment

The City of Lake Elsinore must comply with various Federal, State, and local laws. The following is a list of laws and policies relevant to cultural, historical, and paleontological resources.

- National Historic Preservation Act (NHPA)
- Antiquities Act of 1906

- Paleontological Resources Preservation Act (PRPA)
- National Natural Landmarks Program
- California Environmental Quality Act (CEQA)
- California Public Resources Code
- Health and Human Safety Code
- California Government Code
- Riverside County General Plan
- City of Lake Elsinore General Plan
- City of Lake Elsinore Municipal Code
- SB 18 Consultation

Existing Conditions

Cultural and Historical Resources

Record Search

A records search for the study area was conducted at the Eastern Information Center of the California Historical Resources Information System at the University of California, Riverside on July 12, 2005. The search consulted the state's database of previous cultural resources studies and recorded cultural resources sites, as well as the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), California Historical Landmarks, California Points of Historical Interest, and local historical registers.

Former Crescent Bath House, now referred to as "The Chimes."

According to the record search, 194 cultural resources studies have been previously conducted within the project area and 447 cultural resources (buildings, structures, objects, and archaeological sites) have been previously recorded within the same boundary.

Historic Built Environment

Two buildings within the city boundaries, the Crescent Bath House and the Grand Army of the Republic Armory Hall, are currently listed in the National Register of Historic Places. The Armory Hall is also listed in the California Points of Historical Interest (RIV-070) as is the Elsinore Women's Club (RIV-071) and

Elsinore's Hottest Sulphur Springs (RIV-023). California Historical Landmarks lists no properties within the project area.

In the 1980s, the Riverside County Historical Commission designated a local historic district, Historic Downtown Elsinore that encompasses areas of early residential and commercial development within the City of Lake Elsinore as seen in Figure 7.1. A majority of the district is focused in the areas around Main Street, Heald Avenue, and Graham Avenue, where some of the earliest development occurred. The city is working with the County of Riverside to protect its local cultural heritage and structures of merit, and the historic district has been officially recognized by the County of Riverside and the City of Lake Elsinore

Currently listed in the National Register of Historic Places:

- Crescent Bath House/Chimes Building (P33-6998)
- Grand Army of the Republic Armory Hall (RIV-070)

Currently listed in the California Points of Historical Interest:

- Grand Army of the Republic Armory Hall (RIV-070)
- Elsinore Women's Club (RIV-071)
- Elsinore's Hottest Sulphur Springs (RIV-023)

Currently listed in the Riverside County General Plan as a significant historical resource:

- Lake Elsinore Downtown Historic District (P33-7142)

  Includes:
  - Masonic Lodge (P33-6982)
  - Train Depot (P33-6997)
  - First Presbyterian Church (P33-7040)
  - Pioneer Lumber Company-127 West Graham Avenue (P33-6996)
  - Lake Theatre-310 West Graham Avenue (P33-7001)

Unofficially recognized significant historical resources:

According to the 1990 General Plan, the community unofficially recognizes several sites and structures as significant historical resources. Locally recognized historic resources in the Lake Elsinore area include:

- Delaney Estate-north of Lake Elsinore
- Aimee's Castle- Skyline Drive

- The Adobe Machado House and Butterfield Stage Stop- Riverside Drive, northwest of the lake
- Alberhill School- Lake Street
- Warm Springs Ranch- Walker Canyon Road
- The Cannery- Spring Street
- Elsinore Naval Military Academy- Grand Avenue

Additional Lake Elsinore Historic Homes of Interest [1]:

- 16919 Bell Street, 1930
- 219 Riley Street, 1920
- 29610 Hague Street, 1928
- 29444 Kalina Street
- 29431 Kalina Street
- 17912 Hamlet Circle, 1929, Bredlau Castle
- 17747 Skyline Drive, 1930, Village La Shell
- 16921 Holborow Avenue, Journeys End
- 17541 Barkshatt Drive
- 16685 McPhearson Circle, 1926
- 17271 Lakeview Avenue, 1929
- 226 East Franklin Street, 1924, Scotty's Castle
- 228 Spring Street, 1912, Gardner Home
- 257 Hill Street

Prehistoric and Historic Archaeology

The record search also indicated that 157 prehistoric and historical archaeological sites have been previously recorded in the project area. Of these 157 sites, eight have been evaluated for eligibility to the NRHP. Of those evaluated for eligibility, two prehistoric archaeological sites (CA-RIV-1022 and CA-RIV-2798) have been determined eligible for listing in the NRHP. CA-RIV-1022 is described as a rock shelter and CA-

[1] Information provided by the Lake Elsinore Historical Society, December, 2005.

RIV-2798 is recorded as a prehistoric village site. The remaining six sites have been determined ineligible for listing in the NRHP.

Archival research was conducted at the Lake Elsinore Historical Society, the University of California, Irvine, and the research library at Jones & Stokes. This research was conducted in an effort to determine the prehistoric, ethnographic, and historic contexts for the City of Lake Elsinore.

Prehistoric Context

To date, a distinct cultural sequence has yet to be defined for Lake Elsinore. Traditionally, this area has been incorporated within discussion of Luiseño ethnographic traits and previous descriptions depended upon the similarity of the limited assemblages with those from the more extensively studied Pauma Valley sites (Hampson et al.1992). Based on these comparisons, a discussion of Moratto's (1984) Southern Coast Region (San Diego) sequence is included here. In addition, in response to ethnographic references to shared use of this territory by groups to the east of the Luiseño, particularly the Cahuilla, Moratto's (1984) Desert Region (Colorado River) sequence is also discussed.

Southern Coast Region, San Diego Sequence

San Dieguito (beginning ca. 5500 B.C)

This period reflects a generalized hunting tradition distinct from the Desert Tradition. California units of the San Dieguito Complex include the C.W. Harris site (San Diego County), Playa I and II (San Bernardino County), Lake Mojave, Death Valley I, Panamint Basin, Mono Lake, and Owens Lake assemblages characterized by leaf-shaped knives and points, Lake Mojave and Silver Lake points, scrapers, engraving tools, and crescents.

La Jolla Complex (5500 B.C. – 1000 B.C.)

The origin of the La Jolla Complex began sometime prior to 7500 years ago with the arrival on the coast of a simple gathering people from the interior desert. The reason for the migration may have been that the California deserts became increasingly unfavorable for human habitation. The La Jolla Complex is recognized by millingstone assemblages in shell middens, often in the vicinity of sloughs and lagoons. Characteristic of this assemblage are millingstones, unshaped manos, a large amount of flaked cobble tools, and a few Pinto-like projectile points. Burials tend to be flexed, heads to the north, under stone cairns. Some writers interpret this period as having three distinct phases that reflect developmental changes: La Jolla I (5500-3500 BC) identified by flexed burials, the first appearance of millingstones, and percussion-flaked scrapers; La Jolla II (3500-2000 BC)

with true cemeteries, ground-stone discoidals, and several types of projectile points in addition to the Phase I inventory; and La Jolla III (2000-1000 BC) showing Yuman cultural influence from the east.

Pauma Complex (5500-1000 B.C.)

In 1958, DL True identified a complex similar to both La Jolla and San Dieguito in an area west of Escondido in the Peninsular Ranges of Northern San Diego County (30 to 35 miles south-southeast of Lake Elsinore). An examination of nearly 25 sites revealed San Dieguito-like flaked-stone crescents and leaf-shaped points or knives associated with the La Jollan millingstones, core scrapers, and stone discoidals. The name Pauma Complex was assigned to these materials after the Pauma Valley, where some of the sites were located. As a result of additional surveys and further analysis of artifacts, True recognized that the Pauma Complex as originally defined may have been conglomerate of the San-Dieguito-like materials, Millingstone elements, and assemblages with Millingstone artifacts unlike those typical of the La Jolla Complex.

San Luis Rey Complex I-II (A.D. 1400-1750)

Initially attributed to the ancestors of the Diegueño, studies have determined the complex as almost certainly representing the forebears of the Luiseño. Diagnostic features for San Luis Rey I include cremations, bedrock mortars, milling stones, triangular arrow points, bone awls, and stone and shell ornaments. In addition to those items, San Luis Rey II components include pottery vessels, cremation urns, red and black pictographs, and such non-aboriginal items such as metal knives and glass beads.

Desert Region-Colorado River Sequence

Paleo-Indian Period (ca. 12,000–7,000 B.P.)

The earliest humans to occupy North America are believed to have been highly mobile hunters and gatherers. Rogers (1966) assigned the Paleo-Indian sites within the Colorado Desert to the San Dieguito Culture. Moratto (1984:92) notes that San Dieguito artifact assemblages are similar to those of Lake Mojave and other Paleo-Indian cultures in southern California. Moratto goes on to suggest that assemblages of this early era be divided into a Fluted Point tradition (12,000–10,000 B.P.) and, following Bedwell (1970), a Western Pluvial Lakes Tradition (10,000–7,000 B.P.).

Pinto Period (ca. 7,000–4,000 B.P.)

The Pinto Period is marked by the gradual transition from pluvial to arid conditions during the terminal Pleistocene-Early Holocene. Pinto Period sites are associated with the margins of pluvial lakes and with now extinct springs. Pinto-series projectile points,

crudely made stemmed or basally notched dart points, are the most distinctive artifact type of the Pinto Period. Other artifacts found at Pinto Period sites include large leaf-shaped knives, thick, split cobble choppers and scrapers, scraper-planes, and small milling slabs and manos.

Throughout most of the California desert region, sites containing elements of the Pinto Basin Complex are small and are usually limited to surface deposits, suggestive of temporary and perhaps seasonal occupation by small groups of people. Environmental conditions during the Pinto Period of the Early Holocene were characterized by increasing aridity. However, at least one period of increased moisture, from approximately 6,500 to 5,500 years ago, resulted in the return of pluvial lake conditions. Warren (1984:414) postulates that human occupation of the southern California deserts during the periods from approximately 7,000 to 6,500 years ago and from 5,500 to 4,000 years ago may have been limited because of the arid conditions. It is also suggested that the Pinto Period populations withdrew to the desert margins and oases during these arid periods, leaving large portions of the California deserts unoccupied for many centuries.

Gypsum Period (ca. 4,000–1,500 B.P.)

The Gypsum Period is one of cultural intensification in the deserts of southern California. The beginning of the Gypsum Period coincides with the Little Pluvial, a period of increased effective moisture in the region, wherein the ameliorated climate allowed for more extensive occupation of the desert regions. In addition, periods of drought within this era seem to have resulted in human adaptations to more arid conditions, rather than a retreat from the deserts. Diagnostic projectile points of this period include Humbolt, Gypsum, and Elko-series dart points (Warren 1984). Late in the Gypsum Period, Rose Spring arrow points appear in the archaeological record, reflecting the spread of the bow and arrow technology from the Great Basin and Colorado River region. Other artifact types characteristic of this period include leaf-shaped arrow points, rectangular-based knives, flake scrapers, T-shaped drills, milling slabs and manos, as well as core/cobble tools assemblages such as scraper planes, large choppers, and hammerstones (Warren 1984). In addition to the introduction of the bow and arrow, another technological innovation introduced during this period was the mortar and pestle for processing hard seeds, such as those derived from the mesquite pod. Trade relationships with the Pacific Coast are indicated by the presence of shell ornaments at several Gypsum Period sites.

In addition to diagnostic projectile points, Gypsum Period sites include leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, and occasionally, large scraper planes, choppers, and hammerstones (Moratto 1984:416). Manos and milling stones are common; the mortar and pestle also were introduced during this period. Other artifacts include shaft smoothers, incised slate and sandstone tablets and pendants, bone awls, *Olivella* shell beads, and *Haliotis* beads and ornaments. Technologically, the

artifact assemblage of this period is similar to that of the preceding Pinto Basin Period; new tools also were added either as innovations or as "borrowed" cultural items. Included are the mortar and pestle, used for processing hard seeds, and the bow and arrow.

Saratoga Springs Period (ca. A.D. 500–1200)

This period is, in large part, a continuation of the developments begun during the Gypsum Period, such as an increasing adaptation to the desert environment and an increase in trade relations (Warren 1984). Regional environmental conditions became much wetter, a development known as the Little Pluvial. Variations in regional cultural adaptations during the Saratoga Springs Period also become apparent.

The Saratoga Springs Period is characterized by cultural diversification with strong regional developments. Turquoise mining and long distance trade networks appear to have attracted both the Anasazi and Hakataya peoples into the California deserts from the east and southeast, respectively. Trade with the California coastal populations also appears to have been important in the Antelope Valley region and stimulated the development of large, complex villages. In the northwestern Mojave Desert, however, the basic pattern established during the Gypsum Period changed little during the Saratoga Springs Period. Toward the end of the Saratoga Springs Period, the Hakataya apparently moved far enough north to gain control of the turquoise mines in the central Mojave Desert, thus replacing the Anasazi occupation of the eastern California desert.

Developments during the Saratoga Springs Period in the southern cultural sphere include the gradual introduction of pottery, Cottonwood-series arrow points, and Desert Side-notched arrow points late in the period. Trade with the Pacific and Gulf coastal populations appears to have been extensive, and was likely the driving force that led to the gradual expansion of Hatakaya cultural traits further west into the deserts, and later into the mountains of the Peninsular Range as well as into the inland valleys and coastal regions of southern California. Lake Cahuilla is believed to have formed around A.D. 500, and was the focus of cultural activities such as exploitation of fish, waterfowl, and wetland resources during this period.

Shoshonean Period (ca. A.D. 1200 to the 1800s)

During the Shoshonean Period, sometimes referred to as the Proto-historic Period, there appears to have been a continuation of the technological developments from the earlier Saratoga Springs Period. However, regional developments that indicate the formation of distinct ethnographic groups become clearer during the Shoshonean Period. Two major events affect the archaeological record of this period. The final desiccation of Lake Cahuilla, which had occurred by approximately A.D. 1640, resulted in a population shift away from the lakebed into the Peninsular Ranges to the west and the Colorado

River regions to the east. Subsequently, Spanish exploration and establishment of the Mission system during the late 1700s mark the end of prehistoric lifeways.

In the Southern Desert region, Brown and Buff Ware pottery, first appearing on the lower Colorado River at about A.D. 800, started to diffuse across the California deserts by about A.D. 900 (Moratto 1984). Associated with the diffusion of this pottery were Desert Side-notched and Cottonwood Triangular projectile points dating to about A.D. 1150–1200, suggesting a continued spread of Hakataya influences. Trade along the Mojave River also expanded resulting in middlemen between coastal and Colorado River populations. Large, complex housepit village sites were established along the headwaters of the Mojave River and were somewhat similar to those reported in Antelope Valley. Although both of these areas appear to have participated in extensive trade between the desert and the coast, the lack of Buff and Brown Ware pottery at the Antelope Valley sites suggests that these people were minimally influenced by the Hakataya developments along the Mojave River (Moratto 1984). The Hakataya influence throughout the Colorado and Mojave deserts is evidenced by Desert Side-notched and Cottonwood Triangular projectile points and Buff and Brown Ware pottery. During this period Lake Cahuilla began to recede and the extensive Hakataya populations occupying its shores began moving westward into areas such as Anza-Borrego, Coyote Canyon, the Upper Coachella Valley, the Little San Bernardino Mountains, the San Jacinto Valley, and Perris Plain.

Ethnographic Setting

The ethnographic territory of the Luiseño Indians is within the geographic boundary of the City of Lake Elsinore's SOI. The term Luiseño is derived from the Mission San Luis Rey and has been used in southern California to refer to those Takic-speaking people associated with the mission.

Luiseño territory comprised a total of 1,500 square miles of southern California. Luiseño territory included most of the drainage of the San Luis Rey River and that of the Santa Margarita River (Bean and Shipek 1978). Along the coast it extended from Agua Hedionda Creek on the south to Aliso Creek on the northwest. The boundary extended inland to Santiago Peak, then across to the eastern side of the Elsinore Fault Valley, then southward to the east of Palomar Mountain, then around the southern slope above the San Jose valley. From there the boundary turned west and returned to the sea along the Agua Hedionda Creek.

Villages were located in diverse ecological zones typically located along valley bottoms, along streams or coastal strands near mountain ranges. Each village area contained many named places associated with food products, raw materials, or sacred beings and each place were owned by an individual, family, the chief, or by the group collectively (Bean and Shipek 1978). The village of *Paiahche* is ethnographically

documented immediately north of the lake (Kroeber 1925). The Luiseño knew Lake Elsinore as *Paahashnan*. The area around and including the Elsinore hot springs was known to the Luiseño as *'Atengvo* (meaning "hot springs"). The hot springs also figure prominently in the local creation myth. The location, *Itengvu Wumowmu*, is named in a song about the death of Wiyot, a religious leader who led the people in their migration from the north (Du Bois 1908; Harrington 1978 in Grenda et al. 1997)

Houses were primarily conical, and partially subterranean, thatched structures of locally accessible materials including reeds, brush, or bark. Round, semi-subterranean, earth-covered sweathouses were important for a variety of rituals.

The principal game included deer, rabbit, jackrabbit, woodrat, mice and ground squirrels, antelope, valley and mountain quail, and other birds. Trout and other fish were caught in mountain streams. Acorns were the most important single food source and villages seem to have been located near water resources necessary for the leaching of acorns. Grass seeds were the next most abundant food source (Bean and Shipek 1978). Seeds were parched, ground, and cooked as a mush in various combinations. Additional food sources included various greens, cactus pods, yucca buds, and bulbs, roots, and tubers.

Tools for food acquisition, storage, and preparation included an inventory made from widely available materials. Hunting tools included shoulder-height bows with fire-hardened wood or stone-tipped arrows, curved throwing sticks, rabbit nets, slings, and traps. Seeds were ground with handstones on shallow unshaped basin metates. The same granites were made into shaped or unshaped mortars and pestles for pounding acorns or small game (Bean and Shipek 1978). Coiled and twined baskets were used in food gathering, preparation, storage, and serving. Food was cooked in wide-mouthed clay jars over fireplaces or in earth ovens wrapped with clay or leaves. Other utensils for food preparation included: wooden food paddles, brushes, tongs, tweezers, steatite bowls, and wooden digging sticks (Bean and Shipek 1978).

While the literature recognizes Lake Elsinore as a part of Luiseño linguistic territory, references are also made to possible previous occupation by the Juaneno based on their place names and creation myths, and overlapping use or influence by adjacent groups including the Gabrielino, Serrano, and Cahuilla (Hampson 1992).

Historic Context

The information contained below is a summary statement from Tom Hudson's: *Lake Elsinore Valley, its story 1776-1977*.

Spanish Period

Beginning in 1769, the Spanish set up Missions throughout the area called Alta California. Most of the Missions failed to have an impact beyond their respective region. The San Luis Rey Mission, however, extended its influence into the surrounding regions and used the lands for grazing cattle and other animals. Then in 1818 Leandro Serrano settled in what the Spanish were calling Laguna Grande. He was the first non-Indian to settle what was to become Riverside County with his settlement only a little north of Glen Ivy Hot Springs. Throughout the Spanish Period, this lone settlement was the only region in Riverside County that continued to grow. However, Mexican Independence in 1822 changed the makeup of Laguna Grande, Riverside, and all of Alta California.

Mexican Period

Mexican Independence and the Secularization Act of 1833 led to a population explosion of disastrous consequences and an end to the Mission period. Many of the local Indians became accustomed to the Mission way of life and were not prepared for the aftermath. It became common practice for large land grants to be issued to those friendly to the Mexican cause. The Comisionados, who were placed in charge of the land transfer, took advantage of the situation and became the powerful land holding class known as the Rancheros.

Early American Period: La Laguna

The treaty of Guadalupe-Hidalgo was signed in 1848, ending the Mexican-American war and marking the end of the Mexican Period in California. The treaty ceded much of the Southwest to the United States, including all the lands around La Laguna and the rest of Southern California. The City of Lake Elsinore's historic name La Laguna derived from Laguna Grande, the name the Spanish gave the lake used in the early 1800s that influenced the name given to Rancho La Laguna, land granted to Julian Manriquez in early 1844. The beginning of the American period can be called a Golden era for the region with the announcement of gold discoveries shortly after the war.

Before the outbreak of war between Mexico and the United States, Julian Manriquez received a sizable land grant that included the lands of La Laguna, in 1844. Battle was waged over the land from 1846 to 1848. Then in 1850, California became the 31st state in the Union. Soon thereafter, in 1851, Julian Manriquez sold the land to Abel Sterns, who was Massachusetts-born and the largest landholder in all of Southern California. In 1858, Augustin Machado acquired the land and named it Rancho La Laguna. He was the first landowner to call the lake home, since the Indians, and he immediately began construction of a 7-room adobe home, which immediately became a local landmark. Machado's Adobe house was the first stop for the postal service in the area surrounding

La Laguna. From its inception, La Laguna became an important crossroads for the stagecoach, the railroad, prospectors, recreation seekers, and all travelers alike.

Example of historical building no longer existing in downtown Lake Elsinore.

Founding of the Town

The years between the Civil War and the coming of the railroad saw little progress. Instead, it saw the death of Augustin Machado and the rise of his son, Juan Bernardo Machado, who became known as the legendary Don Juan. Franklin Heald purchased Rancho La Laguna in 1883. He then founded the town of Elsinore, which was named after the famed city of Elsinore from Shakespeare's *Hamlet*. It was not until December of 1972 that by popular vote, the City formally acknowledged the importance of the lake, and became officially known as the City of Lake Elsinore.

In 1884, George Irish bought the remainder of Don Juan Machado's estate, thus ending the Machado family's reign over the valley. Shortly after its inception and due to its rapid growth, the town of Lake Elsinore became a full-fledged city on April 9, 1888, located then in what was San Diego County. In 1893, Lake Elsinore joined the new county of Riverside, encompassing lands that were formerly part of San Diego and San Bernardino Counties.

Throughout this time period, the city continued to expand and developers continued to construct buildings, some of which still stand today. In 1884, Wilson Heald, Franklin's father, built a two-story home on the corner of what is now Grand and Riverside. Lake Elsinore also built its first post office and schoolhouse in the same year.

In early 1887, one of Heald's major accomplishments was the building of a Bathhouse in the ancient hot springs of the Pai-ah-che, known as the Crescent. Also completed in the same year was a two-story meeting hall dedicated to Elsinore's chapter of the Grand Army of the Republic. This building is located at the northeast corner of Main and Franklin, and it has seen many uses throughout the years. Also built in this year was the Consolidated Bank, later used as a schoolhouse and hotel. Once known as the Ambassador Hotel, it was the tallest building in all of Lake Elsinore and is presently vacant.

In 1887, the Lakedale Hotel was completed, which later became the Lake View Inn. This building no longer stands; however, it symbolizes the transformation of Lake Elsinore from a tranquil lakeside town to a vibrant resort town.

Transportation

The development of La Laguna followed similar patterns as the rest of California. The advent of rapid transportation brought many new peoples to the Pacific and to the lake area. The motivation behind the new wave of immigration were both recreation and gold, which brought many well-to-do men and women to the shores of the lake and prospectors into the vicinity of La Laguna.

The transcontinental Railroad opened the floodgates to settlement all along the Pacific. Its completion in 1869 opened the way for land speculators, miners, developers, farmers, and vacationers to swarm into California. The rail opened up the region to a larger population boom. The first colony in the area surrounding La Laguna sprang up in what is modern-day Riverside.

The Atchison, Topeka & Santa Fe Railroad was completed by the early 1880s, bringing the newly created city a lifeline to the outside world. The Elsinore Station, later called Elsinore Junction was located near the intersection of Railroad Canyon Road and Mission Trail. The original building was moved sometime in the past either the city of Alessandro or Arlington but has since been destroyed, possibly by fire. The historic train depot that is currently in the City of Lake Elsinore was originally moved from the City of Arlington where it was originally constructed.

Like the rest of California, the rail line brought new life to the area. The completion of the rail began the process of growth and urbanization for Lake Elsinore. Similar to the rest of California, the city and its surrounding region experienced a large influx in population brought in by the rail and excitement for gold. It was once these people settled that they learned of the splendors along the shores of the lake. Many began to settle and vacation in the valley and development grew to accommodate the demands of vacationers seeking relaxation and recreation.

Signaling the transition away from the railroad towards more modern means of transportation, W. Leonard Bonney and Miss Margaret Stahl were the first to fly over Lake Elsinore in 1913. Soon after, to celebrate the Fourth of July, Harry Holmes flew and landed Glenn L. Martin's hydro-aeroplane in the lake. Then in 1914, five automobiles succeeded in driving the 17-mile course around the lake.

Finally, in 1932, the Ortega highway was opened to the public, continuing to bring people to the city. Around this time, an airport was built bringing many enthusiasts to hang glide and sky dive. As transportation progressed, it brought more people and new ideas to the heart of Lake Elsinore.

Mining

The Gold Rush and the advancing railroads brought in an influx of people into California. Lake Elsinore and the surrounding area were no exception with its mining tin ore, coal, clay and some gold.

In the late 19th century, the town experienced a boom, due to the mining of gold between the towns of Elsinore and Perris. The most prosperous mine was Good Hope Mine, whose discovery has been credited to Juan B. Castillo and Madison Chaney, or a Frenchman by the name of Mache. This mine produced over $2 million worth of gold during its working years. During its height, it used coal extracted from the Terra Cotta mines to process the gold. The coalmines, which were discovered in 1883 by Madison Chaney and his wife Esther, were also used to fire kilns and heat homes. The region surrounding Alberhill was also known for its coal mining. Coal was also mined in the Warm Springs Valley.

Mining of asbestos also began during the 1880s. John D. Huff, owned and operated the Asbestos Company and founded the coal and clay mines near the town of Terra Cotta. The clay mine at Terra Cotta was in operation until the 1940s when the Alberhill mine became the sole operating clay mine in the region. The clay extracted from these mines was of such high quality that it won a gold medal at the San Diego Exposition in 1916. Pacific Clay Brick Products Company is the present owner of the Alberhill commercial area and also encompasses within its grounds the Alberhill School that served the area from 1912 until it was abandoned in 1964.

Historic light fixture in Country Club Heights.

Rail transportation opened up the Lake Elsinore region to prospectors and miners, who took advantage of the untapped reserves to expand their personal wealth and the influence of the city. Lake Elsinore became the main center for mining and transportation in the region. Many additional spurs were built to improve the connection of Lake Elsinore with its surrounding mines. Like the rest of California, the rails opened up the land to settlement and life. The rails injected new life into the valley and kept a steady stream of prospectors, settlers, and vacation seekers flowing to the shores of Lake Elsinore.

Recreation

Many people visited the newly created city of Lake Elsinore, looking for recreation along the shores of the pristine lake. The move towards creating a resort town began shortly after the town's inception. The rail brought ranchers and prospectors to the city in 1883, and then in 1887 the city's first hotel was completed. This move towards becoming a resort town continued into the twentieth century when the Laguna Vista Club

House was completed, the first lakefront resort. And then in 1923 the Mount Elsinore Country Club opened to great fanfare. Lake Elsinore attracted many Hollywood stars such as Will Rogers to its famous bathhouse, pristine waters and proximity to major cities and rails.

The earliest attraction of Lake Elsinore was its legendary Bathhouse, known as the Crescent. At one point it was proclaimed the finest bathhouse in all of California, and more importantly it still stands as of 2005. It is now known as the Chimes and it is located at 201 W. Graham Ave. and has been declared a National Historic Place.

In 1884, Henry Lillie built a Yacht, the Marguerita, to ferry passengers across the Lake. The steamship, the Lady Elsinore, carried passengers on lake cruises, which occasionally featured music bands.

In 1926, the Clevelin Reality Corporation attempted to revitalize the tourist industry by building a double-deck pier. It included a dance club and several games. In 1927 the Aloha Yacht club sponsored the largest gathering of speedboats on the lake, which was a great success. The following year the lake held the National Speed Boat Race that garnered nine world records.

Also in 1928, another bathhouse known as the Briner Bath House was completed at the corner of Sumner and Riley. Later that same year, Hunter's Elsinore Sanitarium opened, bringing health seekers to Elsinore for many years. In 1930, construction was under way for a new large bathhouse at Pachanga Hot Springs. Even during the lean years of the depression, Lake Elsinore still attracted a large number of visitors to the surroundings of the lake. The most unique construction of the 1930s was the Clevelin Realty Corporation's "ship pier" on the south side of the Lake. It had the capability to allow small ships to dock within it. Also, it was mounted on rail track to allow for easy movement to make repairs.

Other entertainment in the area included baseball. The Los Angeles Angels played in the ballpark east of Main Street during spring season of 1916, and the Sacramento Solons and the Hollywood Stars both trained in the valley on a newly constructed field on Poe Street in 1940 and 1941 respectively.

The City of Lake Elsinore

Lake Elsinore began as a small town with the emergence of the railroad around 1883. It soon began to grow with the completion of its first post office and schoolhouse in 1884. In 1893, the town became officially recognized as a city in the same year as the establishment of the Cleveland National Forest. The original City Hall was completed on July 7, 1934; the original building no longer exists.

City of Lake Elsinore Cultural Center on Main Street, previously the Methodist Church.

During the boom years of the 1920s the city of Lake Elsinore saw a great deal of development. This time period saw the building of the Masonic Temple in 1923 at East Graham Avenue, and the building of the Methodist church at Main and Heald, in the same year. This Church is still in use. In 1925, the Elsinore Woman's Club built a meeting place at the corner of Graham and Lowell. The Elsinore Theatre on South Main, built in 1925 replaced the Star theatre, built c.1908, and has been the Franklin Store since 1938. Another interesting structure built in 1929 and located on the hills east of the lake is "Aimee's Castle" that was the home of noted evangelist, Aimee Semple McPherson. It is also important to note that in 1924 the valley's first telephone services were installed. The Great Depression limited expansion, except for the completion of a new post office in 1932.

Agriculture

Early settlers in the valley subsisted on ranching and farming. Even at the height of its tourist season, the region was still in peak production. The farmers in the area grew olives, grapes, apricots, and other produce.

The farmers in the area produced at such high levels that in order to handle their needs, the Lakeland Ranch, owned by C. H. Albers, built one of the largest canning facilities in the state. He was the owner of "Albers' Folly" canned olives. In 1916, Elsinore olive oil took gold at the San Diego Exposition. Later, apricots became the boom crop. These crops sustained the valley during the worst years of the Depression and helped it flourish during its tourist peak. The Eucalyptus trees, Palm trees, and Pepper trees that shade the walkway and line the shores and streets have been there for generations and keep the land connected to its past.

Prehistoric Archaeological Sites

As identified in the record search, Lake Elsinore has an extensive use history from the prehistoric era to modern times. The record search resulted in the identification of 132 prehistoric and historical archaeological sites within the project area. Two of the previously identified prehistoric sites, CA-RIV-1022 and CA-RIV-2798, have been determined eligible for listing in the NRHP.

Additional previously identified prehistoric archaeological sites include: villages, rock shelters, habitation sites, lithic scatters, and milling slicks. Additional isolated artifacts have also been identified within the project area as seen in Figure 7.2; however, given the limited amount of data typically derived from artifacts without associated

features or assemblages, they have not been included in the discussion of previously identified sites in Table 7.1.

These previously identified archaeological sites can provide assistance in determining areas of known sensitivity for prehistoric archaeological resources. The site definitions provided in Table 7.1 are based on the information provided in the record search and are to be used as a general guideline to understanding the nature of prehistoric archaeological sites in the region. In addition, the identification of known areas of sensitivity does not preclude the possibility of locating additional prehistoric sites in other portions of the project area.

Table 7.1 Previously Identified Prehistoric Archaeological Sites Within the SOI

Site Types	Site Definitions and Locations
Village sites	Sites that exhibit a level of sustained residency with resources suitable for sustaining long-term or seasonal habitation. Typically located along watercourses (such as the San Jacinto River and its tributaries or near Lake Elsinore). Associated artifact assemblages may include (but are not limited to) bedrock outcrops, lithic artifacts, groundstone, shell, animal bone, fire-affected rock, ceramics, pictographs and petroglyphs, house rings, and evidence of funerary practices.
Rock shelters	Typically located in higher elevations in areas that sustain habitable rock overhangs that can support brief habitation episodes or be utilized for ceremonial purposes. Associated artifacts can include (but are not limited to) pictographs and petroglyphs, fire-affected rock, lithic artifacts, midden soil, animal bone, bedrock milling features, ceramics.
Habitation sites	Temporary camps or transition areas that exploit an immediate or seasonal resource. Usually located near watercourses such as the San Jacinto River and its tributaries. Associated artifact assemblages may include (but are not limited to) ground stone, lithic debitage, and bedrock milling features.
Lithic scatters	Flaking stations that may indicate possible opportunistic quarrying activities or tool reduction stations. Clusters can be identified in isolation or in association with other site types and are not restricted in geographic location.
Bedrock Milling Features	Grinding stations typically located along watercourses (such as the San Jacinto River and its tributaries) near exposed bedrock outcrops (typically granite or granodiorite) with suitable resources in the area for processing.
Isolates	Not included in the study group

Historical Archaeological Sites

The previously identified historical archaeological sites represent a range of activities including: mining, transportation, recreation, and ranching/homesteading and are represented throughout the City and SOI. The number of previously identified historical archaeological sites is much smaller than prehistoric sites making it more difficult to determine areas of known or established sensitivity. However, it is possible to make informed deductions about the types of resources likely to be encountered in future projects based on the previously identified sites in combination with the documented history of the area.

For example, historical archaeological sites associated with recreation activities tend to be concentrated around, or within the immediate vicinity of Lake Elsinore. In addition, the lake itself has been previously recorded as a cultural resource (33-11009). A majority of the previously recorded mining sites have been identified in the northeastern portion of the project area. These include sites that are representative of extractive operations focused on the acquisition of gold, granite, and limestone. This includes the Good Hope Mine Site (33-3352), the most prosperous gold mine in the region in the 19th century. Early transportation into the area is currently represented through previously recorded segments of the Santa Fe Railroad (CA-RIV-3832H) and associated features. However, it is also possible that early roads might also be eventually added to the existing list of transportation related cultural resources. Ranching and homesteading sites consist of a variety of material culture remains including (but not limited to) building foundations, fence lines, rock walls, orchards and agricultural fields, landscaping elements, and outbuildings. These sites are distributed throughout the City and SOI.

Paleontological Resources

County of Riverside

To ensure that appropriate protection is afforded to the County's rich and extensive record of fossil life, a Countywide inventory for paleontological sensitivity has been conducted. The resulting map evaluates all land within the County as having high, low, or undetermined sensitivity for paleontological resources, consistent with guidelines published by the Society of Vertebrate Paleontology (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995), which represent the industry standard for protection of paleontological resources. It serves as a general guide for environmental review of development proposals and identification of appropriate strategies for avoidance and mitigation of paleontological impacts.

The County's paleontological resources sensitivity mapping shows areas of high paleontological sensitivity in Quaternary deposits north of Lake Elsinore along the west side of the I-15 corridor. Quaternary units of the valley floor immediately surrounding Lake Elsinore are of undetermined paleontological sensitivity, as are the fan deposits flanking the Santa Ana Mountains rangefront south of the lake; Mesozoic metasedimentary rocks northwest of the Lake; and Tertiary and Quaternary sedimentary rocks, and Mesozoic metasediments east of the Lake. Most of the valley floor south of Lake Elsinore, and the plutonic highlands to the west and east of the valley, are considered to have low paleontological sensitivity as seen in Figure 7.3.

City of Lake Elsinore

The City of Lake Elsinore has identified geologic units that are known to contain important paleontological resources in the Alberhill Ranch area in the northeast portion of the SOI. In this area, the Silverado Formation of Paleocene age (approximately 66–55 million years old) is locally highly sensitive for invertebrate and plant material. The fossil plants from this unit have been studied for more than half a century and are therefore considered to be particularly significant.

Constraints and Opportunities

Constraints Due to Regulatory Requirements

Federal, state, and local government regulations and policies concerning cultural resources have the potential to constrain the distribution of land uses associated with the Lake Elsinore General Plan Update.

Historical and Cultural Resources

Section 106 Review

Section 106 of the National Historic Preservation Act requires that all federal agencies review and evaluate how their actions or undertakings may affect historic properties. For the City of Lake Elsinore, Section 106 may apply if there is an Army Corps of Engineers 404 permit involved, Federal Emergency Management Agency (FEMA) funds are allocated in the event of floods or earthquakes, and if the City seeks and receives Community Development Block Grant (CDBG) funds.

California Environmental Quality Act (CEQA)

CEQA mandates that local agencies consider potential significant environmental impacts to cultural resources as a result of proposed projects. Significant resources are those that are listed in or considered eligible for listing in the California Register of Historical Resources (CRHR). The fact that a resource or property is not listed on the

CRHR does not preclude it from being significant and does not make it exempt from CEQA evaluation. Specific to the City of Lake Elsinore, this includes the downtown historic district, and prehistoric and historic archaeological sites within the SOI.

Senate Bill 18: SB 18 requires local governments to consult with tribes prior to making certain planning decisions and to provide notice to tribes at certain key points in the planning process. These consultation and notice requirements apply to adoption and amendment of both general plans and specific plans. Although SB 18 does not specifically mention consultation or notice requirements for adoption or amendment of specific plans, existing state planning law requires local governments to use the same processes for adoption and amendment of specific plans as for general plans (see Government Code §65453). This regulation is of particular significance to the City of Lake Elsinore, since at least two Native American tribes have requested to be consulted as of the publishing date of this document: the Pechanga Band and the Soboba Band.

SB 18 also presents an important opportunity, since the intent of the law is to provide Native American tribes a chance to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. The purpose of involving tribes at these early planning stages is to allow consideration of cultural places in the context of broad local land use policy, before individual site-specific, project-level land use decisions are made by a local government.

Riverside County Comprehensive General Plan

The Riverside County Comprehensive General Plan states that significant historic and prehistoric resources should be identified and documented, and provisions should be made to preserve representative and worthy examples. The value of these resources should be recognized, and the impact of current and proposed land uses upon these resources should be assessed. As recommended in the County Plan, a survey of historic resources was conducted in 1981 through the coordinated efforts of the County Parks Department, the County Historical Commission, the County Planning Department, and the State Office of Historic Preservation. These efforts resulted in the identification of the City of Lake Elsinore's downtown historic district.

Modified craftsman style home in Historic District.

Zoning Code "Historic Downtown Elsinore" Overlay District

Within the City's zoning code is defined a historical district that, as of September 2005, consists of 148 standing historic buildings without severe modifications and encompasses approximately 486 acres located in the core of the City. Established standards of development within this

district as defined in the zoning code are described in the "Historic Elsinore" Design Standards, dated April 1993. The existence of a historic district directs development by setting design standards and review processes to insure compliance and preserve the character of Lake Elsinore's historic downtown.

Paleontological Resources

A number of federal and state regulations protect paleontological resources, including the federal Antiquities Act and Paleontological Resources Preservation Act, and sections of the California Public Resources and Administration Codes. In addition, CEQA requires analysis and mitigation of impacts on paleontological resources. Together these regulations create the context for the County General Plan's policies protecting paleontological resources, and for existing City policies and regulations.

Full compliance with all applicable policies has the potential to constrain development in areas of particular paleontological importance, and will require investigation of the potential for planned development to affect paleontological resources in other areas as well. In the event that an area planned for development is identified as paleontologically sensitive, mitigation for paleontological resources impacts depends on the nature of the resources, and the nature and degree of disturbance anticipated. Policies of the Society of Vertebrate Paleontology's (SVP's) Conformable Impact Mitigation Guidelines Committee (1995), widely accepted as an industry standard for paleontological resources protection, recommend a two-phase approach:

1. assess the likelihood that the project's area of potential effect contains significant nonrenewable paleontological resources that could be directly or indirectly impacted, damaged, or destroyed as a result of the project; and

2. formulate and implement measures to mitigate potential adverse impacts.

Table 7.2 summarizes SVP's recommended mitigation approaches, based on identified sensitivity.

Table 7.2 Society of Vertebrate Paleontology's Recommended Treatment for Paleontological Resources, Based on Sensitivity Category

Sensitivity Category	Definition	Recommended Treatment
High potential (High sensitivity)	Areas underlain by geologic units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered.	■ Preliminary survey and surface salvage before construction begins. ■ Monitoring and salvage during construction. ■ Specimen preparation; identification, cataloging, curation, and storage of materials recovered. ■ Preparation of final report describing finds and discussing their significance. ■ *All work should be supervised by a professional paleontologist who maintains the necessary collecting permits and repository agreements.*
Undetermined potential (Undetermined sensitivity)	Areas underlain by geologic units for which little information is available.	■ Preliminary field surveys by a qualified vertebrate paleontologist to assess project area's sensitivity ■ Design and implementation of mitigation if needed, based on results of field survey
Low potential (Low sensitivity)	Areas underlain by geologic units that are not known to have produced a substantial body of significant paleontologic material.	■ Protection and salvage are generally not required. However, a qualified paleontologist should be contacted if fossils are discovered during construction, in order to salvage finds and assess the need for further mitigation.

Source: Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995.

Constraints Due to Existing Conditions

Built Environment

A number of buildings within the City of Lake Elsinore, including resources outside the Historic Downtown Elsinore overlay district, have been identified as significant historic resources at the federal, state, and local levels. All proposed changes in land use associated with any significant historic resource would necessitate further study of the resource to ensure that the historic value of these properties is not damaged or impaired by potential land uses.

Prehistoric and Historical Archaeology

Sensitive prehistoric and historic cultural resource sites are likely to exist within the project area in those areas that have not been systematically surveyed.

Previously identified and unknown sensitive archaeological sites will require further study and avoidance to ensure that the cultural and scientific value present at these sites are not damaged or impaired by potential land uses.

Paleontological Resources

Several geologic have been identified as sensitive for paleontological resources, and additional unknown resources may be present. As identified in *Constraints Due to Regulatory Requirements* above, activities that require ground disturbance, such as new or infill development, may be constrained to some extent in areas that support significant paleontological resources. However, potential impacts on paleontological resources can often be mitigated through careful assessment and pre-planning in consultation with qualified paleontological experts. Consequently, although mitigation may be required, development is unlikely to be entirely precluded unless the City opts to preserve some sites in an undeveloped state specifically because of their paleontological significance. Development could also be discouraged in areas where mitigation needs would entail prohibitive costs.

Opportunities to Enhance Regulatory Environment

Built Environment

The opportunity exists to present the Mills Act in order for the public to understand the benefits of applying the Act to future projects. The Mills Act is a California state law that enables owners of a historic property to voluntarily enter into historic property contract with a local government agency, city or county, pursuant to Sections 50280-90 of the California Government Code. Under the Mills Act, these properties then qualify for the property tax incentives contained in Section 439.2 of the California Revenue and Taxation Code. The incentive is the reduction of the property's assessed value resulting in a reduced property tax. Owners of both commercial and residential historic buildings may enter into a historic property contract.

The City has the opportunity to further define distinct concentrations of historic structures within the Historic Downtown Elsinore overlay district and within the outlying portions of the City. This will provide the City the opportunity to develop a program and/or centralized location for relocating threatened historic structures located outside of significant concentrated areas. The relocation of significant structures that do not possess a meaningful association with the immediate surroundings provides the City with fewer constraints on development.

Historic building in downtown business district.

The City has the opportunity to further encourage businesses to retain and modify (rather than demolish) historic structures, and borrow aesthetic elements for the creation of new structures in an effort to contribute to the heightened sense of the historic Lake Elsinore character.

Prehistoric and Historical Archaeology

There are opportunities to change the land use designation in areas with important Native American cultural resources to open space in order to preserve these cultural resources.

In addition, the City also has the opportunity to update any historical preservation ordinances that will preserve important archaeological sites. It can include listings of prehistoric and historical archaeological sites as resources of local significance.

Paleontological Resources

The proposed General Plan revision offers the City an opportunity to expand and update its policies supporting preservation/conservation of paleontological resources. The City may wish to adopt SVP's recommendations for paleontological resources mitigation (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995), or to work with local experts to develop similar policies specifically tailored to conditions in the City and SOI. This would also be an excellent opportunity for systematic updated mapping of paleontological sensitivity and known paleontological sites in the City and SOI; the City may want to adopt the County's generalized paleontological sensitivity mapping, or could perform additional, more detailed work. Such mapping would be ideally captured as a GIS layer and/or overlay map for use with City zoning maps. In either case (using existing County or new City mapping), the revised General Plan should ideally present policies for using sensitivity mapping to guide avoidance and mitigation of paleontological impacts. One approach would be variable permitting requirements tied to project site sensitivity, similar to the permit-based approach used by the state for seismic hazards under the Alquist-Priolo Act and Seismic Hazards Mapping Act. The revised General Plan could also include policies in support of educational programs and activities to increase public awareness of the area's rich paleontologic history and resources.

Opportunities to Address Cultural Resources

Built Environment

The City has the opportunity to encourage public and private interest in portraying the historic Lake Elsinore character in addition to the preservation and interpretation of

historic buildings within the larger context of the development of the City of Lake Elsinore.

The opportunity exists to encourage public and private investment in the maintenance and preservation of historic structures.

The Lake Elsinore Historical Society provides a strong base for heightened public awareness, involvement, and investment, and presents an opportunity for the City to invest in a knowledgeable and focused means of directing community interest.

Unique and potentially significant historic structures are likely to exist within the areas that have not been systematically surveyed. Future projects requiring discretionary permits would assist in the identification of unidentified historic structures.

Prehistoric and Historical Archaeology

Sensitive archaeological sites are likely to exist within the project areas that have not been systematically surveyed. Future projects requiring discretionary permits would assist in the identification of unknown prehistoric and historical archaeological resources.

Updating the General Plan is an opportunity to identify locations within the City that are important for preservation of prehistoric and historic resources by carefully considering the impact certain types of land use will have on these resources, and plan accordingly.

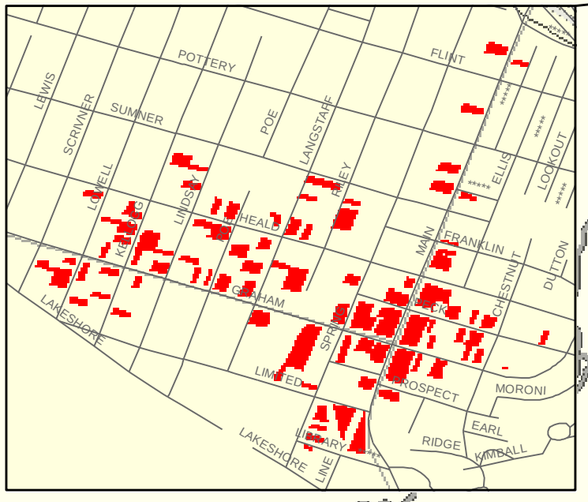
The City has the opportunity to work with the Luiseño people by providing access to cultural and sacred sites, including areas with plants used for traditional purposes such as medicine, basketry, and other functions. In addition, the City also has the opportunity to identify cultural resources (typically prehistoric sites) that can be used to interpret the prehistory and history of the Luiseño people.

Paleontological Resources

Changing land use designations and expanding development—and the paleontological investigations required for CEQA compliance as development proceeds—may lead to the discovery of previously unknown paleontological resources in the City and SOI. This would benefit the scientific community and the general public by furthering research and education, and could be an important source of civic pride and identity.

Sphere of Influence
City Limits
Historic Buildings
Historical Archaeological Sites
Lake Elsinore & Recreation
Historic Mine Locations
Historic Ranching and Homesteading
Historic Transportation
Atchison, Topeka & Santa Fe Railroad lines
Cariso Truck Trail

Downtown Historic District



Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

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Historical Resources
Figure 7.1

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Figure 7.2 (Identified Cultural Resource Areas) has been deleted.

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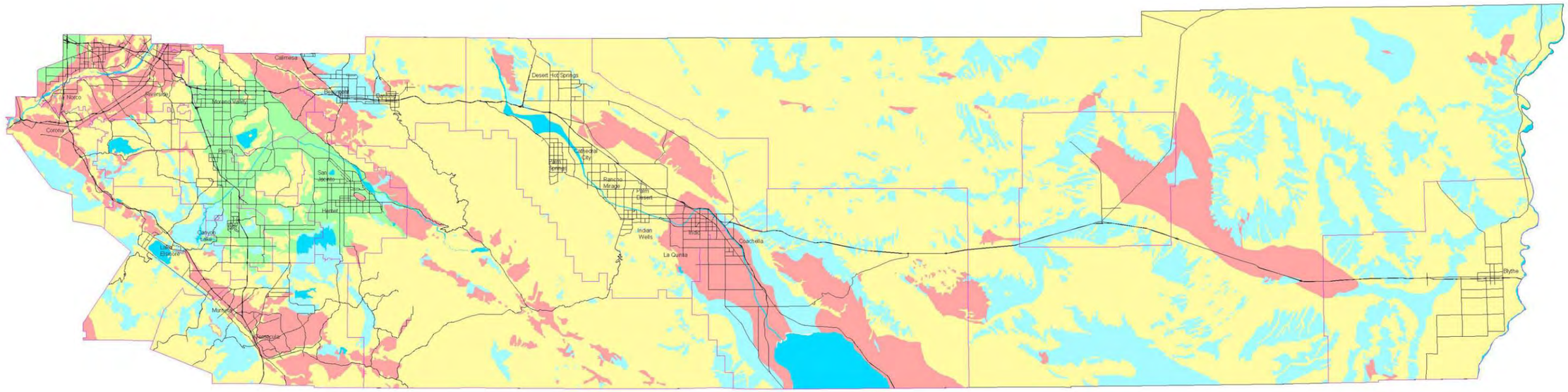

High A (Ha)
High B (Hb)
Low
Undetermined
Waterbodies

Major Roads & Highways
Area Plan Boundaries
Cities

0 65,000 Feet

Source Information: LSA Associates

PALEONTOLOGICAL SENSITIVITY

Figure OS-8

Source: Riverside County Integrated Project

Mooney · Jones & Stokes

Paleontological Resources
Figure 7.3

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CHAPTER 8 – POPULATION AND HOUSING

Introduction

This report assesses population and housing in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan for the City of Lake Elsinore.

Example of attractive home found in City.

Legal Basis and Requirements

Government Code Section 65302 (a) states the General Plan shall include a land use and housing element "that designates the proposed general distribution and general location and extent of the uses of the land for housing…and other categories of public and private uses of land. The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan."

Terminology

The following is a brief background discussion of population and housing terminology.

- **Population Projection:** Computation of future changes in population numbers, given certain assumptions about future trends in the rates of fertility, mortality, and migration. Demographers often issue low, medium, and high projections of the same population, based on different assumptions of how these rates will change in the future.

- **Forecast:** The projection selected as the one most likely to provide an accurate prediction of the future value of a variable such as population or housing. This is a judgmental statement about what the analyst believes to be the most likely future value of a variable.

- **Estimate:** The estimated population is the calculated number of people living in an area as of July 1. The estimated population is calculated from a component of change model that incorporates information on natural change (births, deaths) and net migration (net internal migration, net international migration) that has occurred in an area since a Census 2000 reference date.

- **Regional Housing Needs Assessment (RHNA):** Quantification by Councils of Government (COG) or by the California Department of Housing and Community Development (HCD) of existing and projected housing need, by household income group, for all localities within a region.

- **Family**: (1) Two or more persons related by birth, marriage, or adoption (2) An individual or a group of persons living together who constitute a bona fide single-family housekeeping unit in a dwelling unit, not including a fraternity, sorority, club, or other group of persons occupying a hotel, lodging house or institution of any kind.

- **Natural increase:** The net gain after subtracting the number of deaths from the number of births.

- **Domestic migration:** The net change of the inflow of population from other regions to the region under study and the outflow of population from the region under study to other regions.

- **Redevelopment:** Redevelopment is a tool created by state law to assist local governments in eliminating blight from a designated area.

- **Sphere of Influence (SOI):** A plan, adopted by LAFCO, for the probable physical boundaries and service areas of a city or district.

Regulatory Environment

The City of Lake Elsinore must comply with various Federal, State, and local laws. The following is a list of laws and policies relevant to population and housing.

- California State Planning Law
- Southern California Association of Governments (SCAG)
- Riverside County General Plan
- City of Lake Elsinore General Plan & Housing Element
- City of Lake Elsinore Specific Plans

Existing Housing and Population Conditions

Population

Trends & Projections

The Southern California region consists of six neighboring counties: Orange, Riverside, Ventura, Los Angeles, San Bernardino, and Imperial and encompasses a total of over 38,000 square miles. Los Angeles County, as the urban center of the region, contains over one-half (57 percent) of the region's population with the majority concentrated in the City of Los Angeles (Table 8.1).

Table 8.1 Population Trends – Riverside and Neighboring Counties

	Year		Change (1990-2000)	
County	**1990**	**2000**	**Number**	**Percent**
Imperial	109,303	142,361	33,058	*23.22%*
Los Angeles	8,863,164	9,519,338	656,174	*6.89%*
Orange	2,410,556	2,846,289	435,733	*15.31%*
Riverside	**1,170,413**	**1,545,387**	**374,974**	***24.26%***
San Bernardino	1,418,380	1,709,434	291,054	*17.03%*
Ventura	669,016	753,197	84,181	*11.18%*
TOTAL	14,640,832	16,516,006	1,875,174	*11.35%*

Source: US Decennial Census/ Southern California Association of Governments

Between the years 1990 and 2000, the six county regions grew by approximately 1,900,000 persons, ultimately representing an 11.4% growth in regional population. Numerically, the majority of this growth (35% of the total increase in persons) occurred in Los Angeles County. In terms of proportional growth, Riverside and Imperial counties have grown faster than other counties in the region since 1990. The County of Riverside, with approximately 1,500,000 persons, is the fourth largest county in the region with the largest urban concentration in the City of Riverside (255,000). The two other largest cities in the county are Moreno Valley and Corona, each with over 100,000 persons. The cities of Murrieta, Temecula, and La Quinta have experienced the largest proportional growth within Riverside County. Meanwhile, the City of Lake Elsinore has experienced a relatively significant growth rate of nearly 37% since 1990. The City of Lake Elsinore had a 2000 population estimate of 29,000, which has increased to 38,000 in 2005, according to the CA Department of Finance (Table 8.2 and Table 8.3) [1].

[1] Southern California Association of Governments (SCAG) Socio-Economic Forecast Report

Table 8.2 Riverside County Cities

	Year		Change (1990-2000)	
City	**1990**	**2000**	**Number**	**Percent**
Banning	20,570	23,562	2,992	12.70%
Beaumont	9,685	11,384	1,699	14.92%
Blythe	8,620	12,155	3,535	29.08%
Calimesa	4,647	7,139	2,492	34.91%
Canyon Lake	7,938	9,952	2,014	20.24%
Cathedral City	30,085	42,647	12,562	29.46%
Coachella	16,896	22,724	5,828	25.65%
Corona	76,095	124,966	48,871	39.11%
Desert Hot Springs	11,668	16,582	4,914	29.63%
Hemet	36,094	58,812	22,718	38.63%
Indian Wells	2,480	3,816	1,336	35.01%
Indio	36,793	49,116	12,323	25.09%
La Quinta	11,382	23,694	12,312	51.96%
Lake Elsinore	**18,285**	**28,928**	**10,643**	**36.79%**
Moreno Valley	118,779	142,381	23,602	16.58%
Murrieta	1,520	44,282	42,762	96.57%
Norco	23,302	24,157	855	3.54%
Palm Desert	23,252	41,155	17,903	43.50%
Palm Springs	40,181	42,807	2,626	6.13%
Perris	21,460	36,189	14,729	40.70%
Rancho Mirage	9,778	13,249	3,471	26.20%
Riverside	226,505	255,166	28,661	11.23%
San Jacinto	16,210	23,779	7,569	31.83%
Temecula	27,099	57,716	30,617	53.05%
Unincorporated County Area	371,089	429,029	57,940	13.50%
TOTAL	1,170,413	1,545,387	374,974	24.26%

Source: US Decennial Census, Southern California Association of Governments

Table 8.3 Population Trends

	Year	Population	Interval Change (persons)	Percent	Annual
City of Lake Elsinore	1980	5,982	-	-	-
	1990	18,285	12,303	67.3%	6.7%
	2000	28,928	10,643	36.8%	3.7%
	2005	**38,045**	**9,117**	**24.0%**	**4.8%**
Riverside County	1980	663,199	-	-	-
	1990	1,170,413	507,214	43.3%	4.3%
	2000	1,545,387	374,974	24.3%	2.4%
	2005	**1,877,000**	**331,613**	**17.7%**	**3.5%**

Source: 1980- City of Lake Elsinore Housing Element, 2002
1990/2000- US Decennial Census 2000
2005- CA Department of Finance, E-5 Report, 1/1/2005

The region is projected to increase to 22.9 million by 2025; adding 6.26 million people, 2.26 million households and 3.04 million jobs over the 2000-2030 forecast period. In addition, the region will also experience changes in age structure and ethnic composition, a shift in employment from the western to eastern portions of the region and a continuing shift from a manufacturing to a service-based economy. Population growth at an annual rate of 1.25% is projected to add about 209,000 people to the region per year. The region's population growth is caused by changes in three major components: natural increase, domestic (interstate) migration and international immigration.

Natural increase is the most prominent source of growth in the region and accounts for about 80 percent of regional population growth. Of the projected 6.26 million-population growth, 5.4 million is projected to be due to natural increase. Net international immigration is the second major contributor to regional population growth due to the unique cultural mix, job opportunities and the geographic location of the SCAG region. The projected net international immigration (including both legal and illegal immigrants) is 3.3 million. Domestic migration is the third most important contributor to the regional population change. Based on SCAG's projection, the region is projected to experience a net domestic migration loss of 2.4 million by 2030. The combination of domestic out-migration and international immigration will yield an about 870,000 net population gain, or about 10.4 percent of the regional population growth.

Population by Race and Ethnicity

The US Decennial Census reports that in the year 2000, 66% of the population of Lake Elsinore is identified as "White," while in the County of Riverside overall, 51% of the population is represented by this race category. The remaining 29% of the City's population is identified as "Black," "American Indian & Alaska Native," "Asian," and "Native Hawaiian & Other Pacific Islander." Five percent reported two or more races. Persons of Hispanic origin (of any race) represent 38% of the community or approximately 11,000 persons. The County's population identifies 36% of individuals of Hispanic origin.

The City of Lake Elsinore is predominantly "White" and "Non-Hispanic" with a significant ethnic minority population largely similar in composition to the County, yet comprising a much smaller portion of the overall population. The composition of the City's minority population differs from the County only by the proportionally greater number of persons reporting as being of two or more races as seen in Table 8.4.

Table 8.4 Racial and Ethnic Composition, 2000

	CITY OF LAKE ELSINORE	
Race	**Lake Elsinore**	**Riverside County**
White	18,981	1,013,478
Black or African American	1,501	96,421
American Indian & Alaskan Native	374	18,168
Asian	592	56,954
Native Hawaiian & Other Pacific Islander	87	3,902
Other	5,880	288,868
Two or More Races	1,513	67,596
TOTAL	**28,928**	**1,545,387**
Persons of Hispanic Origin	11,007	559,575

Source: US Census Bureau, 2000

Population by Age Trends

The age breakdown of a population is an important factor in evaluating housing needs and projecting the direction of future housing development. Table 8.5, Population by Age 2000, shows the distribution of age groups reported in the 2000 Census. In 2000, residents in their prime working years (25-54 years of age) comprised approximately 43% of the City's population. The residents of Riverside County representing this particular group are relatively similar, consisting of 40% of the population. The next largest representative age category, school age and young adult citizens are represented at 35% of the population, in comparison to 32% in Riverside County. Between the years of

1990 and 2000 the prime working group showed the greatest rise in population by comprising 42.6% of total population in 2000. However, although the prime working group comprised the largest percentage of overall population, the school age group increased by 4.5% to a total of 26% of the population in 2000.

Table 8.5 Population by Age, 2000

Age (Years)	Lake Elsinore	Riverside County
Under 5	2,834	121,629
5-9	3,223	139,468
10-14	2,850	133,886
15-19	2,346	119,725
20-24	1,849	96,374
25-34	4,245	204,223
35-44	5,026	242,170
45-54	3,048	176,022
55-59	883	61,880
60-64	691	54,046
65-74	1,136	103,154
75-84	636	71,726
85 and over	161	21,084
TOTAL	**28,928**	**1,545,387**

Source: US Census Bureau, 2000

Housing

The State of California requires all California communities to prepare a "Housing Element" every five years. The City of Lake Elsinore adopted its last Housing Element of the General Plan in 2002, including the city's housing goals, objectives, policies and programs. Because the City is currently in compliance with State regulations, no changes to the existing Housing Element are being made. The following information is taken from the existing Housing Element.

Household Characteristics

Before existing housing problems can be understood and future needs anticipated, housing occupancy characteristics need to be identified in the City. The following is an analysis of household size, household growth, tenure, and vacant trends. By definition, a household consists of all the people occupying a dwelling unit, whether or not they are

related. For example, a single person living in an apartment is a household, just as a couple with three children living in the same dwelling unit is considered a household.

The change in the number of households in a city is one of the prime determinants of the demand for housing. Households can form even in periods of static population growth as adult children leave home, through divorce, and with the aging of the population.

Housing Inventory and Market Conditions

Persons per Household

"Persons per household" is an important indicator of the relationship between population growth and household formation. For example, if the persons per household are decreasing, then households are forming at a faster rate than population growth. Conversely, if population were growing faster than households, then the person per household would be increasing. In the City of Lake Elsinore, persons per household increased by 9.4% from 1990 through 2000. This indicates that population within the City is growing faster than households.

Along with the persons per household figures, household size helps determine the size of housing units needed within a jurisdiction. As seen in Table 8.6, the average household size in Riverside County in 1990 was 2.9 persons per household, rising to approximately 3.0 persons per household by 2000. In comparison, Lake Elsinore has maintained a somewhat higher number of persons per household than the countywide average. The US Census indicated that the average household size within the City was approximately 3.0 persons per household in 1990, increasing to nearly 3.3 persons per household in 2000.

Table 8.6 Persons per Household

Area	1990	2000	% Change 1990-2000
Riverside County	2.85	2.98	4.60%
Lake Elsinore	2.99	3.27	9.40%

Source: US Census, 2000/1990

Number of Households

Between 1990 through 2000, the number of Lake Elsinore households grew at a proportionately faster rate than that of either the County or State. The number of households in Riverside County and California increased by approximately 26% and 11% respectively. In comparison, the total number of households in Lake Elsinore grew by

approximately 45% over the same time period. The total number of households in Lake Elsinore in 2000 was 8,817 representing an increase of 2,751 households.

Table 8.7 Total Households

Area	1990	2000	% Change 1990-2000
California	10,381,206	11,502,870	10.80%
Riverside County	402,426	506,218	25.80%
Lake Elsinore	6,066	8,817	45.40%

Source: US Census, 2000/1990

Household Tenure

Household tenure is the ultimate determination whether an owner or a renter occupies a housing unit. Tenure can be affected by several factors, including housing type, housing cost, housing availability, job availability, and consumer preference. Over the course of time, the tenure of housing units within the City of Lake Elsinore has become similar to Riverside County. For example, owners occupied approximately 59% of Lake Elsinore housing units in 1990, while 67% were occupied by owners in Riverside County overall, a difference of 8%. By 2000, the City had a significant increase in level of owner-occupancy consisting of a difference of 4% overall to that of Riverside County.

Table 8.8 Household Tenure

	Year	Owner Occupied Units	% of Total	Renter Occupied Units	% of Total
Lake Elsinore	1990	3,565	58.80%	2,501	41.20%
	2000	5,699	64.60%	3,118	35.40%
Riverside County	1990	270,876	67.40%	131,191	32.60%
	2000	348,532	68.90%	157,686	31.10%

Source: US Decennial Census, 2000/1990

Vacancy Rates

The vacancy rate is a measure of the general availability of housing and an indicator of the relationship between housing supply and demand in the City of Lake Elsinore. For example, if the demand for housing is greater than the available supply, then the vacancy rate is probably low, and the price of housing will most likely increase or remain stable. Whereas a high vacancy rate may indicate either the existence of a high number of units undesirable for occupancy, or an oversupply of housing units. The availability of vacant

housing units provides households with choices on different unit types to accommodate changing needs. The 2000 US Census reports an overall vacancy rate of 7.2% for the City of Lake Elsinore. This is a 5.9% decrease from 1990, which ultimately represents an increased demand for housing within the City

The Regional Housing Needs Assessment (RHNA) prepared by SCAG in 1999 identifies a target vacancy rate of 3.1% for its member jurisdictions. However, a vacancy rate of between 3% and 5% is considered normal, so that it ensures the continued upkeep of rental properties and keeps housing costs down. As previously mentioned, the 2000 vacancy rate in Lake Elsinore was 7.2% in comparison to 12.9% in 1990. This significant decrease enabled the City to become more aligned with other Riverside County cities as well as becoming consistent with the RHNA target vacancy rate.

Age of Housing Stock

Age is one measure of housing stock conditions and a factor for determining the need for rehabilitation. Without proper maintenance, housing units deteriorate over time. Units that are older are likely to be in need of repairs. As a general rule of thumb, houses 30 years or older are considered aged and are more likely to generate major repairs. Additionally, older homes may not be built utilizing current housing standards and building codes pertaining to fire and earthquake safety.

New tract home construction in City.

There are a total of 10,290 housing units as of the last Housing Element update of July 2002. The majority of these units were built between the years of 1970 and 1990. There are only 1,692 or 16.5% of existing housing stock that was built prior to 1970. Between 1970 and 1980, only 1,288 units or 12.5% were built in the City. The period of years between 1980 and 1990 saw the biggest construction boom with 4,001 units constructed, or 38.9% of the total housing stock. The next largest increase was between 1990 and 1999 when 3,309 units or 32.2 % were constructed. Since 83.6% of the housing units in the City were built after 1970, it is not anticipated that these units will require a high level of maintenance. Due to their age, it is possible that units constructed prior to 1970 may need an increased level of maintenance.

Constraints and Opportunities

Constraints Due to Regulatory Requirements

Redevelopment

For two years in a row, the Lake Elsinore Redevelopment Agency (RDA) tax increments have been cut due to the State of California's budget problems. RDA was in financial trouble during the recession of the 1990's, but was able to repay bondholders with assistance from the City and a private bank. Although RDA is once again financially healthy, the RDA is limited to conservative and prudent budgeting as a cushion against the State's confiscatory policies.

Zoning Ordinance

A Zoning Ordinance must be consistent with the General Plan and if zones and densities/ intensities are changed, the potential for inconsistencies arises and may conflict with the Zoning Ordinance.

Multiple Species Habitat Conservation Plan (MSHCP)

The Multiple Species Habitat Conservation Plan (MSHCP) outlines strategies for preserving special status species and natural communities and will require careful planning on the part of the City to avoid further degradation of its natural resources. Changes in land use designations will need to be sensitive to the locations of sensitive water resources, natural communities, special status species, and their associated habitats in order to optimize the balance between development and the continued health of the natural resources present within the City of Lake Elsinore and Sphere of Influence (SOI).

The MSHCP Elsinore Area Plan designates specific areas within the City as areas in need of conservation. Examples include wetlands around Lake Elsinore and the floodplain to the east of the lake. The plan also identifies the need to provide connectivity between the Santa Ana Mountains, Temescal Wash and the foothills north of Lake Elsinore that translates to maintaining these areas as undeveloped in their natural state. Preserving natural habitat may reduce the developable area for new housing.

Constraints Due to Existing Conditions

Existing conditions that have the potential to constrain accommodation of additional population and implementation of new housing within the City include physical challenges such as flood hazards, steep slopes, endangered species and habitat, unstable slopes, liquefaction, and active faults.

Changing population growth is a challenging constraint because it is difficult to anticipate and is beyond the control of the City. Rapid population growth and associated need for new residential development increases the necessity for services such as schools, roads, parks, utilities, public safety and other infrastructure. The City may find it difficult to provide the needed services at the same pace that it is required, putting a strain on these resources.

Opportunities to Enhance Regulatory Requirements

Housing

An opportunity to enhance regulatory requirements is regarding the jobs/housing balance goal for SCAG. Due to the imbalance of more housing than jobs, the City of Lake Elsinore can better balance the rate of development and locate housing closer to compatible employment centers.

In addition, opportunity exists for the City to zone for a diversity of dwelling units. The City can also zone for more multi-family units to address housing needs of low and moderate-income residents as well as senior residents.

Opportunities to Address Existing Conditions

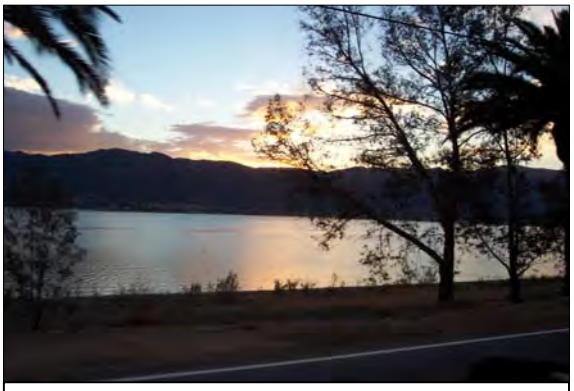
Housing

Lake Elsinore's growing population and desire to both locate housing closer to employment and to redevelop areas of the City present the opportunity to change the types of housing available and shift the City's dynamic. The City has the ability to re-assess housing types and change accordingly. There is also has the opportunity to protect the character of existing neighborhoods throughout the City. By having the opportunity to address housing types and rate of development, the City will be better able to accommodate the changing needs of the City.

CHAPTER 9 – AESTHETIC AND VISUAL RESOURCES

Introduction

This report assesses aesthetic and visual resources in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan for the City of Lake Elsinore.



Sunset viewed from Lakeshore.

Legal Basis and Requirements

Government Code Section 65302(d) states the General Plan shall include a land use element "that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land."

Terminology

The following is a brief background discussion of aesthetic and visual terminology.

- **Scenic Vista:** A view of scenic resources from a specific point that is recognized as having superior visual and/or aesthetic qualities.
- **Viewshed:** An area composed of land, water, and cultural elements, which may be viewed and mapped from one or more viewpoints and that has inherent scenic qualities and/or aesthetic values as determined by those who view it.
- **Viewshed Units:** A viewshed unit is a portion of the landscape that displays primarily homogenous visual characteristics of the basic landscape features (e.g., land and water forms, vegetation, and structures).
- **Vantage Point:** The position from which a viewer looks at an observation point, viewpoint, or viewshed.

- **Sensitive Viewer Groups:** Groups of people who share a commonality, such as being a tourist, resident, or commuter who are affected by the visual quality and character of viewsheds and scenic vistas.

Regulatory Environment

The City of Lake Elsinore must comply with various Federal, State, and local laws. The following is a list of laws and policies relevant to aesthetic and visual resources:

- National Environmental Policy Act (NEPA)
- United States Forest Service
- California Environmental Quality Act (CEQA)
- California Scenic Highway Program
- Riverside County General Plan
- Elsinore Valley Municipal Water District (EVMWD)
- Lake Elsinore Advanced Pump Storage (LEAPS)
- City of Lake Elsinore General Plan
- City of Lake Elsinore Zoning Ordinance
- City of Lake Elsinore Specific Plans

Existing Aesthetic and Visual Conditions

Visual Character

The 38 square mile city of approximately 38,000 people surrounds Lake Elsinore, a 3,000-acre natural lake shown in the aerial, listed as Figure ii in the Introduction. Trees and scrub bushes surround the lake and nearby mountains and hillsides, hiding patches of development. Older buildings including housing, commercial buildings, retail shops, and light industrial uses are scattered around the lake. Southeast of the lake, large areas of undeveloped land are interspersed with older housing and newer, sprawling subdivisions. The mountains on the southwest shore rise up dramatically providing a backdrop for the lake.

The topography of the area accentuates the beauty of the lake. The City is located in a valley with panoramic views of the Santa Ana Mountains that extend from the southwestern edge of the lake, rolling hills along the northeastern borders, and a valley that sweeps to the north and south.

Relative to other cities in Southern California, the City of Lake Elsinore is non-urban. A city center was developed in the northeast portion of the lake known as historic Lake Elsinore. In addition to historic Lake Elsinore, development is also dispersed around the lake. As the city grew, development patterns spread up the valley towards the north. Development within the current City boundaries is limited due to various topographical barriers including the Santa Ana Mountains to the west and rolling hills to the east.

Scenic Resources

Scenic resources within and surrounding the City of Lake Elsinore include the lake, Cleveland National Forest, rugged hills, mountains, ridgelines, rocky outcroppings, streams, vacant land with native vegetation, buildings of historical and cultural significance such as the cultural center, bathhouse and military academy, parks, and trails. Examples of these scenic resources can be seen in photos listed as Figure 9.1a-d.

Sensitive Viewer Groups

Sensitive viewer groups for the City of Lake Elsinore include, but are not limited to, city residents, unincorporated county residents, people who live in other cities but work in Lake Elsinore, tourists, commuters, and motorists on I-15 or Highway 74. Public vantage points for the various viewer groups include the highways, recreational facilities around the lake as well as within the center of lake, and hang gliders, small planes, and others from the sky. Private vantage points include views from individual residences.

Effect on viewshed of new home construction in hillsides.

Viewsheds

Viewsheds or landscaped viewshed units of scenic vistas include the Lake, urban areas around the lake, and the rugged vacant hills in the northern and eastern portion of the City. For purposes of discussion, 15 landscape viewshed units have been identified in the Lake Elsinore area as seen in Figure 9.2. Each of these areas has distinct viewsheds defined by man-made structures and physiographical features such as landform, water, or cultural features.

The following is a brief summary of each of the Landscaped Viewshed Units from Figure 9.2:

1. Mainly vacant land with steep hillsides interspersed with development. Unit is both within the City and SOI.

2. Partially graded land due to mineral extraction. Unit is half in the City and half in the SOI.

3. Mainly developed with residential, commercial, and recreational land uses.

4. Steep slopes mainly outside City boundaries, but within the SOI. Includes portions of the Cleveland National Forest. This unit is mainly undeveloped, but has patches of residential, commercial, and recreational development.

5. Rolling hillsides characterize this unit. It is mainly residential with limited commercial use.

6. Unit is adjacent to the lake with a mix of residential, commercial, and public facilities. This unit is also the location of historic downtown Lake Elsinore.

7. Mainly within City boundaries, the unit is characterized by varying topography and rural development.

8. Majority of this unit is outside City boundaries, but within the SOI. Area is developed with intermittent residential and commercial uses.

9. Unit is outside of the City, but within SOI. Residential community located along I-15.

10. Located outside the City and on the edge of the SOI. Characterized by rolling hills and limited residential development.

11. Located in the center of the SOI. Mainly developed with residential and commercial uses. Contains a public high school

12. Location of the future Lake Elsinore Outlet stores. Large portion to the east is vacant for future expansion.

13. Mainly manufacturing land use located along I-15. Relatively flat topography. Includes current location for the existing Lake Elsinore Outlet Mall.

14. This unit includes Lake Elsinore and surrounding floodplain.

15. Characterized by steep slopes and limited development due to small lots and inadequate utilities. Also known as Country Club Heights.

Figure 9.3 demonstrates the areas within the City of Lake Elsinore, SOI, and outlying areas where views of the lake are visible, and areas where the lake cannot be seen. If an individual is standing in an area that is marked as green on the map, they can see the lake. If they are standing in an area that is red, they cannot see the lake. For example, as a

motorist drives on I-15, the map demonstrates that views of the lake will be sporadic, with visibility of the lake better along the southern portion of I-15 and worse in the north.

Vantage Points

The visual character of the City is dominated by Lake Elsinore, which is the largest natural lake in southern California. Due to the importance of the lake, scenic resources were addressed by identifying key public vantage points of the lake throughout the City. Sites chosen included the view of the lake from I-15, Highway 74, the Lake Elsinore Recreation Area and Campground, the baseball stadium, and the boat launch on the eastern edge of the lake. These points were chosen because they are key public vantage points that can be accessed by every viewer group. Figure 9.3 shows where the vantage points are located, and Figure 9.4 displays photos of each of the locations. The following is a description of each vantage point.

Public Vantage Point No. 1: I-15

With the city's proximity to I-15, the lake can be seen as commuters pass by the city. A full view of the lake appears in the distance, sitting in a valley surrounded by mountains and hills. Most travelers on the I-15 are passing through at high speeds making it difficult to enjoy views of the lake. While the view of the lake is pleasant, travelers are focused on driving and not on the visual quality of the lake and surrounding city. Without pulling off the freeway, the lake is only visible to north and southbound motorists for a short period. From other public vantage points, viewers have prolonged viewing times of the lake, either due to slower speed limits on roadways, or because the viewer is not traveling and has time to view the lake for an extended period of time.

Public Vantage Point No. 2: Highway 74/Ortega Highway

From Highway 74, also known as Ortega Highway, there are several vantage points where sightseers and residents can stop and enjoy the view of the lake. Ortega Highway traverses up and over the Santa Ana Mountains. As the highway switchbacks through the mountains, the view of the lake becomes more impressive as travelers enjoy an aerial view of the entire lake and surrounding rugged topography. From the high viewpoint the lake fills the view. As seen from Figure 9.4, the surrounding hills and distant mountains act as a backdrop for displaying the lake.

Looking down from Ortega Highway, a development of newer homes with red roofs stands out on the southeast side of the lake creating a visual distraction. Towards the west, the topography gets steep very quickly. There are very few shrubs and trees on the hillside that obstruct views of the lake from the roadway Rocky outcroppings at the vantage point provide additional visual interest.

Public Vantage Point No. 3: Lake Elsinore Recreation Area/Campground

Another key public vantage point is from the Lake Elsinore Recreation Area that includes a campground, boat launch and swimming area. It is located adjacent to the water on the northwestern edge of the lake. The view of the lake fills up the southern sightline of the viewer as seen in Figure 9.4. In the summer of 2005, several dozen palm trees were viewed submerged in the water from distances of 15 to 50 feet from the shore, an indicator of the current high water level. A chain link fence surrounds the entire recreation area approximately 20 feet from the shore, also partially submerged in the water. Moss partially covers the surface of the water within the chain link fence boundary.

Mountains to the west can be seen from the recreation area as well as new homes sited along the edge of the mountains. Development around the lake is nearly hidden from view by trees surrounding the water's edge. Trees also nearly hide the hills to the east, but houses on tops of the hills are partially visible between the foliage. The aesthetic quality of the water in the lake is not inviting from close range due to floating vegetation that contributes to the water's murky appearance.

Public Vantage Point No. 4: Baseball Stadium

The baseball stadium is located close to the water in the southeastern part of the city. From this vantage point, an inlet of the lake created by the levee is visible. A distant view of the lake is available from just outside the stadium, but does not dominate the landscape due to the distance from the lake. Most of the views across from the ballpark are of dry, brown grasses and scattered trees, a portion of which has been set-aside as a wildlife habitat area. From this vantage point, a newer housing development can be seen on the hills located to the west of the freeway. Older homes, small buildings and a newer housing development can be seen immediately across the lake to the north. Trees and heavy vegetation make it difficult to see any development clearly. A wide dirt trail available for pedestrians to walk to the edge of the lake is visible from the stadium.

Public Vantage Point No. 5: Boat Launch/Recreation Area

A second boat launch and day-use public recreation area is located on the eastern edge of the lake. The lake can be seen from north to south with the Santa Ana Mountains forming a backdrop at this vantage point. The lake fills up a large portion of the viewpoint, making it the dominant feature. Residential developments can be seen towards the west of the lake from the boat launch. Unobstructed views of the residential development on the north end of the lake are clearly visible from the boat launch. As of the summer of 2005, the visual character of land that has been recently graded contrasts with the forest green shrubs and trees surrounding the new project. Other development to the east of the boat launch is visible, but partially obscured by trees.

The area immediately surrounding the boat launch is covered by dark sand and a short distance to the north there is a small patch of grass and recreation-oriented facilities. Large shade trees on the grassy patch provide relief from the sun for visitors. The area is characterized by more recreational activities and facilities than other vantage points including a visitor parking lot, boat launch, established swimming area, and restrooms.

Sources of Light and Glare

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Initial Study Environmental Checklist form that includes questions relating to aesthetics. One of the aesthetic issues addresses whether the "project" will create a new source of substantial light or glare that would adversely affect the day or nighttime views of the area.

In assessing current conditions, light and glare from existing development is minimal. While not substantial, light and glare during the day and night is created from various residential, commercial, and industrial uses throughout the city. Examples of these sources include night lighting such as street lamps, accent and security lighting on buildings, parking lot lighting, and vehicle headlights at night. Substantial sources of night lighting include the existing ballpark and public parks. Alliance Skate Park of Lake Elsinore located in McVicker Park is open until 9 pm most evenings and other public parks are open until 10 pm for recreation purposes. Sources of glare during the day result primarily from parked cars located in large parking lots and from sunlight reflected off of window glazing on buildings.

Opportunities and Constraints

Constraints

National Environmental Protection Act (NEPA) and Cleveland National Forest

Development or public facility projects involving use of Federal funds or proposed by a Federal Agency must comply with the National Environmental Protection Act (NEPA). NEPA requires that an agency evaluate the potential impacts of facilities on environmental resources such as sensitive biological resources. Compliance with NEPA may involve limits to the location of proposed facilities due to preservation of land as mitigation for impacts of a project to biological resources.

The Cleveland National Forest extends along the western portion of the City and consists of important visual resources including steep slopes and native vegetation. Requirements of the USFS for management of the Cleveland National Forest will ensure that the visual resources within the forest are preserved.

NEPA and the Cleveland National Forest have regulations that cannot be altered by updating the General Plan and implementing new land uses and designations with the City. Any development project in designated areas must preserve a percentage of land previously established by the United States Fish and Wildlife service, or in extreme examples, not allowed to develop at all. The National Forest also has strict guidelines about the types of uses allowed in the Cleveland National Forest; for example, hang gliders, a popular sport in the city are not allowed in the wilderness area.

Lake Elsinore Advanced Storage Project (LEAPS)

The Lake Elsinore Advanced Storage Project (LEAPS) as proposed by EVMWD has the potential to affect visual resources around the lake. The proposal includes filling up one of two canyons as a lake reservoir at the top of the Santa Ana mountain range, and includes an underground powerhouse at the bottom of the mountains. A two or three story building is proposed to be located on top of the powerhouse. Transmission lines will be located at the base, but the path of the transmission lines is still to be determined. The pipes that carry the water will be tunneled through the mountain connecting the reservoir with the lake. This will likely not affect visual conditions because instead of trenching the pipes, a boring machine will be used to go through the mountain. Implementation of the project will likely affect the visual resources of the LEAPS (EVMWD) project area, but Federal NEPA and State CEQA processes are still in motion and the final proposal is still to be determined.

Aesthetic Conditions

Existing aesthetic conditions have potential to constrain the implementation of new land uses and designations within the City due to the relatively undeveloped nature of Lake Elsinore. Any new development in the hillsides, foothills, or other areas around the lake will affect current viewsheds. As described in a previous section, trees and shrubs surrounding the lake and nearby hillsides block a great deal of development from a viewer's perspective. New land uses and designations around the lake may result in cutting down trees to accommodate new development, resulting in fewer trees to block more development thereby altering the aesthetic quality of the current view. In addition, new subdivisions and large-scale development set away from the lake are visually distracting, resulting in diverting a viewer's perspective from the visual resources of the city.

Opportunities to Enhance Regulatory Requirements

New regulatory requirements have the opportunity to address existing and future aesthetic conditions within the City. Policies can be implemented to protect the visual quality of the lake, protect public views, and ensure the long-term viability of the lake as a recreation area; additional light and glare policies can be implemented to prevent

current and future visual distraction; and policies regarding trees can be implemented to protect the visual landscape surrounding the lake.

Multiple Species Habitat Conservation Plan (MSHCP)

When implemented, federal regulations can contribute to the preservation of visual character of an area by limiting the location of urban development. For example, implementation of the Multiple Species Habitat Conservation Plan (MSHCP) involves preservation of vacant land as permanent open space to provide habitat for animal and plant species listed as endangered or threatened under the Federal Endangered Species Act (ESA). The MSHCP establishes requirements for preservation of habitat as permanent open space within the City and SOI. Setting aside land within planned urban developments preserves open space. Through the MSHCP, visual resources such as steep hillsides and riparian areas can be preserved, protecting the visual character.

Regulations to Enhance Aesthetics

In addition, revising regulatory requirements can help address existing and future aesthetic conditions by including additional guidelines for architecture, landscape, and streetscape design. Other aesthetic and visual considerations include the addition of city and community gateways, highlighting city landmarks, lighting requirements, preserving buildings of local historical and cultural significance, establishing scenic vistas, and designating a scenic route through the City.

Caltrans currently defines I-15 and Highway 74 as an eligible state scenic highway, but not officially designated. A regulatory opportunity for Lake Elsinore is to apply for official state designations for these roadways. Caltrans outlines advantages of official designation as being able to promote local tourism that is consistent with the community's scenic values, protecting the scenic values of an area, enhancing community identity and pride, and enhancing land values and making the area more attractive.

As an alternative to applying for state scenic highway designation, the City has the opportunity to petition Caltrans for taking control of portions of the Highway 74 corridor. This will give the City control over signage, landscaping and traffic control. While the downside is the City will be responsible for the maintenance cost of the highway, the benefits are having control over beautification and other improvements for the corridor.

The City also has the opportunity to designate a scenic route in the City using a combination of State routes and local roadways as a way to tie together various parts of the City and take advantage of the City’s stunning scenic beauty. Scenic route identification and designation could include special features such as common signage, landscaping and lighting.

The City also has the opportunity to preserve the aesthetics qualities of the downtown historic Lake Elsinore. Regulations could be implemented that preserve historic structures as well as enhance debilitated structures. Preserving the historic district is an opportunity for this area to serve as a possible gateway for the City.

The MSHCP provides opportunities for preservation of open space that will preserve the rural, open, visual character of the outlying portions of the City and SOI. Specific areas in the City that are targeted for preservation of open space include the rolling hills east of I-15, Temescal creek and associated floodplain, and the floodplain to the southeast of the lake. Preserving floodplains for MSHCP purposes will also serve to protect the aesthetic and visual qualities of floodplains as well as accommodate FEMA requirements regarding development in flood plains.

View of lake and dramatic mountain scenery from County Club Heights.

A General Plan update can also include policies that will serve to improve the quality of the water that will subsequently improve the aesthetic image of the lake. New policies can be added that work to enhance views from public vantage points listed in this report, as well as create new public vantage points. These can include improving access to public vantage points, using these vantage points to create "gateways" to the City, and creating a trail at the lake edge.

Opportunities to Address Existing Conditions

Updating land use designations can help address existing aesthetics and potential future conditions within the City by ensuring that additional policies are established that protect the visual resources of the lake. Avoiding visual distractions such as sprawling subdivisions can be addressed by creating land use policies that prevent or mitigate the visual impact of these types of land patterns. Policies that consider key public vantage points will ensure that viewsheds are protected.

Updating the General Plan is also an opportunity to maintain the quality and characteristics of the landscape viewshed units by creating policies that ensure compatibility of desired existing uses with all new development.

Panoramic Photograph of Lake Elsinore and the Santa Ana Mountains from Country Club Heights

Panoramic Photograph of Open Space and the Cleveland National Forest from South End of Lake

Mooney · Jones & Stokes

Scenic Resources Photos
Figure 9.1a

G//Projects/05091.05/Graphics/Background Report/9.1a.cdr (1/17/06)

Oblique Aerial View of the Southern End of the Lake, Wildlife Refuge, and Santa Ana Mountains

White Pelicans and Waterfowl on Lake Elsinore with Open Space in the Background

Mooney · Jones & Stokes

Scenic Resources Photos
Figure 9.1b

G//Projects/05091.05/Graphics/Background Report/9.1b.cdr (1/17/06)

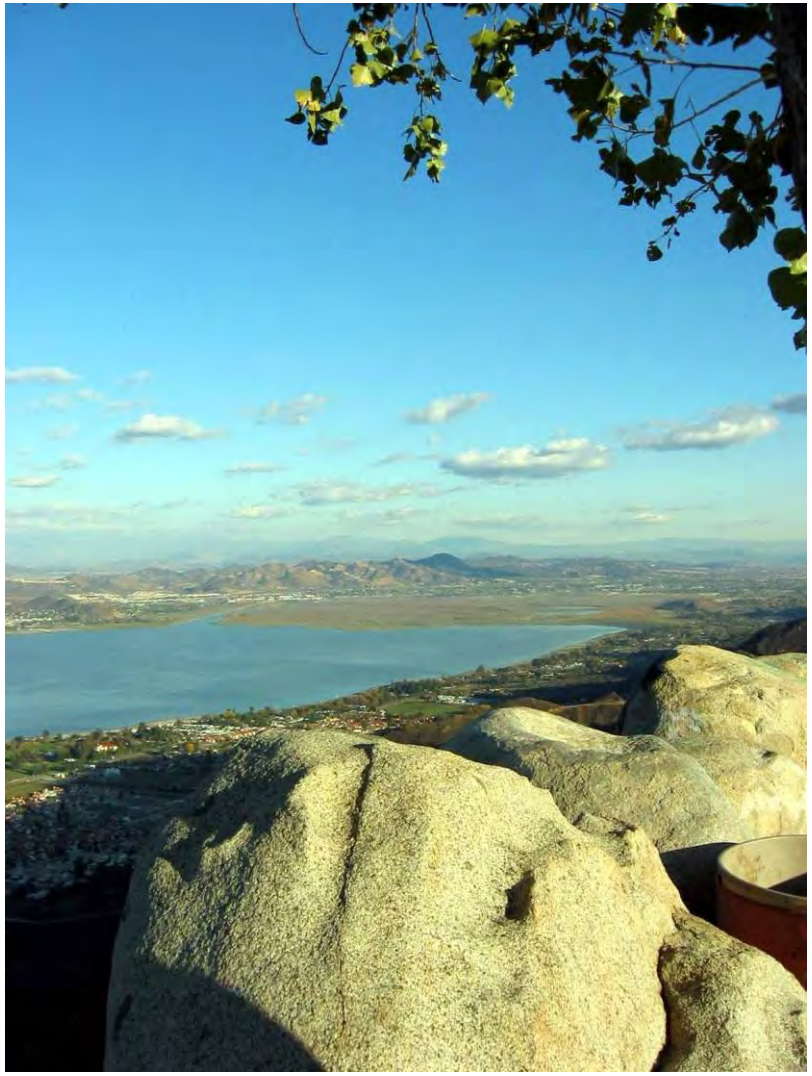
Campground and Beach at North End of Lake Elsinore

View of the Lake, Santa Ana Mountains, and Cleveland National Forest from Whiskers

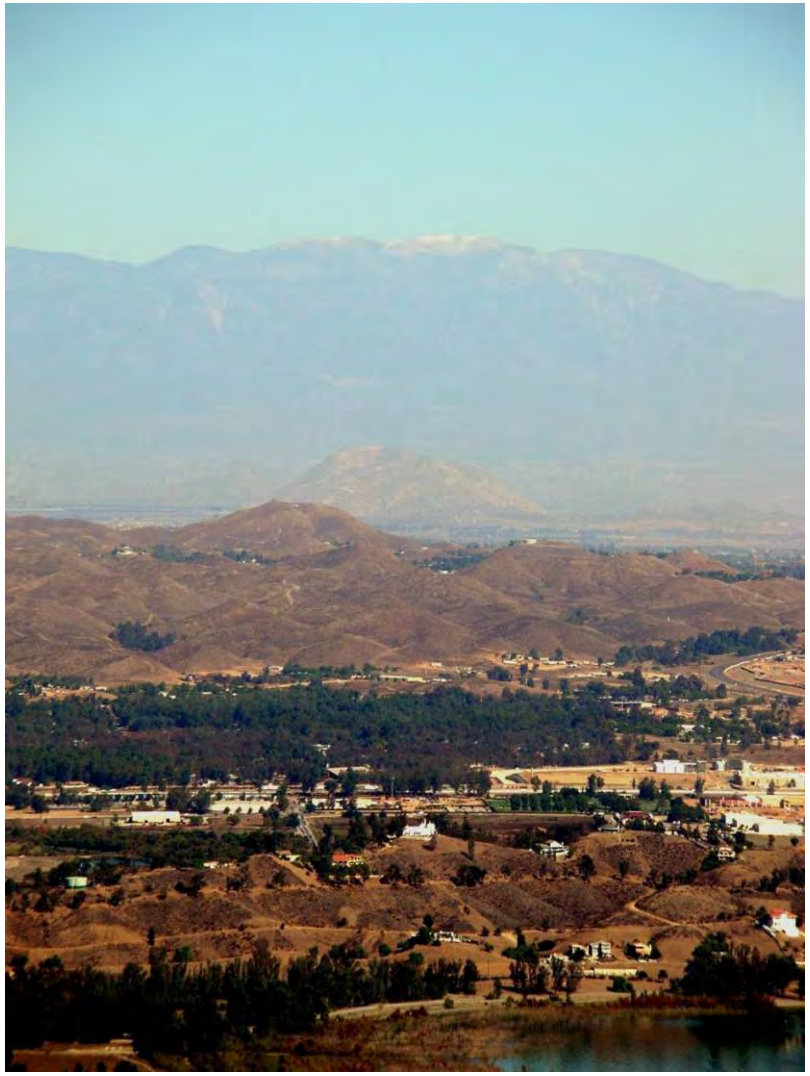
Mooney · Jones & Stokes

Scenic Resources Photos
Figure 9.1c

G//Projects/05091.05/Graphics/Background Report/9.1c.cdr (1/17/06)



Rock Outcrop and Lake Elsinore from Lookout Roadhouse



View of Gorgonio Mountain from the Cleveland National Forest
(Country Club Heights in Foreground)

Mooney · Jones & Stokes

Scenic Resources Photos
Figure 9.1d

G//Projects/05091.05/Graphics/Background Report/9.1d.cdr (1/17/06)

City Limits
Sphere of Influence

View units

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig9_2vw

0 6,500 13,000
Feet

Landscape Viewshed Units
Figure 9.2

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City Limits
Sphere of Influence
Vantage Points
Lake Viewshed
Not Visible
Visible

1
2
3
4
5

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig9_3vw

0 6,500 13,000
Feet

Viewshed and Vantage Points
Figure 9.3

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Vantage Point 1 - Northbound I-15

Vantage Point 2 - Lookout Roadhouse

Vantage Point 3 - Campground

Vantage Point 4 - Ballpark

Vantage Point 5 - Beach

Mooney · Jones & Stokes

G//Projects/05091.05/Graphics/Background Report/9.4.cdr (1/18/06)

Location Photographs
Figure 9.4

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CHAPTER 10 – COMMUNITY SERVICES AND UTILITIES

Introduction

This report assesses existing Community Services and Utilities in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan for the City of Lake Elsinore.

Terminology

The following is a brief background discussion of community services and utilities terminology.

- **Hazardous Waste:** Waste that poses a risk to human health or the environment and requires special disposal techniques to make it harmless or less dangerous.

- **Recyclables:** Recyclables are those materials that can be recycled into the same or new products. Examples include glass, metals, paper, cardboard and some plastics.

- **Recycled Water:** Treated wastewater that undergoes additional, advanced treatment to make it safe for non-potable uses such as landscape irrigation.

- **Renewable Energy:** Generally refers to energy derived from non-fossil fuel resources that are naturally and continually replenished, such as wind, solar power, geothermal, hydropower, and various forms of biomass.

- **Solid Waste:** All solid, semi-solid, liquid and gaseous wastes, including trash, garbage, yard waste, ashes, industrial waste, construction waste, and household discards such as appliances, furniture and equipment.

- **Wastewater:** The used water and solids from a community that flow to a treatment plant. Storm water, surface water, and groundwater infiltration also may be included in the wastewater that enters a wastewater treatment plant. The term “sewage” usually refers to household wastes, but this word is being replaced by the term “wastewater.”

Regulatory Environment

The City of Lake Elsinore must comply with various Federal, State, and local laws. The following is a list of laws and policies relevant to community services and utilities:

- United States Federal Energy Regulatory Commission (FERC)
- California Department of Forestry and Fire Protection
- California Public Utilities Commission (CPUC)
- California Independent System Operator (Cal ISO)
- The Integrated Waste Management Act of 1989
- Riverside County General Plan
- Lake Elsinore Advanced Pump Storage (LEAPS)
- City of Lake Elsinore General Plan
- Household Hazardous Waste Program

Existing Conditions: Community Services and Utilities

Community Services

Fire Protection

The City of Lake Elsinore contracts for fire services with the Riverside County Fire Department (RCOFD) and the California Department of Forestry and Fire Protection (CDF). The RCOFD operates 93 fire stations in 17 battalions, providing fire suppression, emergency medical, rescue, and fire prevention services. Equipment used by the department has the ability to respond to both urban and wildland emergency conditions[1].

Battalion 2 in the Southwest Division of RCOFD services the City of Lake Elsinore. Two fire stations are located within the City boundaries.

The following stations are located within city limits:

- Fire Station No. 10, servicing the central area of the city, located on the northeast side of the lake on W. Graham Ave;
- Fire Station No. 85, McVicker Park Fire, located to the north at McVicker Park slightly east of the lake on Grand Avenue;

[1] City of Lake Elsinore http://www.lake-elsinore.org and Riverside County Fire Department http://www.rvcfire.org.

- Canyon Hills Fire Station #94; and

New fire station, FS #94, near Canyon Hills.

- Proposed Fire Station, Rosetta Canyon, proposed to be located south of Ramsgate Drive.

The following stations are located outside City limits:

- Lakeland Village Station #11
- El Cariso Station #51
- Wildomar Station #61
- Wildomar Station #74
- Canyon Lake Station #60

According to the current Battalion Chief, although the fire stations are operated by RCOFD, CDF staffs firefighters and stores fire-fighting equipment at stations throughout the City, particularly during peak fire season. Both agencies respond to all types of emergencies, depending on the need and equipment available. Emergencies range from wildland fires, residential/commercial structure fires, automobile accidents, medical aid of all types, search and rescue missions, hazardous material spills, floods, earthquakes and more. Standard response times are established by RCOFD guidelines. A goal established in the guidelines is that response time to any location within the city will be seven (7) minutes with the intent to reduce that time to five (5) minutes.

Since October 2003, fire paramedics are required at each station. These specially trained firefighters are equipped to respond to medical emergencies and ride on all calls. Their arrival on the scene can ensure the timely start of emergency medical treatment until an ambulance arrives for patient transport. Each fire engine carries nearly $35,000 worth of state-of-the-art emergency medic equipment.

Police Protection

The City of Lake Elsinore contracts for police protection with the County of Riverside Sheriff's Department. The Lake Elsinore Police Department/Sheriff's Station is located on the northeast edge of the lake at 333 Limited Avenue. (See Figure 10.1) The police department has various programs in place to deter crime such as Neighborhood Watch, Crime-Free Multi-Housing Program, and community-oriented policing.

According to the City of Lake Elsinore *Comprehensive Annual Financial Report* FY *2004-05,* the total sworn officers within the City equates to 38, or a ratio of 1 sworn

officer per 1,000 population. According to response time data provided by the Riverside County Sheriff's Department, average response times have incrementally decreased since 2003. In 2003 the average response time was 10.20 minutes, in 2004 the response time was 10.07, and as of mid-year 2005 the response time was 10.06 minutes.

The police department manages the Lake Patrol with 20 personnel who enforce boating rules and regulations on the lake and perform rescue tactics. The Lake Elsinore Marine Search and Rescue (LEMSAR) volunteers who both patrol the lake and assist with boating accidents involving a death or serious injury on the lake augment the Lake Patrol. LEMSAR volunteers are trained in First Aid and CPR, and must also complete an USCG auxiliary boating and safety course[2].

Schools

The Lake Elsinore Unified School District (LEUSD) serves all of the City of Lake Elsinore, all of the City of Canyon Lake, and a portion of the unincorporated County of Riverside. The District covers a 140 square mile area with a population of approximately 70,000 and is the largest employer in the Lake Elsinore Valley with more than 1,955 full and part-time employees.

LEUSD is composed of 22 schools including thirteen elementary, four middle, two comprehensive high schools, a continuation school, an alternative education center, and an adult education program. The District also provides Head Start programs located at four school sites.

There are plans to expand and upgrade/modernize existing facilities and build new elementary, middle, and high schools to accommodate future growth.

According to the District-wide School Facilities Master Plan (Master Plan) updated July 2004, it was determined that existing school facilities are insufficient to house all of the students to be generated from both existing and future residential unit. According to the Master Plan, an additional 10,864 students are projected for the school year 2013-2014. The District does not have sufficient capacity to house the additional students. However, there are plans to expand and upgrade/modernize existing facilities and build new elementary, middle, and high schools to accommodate future growth. According to the Master Plan, the District will need to house an additional 2,450 elementary students (approximately 2.88 new elementary facilities) over the next ten (10) years. The District will need to house an additional 442 middle school students (approximately 0.33 new middle school facilities) over the next ten (10) years. The District will also need to

[2] Information regarding police protection services was obtained from the City of Lake Elsinore at http://www.lake-elsinore.org and Riverside County Sheriff's Department at http://www.rvcfire.org.

provide facilities for an additional 488 high school students over the next ten (10) years, which equates to approximately 0.18 new high school facilities.

Examples of future plans listed in the Master Plan to accommodate future growth includes expansion of existing facilities such as adding three classrooms to Collier Elementary School, and five classrooms to Graham Elementary School as well as to build new schools such as Middle School No. 6 and High School No. 5. A full list of future plans are listed in the Master Plan.

There are two portions of the City of Lake Elsinore that are not within the LEUSD. In the center of the northern part of the city, a small section falls within the Perris Elementary and Union High School District; and on the eastern edge of the city, a small section falls within the Menifee Union School District. There is one portion within the northwest corner of the Lake Elsinore sphere of influence (SOI) that is not in the LEUSD. This small portion of the SOI falls within the Corona-Norco Unified School District. Figure 10.2 shows the location of the school districts within the City and SOI.

McVicker Canyon Park and McVicker Skate Park.

Parks

There are 12 parks (93.5 developed acres) in the City of Lake Elsinore as shown in Figure 10.3. Each park has a unique set of features with a variety of passive and active recreation. These features include fields for baseball, softball, football, and soccer; also play equipment, picnic areas, barbeque facilities, drinking fountains, tennis courts, and grass for passive recreation. A section of McVicker Park is devoted to skateboarding and inline skating.

There are 3,000 sports league participants that use the sports fields throughout the City including nine (9) local youth and adult sports leagues. Special events are sponsored by the City Parks Department, Lake Community Center, and Senior Activity Center and include the Lake Elsinore Children's Fair, Kid's Fishing Derby, July 4th Celebration, Music with a View Concerts, Safe Candy Night, Unity in the Community Parade, and Winterfest.

The City of Lake Elsinore also offers a program called Volunteers in Park (VIP) Program, which is a partnership between the Community Services and Parks/Open Space Divisions. Volunteers from the community help clean up parks and open space areas on a quarterly basis.

Libraries

The City of Lake Elsinore is part of the Riverside County Library System. Residents have access to all 29 libraries and 2 bookmobiles of the system. There are two libraries within city boundaries including the Lake Elsinore Library located on West Graham Avenue northeast of the lake, and Lakeside Library on Riverside Drive located northwest of the lake. The Canyon Lake Library is just outside the city boundary on Railroad Canyon Drive.

Recreational Facilities

In addition to parks, the City of Lake Elsinore features the Lake Community Center and a Senior Activity Center. Both centers are very active and feature a large number of programs.

There are over 40 recreational classes held at the Lake Community Center ranging from art, gymnastics, acting, dancing, music, martial arts, dog obedience, and more. Over 1,000 people per week currently use the Lake Community Center.

The Senior Activity Center hosts over 3,500 seniors every month and features clubs, health services, legal services, leisure activities, and a daily nutrition program. Clubs offered include the Arthritis Support Group, Bingo Club, Bereavement Support Group, Bridge Club, Elsinore Valley Senior Citizen Club, and Caregivers Support Group. Activities include cards and other games, art classes, singing, exercise classes, excursions, special events, and other programs benefiting the senior community.

Utilities

Water, Wastewater, and Reclaimed Water

The Elsinore Valley Municipal Water District (EVMWD) is a public non-profit agency, and was created on December 23, 1950 under the Municipal Water District Act of 1911. EVMWD provides water, wastewater and reclaimed water service to the City of Lake Elsinore, the City of Canyon Lake, portions of the City of Murrieta, and unincorporated portions of the County of Riverside. The EVMWD is a special district, whose powers include provision of public water service, water supply development and planning, wastewater treatment and disposal, and recycling. Currently, the district has over 35,000 water, wastewater and agricultural service connections. EVMWD is a sub agency of the Western Municipal Water District, a member agency of the Metropolitan Water District of Southern California.

EVMWD's water supply comes from local groundwater, surface water from Railroad Canyon Reservoir (Canyon Lake), and imported water. On average, half of the water

supply is imported, mainly from the Colorado River Aqueduct and State Water Project, but also from treated and disinfected water from Lake Skinner and Lake Mathews, both operated by the Metropolitan Water District of Southern California.

EVMWD's Temescal Division was acquired in 1989 when the district purchased the Temescal Water Company. Residential customers are served from domestic wells in the Coldwater Basin. Domestic water supply is also supplemented by imported water from Lee Lake Water District. Agricultural customers in the Temescal Valley receive water from several wells in the Bunker Hill, Colton and Temescal Valley basins, and surface water from Lee Lake, which is fed by the Temescal Wash.

The Water Distribution Master Plan from May 2002 has a projected need assessment based on future growth projections. Water demands for future scenarios are determined based on water duty factor (WDF) and future projected growth. If growth occurs at a different pace than expected, it is acknowledged that improvements may need to be implemented so that water will be continuously available. The existing system capacities are sufficient for most zones. However, to meet future demand, three (3) pump stations are required as well as eighteen (18) new pump stations. Pump stations are needed for the majority of new developments, located at higher elevations along the hillsides.

To meet rising future demands additional water source capacities are also required. The District is currently planning two groundwater wells in the Lake Elsinore Back Basin. Improvements to fix existing system deficiencies and to accommodate future growth are funded by three different categories including ratepayers for existing services, future Capital Improvement Programs (CIP) and developers for future development projects.

The EVMWD Sewer District provides service for the City of Lake Elsinore, the City of Canyon Lake, portions of the City of Murrieta, and unincorporated portions of the County of Riverside. The District collects and conveys wastewater generated by homes and businesses to one of three tertiary level treatment facilities. There are three major operating systems handled by the District including solids handling and disinfection, preliminary treatment, and secondary treatment. The District uses four wastewater treatment facilities including the Regional WWTP, the Horsethief Canyon WWTP, the Railroad Canyon WWTP and RCWD's Santa Rosa WRF by agreement. The EVMWD Wastewater Management Plan makes recommendations for improvements such as for gravity sewer mains, force mains, lift stations and wastewater treatment facilities.

EVMWD also produces recycled water. Recycled water is used to irrigate parks, street medians, golf courses, wildlife habitat, and for lake stabilization. It is the goal of EVMWD to build additional lines and expand the services of recycled water in order to free up this water to be used for additional residential drinking water.

The Elsinore Water District (EWD) provides water services for a limited area in Country Club Heights and parts of Lakeland Village. The EWD does not provide wastewater services. Water resources for the Elsinore Water District are generated from several local wells as well as purchases from the Elsinore Valley Municipal Water District (EVMWD). EWD supplies water to just over 1,800 customers. According to several studies performed by the City, water service in these areas was identified as a major issue for existing residential uses and a constraint to future development. It is likely that more water will have to be purchased from EVMWD and additional water lines will have to be constructed if additional development is anticipated.

Electrical and Natural Gas

Southern California Edison (SCE), a subsidiary of Edison International, provides electricity to the City of Lake Elsinore. They are providers for 13 million customers, 5,000 large businesses, and 280,000 small businesses in 430 cities. SCE provides a significant amount of energy from alternate and renewable energy, and from a variety of sources. There are 16 utility interconnections, 4,990 transmission and distribution circuits, and 425 transmission and distribution crews.

The City of Lake Elsinore receives its natural gas through the Southern California Gas Company (The Gas Company). The Gas Company is a regulated subsidiary of Sempra Energy and is the nation's largest natural gas distribution utility, serving 19.5 million consumers through 5.5 million meters. The company's service territory encompasses 23,000 square miles in most of central and Southern California.

Both Southern California Edison and the Gas Company anticipate the ability to accommodate future growth within the City of Lake Elsinore; development proposals will be required to formally request "will serve" letters on an individual basis.

Lake Elsinore Advanced Pump Storage (LEAPS)

Elsinore Valley Municipal Water District (EVMWD) in conjunction with The Nevada Hydro Company, Inc. is proposing the Lake Elsinore Advanced Pump Storage (LEAPS) and Talega-Escondido/Valley-Serrano (TE/VS) Transmission Line Project. The project proposes a hydroelectric plant using a reservoir that would be built in the hills above Lake Elsinore and a related transmission line connecting Riverside and San Diego counties. The benefits include producing power for 500,000 homes, and provide sufficient water to stabilize the lake at or above the critical 1240' above sea level. The proposed facility will generate electricity from falling water during the day at peak energy levels and in the evening, water will be pumped from Lake Elsinore to the upper reservoir repeating the cycle the following day

Proponents of the LEAPS (EVMWD) project report that the project would contribute to improving the water quality of the Lake. Both the State Water Resources Control Board (SWRCB) Watershed Management Initiative and the LESJWA Lake Elsinore Stabilization and Enhancement Project consider stabilization of lake levels critical for improving water quality in the Lake. It is anticipated that part of the agreement would be to supply a continuous supply of water to Lake Elsinore, and theoretically, the lake would never go below the minimum level of 1,240'.

Other Public Facilities

Trash and Recycling

CR&R Incorporated is responsible for trash disposal in City of Lake Elsinore as well as Temecula, Canyon Lake, and parts of the unincorporated County of Riverside. Residents are provided a 60-gallon trash container for garbage. Trash is taken to either a landfill within Riverside County or to the Materials Recovery Facility (MRF). There are no landfills in the city. Riverside County Waste Management (RCWM) Department manages the landfills used by the City of Lake Elsinore. According to Riverside County Waste Management, capacity levels of landfills within the jurisdiction of RCWM are calculated on a system-wide capacity level. That is to say that landfills within their jurisdiction adhere to state guidelines, which specify that a minimum of fifteen (15) years of system-wide landfill capacity, shall be provided.

Riverside County Waste Management facilitates waste management services for Riverside County. These services are provided on a countywide basis and each private or public entity determines which landfill or transfer station to use. Typically this determination is made based on geographic proximity. The landfills typically used by the City of Lake Elsinore are El Sobrante, Badlands, and Lamb Canyon Landfill.

The El Sobrante Landfill is located east of Interstate 15 and Temescal Canyon Road to the south of the City of Corona. The El Sobrante Landfill is currently permitted to receive 10,000 tons of refuse per day (tpd), of which 4,000 tpd is reserved for refuse generated within Riverside County. The landfill has a total capacity of approximately 109 million tons or 184.93 million cubic yards. As of January 1, 2005, the landfill had a remaining in-County disposal capacity of approximately 39.613 million tons. The landfill is expected to reach capacity by approximately 2031.

The Badlands Landfill is located northeast of the City of Moreno Valley at 31125 Ironwood Avenue and accessed from State Highway 60 at Theodore Avenue. The landfill is currently permitted to receive 4,000 tons per day and has an overall remaining disposal capacity of approximately 10,206,374 tons by the end of 2004. The Badlands Landfill is projected to reach capacity between 2015 and 2016. Further landfill expansion potential exists at the Badlands Landfill site.

The Lamb Canyon Landfill is located between the City of Beaumont and City of San Jacinto. The landfill is currently permitted to receive 3,000 tons of refuse per day and has a remaining disposal capacity of approximately 12,874,377 tons by the end of 2004. The current remaining disposal capacity is estimated to last until approximately 2017. Landfill expansion potential exists at the Lamb Canyon Landfill site.

As mandated by the State of California, 50% of Lake Elsinore's trash must be recycled by December 31, 2005. Due to the extensive amount of new homebuilding in the area, excessive construction waste has caused the City of Lake Elsinore to file an extension to receive more time to comply with the law.

Telecommunications

Verizon provides the local "land line" telephone service, although long distance services may also be obtained from a number of other providers. In addition, a number of companies provide wireless or cell phone services. Comcast of Los Angeles provides cable television and high-speed internet.

Constraints and Opportunities

Constraints

Increasing density or changing the location of land uses may result in increased need for most utilities and community services. The various utility service providers generally anticipate future expansion of their facilities based on SCAG's population projections, but changing land use designations where not previously anticipated may require a change in service plans.

Schools

School districts are potentially constrained if they are not knowledgeable about future development. In order to be prepared for new enrollment, the district need sufficient time to plan for and build new facilities. The City can also ensure that developers set aside sufficient land for schools as new developments are proposed.

One of many public schools in the City.

Water, Wastewater, and Reclaimed Water

As indicated by the EVMWD Wastewater Management Plan, new development and future growth will significantly impact the ability of the District to service new growth. Projections for needed facilities are based upon SCAG's population forecast. If growth does not occur as predicted, facility improvements may be needed before being able to

provide them, and conversely, if actual population is less than anticipated, facility improvements may be delayed. Water systems will also be affected by unanticipated growth patterns.

Sewer

Based upon current construction and the Sewer Master Plan, the regional wastewater treatment plants (WWTP) have a current capacity of 8 mgd. The Sewer Master Plan states that the capacity will be expanded to 20 mgd by year 2020 in order to accommodate additional growth and increased service levels.

Opportunities to Enhance Regulatory Requirements

The City has an opportunity to adjust land uses to more accurately represent future population growth. Revising regulatory requirements associated with land uses can help address existing and future community services and utilities by more accurately assessing future needs of the city. Using revised population projections will help utility companies and other community services become more efficient by knowing how to update their facilities based upon existing and future needs.

Opportunities to Address Existing Conditions

New land use designations can help address existing and potential future community services within the City by designating land for additional facilities required for future population increases. With expected population increases, there will be a need for more fire stations, police stations, schools, and parks. New land use designations can be implemented accommodating these integral community services.

New land use designations can help address existing and potential future utilities issues by avoiding certain uses in areas where expansion of utilities may not be practical. This can include avoiding residential development in areas of steep topography where sewer or water may not be reasonably accommodated.

By implementing the LEAPS (EVMWD) and TE/VS Project, the City may have the opportunity to obtain additional electricity, with the reported benefit of stabilizing lake levels.

The future goal of building and expanding recycled water pipelines will allow this water to be used for parks, greenbelts, golf courses and supplemental water for stabilizing Lake Elsinore. The potable drinking water that has been used for these purposes in the past will be freed up for residential drinking water.

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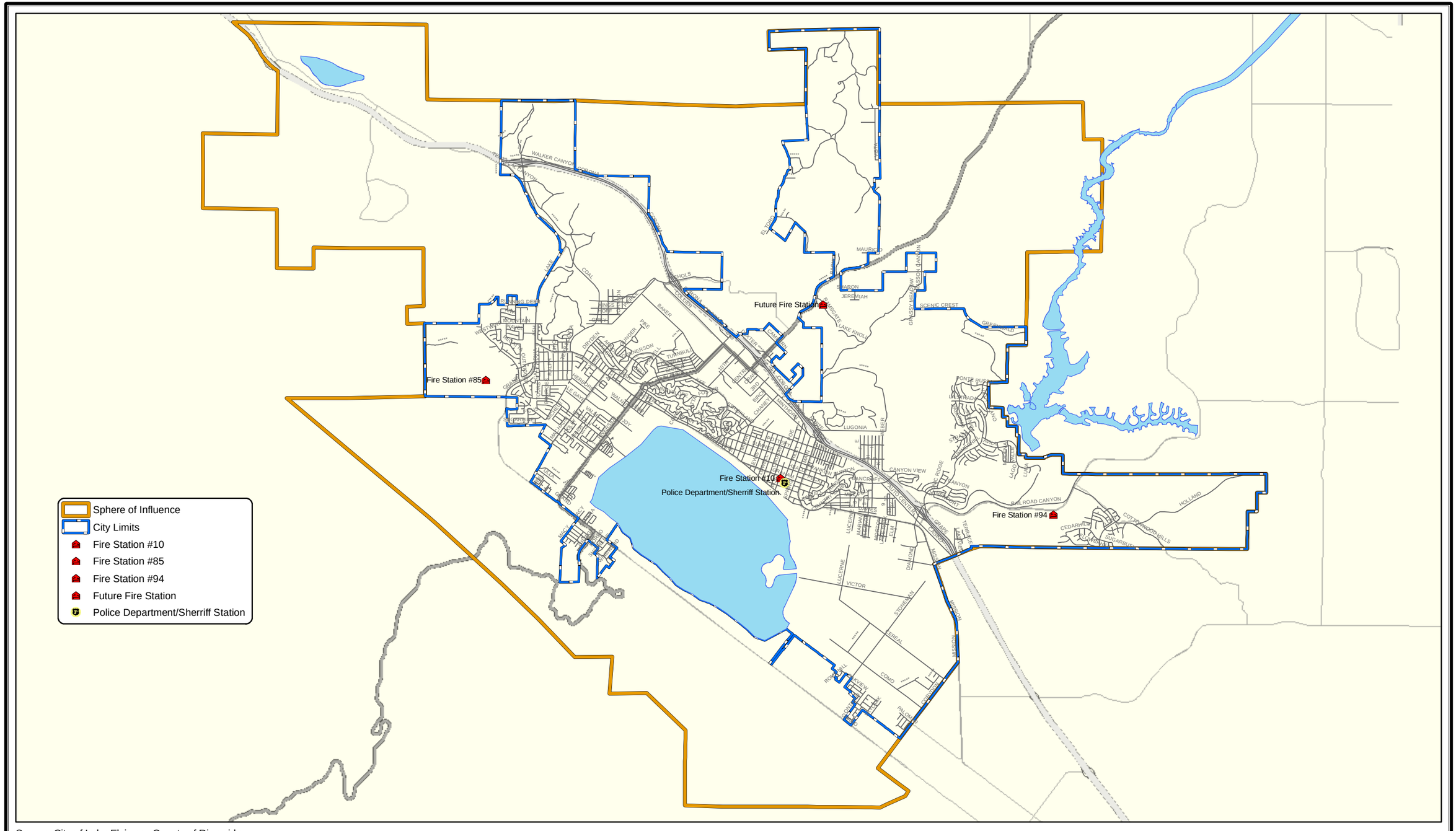

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

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Police & Fire Stations
Figure 10.1

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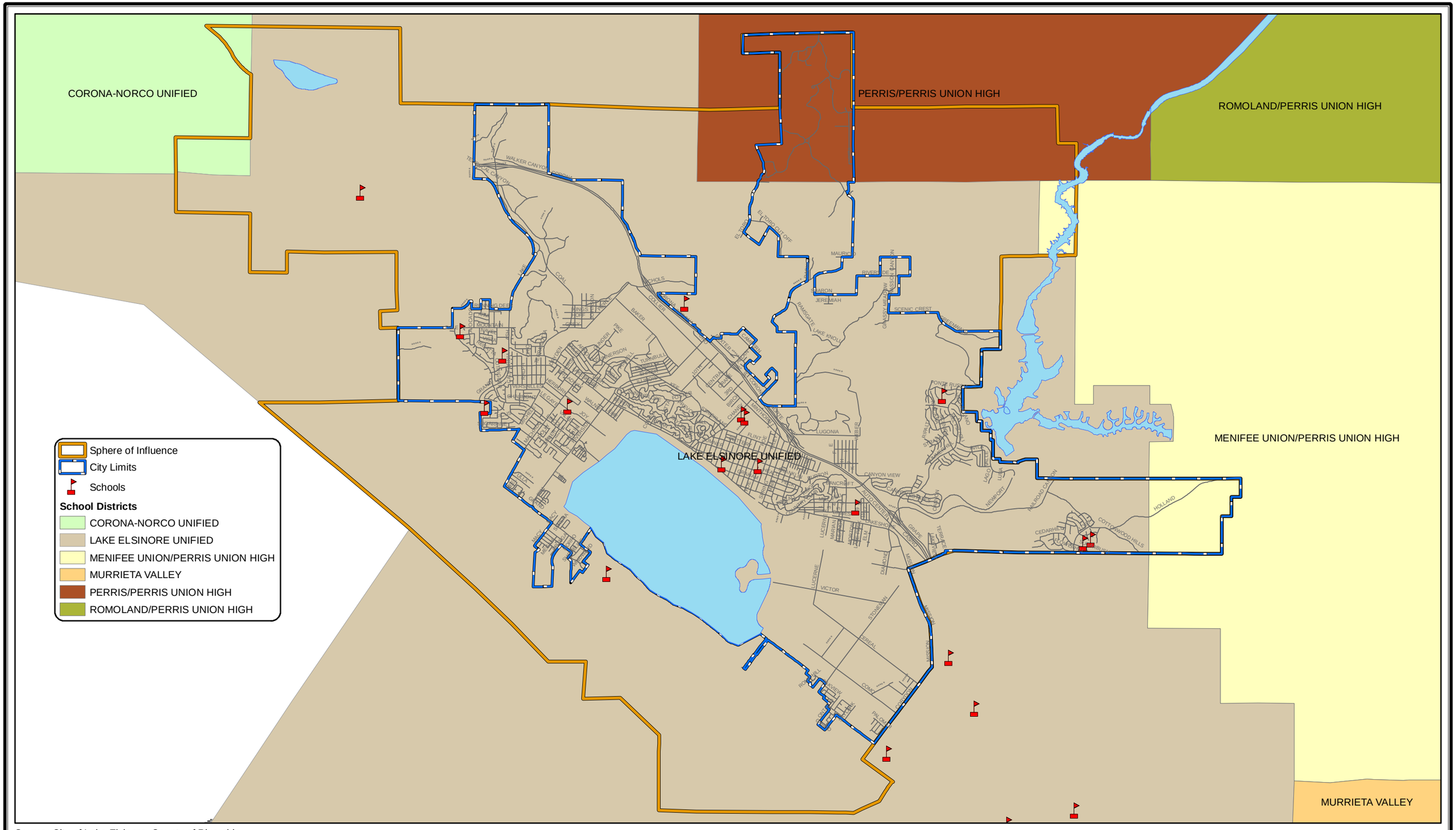

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

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0 6,500 13,000

Feet

Schools & District Boundaries
Figure 10.2

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Sphere of Influence
City Limits
Existing Parks
Proposed Parks
Recreation Center

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

1/18/06: /GIS/elsinore/mxd/fig10_3prk

0 6,500 13,000
Feet

Parks
Figure 10.3

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Sphere of Influence
City Limits
Elsinore Valley Municipal Water District(EVMWD)
Elsinore Water District(EWD)

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig10_4h20

0 6,500 13,000
Feet

Water District Boundaries
Figure 10.4

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CHAPTER 11 – HAZARDS AND HAZARDOUS MATERIALS

Introduction

This report assesses hazards and hazardous materials in the City of Lake Elsinore and its associated sphere of influence (SOI). The regulatory environment and existing conditions will be assessed and analyzed to determine associated constraints and opportunities. The purpose of this discussion is to use the information as a resource for updating the General Plan for the City of Lake Elsinore.

Legal Basis and Requirements

Government Code Section 65302(a) states the General Plan shall include a land use element "that designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land."

Terminology

The following is a brief background discussion of hazards and hazardous materials terminology.

- **Brine Waste**: Water saturated with or containing large amounts of a salt, especially sodium chloride.
- **Defensible Space:** An area around residences or other structures, which is either man-made or natural where the vegetation is modified and maintained to slow the rate and intensity of an advancing wildland fire. It also provides room for firefighters to work and helps protect the forest from becoming involved should a structure fire occur.
- **Groundwater Recharge:** The inflow to an aquifer.
- **Hazards:** Dangers to human health, safety, and welfare.
- **Hazardous Materials:** A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible,

illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed (California Code of Regulations, *Title 22, Section 66260.10).*

- **Santa Ana Conditions:** Warm, dry, prevailing wind that is forced over a mountain range resulting in air pressure buildup in the high-altitude Great Basin between the Sierra Nevada and the Rocky Mountains. The air is forced down the mountain slopes of the Transverse Ranges and out toward the western Pacific Coast; the air mass is heated by compression as it falls and further heated and dried by a trip through the Mojave Desert before reaching southern California at speeds typically of 40 mph. These winds characteristically appear in late autumn and winter.

- **Sensitive Receptors:** Individuals who are more susceptible to hazardous conditions such as children, the elderly, and people with pre-existing health conditions. Examples of sensitive receptor sites are schools, day care facilities, nursing homes, and residences.

- **State Responsibility Areas:** Areas of the state in which the financial responsibility for preventing and suppressing fires has been determined by the State Board of Forestry (pursuant to Public Resources Code §4125) to be primarily the responsibility of the State.

- **Wildland-Urban Interface (WUI):** A zone where human development intermingles with forests and grasslands.

Regulatory Setting

- Environmental Protection Agency (EPA)
- Federal Hazards Regulations (RCRA, CERCLA, SARA)
- Code of Federal Regulations (CFR): 29, 40, and 49
- Resource Conservation and Recovery Act (RCRA)
- Healthy Forests Restoration Act (HFRA)
- Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
- Department of Forestry: Fire Protection Regulations
- Superfund Amendment and Reauthorization Act Title III (community right-to-know laws)

- California Hazards Regulations (Cal-OSHA, etc.)
- The California Department of Forestry and Fire (CDF)
- Hazardous Materials Release Response Plans and Inventory Act of 1985
- Hazardous Waste Control Act
- California Office of Emergency Services
- California Food and Agricultural Code
- Polychlorinated Biphenyl Regulations and Requirements (PCBs)
- Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)
- The Resource Conservation and Recovery Act (RCRA)
- California Code of Regulations
- California Education Code
- California Health and Safety Code
- Santa Ana Watershed Project Authority
- The Riverside County General Plan (Riverside County 1992)
- Riverside County Hazardous Waste Management Plan (HWMP)
- Riverside County Underground Storage Tank Local Oversight Program
- Riverside County General Plan
- Lake Elsinore General Plan
- Lake Elsinore Specific Plan Area

Existing Conditions

Regional and County

Hazardous Materials

Hazardous materials including agricultural chemicals, natural gas and petroleum, explosives, radioactive materials and various commercial chemical substances are used, stored, or produced in Riverside County. The pesticide DBPC (dibromochloropropane), has been discovered in wells in Riverside County and other parts of the state, and has caused wells to be shut down. Additionally, underground storage containers have been found to be a source of contamination of soil and groundwater.

Many miles of natural gas and petroleum pipelines traverse the County, carrying natural gas, crude oil, and other petroleum products. Hazards associated with petroleum

pipelines are accidental releases into the environment in the event of a pipeline break, creating a hazardous condition for people living in the area and the environment.

The County's solid waste disposal facilities pose an additional hazard due to illegal dumping and disposal of household hazardous wastes, as well as accidental dumping of hazardous wastes.

Radioactive Materials

Radioactive materials (mostly low level) are also used throughout the County. While low level radioactive materials are used by medical, educational, governmental, and industrial uses, higher levels of radioactive materials are associated with governmental research, military weapons, and nuclear power plants.

Hazardous Waste Production and Facilities

The California Department of Health Services (DOHS) estimates that within Riverside County approximately 33,270 tons per year of hazardous waste are generated. Approximately 17,780 tons of this total is managed on-site, that is, in treatment, storage, or disposal facilities located on the property producing the waste. The other 15,490 tons is managed off the property at hazardous waste facilities.

City of Lake Elsinore

Hazardous Sites

Records searches of government databases were performed using Environmental Data Resources (EDR) for the study area, which included the City jurisdictional boundaries and the SOI (the complete report of approximately 668 pages is available for review at the City of Lake Elsinore). The records searches met the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00.

There are large numbers of businesses and other entities within the City and the SOI that generate, transport, store, treat, or dispose of hazardous waste as defined by the RCRA. Since almost all fuels, lubricants, solvents, and paints are considered hazardous materials under RCRA, businesses and institutions that use substantial quantities of such materials are required to adhere to very strict requirements in handling, transporting, and storing of hazardous materials.

There is a wide range and variety of entities that deal with hazardous materials in the course of their activities. As indicated above, these include but are not limited to:

- Automobile repair facilities
- Gas stations
- Automobile service facilities
- Construction firms
- Manufacturing firms
- Painting contractors and paint suppliers
- Dry cleaning firms
- Schools
- Hospitals and medical facilities
- Trucking firms

A review of the executive summary of the EDR report and records referenced therein do not currently indicate any active enforcement actions relating to hazardous materials. There do not appear to be any active Resource Conservation and Recovery Action (RCRA)-related violations or enforcement actions.

The City of Lake Elsinore's Fire Department provides oversight of hazardous materials and regulates permits for the handling, storage and use of any explosive or other hazardous material. These permits note the location of the user as well as the type of material used. This enables the City to be aware of locations where such uses occur and thus to note areas where high concentrations of such uses occur such as in industrial and manufacturing areas. Hazardous materials also occur in other individual locations such as gas stations and dry cleaners.

Santa Ana Regional Interceptor (SARI)

The Santa Ana Regional Interceptor (SARI) line is a regional brine line constructed to protect the Santa Ana Watershed from various saline wastes. The SARI line collects up to 30 million gallons per day (MGD) of non-reclaimable wastewater from the upper Santa Ana River basin and after treatment is discarded in the ocean. The purpose is to maintain the quality of water in the Santa Ana Watershed by balancing the amount of salt in the basin. Increased salt in the watershed is mainly caused by industrial and agricultural uses and can affect all water users. Increased salinity in the water creates problems ranging from decreasing the effectiveness of laundry detergents, wearing out plumbing fixtures and household appliances, and affecting the taste of the water.

A brine line is necessary because industrial and commercial users are only able to dispose a limited amount of saline waste into wastewater plants due to the difficulty of removing salts and minerals from water. Users that produce a lot of saline waste can go

through an application process to make a connection to the SARI line; SAWPA establishes connection fees and monthly rates for using the SARI line. Businesses who do not generate a substantial flow and are not close enough to make a direct connection can haul the waste by truck to a SARI truck collection station. SAWPA has permit fees and fees based upon volume for indirect connection users.

As shown in Figure 11.1, the alignment of the SARI pipeline through the City of Lake Elsinore and sphere of influence runs along the I-15 corridor until it hits the San Jacinto River where it then follows the river up towards Canyon Lake Reservoir, ending in Sun City. As seen in Figure 11.1, the western part of the SARI line is owned by SAWPA and operated by the Western Municipal Water District (WMWD). The eastern portion is owned and operated by the Eastern Municipal Water District (EMWD).

Wildfire Hazard

Structure fire attended to by local firefighting personnel.

Much of the area to the southwest, west and northwest within the SOI supports coastal shrub and chamise redshank chaparral. These are prime fuel sources for wildfire. As shown in Figure 11.2, which is Figure S-11 of the County of Riverside's General Plan Safety Element, the wildfire susceptibility in this area is defined as moderately high. The steep terrain in these areas also contributes to rapid spread of wildfire when one occurs.

The danger of damage to land and structure from wildfire is high in California due to a generally dry climate and a preponderance of highly flammable vegetation over much of the state. In the years from 1999 to 2003 wildfires within the jurisdiction of the California Department of Forestry and Fire (CDF) numbered an average of 6,081 per year and burned an average of 217,908 acres per year. The number of structures damaged during that 5-year span averaged about 1,560 per year. Average annual monetary damages are estimated to be about 275,600,000 dollars. In 2003 alone, the damage from wildfires, which burned 527,753 acres within the CDF jurisdiction, was estimated at about 950 million dollars.

The combination of southern California's Mediterranean climate, with its winter and spring rainfall and hot dry summers, and the frequency of high wind velocity creates optimum conditions for wildfires. The annual rainfall pattern supports grasses, shrubs, and trees, and the hot arid summers result in dry vegetation. This readily combustible material can be easily ignited and will burn hot and fast especially during high wind conditions. In fact, southern California fires that have consumed more than 90% of the wildfire-burned acreage were accompanied by high-velocity winds.

The City of Lake Elsinore and SOI is known for periodic high-velocity wind conditions through the Temescal Valley and the steep canyons to the northwest, west and southwest portions of the SOI. Such winds are due mostly to the area's topography, which forms a natural wind tunnel along the valley and through the canyons. The area is also subject to occasional Santa Ana conditions.

Past fire management policy mandated immediate fire suppression action for all fires, including those in wilderness areas. This policy resulted in a long-term accumulation of vegetation (fuel) and poses a significant hazard in many areas, especially in forested and chaparral areas of rural southern California. Much of the areas in the Cleveland National Forest and along the Ortega Highway (SR-74) contain large areas of chaparral and oak/pinyon plant communities that are highly flammable in the summer dry season and can support spreading of wildfire over large distances, especially during high wind conditions. Chaparral in particular poses unique problems for fire prevention because its components (tough shrubs such as chemise, manzanita, and sage) are genetically predisposed to burn. Many of the plants in this community need fire to sprout their seeds; chaparral burns naturally every 30 to 100 years. Much of the area within the SOI supports this type of vegetation.

The heavy use of the Ortega highway and the location of residences in the mountains, poses additional fire risk. Traffic on this route provides an ignition source from tossed cigarettes and vehicle fires; residences provide other potential ignition sources such as power equipment, barbeques, and residential fires.

Community Wildfire Protection Plan

Community Wildfire Protection Plans (CWPP) are authorized and defined in the Healthy Forests Restoration Act (HFRA) passed by Congress in November 2003. The HFRA places emphasis on community planning by extending a variety of benefits to communities with a wildfire protection plan. Critical among these benefits is the option of establishing a localized definition and boundary for the wildland-urban interface and the opportunity to help shape fuels treatment priorities.

Local Wildfire Protection Plans can take a variety of forms based on the needs of the people involved in their development. These plans may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection, or all of the above. The process of developing a CWPP can help a community clarify and refine its priorities for the protection of life, property and critical infrastructure in the wildland-urban interface.

The wildland-urban interface is commonly described as the zone where structures and other human development meet and intermingle with undeveloped wild land or vegetative fuels. The wildland-urban interface poses tremendous risks to life, property,

and infrastructures. Local wildfire protection plans can take a variety of forms, based on the needs of those involved in their development. They can be as simple or complex as the community desires.

The minimum requirements for a CWPP are:

- Collaboration: local and state government representatives in consultation with federal agencies and other interested parties must collaboratively develop a CWPP.

- Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.

- Treatment of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

Funding for CWPP

- USDA Forest Service Community Protection: Funds are available to assist with hazardous fuel removal projects adjacent to Forest Service prescribed burn projects.

- USDA Forest Service State Fire Assistance WUI Funds: Available to assist with fire hazard mitigation and hazardous fuel reduction activities in high-hazard, wildland-urban interface. Funds are to be used on non-federal lands

- California Department of Forestry and Fire Protection: Funding is available to assist project proponents with preparation on CWPP and/or analysis of environmental impacts as necessary to comply with CEQA.

- Federal Funding: The Forest Service, Department of the Interior and the Federal Emergency Management Administration provide funding for fire prevention, preparedness, and suppression. Funding enables provisions for equipment, personnel training, community hazard mitigation plans, fuels reduction projects, and cost reimbursement.

California Fire Alliance

The California Fire Alliance is a cooperative membership whose purpose is to ensure pre-fire management. It is an interagency forum whose members work together to accomplish common goals and objectives. Members include the California Department

of Forestry and Fire Protection, USDA Forest Service, California Fire Safe Council, Bureau of Indian Affairs, Bureau of Land Management, Governor's Office of Emergency Services, Los Angeles County Fire Department, National Park Service, and US Fish and Wildlife Service. The Alliance emphasizes taking care of what needs to be done long before a fire happens such as creating fuel breaks, constructing greenbelts, or prescribing burn areas. Their goal is to provide for public and community safety, minimize costs and losses, and maintain and improve the quality of the environment.

Economic Action Program

The Economic Action Program is a program administered by the United States Department of Agriculture Forest Service (USDA Forest Service) to encourage preparation of community Firesafe plans to reduce fire hazards and to learn how to utilize byproducts of fire management activities. The USDA Forest service may cover up to 80% of the total cost of a project.

State Fire Assistance (SFA) and Volunteer Fire Assistance (VFA) Programs

The SFA and VFA are programs administered by the National Association of State Foresters whose goal is to provide management assistance and protection services for over two-thirds of the nation's forests. The National Association of State Foresters is a non-profit organization that represents the directors of the State Forestry agencies, eight U.S. territories (American Samoa, the Federated States of Micronesia, Guam, the Northern Marianas Islands, Palau, Puerto Rico, Republic of the Marshall Islands, and the U.S. Virgin Islands), and the District of Columbia.

The goal of the SFA and VFA programs is to reduce the fire threat in wildland urban interface (WUI) zones through hazardous fuels mitigation reduction. The SFA program provides State forestry agencies with assistance in delivering a coordinated wildfire response. They also help them comply with national safety and training standards. The VFA program provides 50-50 cost-sharing grants to local fire departments for training and equipment.

Hazard Mitigation Grant Program (HMGP) and Pre-disaster Mitigation Program (PDM)

These respective programs are both administered by the Federal Emergency Management Agency (FEMA) to assist communities in hazard identification, local planning, and project development. Funding is provided by FEMA to states, territories, Indian tribal governments, and communities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. The goals of these programs are to reduce or eliminate the long-term risk to life and property by assisting communities to develop and implement hazard mitigation projects.

Constraints and Opportunities

Constraints Due to Regulatory Requirements

Hazardous Materials

Government regulations, standards and policies such as the Clean Water Act, RCRA, California State Proposition 65 and a long list of others, constrain the planning process in terms of where to locate various land uses that involve the use of hazardous materials. Carefully controlling the proximity of hazardous materials use in areas where sensitive receptors are located is a necessary function of local government.

The sensitivity of groundwater recharge areas, wetlands, riparian areas and streams to hazardous materials will constrain the placement of land uses that use these materials. Regulations protecting these areas such as the federal and state endangered species acts do not mention hazardous materials per se, but they do regulate the effects that can result from exposure of sensitive and protected resources to hazardous materials. Thus this constrains the siting of these types of uses. Although these are planning constraints, their link to protection of public safety and natural resources is clear and reasonable.

Wildfires

Government regulations, standards and policies identified above limit location of development, type of development and building and infrastructure standards.

Constraints Due to Existing Conditions

Hazardous Materials

The government database records search completed for the City and SOI identified many existing land uses and businesses that are permitted to use, transport, and store hazardous materials (see Figure 11.1). The City's obligation to protect public safety and the environment limits where future lands uses should be located. Considerations in locating sensitive receptors such as single family residences, pre-schools, convalescent homes, etc. in proximity to the existing businesses and land uses with permits to utilize hazardous materials would include:

City sponsored household hazardous waste collection site.

- The likelihood of accidental releases of hazardous materials into the environment.
- Level or degree of the toxicity of materials being used.
- Amounts of hazardous materials being used or stored.
- Characteristics and proximity of transport mechanisms that could carry hazardous materials in the event of a spill or accidental release.

Considerations in locating new businesses and land uses needing permits to utilize hazardous materials would include:

- Proximity of sensitive receptors such as children, senior citizens, and those with impaired health.
- Proximity to sensitive biological resources.
- Characteristics and proximity of transport mechanisms that could carry hazardous materials in the event of a spill or accidental release.

The records search completed for the project did not reveal the existence of any recorded sites that are known to be currently contaminated by hazardous materials or land uses relating to hazardous materials that would represent a substantial constraint to implementation of the General Plan land use plan or to extension of urban uses into currently vacant land. As noted above none of the sites identified include currently active enforcement actions relating to hazardous materials. In addition, there do not appear to be any active RCRA-related violations or enforcement actions.

SARI Line

The alignment of the SARI line may be a constraint to certain types of development that require extensive subsurface components. Avoiding placement of schools and other sensitive receptors in this area will be necessary.

Wildfires

As shown in Figure 11.2, very high, high, and moderate wildfire hazard areas have been identified as currently existing in several locations within the City's SOI where development of urban uses could be expanded. Areas of vacant land primarily in the northwestern portion of the SOI in the sloping terrain both east and west of I-15 include vacant land that is characterized by native and non-native vegetation that is subject to wildfires. Development within or adjacent to areas susceptible to wildfires would not be

precluded but must incorporate measures to minimize impacts of the fires to structures including:

- Water supply infrastructure must provide adequate onsite fire storage and use of hydrants and appropriate interior sprinkler systems that are easily accessible by emergency vehicles.
- Project circulation must incorporate adequate secondary access for emergency vehicles.
- Road design must be appropriate to support emergency vehicles.
- Adequate fire buffers should be developed along the perimeter of development. Fire buffers can include a mix of both cleared areas and areas of native vegetation that has been selectively thinned.
- All structures must be designed to comply with appropriate fire codes.
- Use of materials such as propane or gas in developments should be regulated in accordance with appropriate fire codes.
- Development landscaping in areas of high wildfire susceptibility should be limited to species that are not considered to be highly flammable. Plant spacing should be provided between trees and shrubs.

Opportunities to Enhance Regulatory Requirements

Hazardous Materials

As discussed above there are Federal, State and Local regulations currently in place to address the use and transport of hazardous materials. The General Plan should reiterate that compliance with all applicable regulations related to hazardous materials is critical to ensure public safety.

Wildfires

It should be a policy of the General Plan that developments proposed in areas identified as having a very high, high or moderate susceptibility to wildfires should be required to prepare a Fire Protection Plan. The Fire Protection Plan would include a detailed assessment of the fire hazard severity present at the project site. Based on the specific fire severity rating present at the site the Fire Protection Plan would recommend specific measures to reduce hazards related to:

- Defensible space and vegetation management.

- Desirable landscaping.
- Fire resistant materials.
- Circulation and emergency access.
- Water supply and fire flow.
- Use of hazardous materials.

Opportunities to Address Existing Conditions

Hazardous Materials

As shown in Figure 11.1 numerous existing businesses are currently permitted to use and/or transport hazardous materials. Considering that there are extensive federal, state and local regulations in place to ensure public safety, additional General Plan policies and objectives regarding the locations of sensitive receptors such as residential uses or schools in proximity to the local businesses that use hazardous materials is not necessarily needed. In addition, a host of government regulations, standards and policies identified above such as the Clean Water Act, RCRA, and California State Proposition 65 already address the planning issues in terms of where to locate various land uses that involves the use of hazardous materials.

City of Lake Elsinore Hazardous Waste Collection Facility.

Wildfires

The City has the opportunity to implement various fire-related programs to serve areas characterized by high wildfire susceptibility. Language can be included in the goals and objectives of the General Plan discussing the opportunities available to obtain funding to implement fire protection measures at the City and project specific level.

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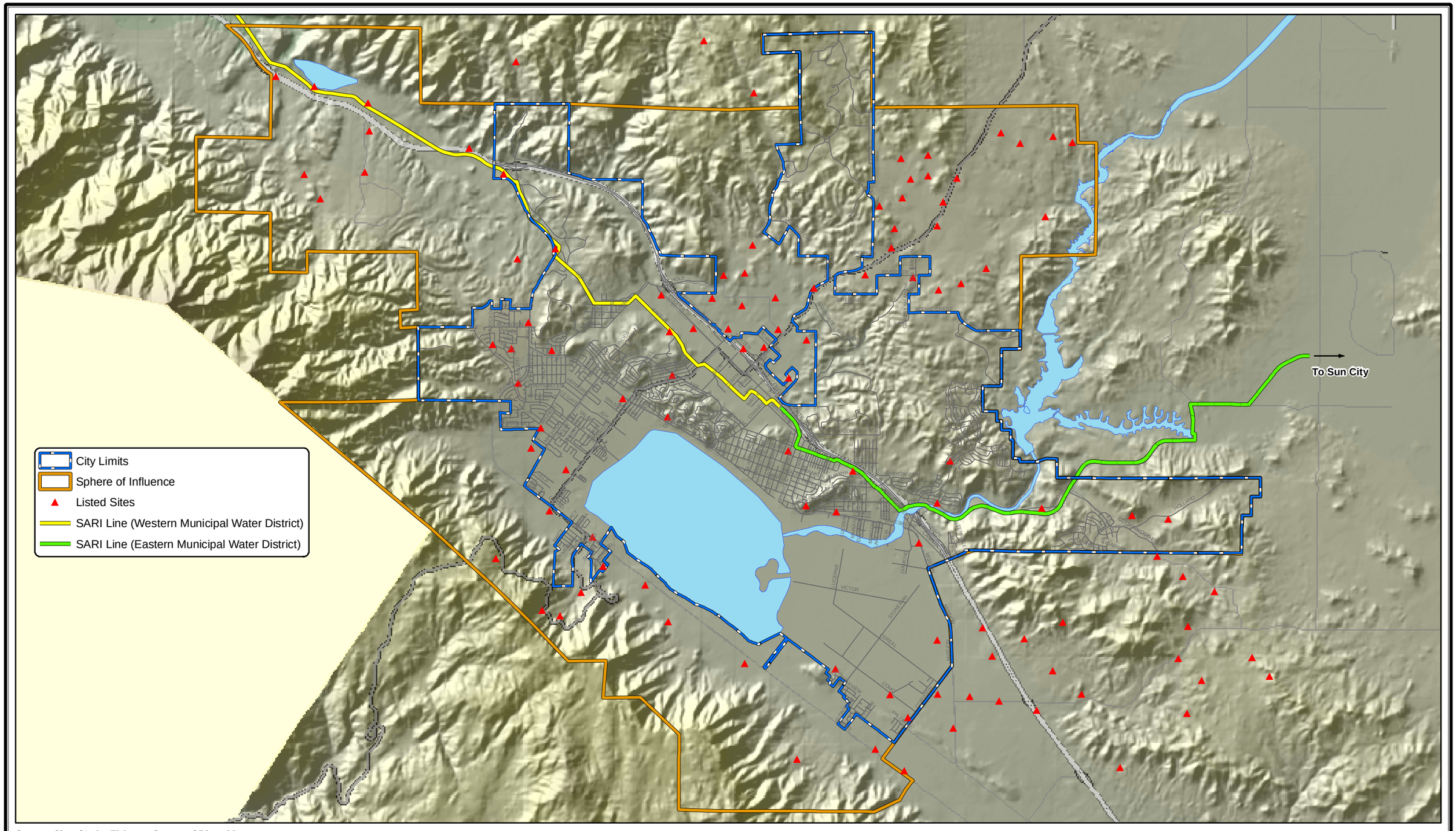

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

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Hazardous Materials Sites & SARI Line
Figure 11.1

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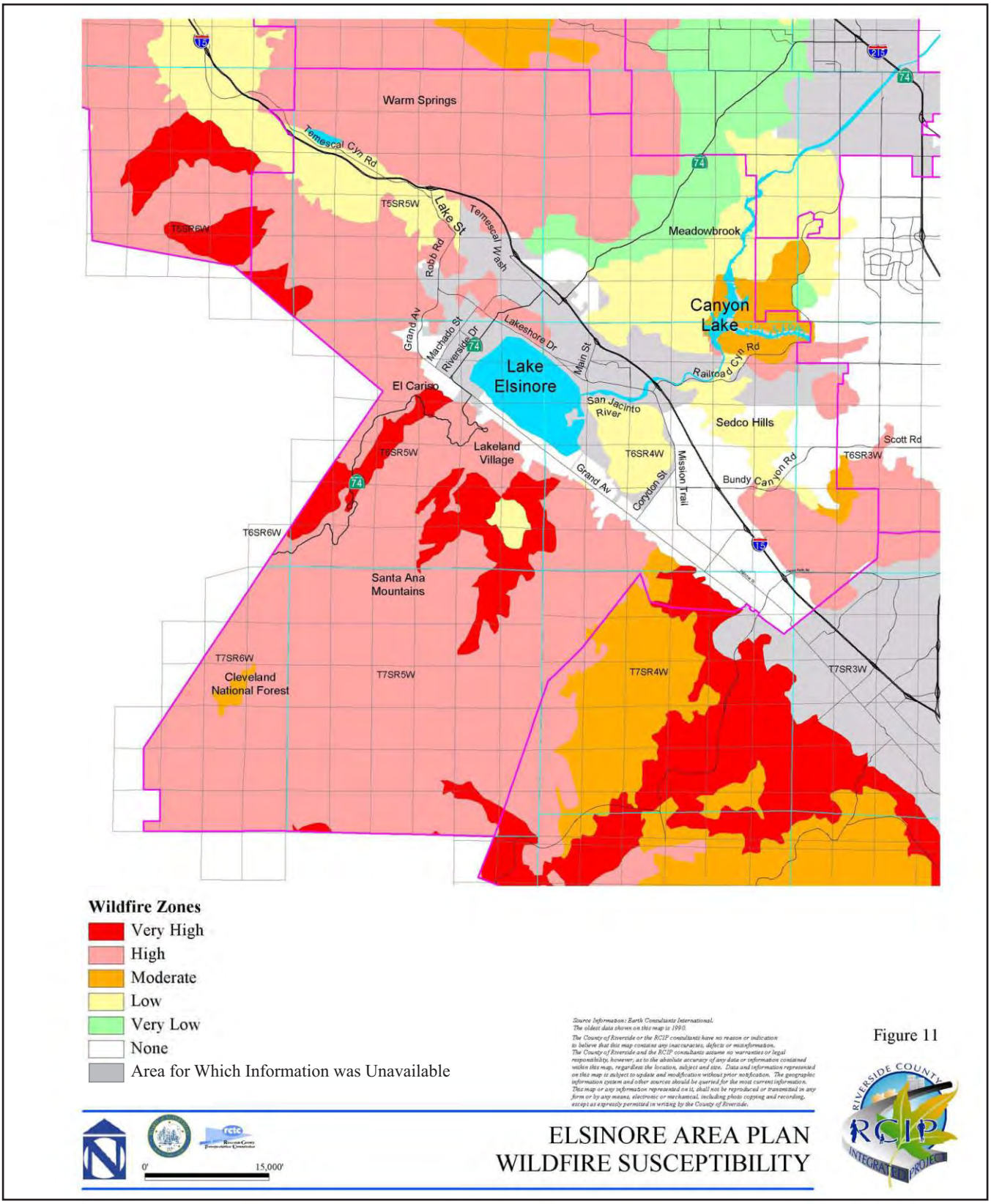

Source: Riverside County Integrated Project

Mooney · Jones & Stokes

Elsinore Area Plan: Wildfire
Figure 11.2

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CHAPTER 12 – GEOLOGY AND MINERAL RESOURCES

Introduction

This report assesses geology, geologic hazards, and geologic resources in the City of Lake Elsinore and its associated sphere of influence (SOI). It includes an analysis of planning constraints and opportunities in light of the current regulatory climate and the City's existing geologic and mineral resources. This report is intended to serve as a resource for updating the City of Lake Elsinore General Plan.

Legal Basis and Requirements

Government Code Section 65302(g) states that the General Plan shall include a safety element "for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction and other seismic hazards identified pursuant to Chapter 7.8 (commencing with Section 2690) of the Public Resources Code, and other geologic hazards known to the legislative body; flooding; and wild land and urban fires."

Government Code Section 65302(d) states the General Plan shall include a conservation element for the "conservation, development, and utilization of natural resources including water and its hydraulic force, forest, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources."

Terminology

Following are brief definitions of key technical terms used in the text of this report. For additional definitions, see the American Geological Institute's *Glossary of Geology* (Jackson 1997).

- **Active:** As defined by the State of California, describes a fault that shows evidence of surface displacement during Holocene time (approximately the last 11,000 years). California's Alquist-Priolo Earthquake Fault Zoning Act requires the state to identify the state's active faults, and strictly regulates construction (particularly residential construction) along them.

- **Alluvial fan:** The fan- or cone-shaped deposit of alluvium formed where a mountain stream empties onto the valley floor.

- **Alluvium:** Sediment transported and deposited by water (for instance, in a river or on an alluvial fan).

- **Batholith:** A large body of igneous rock formed at depth within the earth.

- **Bedrock:** Rock that underlies soil or other loose, unconsolidated material.

- **Biotite:** Magnesium- and iron-rich mineral belonging to the mica group.

- **Claystone:** Sedimentary rock formed by the consolidation and hardening (induration) of very fine particles.

- **En Echelon:** Describes parallel fault segments that form an oblique, staggered pattern (from the French *en echelon*, "stepwise").

- **Fault:** A fracture in earth materials along which displacement (slip) has occurred.

- **Gabbro:** A type of igneous rock formed at depth within the earth, containing a high proportion of minerals rich in iron and magnesium, with feldspar content dominated by calcium feldspar.

- **Geothermal:** Related to heat sources within the earth.

- **Granite:** A type of igneous rock formed at depth within the earth, consisting of roughly equal to subequal proportions of quartz, potassium feldspar, and calcium and sodium feldspars.

- **Granitic:** General term describing granites and other compositionally similar igneous rocks that are formed at depth within the earth.

- **Granitoid:** General term describing a wide variety of igneous rock types that are formed at depth and contain a high proportion of minerals rich in silica, aluminum, and potassium.

- **Granodiorite:** A type of granitoid igneous rock consisting of subequal proportions of quartz and feldspars, with calcium and sodium feldspars substantially dominant over potassium feldspar.

- **Hornblende:** A common dark-colored mineral belonging to the amphibole group.

- **Igneous:** Describes rock that forms by cooling and crystallization from a molten state.

- **Latite:** A type of volcanic rock in which feldspars are substantially dominant over quartz, and calcium and sodium feldspars are dominant to subequal with potassium feldspar.

- **Liquefaction:** Phenomenon in which unconsolidated materials (soil or sediment) lose cohesion and behave as a liquid, typically as a result of earthquake shaking. Liquefaction poses a hazard to structures (hence to life and safety) because liquefied materials lose their strength and may become unable to support structures built on them. This can result in severe structural damage, particularly in poorly designed or constructed structures.

- **Magnitude:** Describes the "size" of an earthquake. Commonly used scales for earthquake magnitude include Richter magnitude and moment magnitude. The *Richter magnitude* scale is based on the degree of ground motion experienced as a result of the first seismic waves to affect an area. The *moment magnitude* scale relies on an event's seismic moment, a measure of earthquake strength as a function of the extent (area) of fault rupture, the average displacement or slip on the ruptured surface, and the rigidity of the rock materials ruptured.

- **Metasandstone:** Metamorphic rock formed by exposing sandstone to elevated temperatures and pressures at depth within the earth. Generally used to describe rocks in which original sedimentary textures can still be recognized.

- **Metasediment, Metasedimentary:** General term referring to metamorphic rocks formed when sedimentary rock is exposed to elevated temperatures and pressures deep within the earth.

- **Mica Schist:** A schist whose mineralogic composition is dominated by micas.

- **MRZ Classification:** Mineral Resource Zone classification system; the classification system used to evaluate an area's mineral resources pursuant to the Surface Mining and Reclamation Act of 1975 (SMARA). For any given mineral resource, an area may be classified as MRZ-1, MRZ-2, MRZ-3, or MRZ-4, as follows.

  - **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

  - **MRZ-2:** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.

  - **MRZ-3:** Areas containing mineral deposits, the significance of which cannot be evaluated from available data.

  - **MRZ-4:** Areas where available information is inadequate for assignment into any other MRZ.

The MRZ classifications are applied based on available geologic information, including geologic mapping and other information on surface exposures, drilling records, and mine data; and on socioeconomic factors such as market conditions and urban development patterns.

- **Parent Rock:** The bedrock from which sediment or soil is formed by processes of weathering and physical erosion.

- **Potentially Active:** As defined by the State of California, describes a fault that shows evidence of surface displacement during Quaternary time (approximately the last 1.6 million years). The state no longer zones or regulates construction along potentially active faults.

- **Phyllite:** Fine-grained metasedimentary rock characterized by a well-developed planar fabric and a satiny sheen on broken planar surfaces.

- **Pull-Apart:** Describes a depression or topographic basin formed where en echelon or parallel strands of a strike-slip fault system create tension in bedrock materials.

- **Roof Pendant:** A remnant of the overlying metamorphic rock preserved within batholithic rocks that have been uplifted, eroded, and exposed at the earth's surface.

- **Sandstone:** Sedimentary rock formed by the consolidation and induration (hardening) of sandy deposits.

- **Schist:** Metamorphic rock with a well developed planar fabric, commonly defined by parallel arrangement of flat, platy mineral crystals such as micas.

- **Sedimentary:** Describes rocks formed when unconsolidated sediments are consolidated and hardened by increased pressure, temperature, and chemical activity that result from burial.

- **Siliceous:** Describes a rock that contains a high proportion of silica (SiO_2), commonly as the mineral quartz.

- **Siltstone:** Sedimentary rock formed of particles intermediate in size between sand and clay.

- **Step-Over:** An area where slip is transferred from one strand of a strike-slip fault system to another parallel strand, creating either compression (restraining step-over) or tension (releasing step-over).

- **Strike Slip:** Fault movement (slip) in which the dominant motion is approximately horizontal, parallel to the surface trace of the fault.

- **Tectonism:** Processes associated with plate tectonics; faulting and/or folding of earth materials.

- **Tonalite:** A type of granitoid igneous rock consisting of abundant quartz, with feldspar content dominated by calcium feldspar.

- **Volcanic:** Describes rocks that form as a result of volcanic activity, when molten rock (magma or lava) is erupted onto the earth's surface, where it cools and hardens.

Regulatory and Planning Framework

- Alquist-Priolo Earthquake Fault Zoning Act
- Seismic Hazards Mapping Act
- Surface Mining and Reclamation Act
- Riverside County General Plan
- Riverside County Code Conformance Policies and Hazard Reduction Programs
- Elsinore Area Specific Plan
- City of Lake Elsinore Zoning Ordinance

Methodology

This report focuses on the area within the City and SOI. Analysis of geologic, seismic, and mineral resources constraints and opportunities for land use planning was based on qualitative evaluation of information available in the published geologic literature. Identification of geologic constraints on land use planning was guided by prevailing geologic, engineering geologic, and geotechnical standards of care, as established by relevant codes and regulations and current professional practice.

Information on existing geologic, seismic, and soils conditions and mineral resources was compiled from the following sources.

- Maps and reports prepared by the U.S. Geological Survey (USGS), the California Geological Survey (CGS), and the USDA's Natural Resources Conservation Service (NRCS).

- The Southern California Earthquake Data Center (SCEC) website (www.data.scec.org).

- The Riverside County General Plan (County of Riverside 2003a) and Elsinore Area Plan (County of Riverside 2003b).

Specific reference information is provided in the text.

Existing Conditions

The following sections describe the physiographic setting, geomorphology, and geology of the City and SOI, with an emphasis on Quaternary geology and geologic hazards.

Physiography and Geologic Setting

The City and SOI are within California's Peninsular Ranges geomorphic province. They are located in the Elsinore Valley, a pull-apart depression formed by movement along en echelon strands of the active Elsinore fault zone. Elevations on the valley floor are approximately 1,240–1,255 feet above mean sea level. The valley is bounded to the west by the faulted east flank of the rugged Santa Ana Mountains; the portion of the uplift immediately west of Lake Elsinore is sometimes referred to as the Elsinore Mountains, although it is physically continuous with the rest of the range. Maximum elevations west of the valley reach 4,500 feet above sea level. The east margin of the valley is approximately defined by the Glen Ivy fault, a strand of the Elsinore system, and hilly topography to the east reflects active tectonism combined with differential erosion of lithogically diverse bedrock units (Norris and Webb 1990, Morton et al. 2003, Morton 2004, Lake Elsinore and San Jacinto Watersheds Authority 2005).

West of the Elsinore Valley, the Santa Ana Mountains uplift is dominated by primarily granitoid rocks of Cretaceous age belonging to the Peninsular Ranges batholith (see Figure 12.1). Immediately above Lake Elsinore, rocks are primarily potassium feldspar–bearing tonalite and granodiorite. Bodies of biotite and hornblende granodiorite are present to the northwest and southwest; farther to the west, hornblende gabbro occurs locally. Roof pendants consisting of metasedimentary rocks of Mesozoic age are also locally present to the west. To the west and north, siliceous metasediments of the Jurassic Bedford Canyon Formation are exposed in a broad east-west trending belt. Where drainages debouch on the valley floor, alluvial fan deposits comprising gravel, sand, and silt and ranging in age from mid-Pleistocene to Holocene are conspicuous. Unconsolidated Holocene

Example of topography surrounding the City.

deposits of bouldery to sandy alluvium are present in active and recently active drainage channels (Morton et al. 2003, Morton 2004; see Figure 12.1).

Hills east of the Elsinore Valley expose a broad tract of Mesozoic metasedimentary rock (phyllite) that forms an apparent roof pendant in surrounding Peninsular Ranges granitoid rocks. Nonmarine and marine sandstone, siltstone, and claystone of the Paleocene Silverado Formation depositionally overlie Mesozoic units northeast of Lake Elsinore. As in the hills to the west, Pleistocene-Holocene alluvial fan deposits mark the mouths of the principal drainages, with Holocene alluvium present in active stream channels (Morton et al. 2003, Morton 2004).

The Elsinore Valley itself is floored primarily by unconsolidated sand, silt, and clay of latest Pleistocene and Holocene age, recording riverine drainage along the valley axis. Immediately surrounding Lake Elsinore is a broad expanse of late Holocene lake deposits consisting of gray, fine-grained sediments (clay, silt, and fine-grained sand) documenting the lake's former extent (Morton et al. 2003, Morton 2004).

Soils

Soils of the City, SOI, and surrounding areas have been mapped by the U.S. Department of Agriculture's Natural Resources Conservation Service (formerly the U.S. Soil Conservation Service). Following is a summary of key soils characteristics based on their soils mapping (1971) and recent summaries created for the Lake Elsinore and San Jacinto Watersheds Authority (2005).

The Temescal Valley, including the mouth of Temescal Wash, and most of the City itself are underlain by soils assigned to the Cajalco-Temescal-Las Posas association, which comprises well-drained shallow to moderately deep soils that formed on gabbro or latite bedrock. The surface layer typically consists of fine sandy loam and loam. Soils of this association were identified in the original (1971) SCS survey as suitable to support pasturage, irrigated agriculture, development, recreational uses, and wildlife habitat.

The Elsinore Valley floor surrounding the lake is primarily underlain by soils assigned to the Hanford-Tujunga-Greenfield association, which comprises very deep, well drained to excessively drained soils formed in granitic alluvium on small alluvial fans and on floodplains. The surface layer typically consists of sand to sandy loam. Soils of this association were identified in the original (1971) SCS survey as suitable to support dryfarming, irrigated agriculture, and development.

The Back Basin flood control area is largely underlain by Waukena loamy fine sand, Willows silty clay, and Traver loamy fine sand. The Waukena and Traver series comprise moderately well drained basin and floodplain soils developed in alluvium derived from granitic parent rock. Soils of the Willows series developed in basin and

distal fan-margin alluvium and are typically poorly drained. The Waukena loamy fine sand, Willows silty clay, and Traver loamy fine sand qualify as saline-alkali soils, with pH values of 7.9 to more than 9.0 and salinities from 4 to more than 15 mmhos/cm at 25° C.

The Canyon Lake area is underlain by soils assigned to the Friant-Lodo-Escondido association, which comprises well-drained to somewhat excessively drained shallow to deep soils formed on metasedimentary (metasandstone and mica schist) bedrock. The surface layer consists of fine sandy loam and gravelly loam. Soils of this association were identified in the original (1971) SCS survey as suitable to support dryfarming, irrigated agriculture, recreational uses, and wildlife habitat.

From Canyon Lake to Lake Elsinore, the San Jacinto River and Cottonwood Creek drainages are underlain by soils assigned to the Cieneba-Rock Land-Fallbrook association, which comprises well drained to somewhat excessively drained very shallow to moderately deep upland soils formed on granitic bedrock. The surface layer consists of sandy loam and fine sandy loam. Soils of this association were identified in the original (1971) SCS survey as suitable to support pasturage and dryfarming, irrigated agriculture, development, and wildlife habitat.

Geologic Hazards

Primary Seismic Hazards—Surface Fault Rupture and Groundshaking

As discussed in the preceding section, the Elsinore Valley is a pull-apart depression formed at a right (releasing) step-over in the Elsinore fault system. The Elsinore fault consists of multiple strands, a number of which are recognized as active and zoned by the State of California under the Alquist-Priolo Act (Hart and Bryant 1997). Risk of surface rupture along these zoned active traces is substantial. Note that although the County has zoned additional faults as active, none of the County-zoned traces is in the immediate vicinity of the City or SOI.

The Uniform Building Code recognizes the northern portion of the Elsinore fault as a Type B seismic source (International Council of Building Officials 1997).[1] The Elsinore fault is believed to be capable of generating earthquakes with moment magnitudes in the range of 6.5–7.5, with a recurrence interval of approximately 250 years between major events. Smaller events may occur more frequently. Thus, the City and SOI are likely to

[1] The UBC evaluates the risk associated with active faults based on their potential to generate large earthquakes (measured as the moment magnitude for the largest earthquake anticipated on the fault) and their degree of seismic activity (measured as average annual slip rate). Under this system, a *Type A seismic source* is a fault that is capable of producing large-magnitude events ($\geq$ M 7.0) and is highly active (has a high average annual slip rate). A *Type B seismic source* is

experience repeated moderate to strong groundshaking generated by the Elsinore fault in the foreseeable future. The City and surrounds also have the potential to experience significant groundshaking as a result of seismic activity on a number of the Peninsular Ranges' other active faults, shown in Figure 12.2 and 12.3. Table 12.1 summarizes recurrence intervals and maximum credible earthquake (MCE) events for key faults in southern California.

Table 12.1 Maximum Credible Earthquake and Recurrence Interval for Key Southern California Faults

Fault	Magnitude of Maximum Credible Earthquake	Approximate Recurrence Interval
Newport-Inglewood	M_w 6.0–7.4	Unknown
Whittier	M_w 6.0–7.2	Unknown
Raymond Hill	M_w 6.0–7.0	Unknown
Cucamonga	M_w 6.0–7.0	Estimated at 600–700 years
Elsinore	M_w 6.5–7.5	250 years
San Jacinto	M_w 6.5–7.5	100–300 years on each segment
San Andreas	M_w 6.8–8.0	Ranges from less than 20 years at Parkfield in the north to more than 300 years; averages about 140 years on Mojave segment of fault
North Frontal fault of San Bernardino Mountains	M_w 6.0–7.1	Uncertain
Pinto Mountain	M_w 6.5–7.5	Uncertain
Kickapoo (source of 1992 M 7.3 Landers earthquake)	M_l 4.8–5.3 alone; possibly greater than M_w 7.3 in combination with other nearby faults	Uncertain; probably about 7,000 years

M_l = Richter (local) magnitude
M_w = Moment magnitude

Source: Southern California Earthquake Data Center 2005.

Secondary Seismic Hazards—Liquefaction and Ground Failure

The State of California has not yet issued seismic hazards maps for the Lake Elsinore area under the mapping program mandated by the Seismic Hazards Mapping Act. Mapping is in progress in the Murrieta and Temecula 7.5′ quadrangles to the south, and is planned for the Lake Elsinore and Wildomar quadrangles in coming years.

The County of Riverside recognizes the importance of addressing secondary seismic hazards, and both the County General Plan and Elsinore Area Plan include maps delineating areas of known and suspected liquefaction hazard. In general, liquefaction susceptibility ranges from very low in the former lake footprint to moderate on much of the remainder of the valley floor, and very high in the valley floor corridor formerly

associated with smaller maximum event and/or is less active, but still constitutes a substantial seismic threat (International Conference of Building Officials 1997).

occupied by the axial riverine drainage. Liquefaction potential is also very high along the area's principal tributary drainages and on portions of the alluvial fans on the valley's eastern margin (County of Riverside 2003a, 2003b). Figure 12.4 presents a generalized map of liquefaction potential based on data on file with the City.

Landslide and Other Slope Stability Hazards

As discussed in the previous section, the State of California has not yet issued seismic hazards maps for the Lake Elsinore Area; when completed, these maps will be required to delineate areas at risk from seismically induced landslides. In the meantime, both the County General Plan and the Elsinore Area Plan include maps showing areas of general slope failure hazard. As shown in Figure 12.5 a substantial proportion of the City, SOI, and surrounding area are located on slopes of 30% or steeper, and much of the area is at substantial risk of seismically induced slope failure. Non–seismically induced slope failure is also a hazard in these areas, as evidenced by numerous existing landslides (County of Riverside 2003a, 2003b).

Sparsely vegetated slope near new housing development.

Geothermal and Mineral Resources

The County's principal renewable geologic resource is geothermal power. Nonrenewable geologic resources include minerals and petroleum and natural gas. The following paragraphs discuss geothermal and mineral resources in the Lake Elsinore area. Petroleum reserves are not discussed because none are known to exist within the City or SOI.

Geothermal Resources

Geothermal resources associated with elevated heat flow along the Elsinore fault zone have been known for some time. Native Americans and early settlers are believed to have used the area's hot springs, and in the 19th century, the town of Elsinore (now the City of Lake Elsinore) became famous for its sulfur waters, which supported a local spa industry. The region's largest hot springs are at Murrieta Hot Springs near Temecula, along the principal trace of the Elsinore fault. Smaller hot springs are present in a number of places along splay faults (Norris and Webb 1990).

To date, the SOI's geothermal resources have not been developed for power production, although the County General Plan (County of Riverside 2003a) identifies some potential for such development.

Mineral Resources

The County's principal mineral resources include clay, limestone, iron ore, sand, and construction aggregate (County of Riverside 2003a). The SOI and surrounds encompass areas with economically viable deposits of clay, sand, gravel, and stone products, including decomposed granite; as shown in Figure 12.6, the City, SOI, and surrounding area have been classified as MRZ-3, and areas along the I-15 corridor north of Lake Elsinore are classified MRZ-2. As of 2005, five mines were active in the Lake Elsinore area, producing clay, stone/rock, and sand and gravel (County of Riverside 2005, Larose et al. 1999). Decomposed granite has also been mined in the Lake Elsinore area in recent years (Larose et al. 1999).

Constraints and Opportunities

The following sections include an overview of geologic/geotechnical regulatory constraints and responsibilities that will affect the City's future land use planning; and planning constraints and opportunities presented by existing geologic and mineral resources conditions in the City, SOI, and surrounding area.

Constraints Due to Regulatory Requirements

Alquist-Priolo Earthquake Fault Zoning Act

Surface fault rupture during earthquakes can cause severe structural damage, potentially resulting in injury or loss of life. California's Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Sec. 2621 *et seq*.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, was developed specifically to reduce the risk to life and property from surface fault rupture. Additional purposes of the Act include encouraging seismic retrofits of some types of structures, and supporting local jurisdictions in developing General Plan policies that address seismic hazards.

The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (referred to as *earthquake fault zones*). It defines criteria for identifying active faults, giving legal weight to terms such as *active*, and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones.

Under the Alquist-Priolo Act, faults are zoned and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered *sufficiently active* if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the Act as referring to approximately the last 11,000 years). A fault is considered *well-defined* if its trace can

be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment (Hart and Bryant 1997).

Although the Alquist-Priolo Act charges the State of California (the State Geologist, through the California Geological Survey) with identifying active faults and delineating earthquake fault zones where construction should be regulated, the actual responsibility for implementing the Act's limitations rests with local jurisdictions. The permit review process is the tool typically used to enforce the Act's requirements, which are summarized in Table 12.2.

Table 12.2 Key Alquist-Priolo Act Requirements for Lead Agencies

1. No structure for human occupancy that qualifies as a *project* as defined by the Act is permitted on the trace of an active fault.
2. Unless proven otherwise by appropriate geologic studies, the area within 50 feet of an active fault is presumed to be underlain by active branches of the fault; note that this defines a corridor that totals 100 feet wide.
3. Buildings converted to structures for human occupancy must comply with provisions of the Act.
4. A geologic report that evaluates the potential for surface fault rupture is required for any undertaking that qualifies as a *project* as defined by the Act. Reports must be prepared and stamped by a state-registered professional geologist (PG). The lead agency is responsible for having reports independently peer reviewed for adequacy by a PG.
5. Final geologic reports ("fault evaluation reports") must be submitted to the State Geologist within 30 days of project completion so they can be open-filed.
6. Earthquake fault zones must be disclosed to the public.

Source: modified from Hart and Bryant 1997.

The revised City General Plan should include policies supportive of the City's responsibilities in enforcing the Alquist-Priolo Act.

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (California Public Resources Code Sections 2690–2699.6) is intended to reduce damage and loss of life resulting from earthquakes, but while the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act; the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards, and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been carried out and appropriate measures to reduce (mitigate) potential damage have been incorporated into the development plans.

As discussed in *Secondary Seismic Hazards* above, the State has not yet issued seismic hazards maps for the Lake Elsinore area. However, mapping is in progress in the Murrieta and Temecula 7.5′ quadrangles to the south, and is planned for the Lake Elsinore and Wildomar quadrangles in the near future. Consequently, although the City currently has no means to implement its responsibilities under the Seismic Hazards Mapping Act, these responsibilities are likely to come into effect during the lifespan of the proposed General Plan revisions, and the General Plan should include policies supportive of Seismic Hazards Mapping Act enforcement.

Constraints Due to Existing Conditions

The City's spectacular setting at the foot of the Elsinore Mountains entails substantial geologic hazards, in particular seismic hazards and the potential for landsliding and debris flows. All of these issues will need to be addressed as the City plans for continued growth. As discussed above, the City's specific responsibilities in implementing the Alquist-Priolo Act and Seismic Hazards Mapping Act are a key avenue to address these constraints, and limits on development imposed by the Alquist-Priolo Act and Seismic Hazards Mapping Act should be factored into land use planning. Additional avenues to address geologic hazards are discussed in *Opportunities Due to Existing Conditions* below.

The City also has significant geologic resources, including geothermal resources associated with the Elsinore fault zone, which are currently undeveloped; and economically viable deposits of clay, sand, gravel, stone/rock, and decomposed granite, some of which are currently being mined. To the extent that the City chooses to continue current patterns of mineral resources recovery, and/or to develop currently undeveloped resources (see *Opportunities Due to Existing Conditions* below), the presence and location of these resources will constrain future patterns of land use. This will directly affect the feasible uses of parcels that support mineral and/or geothermal resources, and will likely also have indirect effects constraining development of neighboring parcels to uses compatible with mineral or geothermal resource recovery.

Opportunities Related to Regulatory Requirements

Clean Water Act Section 402[p]

Amendments to the federal Clean Water Act (CWA) in 1987 added Section 402[p], which created a framework for regulating municipal and industrial storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. In California, the State Water Resources Control Board is responsible for implementing the NPDES program; pursuant to the state's Porter-Cologne Water Quality Control Act, it delegates implementation responsibility to the state's nine Regional Water Quality Control Boards.

Under the NPDES Phase II Rule, any construction project disturbing 1 acre or more must obtain coverage under the state's General Permit for Storm Water Discharges Associated with Construction Activity. The purpose of the Phase II rule is to avoid or mitigate the effects of construction activities, including earthwork, on surface waters. To this end, General Construction Permit applicants are required to file a Notice of Intent to Discharge Storm Water with the Regional Water Quality Board that has jurisdiction over the construction area, and to prepare a Storm Water Pollution Prevention Plan (SWPPP) stipulating best management practices (BMPs) that will be in place to avoid adverse effects on water quality. The SWPPP is indirectly relevant to geologic/geotechnical practice because, among other provisions, it requires erosion and sediment control measures during construction earthwork, aspects of which may be under the oversight responsibility of the project engineering geologist.

Because the SWPPP requirement is administered through the Regional Water Quality Board with jurisdiction, the City has no specific responsibility or authority. However, the City may wish to consider including policies that support water quality protection through the implementation of construction erosion and sediment control measures in the revised General Plan.

Alquist-Priolo Act and Seismic Hazards Mapping Act

The proposed General Plan update offers several planning opportunities relative to the Alquist-Priolo Act and Seismic Hazards Mapping Act.

As identified in *Primary Seismic Hazards* above, the County of Riverside has zoned additional fault traces for which it enforces Alquist-Priolo Act requirements although these traces are not currently zoned by the State of California. In revising and updating its General Plan, the City should consider whether it will adopt the County's additional fault zoning; if so, the revised General Plan should capture the City's policy vision for design review, permitting, and construction in County fault zones. The City may also wish to consider creating a City mechanism for zoning additional faults besides those

zoned by State and County. In this case, General Plan policies expressing this intent would be appropriate and helpful, and could be drafted to reflect a proactive stance on seismic hazards abatement planning in general. Along a related line, the City may also want to consider expanding on the Alquist-Priolo Act's encouragement of seismic retrofits for certain types of structures.

Depending on, and compatible with, the City vision for community development, the revised General Plan could include a variety of types of policies in support of creative use of the open space required by regulated setbacks from active fault traces. Such spaces can accommodate greenbelts, recreational facilities, community centers, some types of nonresidential development, etc. Similar possibilities for creative use of space could perhaps be identified for areas at risk from secondary seismic hazards such as steep slopes prone to seismically induced landsliding.

Finally, in line with proactive planning for seismic hazards reduction, the revised General Plan could include updated policies in support of educational programs and activities to increase public awareness of the Lake Elsinore area's geologic hazards and resources; fault-controlled landforms; landslide-prone areas; appropriate landscaping and irrigation for development in landslide prone areas; the need for seismic hazards awareness and planning; citizen earthquake preparedness; and other relevant topics.

Opportunities Related to Existing Conditions

Existing geologic conditions in the City, SOI, and surrounding area offer the City a number of planning opportunities.

Opportunities Related to Geologic Hazards

Hillside showing scarring from grading.

As discussed in *Primary Seismic Hazards* above, the City and SOI have the potential to experience moderate to strong groundshaking as result of earthquakes on any of a number of active faults. Such groundshaking can cause structural damage, particularly in improperly designed or constructed buildings, potentially resulting in injury or loss of life as well as financial losses related to property damage. Construction subject to County permitting is currently required to adhere to the minimum standards provided by the Uniform Building Code, which includes provisions for construction to resist seismic loading. The City may wish to consider adopting the more stringent minimum standards of the California Building Code. In either case, as part of

the City's vision for citizen safety, the updated General Plan would be an opportunity to promulgate awareness of the City's minimum building standards code.

Landsliding (both seismic and non-seismic in origin) and other types of slope failure also have the potential to result in structural damage and injury/loss of life. The City may wish to consider including policies in the updated General Plan to support assessment and appropriate mitigation of slope failure hazard within the City and SOI. This could include delineation of landslide hazard zones within which site-specific geologic/geotechnical investigations prepared by state-registered professionals and including slope stability analyses are required as a condition for building permitting. One way to address this would be to adopt current Riverside County provisions for delineating and regulating construction in Landslide Management Zones (LMZs), but the City may also want to assess whether additional City-specific assessment and/or management provisions are warranted. In addition, because hazards can be exacerbated (or created where they do not exist), by improper earthwork, the City should consider specifically adopting the UBC's Appendix Chapter 33 provisions regulating grading, or the equivalent portion of the California Building Code, if it has not already done so; and may want to include policies relative to grading and earthwork safety standards in the revised General Plan.

Inappropriate design or construction of structures sited on expansive, collapsible, or corrosive soils can result in substantial structural damage over time. Soils-related hazards are typically appropriately mitigated by adherence to provisions of the Uniform or California Building Code. As identified above, the updated City General Plan could include policies supporting adherence to specific, appropriate building standards, with reference to the need to mitigate expansive, collapsible, and corrosive soils hazards. The City may also wish to develop and include soils mapping that identifies specific areas within the City and SOI that are subject to these conditions, and could include this in appropriate General Plan policies.

Opportunities Related to Geologic Resources

As identified in *Mineral Resources* above, the SOI includes areas with economically viable deposits of clay, sand, gravel, stone/rock, and decomposed granite, some of which are currently being mined. As part of the General Plan revision process, the City has the opportunity to decide whether it wants to continue to permit mineral resources extraction within the SOI in the future, and establish appropriate policies to support any extraction activities identified as desirable. If the City intends to consider mineral resources extraction as a permissible land use in the SOI, the revised General Plan should include guidance as to where it is permissible, in light of the City's overall vision for the mosaic of acceptable/desirable land uses within the SOI; and what types of operations will be permitted. Policies supporting or expanding on reclamation requirements of the Surface Mining and Reclamation Act of 1975 (SMARA) could also be developed, along with

policies identifying the preferred uses for reclaimed mining areas, which may offer opportunities for habitat restoration and open space uses, as well as various types of development.

Geothermal resources associated with the Elsinore fault zone are currently undeveloped. The proposed General Plan update offers the City an ideal opportunity to assess the likelihood that it will want to see geothermal resources further evaluated and potentially developed in the future, and to establish policies in support of any geothermal exploration identified as desirable. The updated General Plan could also include policies to avoid conflict between geothermal resources development and other land uses in the City and SOI.

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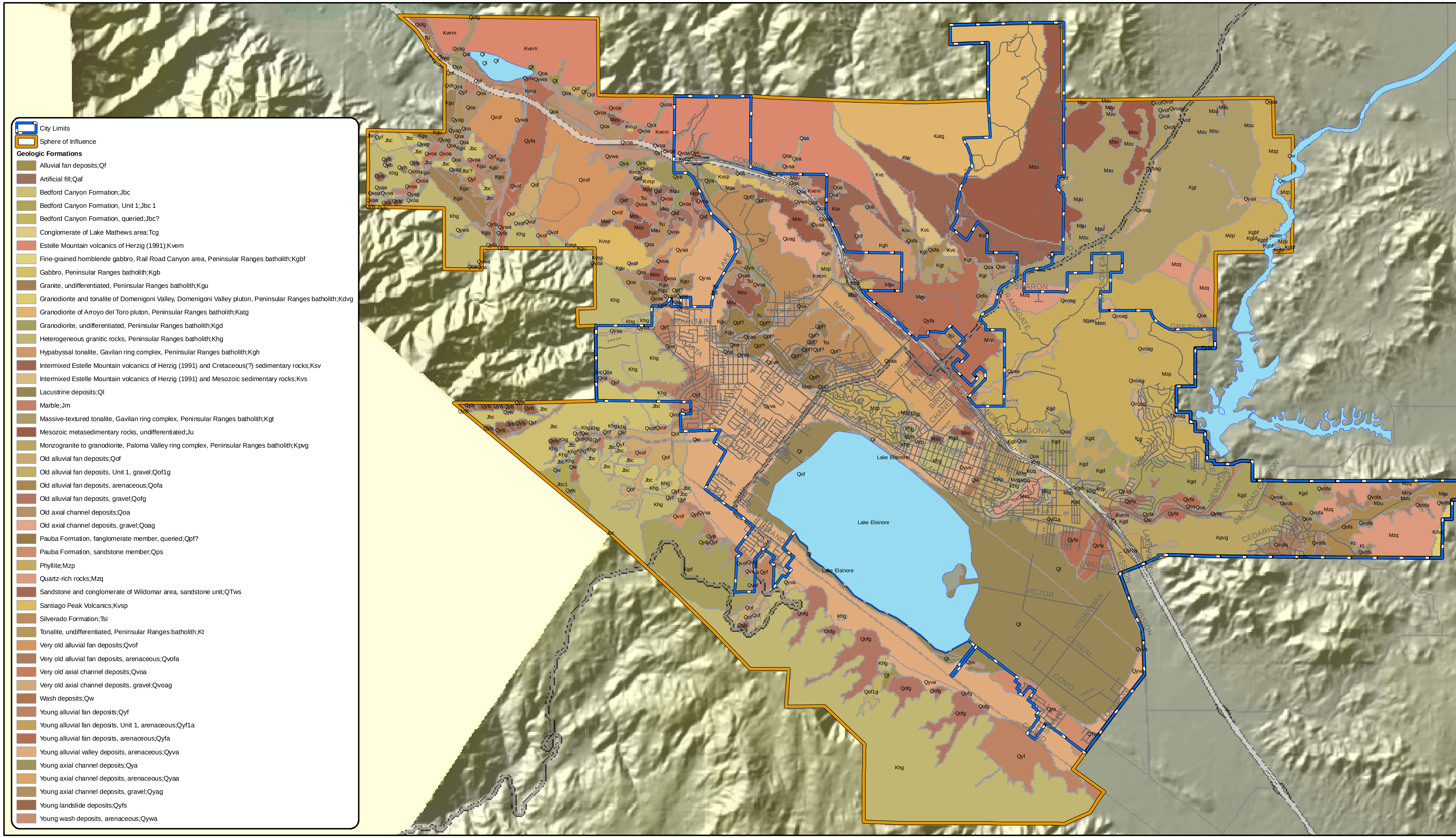

Source: City of Lake Elsinore, County of Riverside, USGS

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Feet

Mooney · Jones & Stokes

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Geologic Formations

Figure 12.1

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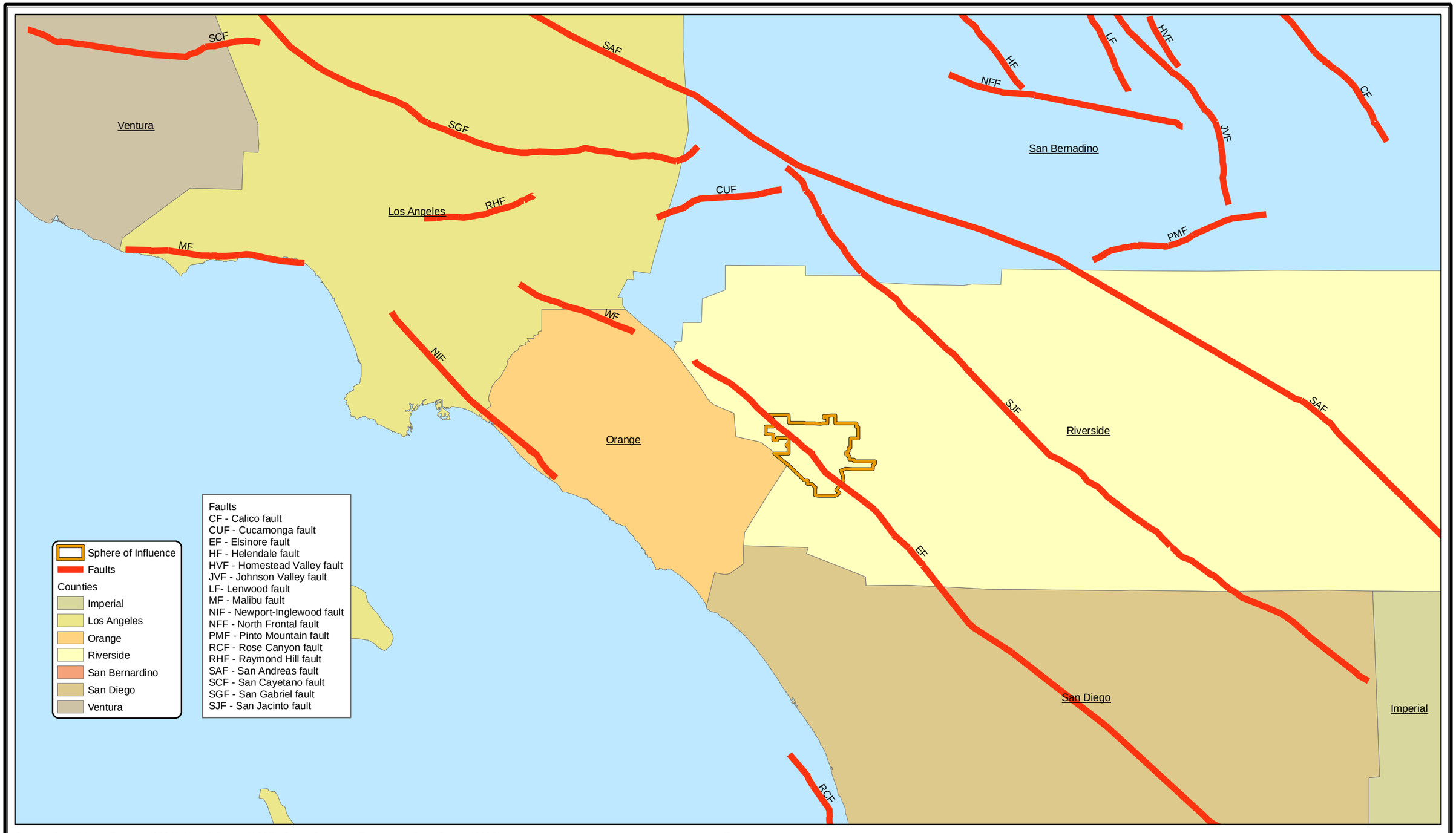

Source: City of Lake Elsinore (2004), Hart & Bryant (1997), South California Earthquake Data Center (2005)

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig12_2flt

Approximate Traces of Prinicipal Active Faults of Peninsular Ranges and Mojave Desert Near Lake Elsinore
Figure 12.2

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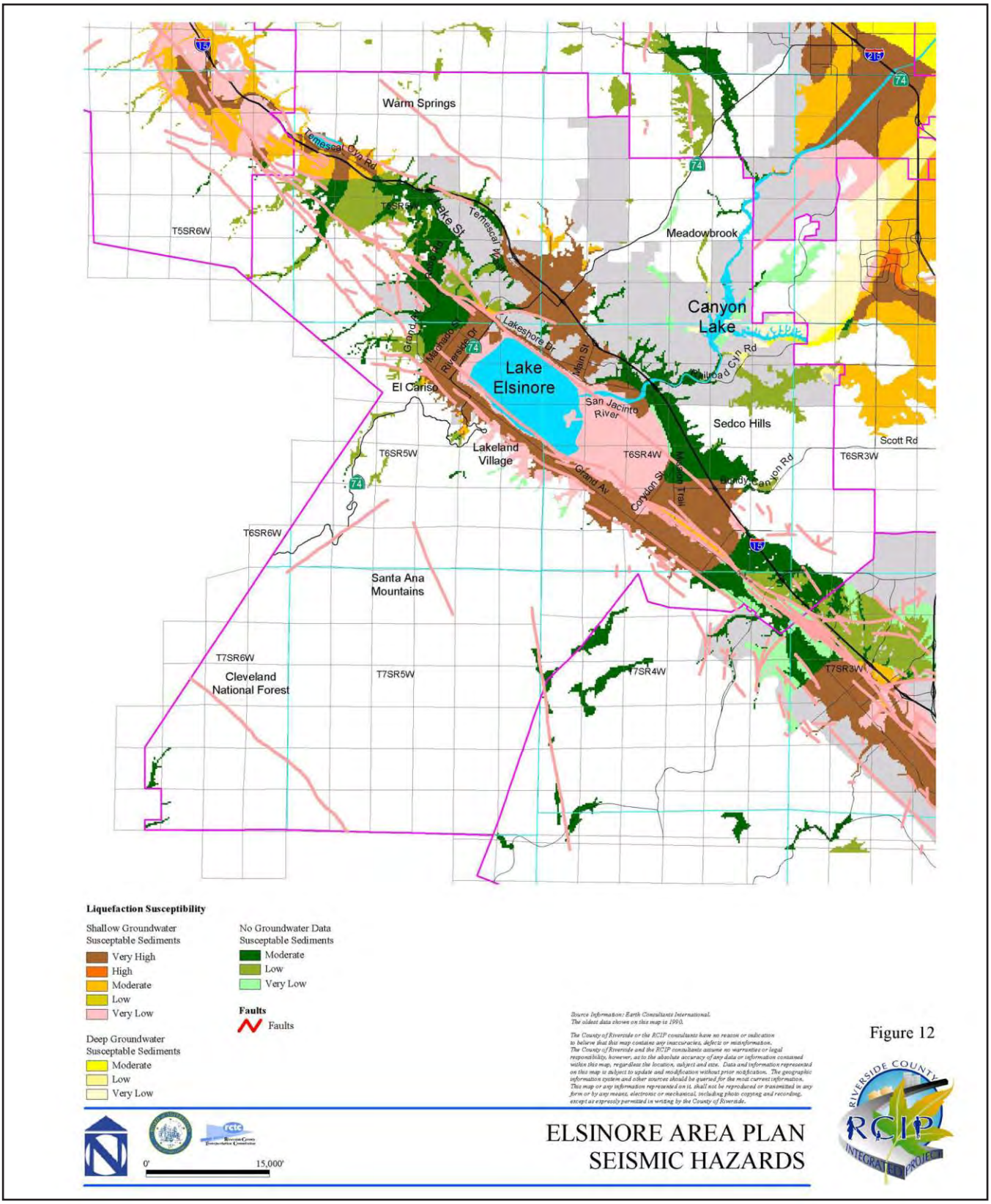

Source: Riverside County Integrated Project

Mooney · Jones & Stokes

Seismic Hazards
Figure 12.3

G//Projects/05091.05/Graphics/Background Report/12-3.cdr (12/20/05)

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City Limits
Sphere of Influence
Liquefaction Potential
Very low
Low
Moderate
High
Very High

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/01/05: /GIS/elsinore/mxd/fig12_4liq

0 6,500 13,000
Feet

Liquefaction Susceptibility in Lake Elsinore Area
Figure 12.4

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Sphere of Influence
City Limits

Percent slope

0 - 15%
15. - 25%
25 - 35%
>35%

Major Roads

Limited Access
Highways
Secondary Roads
Other
Highway Ramp

Source: City of Lake Elsinore, County of Riverside

Mooney · Jones & Stokes

12/05/05: /GIS/elsinore/mxd/fig12_5slp

0 6,500 13,000
Feet

Percent Slope
Figure 12.5

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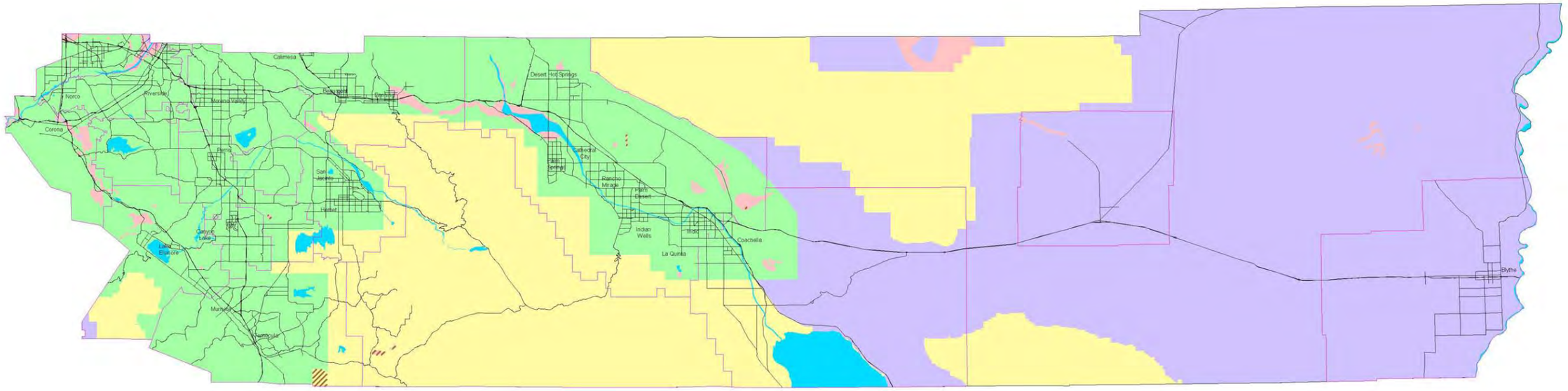

MRZ-2
MRZ-3
MRZ-4
Unstudied
State Designated Aggregate Resource Area
Water
Major Roads & Highways
Area Plan Boundaries
Cities

0 65,000 Feet

Source Information: LSA Associates

Figure OS-5

MINERAL RESOURCES

Source: Riverside County Integrated Project

Mooney · Jones & Stokes

Mineral Resources
Figure 12.6

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