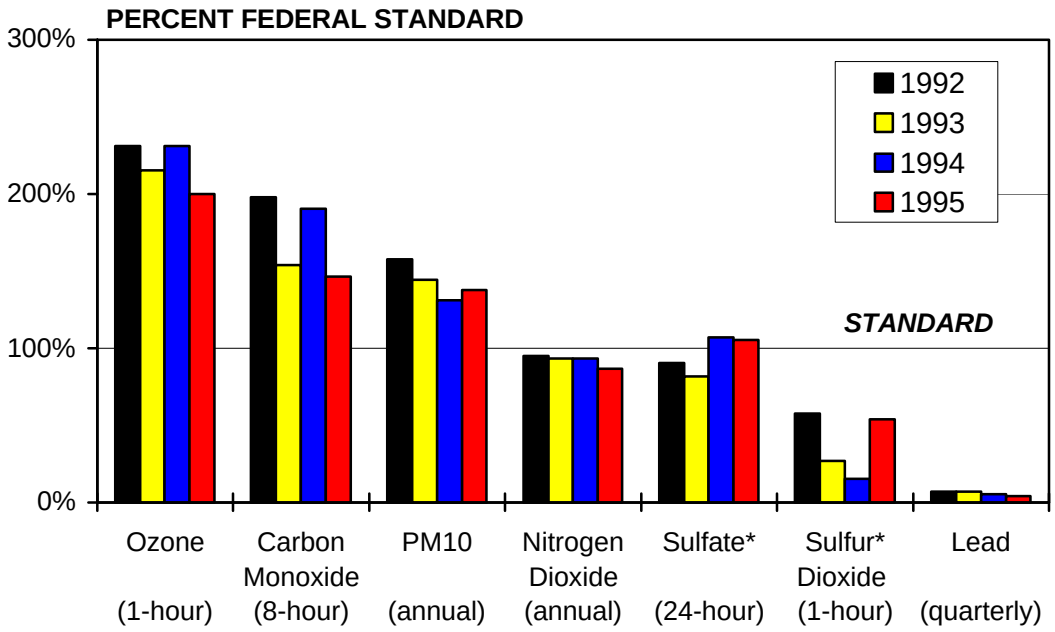
Current Air Quality and Trends

in the South Coast Air Quality Management District

Maximum Pollutant Concentrations in 1995

In 1995, pollutant concentrations in Southern California's South Coast Air Basin (Basin) continued to exceed federal and state standards for ozone, carbon monoxide and particulate matter (PM10). The state standard for sulfate was also exceeded. In the desert areas downwind of the Basin, the standards for ozone and PM10 were exceeded.

Maximum pollutant concentrations in the Basin continued to exceed the federal standards for ozone, carbon monoxide and PM10 by a wide margin. Figure 1 shows the 1995 Basin maximum pollutant concentrations as percentages of the federal standards compared to maxima for the previous three years. The maximum 1-hour average ozone



*Percent of state standard for sulfate and sulfur dioxide.

**Higher concentrations were recorded at special monitoring sites located immediately dowmwind of stationary sources of lead.

Figure 1

Maximum Pollutant Concentrations As Percent of Standards
1995 Compared to 1992-1994

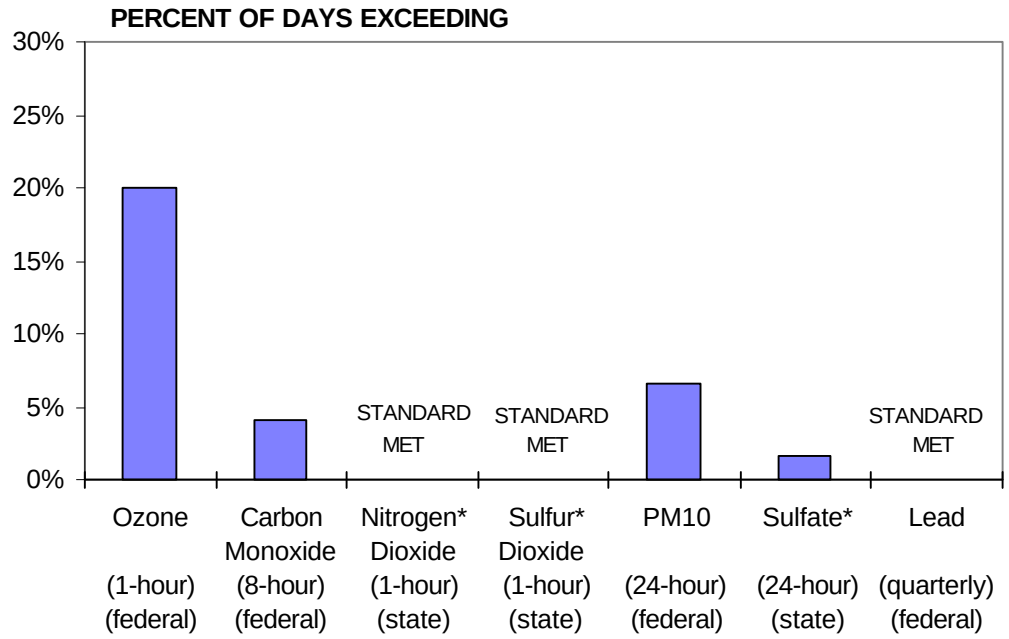
South Coast Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-0938

concentration in 1995 (0.26) was 200% of the federal standard, lower than the previous three years. The highest 8-hour average carbon monoxide concentration of the year (13.9 ppm) was 145% of the federal standard. Maximum 24-hour average and annual average PM10 concentrations (219 µg/m^3 and 69.0 µg/m^3) were 145% and 138% of the federal 24-hour and annual standards. The highest 24-hour average sulfate in 1995 (26.3 µg/m^3) was 105% of the state standard. (There is no federal sulfate standard.)

The federal nitrogen dioxide standard was not exceeded in 1995, with a maximum concentration (0.0464 ppm) which was 87% of the standard. The more stringent state standard was not exceeded either, with a maximum 1-hour average nitrogen dioxide concentration (0.24 ppm) which was 92% of the standard. Sulfur dioxide concentrations continued to remain well below the federal and state standards. Federal and state lead standards were not exceeded in 1995.

Number of Days Exceeding Standards in 1995

In recent years the South Coast Air Basin has been the worst location in the U.S. in terms of the annual number of days exceeding the federal standards. In 1995, there were 116 days on which one or more federal standards were exceeded somewhere in the Basin. Figure 2 shows the percent of days exceeding each of the federal or state standards in 1995 at the individual locations which recorded the greatest number of



*Percent of state standards for nitrogen dioxide, sulfur dioxide, and sulfate.

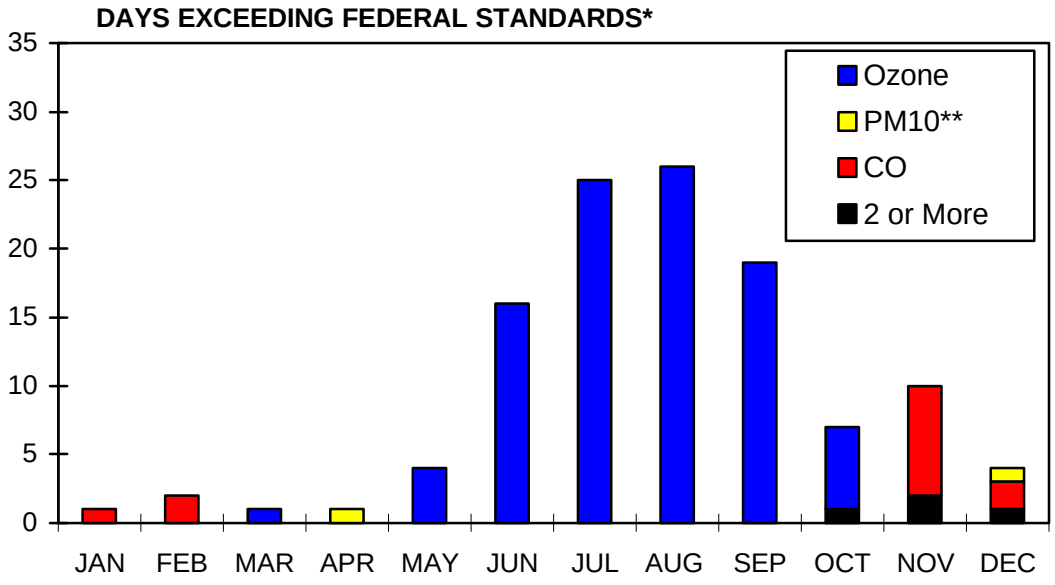
Figure 2

Percent of Days Exceeding Federal Standards*
at Most Affected Locations in 1995

exceedances. The federal ozone standard was exceeded on 73 days (20% of days) in the East San Gabriel Valley. The carbon monoxide standard was exceeded most frequently in the South Central Los Angeles County area, which recorded 13 days (4% of days) exceeding. PM10 concentrations are normally only sampled every sixth day, and exceedances are accordingly reported in terms of percent of days sampled. In 1995, the Metropolitan Riverside County area exceeded the federal PM10 standard most frequently, with 6.6% of days sampled exceeding. The Metropolitan Riverside County area was the only area to exceed the sulfate standard with 1.6% of days sampled exceeding.

Seasonal Variation in Pollutant Concentrations

Although concentrations of pollutants exceeding the standards were recorded frequently in the Basin in 1995, the number of exceedances recorded varied with time of year. Figure 3 shows the number of days exceeding the federal standards in the Basin during each month of 1995. Ozone exceedances peaked during the summer, and carbon monoxide exceedances peaked during the late fall and winter. Since PM10 exceedances are relatively infrequent and samples are normally collected every sixth day, no clear pattern can be seen for PM10 in 1995. However, examination of data for the 10-year period 1985-1995 shows that exceedances of the federal PM10 standard occur with greatest frequency in the fall and winter.



*Monthly number of days on which one or more Basin locations exceeded one or more federal standards. The standards were exceeded on a total of 116 days in 1995.

**The number of exceedances due to PM10 alone may have been higher, since PM10 samples are only collected every sixth day.

Figure 3

Monthly Number of Days Basin Exceeded Federal Standards*

Comparison of Air Quality in Different Areas

Ozone (O_3)

Figure 4 shows the average number of days exceeding the federal ozone standard at U.S. locations for the period 1993-1995. The Basin exceeded far more frequently than other areas of the U.S. However, the number of exceedances also varied widely between different areas of the Basin.

Figure 5 shows the number of days on which the federal ozone standard was exceeded in different areas of the Basin in 1995. The standard was exceeded most frequently in the Basin's inland valleys in an area extending from the West San Gabriel Valley eastward to the Riverside-San Bernardino area and into the adjacent mountains.The East San Gabriel Valley area recorded the greatest number of exceedances of the federal standard (73 days). The coastal areas of Los Angeles and Orange Counties, and the southeastern portion of the Basin near the San Diego County line, recorded no exceedances of the federal standard. However, most of these areas did exceed the more stringent state standard.

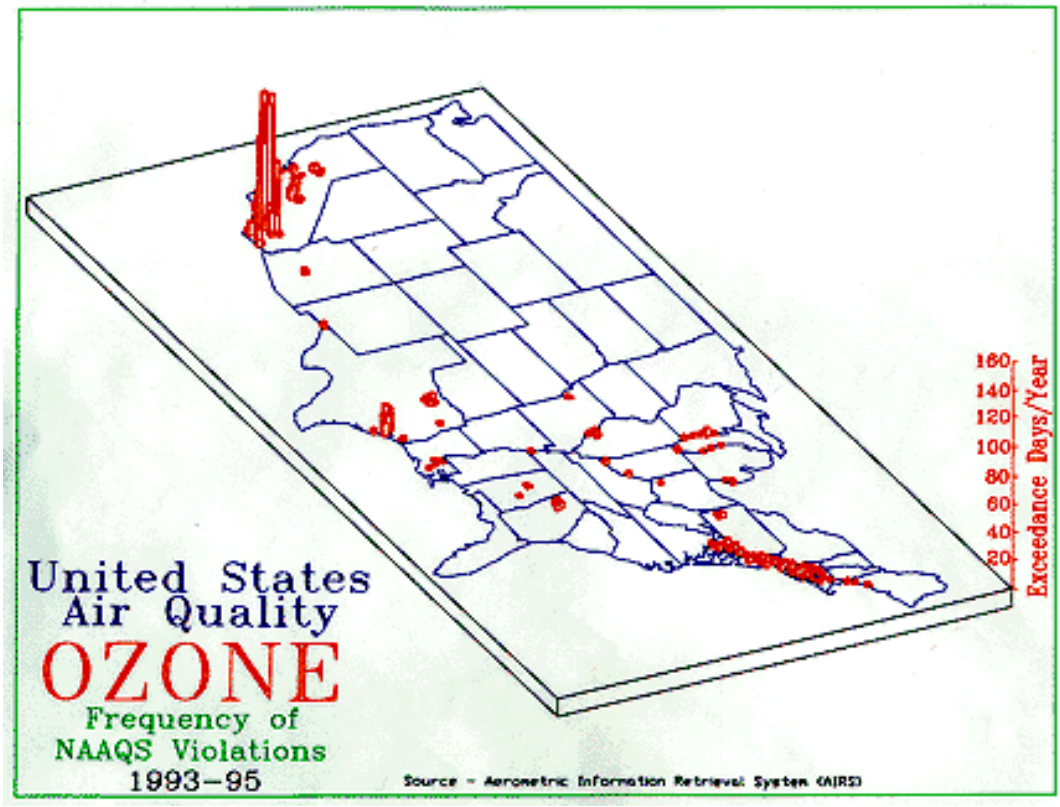


Figure 4

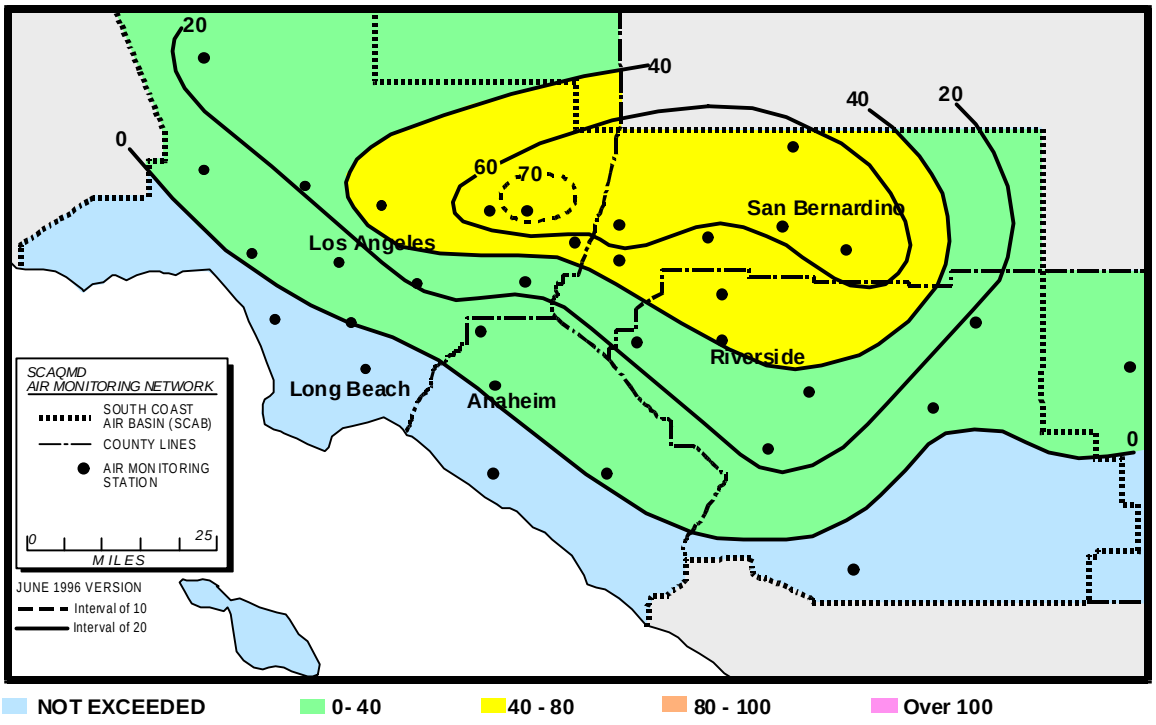


Figure 5

Ozone 1995
Number of Days Exceeding the Federal Standard

Carbon Monoxide (CO)

Figure 6 shows the average number of days exceeding the federal 8-hour standard for carbon monoxide at U.S. locations in 1994-1995. The Basin was highest in number of exceedances of the carbon monoxide standard.

Figure 7 shows the number of days exceeding the federal CO standard in the various areas of the Basin in 1995. The standard was exceeded only in Los Angeles County areas, where vehicle traffic is most dense. The South Central Los Angeles County area exceeded most frequently, with 13 days exceeding the federal standard.

Particulate Matter (PM10)

Figure 8 shows the U.S. locations with annual average PM10 concentrations exceeding the federal standard during the period 1993-1995. The height of the bar indicates the maximum annual average concentration for locations with annual averages over 50 $\mu g/m^3$ during the period. The areas indicated by a triangle rather than a bar exceeded the 24-hour, but not the annual, standard. The Basin was among the few areas exceeding the annual PM10 standard and also exceeded the 24-hour standard.

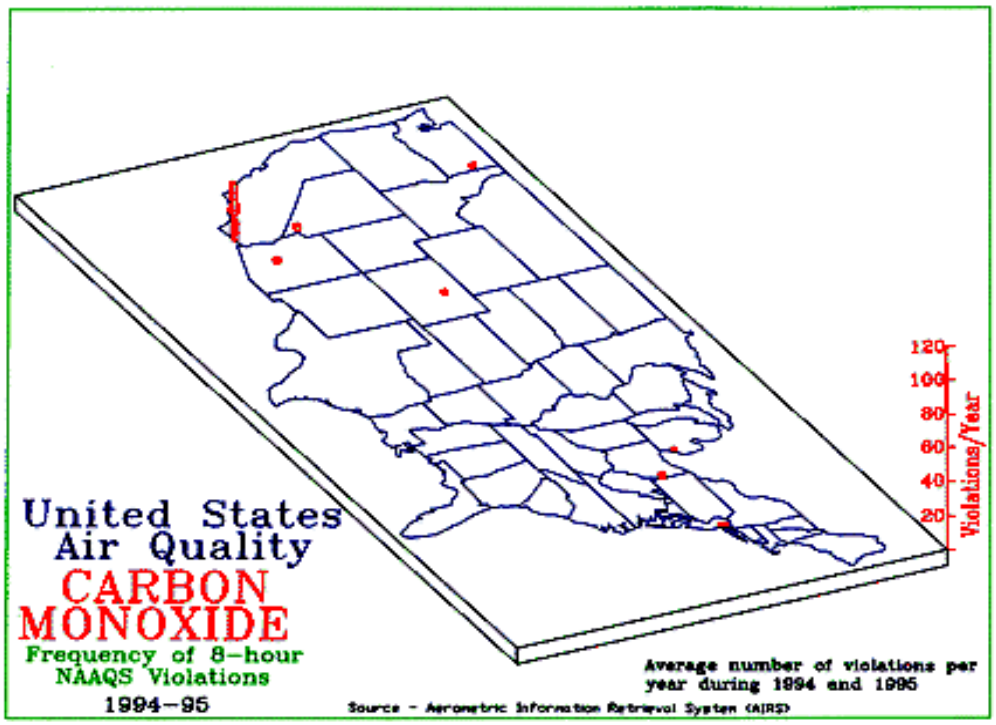


Figure 6

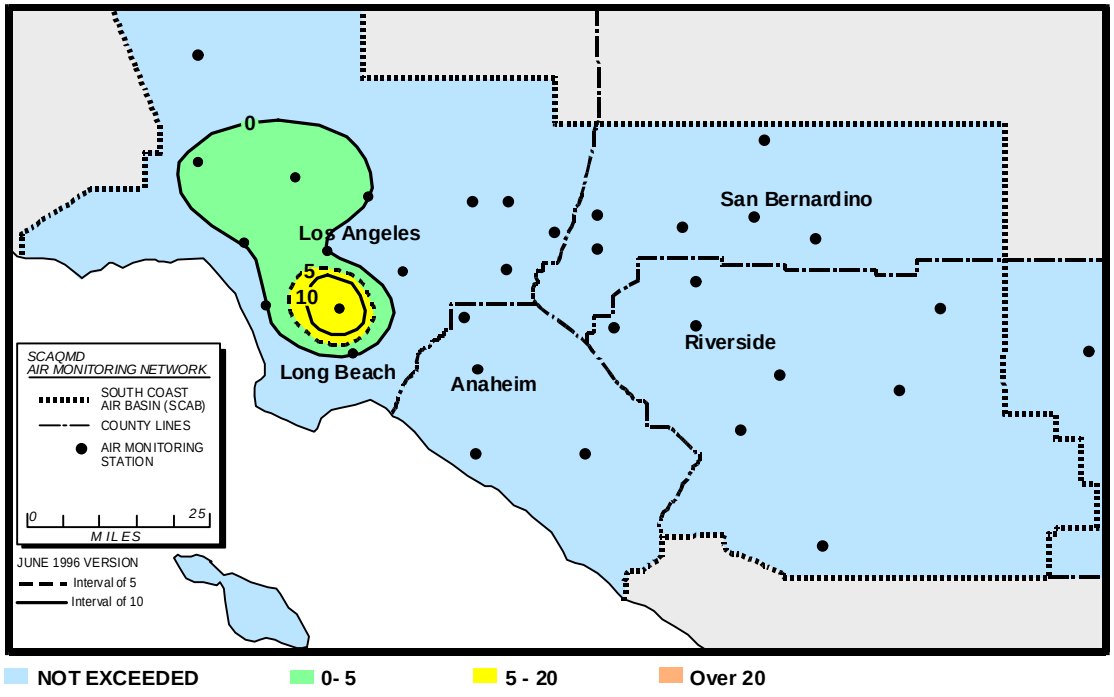


Figure 7

Carbon Monoxide - 1995
Number of Days Exceeding the Federal Standard

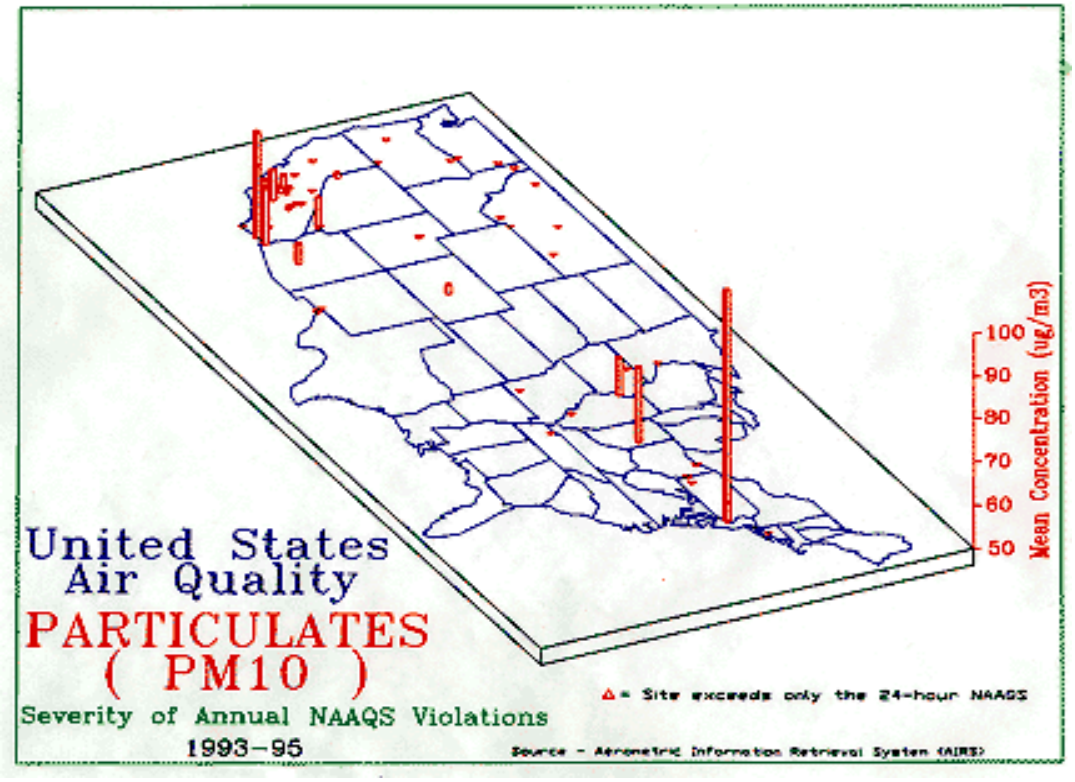


Figure 8

Figure 9 shows the 1995 annual average PM10 concentrations at locations in the Basin. Exceedances of the annual PM10 standard were limited to areas in western Riverside and San Bernardino Counties near the Metropolitan Riverside County area. Most areas of the Basin, including all locations monitored in Los Angeles and Orange Counties, did not exceed the federal annual PM10 standard in 1995. However, the much more stringent state annual PM10 standard was exceeded in virtually all areas of the Basin.

Figure 10 shows the percent of days exceeding the federal 24-hours PM10 standard. The federal 24-hour standard was exceeded over a wider area than the annual standard, with exceedances in parts of all four Basin counties. The far more stringent state 24-hour standard was exceeded in all areas of the Basin. Both the federal and state 24-hour standards were exceeded most frequently in the Metropolitan Riverside County area, where 7% of days sampled exceeded the federal standard and 62% exceeded the state standard.

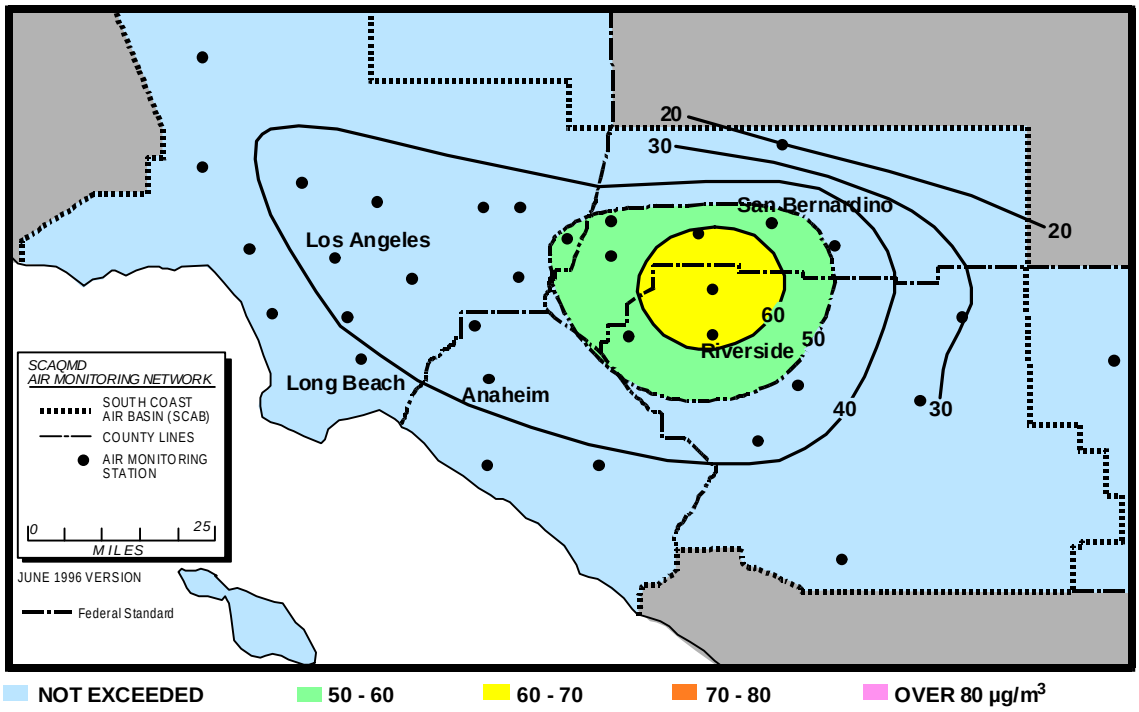


Figure 9

Suspended Particulate Matter (PM10) - 1995
Annual Arithmetic Mean, µg/m^3

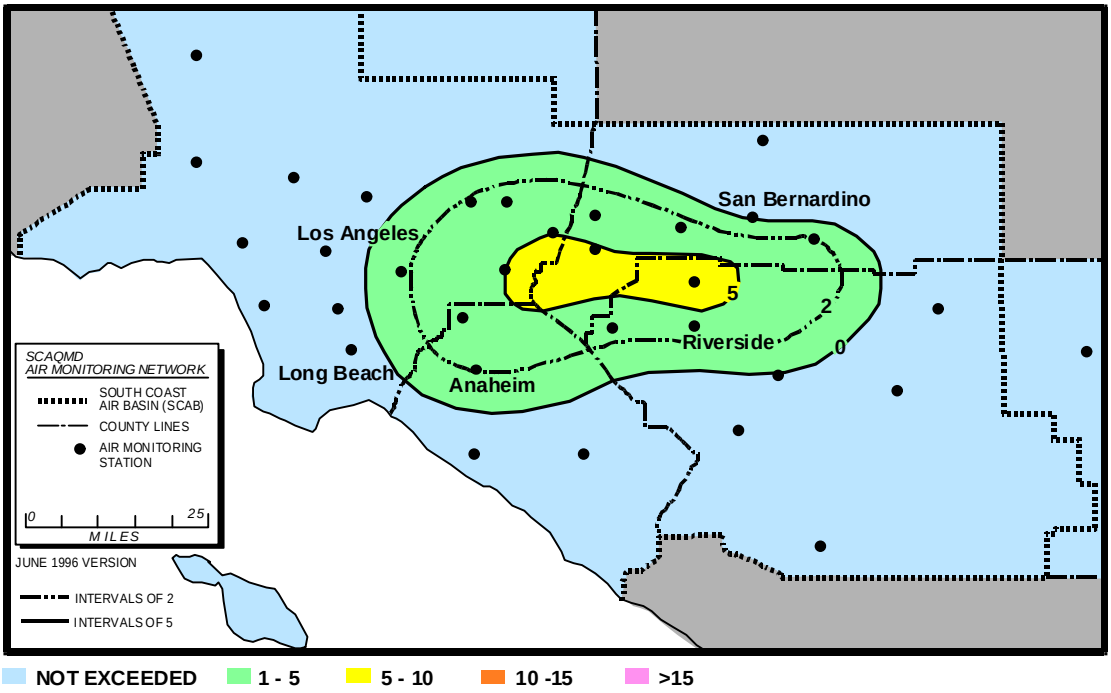


Figure 10

PM10 - 1995
Percent of Days Exceeding the Federal Standard

Nitrogen Dioxide (NO_2)

In 1995, no area of the Basin exceeded the federal standard for nitrogen dioxide. The maximum annual average NO_2 in 1995 was 87% of the federal standard. The state standard was not exceeded in 1995 either. The maximum 1-hour average NO_2 concentration in 1995 was 92% of the state standard.

Although nitrogen dioxide concentrations are not currently exceeding the standards, nitrogen dioxide contributes to the formation of ozone and PM10, and standards for both of these pollutants were exceeded in 1995.

Sulfur Dioxide (SO_2)

No area of the Basin has exceeded federal standards for sulfur dioxide since the 1960's and the state standard was last exceeded in 1990, prior to which there had been no exceedances since 1984. Standards for sulfur dioxide were not exceeded in 1995. Although sulfur dioxide standards are currently being met, sulfur dioxide reacts in the air to form sulfuric acid, which contributes to acid precipitation. Sulfuric acid reacts with basic substances to form sulfates which are part of particular matter or PM10, and standards for both sulfate and PM10 were exceeded in 1995.

Sulfate ($SO_4^{=}$)

In 1995, the sulfate standard was exceeded in the Metropolitan Riverside County area on 2% of days sampled. No exceedances were recorded in any other area of the District.

Lead (Pb)

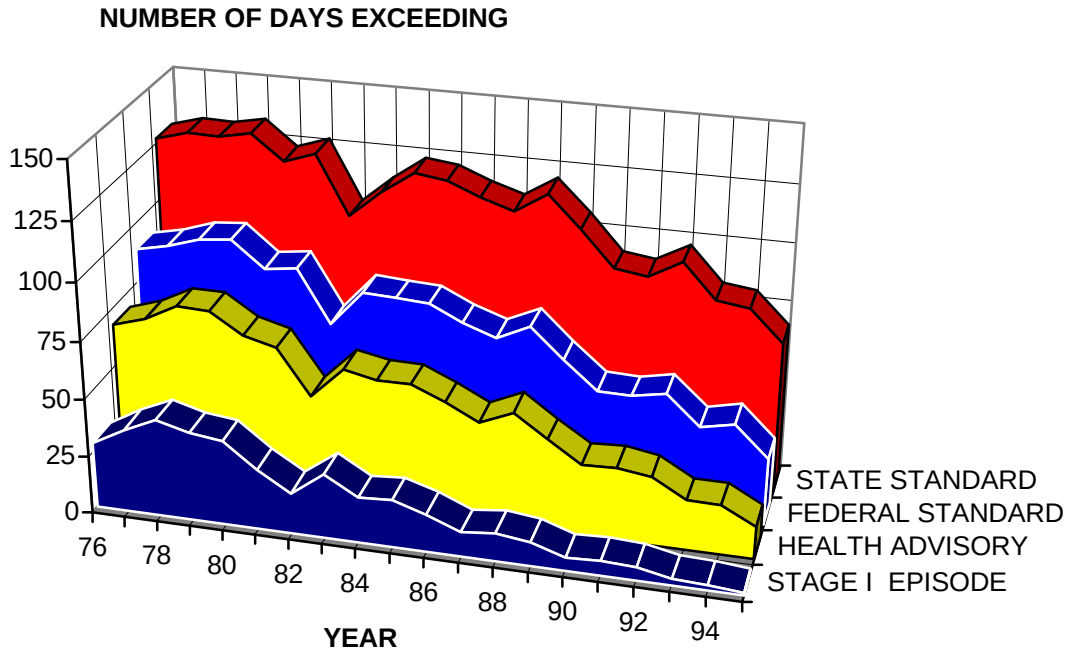
Lead concentrations ceased to exceed the state and federal standards at the District's regular monitoring stations after 1983 due to the phasing out of leaded gasoline. However, very localized violations were recorded in the Basin by special monitoring sites immediately adjacent to stationary sources of lead after 1990. No violations of state or federal lead standards were recorded in 1995 in any area of the Basin.

Air Quality Trends Through 1995

Air quality trends through 1995 have been examined and it was found that the number of exceedances recorded in 1995 is consistent with a continuation of the downtrends reported in previous years. (Basin trends through 1994 were discussed in the December 1994 issue of the AQSCR, Vol. 7, No. 12, and trends for individual stations were discussed in detail in Appendix II-B of the 1994 AQMP, "Air Quality Trends, 1976-1993.")

Ozone

Figure 11 shows the average number of days exceeding state and federal ozone standards and health advisory and episode levels for the years 1976-1995 for 17 stations in the Basin with complete data throughout the period. There has been a significant decrease in the average number of exceedances at all levels. The three-year average number of days exceeding decreased by 42% for the federal standard and 28% for the state standard between the years 1976-1978 and 193-1995.



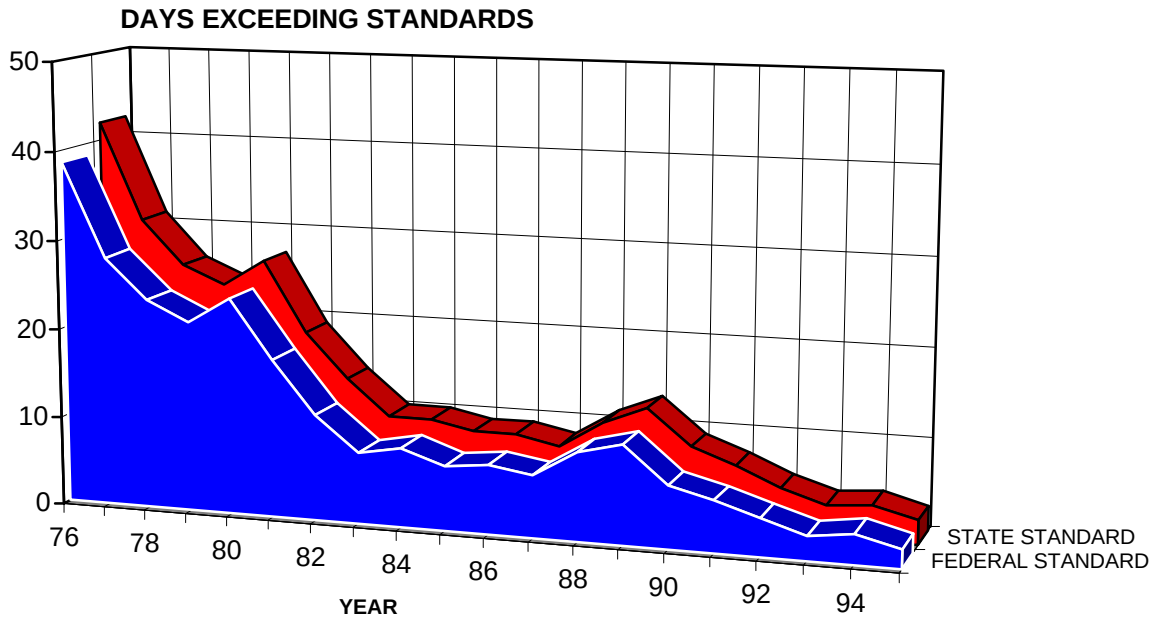
*Average days for 17 sites with complete data throughout the period.

Figure 11

OZONE
Aveage* Days Exceeding Standards and Episode Levels, 1976-1995

Carbon Monoxide

Figure 12 shows the average number of days exceeding the state and federal carbon monoxide standards for the years 1976-1995 for the eight stations with complete data throughout the period. Between 1976-78 and 1993-95, the three-year average number of exceedances decreased by 89% and 91% for the state and federal standards, respectively.



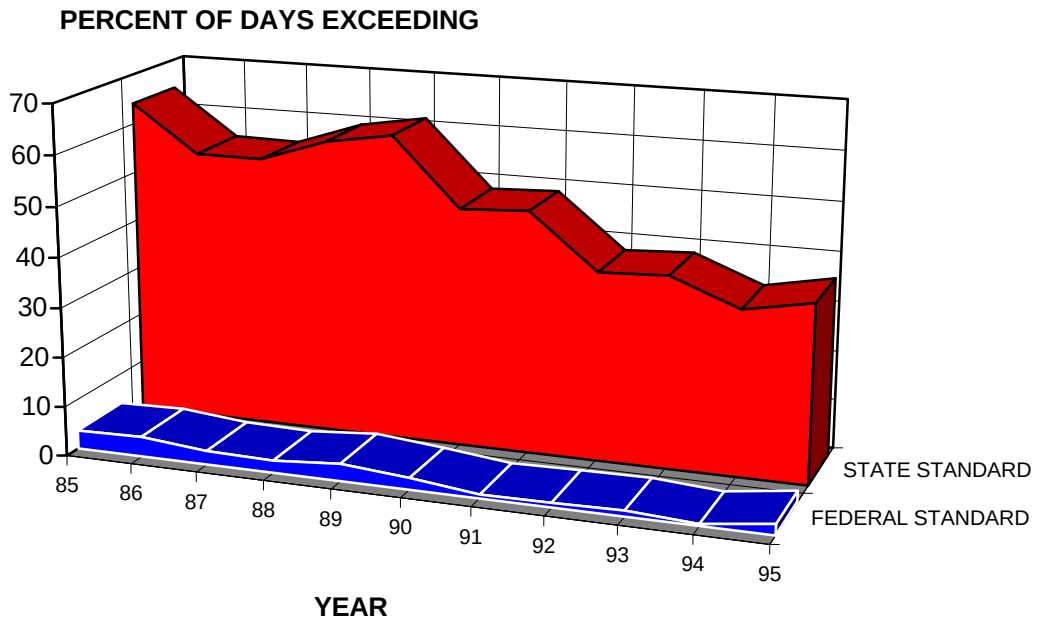
*Average days for 7 sites with complete data throughout the period.

Figure12

CARBON MONOXIDE
Average * Days Exceeding 8-Hour Standards, 1976-1995

PM10

Figure 13 shows the average percent of days exceeding the state and federal 24-hour average PM10 standards for the period 1985-1995 at the six Basin air monitoring stations with complete data throughout the period. The three-year average of percent of days exceeding decreased by 53% for the federal standard and 38% for the state standard between the years 1985-1987 and 1993-1995. Exceedances of the state 24-hour average PM10 standard show a significant downtrend through 1995.



*Average percent days for 6 sites with complete data throughout the period.

Figure13

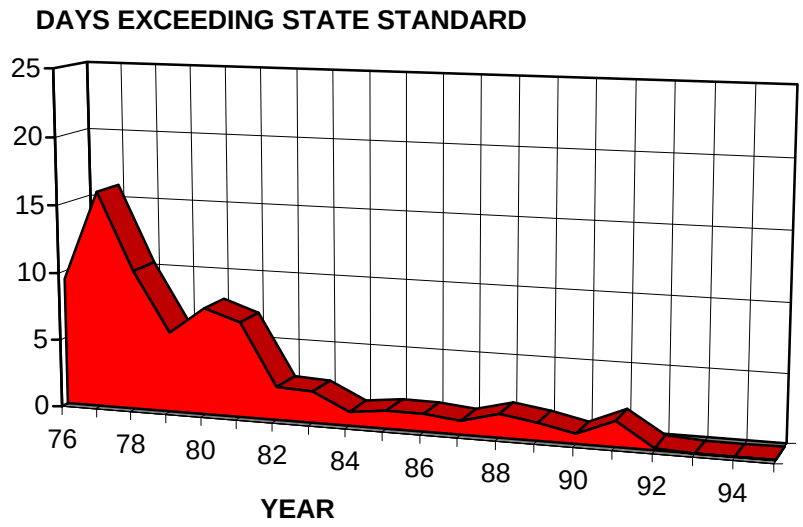
PM10
Average * Percent of Days Exceeding Standards, 1985-1995

Nitrogen Dioxide

Figure 14 shows the average number of days exceeding the state 1-hour nitrogen dioxide standard for the period 1976-1995 for the seven sites with complete data throughout the period. The three-year average number of days exceeding the state standard at the seven trend sites between 1976 and 1995 decreased by 100% from an average of 12 days in 1976-1978 to zero days in 1993-1995. The average nitrogen dioxide concentration for the seven trend sites decreased 31% between 1976-1978 and 1993-1995. There were no exceedances of the federal annual nitrogen dioxide standard in the Basin in 1995.

Sulfur Dioxide

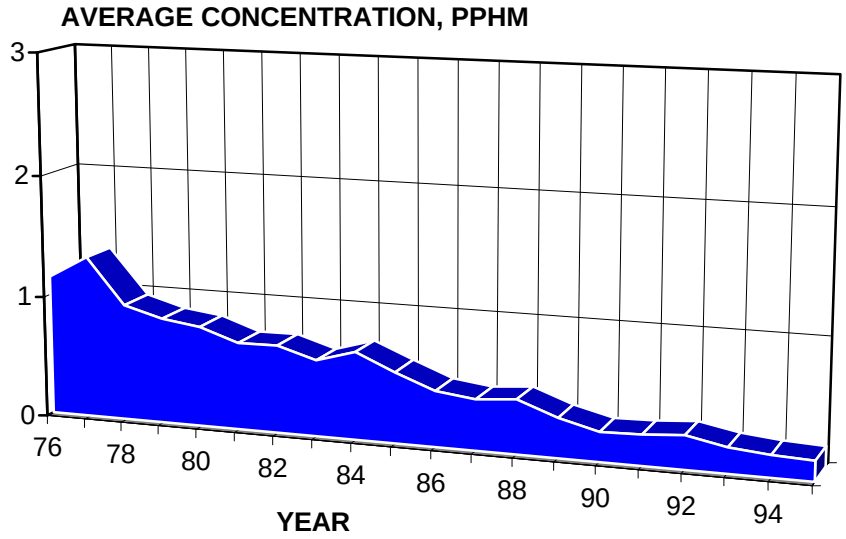
Sulfur dioxide concentrations continued to remain well below the state and federal standards in 1995. Figure 15 shows the average of the annual mean sulfur dioxide concentrations at five sites with complete data for the period 1976-1995. The average concentration at the five trend sites decreased 84% between 1976-1978 and 1993-1995.



*Average days for 7 sites with complete data throughout the period.

Figure14

NITROGEN DIOXIDE
Average * Days Exceeding State Standard, 1976-1995



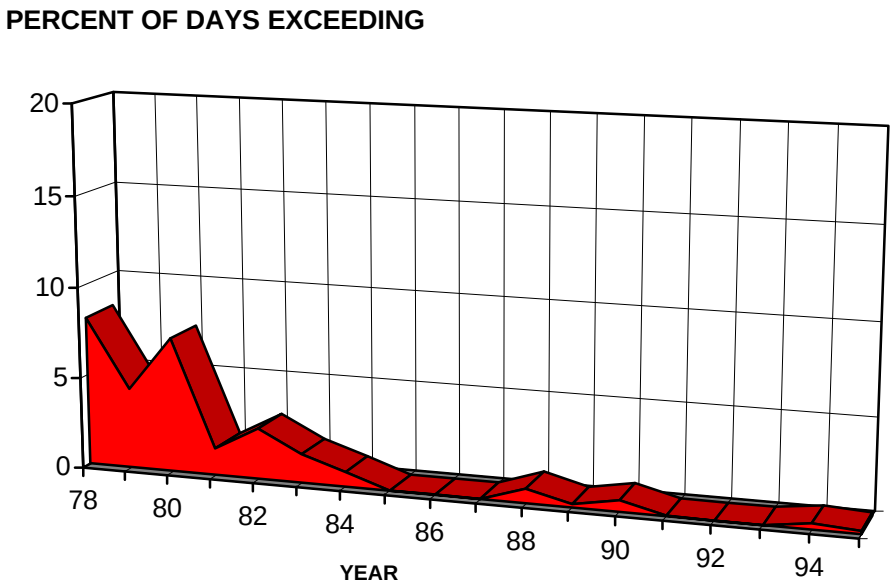
*Average of annual concentration at 5 sites with complete data throughout the period.

Figure15

SULFUR DIOXIDE
Average * Concentration (pphm), 1976-1995

Sulfate

Figure 16 shows the average percent of days exceeding the state sulfate standard for 10 sites with complete data for the years 1978-1995. In 1995, the sulfate standard was exceeded on one day at one site in the Basin. The three year average percent of days exceeding the state sulfate standard decreased by 99% between 1978-1980 and 1993-1995.



*Average percent of days sampled exceeding standard for 10 sites with complete data.

Figure16

SULFATE
Average * Percent of Days Exceeding Standards, 1985-1995

FURTHER INFORMATION

The maximum concentrations and the number of exceedances in all areas of the District are given in the one page report "*1995 Air Quality.*" The location of the District's air monitoring stations and cities that are in each area are shown in the map "*South Coast Air Quality Management District and Air Monitoring Areas.*" Both of these documents are available free of charge, and may be obtained by calling (800)242-4666 or by writing to the District, attention of the Public Advisor.

Subscriptions to the monthly "Air Quality Standards Compliance Report" which contains detailed information on the number of days and locations where state and federal ambient air quality standards are exceeded, are available by writing to the South Coast Air Quality Management District, attention of the Public Advisor, or by calling (800)242-4666. Subscription request forms for subscribing to the AQSCR may be obtained by calling (909)396-3720. The annual subscription fee for the calendar year 1996 is $6.00.

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