KERN COUNTY
AIR POLLUTION CONTROL DISTRICT

OZONE
ATTAINMENT DEMONSTRATION, MAINTENANCE PLAN, AND REDESIGNATION REQUEST

EASTER KERN COUNTY
FEDERAL PLANNING AREA

ADOPTED: JANUARY 9, 2003

AMENDED: MAY 1, 2003

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KERN COUNTY

AIR POLLUTION CONTROL DISTRICT

SERVING EASTERN KERN COUNTY

Thomas Paxson, P.E.
Air Pollution Control Officer

AIR POLLUTION CONTROL BOARD

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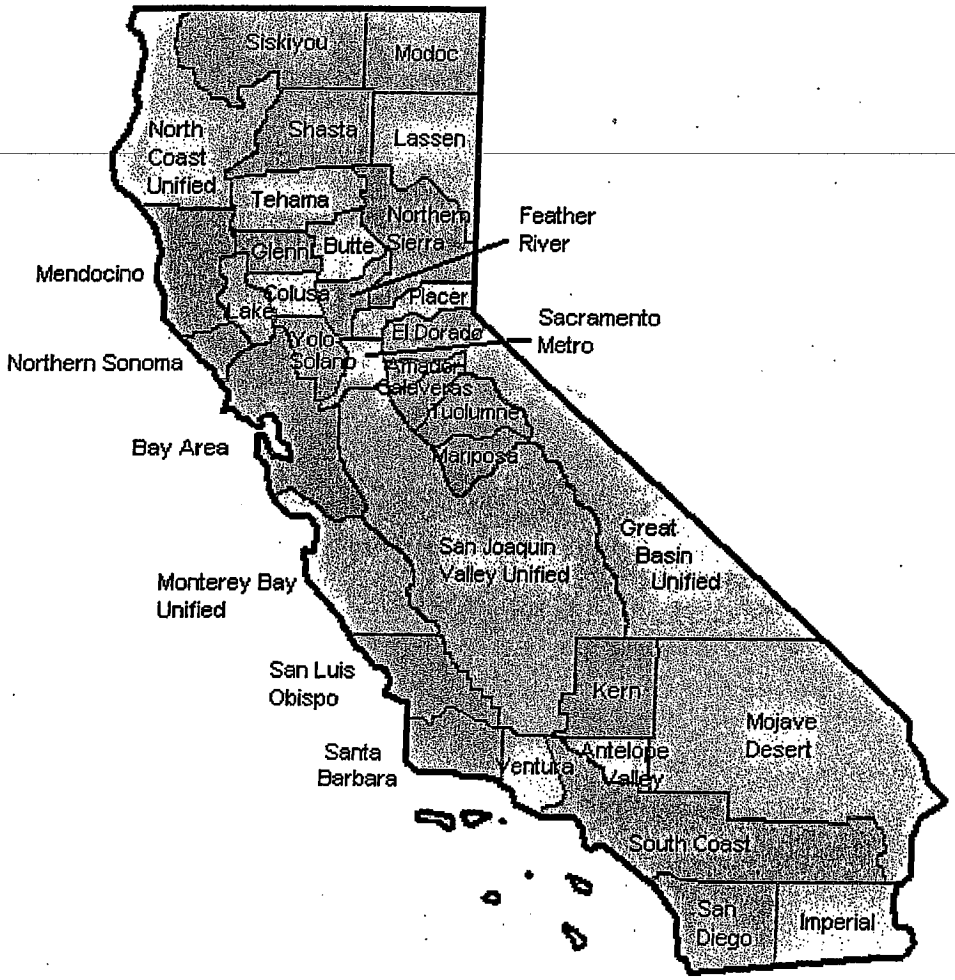
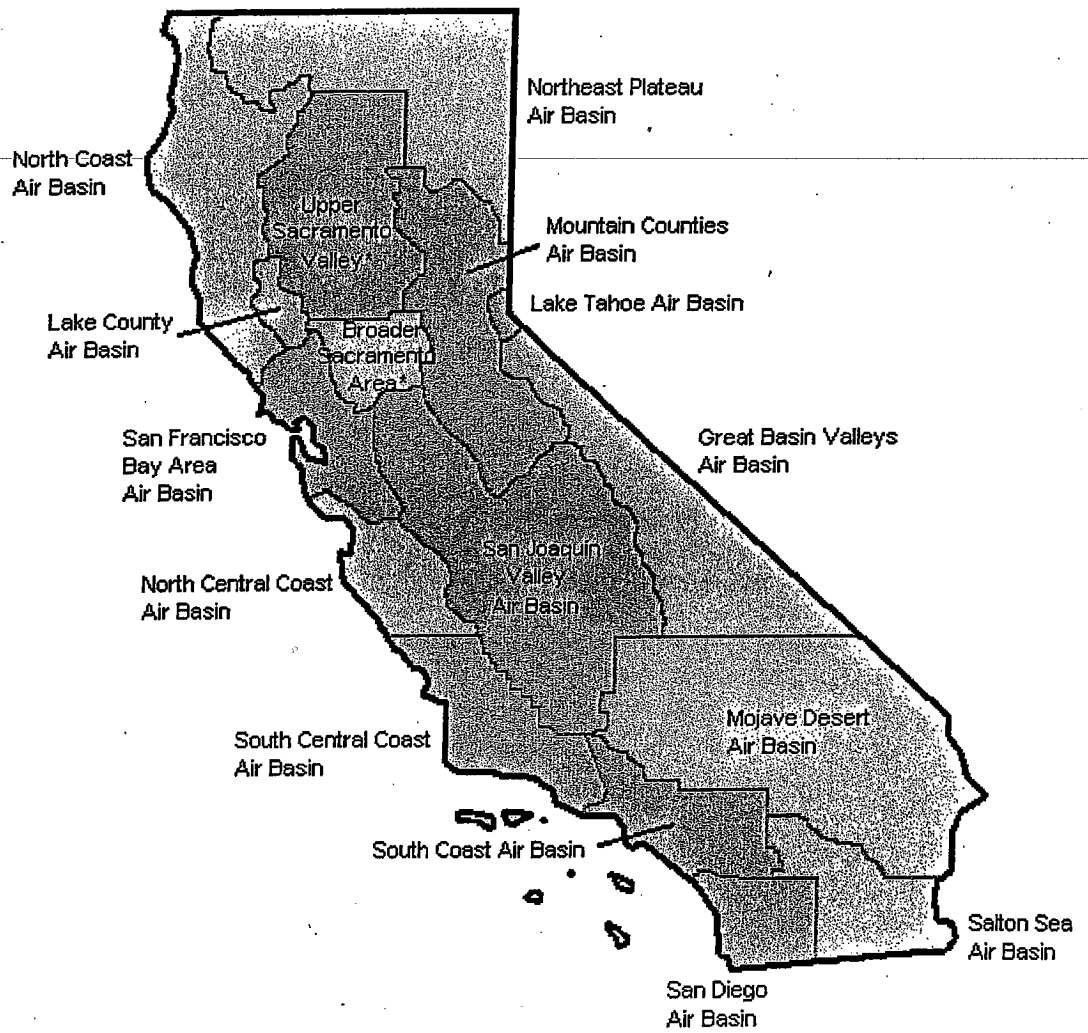
California Air Pollution Districts



California Air Basins*



** The Broader Sacramento Planning Area and the Upper Sacramento Valley planning areas together make up the Sacramento Valley Air Basin. The Sacramento Valley Air Basin has been split into two planning areas.*

ACRONYMS USED IN THIS DOCUMENT

APCD	Air Pollution Control District
AQAP	Air Quality Attainment Plan
CARB	California Air Resources Board
CC	Control Code
CCAA	California Clean Air Act of 1988
District	Kern County Air Pollution Control District
EMFAC7F	CARB's Motor Vehicle Emissions Software
EPA	U.S. Environmental Protection Agency
FCAA	Federal Clean Air Act
FCAAA	1990 Federal Clean Air Act Amendments
I&M	Motor Vehicle Inspection and Maintenance
NAAQS	National Ambient Air Quality Standards
NO_x	Oxides of Nitrogen
NSR	New Source Review
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
ROG	Reactive Organic Gases
ROP	Rate-of-Progress
RVP	Reid Vapor Pressure (for Gasoline)
SIP	State Implementation Plan
TPD	Tons Per Day
VOC	Volatile Organic Compounds

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BACKGROUND

Section 181 (a) of the Federal Clean Air Act Amendments (FCAAA) establishes ozone nonattainment classifications and mandatory attainment dates as follows:

Area Class	Ozone Design Value[1]	Primary Standard Attainment Date[2]
Marginal	0.121 up to 0.138	3 years after enactment
Moderate	0.138 up to 0.160	6 years after enactment
Serious	0.160 up to 0.180	9 years after enactment
Severe	0.180 up to 0.280	15 years after enactment
Extreme	0.280 and above	20 years after enactment

1. The design value is measured in parts per million (ppm).
2. The primary standard attainment date is measured from the date of the enactment of the Clean Air Amendments of 1990.

Based on ozone monitoring data available in 1990 from the San Joaquin Valley portion of Kern County and the United States Environmental Protection Agency's view that all Kern County was one "planning area", Kern County was classified as "serious" nonattainment with respect to the National Ambient Air Quality Standard (NAAQS) of 0.12 ppm. Consequently, Eastern Kern's statutory attainment date became November of 1999.

Since 1992, the San Joaquin Valley portion of Kern County has been part of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and Kern County Air Pollution Control District (KCAPCD) has had jurisdiction only in East Kern.

Ozone data collected from 1999-2002 at Eastern Kern County's three ozone monitors show attainment of the NAAQS.

PLAN REQUIREMENTS

Section 182 (c) of the FCAAA prescribes requirements and schedules for attainment planning. In accordance with these requirements, three plans were required as follows:

1. A minus 15% Volatile Organic Compounds Rate-of-Progress (ROP) Plan by 11/15/93,
2. A minus 3% Per Year Volatile Organic Compounds or Oxides of Nitrogen Reasonable Further Progress (RFP) Plan by 11/15/94, and
3. An Attainment Plan by 11/15/94.

The Kern County Air Pollution Control District prepared and submitted its Rate-of-Progress Plan by 11/15/93 and submitted its Reasonable Further Progress Plan and Attainment Plan by 11/15/94.

This document constitutes KCAPCD's Attainment Demonstration, Maintenance Plan, and Request for Redesignation for Eastern Kern County.

1994 ATTAINMENT PLAN

The Kern County Air Pollution Control District's Attainment Plan was presented in two parts: I (Transport Analysis) and II (Attainment Demonstration).

Part I showed Kern County Air Pollution Control District (Eastern Kern) is overwhelmingly impacted by ozone transport from both the San Joaquin Valley Air Basin and the South Coast Air Basin, i.e., Eastern Kern air pollutant emission sources by themselves do not cause exceedances of National (or California) Ambient Air Quality Standards.

Part II showed Kern County Air Pollution Control District (Eastern Kern) would attain National (but not California) Ambient Air Quality Standards for ozone by 1999. This did, in fact, occur. Part II of the Plan showed attainment would occur. This was by analyzing projections of two United States Environmental Protection Agency-approved photochemical dispersion modeling efforts: The San

Joaquin Valley Air Quality Study and the South Coast Air Quality Management District modeling effort. SJVUAPCD Volatile Organic Compound (VOC) and oxides of nitrogen (NO_x) control measures developed, adopted and implemented by 1999, resulted in transported ozone reductions sufficient to result in attainment in the Kern County Air Pollution Control District (Eastern Kern). Reductions from implementation of control measures contained in KCAPCD's Rate-of-Progress and Reasonable Further Progress Plans also served to ensure attainment by 1999, as well as reductions achieved by statewide California Air Resources Board (CARB) control measures.

If KCAPCD is unable to maintain attainment due to the "eastward shifting" of the Southern San Joaquin Valley's ozone peak, the San Joaquin Valley Unified APCD's attainment strategy will require restructuring as mandated by Section 40912 of the California Health and Safety Code.

All control measures identified in the Plan have been implemented, and Eastern Kern County has attained the one-hour ozone NAAQS of 0.12 ppm.

A forecast emission inventory has been prepared for the area, using local industry and regional planning entity estimates of future activity. No additional control measures or contingency measures beyond those already in place for the area will be required to maintain attainment of the ozone NAAQS through 2015. It will be incumbent, however, for the San Joaquin Valley Unified APCD and the South Coast AQMD to ensure transported ozone does not increase, and, in fact, decreases as these areas approach attainment. The forecast inventory constitutes a maintenance plan for the region, a FCAA requirement for the region to be redesignated to attainment.

U.S. EPA's approval of data, findings and forecasts presented in this document will provide that agency with all elements required by the Federal Clean Air Act to redesignate Eastern Kern County from a Federal Ozone Nonattainment Area to attainment.

This document consists of an introduction, three sections, and appendices. Section I presents an attainment demonstration, including Chapter 2 which describes ambient monitoring data and emission reductions. Section II presents a maintenance plan, including Chapter 3 which describes

the regional forecast in terms of expected emissions and ambient concentrations, and Chapter 4 which describes ozone control measure needs. Section III presents a redesignation request, including Chapter 5 which discusses statutory requirements for a redesignation request. Appendix A presents ambient ozone monitoring results for the area. Appendix B presents emission inventories for the area, including a forecast through the year 2015.

CHAPTER 1

INTRODUCTION AND BACKGROUND

PURPOSE OF DOCUMENT

REGULATORY BACKGROUND

POLLUTANT TRANSPORT

PHOTOCHEMICAL GRID MODELING

PURPOSE OF DOCUMENT

The Eastern Kern County Ozone Nonattainment Area has experienced less than an average of one exceedance per year for the one-hour Federal Ozone National Ambient Air Quality Standard (NAAQS) over the last three years. This document: 1) demonstrates this air quality improvement is due to successful implementation of ozone control strategies contained in the region's State Implementation Plan (SIP); 2) demonstrates the significant ozone precursor emission reductions generated in the region are permanent and enforceable; and 3) contains a maintenance plan to ensure the region will not experience any exceedances through the year 2015. This document concludes by requesting a redesignation of Eastern Kern County Ozone Nonattainment Area from "nonattainment" to "attainment" for the ozone NAAQS. Furthermore, this document satisfies Federal Clean Air Act requirements regarding milestone information, maintenance plan contents and redesignation requests.

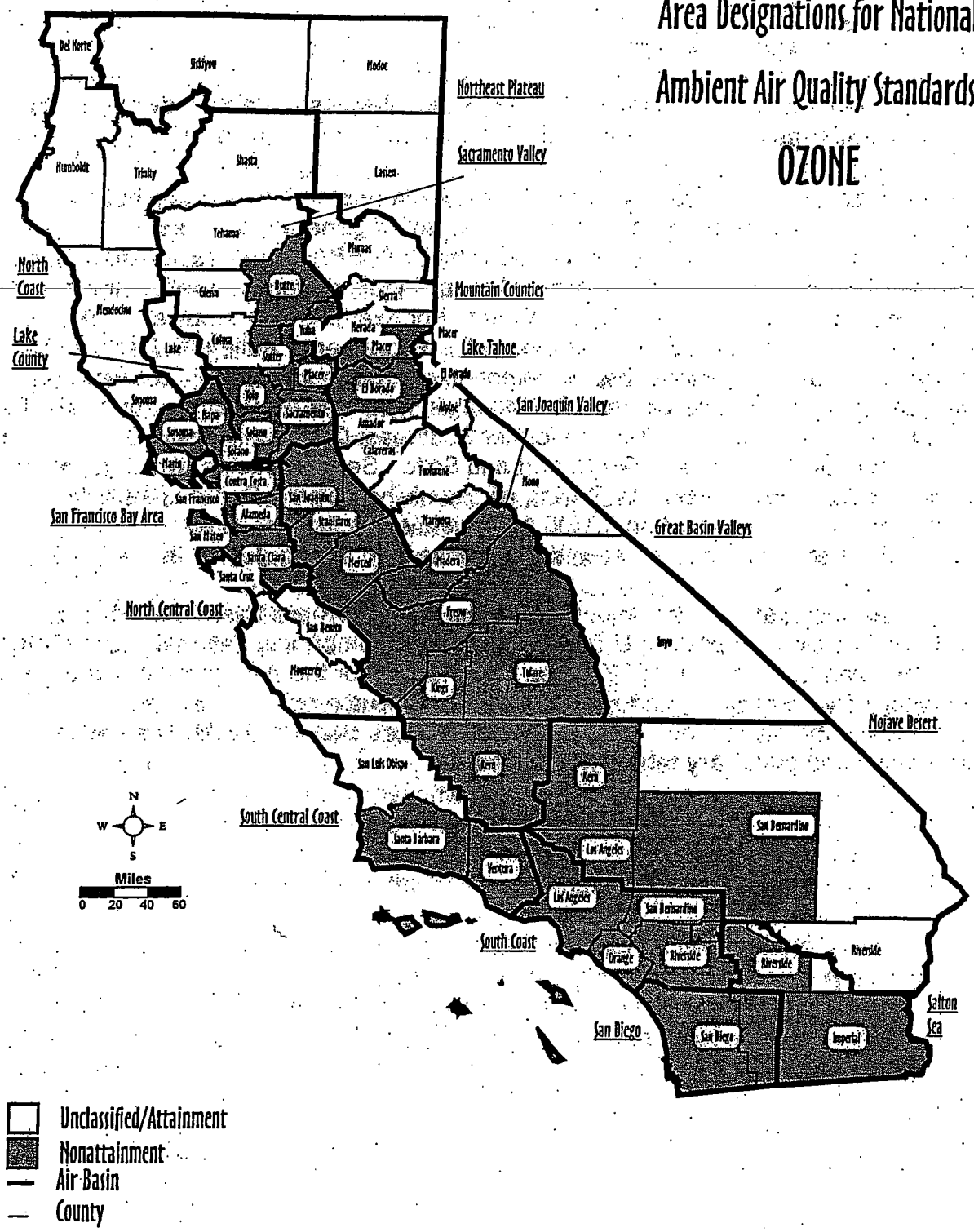
REGULATORY BACKGROUND

The 1970 Federal Clean Air Act required the U.S. EPA to develop health-based National Ambient Air Quality Standards for several categories of air pollutants, including ozone (03).

Section 110 (a)(1) of the 1977 Federal Clean Air Act Amendments (FCAAA) required U.S. EPA to divide the United States into "Planning Areas" and designate these areas "attainment", "nonattainment", or "unclassified" within 3 years of adopting an Ambient Air Quality Standard. Figure 1-1, Page 1- 2, shows California's U.S. EPA designated Federal ozone nonattainment areas.

In 1990, pursuant to the Federal Clean Air Act Amendments (FCAAA), all of Kern County was designated by the United States Environmental Protection Act (EPA) as a "serious" nonattainment area for ozone based on air monitoring data collected in the San Joaquin Valley portion of the County. These monitoring data were applied to the eastern portion of Kern County because an ozone monitoring station did not then exist in this area. In 1992, and in conjunction with unification of air districts in the San Joaquin Valley, the jurisdictional boundary of the Kern County Air Pollution Control District (KCAPCD) was changed to include only that portion of Kern County

Figure 1-1


Area Designations for National
Ambient Air Quality Standards
OZONE
Northeast Plateau
Sacramento Valley
Mountain Counties
Lake Tahoe
San Joaquin Valley
Great Basin Valleys
Mojave Desert
South Coast
Salton Sea
San Diego
South Central Coast
San Francisco Bay Area
North Central Coast
North Coast
Lake County
Del Norte
Siskiyou
Modoc
Humboldt
Trinity
Shasta
Lassen
Tehama
Plumas
Glenn
Butte
Sierra
Mendocino
Lake
Colusa
Yuba
Nevada
Placer
Sutter
El Dorado
Yolo
Sacramento
Napa
Solano
Sonoma
Marin
Contra Costa
San Francisco
San Joaquin
Alameda
Stanislaus
San Mateo
Merced
Santa Clara
Mariposa
Madera
Santa Cruz
Fresno
San Benito
Inyo
Monterey
Tulare
Kings
San Luis Obispo
Kern
Santa Barbara
Ventura
Los Angeles
San Bernardino
Orange
Riverside
Imperial
N
W
E
S
Miles
0 20 40 60
Unclassified/Attainment
Nonattainment
Air Basin
County

contained in the Southeast Desert air basin, i.e., Eastern Kern. Unfortunately, at that time, Eastern Kern County remained as part of the San Joaquin Valley Federal Ozone Planning Area even though it is in a separate air basin. Then, in November of 2001, U.S. EPA formally agreed to consider KCAPCD (East Kern) as a separate ozone planning area. (See Figure 1-2, Page 1-4.)

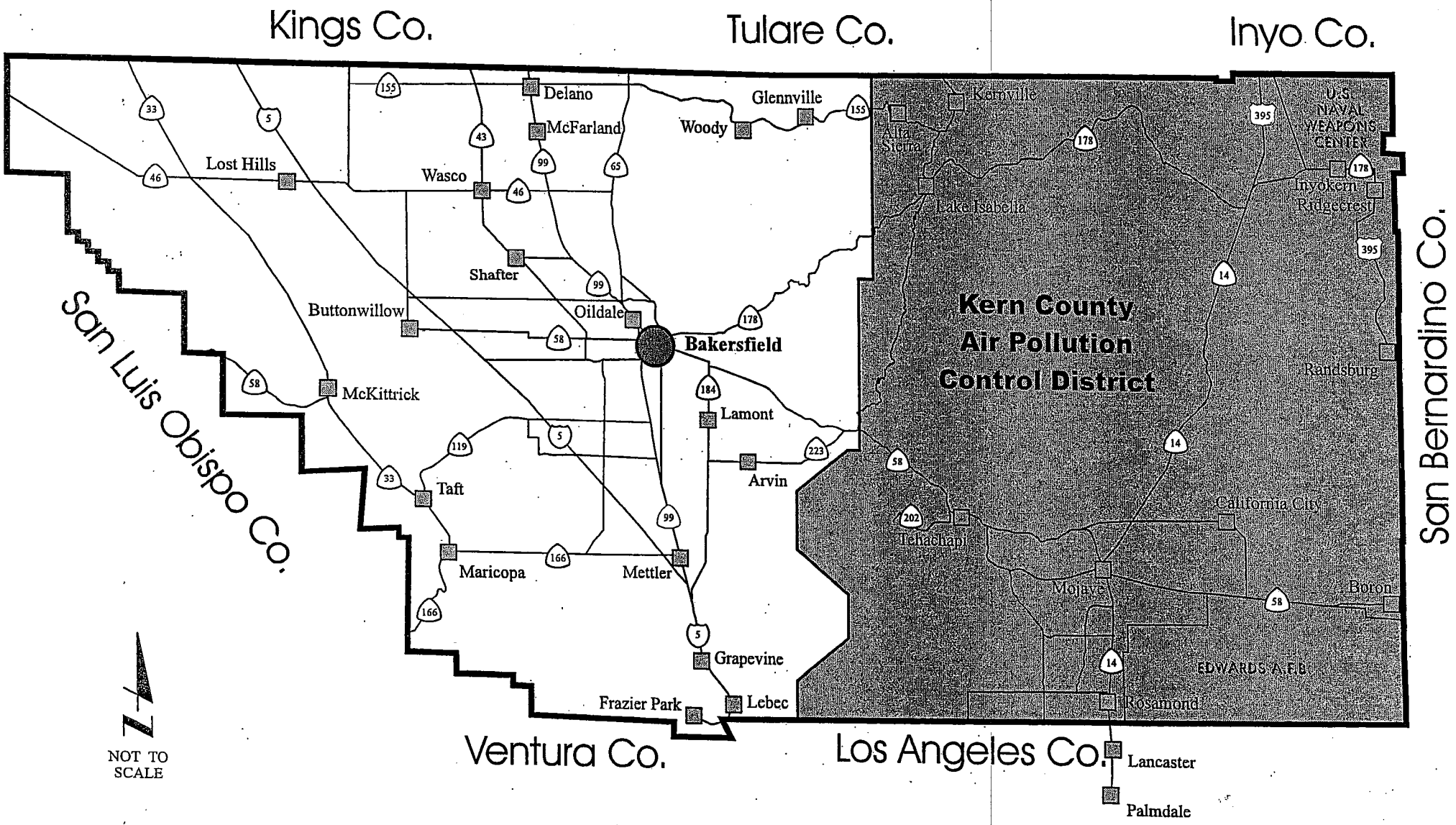
The California Air Resources Board has formally requested U.S. EPA further divide Eastern Kern County into two ozone planning areas: the Indian Wells Valley (IWV) and the remainder of Eastern Kern. (Ozone monitoring in the IWV shows attainment with the stricter, new NAAQS for ozone of 0.08 ppm (8 hour average).) U.S. EPA has preliminarily agreed.

In contrast, KCAPCD's ozone nonattainment classification for the 1988 California Clean Air Act is "moderate". This classification is based upon data collected at KCAPCD's Mojave ozone monitoring station. In July of 1993, this station commenced operation. Data collected at this station, show peak concentrations less than 0.138 ppm. Had these data been used by EPA to designate Eastern Kern, Section 181 (a)(1) of the FCAAA would have specified a "marginal" designation.

Section 40910 of the California Health and Safety Code allows removal of transport impact before assigning area classifications; Mojave data were adjusted accordingly. Unfortunately, the Federal Clean Air Act Amendments do not explicitly provide for consideration of intrastate transport when assigning severity of nonattainment. However, U.S. EPA is in the process of developing a policy to address intrastate transport.

The FCAAA establish interim milestones culminating in attainment. For ozone, milestones are mandatory percent VOC emission reductions. For example, all moderate and above ozone nonattainment areas were required to reduce VOC emissions at least 15 percent by 1996; and serious and above ozone nonattainment areas were required to reduce VOC emissions at least 3 percent per year, averaged over each consecutive three year period thereafter, until attainment.

The FCAA Amendments of 1990 anticipate possible failure to attain. Areas failing to meet milestones or deadlines must institute contingency measures or the area can be "bumped up" to the



Kern County California

Figure 1-2
Eastern Kern County Planning Area

next higher classification, resulting in imposition of more stringent requirements. Because Eastern Kern County attained the ozone NAAQS by its deadline of 1999, neither "bumping up" nor imposition of contingency measures was necessary.

POLLUTANT TRANSPORT

Documented KCAPCD exceedances of the NAAQS are caused by transport from either the San Joaquin Valley Air Basin or from the South Coast Air Basin. Attainment of the NAAQS occurred in KCAPCD only when standards were achieved at the southeastern boundary of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the northern boundary of the South Coast Air Quality Management District (SCAQMD). An attainment date was projected using predictions of the EPA-approved photochemical dispersion models being used by these upwind and adjacent districts. By making these showings, KCAPCD satisfied attainment demonstration requirements of Section 182 (c)(2)(A) of the Federal Clean Air Act Amendments. In 1994, attainment in KCAPCD was predicted by 1999; this, in fact, occurred.

It has been known for over 20 years, transport of pollutants can occur between air basins and these transported pollutants affect air quality downwind. Significance of transported pollutants on air quality in a downwind air basin depends upon several factors. These include: quantity of emissions in the upwind air basin compared to the downwind air basin, prevailing wind direction, and wind speed during times of high pollutant concentrations. Atmospheric chemistry and pollutant emissions in the downwind area also determine how transported pollutants affect downwind ozone concentrations.

Transported ozone, and its precursors, VOC and nitrogen oxides, affect ozone concentrations in a downwind area. Transport from an upwind area to a downwind area occurs when winds are of sufficient magnitude, direction and duration. Transport can take place from the surface up to several thousand feet elevation.

Transport analysis techniques used were based on guidance provided by the California Air Resources Board (CARB) in the document *"Assessment and Mitigation of the Impacts of Transported Pollutants on Ozone Concentrations in California"* dated June 1993. Analyses included addressing all parameters required by CARB to be analyzed in determining it transport is overwhelming, significant or inconsequential.

PHOTOCHEMICAL GRID MODELING

Section 182 (c)(2)(A) of the Federal Clean Air Act requires an attainment demonstration be based upon photochemical grid modeling. Both the SJVUAPCD and SCAQMD developed and "ran" EPA-approved grid models for their districts for purposes of fulfilling Section 182 (c)(2)(A). Both modeling domains included portions of KCAPCD (see Figure 1-3, Page 1-8). Since transport analyses showed the ozone standards to be exceeded solely because of transport from these two other districts, rather than generate a model specifically for KCAPCD, "boundary condition" predictions of these two models were used to project an attainment date. This approach clearly fulfilled the intent of Section 182 (c)(2)(A). KCAPCD's emissions did not need to be included in these modeling efforts since both VOC and NO_x decreased with implementation of ROP and RFP Plan control measures.

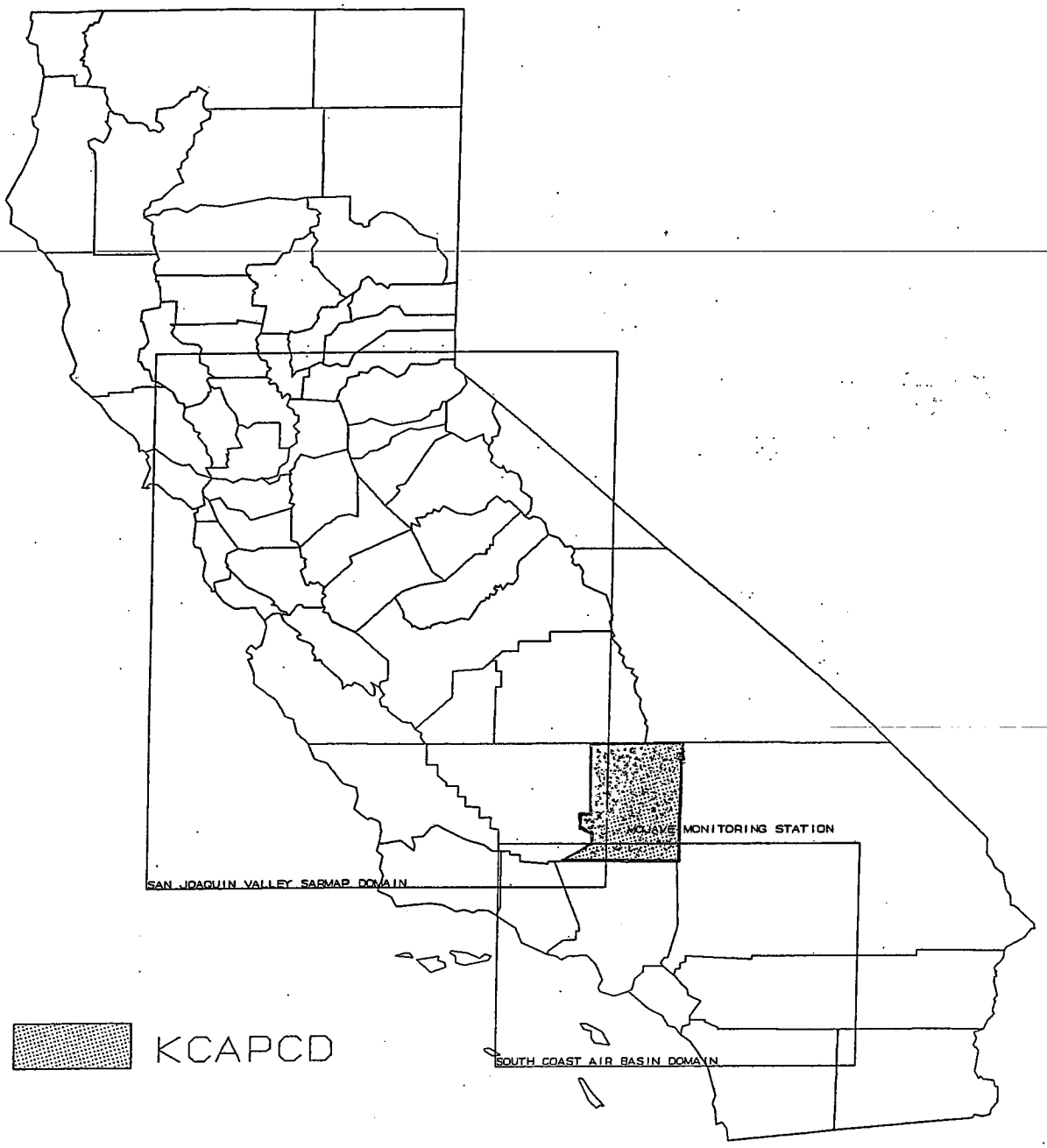


Figure 1-3 - Modeling Domains for San Joaquin Valley and South Coast

SECTION I

ATTAINMENT DEMONSTRATION

CHAPTER 2

ATTAINMENT PLAN

SETTING

1994 ATTAINMENT DEMONSTRATION (PLAN)

PLAN APPROVAL

SETTING

BACKGROUND

Eastern Kern County is located on the western edge of the Mojave Desert. This area is separated from populated valleys and coastal areas to the west by several mountain ranges. These valleys and coastal areas are the major source of ozone precursor emissions affecting ozone exceedances within Kern's part of the Mojave Desert. Surrounding mountain ranges contain a limited number of passes serving as "transport corridors". These passes include Tehachapi Pass, connecting the San Joaquin Valley to the Mojave Desert, and Soledad Canyon and Cajon Pass connecting the South Coast Air Basin to the Mojave Desert. Air quality in the Kern County portion of the Mojave Desert is primarily influenced by the Tehachapi Pass corridor with some influence through Soledad Canyon. Soledad Canyon and Cajon Pass mainly influence air quality in the eastern portion of the Mojave Desert due to prevailing wind directions.

Relative humidity in the desert during summer is very low with humidities below 10 percent common in the hottest part of the day. Temperatures can be in excess of 100° Fahrenheit for sixty to seventy days per year between May and September with almost no rainfall. This combination of hot, dry, clear days results in intense solar radiation very conducive to photochemical ozone formation.

In establishing that meteorological conditions are favorable to overwhelming transport of ozone into KCAPCD, each of the following components was analyzed: surface winds, winds aloft, estimated transport time, daily streamlines, surface airflow types, air parcel trajectories and daily maximum temperature.

METEOROLOGY

Meteorological data from several ambient air monitoring stations and airports located in Kern, Los Angeles and San Bernardino Counties and obtained from CARB were evaluated. More specifically, these data from Mojave Desert ambient air monitoring stations at Mojave in Kern County, Lancaster

in Los Angeles County, and Barstow and Trona in San Bernardino County. Data from monitoring stations located in the San Joaquin Valley Air Basin at Bakersfield, Edison, Oildale and Arvin were also included. Meteorological data from eight airports in Kern, Los Angeles and San Bernardino Counties were also examined. Included were Mojave Airport, Edwards Air Force Base, Meadows Field, Naval Air Weapons Station, Lancaster, Ontario, San Bernardino and Daggett. A map showing the location of monitoring stations and airports used in this study is shown in Figure 2-1, Page 2-2.

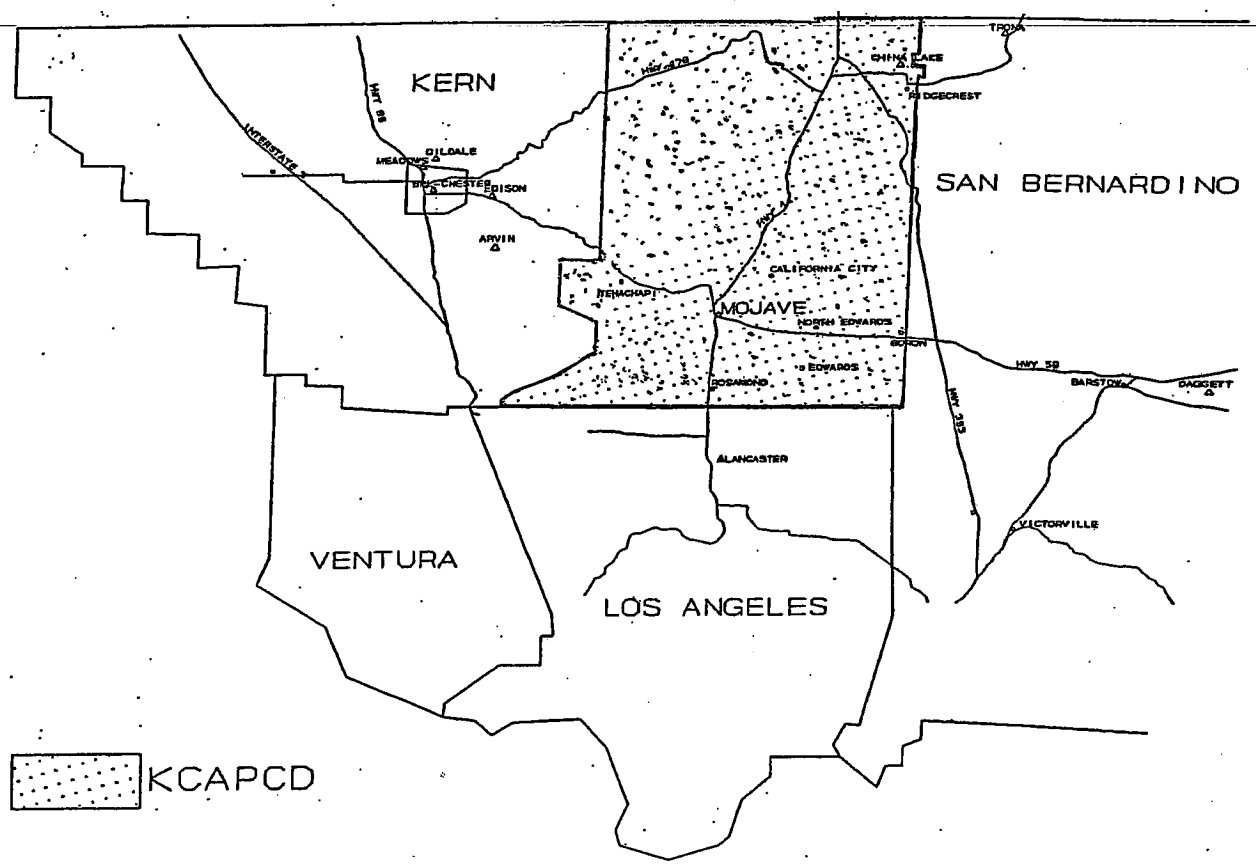


Figure 2-1 - Monitoring Station Locations

SURFACE WINDS

CARB's summary analyses of hourly surface wind speed and direction data were evaluated to determine whether the surface air flow could transport pollutants from upwind of KCAPCD into KCAPCD. Transport potential exists if: 1) wind directions are consistently from the upwind to the downwind area, and 2) wind speeds are persistent and of high enough velocity to move emissions from the upwind area to the downwind area in a period of time coinciding with time of maximum ozone concentrations in the downwind area.

Predominant surface wind flow patterns were prepared by CARB for the four seasons of the year using data from most of the available stations in California and several nearby stations in other states. Stations were used which had at least one full season of data. Figure 2-2 through Figure 2-5[1], Page 2-4 to 2-7, show wind streamlines for nonmountainous areas of California and streamlines in mountainous zones where data indicate continuous streamlines through these mountainous zones from nonmountainous zones. Streamlines through mountainous areas are generally regions where interbasin transport of air is evident and important to air pollution concentrations. Surface wind flow patterns generated for summer and fall seasons show, based upon predominant wind flows, transport of ozone from the San Joaquin Valley Air Basin to the Mojave Desert definitely occurs with some influence from the South Coast Air Basin along the eastern edge of Kern County.

[1]California Air Resources Board. "California Surface Wind Climatology", June 1984 (reprinted 1992).

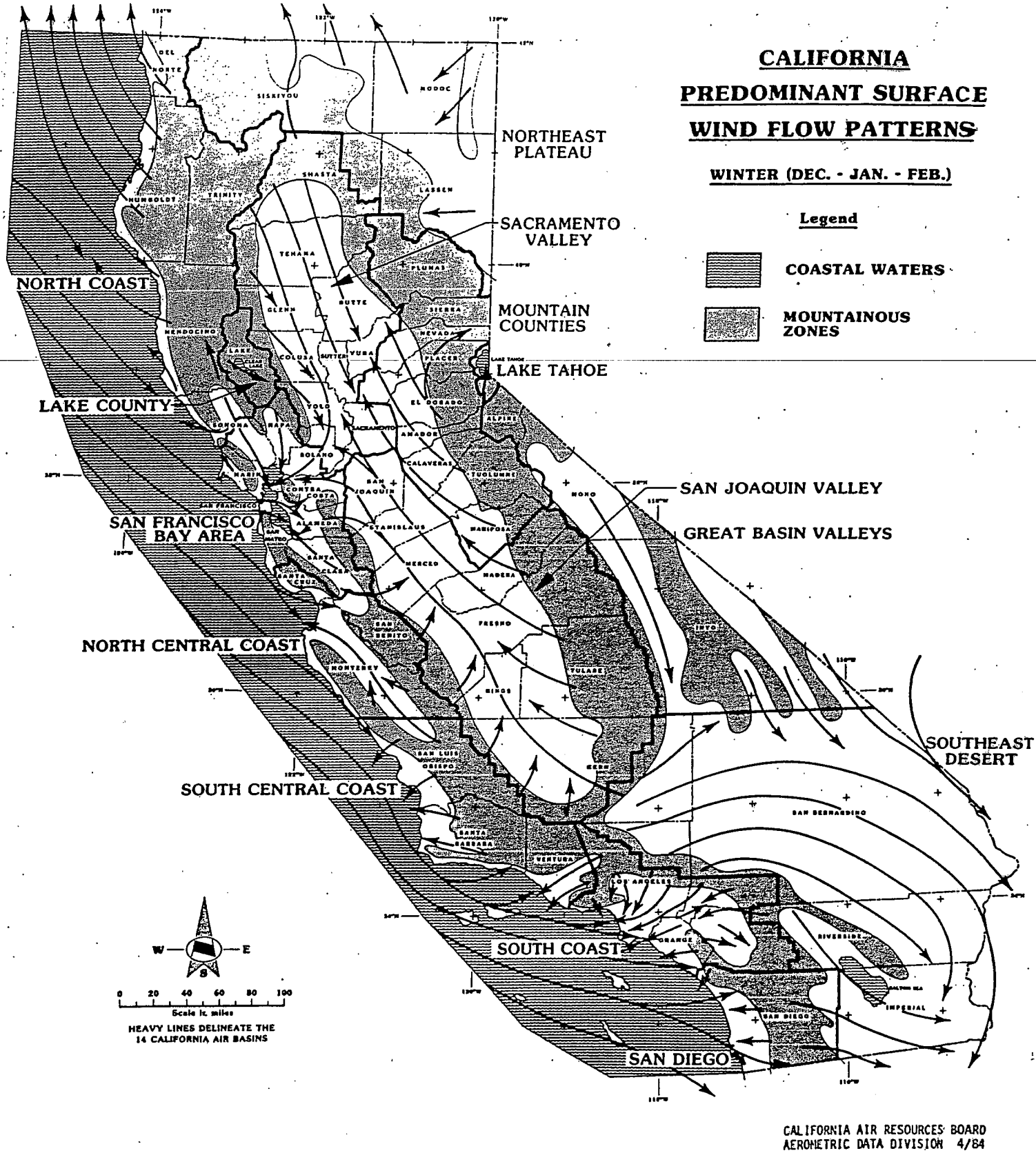


Figure 2-2 - California Predominant Surface Wind Flow Patterns - Winter

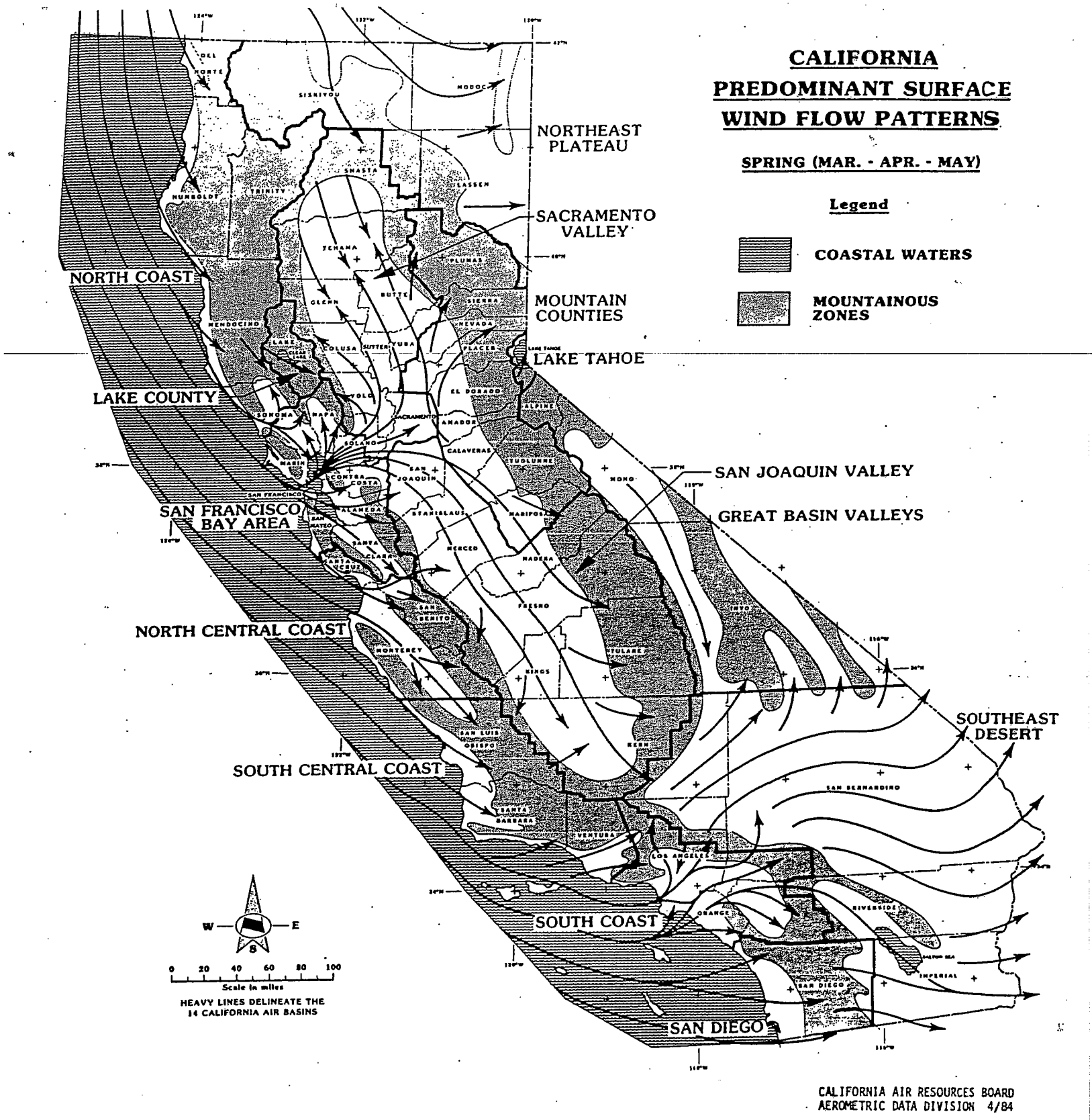


Figure 2-3 - California Predominant Surface Wind Flow Patterns - Spring

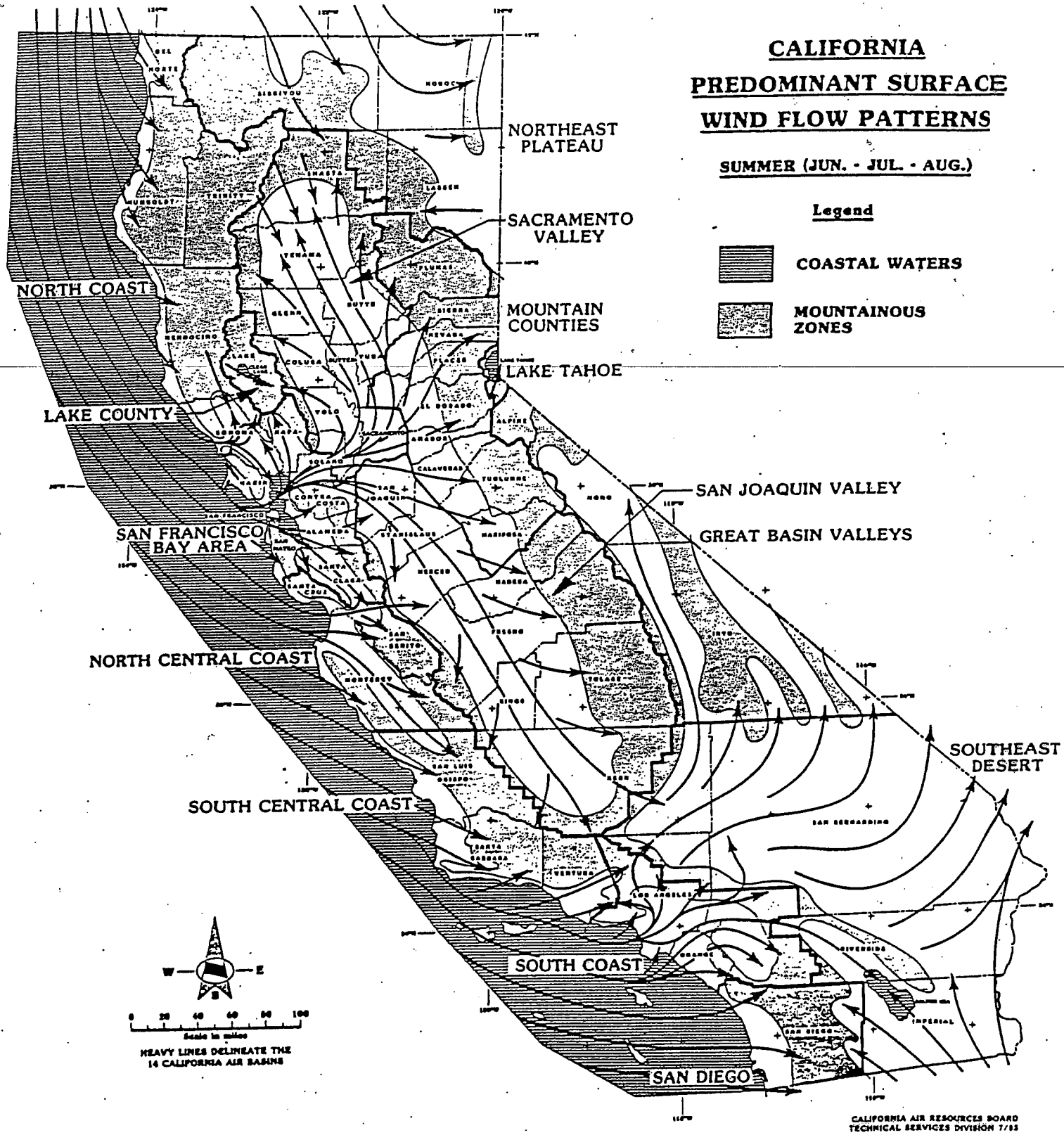


Figure 2-4 - California Predominant Surface Wind Flow Patterns - Summer

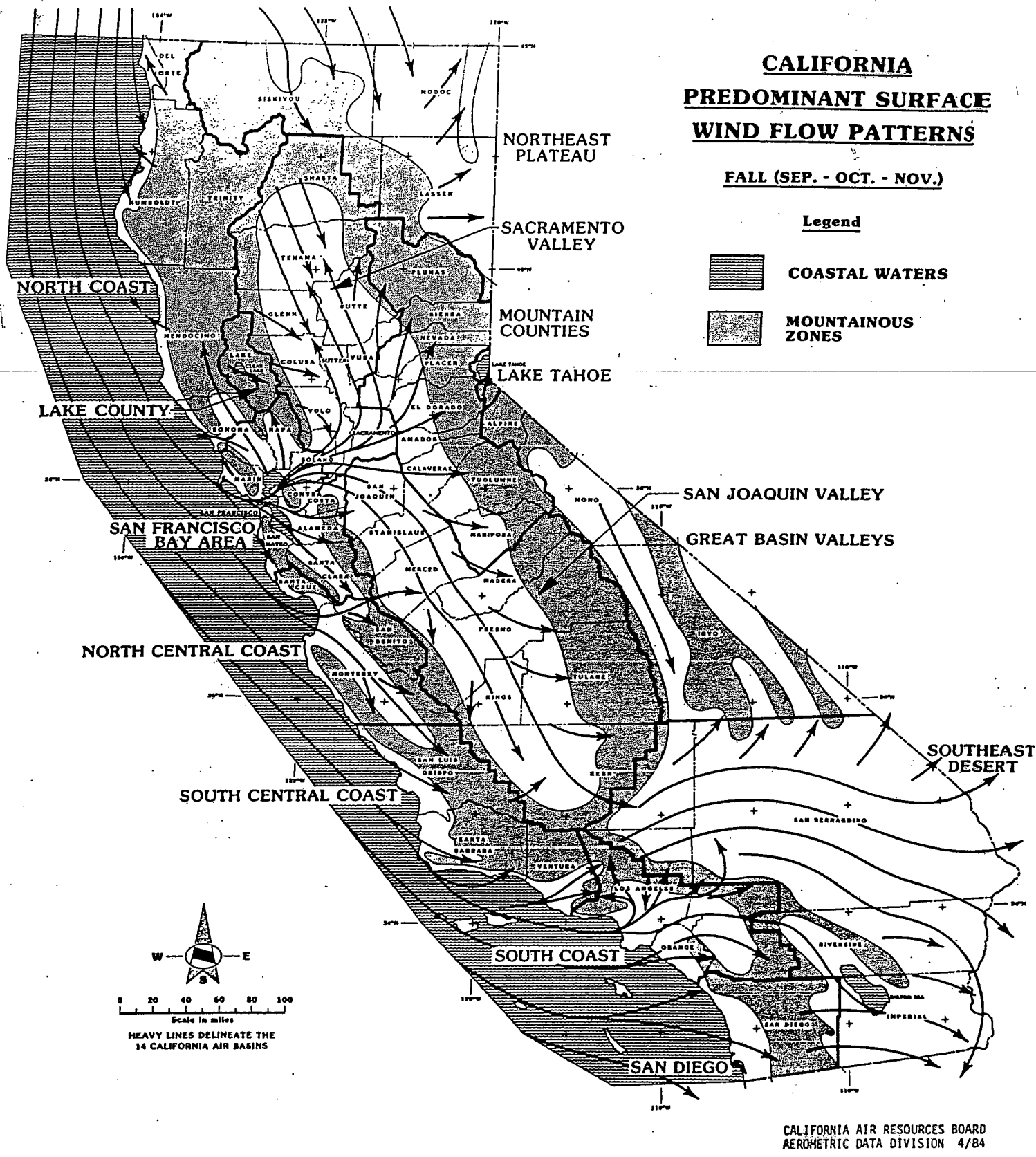


Figure 2-5 - California Predominant Surface Wind Flow Patterns - Fall

ESTIMATED TRANSPORT TIME

Transport time is time required to move an air parcel from an upwind area to a downwind area. This time is computed by dividing distance between the two areas by mean wind speed. If transport time for upwind emissions is sufficient to allow arrival in the downwind area near time of day of maximum ozone concentration in the downwind area, significant transport impact occurs.

"Analyses of the time of peak ozone concentration at various monitoring sites can yield useful information on transport patterns and source areas. In most major source areas in California, transport winds are light in the morning, allowing ozone precursor concentrations to build up and ozone to form. By noon, transport winds generally increase and ozone moves downwind out of major source regions. This leads to peak concentrations in principal source areas around 1300-1500 local time with a decrease thereafter as ozone-rich air is replaced by cleaner air from upwind. Consequently, peak ozone concentrations occurring after 1500 local time indicate transport into the area from an upwind source."[2]

KCAPCD's Mojave monitoring station is located approximately 80 kilometers from Bakersfield. Wind speed at Mojave averaged from 12.0 to 23.3 kilometers per hour (kph) in August and September 1993 for hours from 1200 to 2000. Based upon an average afternoon wind speed of 18.9 kph, peak ozone concentrations caused by transport would be expected to occur in late afternoon or early evening and from three and one-half to seven hours after upwind ozone formation. Exceedances of the NAAQS at Mojave fit these criteria, i.e., they occur between 1600 and 1900, respectively. Furthermore, Figure 2-6, Page 2-9, is a chart showing typical frequency of maximum ozone reading by hour of day for ozone exceedances of the California Ambient Air Quality Standard of 9 pphm. All but one of these fit this transport criteria.

Figure 2-7, Page 2-10 illustrates this transport phenomenon for August 7, 1997.

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[2] "Analysis of San Joaquin Valley Air Quality and Meteorology Final Report", Sonoma Technology Inc. Prepared for San Joaquin Valley Air Pollution Study Agency, California Air Resources Board, October 8, 1990. Page 4-19.

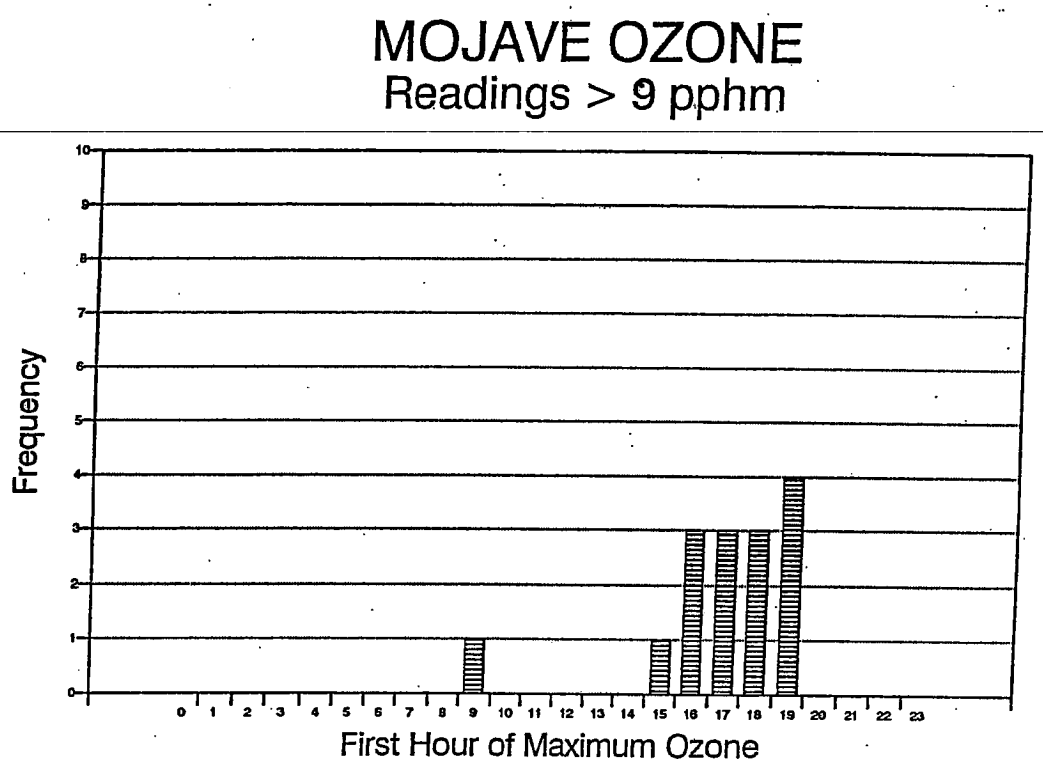

Figure 2-6 - Hour of Maximum Ozone Reading

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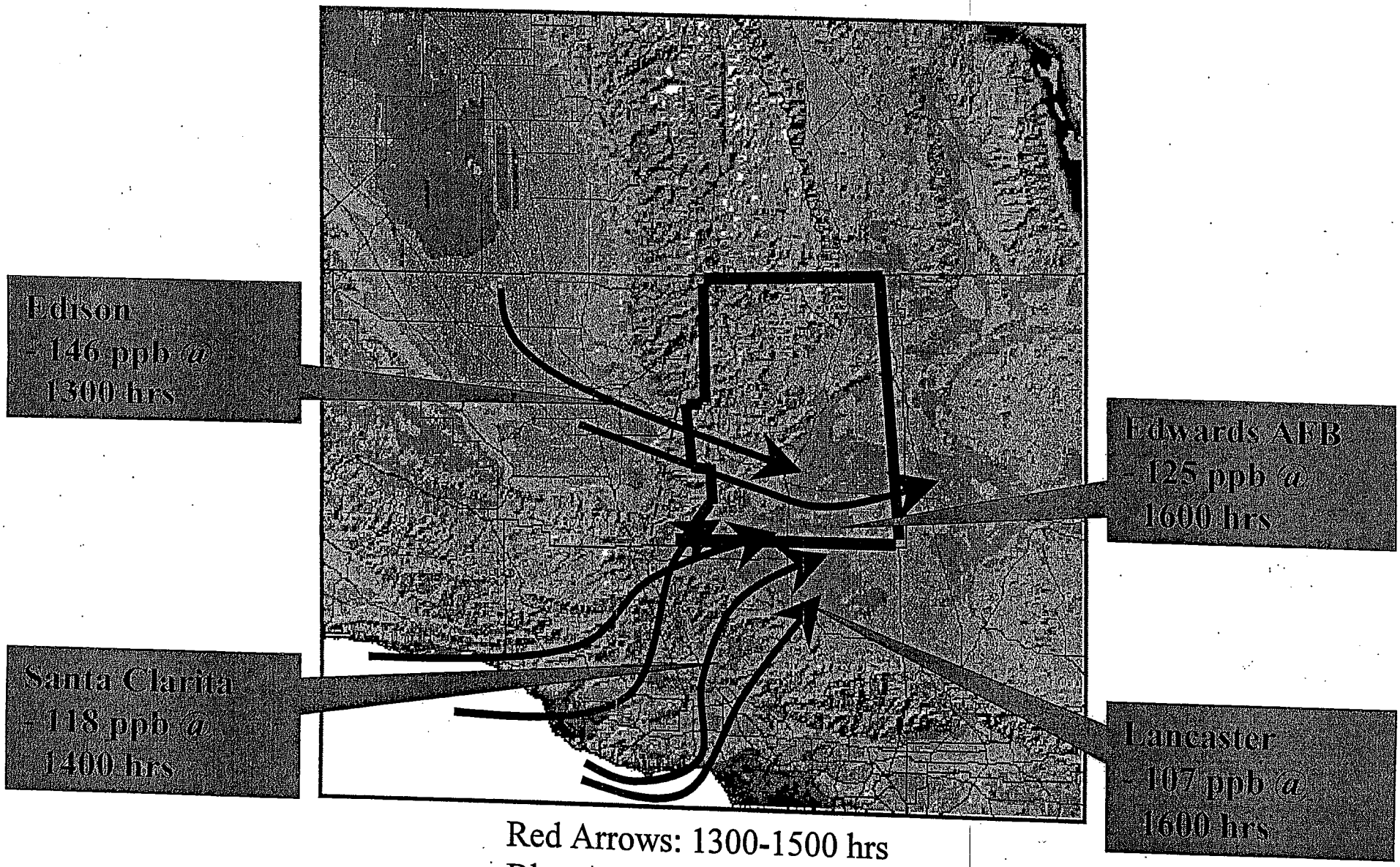
[6] "Analysis of San Joaquin Valley Air Quality and Meteorology Final Report", Sonoma Technology Inc. Prepared for San Joaquin Valley Air Pollution Study Agency, California Air Resources Board, October 8, 1990. page 4-19.

SURFACE WIND FLOW PATTERNS DURING 7 AUGUST 1997 EPISODE



Red Arrows: 1300-1500 hrs
Blue Arrows: 1600-1700 hrs

Figure 2-7

DAILY STREAMLINES

CARB staff has created daily surface streamline charts for 4 a.m., 10 a.m. and 4 p.m. for most of California. Streamlines are lines drawn parallel to plotted wind directions depicting air flows of differing scales. These streamlines are used to show wind flow patterns and predominant prevailing wind directions. While specific days may diverge from a predominant direction, if the pattern of typical days is from the upwind air basin to the downwind air basin, transport occurs. For summer and fall seasons (June through November), predominant surface wind flow patterns are from the San Joaquin Valley and South Coast Air Basins through the Kern County portion of the Mojave Desert Air Basin resulting in transport on most days. (See Figures 2-4 and 2-5, Pages 2-6 and 2-7.)

TRAJECTORIES

Air parcel trajectory analysis is utilized by CARB to document significance of transport from one air basin to another. Typically, if a trajectory indicates air reaching a monitoring station at the time of the observed exceedance was over a local metropolitan area between 8 a.m. and noon, local emissions are assumed to be significant; otherwise, overwhelming transport is assumed.

Trajectory analysis is performed using hourly surface wind speed and wind direction data to construct both forward and backward trajectories to determine origin of an air parcel contributing to an observed ozone exceedance.

UPWIND AND DOWNWIND OZONE PRECURSOR EMISSIONS

Ozone-rich air masses can be transported from South Coast Air Basin through Newhall and Soledad passes into Antelope Valley and, as already discussed, from the San Joaquin Valley into the Mojave vicinity. Additionally, ozone precursors composed of VOC and NO_x and emitted by numerous sources in South Coast Air Basin and San Joaquin Valley react in the presence of sunlight to form ozone while the polluted air mass is being transported. There are two reasons for long range transport of ozone. First, control of VOC emissions in South Coast Air Basin has slowed formation of higher ozone levels locally allowing photochemical reactions to continue as the air mass is carried

great distances. Second, ozone concentrations can remain high during transport in the desert due to lack of nitric oxide scavenging.

Consequently, if an upwind area's ozone precursor emissions are much larger than a downwind area's, overwhelming ozone impact can be expected given the preceding discussion of wind flow patterns.

SAN JOAQUIN VALLEY IMPACT

Ozone precursors, Volatile Organic Compound (VOC) emissions and oxides of nitrogen (NO_x), from the upwind San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and from KCAPCD are tabulated in the 1999 Central California Ozone Study (CCOS) emission inventory. VOC emissions in KCAPCD are 14 tons/day. Of this total, about 8 tons/day were emitted from mobile sources and were, therefore, fairly well distributed over the area. Total VOC emissions from the San Joaquin Valley portion of Kern County were about 109 tons/day. Of this total, about 22 tons/day were emitted from mobile sources and were, therefore, well distributed over the entire area. VOC emissions in this upwind area were approximately 10 times greater than emissions in the downwind area. NO_x emissions were approximately 5 times greater. See Table 2-1, Page 2-13. This Table also shows VOC and NO_x emissions from the entire San Joaquin Valley. VOC emissions were approximately 31 times greater than KCAPCD's and NO_x emissions were approximately 15 times greater than KCAPCD's. Clearly, ozone precursors from the area impacting on Mojave by transport (the San Joaquin Valley) were, in 1999, and still are, overwhelming in comparison to local precursor emissions.

TABLE 2-1
1999 Emission Inventory Comparison

Area	VOC	NO_x
KCAPCD	14	36
SJVUAPCD	438	533
Kern County portion of SJV	137	165
Ratio SJVUAPCD:KCAPCD	31	15
Ratio Kern County portion of SJV:KCAPCD	10	5

SOUTH COAST IMPACT

While emissions of ozone precursors in SCAQMD have been reduced, they are still 17 (for NO_x) to 27 (for VOC) times greater than in the downwind area (Antelope Valley plus KCAPCD). Table 2-2, Page 2-13, shows 1999 CCOS emissions for South Coast, Antelope Valley and Kern County Air Pollution Control District.

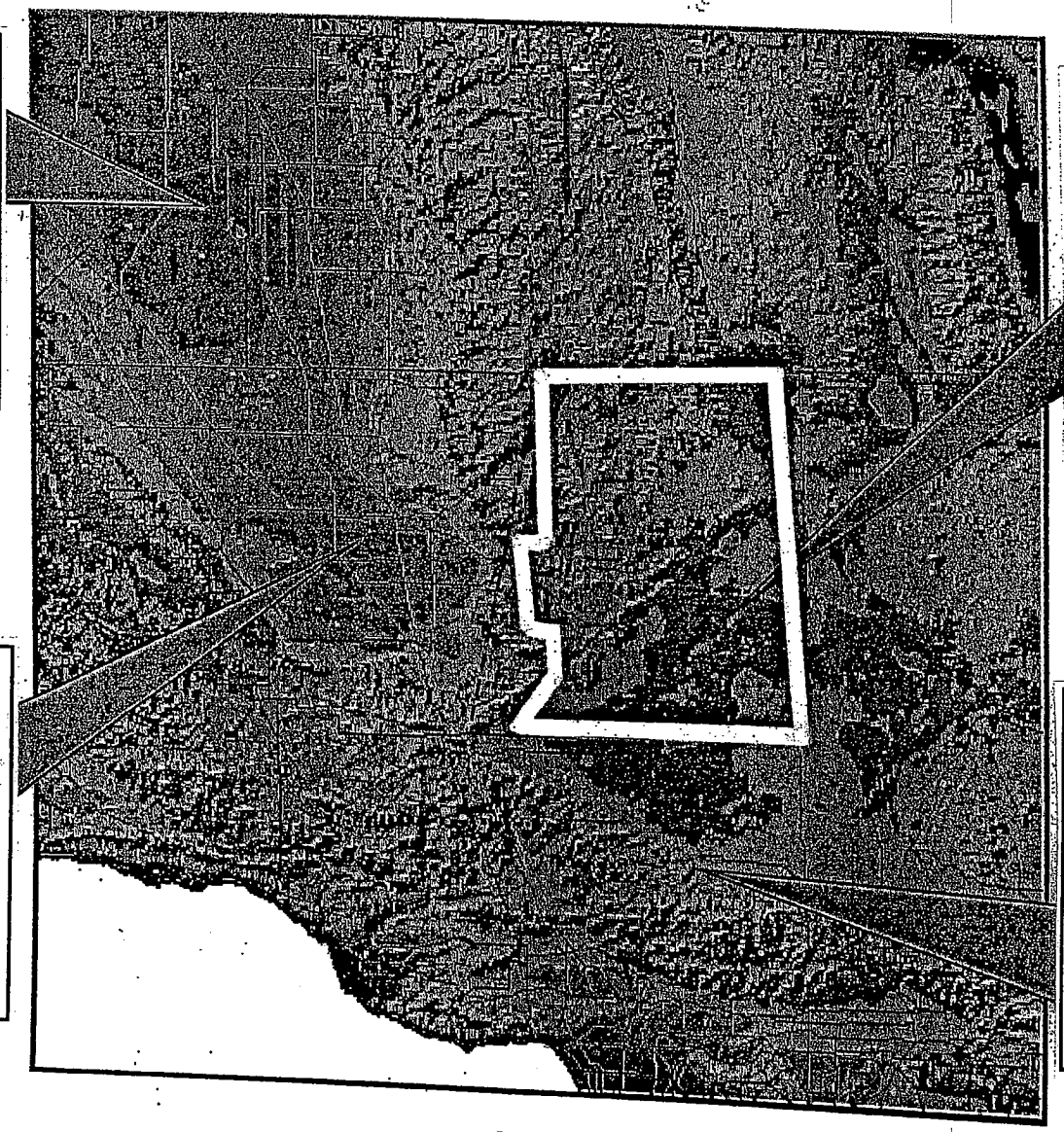
TABLE 2-2
1999 Emission Inventory Comparison

Area	VOC	NO_x
KCAPCD	14	36
South Coast	947	1117
Antelope Valley	22	30
Ratio SCAQMD:KCAPCD + Antelope Valley	26	17

Figure 2-8, Page 2-14 provides a satellite view of these areas and their associated emissions. Figure 2-9, Page 2-15 shows the distribution of major sources throughout California and on the East Coast. Clearly, East Kern has a low density of sources. Again, because the upwind area's ozone precursor emissions are so much greater than the downwind area, overwhelming ozone impact can be expected given the preceding discussions of wind flow patterns.

Comparison of KCAPCD and Adjacent Vicinities

SJVAB
-2,986,295 People
-24,580 sq miles
-934 Facilities
-438 tpd ROC
-533 tpd NOx



East Kern
-120,000 People
-3,700 sq miles
-10 Facilities
-14 tpd ROC
-36 tpd NOx

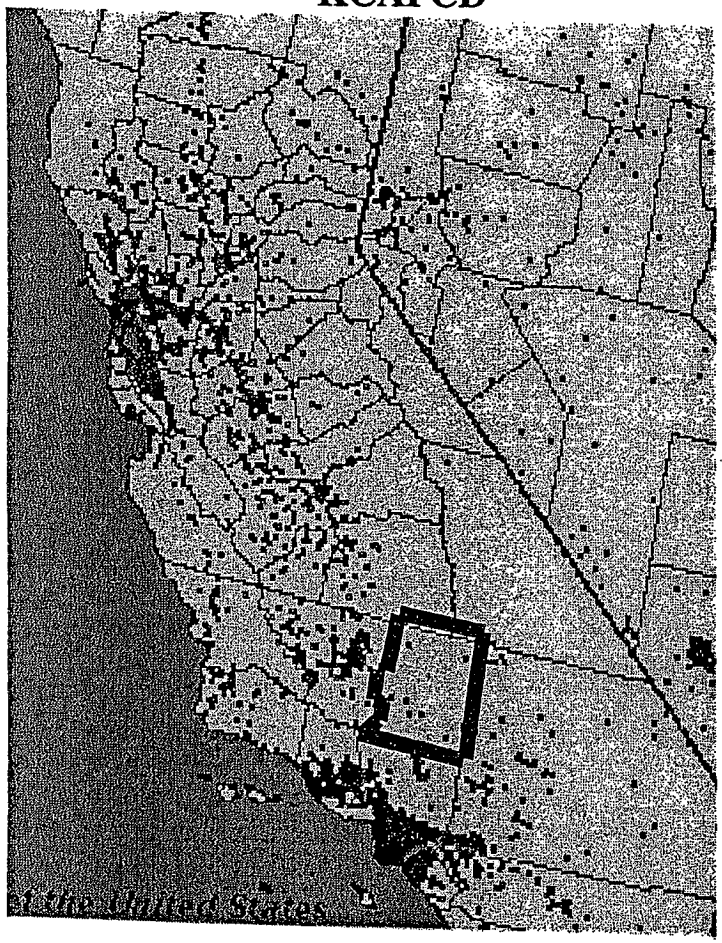
West Kern
-524,195 People
-5,580 sq miles
-316 Facilities
-137 tpd ROC
-165 tpd NOx

South Coast AQMD
-14,433,505 People
-5,112 sq miles
-4,694 Facilities
-947 tpd ROC
-1,117 tpd NOx

Figure 2-8

Comparison of emissions

KCAPCD



U.S. East Coast

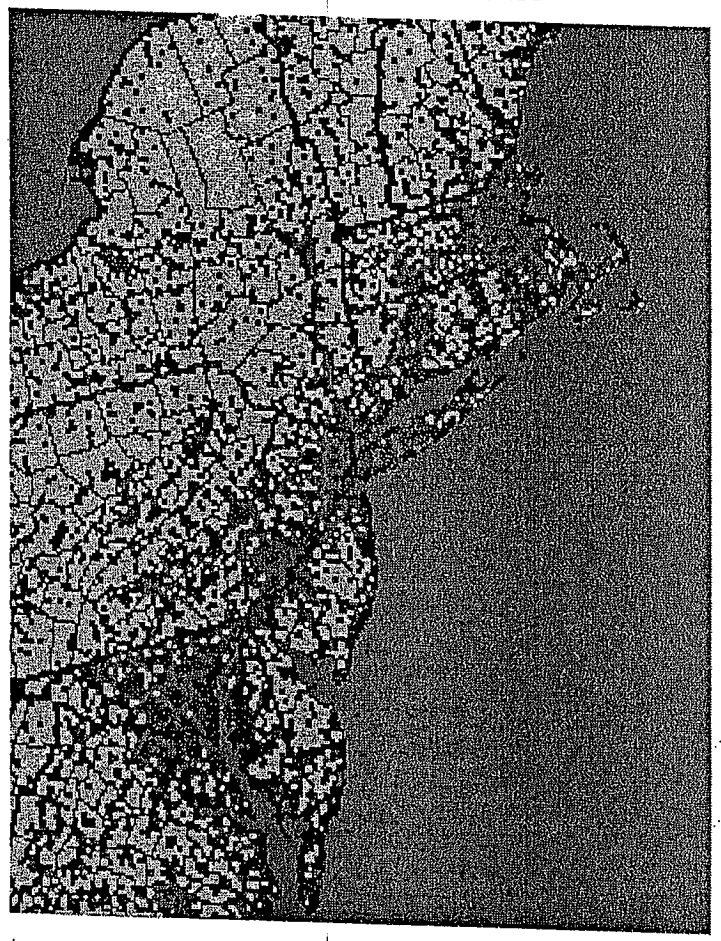


Figure 2-9

1994 ATTAINMENT DEMONSTRATION (PLAN)

Part I (Transport Analysis) of KCAPCD's 1994 Attainment Demonstration (Plan) clearly demonstrated KCAPCD would attain National Ambient Air Quality Standards for ozone when two upwind air districts, San Joaquin Valley Unified Air Pollution Control District and South Coast Air Quality Management District reduced transported ozone and precursors.

Part II (Attainment Demonstration) of the 1994 document analyzed modeling results from San Joaquin Valley Unified Air Pollution Control District's and South Coast Air Quality Management District's attainment demonstrations and found Kern County Air Pollution Control District would attain the NAAQS for ozone by 1999 even though both other districts would continue to contain nonattainment areas after that date. This has proved to be the case as 1999, 2000 and 2001 ozone monitoring show East Kern is attainment for the one-hour NAAQS.

It is important to note Kern County Air Pollution Control District was able to make its attainment demonstration without considering the significant internal VOC and NO_x emission reductions planned from implementation of Reasonably Available Retrofit Control Technology rules mandated by both the 1988 California Clean Air Act and 1990 Federal Clean Air Act Amendments. (These control measures were set forth in Kern County Air Pollution Control District's 1993 Rate-of-Progress Plan and 1994 Reasonable Further Progress Plan.) However, these VOC AND NO_x reductions were made and "complemented" the ozone control strategy of both the San Joaquin Valley Unified Air Pollution Control District and the South Coast Air Quality Management District, i.e., control of both ozone precursors.

PLAN APPROVAL

Kern County APCD's 1994 Ozone Attainment Demonstration (Attainment Plan) was approved by U.S. EPA on September 25, 1996 (62 Fed. Reg. 1150, January 8, 1997).

CHAPTER 3

ATTAINMENT PLAN IMPLEMENTATION

INTRODUCTION

CONTROL MEASURES AND EMISSION REDUCTIONS

ADDITIONAL MEASURES

INTRODUCTION

This chapter presents Kern County APCD's strategy used to satisfy Reasonable Further Progress requirements of the FCAAA and to attain the ozone NAAQS. Primary control measures (both VOC and NO_x) are described in the next section, including information about implementing agency, adoption and implementation dates, and associated emission reductions. Other measures are considered contingency measures and would be used in the event primary control measures do not result in maintaining the standard. (See Chapter 6.) These measures constitute virtually all feasible and Reasonably Available VOC and NO_x controls for East Kern's stationary sources.

CONTROL MEASURES AND EMISSION REDUCTIONS

Kern County APCD's strategy for providing reductions necessary to achieve attainment by 1999, consisted of CARB-implemented VOC and NO_x and District-implemented VOC and NO_x control measures. These control measures (CM's), were sufficient to achieve required emission reductions by 1999 and helped result in attainment. These control measures are briefly described in this section; VOC, CM's in Table 3-1 and NO_x CM's in Table 3-2. These tables include both KCAPCD and CARB control measures. Detailed descriptions of KCAPCD VOC and NO_x control measures adopted and implemented since 1991, can be found in KCAPCD's Rate-of-Progress Plan.

Shown on Tables 3-1 and 3-2 for each Rule is adoption date, implementing agency or agencies, and estimated emission reductions.

ADDITIONAL MEASURES

In addition to adoption and implementation of conventional "command and control" emission limit regulations, KCAPCD has implemented two programs which have affected NO_x and VOC emission reductions. These are the Carl Moyer Heavy Duty Engine Replacement Program and use of vehicle registration air quality surcharge fees for replacement and/or removal of older onroad motor vehicles.

TABLE 3-1
VOC Control Measures

Adoption Date	Full Implementation Date	Rule Number	Title	Implementing Agency	1996 VOC Emission Reduction	VOC Emission Reduction Tons/Day Summer 80% Rule Effectiveness
#1 1989	1993	412.1	Retail Gasoline Station Vapor Recovery	KCAPCD		0.02
#2 1991	1992	210.1	New Source Review	KCAPCD		0.19
#3 1991	1993	412	Gasoline Transfer/Storage Containers and Bulk Plants	KCAPCD		0.07
#4 1991	1992	410.5	Cutback Asphalt Paving Material	KCAPCD		1.76
#5 1991	1995	410.4A	Coating-Motor Vehicle & Mobil Equipment Refinishing	KCAPCD		0.05
#6 1994	1995	410.3	Organic Solvent Degreasing	KCAPCD		0.16
#7 1994	1995	410.1	Coatings-Architectural	KCAPCD		0.06
#8 1994	1995	410.4	Coatings-Metal Parts Painting (Further Control)	KCAPCD		0.01
#9 1994	1995	410.7	Graphic Arts	KCAPCD		0.05
#10	1999		Long Range Motor Vehicle Plan	CARB		0.21

Continued...

TABLE 3-1
VOC Control Measures

Adoption Date	Full Implementation Date	Rule Number	Title	Implementing Agency	1996 VOC Emission Reduction	VOC Emission Reduction Tons/Day Summer 80% Rule Effectiveness
#11	1999		Pesticides	DPR		0.27
#12	1999		Consumer Products	CARB		0.09
	1998	422.1	Solid Waste Landfills	KCAPCD		0.02
	1999	414.2	Soil Decontamination	KCAPCD		0.01
	1995		Domestic Solvent Use	CARB		0.14
	1995		Lawn & Garden Equipment	CARB		0.04
	1995		Aerosol Paint	CARB		0.02
					TOTAL REDUCTIONS	**3.2 tons/day**

TABLE 3-2
NO_x Control Measures

	Adoption Date	Full Implementation Date	Rule Number	Title	Implementing Agency	Reduction Tons/Day Summer 80% Rule Effectiveness
#1	1992	1997	425	Station Gas Turbine Engines	KCAPCD	1.26
#2	1994	1997	425.3	Portland Cement Kilns	KCAPCD	2.54
#3	1994	1997	425.1	Hot Mix Asphalt Batch Plants	KCAPCD	0.01
#4	1994	1997	425.2	Boilers, Steam Generators And Process Heaters	KCAPCD	0.34
#5	1994	1997	427	Stationary Piston Engines	KCAPCD	0.35
#6		1999		Long Range Motor Vehicle Plan	CARB	0.35
				Total Reduction		**4.85**

CHAPTER 4

ATTAINMENT DEMONSTRATION

OZONE AIR QUALITY TRENDS

EAST KERN OZONE AIR QUALITY

OZONE AIR QUALITY TRENDS

The California Air Resources Board (and others) have determined East Kern Ozone Air Quality is overwhelmingly impacted by ozone transported by winds from two upwind air basins: The San Joaquin Valley Air Basin and the South Coast Air Basin. Ozone air quality has been improving in these two areas, but they have yet to attain National Ambient Air Quality Standards. (See Figure 4-1, Page 4-2). Concurrently, ozone air quality in the Mojave Desert Air Basin has been improving and to the extent Eastern Kern County has attained the National Ambient Air Quality Standard of 0.12 ppm (1 hour average).

EAST KERN OZONE AIR QUALITY

Three ambient ozone monitors are operated in Eastern Kern County, one at Mojave Airport, one at the Naval Air Weapons Station (NAWS), China Lake, and one at Edwards Air Force Base (EAFB). Figure 2-1, Page 2-2, shows the monitor locations. The Mojave monitor is part of the SLAMS/NAMS network, owned by KCAPCD, and operated by CARB. The other two monitors are owned by the respective military bases upon which they are located. NAWS personnel operate its monitor and EAFB's monitor is operated by XONTECH. The Mojave monitor went into operation in 1993, the EAFB monitor in 1997, and the NAWS monitor in 1999.

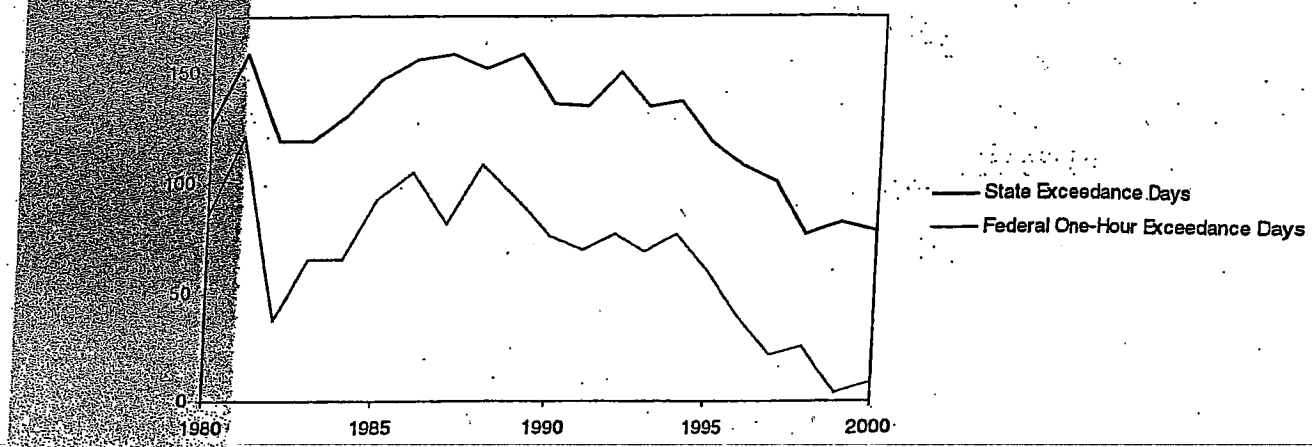
Monitoring data for all three stations for 1999, 2000 and 2001, show Eastern Kern County has attained the National Ambient Air Quality Standard for ozone (0.12 ppm, one hour average). In other words, at each station, there is not more than an average, over these three years, of one exceedance day per year. All monitoring data appear in Appendix A.

2002 and 2003 (to date) data show continued attainment.

Figure 4-1

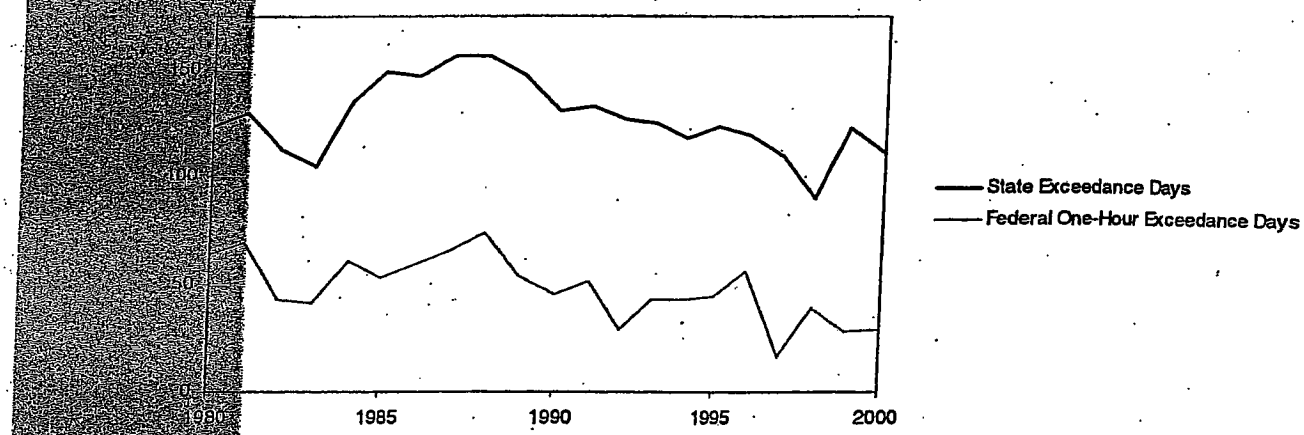
Mojave Desert Air Basin

(KCAPCD, MDAQMD, and AVAQMD)

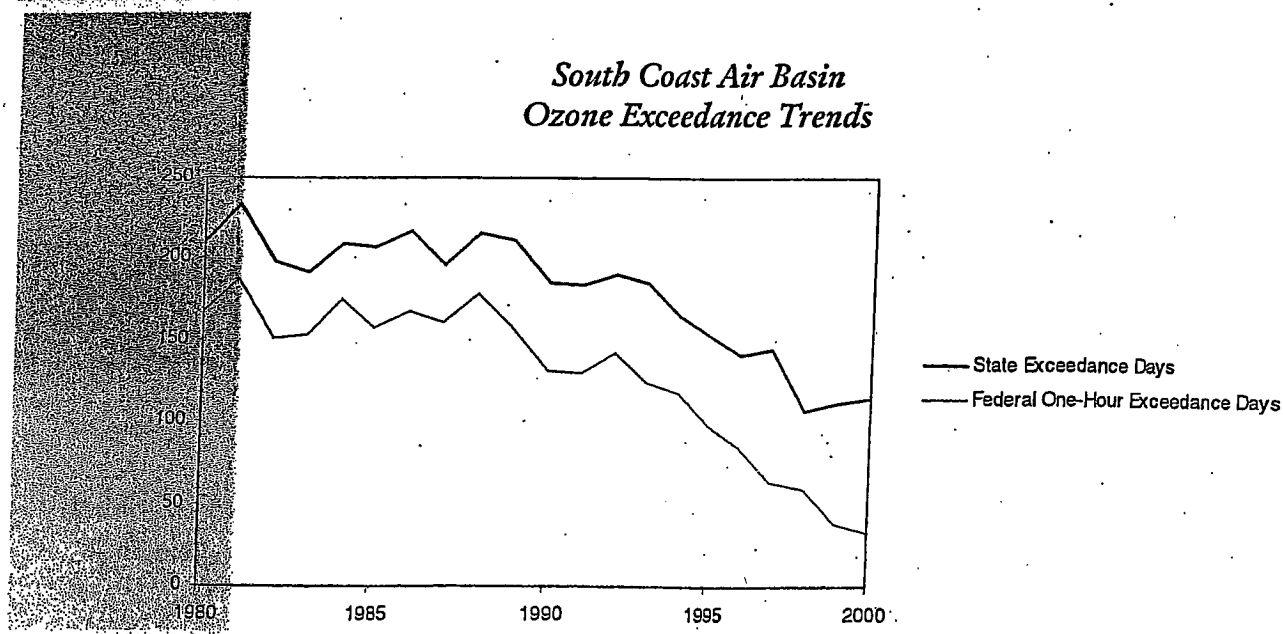


Ozone Exceedance Trends

San Joaquin Valley Air Basin
Ozone Exceedance Trends



South Coast Air Basin
Ozone Exceedance Trends



SECTION II

MAINTENANCE PLAN

CHAPTER 5

REGIONAL FORECAST

FORECAST EMISSION INVENTORY

GROWTH CODES

CONFORMITY

FORECAST EMISSION INVENTORY

42 U.S.C. §7505a (FCAA §175A) requires a maintenance plan to include an emission inventory extending at least 10 years beyond the redesignation date. KCAPCD's Ozone Attainment Plan was required to forecast regional emissions through 1999, the mandatory serious classification attainment date. An emission inventory has been prepared by CARB for Eastern Kern County that forecasts emissions through the year 2015. This forecast inventory covers 14 years beyond the attainment date, and 12 years beyond the expected redesignation data, i.e., 2003.

Table 5-1 shows the actual emission inventory for the two ozone precursors (NO_x and ROG (VOC)) for 1990 through 2000, and the forecast emission inventories for 2005, 2010 and 2015. The region's precursor emission inventory declines through the year 2015. Continued attainment is expected. Furthermore, transported ozone will continue to decline from now on. Appendix B consists of CARB's support data for forecast inventories.

GROWTH CODES

Forecast inventories are estimated by multiplying a base year value for each category by a "growth code" for a given future year. The "growth code" is indexed to the base year (1990 for this document), so its value is 1.00. This allows the growth code to estimate future emissions; for example, if the growth code for the year 2001 is 1.50, activity in that category (and resulting emissions) is expected to be 50 percent greater than in 1990.

Growth codes used for ozone precursors for Eastern Kern County reflect lack of significant historical change since 1990 and lack of significant future expected change in the region. No significant population increase in the area is expected. Eastern Kern County has about 115,000 residents. The economy is heavily dependent upon Naval Air Weapons Station (NAWS) and Edwards Air Force Base (EAFB) activities, which have declined or remained about the same in recent years with Department of Defense cutbacks. Related private industry aerospace activities have correspondingly decreased. Mining activity is the other economic base in East Kern. Gold and silver mining has diminished since 1992. Borax mining and processing has remained constant with

the sole producer, U.S. Borax, streamlining its operation by shutting down many combustion processes. East Kern's three Portland cement plants have increased production without increasing emissions (by providing offsets).

Since 1975, a significant number of metals recovery operations, which were a significant source of NO_x and ROG (VOC) emissions, have shut down. Near Rosamond, a chemical milling operation with ROG emissions of over 100 tons per year ceased operation in 1993. Near Mojave, two carbon black plants have closed.

TABLE 5-1
KCAPCD Emissions Inventory
Summary of Emission Trends and Forecasts

ROG Emissions (tons/day, Summer Inventory)

1990	1995	1999	2000	2001	2005	2010	2015	2020
28	17	14	14	14	13	12	13	12

NO_x Emissions (tons/day, Summer Inventory)

1990	1995	1999	2000	2001	2005	2010	2015	2020
47	35	36	36	36	36	35	36	36

CONFORMITY

The 1990 Federal Clean Air Act requires all federally-funded projects, including transportation projects, projects at military bases, etc., to be analyzed to verify associated air pollutant emissions will not interfere with attainment of air quality standards.

TRANSPORTATION CONFORMITY

Onroad Motor Vehicle Emissions Budgets for Transportation Conformity

The federal transportation conformity regulation[3] requires the Maintenance Plan to specify onroad motor vehicle emissions budgets for the last year of the Maintenance Plan that represent allowable levels of onroad motor vehicle emissions that demonstrate maintenance in the region.[4] Conformity regulations also allow development of emissions budgets for any interim years. Emissions budgets are established in this Maintenance Plan for the attainment year of 2001, an interim year of 2005, and the last year of the Plan, 2015 (Table 5-2). The 2015 horizon year emissions budgets will also supply to all post-2015 future transportation conformity analysis years, as authorized in the federal transportation conformity rule.[5]

TABLE 5-2

EASTERN KERN COUNTY
ONROAD MOTOR VEHICLE EMISSIONS BUDGETS
OZONE MAINTENANCE PERIOD
(tons per day)

Pollutant	2001	2005	2015
ROG	4.8	3.9	2.1
NO_x	8.1	7.1	4.0

Note: Emissions budgets are based on CARB's EMFAC2002 motor vehicle emission factor model and reflect the summer inventory.

[3] 40 CFR 93.118 ("Criteria and Procedures: Motor Vehicle Emissions Budget").
[4] 40 CFR 93 ("Determining Conformity of Federal Actions to State or Federal Implementation Plans").
[5] 40 CFR 93.118(b)(2) ("Criteria and Procedures: Motor Vehicle Emissions Budget").

Emissions budgets presented in Table 5-2 represent onroad motor vehicle emissions levels projected for 2005 and 2015, as determined using travel activity forecasts provided by the Kern Council of Governments (Kern COG) and matched in CARB's EMFAC2002 onroad motor vehicle emission factor model using CARB's "Recommended Methods for Use of EMFAC2002 to Develop Motor Vehicle Emissions Budgets and Assess Conformity". These budgets are environmentally conservative in that they are substantially lower (more stringent) than needed to provide for maintenance of the one-hour ozone NAAQS. These budgets readily provide for such maintenance, as well as continue the region's progress toward attaining the new, more-stringent eight-hour ozone NAAQS.

Emissions budgets presented in Table 5-2 are reported to the tenth of a ton, and 2005 and 2015 budgets were slightly adjusted by adding one tenth of a ton to account for potential emission increases associated with recent state legislation affecting smog check requirements.[6] Because these emissions budgets are expressed in tenths of a ton per day, onroad motor vehicle emissions estimates should be rounded up to the next tenth of a ton conformity determinations.

GENERAL CONFORMITY

To ensure federal agencies do not take or support actions, which conflict with KCAPCD's efforts to achieve federal air quality standards, EPA promulgated the Federal General Conformity Rule on November 30, 1993 (58 FR 63214). KCAPCD Rule 210.7 incorporates this federal rule into the District's regulations. General Conformity is intended to assure federal actions do not adversely affect attainment and maintenance of federal air quality standards. Rule 210.7 addresses both direct and indirect emissions of ozone precursors (NO_x and ROG) caused by a federal action which exceed specified *de minimis* levels. Certain federal actions are not subject to conformity determinations, e.g., an action that involves a major new or modified stationary source that requires a permit under the District's New Source Review Rule or Prevention of Significant Deterioration provisions of the Federal Clean Air Act.

Since KCAPCD is designated a "serious" ozone nonattainment area, general conformity

[6]California Assembly Bill 2637 (2002 Statutes).

determinations are triggered for nonexempt federal actions when emissions will exceed 50 tons/year of any ozone precursor. Eastern Kern County has attained the federal one-hour ozone standard and is petitioning for redesignation as a maintenance area. Upon redesignation as a maintenance area the exemption threshold will become 100 tons/year. The following criteria are used to determine conformity of nonexempt federal actions[7]:

1. The action is in conformity if its emissions are specifically identified and accounted for in the applicable state implementation plan (SIP)[8].

2. If emissions from the action are fully offset with reductions of existing emissions, the action is in conformity.

3. Where EPA has approved a revision to an area's attainment or maintenance demonstration after 1990, an action is in conformity if emissions from the action, together with all other emissions in the nonattainment or maintenance area, do not exceed emissions budgets set forth in the applicable SIP. This criterion is known as the "budget" test.

4. Where EPA has not approved a revision to an area's attainment or maintenance demonstration after 1990, an action is in conformity if its emissions do not increase emissions with respect to baseline emissions. Eastern Kern County baseline emissions reflect historical activity levels that occurred in the geographic area affected by the federal action in the calendar year 1990. Baseline emissions are total direct and indirect emissions calculated for future years using historic activity levels and appropriate emission factors for future years.[9] This is known as the "build/no build" test.

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7 For further detail, see Title 40, Code of Federal Regulations, Part 51.858.

8 The applicable SIP means the portion or portions of the SIP, or its most recent revision, which has been approved by EPA under Section 110 of the Clean Air Act.

9 The future years are defined at 40 CFR 51.859(d).

CHAPTER 6

EMISSION CONTROL MEASURES

ADDITIONAL MEASURES

CONTINGENCY MEASURES

ADDITIONAL MEASURES

42 U.S.C. §7505a(a) (FCAA §175A(a)) requires a maintenance plan to include sufficient additional emission control measures to ensure attainment with the NAAQS's. Continued attainment without additional control measures is expected for two reasons. First, KCAPCD's emission inventory is not expected, in the future, to exceed the inventory during the period when attainment was demonstrated, i.e., 1999-2001. Second, Eastern Kern County is overwhelmingly impacted by airborne ozone transported from the San Joaquin Valley Air Basin and the South Coast Air Basin. Continued ozone reductions in these areas in their quest for attainment will ensure KCAPCD will not experience future exceedances of the ozone NAAQS's. Accordingly, no additional control measures are required to maintain ambient concentrations below the ozone NAAQS's.

CONTINGENCY MEASURES

42 U.S.C. §7505a(a) (FCAA §175A(a)) requires a maintenance plan to include contingency measures sufficient to ensure any exceedance of the NAAQS's that occurs after redesignation will be corrected. KCAPCD's 1994 ozone reasonable further progress plan included both NO_x and ROG contingency measures. Table 6-1 lists these measures.

TABLE 6-1
VOC and NO_x Contingency Measures

Rule Number	Title	Implementing Agency	VOC or NO_x Emission Reduction
422.1	Solid Waste Landfills	KCAPCD	VOC
New	Coatings-Aircraft and Aerospace Exterior	KCAPCD	VOC
New	Electronics Manufacturing	KCAPCD	VOC
New	Commercial Charbroiling	KCAPCD	VOC
425	Stationary Gas Turbine Engines	KCAPCD	NO_x
425.3	Portland Cement Kilns	KCAPCD	NO_x
425.1	Hot Mix Asphalt Batch Plants - Combustion	KCAPCD	NO_x
425.2	Industrial & Commercial Package Boilers	KCAPCD	NO_x
427	Stationary Piston Engines	KCAPCD	NO_x
New	Natural Gas Combustion in External Combustion Devices	KCAPCD	NO_x

SECTION III

REDESIGNATION REQUEST

CHAPTER 7

REQUIREMENTS

REDESIGNATION REQUIREMENTS

REDESIGNATION

Eastern Kern County has attained the ozone NAAQS's as shown by 1999, 2000 and 2001 monitoring data. Contingency measures are in place to ensure no future exceedances will persist.

Accordingly, Kern County Air Pollution Control District hereby requests the Eastern Kern County Ozone Planning Area (formerly part of the Kern County Nonattainment Area) be redesignated from "nonattainment" to "attainment" for the Federal Ozone NAAQS's.

REQUIREMENTS

42 U.S.C. §7407(d)(3)(E) (FCAA §107(d)(3)(E)) presents requirements which must be met to be redesignated to attainment. All requirements have been satisfied by previous actions and this document. These requirements area:

1. The area shall have attained the NAAQS's (refer to Chapter 5). [42 U.S.C. §7407(d)(3)(E)(i) (FCAA §107(d)(3)(E)(i))]

2. An implementation plan shall have been approved for the area (refer to Chapter 2). [42 U.S.C. §7407(d)(3)(E)(ii) (FCAA §107(d)(3)(E)(ii))]

3. The area's improvement in air quality shall be determined to be the result of permanent and enforceable emission reductions resulting from implementation of the applicable implementation plan and other permanent and enforceable mechanisms (refer to Chapters 3 and 4). [42 U.S.C. §7407(d)(3)(E)(iii) (FCAA §107(d)(3)(E)(iii))]

4. A maintenance plan shall have been approved for the area (this document in Section II contains a maintenance plan for the area; approval of this document constitutes approval of a maintenance plan for the area). [42 U.S.C. §7407(d)(3)(E)(iv) (FCAA §107(d)(3)(E)(iv))]

5. All implementation plan and nonattainment area requirements shall have been met for the area (refer to Chapter 1). [42 U.S.C. §7407(d)(3)(E)(v) (FCAA §107(d)(3)(E)(v))]