

## **ENCLOSURE 3**

### **STATE OF CALIFORNIA INFORMATION TO SUPPORT NONATTAINMENT AREA BOUNDARY RECOMMENDATIONS FOR THE 2008 FEDERAL 8-HOUR OZONE STANDARD**

#### **CONTINUING NONATTAINMENT AREAS**

Because the 2008 revised 8-hour ozone standard (0.075 parts per million (ppm)) is more stringent than the previous 8-hour standard (0.08 ppm), all areas that were nonattainment for the previous standard continue to be nonattainment under the revised standard. These continuing nonattainment areas and their respective boundaries were justified when they were designated for the previous standard. ARB staff recommends retaining the current boundaries for 15 of the 16 areas, as summarized below. In addition, ARB staff recommends expanding the current Eastern Kern County nonattainment area, as described in the section titled *"New and Expanded Nonattainment Areas,"* below.

#### **South Coast Air Basin**

Based on 2006 through 2008 monitoring data, the South Coast Air Basin remains nonattainment for the revised 8-hour ozone standard with a design value of 0.119 ppm for the Crestline (Lake Gregory) site in San Bernardino County. The recommended South Coast Air Basin ozone nonattainment area would continue to include western Los Angeles County (including San Clemente and Santa Catalina islands), Orange County, western Riverside County, and southwestern San Bernardino County. This area falls under the jurisdiction of the South Coast Air Quality Management District (AQMD).

#### **San Joaquin Valley**

The San Joaquin Valley nonattainment area would continue to comprise the entire San Joaquin Valley Air Basin: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and western Kern counties. The San Joaquin Valley violates the federal 8-hour standard with a design value of 0.108 ppm at the Arvin-Bear Mountain Blvd. monitoring site in Kern County. This area is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (APCD).

#### **Sacramento Metro Area**

The Sacramento Metro nonattainment area would continue to include all of Sacramento and Yolo counties, southern Sutter County, the Sacramento Valley Air Basin portion of Solano County, the Sacramento Valley and Mountain Counties air basin portions of Placer County, and the Mountain Counties

Air Basin portion of El Dorado County. This area violates the standard with a design value of 0.102 ppm at the Folsom-Natoma Street site in Sacramento County. The Sacramento Metro nonattainment area involves multiple local air pollution control agencies, including the Sacramento Metro, El Dorado County, Feather River, and Yolo-Solano AQMDs and the Placer County APCD. However, all but the Solano County portion of the nonattainment area are covered by a single transportation planning agency.

### **San Francisco Bay Area**

The San Francisco Bay Area nonattainment area would continue to comprise all of the San Francisco Bay Area Air Basin: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties and the San Francisco Bay Area Air Basin portions of Solano and Sonoma counties. The area's nonattainment designation is based on a design value of 0.081 ppm for the Livermore-793 Rincon Avenue site in Alameda County. The nonattainment area falls under the jurisdiction of the Bay Area AQMD.

### **Ventura County**

The Ventura County 8-hour nonattainment area would continue to include only the continental portion of Ventura County. Anacapa and San Nicolas Islands, two of the Channel Islands, would not be included. Ventura County violates the federal standard with a design value of 0.088 ppm at the Simi Valley-Cochran Street site. This area is under the jurisdiction of the Ventura County APCD.

### **Western Mojave Desert**

The Western Mojave Desert nonattainment area would continue to comprise the central portion of San Bernardino County that is located in the Mojave Desert Air Basin. Ozone concentrations at a number of sites in this area violate the federal 8-hour standard, and the area has a design value of 0.104 ppm at the Joshua Tree-National Monument site. The Mojave Desert AQMD has jurisdiction over this area.

### **Antelope Valley**

The Antelope Valley nonattainment area, under the jurisdiction of the Antelope Valley AQMD, would continue to comprise the portion of Los Angeles County that is located in the Mojave Desert Air Basin. The area has a design value of 0.094 ppm at the Lancaster-43301 Division Street site.

### **Coachella Valley**

The Coachella Valley ozone nonattainment area would continue to include the portion of Riverside County that is located in the Salton Sea Air Basin. The design value for this area is 0.097 ppm at the Palm Springs-Fire Station site. Coachella Valley is under the jurisdiction of the South Coast AQMD.

### **San Diego County**

This 8-hour nonattainment area falls under the jurisdiction of the San Diego County APCD and would continue to include all of San Diego County. Ozone concentrations in the County exceed the standard at several sites, and the design value is 0.092 ppm at Alpine-Victoria Drive.

### **Imperial County**

Similar to San Diego County, the Imperial County nonattainment area would continue to include the entire County. The design value for Imperial County is 0.082 ppm at both El Centro-9<sup>th</sup> Street and Westmorland-West 1<sup>st</sup> Street. The County is under the jurisdiction of the Imperial County APCD.

### **Sutter Buttes**

The Sutter Buttes nonattainment area would continue to include that portion of the Sutter Buttes above 2000 feet elevation. Located in Sutter County, the design value for this area is 0.085 ppm at the Sutter Buttes site, and the area is under the jurisdiction of the Feather River AQMD.

### **Central Mountain Counties**

The Central Mountain Counties nonattainment area would continue to include all of Amador and Calaveras counties, under the jurisdiction of the Amador County and Calaveras County APCDs, respectively. The design value for this two-county area is 0.089 ppm at the San Andreas-Gold Strike Road site in Calaveras County.

### **Southern Mountain Counties**

The Southern Mountain Counties nonattainment area would continue to include all of Mariposa and Tuolumne counties. The design value for this area is 0.088 ppm at the Turtleback Dome site in Yosemite National Park, which is in Mariposa County. The two counties are under the jurisdiction of the Mariposa County APCD and the Tuolumne County APCD.

### **Western Nevada County**

This nonattainment area would continue to comprise the western portion of Nevada County, up to the crest of the Sierra Nevada. The Northern Sierra AQMD has jurisdiction over this area. The current design value for western Nevada County is 0.091 ppm at the Grass Valley-Litton Building site.

### **Butte County**

This nonattainment area would continue to comprise all of Butte County, which falls under the jurisdiction of the Butte County AQMD. There are two monitoring sites in Butte County, and both have design values that violate the standard. The Paradise-4405 Airport Road site has the higher value, with a design value of 0.085 ppm.

## **NEW AND EXPANDED NONATTAINMENT AREAS**

The following six areas represent new or expanded nonattainment areas under the revised standard. Because the revised standard is set at a lower level, it brings in areas that increasingly rural in nature. In addition to being rural, ozone concentrations in all of the new and expanded areas are dominated by transport from an upwind urban area. With the addition of the new areas, California will have a total of 21 ozone nonattainment areas.

Justification for each of the new and expanded areas is outlined below, using the nine factors U.S. EPA included in its guidance memo (*December 4, 2008, Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards, Memorandum from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation to Regional Administrators, Regions I-X*). These factors include air quality data, emissions data, population density and degree of urbanization, traffic and commuting patterns, growth rates and patterns, meteorology, geography and topography, jurisdictional boundaries, and level of control of emission sources.

### **Northeast San Bernardino County**

#### ***Jurisdictional Boundaries:***

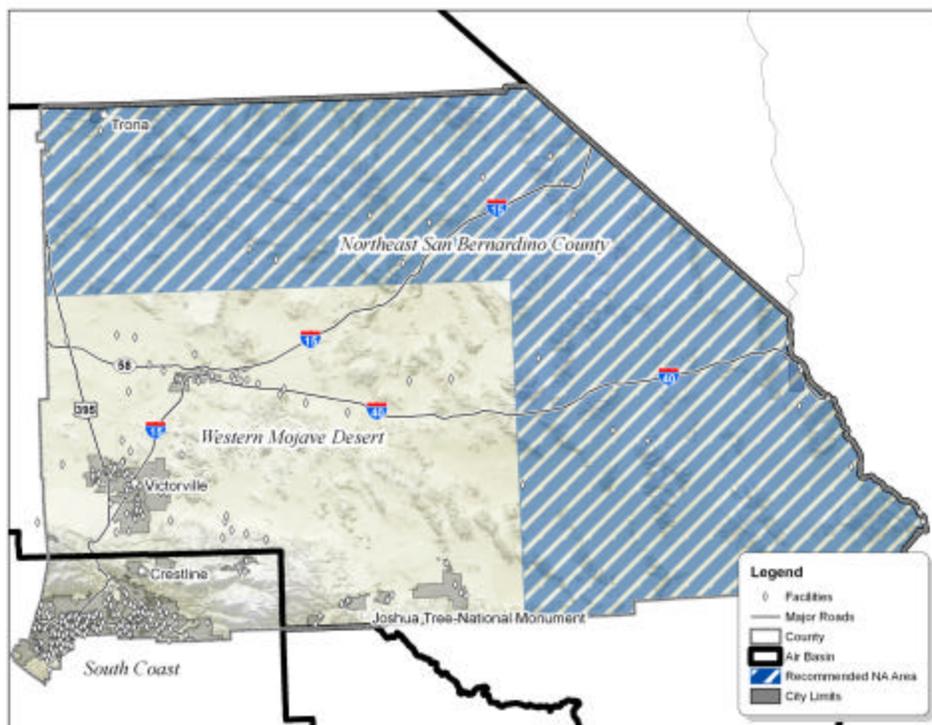
The southwest and central portions of San Bernardino County, which are under the jurisdiction of the South Coast AQMD and the Mojave Desert AQMD, respectively, were designated as nonattainment for the previous 8-hour ozone standard. ARB staff recommends these areas continue as two distinct nonattainment areas for the revised 2008 standard.

In contrast, the northeast portion of the County did not violate the previous standard, but does violate the revised standard. Although this area also falls under the jurisdiction of the Mojave Desert AQMD, it is sufficiently different in terms of air quality, emissions, population, and other human, economic, and geographic factors that ARB staff recommends it be designated as a separate nonattainment area. Designating Northeast San Bernardino County separately will give this area a classification consistent with its overall air quality problem and will facilitate a more timely attainment finding.

**Geography / Topography:**

San Bernardino County is the largest county in the United States (refer to Figure 1). At just over 20,000 square miles, it encompasses a very diverse set of geographic conditions, from the over 11,000 foot mountain peaks in the southwest (South Coast Air Basin) portion of the County, to the high desert areas of the central (Western Mojave Desert) portion, to the low desert areas in the eastern (Northeast San Bernardino County) portion. The variety of physical conditions has impacted the way the County has grown and resultant air quality.

**FIGURE 1  
SAN BERNARDINO COUNTY**



### ***Meteorology:***

The variety of landscapes within San Bernardino County makes for a variety of different climate areas. Rainfall and temperatures show substantial variation throughout the area. The South Coast portion of the County receives an average of 16 inches of rainfall each year, with a maximum monthly average temperature of 97 degrees Fahrenheit. In contrast, the central portion receives an average of 6 inches of rainfall each year, with an average maximum summer temperature of 102 degrees Fahrenheit. In the northeast portion of the County, rainfall averages 4 inches per year, and the average maximum summer temperature is 107 degrees Fahrenheit.

Information about meteorology, ozone concentrations, and transport within the northeast portion of the County is based on data for Trona and for sites in the surrounding area at Ridgecrest, Mojave National Preserve, Jean (Nevada), Blythe, Barstow, and Mojave. Additional information is based on back trajectories constructed as part of an ozone transport assessment.

Northeast San Bernardino County is rural in nature, with extremely low population and few significant emissions sources. Because local emissions are low, locally measured ozone concentrations reflect the impact of long range transport from upwind urban areas. Based on general wind patterns, Northeast San Bernardino County is downwind of several high emission source areas, including the highly urbanized South Coast and San Joaquin Valley air basins. Previous ARB transport assessments have found that the transport contribution from both the South Coast and the San Joaquin Valley into the desert portions of San Bernardino County can be overwhelming. An evaluation of back trajectories corroborates these findings.

### ***Air Quality Data:***

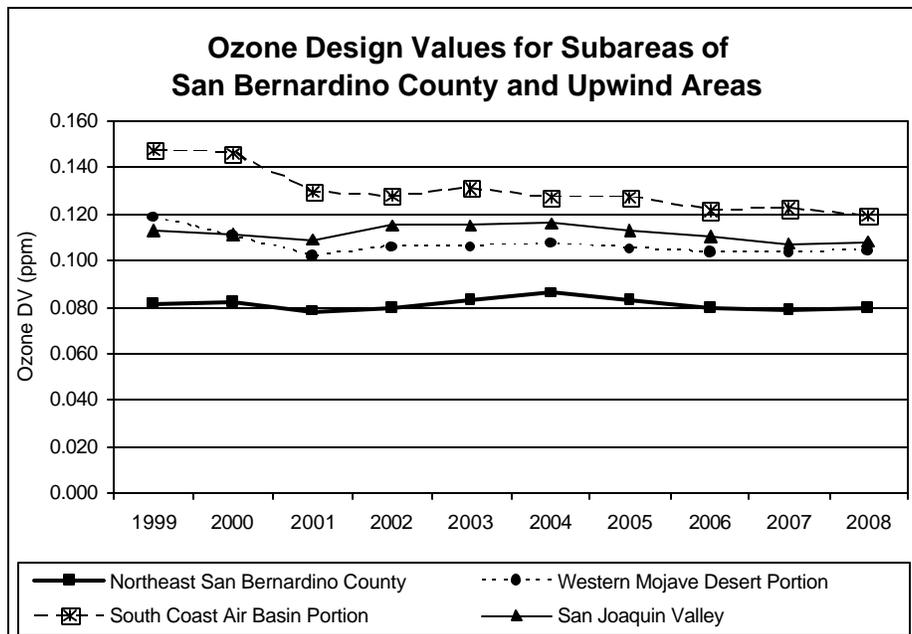
There is one ozone monitor in Northeast San Bernardino County, located at Trona (refer to Figure 1). The design value for this site is 0.080 ppm, based on data for 2006 through 2008. This value does not violate the previous 8-hour standard, but it does violate the revised standard. As shown in Table 1, the design value for Northeast San Bernardino County is significantly lower than the design values for the Western Mojave Desert portion of the County and for the upwind areas of the South Coast and the San Joaquin Valley. The design value for the northeast portion of the County is less than 10 percent above the level of the standard, while design values for the other three areas are 40 to 60 percent above the standard. Because of the significant differences in design value, the northeast portion of the County should be designated separately and given a classification that is commensurate with the overall magnitude of the ozone problem in this area.

**TABLE 1**  
**8-HOUR OZONE DESIGN VALUES FOR VARIOUS PORTIONS OF**  
**SAN BERNARDINO COUNTY AND UPWIND AREAS**  
**BASED ON 2006 THROUGH 2008 DATA**

<b>AREA</b>	<b>DESIGN SITE</b>	<b>DESIGN VALUE (ppm)</b>	<b>PERCENT ABOVE STANDARD</b>
NE San Bernardino Portion of County	Trona	0.080	7%
Western Mojave Desert Portion of County	Joshua Tree-NM	0.104	39%
South Coast Air Basin Portion of County	Crestline	0.119	59%
San Joaquin Valley Air Basin	Arvin	0.108	44%

The design value trends for all four areas are shown in Figure 2. It is apparent from the graph that design values for the South Coast and Western Mojave Desert Air Basin portions of the County, as well as for the San Joaquin Valley, are higher than that for Northeast San Bernardino County. However, regardless of level, the design value trends for the Western Mojave Desert and Northeast portions of San Bernardino County mirror those for the South Coast and San Joaquin Valley. This reflects the overwhelming impact of transport in these areas, where improvements in ozone air quality are tied to improvements in the upwind urban area.

**FIGURE 2**



Past control strategies for both the South Coast and the San Joaquin Valley have relied heavily on reducing reactive organic gas (ROG) emissions. While this strategy has been effective in reducing ozone close to the urban areas, ozone in transport-impacted areas has not seen the same level of improvement. Future strategies will rely more heavily on reducing oxides of nitrogen (NOx) emissions. ARB expects ozone concentrations in the northeast and Western Mojave Desert portions of San Bernardino County will begin to decrease at a faster rate as emission control strategies contained in the recently submitted State Implementation Plan begin to be effective.

***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

Similar to air quality, there are vast differences among the population in each of the three San Bernardino County subareas. Based on an analysis of census data, Table 2 gives a summary of the size of each area and its population. More than three-quarters of the County population lives in the highly urbanized, South Coast portion of San Bernardino County. Most of the rest of the County population (20 percent) lives in the Western Mojave Desert portion. Less than 2 percent live in Northeast San Bernardino County. Because Northeast San Bernardino County is so large, the population density is very low, with less than 2 people per square mile. This compares with more than 1,100 people per square mile in the South Coast portion of the County, and 47 people per square mile in the Western Mojave Desert portion.

With higher population numbers and densities comes a greater degree of urbanization and generally higher growth rates, because of the jobs and convenience associated with the urban area. San Bernardino County is no exception. The Western Mojave Desert portion of the County is closely linked to the South Coast portion because of its proximity to the larger urban area. Many people within this area commute to jobs in the South Coast, while others work in the cities that have developed close to the South Coast / Western Mojave boundary. These ties are less obvious, as one moves further away from the South Coast area, into the northeast portion of the County.

Over time, both the South Coast and Western Mojave Desert portions of San Bernardino County have seen much higher growth rates when compared with Northeast San Bernardino County. Table 2 shows these different rates from 1990 to 2000. Growth rates in the urbanized portions of the County have been more than triple the rates in the northeast. This discrepancy in growth is expected to continue.

**TABLE 2  
8-HOUR OZONE DESIGN VALUES FOR VARIOUS PORTIONS OF  
SAN BERNARDINO COUNTY BASED ON 2006 THROUGH 2008 DATA**

<b>AREA</b>	<b>SIZE (square miles)</b>	<b>POPULATION</b>	<b>GROWTH IN POPULATION (1990-2000)</b>	<b>PEOPLE PER SQUARE MILE</b>
NE San Bernardino County Portion	11,470	25,941	+ 6%	2
Western Mojave Desert Portion	7,503	350,426	+ 22 %	47
South Coast Air Basin Portion	1,132	1,333,067	+ 20 %	1,178

***Emissions Data and Level of Emission Controls***

Similar to population, there are vast differences in ozone precursor emissions among the three County subareas (refer to Table 3). In terms of number, ARB's emissions inventory shows five times more facilities in the Western Mojave Desert portion (125 facilities) and more than 10 times more in the South Coast portion (320 facilities), as are located in Northeast San Bernardino County (26 facilities). Facilities tend to be concentrated in the urban areas and along the major roadways in the South Coast and Western Mojave Desert portions, in contrast to being scattered throughout the area in Northeast San Bernardino County.

**TABLE 3  
TOTAL ROG AND NO<sub>x</sub> EMISSIONS IN VARIOUS PORTIONS  
OF SAN BERNARDINO COUNTY**

<b>AREA</b>	<b>TONS / DAY ROG</b>	<b>TONS / DAY NO<sub>x</sub></b>
NE San Bernardino County Portion	10.4	19.5
Western Mojave Desert Portion	48.4	149.5
South Coast Air Basin Portion	81.6	92.3

In combination, facilities in the South Coast and Western Mojave Desert portions of the County emit three and ten times more NO<sub>x</sub> and ROG than facilities in the northeast portion of the County. When mobile source emissions are added in, the discrepancy is similar (refer to Table 3). Total emissions of ROG and NO<sub>x</sub> in the South Coast and Western Mojave Desert portions of the County are five to eight times higher than in Northeast San Bernardino County. In terms of mobile source emissions, the dense network of streets and freeways in the South Coast portion of San Bernardino County carry significant amounts of traffic, averaging over 38 million vehicle miles travelled (VMT) each day. In contrast, the more

limited networks in the Western Mojave Desert and Northeast portions of San Bernardino County average less than half that amount (19.8 million VMT each day). The bulk of the daily VMT in these areas is concentrated near the South Coast portion of the County.

In terms of emissions controls, the statewide mobile source and consumer product regulations form the cornerstone of the attainment strategy for rural transport-impacted areas, along with the emissions reduction controls in the upwind regions of the South Coast and San Joaquin Valley. In addition, the Mojave Desert AQMD has adopted rules to reduce emissions from existing, as well as new or modified stationary sources under its jurisdiction.

***Summary and Recommendation:***

In summary, the air quality problem in Northeast San Bernardino County is much less severe than in the Western Mojave Desert portion of the County. Ozone concentrations in the northeast County are overwhelmed by transport, even more so than in the Western Mojave Desert portion. As a result, the primary attainment strategy will rely on statewide controls and control measures implemented by upwind districts. Although there are few stationary emissions sources in Northeast San Bernardino County, there are few significant differences in the control requirements for stationary sources under the jurisdiction of the Mojave Desert AQMD.

Although Northeast San Bernardino County is contiguous with the Western Mojave Desert nonattainment area, and both areas will rely on controls in upwind areas to reach attainment, the magnitude of their problems is substantially different. Therefore, ARB recommends Northeast San Bernardino County be designated as a separate nonattainment area. Designating the area separately will give them a classification consistent with the nature and severity of their overall air quality problem and will facilitate a more timely attainment finding.

**Southern Inyo County**

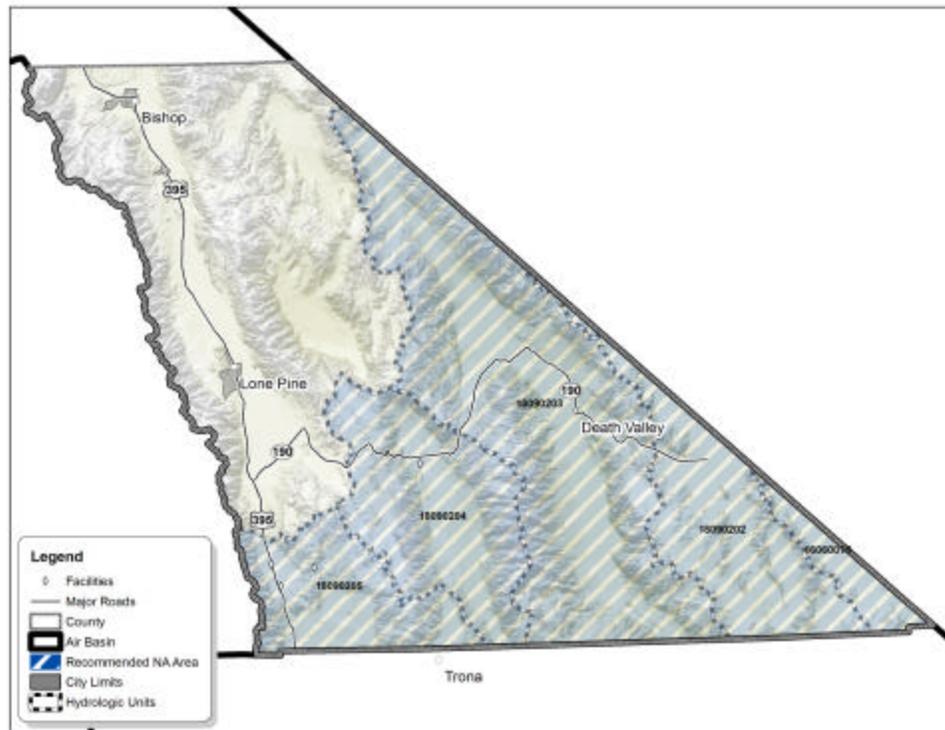
***Jurisdictional Boundaries:***

Inyo County falls under the jurisdiction of the Great Basin Unified Air Pollution Control District (GBUAPCD). Whereas Inyo County attained the previous 8-hour standard, concentrations violate the revised ozone standard. Because of the transport-impacted nature of the air quality problem in Southern Inyo County, ARB staff recommends limiting the extent of the nonattainment area.

### ***Geography / Topography:***

Inyo County is the second largest county in California, encompassing over 10,000 square miles of varied terrain (refer to Figure 3). Within its borders lies the highest point in the continental United States, Mount Whitney, towering nearly 14,500 feet above sea level. Less than 100 miles away is Death Valley. Its lowest point, near Badwater, lies 282 feet below sea level. This is not only the lowest point in the 48 contiguous states, but in the entire North American continent. With these extremes in elevation come extremes in temperature and precipitation, both of which can impact air quality.

**FIGURE 3  
INYO COUNTY**



### ***Meteorology:***

The geographical extremes of Inyo County provide for extremes in weather. The southern portion of the County is a high desert area with a typical desert climate. Summers are hot, while winters are cool. Maximum daily temperatures during the summer months are frequently well over 100 degrees Fahrenheit. What little rainfall does occur, generally falls during the winter months. On average, rainfall in the Death Valley area is less than 2 inches per year.

Information about ozone concentrations in Inyo County are based on data for Death Valley, Bishop, and the Trona air monitoring site, which is just south of the Inyo County line in San Bernardino County. Some additional information is based on back trajectories constructed for a transport assessment.

Similar to Northeast San Bernardino County, Southern Inyo County is rural in nature with few ozone precursor emissions sources. Because the area lacks significant emissions sources capable of generating ozone locally, ozone concentrations measured in Southern Inyo County reflect the impact of long range transport. Based on general wind patterns, Southern Inyo County is downwind of two major emissions source areas: the South Coast Air Basin and the San Joaquin Valley Air Basin.

General wind patterns suggest that ozone is transported into Southern Inyo County from the south to southwest. This transported ozone travels northward, up valleys bounded by tall north-south mountain ranges. The extent of this transport is limited by tall mountains that are transverse to these north-south ranges. These transverse ranges represent the northern extent of transported airflow. When air pollutants reach this point, they disperse vertically upslope, and concentrations are lowered considerably. Although there are several towns, such as Lone Pine and Bishop, that are located north of the recommended Southern Inyo County ozone nonattainment area, there is no evidence that emissions from these areas are transported south, thereby impacting Southern Inyo County.

The extent of airflow into Southern Inyo County is limited by terrain. Similarly, federal hydrologic units are defined by terrain. These water drainage units generally follow the crests of mountain ranges. Hydrologic units are defined in a manner similar to the way air basins are defined, because water drainage is constrained by the same geographic features as airflow. As a result, hydrologic units provide an appropriate basis for defining the extent of ozone transport impacts in Southern Inyo County.

#### ***Air Quality Data:***

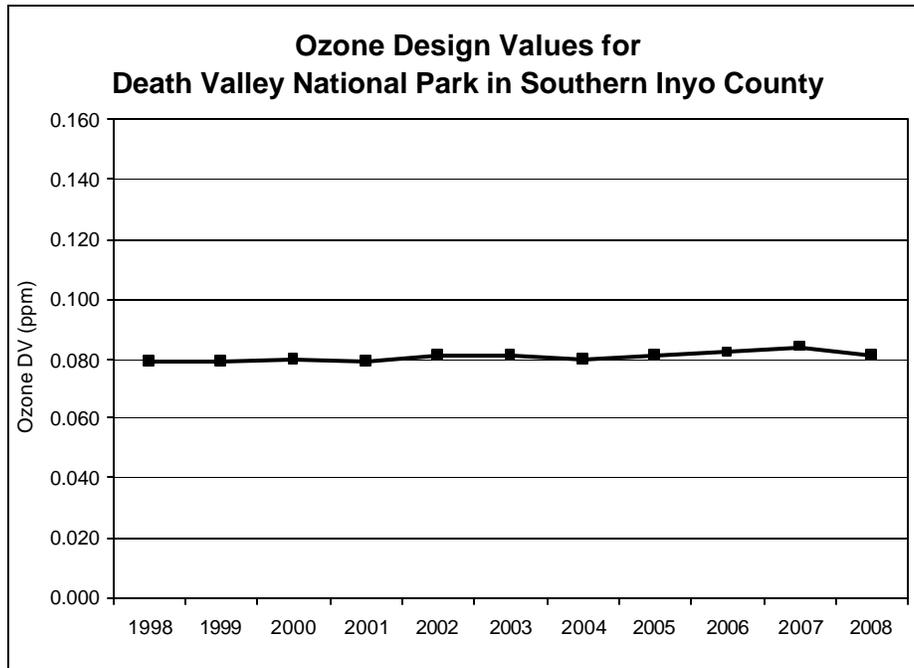
There is only one ozone monitor in Inyo County for which complete, quality assured data are available. This monitor is located within the bounds of Death Valley National Park. The design value based on 2006 through 2008 data is 0.081 parts per million, which exceeds the standard by 8 percent. The design value for Death Valley is similar to that for Trona in San Bernardino County (0.080 ppm) and the China Lake area of Kern County (0.081 ppm). Both of these areas are located near Inyo County's southern boundary, and both are highly impacted by transport, as well.

Figure 4 shows a trend line for design values at Death Valley since 1998. There has been little change in the trend over the years. Similar to the desert areas of

southern California, Southern Inyo County is impacted by transport from the South Coast and southern San Joaquin Valley areas.

Although air quality in these upwind areas has improved over the years, the same degree of improvement has not been seen in downwind areas. However, trends in downwind areas are expected to improve with the implementation of control strategies emphasizing greater NOx reductions.

**FIGURE 4**



***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

While population density is relatively sparse throughout Inyo County, it is even more spread out in the southern portion. The GBUAPCD estimates only 0.22 people per square mile in the recommended Southern Inyo County nonattainment area. Over time, this area has actually seen a decrease in population, from 3,473 people in 1990 to 3,117 people in 2000. This represents an overall decrease of about 10 percent, and the population is not expected to grow significantly in the next several years. Although there are several roadways carrying traffic through Southern Inyo County, emissions related to commutes within the area are not significant because of the low population and scattered nature of development within the area.

### ***Emissions Data and Level of Emission Controls***

Emissions in Southern Inyo County are very low in comparison to the upwind South Coast and San Joaquin Valley air basins. As shown in Figure 3, there are only a handful of industrial stationary sources in Southern Inyo County. Emissions from these sources total 181 tons per year of NO<sub>x</sub>, and there are no measurable ROG emissions. In addition to stationary sources, there are several highways traversing Inyo County that contribute mobile source emissions.

Overall, countywide emissions for Inyo County total 1,699 tons per year of NO<sub>x</sub> and 2,184 tons per year of ROG. Since 1990, there has been a 21 percent reduction in countywide NO<sub>x</sub> emissions and a 9 percent reduction in ROG emissions. The statewide strategy will continue to reduce overall emissions in the future. These future emission reductions will place greater emphasis on NO<sub>x</sub> reductions. Photochemical modeling shows that a greater emphasis on NO<sub>x</sub> reductions will have a greater benefit in terms reducing ozone concentrations in downwind, transport-impacted areas such as Southern Inyo County.

### ***Summary and Recommendation:***

Inyo County is one of the largest counties in the nation, and encompasses a variety of landscapes, from high mountain peaks to below sea level deserts. The revised ozone standard is exceeded in the southern portion of the County, which has an extremely low population and lacks significant industrial emissions sources. While the presumptive boundary for the nonattainment area would include all of Inyo County, ARB recommends a smaller nonattainment area because of the diversity of the area's geography and the nature of the ozone impact.

Previous studies suggest that ozone concentrations at the Death Valley site are substantially impacted by transport. Wind flow into the southern portion of the County is generally from the south to southwest, carrying pollutants and emissions from the highly urbanized South Coast and southern San Joaquin Valley air basins into Southern Inyo County. Although Death Valley is the only monitoring site in Southern Inyo County, data are also collected at the Trona site in San Bernardino County and in the China Lake area of Kern County. These sites are close to the southern boundary of Inyo County and suggest that exceedances are likely to occur throughout Southern Inyo County.

The recommended boundary for Southern Inyo County is based on federal hydrologic units. Hydrologic units are based on topography and water drainage, similar in many respects to the way California's air basins are defined. Therefore, it is appropriate to use them in defining the nonattainment area boundary, since mountainous terrain affects the transport and mixing depth of pollution. In addition, hydrologic units have been used in the past, to define ozone designation areas. ARB staff recommends the Southern Inyo County

ozone nonattainment area comprise the Inyo County portions of federal hydrologic units 16060015, 18090202, 18090203, 18090204, and 18090205. These units cover not only the areas exceeding the standard, but also the extent of the region expected to be impacted by transport from the major upwind urban areas.

### **Eastern San Luis Obispo County**

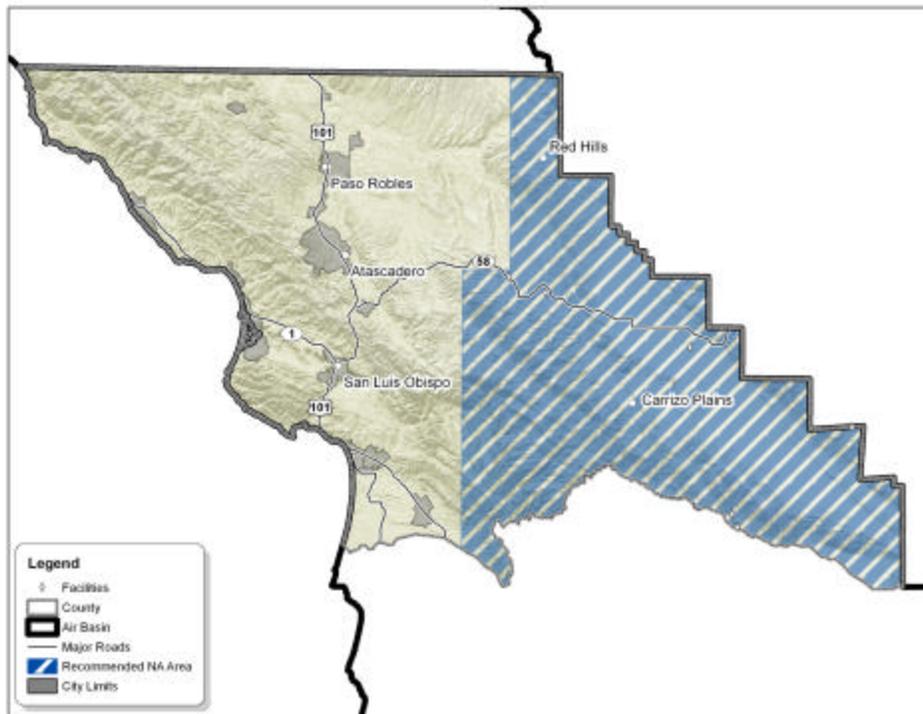
#### ***Jurisdictional Boundaries:***

San Luis Obispo County is part of California's South Central Coast Air Basin. Air quality control in the County is under the jurisdiction of the San Luis Obispo County Air Pollution Control District (SLOAPCD)

#### ***Geography / Topography:***

Although San Luis Obispo County is generally considered a coastal area, this generalization applies only to the western portion of the County (refer to Figure 5). This western portion includes the major cities in the County such as San Luis Obispo, Atascadero, and Paso Robles. As one moves inland, the coastal plain gives way to the mountains of the Coast Ranges, interspersed with

**FIGURE 5  
SAN LUIS OBISPO COUNTY**



a series of valleys and high plains which range in elevation from about 2000 to more than 5000 feet. These rural, higher elevation areas separate San Luis Obispo County from the San Joaquin Valley. Although Eastern San Luis Obispo County is sparsely populated, there are scattered settlements and public facilities, such as schools. This area also includes Carrizo Plains National Monument, with grinding rocks and rock paintings reflecting the historic Native American population.

***Meteorology:***

San Luis Obispo County is a meteorologically diverse region. To the west, high summer temperatures average in the low to mid 60s. Toward the middle of the County, high summer temperatures average in the low to high 70s. In contrast to both these areas, Eastern San Luis Obispo County sees high summer temperatures, averaging in the 90s, and the mountains separating the eastern portion of the County from the western portion effectively block the tempering influence of the ocean.

In terms of general wind patterns, Eastern San Luis Obispo is downwind of both the San Joaquin Valley and the San Francisco Bay Area air basins. Previous ARB transport assessments found these areas to have an overwhelming impact on ozone concentrations in San Luis Obispo County.

***Air Quality Data:***

Ozone data are available for two sites in Eastern San Luis Obispo County: Carrizo Plains and Red Hills. Table 4 includes design values, based on data for 2006 through 2008, for sites in both the eastern and western portions of San Luis Obispo County. Values for the eastern sites are 12 to 17 percent above the level of the standard, whereas values for the western sites attain the standard.

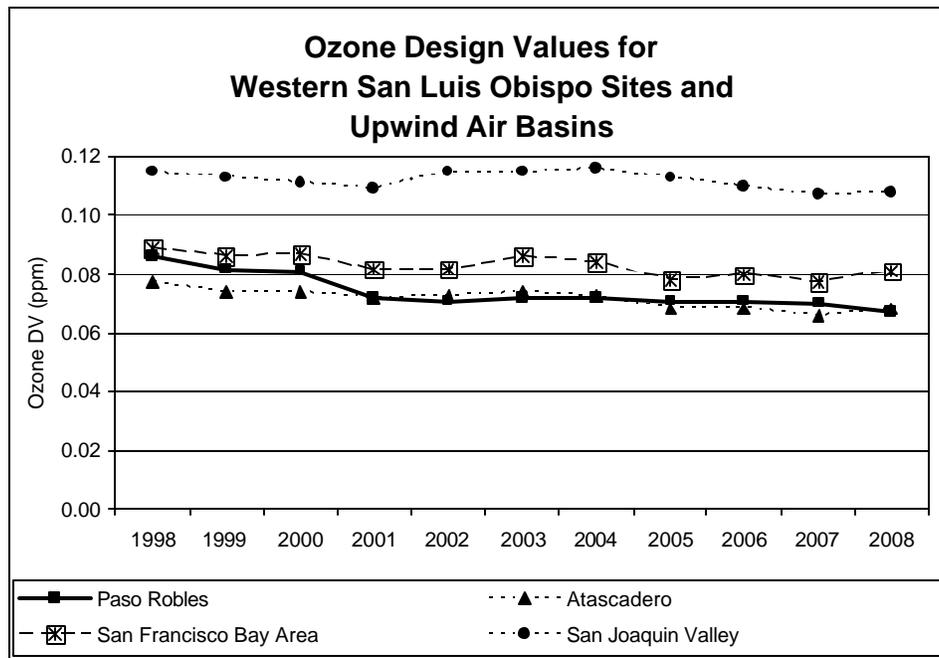
**TABLE 4  
8-HOUR OZONE DESIGN VALUES FOR VARIOUS PORTIONS OF  
SAN LUIS OBISPO COUNTY BASED ON 2006 THROUGH 2008 DATA**

<b>SITE / COUNTY PORTION</b>	<b>DESIGN VALUE (ppm)</b>	<b>PERCENT ABOVE STANDARD</b>
Carrizo Plains / Eastern San Luis Obispo	0.084	12%
Red Hills / Eastern San Luis Obispo	0.088*	17%
Paso Robles / Western San Luis Obispo	0.068	0%
Atascadero / Western San Luis Obispo	0.068	0%

\* Design Value based on 2 years of data (2007-2008).

Because long-term data are not available for either Carrizo Plains or Red Hills, design value trends are not available. However, long-term trends for high sites in the western portion of the County and for the upwind air basins are plotted in Figure 6. The trends for the San Luis Obispo sites, which are also impacted by transport from the San Francisco Bay Area and San Joaquin Valley air basins, track fairly well with the upwind areas and show similar rates of improvement. We expect sites in Eastern San Luis Obispo County would show similar trends.

**FIGURE 6**



***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

More than 250,000 people reside in San Luis Obispo County, with the majority living in the western portion of the County. Overall, more than 95 percent of the County's population lives in Western San Luis Obispo County. Those that live in Eastern San Luis Obispo County are scattered throughout the area. Between 1990 and 2000, the total number of people in the eastern portion of the County actually decreased, and the SLOAPCD expects little growth in the area over the next several years. In contrast, the number of people living in the western portion increased by about 15 percent between 1990 and 2000. Emissions related to commutes within the area are not significant because of the low population and scattered nature of development.

### ***Emissions Data and Level of Emission Controls:***

Emissions in Eastern San Luis Obispo County are very low. The SLOAPCD estimates a total of 2.2 tons per year of ROG and 4.3 tons per year of NOx in the eastern portion of the County. These amounts are less than 1 percent of the total countywide ROG and NOx emissions. There are limited mobile source emissions from several highways traversing the eastern County area. Emissions from these sources are not expected to significantly impact ozone concentrations in Eastern San Luis Obispo County. Overall, emission sources located throughout San Luis Obispo County are subject to the rules and regulations of the SLOAPCD. In addition, mobile source emissions will continue to be reduced under the statewide strategy.

### ***Summary and Recommendation:***

San Luis Obispo County comprises coastal, as well as inland areas. However, the revised ozone standard is violated only at the inland sites, which are high elevation sites located in the rural, eastern portion of the County. This portion of the County is sparsely populated and lacks emissions sources. The design value for the eastern area is 0.084 ppm, measured at Carrizo Plains (Red Hills has a higher value, 0.088 ppm, but this value is based on only two years of data). Sites in Western San Luis Obispo County, as well as in counties to the north and to the south, all attain the standard.

The high elevation sites in Eastern San Luis Obispo County were originally sited to provide information on transport impacts from upwind urban areas. Previous studies have shown that ozone and ozone precursor emissions from the San Joaquin Valley are transported west, impacting Eastern San Luis Obispo County, including the Carrizo Plains and Red Hills sites. Ozone concentrations can also be impacted by transport south from the San Francisco Bay Area. Because violations occur only at elevated sites in the eastern County, ARB recommends limiting the nonattainment area to Eastern San Luis Obispo County, which reflects the extent of the County influenced by transport sufficient to cause violations of the federal standard.

### **Pinnacles National Monument**

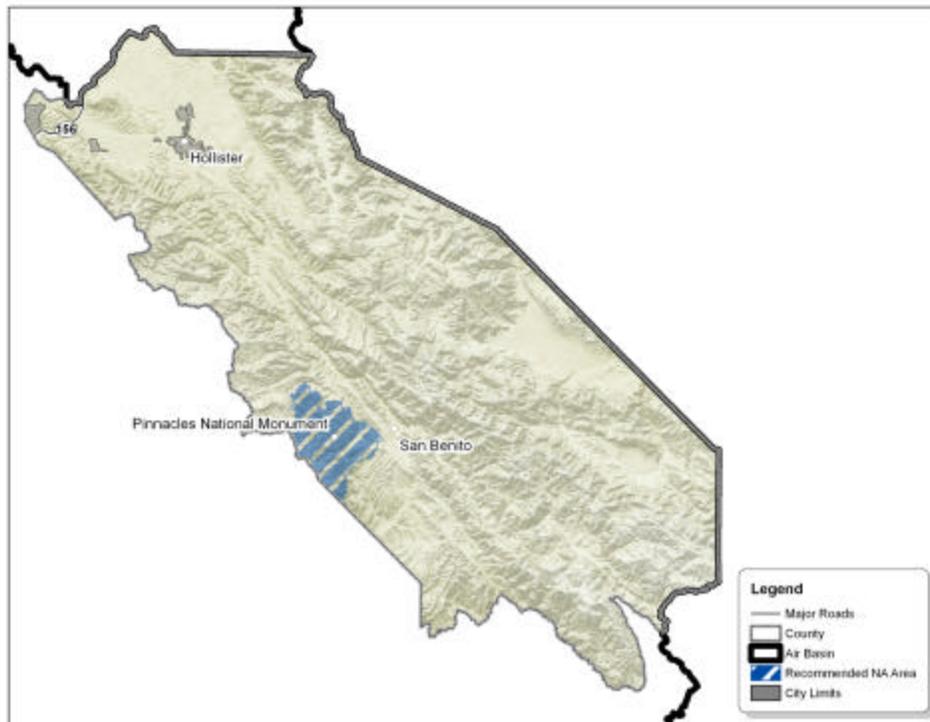
#### ***Jurisdictional Boundaries:***

Nearly all of Pinnacles National Monument is located in San Benito County, with a small portion in Monterey County. Air quality control throughout San Benito County falls under the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD). All sites within the MBUAPCD region attained the previous 8-hour standard. The monitor at Pinnacles is the only one that violates the revised standard.

**Geography / Topography:**

Pinnacles National Monument is located in an area of rugged terrain in California's North Central Coast Air Basin (refer to Figure 7). It lies about 40 miles inland from the Pacific Ocean, just east of the Salinas Valley, and about 80 miles south of the San Francisco Bay Area. The monument is in the southern portion of the Gabilan Mountains, which are part of California's Central Coast Range. Elevations within the Monument boundaries range from 824 feet to 3,304 feet at the top of North Chalone Peak. The landscape includes the spectacular remains of an ancient volcano. Massive monoliths, spires, sheer-walled canyons, and talus passages have been created through millions of years of erosion, faulting, and tectonic plate movement. Established in 1908, the Monument has increased by bits and pieces to its present size of about 26,000 acres. It boasts over 30 miles of trails, but has no overnight facilities.

**FIGURE 7  
PINNACLES NATIONAL MONUMENT IN SAN BENITO COUNTY**



**Meteorology:**

Pinnacles National Monument has a Mediterranean climate with hot, dry summers and cool, moderately wet winters. Although the Monument is only 40 miles inland from the Pacific Ocean, the Santa Lucia Mountains to the west

strongly modify the ocean influence before it reaches Pinnacles. As a result, summer temperatures at Pinnacles might range from 50 degrees Fahrenheit at night to 100 degrees during the day, while those near the coast are a fairly steady 60 degrees. Similarly, winter temperatures at Pinnacles often drop below freezing while coastal temperatures remain moderate. Average rainfall at Pinnacles is 16 inches per year, with most of it occurring between January and March. Small amounts of snow fall at the higher elevations between mid-December and January.

Based on general wind patterns, Pinnacles National Monument is downwind of the San Francisco Bay Area, which has significant emissions sources. Pollutants and emissions from the Bay Area are transported aloft, impacting concentrations at high elevations in the Pinnacles area. Previous transport assessments found the transport contribution from the San Francisco Bay Area can have an overwhelming impact on ozone concentrations measured at Pinnacles.

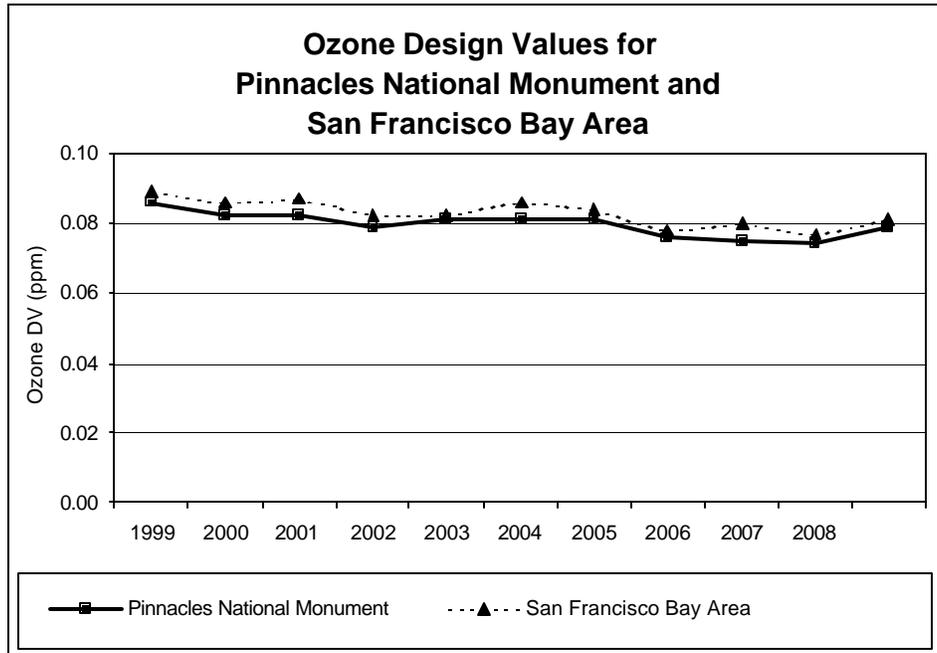
### ***Air Quality Data:***

The monitor at Pinnacles National Monument was sited to measure high elevation transport from the San Francisco Bay Area. The location is isolated and remote. Ozone concentrations measured at Pinnacles exceed the revised federal 8-hour ozone standard, with a design value of 0.079 ppm. In contrast, design values for other sites in the surrounding north central coast region are all well below the level of the standard, ranging from 0.052 ppm to 0.069 ppm. All of these sites are located at lower elevations.

The design value trend for Pinnacles is shown in Figure 8. With the exception of 2008, the design value for Pinnacles has shown an overall downward trend since 1998. In fact, the 2006 and 2007 design values for this site (0.075 ppm and 0.074 ppm, respectively) show attainment. The higher value for 2008 likely reflects the impact of wildfires that burned throughout the State during the summer of 2008. If the impacted days were removed from consideration, the 2008 design value would be more consistent with values for previous years. However, the area would still be nonattainment.

The trend for Pinnacles closely follows the trend for the San Francisco Bay Area, although at a slightly lower level. Previous transport study indicates that exceedances measured at Pinnacles are overwhelmingly impacted by transport aloft from the Bay Area. Although the San Francisco Bay Area does not yet attain the standard, design values for Bay Area sites have decreased at a rate similar to those for Pinnacles. As emissions in the San Francisco Bay Area continue to decrease, ozone concentrations in downwind areas such as Pinnacles will also continue to improve.

**FIGURE 8**



***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

There is no permanent population living at Pinnacles National Monument, and there are no overnight accommodations for those visiting the monument. Because there are no roads travelling through the Monument, traffic is limited to those visiting the Monument for day use.

***Emissions Data and Level of Emission Controls***

With the exception of the few roads, there are no significant emissions sources located within Pinnacles National Monument. As a result, the area lacks emissions for locally generating ozone. Previous analyses indicate that ozone concentrations measured at the Pinnacles monitor are attributable to the transport of pollutants and emissions from the San Francisco Bay Area. Ozone concentrations at Pinnacles should continue to decrease, with continued implementation of upwind district controls and the statewide strategy.

### ***Summary and Recommendation:***

The Pinnacles monitor is an elevated site (1000 feet) located in an area of complex terrain within the boundaries of Pinnacles National Monument. With the exception of a few roads, there are no local ozone precursor emissions sources. In addition, there are no permanent residents, and overnight stays are not allowed within the Monument boundaries. Ozone exceedances in the North Central Coast Air Basin are measured only at Pinnacles. All other sites in the surrounding areas attain the standard, with design values ranging from 0.052 to 0.069 ppm in the surrounding three-county area (Monterey, Santa Cruz, and San Benito counties). Furthermore, the violations at Pinnacles are attributable to transport from the San Francisco Bay Area, which will continue to be designated as nonattainment.

ARB recommends a focussed nonattainment area, limited to that portion of Pinnacles National Monument located within San Benito County. Using the Monument boundary provides an easily identifiable nonattainment area, and it adequately reflects the region impacted by the upwind urban area.

### **Tuscan Buttes**

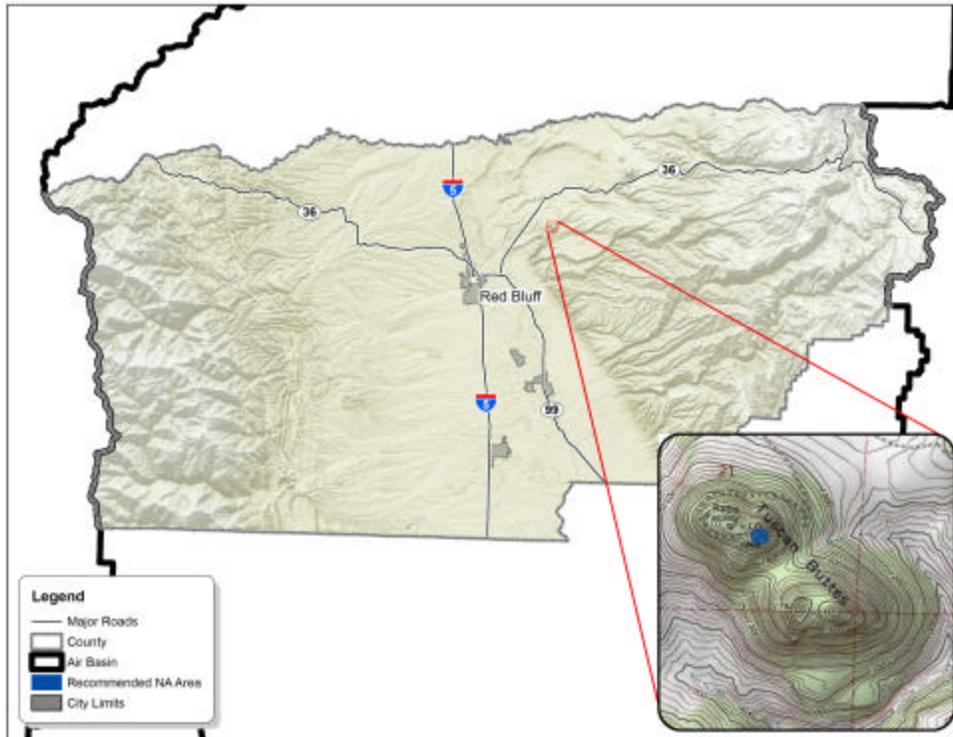
#### ***Jurisdictional Boundaries:***

Tuscan Buttes is located in eastern Tehama County in the northern Sacramento Valley. All of Tehama County is under the jurisdiction of the Tehama County Air Pollution Control District.

#### ***Geography / Topography:***

As shown in Figure 9, Tuscan Buttes is an isolated, elevated area in the Upper Sacramento Valley, where the majority of the land is near sea level. Located about 10 miles northeast of Red Bluff, Tuscan Buttes is a narrow, small ridge on the eastern side of the Valley. The area at the top of the Buttes stands above 1800 feet elevation.

**FIGURE 9**  
**TUSCAN BUTTES IN TEHAMA COUNTY**



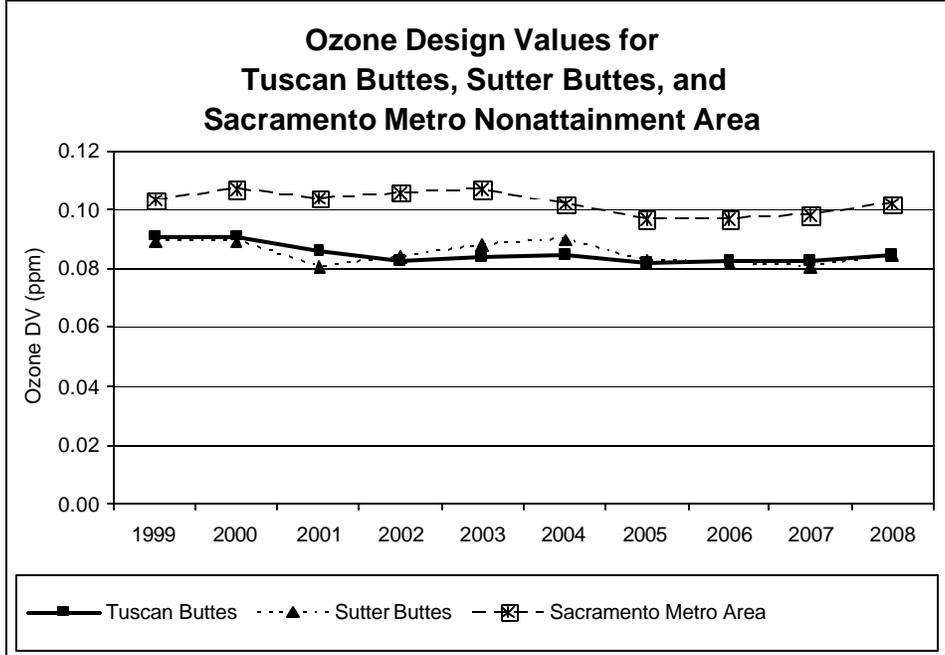
***Meteorology:***

Tuscan Buttes exhibits the typical climate pattern of the Sacramento Valley, with hot, dry summers and cooler, wetter winters. In terms of air quality, the Buttes are impacted by transport from the Sacramento urban area. Based on general wind patterns, this area is downwind of significant emissions sources within the Sacramento Metro Area. Previous transport assessments found that the transport contribution from the Sacramento Metro Area to the Upper Sacramento Valley can be overwhelming. Because there are no local population or emissions sources, ozone concentrations measured at Tuscan Buttes are attributable to transport.

***Air Quality Data:***

Figure 10 shows the design value trends for Tuscan Buttes, as well as for the upwind Sacramento Metro Area. The graph also shows the trend line for Sutter Buttes, another high elevation, transport dominated site in the Upper Sacramento Valley. The trends for both Tuscan Buttes and Sutter Buttes are nearly identical. Both track well with the trend for the Sacramento Metro Area, illustrating the importance of transport at the two locations.

**FIGURE 10**



Although all three areas show general improvement over the years, the values for 2008 are slightly higher than for previous years. These higher values likely reflect the impact of wildfires that burned throughout California during the summer of 2008. If the fire-impacted days were removed, the design values for 2008 would be lower, but the areas would still be nonattainment.

Because there is no population in either the Tuscan Buttes or Sutter Buttes areas, ozone concentrations measured at these sites do not represent population exposure. In contrast to these sites, design values for surrounding sites that are located in populated areas, such as the Red Bluff site in Tehama County and sites in the populated areas of Colusa, Glenn, and northern Sutter counties, show attainment of the revised standard.

***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

There is no population living at Tuscan Buttes or in the surrounding local area. This is not expected to change in the next several years. Access to the area is limited, and traffic-related emissions are insignificant.

***Emissions Data and Level of Emission Controls***

There are virtually no ozone precursor emissions sources in the Tuscan Buttes area. The only development on the Buttes is a radio facility and a fire lookout.

Access to these facilities is very limited. The site is dominated by transport from the Sacramento Metro area, and attainment will depend on upwind district controls and the statewide strategy.

***Summary and Recommendation:***

There are two monitors in Tehama County. The first site, Red Bluff-Oak Street, is located in the town of Red Bluff at an elevation of 322 feet. The design value for this site reflects population exposures and meets the revised standard. In contrast, the design value for the Tuscan Buttes site violates the standard. There are no population or emissions in the Tuscan Buttes area. Ozone concentrations measured at the site are dominated by transport from the Sacramento Metro Area.

Located at an elevation of 1,877 feet, the Tuscan Buttes monitor is similar to the Sutter Buttes monitor in Sutter County. Both of these monitors were sited to study high-elevation transport of pollutants from the Sacramento Metro Area into the Upper Sacramento Valley. There are no pollution sources or populated areas near either site. In both cases, design values for lower elevation sites in the surrounding populated areas all attain the standard, lending additional support to the argument that the ozone problems at the elevated sites are unique and isolated.

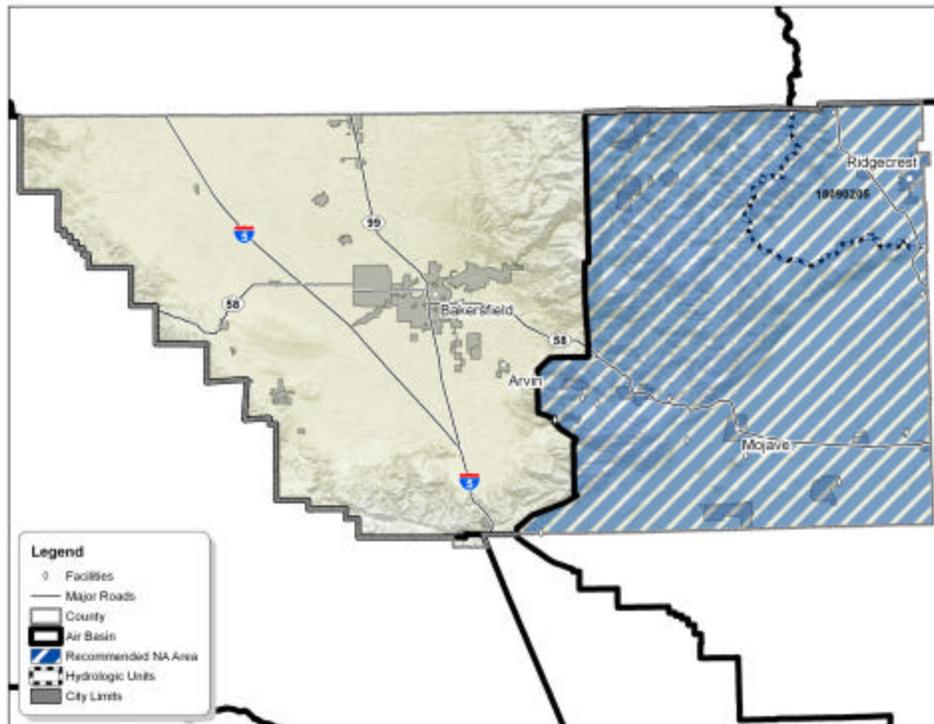
Sutter Buttes is currently designated as nonattainment, and the nonattainment area includes the immediate area above 2000 feet elevation. Because of the elevated location and lack of population exposure at the Tuscan Buttes site, ARB recommends the geographic scope of this nonattainment area be limited to that portion of the Tuscan Buttes area with an elevation of 1800 feet or more. This approach is consistent with the approach U.S. EPA used in designating the Sutter Buttes ozone nonattainment area.

**Eastern Kern County**

***Jurisdictional Boundaries:***

Kern County is located in two different air basins. The western portion of the County is located in the San Joaquin Valley Air Basin, while the eastern portion is located in the Mojave Desert Air Basin (refer to Figure 11). The eastern portion of the County falls under the jurisdiction of the Kern County Air Pollution Control District. Currently, the northeast corner of Eastern Kern County, which coincides with the Kern County portion of federal hydrologic unit #18090205, is designated as attainment for the old federal 8-hour standard. In contrast, the remainder of Eastern Kern County is designated as nonattainment.

**FIGURE 11**  
**EASTERN KERN COUNTY**



***Geography / Topography:***

Eastern Kern County occupies the northwestern portion of the Mojave Desert, as well as portions of the Tehachapi Mountains and the southern end of the Sierra Nevada. The ozone monitors in Eastern Kern County are located in the desert portions of the region, which are classified as high desert. Elevations in this area range from about 2000 to 5000 feet above sea level.

***Meteorology:***

Violations of the revised ozone standard are measured at two sites in the desert portion of Eastern Kern County. This desert region has a typical desert climate, with hot dry summers and cool winters with little rainfall. In the southern part of Eastern Kern County, maximum summer temperatures average 94 degrees Fahrenheit, and rainfall averages 6 inches per year. Values in the northeast corner (Indian Wells Valley area) are a little higher, with maximum summer temperatures averaging 100 degrees and rainfall averaging 7 inches each year.

Based on general wind patterns, Eastern Kern County is downwind of two major urban source areas: the South Coast Air Basin and the San Joaquin Valley Air Basin. As a result, ozone concentrations throughout Eastern Kern County are

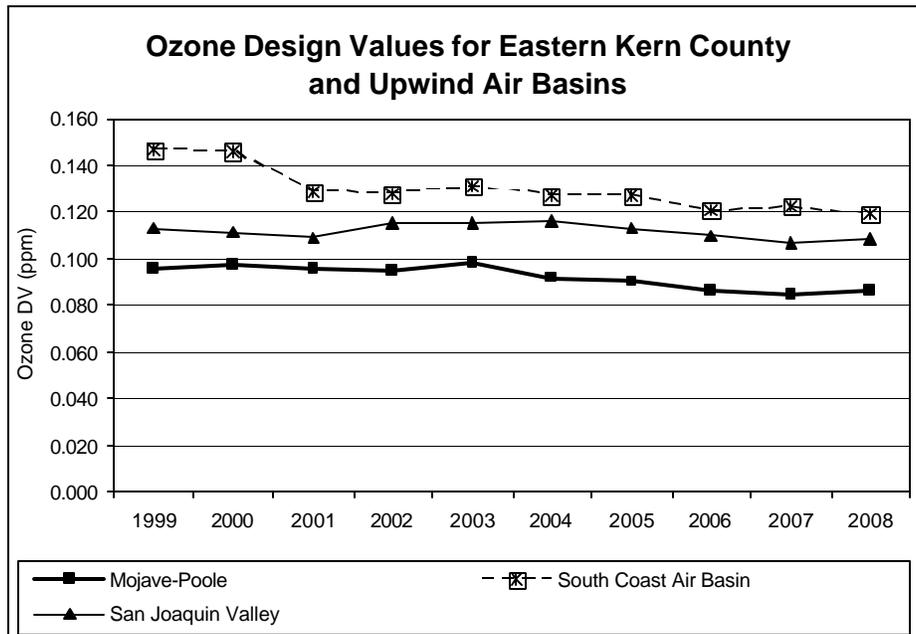
impacted by long range transport from these areas. Previous transport assessments show that ozone concentrations in Eastern Kern County can be overwhelmed by transport from the upwind areas.

**Air Quality Data:**

Ozone data are available for a site at the China Lake Naval Air Weapons Station in the Indian Wells Valley and a site at Mojave-Poole Street in the current nonattainment area. The design value for China Lake is 0.081 ppm, while the design value for Mojave is 0.086 ppm. Both of these values violate the revised standard.

As mentioned previously, ozone air quality in Eastern Kern County is significantly impacted by transport from both the San Joaquin Valley and the South Coast air basins. Figure 12 shows the trend in design values for Mojave, as well as for the San Joaquin Valley and South Coast Air Basin (long-term trend data are not available for the China Lake site). The trends show that although the design value for Mojave is lower, it tracks well with the South Coast and San Joaquin Valley trends. Because of the overwhelming transport impact, ozone air quality in Mojave has decreased at a rate similar to that in the upwind areas. Although China Lake is not included on the graph, this site is also impacted by transport, and we would expect the trend to be similar to that for Mojave, but at a lower level, overall.

**FIGURE 12**



***Population Density and Degree of Urbanization; Growth Rates and Patterns; and Traffic and Commuting Patterns:***

Several towns are scattered throughout Eastern Kern County. The largest one in the Indian Wells Valley area is Ridgecrest. This town grew up around the China Lake Naval Air Weapons Center. Overall, population in all of Eastern Kern County is small, compared with that in the South Coast and San Joaquin Valley areas. The total Eastern Kern County population in 2005 was about 132,000. The increase in population has also been small, increasing only 13 percent between 1995 and 2005. Because of the limited population, overall local, traffic-related emissions are not expected to be significant.

***Emissions Data and Level of Emission Controls***

Relative to the South Coast and San Joaquin Valley air basins, ozone precursor emissions in Eastern Kern County are insignificant. There are only a handful of stationary sources (refer to Figure 11), and nearly all of these are located in the portion of Eastern Kern County that is already designated as nonattainment. In addition to these stationary sources, several highways traverse the region, carrying traffic in and out of the Eastern Kern County area. Because of the sparse population and limited emissions sources, attainment in Eastern Kern County is dependent on emissions reductions in the upwind districts and from the statewide strategy.

***Summary and Recommendation:***

Indian Wells Valley is a high desert area in the northeast corner of Kern County. It includes the China Lake Naval Air Weapons Station and the town of Ridgecrest. Similar to the rest of Eastern Kern County, Indian Wells Valley is sparsely populated and has few significant emissions sources. The design value for Indian Wells Valley (0.081 ppm) is similar to the design value for the current Eastern Kern County nonattainment area (0.086 ppm). Furthermore, previous studies have shown that ozone concentrations in both of these areas are overwhelmingly impacted by transport from the San Joaquin Valley and South Coast air basins.

Because both areas are similar in terms of air quality, population, emissions, and transport impacts, ARB recommends the current Eastern Kern County nonattainment area be expanded to include the Indian Wells Valley area. As a result, the entire portion of Kern County within the Mojave Desert Air Basin would be included in the Eastern Kern County ozone nonattainment area.