CHAPTER 2

EXISTING AND PROJECTED PLANNING AREA CHARACTERISTICS

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GEOGRAPHICAL SETTING

The Santa Clarita Valley Planning Area

The planning area for the 2015 Plan encompasses the majority of the developable portion of the Santa Clarita Valley, including the existing service area of Districts Nos. 26 and 32. The planning area is also considerably more extensive than the existing spheres of influence for the two districts. Specifically, the planning area is composed of the developable area of the valley, excluding the area reserved for the proposed Newhall Ranch Project. This area was excluded due to the fact that the Newhall Ranch Project proponents have completed their own planning process, including planning for provision of sewerage services.

The planning area is approximately 250 square miles, of which the City of Santa Clarita occupies approximately 45 square miles in the central part of the valley.[1] Both political and topographical boundaries define the extent of the planning area (see Figure 2-1). The Angeles National Forest forms the main portion of the northern boundary. To the south, the Santa Susana and San Gabriel Mountain ridgelines, as well as the Angeles National Forest, provide limits to the Santa Clarita Valley. On the west, the boundary is defined by the Los Angeles/ Ventura County line and the Los Padres National Forest. The eastern boundary abuts the Agua Dulce area.

The planning area is located in the northwestern portion of Los Angeles County. The population center of the valley, the City of Santa Clarita, is located approximately 35 miles northwest of the Los Angeles Civic Center, and the valley is linked to the rest of the county by the Golden State Freeway (I-5) and the Antelope Valley Freeway (SR-14).

Communities Within the Planning Area

Communities within the City of Santa Clarita include Newhall, Valencia, Saugus, and Canyon Country. Smaller subcommunities within Canyon Country include Sand Canyon and Placerita Canyon. The earliest permanent settlement in the Santa Clarita Valley was Newhall, originally created to service the Southern Pacific Railroad. Valencia, a master planned community dedicated in 1965, is a mixed-use community of residential, commercial, and industrial developments. Canyon Country is the largest residential development and, thus, has the largest population of any of the communities within the City of Santa Clarita. Canyon Country also supports some commercial and manufacturing activities. The two subcommunities of Canyon Country, Sand Canyon and Placerita Canyon, are almost exclusively low-density, residential developments.

A number of other communities in the Santa Clarita Valley, Pico Canyon, Castaic, Val Verde, and Hasley Canyon, are located in unincorporated Los Angeles County. Pico Canyon, Hasley Canyon, and Val Verde are primarily residential. Castaic is characterized by its proximity to the Golden State Freeway and Castaic Lake. Commercial development associated with the lake is prevalent.

HISTORY OF THE PLANNING AREA

Historically, the Santa Clarita Valley was the home of the Alliklik, or Tataviam, Indians. The Alliklik utilized the abundant natural resources of the valley and the Santa Clara River to support their community (Phillips, 1981). The demographics of the valley changed, however, with the advent of European colonialism. In the late 1700s, Gaspar de Portola

1. The Santa Clarita Watershed is approximately 500 square miles of which the planning area encompasses approximately 51 percent.

claimed the Santa Clarita Valley for Spain, which facilitated the arrival of Spanish and other European colonists. Shortly thereafter, the valley was marked for missionary activity, and it became a stop along the Camino Viejo, which ran along the western coast of California from Monterey to San Diego. In 1797, the San Fernando Mission was established, and the lands of the Santa Clarita Valley were ceded to the Mission (Caughey, 1982).

The character of the Santa Clarita Valley changed drastically with the arrival of the Gold Rush. In 1842, gold was discovered in Placerita Canyon, and a whole new wave of immigration began. The influx of immigrants caused the rural character of the valley to gradually transform to a more urban form (Forbes, 1919).

At the end of the Mexican-American War, the state of California was admitted to the Union in 1850. In 1875, Henry Mayo Newhall purchased much of the western side of the Santa Clarita Valley, and the pace of development in the valley increased. Shortly thereafter, rail lines were placed through the valley. A further impetus to development came with the discovery of oil in Pico Canyon.

The recent history of the Santa Clarita Valley has been influenced by its proximity to the Los Angeles metropolitan area. The development of affordable housing throughout the valley has spurred a dramatic increase in population growth. Consequently, the Santa Clarita Valley has become a suburban bedroom community with a large number of residents commuting out of the valley. This trend, however, may be slowing as new projects have placed a large emphasis on mixed-use development.

Archaeological and Historical Resources

As mentioned previously, the Santa Clarita Valley has a rich history from the early Native American settlement through the gold rush and into the present. Consequently, the valley has a wealth of archeological and historical resources. For example, 22 semi-permanent villages erected by the Alliklik Indian tribe have been identified. The tribe arrived in the Santa Clarita Valley around 500 AD during the Shoshone Migration and were the valley's principal residents until the arrival of Spanish explorers in the 18th Century (Phillips, 1981). Additionally, the Santa Clarita Valley has one site listed on the National Register of Historic Places, eight California Registered Historical Landmarks, and four State Points of Historic Interest. These sites are representative of the significant historical periods experienced by the valley, including the Missionary period, the gold rush, the discovery of oil, and the development of rail links to the valley (Santa Clarita, 1991).

ENVIRONMENTAL SETTING

Topography

The topography of the Santa Clarita Valley planning area is dominated by the Santa Clara River and the surrounding highlands (see Figure 2-2). The Santa Clara River, the primary drainage course, flows westward through the planning area from Soledad Canyon to the east into the Santa Clarita Valley. The headwaters of the river are located east of the planning area within the San Gabriel Mountains. A southern branch of the Santa Clara River joins the main river course near Saugus. The Santa Clara River and its tributaries form a dendritic drainage pattern in the western half of the planning area and a trellis drainage pattern in the eastern half of the planning area. Tributary streams to the Santa Clara River include the south-flowing Castaic Creek, Bouquet Canyon Creek, San Francisquito Creek, and Mint Canyon Creek, and the north-flowing Newhall and Placerita Creeks. Additional north-flowing tributaries consist of streams emanating from Salt, Potrero, Elsmere, Sand, and Oak Spring Canyons; additional south-flowing tributaries consist of the streams within Tick, San Martinez, Chiquito, and San Martinez

Grande Canyons. Castaic Lake, a man-made impoundment, is the largest surface water body within the planning area, with a maximum storage capacity of 323,700 acre feet (AF) of fresh water. Dry Canyon reservoir is located just north of the planning area. Both Castaic Lake and Dry Canyon Reservoir are fed by the California Aqueduct, which crosses the planning area to the east of San Fernando Road.

Mountainous areas within the planning area include the San Gabriel Mountains to the east and southeast, the Santa Susana Mountains to the south, the Topatopa and Piru Mountains to the north and northwest, and the Sierra Pelona Mountains to the northeast.

While the floodplain of the Santa Clara River is fairly flat, most of the topography within the planning area is rugged, characterized by steep-sided canyon lands. Elevations range from approximately 400 feet above mean sea level near the western boundary of the planning area along the Santa Clara River to over 4,000 feet above mean sea level within the San Gabriel Mountains in the southeastern extreme of the planning area.

Geology

The geology within the planning area is depicted in Figures 2-3 and 2-4. The planning area lies within the Transverse Ranges' Geomorphic Province, which is characterized by east-west trending mountain ranges and valleys formed by compressional forces across the big bend of the San Andreas Fault. The Transverse Ranges are relatively young geomorphic features that will continue to evolve under the current tectonic interaction between the Pacific and North American plates.

The Santa Clarita Valley planning area is primarily underlain by a thick sequence of Tertiary-age (2 to 65 million years old) sedimentary rocks. The sedimentary sequence rests on a basement complex composed of Mesozoic (older than 65 million years) and Precambrian (older than 500 million years) metamorphic and igneous rock bodies. Mantling the Tertiary sequence is a relatively thin section of Quaternary-age (younger than two million years) sedimentary rock and recent sediments. The San Gabriel Fault bisects the study area along a northwest-striking plane. Pre-Pliocene rock units to the northeast of this fault are markedly different from those to the southwest of the fault (Dibblee, 1982).

The southwest portion of the planning area is primarily underlain by marine and nonmarine sedimentary rocks divided among the Modelo, Towsley, Pico, and Saugus Formations. The sedimentary sequence overlies a basement complex that is chiefly composed of Mesozoic-age metamorphic and igneous rocks. The Modelo, Towsley, and early Pico Formations were deposited in a marine environment at depths greater than 600 feet. These formations, which interfinger and have similar rock characteristics, are differentiated primarily on the basis of fossils found within them. The Modelo, Towsley, and Pico Formations are comprised of bedded siltstone, mudstone, siliceous shale, and conglomerate. The latest Pico and earliest Saugus Formations were deposited as Southern California was uplifted, and the shoreline moved westward toward its current position. The upper Saugus Formation is a nonmarine stream and lakebed deposit. The Saugus Formation is characterized as a brown to reddish-brown, tan sandstone, and conglomerate with locally occurring greenish-gray siltstone. The ancient river terrace deposits that overlie the Saugus Formation and older formations are referred to as the Pacoima Formation. This formation includes poorly consolidated silt, clay, sand, gravel, and occasional organic-rich layers deposited along the banks of the rivers that crossed this area during the Pleistocene epoch.

The northeastern portion of the planning area is underlain by marine and nonmarine sedimentary rocks of the San Francisquito, Vasquez, Mint Canyon, Castaic, and Saugus Formations. This sedimentary sequence overlies a basement complex that includes Precambrian-age anorthosite and Mesozoic-age granite and schist. The late Cretaceous-Paleocene-age San Francisquito Formation roughly consists of 7,500 feet of deep marine deposits that include alternating beds of tan sandstone, dark gray shale, and gray to brown pebble conglomerate. The Vasquez Formation is composed of roughly 4,000 feet of red to gray claystone, sandstone, and conglomerate. Locally, andesite and basaltic lava flows comprise the lower portion of the Vasquez Formation. The Vasquez Formation is a river deposit of Oligocene age (about 25 to 40 million years old). The upper Miocene (5 to 10 million years old) Mint Canyon Formation unconformably overlies the Vasquez Formation. The Mint Canyon Formation consists of roughly 5,500 feet of stream-laid, cobble-pebble conglomerate with associated sandstone and claystone. The upper Miocene Castaic Formation is a marine deposit of dark gray, micaceous shale with minor sandstone interbeds. The upper Pliocene-Pleistocene Saugus Formation overlies the Castaic Formation in the northeastern portion of the planning area. The chiefly nonmarine Saugus Formation is as much as 1,600 feet thick and unconformably overlies the Castaic and Mint Canyon Formations (Jahns, 1954).

The geologic structure within the planning area is dominated by youthful folding and reverse faulting related to compression across the big bend of the San Andreas Fault. Fold axes and fault planes have a general northwesterly trend. The San Gabriel Fault is a high angle right-lateral strike-slip fault, which transects the planning area along a northwest-striking plane. The Santa Susana Fault is a north-dipping reverse fault that surfaces near the southern edge of the planning area. The Del Valle and Holser Faults are south-dipping reverse faults. The Del Valle Fault is located in the western planning area, north of the Santa Clara River. The Holser Fault branches off from the San Gabriel Fault west of Saugus. Several prominent fold axes are mapped within the Santa Susana Mountains. These include the Oat Mountain syncline, the Pico anticline, the Weldon syncline, the Santa Clara River syncline, and the Del Valle anticline.

Seismicity

The Santa Clarita Valley planning area lies within a region of high seismic potential and has been subjected to numerous significant earthquakes within the past century. The 1971 San Fernando Earthquake (Richter magnitude 6.4) and the 1994 Northridge Earthquake (Richter magnitude 6.7) both caused significant damage within the planning area. Earthquakes that occur in this area, as well as throughout Southern California, are the result of crustal deformation associated with the interaction of the Pacific and North American plates. The Pacific plate moves northward past the North American plate at a rate of approximately one-eighth to one-half inch per year (Oakeshott, 1978). The boundary between these two plates occurs along the San Andreas Fault which, at its closest approach, is located approximately 10 miles to the north of the planning area. A large westward bend in the San Andreas Fault to the north of the San Gabriel Mountains results in conversion of the right-lateral transform motion to compressional motion. The Santa Clarita Valley planning area lies within a zone that has experienced significant crustal shortening due to compression across the San Andreas Fault. Reverse faults and folds have developed to accommodate this crustal shortening. The Santa Susana Mountains, which form the southern boundary of the planning area, are a recent expression of these compressional forces (Ziony and Yerkes, 1985).

Table 2-1
QUATERNARY FAULTS IN THE SANTA CLARITA VALLEY PLANNING AREA

FAULT NAME	FAULT TYPE	FAULT LENGTH (miles)	MAXIMUM PROBABLE EARTHQUAKE (moment magnitude)	ACTIVITY[a]
Del Valle	Reverse	6	6.2	LQ
Holser	Reverse	12	6.6	LQ
Oakridge	Reverse	24	6.9	H
San Andreas	Right Lateral	110	7.4	A
San Cayetano	Reverse	30	7.1	H
San Fernando	Reverse	11	6.5	A
San Gabriel A	Right Lateral	29	7.0	A
Santa Susana	Reverse	24	6.9	LQ
Sierra Madre A	Reverse[b]	10	6.5	LQ
Simi-Northridge	Reverse[b]	28	7.0	A

Source: Wesnousky, 1986.

Notes: a) A = Active within the last 200 years.
H = Active within the last 10,000 years.
LQ = Active within the last 700,000 years.
b) Fault type not precisely known.

Several reverse and strike-slip faults are considered to have the potential to generate earthquakes across the planning area. Seismic Risk Zones have been developed based on the known distribution of historic earthquake events, evidence of past earthquakes, proximity to earthquake areas and active faults, and frequency of earthquakes in a given area. These zones are generally classified using either the California Division of Mines and Geology (CDMG) Maximum Expected Earthquake Intensity Map or Uniform Building Code (UBC) Seismic Risk Map of the United States. Because of the number of active faults in Southern California, the Santa Clarita Valley planning area is located in the highest risk zone defined by both the CDMG and UBC standards (Zones III and IV, respectively). Listed in Table 2-1 are the active, quaternary faults located within the planning area and the maximum probable earthquake expected to occur along each fault in any given one hundred-year period (Wesnousky, 1986). The Salt Creek Fault, shown on Figure 2-3, is a pre-quaternary fault of unknown fault type, with activity within the past 1.6 million years (Jennings, 1994).

Biological Resources

The Santa Clarita Valley is noted for its botanical and wildlife resources. Approximately 70 percent (167 square miles) of the valley is classified as undeveloped or open space, allowing diverse plant and animal communities to flourish. Furthermore, the Santa Clara River and its tributaries throughout the valley provide riparian habitat. In addition, Castaic Lake, Castaic Lagoon, and the slower flowing portions of the Santa Clara River establish open water habitats for plants and animals.

Aerial photographs and field verification have identified seven major plant communities within the valley: 1) interior live oak woodland, 2) valley oak woodland, 3) coast live oak woodland, 4) riversidean sage scrub, 5) semi-desert chaparral, 6) southern cottonwood-willow riparian forest, and 7) mulefat scrub (Santa Clarita, 1991).

Significant Ecological Areas

Significant ecological areas (SEAs) are designated by Los Angeles County. These areas warrant designation as SEAs because they are ecologically important areas that are valuable as plant or animal communities. There are five designated SEAs in the Santa Clarita Valley, the Santa Clara River being the largest. The city as well as the county have designated the Santa Clara River as an SEA un their respective general plans. The river, as well as the surrounding floodplain, are included in the SEA. Furthermore, the Santa Clara River is one of the few remaining habitats for a federal and state designated endangered species, the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*). Two canyons in the valley, San Francisquito Canyon and Lyon Canyon, are also designated as SEAs. The San Francisquito Canyon is also home to the unarmored threespine stickleback. Lyon Canyon is a narrow canyon which is home to both an oak woodland community and a chamisal chaparral community. The fourth SEA, the Santa Susana Mountains, encompasses 12,000 acres and has a diverse range of vegetation, including an important oak woodland habitat. Valley Oaks Savannah, located in Newhall, is the fifth SEA. This 400-acre area is one of the last habitats of the Valley Oak (County of Los Angeles, 1990).

Endangered and Sensitive Species

A number of endangered and sensitive plant and animal species are contained within the diverse ecological communities of the Santa Clarita Valley. In particular, the previously-mentioned unarmored threespine stickleback, a federal and state listed endangered species known to occur in the Santa Clara River, is of concern. Furthermore, the loss of habitat for the stickleback in other areas of Los Angeles and Ventura Counties has focused scrutiny on the valley as one of the last remaining viable habitats. A number of sensitive bird species are known to use the riparian habitat along the Santa Clara River for nesting and foraging, including the western yellow-billed cuckoo, least Bell's vireo, and southwestern willow flycatcher. Other sensitive wildlife species in the valley include, or may potentially include, the following: the southwestern pond turtle, arroyo southwestern toad, California red-legged frog, western snowy plover, bank swallow, California least tern, Belding's savannah sparrow, California yellow warbler, western least bittern, white-tailed kite, northern harrier, Cooper's hawk, elegant tern, loggerhead shrike, Southern California saltmarsh shrew, San Diego horned lizard, California horned lizard, coastal western whiptail, silvery legless lizard, coast patch-nosed snake, two-striped garter snake, south coast garter snake, sandy beach tiger beetle, greater western mastiff bat, Townsend's big-eared bat, southern marsh harvest mouse, steelhead trout, arroyo chub, and Santa Ana sucker. The riparian habitats along the upper Santa Clara River also have the potential to support two sensitive plant species, the slender-horned spineflower and the Nevin's barberry (Jones & Stokes, 1996). For more information on the biological resources of the valley, including the endangered and sensitive species, see Chapter 18, Biological Resources.

Aesthetics

The Santa Clarita Valley is endowed with a wealth of natural beauty. Stark ridgelines frame the valley to the south. Protected natural forest areas exist throughout, and the central part of the valley is marked by the Santa Clara River, picturesque canyons, and wide savannah. The natural aesthetic, however, has been encroached upon by the development of the valley.

Manmade facilities also provide a pleasant backdrop for the Santa Clarita Valley. Castaic Lake, a manmade water impoundment facility, supplies ample recreational opportunities. Six Flags Magic Mountain Amusement Park also supplies a varied backdrop to the valley. For more information on the aesthetics of the valley, see Chapter 15, Aesthetics.

AIR QUALITY

The SCVJSS service area lies completely within the South Coast Air Basin (SCAB), which is regulated by the South Coast Air Quality Management District (SCAQMD). The SCAB encompasses an area of approximately 6,600 square miles and includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties, as shown in Figure 2-5. It is bounded on the northwest by Ventura County and on the south by San Diego County. The northern boundary runs roughly along the Angeles National Forest north of the ridge lines of the San Gabriel and San Bernardino Mountains. The eastern border runs north-south through the San Bernardino and San Jacinto Mountains. The Banning Pass area is excluded from the SCAB. The western boundary is the entire shoreline of Los Angeles and Orange Counties, including Catalina and San Clemente Islands.

Climate and Meteorological Conditions in the South Coast Air Basin

The SCAB lies within the semipermanent high pressure zone of the eastern Pacific Ocean. This region is characterized by warm, dry summers and mild winters with moderate rainfall, which are typical of coastal zones along the western shores of continents at lower latitudes.

The SCAB's climate and topography are conducive to the formation and transport of photochemical pollutants throughout the region. Prevailing daily winds in the region are westerly, with a nighttime return flow. This pattern is broken approximately 10 days a year when strong northeasterly winds, commonly known as Santa Ana Winds, sweep down from the desert. Wind speeds in the desert areas are generally much higher than those in the coastal plains.

Emissions to the atmosphere are roughly constant throughout the year, but concentrations of photochemical pollutants, such as ozone (O_3), are greatest between the late spring and early fall when the photochemical reactions that generate these pollutants are greatest as a result of higher sunlight intensity and longer daylight hours. In addition, the SCAB climate is conducive to the formation of strong atmospheric inversion layers during these same months. An atmospheric inversion layer forms when cooler denser air is trapped by warmer lighter air. The resulting inversion layer effectively traps pollutants close to the ground and creates a visible photochemical smog, which is characteristic of the SCAB. The highest concentrations of ozone in the United States occur in the SCAB (SCAQMD, 1996).

The highest concentrations of carbon monoxide (CO) in the SCAB occur during winter months. CO is largely a byproduct of the incomplete combustion of fossil fuels. CO emissions increase during winter months when temperatures are generally somewhat lower because internal combustion engines are less efficient at combusting fuels at lower operating temperatures. The highest concentrations of CO in the SCAB occur in the vicinity of heavily-traveled and/or congested roadways.

Existing Air Quality in the South Coast Air Basin

Over the last decade and a half, the air quality in SCAB has improved significantly. However, with respect to the National Ambient Air Quality Standards (NAAQS) established for the six criteria pollutants: sulfur dioxide (SO_2), nitrogen dioxide (NO_2), CO, O_3, lead, and fine particulate matter (PM_{10}), the SCAB is designated as an attainment area for only SO_2 and lead. The SCAB is designated as an extreme non-attainment area for NO_2, a serious non-attainment area for CO and PM_{10}, and an extreme non-attainment area for O_3. Table 2-2 presents the

Table 2-2
SUMMARY OF 1995 MONITORING DATA FOR CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

	AIR QUALITY STANDARDS		MAXIMUM MONITORED CONCENTRATION		NUMBER OF DAYS STANDARD EXCEEDED[a]	
	FEDERAL	STATE	CONCENTRATION	TIME PERIOD	FEDERAL	STATE
Ozone	0.12 ppm (1 hour)	0.09 ppm (1 hour)	0.26 ppm	1 hour	73	123
Carbon Monoxide	9.0 ppm (8 hours) 35 ppm (1 hour)	9.0 ppm (8 hours) 20 ppm (1 hour)	13.86 ppm 17 ppm	8 hours 1 hour	13 none	15 none
Fine Particulate Matter	150 $\mu g/m^3$ (24 hours) 50 $\mu g/m^3$ (AAM)	50 $\mu g/m^3$ (24 hours) 30 $\mu g/m^3$ (AGM)	219 $\mu g/m^3$ 69 $\mu g/m^3$ 51.8 $\mu g/m^3$	24 hours (AGM) (AAM)	4 none none	38 none none
Nitrogen Dioxide	0.053 ppm (AAM)	0.25 ppm (1 hour)	0.0464 ppm 0.24 ppm	annual average 1 hour	none[b] none[b]	none[b] none[b]

Source: South Coast Air Quality Management District, 1996.

Notes: a) National and state standards differ. Please see the text for an explanation of differences.
b) Although there have been no exceedances of the state and federal NO_2 standards since 1993 and 1991, respectively, SCAB has not yet been officially designated as an attainment area for NO_2. California is in the process, via the 1997 AQMP, of seeking a redesignation to attainment status for NO_2 from the federal government.

federal and state standards and a summary of air quality monitoring data in the SCAB for these four criteria pollutants. The following sections will discuss only those criteria pollutants for which the SCAB is designated as a non-attainment area by the federal government.

Existing State and Federal Air Quality Standards for Criteria Pollutants

Both the state of California and the federal government have established ambient air quality standards for various pollutants. For some pollutants, separate standards have been set for different time periods. Primary standards have been set to protect public health, while secondary standards have been set to protect public welfare (i.e., protection of crops, protection of materials, maintenance of visibility, and avoidance of nuisance conditions).

- *Ozone:* State and federal O_3 standards are based on a one-hour average (see Table 2-2). In order to achieve attainment with state and federal O_3 standards, the state one-hour ozone standard of 0.09 parts per million (ppm) may not be exceeded over any one-hour period during any year, and the federal one-hour O_3 standard of 0.12 ppm may not be exceeded more than three times over any three-year period.

- *Carbon Monoxide:* State and federal CO standards have been set for both one-hour and eight-hour averages (see Table 2-2). The state and federal one-hour CO standards are 20 ppm and 35 ppm, respectively, and the state and federal eight-hour CO standards are both 9.0 ppm. In order to achieve attainment with state and federal CO standards, state standards may not be exceeded during any year, and federal standards may not be exceeded more than once in any year.

- *Particulate Matter:* Both the federal and state air quality standards for particulate matter have recently been revised to apply only to PM_{10}. State and federal PM_{10} standards have been set for 24-hour and annual averaging times. The state 24-hour PM_{10} standard is 50 micrograms per cubic meter ($\mu g/m^3$), and the federal 24-hour standard is 150 $\mu g/m^3$. The state annual PM_{10} standard is 30 $\mu g/m^3$ on an annual geometric mean, whereas the federal annual PM_{10} standard is 50 $\mu g/m^3$ on an annual arithmetic mean. Federal and state 24-hour PM_{10} standards are not to be exceeded more than one day per year, and none of the annual standards are to be exceeded.

- *Nitrogen Dioxide:* State and federal NO_2 standards have been set for different averaging times. The federal NO_2 standard is 0.053 ppm on an annual average basis, while the state standard is 0.25 ppm for a one-hour period. Both state and federal NO_2 standards may not be exceeded at any time in order to achieve attainment.

Health Effects of Non-Attainment Criteria Pollutants

- *Ozone:* O_3 is a public health concern because it is a respiratory irritant that also increases susceptibility to respiratory infections. O_3 can cause substantial damage to leaf tissues of crops and natural vegetation. It can also damage many materials by acting as a chemical oxidizing agent.

- *Carbon Monoxide:* CO levels are a public health concern because CO combines readily with hemoglobin and, thus, reduces the amount of oxygen that can be transported in the blood stream. Relatively low concentrations of CO can significantly affect the amount of oxygen in the blood stream because CO binds to hemoglobin 220 to 245 times more strongly than oxygen. Both the cardiovascular system and the central nervous system can be affected when 25 to 40 percent of the hemoglobin in the blood stream is bound to CO rather than to oxygen. State and federal ambient air quality standards for CO have been set at levels intended to keep CO from combining with more than 15 percent of the blood's hemoglobin.

- *Particulate Matter:* Health concerns associated with suspended particles focus on those particles small enough to reach the lungs when inhaled. Few particles larger than ten microns in diameter reach the lungs. Consequently, both the federal and state air quality standards for particulate matter have recently been revised to apply only to small inhalable particles less than ten microns in diameter (designated as PM_{10}).

- *Nitrogen Dioxide:* NO_2 is a byproduct of fuel combustion. The principal form of nitrogen oxides (NO_x) produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating a mixture of NO and NO_2 that is generally called NO_x. NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, only NO_2 is potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in two to three year old children has been observed at concentrations below 0.3 ppm. NO_2 absorbs blue light; the result is a brownish red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM_{10}.

Monitoring Data Summary

As mentioned previously, Table 2-2 presents a summary of air quality monitoring data in the SCAB for the three criteria pollutants designated as non-attainment. The data presented in Table 2-2 show maximum monitored concentrations of criteria pollutants in the SCAB and the number of days that national and state air quality standards were exceeded in 1995.

- *Ozone:* Both federal and state O_3 standards are commonly exceeded in the SCAB. In 1995, federal and state O_3 standards were exceeded 73 and 123 days, respectively. In the Santa Clarita Valley during 1995, the federal standard was exceeded 26 days and the state standard was exceeded 72 days.

- *Carbon Monoxide:* In 1995, both federal and state eight-hour CO standards were exceeded a substantial number of days in the SCAB. Federal and state eight-hour CO standards were exceeded 13 and 15 days, respectively. The state one-hour CO standard and the one-hour national CO standard were not exceeded in the SCAB in 1995. The federal and state eight-hour standards were not exceeded in the Santa Clarita Valley during 1995.

- *Particulate Matter:* In 1995, the state 24-hour PM_{10} standard was exceeded a substantial number of days in the SCAB (38 days). The federal PM_{10} standard was exceeded infrequently (four days in 1995). Both state and federal annual standards were not exceeded in the Santa Clarita Valley for 1995, however, the state 24-hour standard was exceeded 13 days in 1995.

- *Nitrogen Dioxide:* The state and federal NO_2 standards were not exceeded in the SCAB during 1995. Similarly, in the Santa Clarita Valley during 1995, both standards were not exceeded.

Existing Regional Emissions Inventory

Table 2-3 presents an inventory of 1993 air pollutant emissions in the SCAB. Emissions types shown in Table 2-3 are reactive organic gases (ROG), CO, NO_x, sulfur oxides (SO_x), and PM_{10}. ROG is a class of gaseous, reactive chemical compounds that contain the element carbon and contribute to the formation of photochemical oxidants such as ozone. As shown in Table 2-3, ROG and SO_x emissions from mobile sources are greater than those from stationary sources in the SCAB. Mobile sources also emit substantially more CO and NO_x than stationary sources. Conversely, stationary sources emit substantially more PM_{10} than mobile sources.

POPULATION AND ECONOMY

This socioeconomic profile of Los Angeles County and the SCVJSS service area for 1990 is based on the 1990 census data, since this is the most recent available data for detailed demographic analysis at the census tract level. This section does not address projected growth for the SCVJSS, which is discussed in Chapter 5. The data presented in this section for years other than 1990 is based on information provided by SCAG, the California Department of Finance (DOF), and the California Economic Development Department (EDD).

Population

The population of Los Angeles County more than doubled between 1950 and 1990. In 1950, approximately 4.2 million people lived in the county, and the population had grown to approximately 8.9 million by 1990.[2] This represents an increase of 4.7 million residents over 40 years or an annualized growth rate of approximately 1.9 percent per year. In the last decade (1980-1990), the population of the county grew by 1.4 million, or 1.7 percent growth per year.

2. In 1990, the population of undocumented aliens for the state of California was estimated to be 1.44 million people by the U.S. Bureau of the Census. Although the 1990 Census tried to include all residents, including undocumented aliens, the 1990 population of 8.9 million is assumed by the census to be under-counted by an estimated 430,000 people.

Table 2-3
1993 INVENTORY OF CRITERIA POLLUTANT EMISSIONS IN THE SCAB
(Average Annual Day)

MAJOR SOURCE CATEGORY	REACTIVE ORGANIC GASES		NITROGEN OXIDES		CARBON MONOXIDE		SULFUR OXIDES		PARTICULATE MATTER	
	TONS PER DAY	PERCENT OF TOTAL	TONS PER DAY	PERCENT OF TOTAL	TONS PER DAY	PERCENT OF TOTAL	TONS PER DAY	PERCENT OF TOTAL	TONS PER DAY	PERCENT OF TOTAL
Stationary Sources:										
Fuel Combustion	11	0.9	136	11.4	65	0.9	8	10.1	10	2.4
Waste Burning	1	0.1	3	0.3	17	0.2	2	2.5	2	0.5
Solvent Use	331	26.7	0	0.0	0	0.0	0	0.0	1	0.2
Petroleum Process, Storage & Transfer	58	4.7	8	0.7	5	0.1	11	13.9	2	0.5
Industrial Processes	17	1.4	6	0.5	1	0.0	2	2.5	15	3.6
Misc. Processes[a]	32	2.6	1	0.1	11	0.2	0	0.0	344	82.7
Subtotal	450	36.3	154	12.9	99	1.4	23	29.1	374	89.9
Mobile Sources:										
On-Road Vehicles	676	54.5	794	66.5	5,682	80.7	25	31.6	27	6.5
Other Mobile Source	114	9.2	246	20.6	1,264	17.9	31	39.2	15	3.6
Subtotal	790	63.7	1,040	87.1	6,946	98.6	56	70.9	42	10.1
Total of All Sources	**1,240**	**100.0**	**1,194**	**100.0**	**7,045**	**100.0**	**79**	**100.0**	**416**	**100.0**

Source: Draft 1997 Air Quality Management Plan.

Note: a) Travel related road dust included.

Based on DOF data, approximately two-thirds of this growth may be attributed to natural increase (births minus deaths) and the remaining one-third to net in-migration (domestic and international) (DOF, 1991 and 1994). As a result of the recent economic recession in Southern California, however, in-migration has since dropped significantly. Between 1990 and 1995, more people departed Los Angeles County than entered, resulting in a net out-migration of over 750,000 residents. Despite this out-migration, the population of the county has continued to grow. This continued growth between 1990 and 1995 indicates the significance of the natural increase in population to the county.

The SCVJSS service area includes approximately four percent of the Los Angeles County land area and 1.5 percent of the 1990 total county population. The population within the SCVJSS service area increased from approximately 69,000 people in 1980 to 125,000 in 1990, an average increase of 6.2 percent per year. Table 2-4 presents the population growth and characteristics of the Los Angeles County and the SCVJSS service area.

In 1990, 13.4 percent of the SCVJSS population was Hispanic, 80.6 percent was White, 1.5 percent was Black, and 4.5 percent was Asian or other. Similarly, in the entire Los Angeles County region, the White population represented the largest segment of population at 41.0 percent. According to DOF projections, however, the Hispanic population is anticipated to represent over one-half (52.0 percent) of the total population in the county by the year 2010 (DOF, 1993); the projected White, Asian/other, and Black populations, expressed as percentages of the total county population, are 27.6, 11.7, and 8.7, respectively.

Table 2-4
TOTAL POPULATION IN 1990

	LA COUNTY	SCVJSS SERVICE AREA
Total Population	8,863,200	125,000
Difference, 1980-1990	1,385,700	56,000
% Growth	18.5%	81.2%
Ethnicity/Racial[a]		
Hispanic	37.3%	13.4%
White	41.0%	80.6%
Black	10.7%	1.5%
Asian/Other	11.0%	4.5%
Age Distribution		
4 and Under	8.2%	10.6%
5-17	18.0%	17.3%
18-64	64.1%	65.8%
65 and Over	9.7%	6.3%

Source: 1990 U.S. Census.

Note: a) White, Black, and Asian/other represents Non-Hispanic populations.

Housing

In 1990, there were over 41,133 dwelling units in the SCVJSS service area. Table 2-5 presents the characteristics of the total housing stock for the SCVJSS service area as of 1990. Approximately 73.3 percent of the housing units were single-family units and 26.7 percent were multi-family units. By comparison, the composition of the county-wide housing stock is 48.6 percent single-family units and 51.4 percent multi-family units. Low vacancy rates[3] (below five percent) indicate that the housing market is constrained by insufficient development to meet the demand. Generally, a vacancy rate of five to six percent indicates a well-functioning and healthy housing market. The SCVJSS service area vacancy rate (shown in Table 2-5) is 6.5 percent. Countywide, the vacancy rate for 1990 was 5.5 percent.

3. Vacancy rates are defined as the percentage of unoccupied units in the total available housing stock.

Since 1990, however, the recession has caused the conditions of the housing market in the SCVJSS service area to change dramatically. A combination of out-migration and increasing household sizes (from 2.80 persons per house in 1990 to 2.94 in 1995) has resulted in decreased demand for housing, while speculative building fueled by the excess demand for housing in the late 1980s has increased the supply of housing.

Table 2-5
TOTAL HOUSING IN 1990

	LA COUNTY	SCVJSS SERVICE AREA
Total Housing	3,163,300	41,133
Households	2,994,300	38,474
Household Size	2.96	2.80
Housing Type		
Single Units	48.6%	73.3%
Multiple Unit	51.4%	26.7%
Vacancy Rate	5.5%	6.5%
Housing Built After 1960	49.3%	95.01%

Source: 1990 U.S. Census.

Between 1980 and 1990, the number of households in the SCVJSS service area increased by 94 percent, while the population grew by 81.2 percent. This pattern of growth resulted in a decrease in the persons per household from 3.07 in 1980 to 2.80 in 1990. By comparison, the average household size in Los Angeles County was 2.96 persons per house in 1990. The downward swing in household size in the SCVJSS may be attributable to a number of factors, including the housing stock growth commensurate with the population growth during the late 1980s as well as socioeconomic factors such as the increase in employment and affordability of housing.

Most of the existing housing stock within the SCVJSS service area is relatively new. In 1990, 95 percent of the housing stock was built after 1960. By comparison, only 49.3 percent of the countywide housing stock was built after 1960. This disparity is due to the increased development built in the 1980s in the SCVJSS service area.

Economy and Employment

With an estimated gross regional product (GRP) of approximately $322 billion, the six-county SCAG region, which includes Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties, is considered one of the major centers of economic activity in the world. The GRP of the Southern California economy would rank 12th in the world, just behind Spain and just ahead of India. Los Angeles County, alone, represents over two-thirds of Southern California's economy.

In fact, the SCAG region accounted for approximately one-half of the employment growth and one-half of the economic activity in California during the 1980s. Key features of the regional economy include (SCAG, 1996):

- A large, diversified, and skilled labor force that is the nation's largest regional labor market.
- A large domestic market (i.e., regional population and consumer base) and access to both regional and national markets.
- The state's largest port and airport system, located within reach of fast-growing markets in Mexico and the Pacific Rim.
- A rapidly growing financial services sector serving both domestic and international financial markets.
- A group of high-tech complexes built around the region's educational institutions, skilled labor force, and venture capital industry.
- One of the largest and most diverse group of manufacturing complexes in the nation.
- A diversity of locations for living and working, which has enabled the region to absorb substantial population and job market growth in urbanizing areas.

Employment is one of the major indicators of the region's economic health. In 1990, there were approximately 7.1 million jobs in the SCAG region, approximately two-thirds of which were located in Los Angeles County. Between 1980 and 1990, employment growth in the SCAG region averaged three percent annually; but as a result of the recent economic recession, employment has declined by 7.3 percent between 1990 and 1993. This downward trend has recently been offset by an upward swing of 0.4 percent in 1994 and 0.9 percent in 1995. Between 1990 and 1995, however, the SCAG region experienced a loss of 388,000 jobs or a decrease of 5.5 percent.

According to SCAG's 1990 employment estimates, approximately 65,000 jobs were located in the SCVJSS service area. This represents 1.4 percent of the approximately 4.6 million jobs in Los Angeles County. With approximately 1.5 percent of the county population, the SCVJSS service area had a 1990 jobs to housing ratio of 1.58 as compared to 1.46 for the entire county (65,000 / 41,133 = 1.5 jobs for every housing unit in the service area).

Employment opportunities within the SCVJSS service area are concentrated among three major industrial sectors. As indicated in Table 2-6, the major industries that provide employment within the SCVJSS service area are service (32.9 percent), retail trade (21.7 percent), and manufacturing (19.5 percent). When compared to Los Angeles County, the SCVJSS service area has a higher proportion of retail trade jobs (21.7 percent versus 15.7 percent) and a slightly lower proportion of service jobs (32.9 percent versus 35.9 percent). Manufacturing is relatively the same.

Table 2-6
TOTAL EMPLOYMENT IN 1990

	LA COUNTY	SCVJSS SERVICE AREA
Total Employment	4,615,700	65,000
Industry as % of Total Employment:		
Agriculture	0.3%	1.0%
Mining	0.2%	1.6%
Construction	3.9%	5.6%
Manufacturing	19.1%	19.5%
Utilities	4.9%	4.2%
Wholesale Trade	7.0%	6.3%
Retail Trade	15.7%	21.7%
FIRE[a]	6.8%	6.0%
Service	35.9%	32.9%
Government	6.3%	1.1%

Source: Southern California Association of Governments, Employment Estimates, 1990.

Note: a) Finance, insurance, and real estate (FIRE).

LAND USE

Land use planning in the Santa Clarita Valley has been addressed by the City of Santa Clarita in the *City of Santa Clarita General Plan* (City General Plan)[4] and by the county in the *Santa Clarita Valley Area Plan*. The land use plans proposed by the city are for the whole valley rather than being strictly limited to city boundaries. The city's land use plans, however, are non-binding outside the city's sphere of influence. In addition to the City General Plan and the *Santa Clarita Valley Area Plan, Los Angeles County General Plan* (County General Plan), *Forest Plan for the Angeles National Forest, Forest Plan for the Los Padres National Forest*, and various redevelopment plans also address land use in the Santa Clarita Valley. The plans are intended to guide the valley through coordinated and orderly development.

4. Adopted June 26, 1991.

Existing Land Use

Existing land use in the Santa Clarita Valley is identified in the City General Plan. The City General Plan incorporates a number of specific plans and master plans for large developments in the valley. These specific plans and master plans include the *Santa Fe Ranch Specific Plan, Clougherty Ranch Specific Plan, Canyon Park Specific Plan, Northlake Specific Plan, Stevenson Ranch Specific Plan, Castaic Corridor Master Plan*, and *Valencia Company's Master Plan*. Figure 2-6 depicts land use by area and shows that only 31 percent of the area of the Santa Clarita Valley is developed, while the balance of the area, 69 percent, is vacant or designated as open space. Also, as shown in Figure 2-6, the land use of the developed portion in the valley is primarily residential.

Saugus WRP and Vicinity

As compared to the VWRP, the SWRP is located in an area of more intensive development and is subject to more topographic and infrastructure-related (roads and railways) constraints (see Figure 2-7). Since the plant and its immediate surroundings are all located within the City of Santa Clarita, the land use of the SWRP and the immediate vicinity is subject to the city's zoning and development polices. Some parcels proximate to the site, but to the north of Valencia Boulevard are located in unincorporated Los Angeles County and are under the jurisdiction of the county.

The plant property is bounded by parcels owned by a number of public entities including the City of Santa Clarita, the Metropolitan Transportation Authority

(MTA), and the Metropolitan Water District. Farther to the south, the land use is primarily industrial, while to the east, across Bouquet Canyon Road, the land use is primarily commercial.

Valencia WRP and Vicinity

Figure 2-8[5] shows the land use in the vicinity of the VWRP. The VWRP is located in unincorporated Los Angeles County and, therefore, is subject to the land use policies of the county. However, the parcels to the east of I-5 are within the City of Santa Clarita, and thus are subject to the land use policies of the city. The land uses shown in Figure 2-8 are relevant county or city designations, as appropriate.

The parcels owned by the District No. 32 are labeled Parcels 1 through 4. Currently, Parcels 1, 2, and 4 accommodate the treatment facilities of the VWRP. As is discussed in Chapter 6, a portion of the proposed expansion of the VWRP is slated for Parcel 3, which is currently being used as a construction staging and storage area. The VWRP's most prominent neighbor is Six Flags Magic Mountain Amusement Park, located to the west. Development to the east is largely constrained by the Golden State Freeway.

WATER RESOURCES

Existing Water Supply and Demand

The Santa Clarita Valley is served by one water wholesaler, the Castaic Lake Water Agency (CLWA), and four retail water purveyors, the Santa Clarita Water Company, the Valencia Water Company, the Newhall County Water District, and Los Angeles County Waterworks District No. 36. Excluding agricultural demand, the total water demand in the valley for 1995 was approximately 70,000 acre feet per year (AFY) (63 mgd).[6] The Santa Clarita Valley relies on two sources for its water supply: the State Water Project (SWP) and local groundwater sources. The two groundwater aquifers that provide the local water supply are the alluvial level of the Eastern Groundwater Basin (Alluvial Aquifer) and the Saugus Aquifer. The potential distribution of water supply sources according to estimated aquifer yields and imported water entitlements is shown in Figure 2-9.

Future Water Supply and Demand

Based on the Los Angeles County Department of Regional Planning population projections, the CLWA estimates shortfalls in water supply from the SWP and groundwater sources to occur beginning in 2006. Figure 2-10 shows CLWA's estimates for future water supply and demand. The estimates of future water supply are based on a simulation that incorporates the possibility for future drought conditions and does not include use of reclaimed water.

To mitigate these projected shortfalls, the CLWA and the Newhall County Water District have proposed the use of reclaimed water. CLWA, for example, has identified a number of potential uses of reclaimed water and have proposed to use in excess of 9,000 AFY (8.0 mgd) of reclaimed water generated from the SWRP and the VWRP (CLWA, 1993). Initial negotiations between Districts Nos. 26 and 32 and CLWA have resulted in an agreement in which the CLWA is entitled to 1.4 mgd of reclaimed water from the VWRP.

5. In this figure and subsequently in this document, *plant north* refers to an alignment corresponding with the orientation of tankage and boundaries at the VWRP; *plant north* is 44°-24'-30" west of true north.

6. Estimated by the CLWA for their total service area, which includes a small portion of Ventura County.