SECTION IV.D. SULFUR DIOXIDE

SOURCES

Sulfur dioxide, unlike most of the pollutants emitted in the South Coast Air Basin is not primarily attributable to emissions from the motor vehicle. The major sources are sulfur recovery operations and the combustion of sulfur-containing fuels by power plants and heavy industry. As with most contaminants, the concentration of sulfur dioxide is affected by meteorology as well as by variations in emissions. A precise meteorological index for this contaminant has not as yet been developed.

GEOGRAPHICAL DISTRIBUTION

In Figures IV.D-1 to IV.D-3 the annual arithmetic mean sulfur dioxide concentrations are plotted for 1972, 1974, and 1976 on maps of the South Coast Air Basin. Supplementary data, 1970-1976, are given in Tables IV.D-I. It should be pointed out that even the highest station in the basin complies with the federal standard (annual average SO_2, 0.03 ppm). In 1972 and 1974 the high annual average SO_2 concentration was in the coastal areas of Los Angeles County, where there is a concentration of power plants, refineries, and other industries. In 1976, this area showed much lower concentrations. A high was observed at Fontana, which is close to Kaiser Steel. (Difficulties

with the instrument at this station leave some question as to the validity of the data.)

In Figures IV.D-4 to IV.D-6 the number of violations of the state one-hour standard (one-hour average $SO_2 \geq 0.50$ ppm) for SO_2 in 1972, 1974, and 1976 are given. This standard is almost never violated in the South Coast Air Basin. One violation occurred at Lennox in 1972 (Table IV.D-II).

Figures IV.D-7 to IV.D-9 show the number of violations of the very stringent state 24-hour standard for SO_2 for the years 1972, 1974, and 1976. The area with the greatest number of violations is coastal Los Angeles County, except for 1976, when the greatest number of violations occurred in an isolated pocket around Fontana (Table IV.D-III).

SEASONAL DISTRIBUTION

In Figure IV.D-10 the monthly average of daily maximum one-hour average SO_2 is plotted for each month of 1976 at six stations. These data are also shown in Table IV.D-IV. The four stations in Los Angeles and Orange counties do not show a consistent seasonal trend. However, Riverside and San Bernardino have higher monthly average SO_2 concentrations during the summer months.

In Figure IV.D-11 the number of violations per month of the state 24-hour sulfur dioxide standard are plotted. As with the monthly average of concentration, no consistent seasonal trend is shown.

DIURNAL DISTRIBUTION

Averages of sulfur dioxide concentration for each hour of the day during summer 1976 and winter 1976-1977 are given in Figures IV.D-12 and IV.D-13. At Anaheim, Riverside, and San Bernardino there was a tendency to have higher SO_2 during the day and very low or zero concentrations at night. Central Los Angeles and Lennox had similar concentrations during the day; but the concentrations did not drop at night. Azusa had the lowest daytime concentrations but did not drop much at night.

FREQUENCY DISTRIBUTIONS

In Figures IV.D-14 to IV.D-17 the frequency distributions of daily maximum hourly average are plotted for the years 1972, 1974, and 1976. The most marked change at any of the stations occurred at Lennox, where SO_2 appears to have gone down sharply. However, there is no clear upward or downward trend for the South Coast Air Basin as a whole.

TREND DATA

In Figures IV.D-18 to IV.D-35 several annual statistics for sulfur dioxide are presented for the years 1972 through 1976 for representative stations. Table IV.D-V lists the supporting data. At Lennox, Long Beach, and La Habra SO_2 concentrations have dropped during this period. Los Angeles

and Anaheim have exhibited little or no change, while San Bernardino has gone up slightly. The remaining stations have insufficient data for determination of a trend.

Long term data (annual average of daily one-hour sulfur dioxide maxima, 1955-1976) are shown in Table IV.D-VI for stations in the Los Angeles Basin, where the highest concentrations of sulfur dioxide frequently occur. Similar data, in terms of the annual maximum one-hour average are given in Table IV.D-VII. The long term downward trend seen at many stations may be attributable to the control of direct SO_2 emissions (i.e. sulfur recovery plants) and to the limitation of the sulfur content of fuels over this period. The annual maximum one-hour average indicates a similar trend at some stations; but virtually no consistent trend at others.

SUMMARY

The coastal areas of Los Angeles County which have had the greatest number of violations of the standard and highest annual mean concentrations of SO_2 have shown a downtrend in SO_2 concentrations. At Lennox, the downtrend is known to have occurred after institution of controls on SO_2 emissions and is probably due to reduction of same. The slight uptrend at San Bernardino, which is still insufficient to cause violation of the stringent state 24-hour standard, may be related to emissions in the Fontana area.

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Con't.

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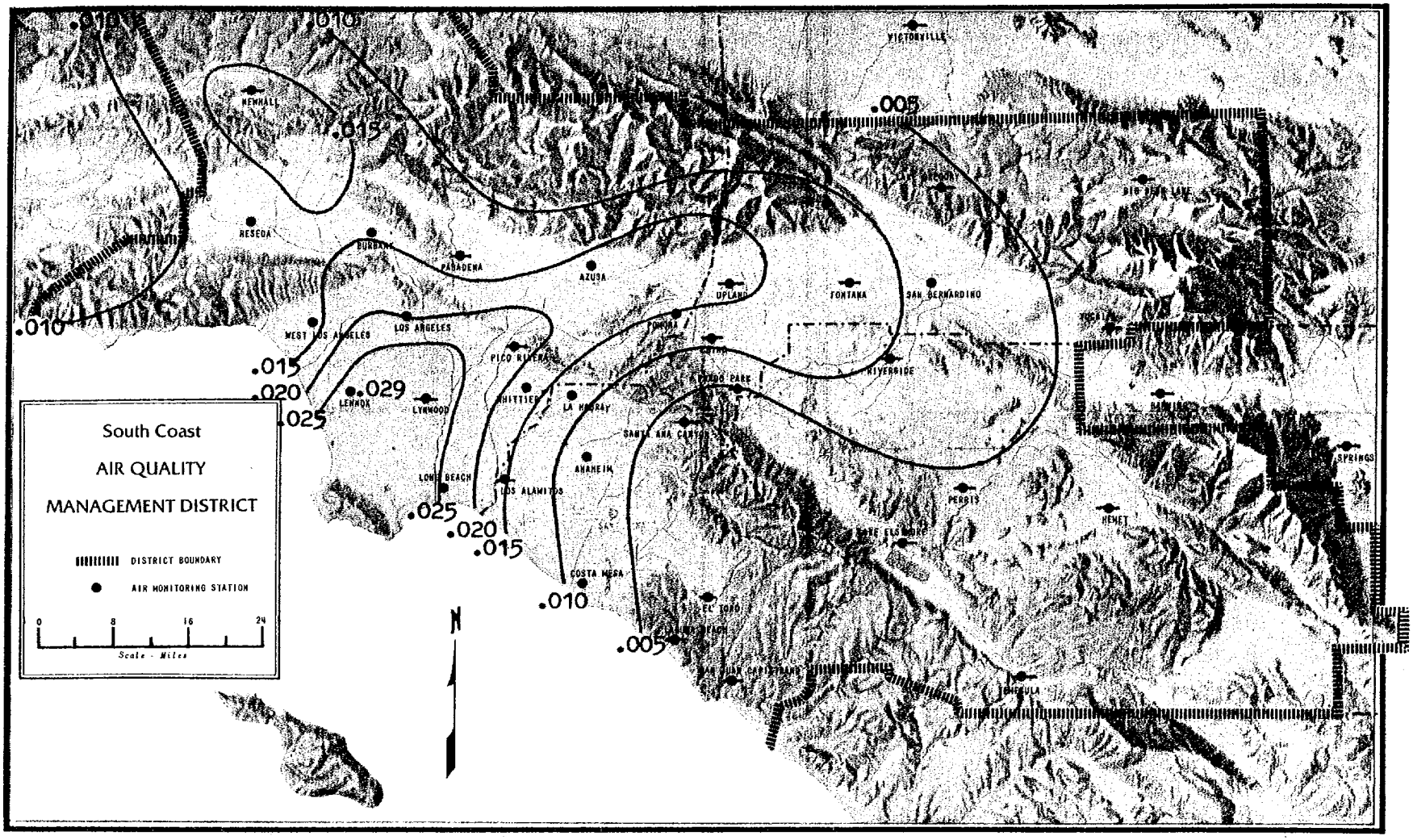
SULFUR DIOXIDE
ANNUAL ARITHMETIC MEAN, PPM
1972



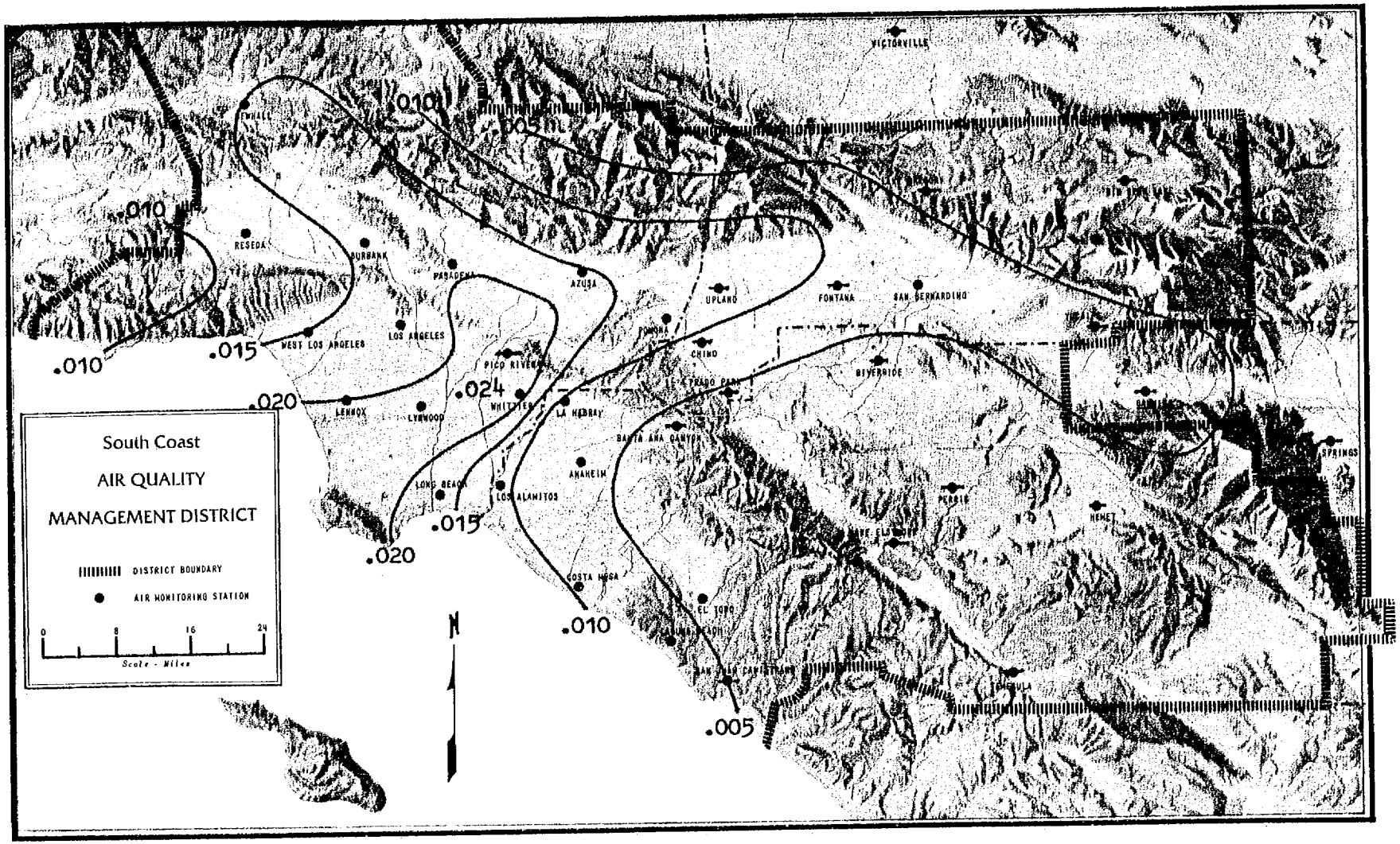
Less than 9 months of data.

Figure IV.D-1

SULFUR DIOXIDE

ANNUAL ARITHMETIC MEAN, PPM

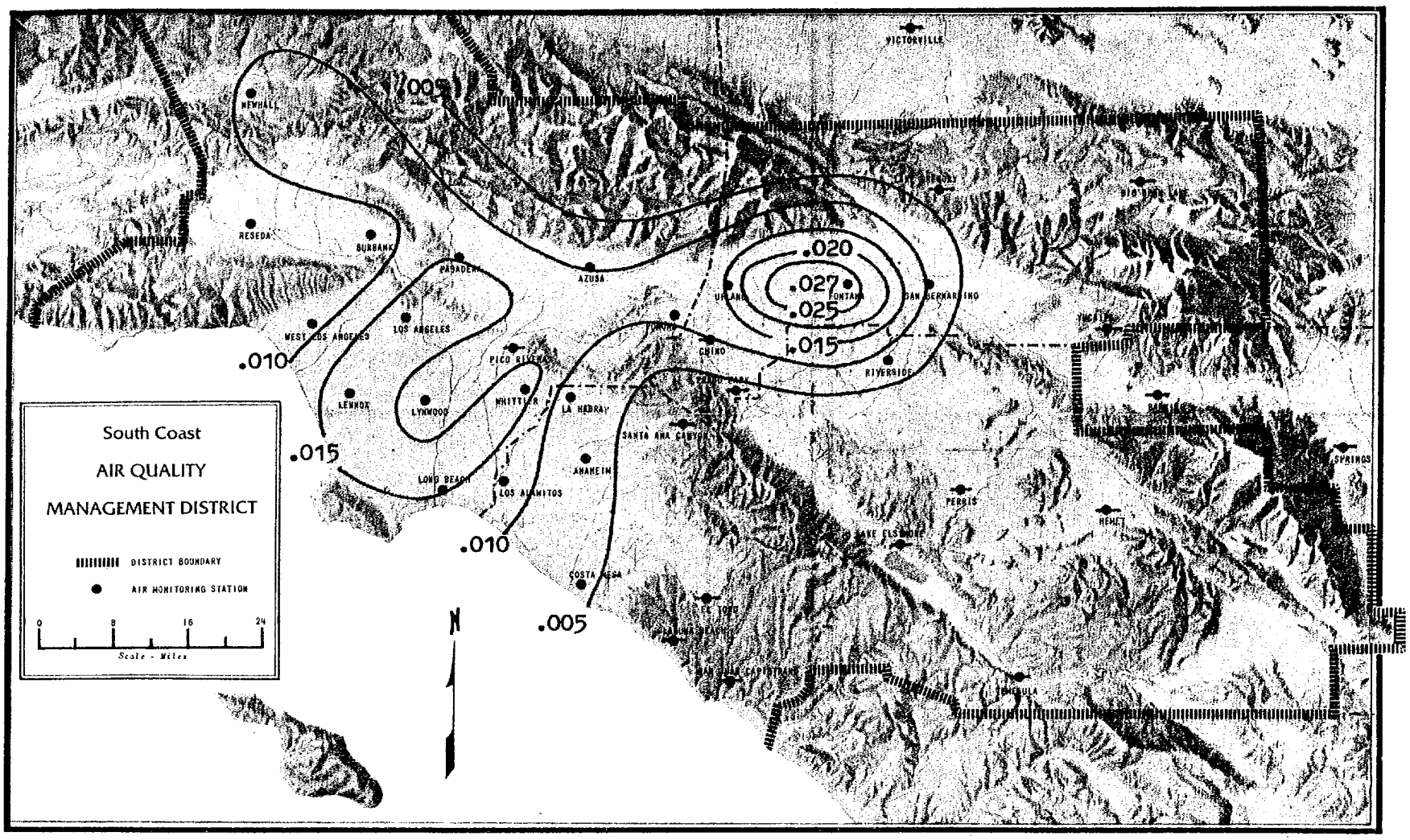
1974



Less than 9 months of data.

Figure IV.D-2

SULFUR DIOXIDE
ANNUAL ARITHMETIC MEAN, PPM
1976



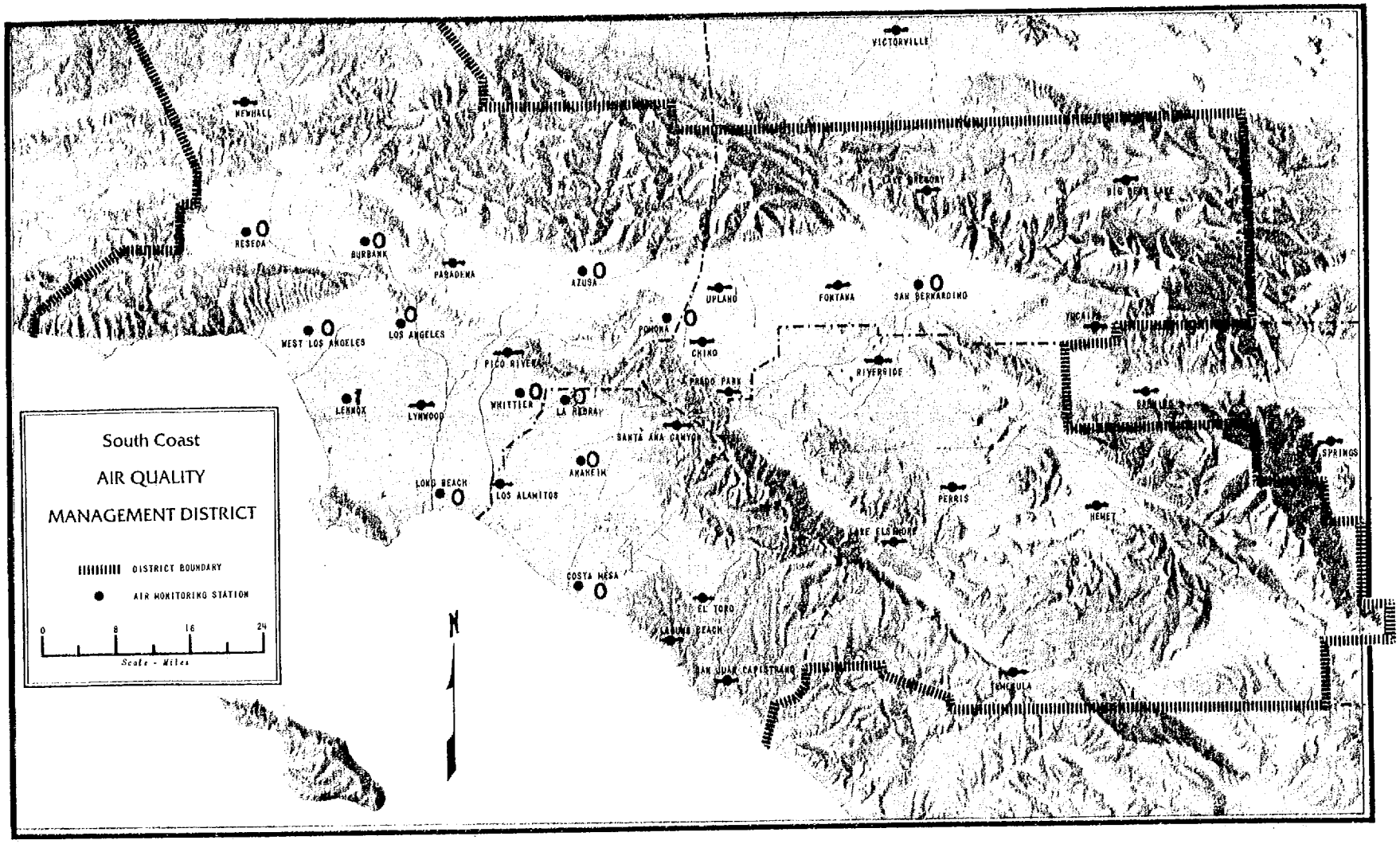
Less than 9 months of data.

Figure IV.D-3

SULFUR DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR AVG. $SO_2 \geq 0.50$PPM)

1972



Less than 9 months of data.

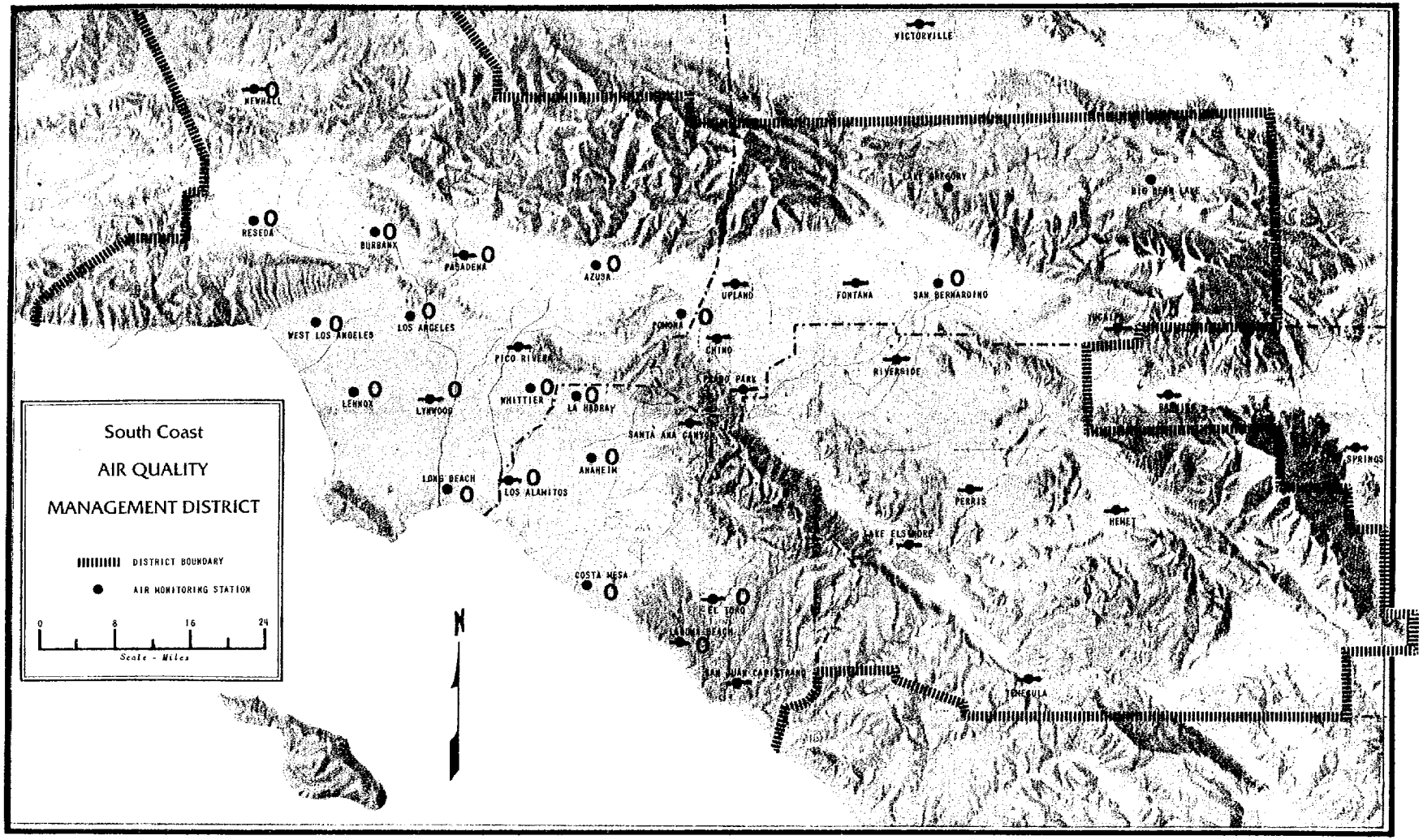
RPG 9/06/77

Figure IV.D-4

SULFUR DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $SO_2 \geq 0.50$ PPM)

1974



Less than 9 months of data.

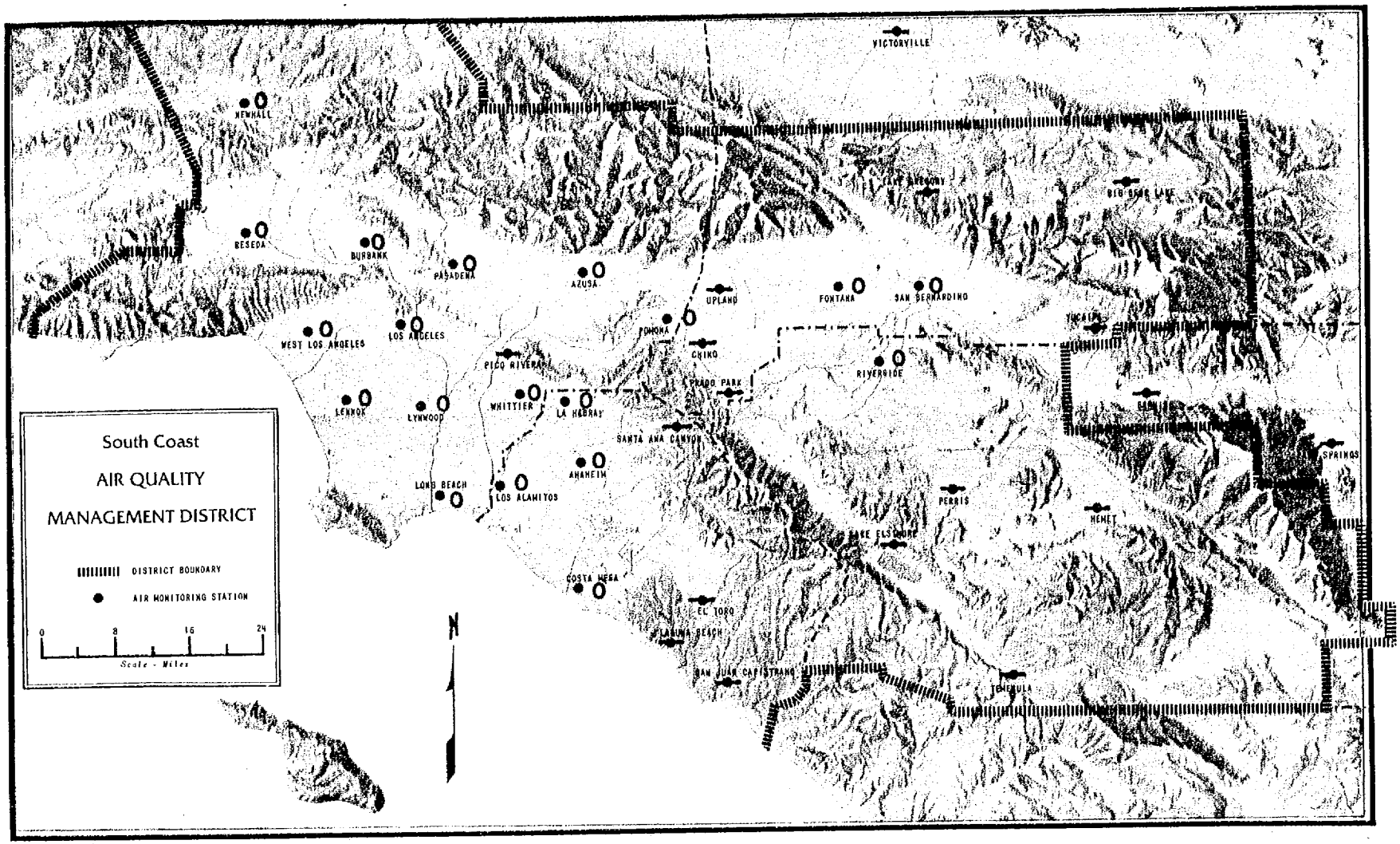
RPG 9/06/77

Figure IV.D-5

SULFUR DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $SO_2 \geq 0.50$ PPM)

1976

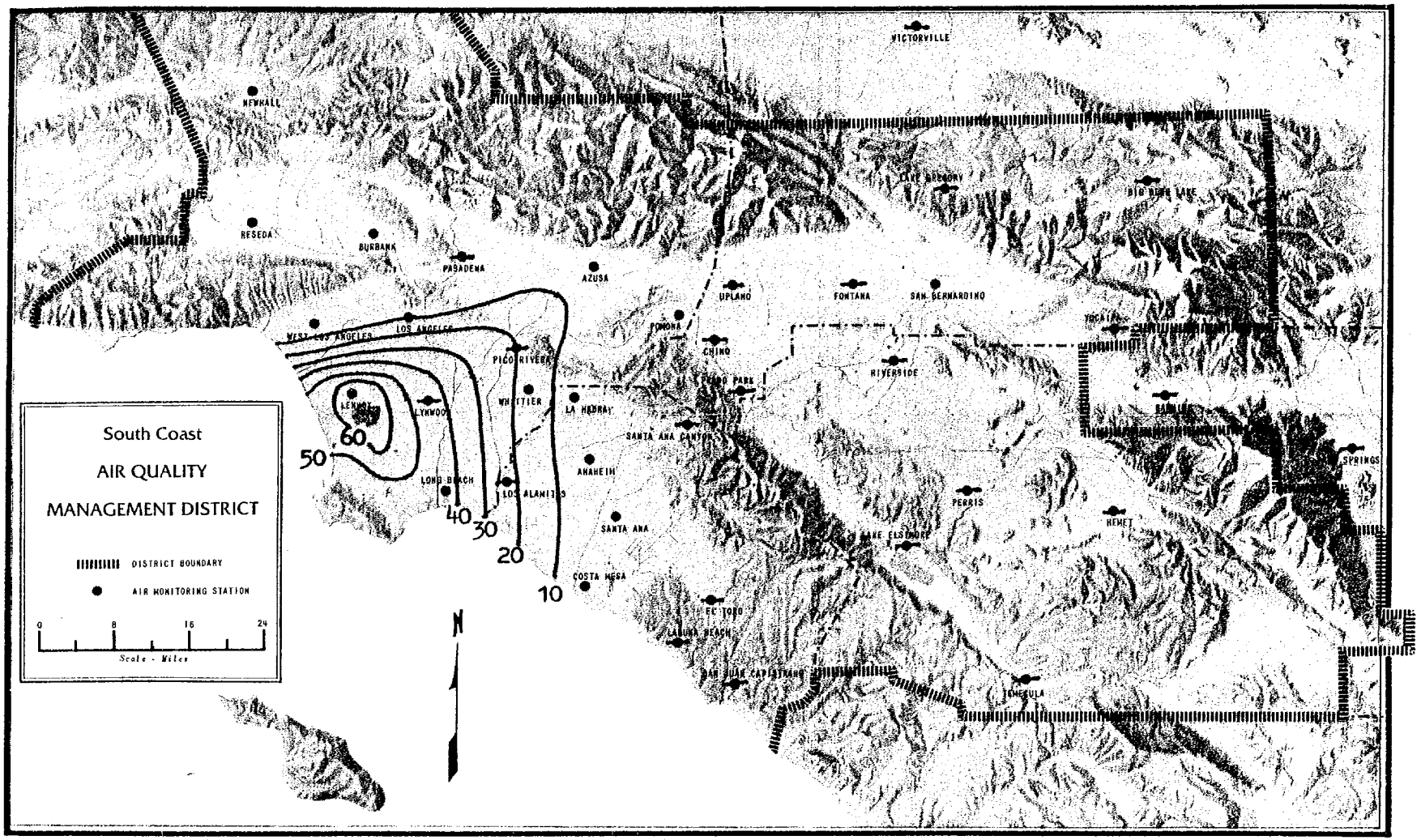


Less than 9 months of data.

RPG 9/06/77

Figure IV.D-6

SULFUR DIOXIDE
NUMBER OF DAYS VIOLATING STATE STANDARD (24-HR. AVG. $SO_2 \geq 0.04$ PPM)
1972



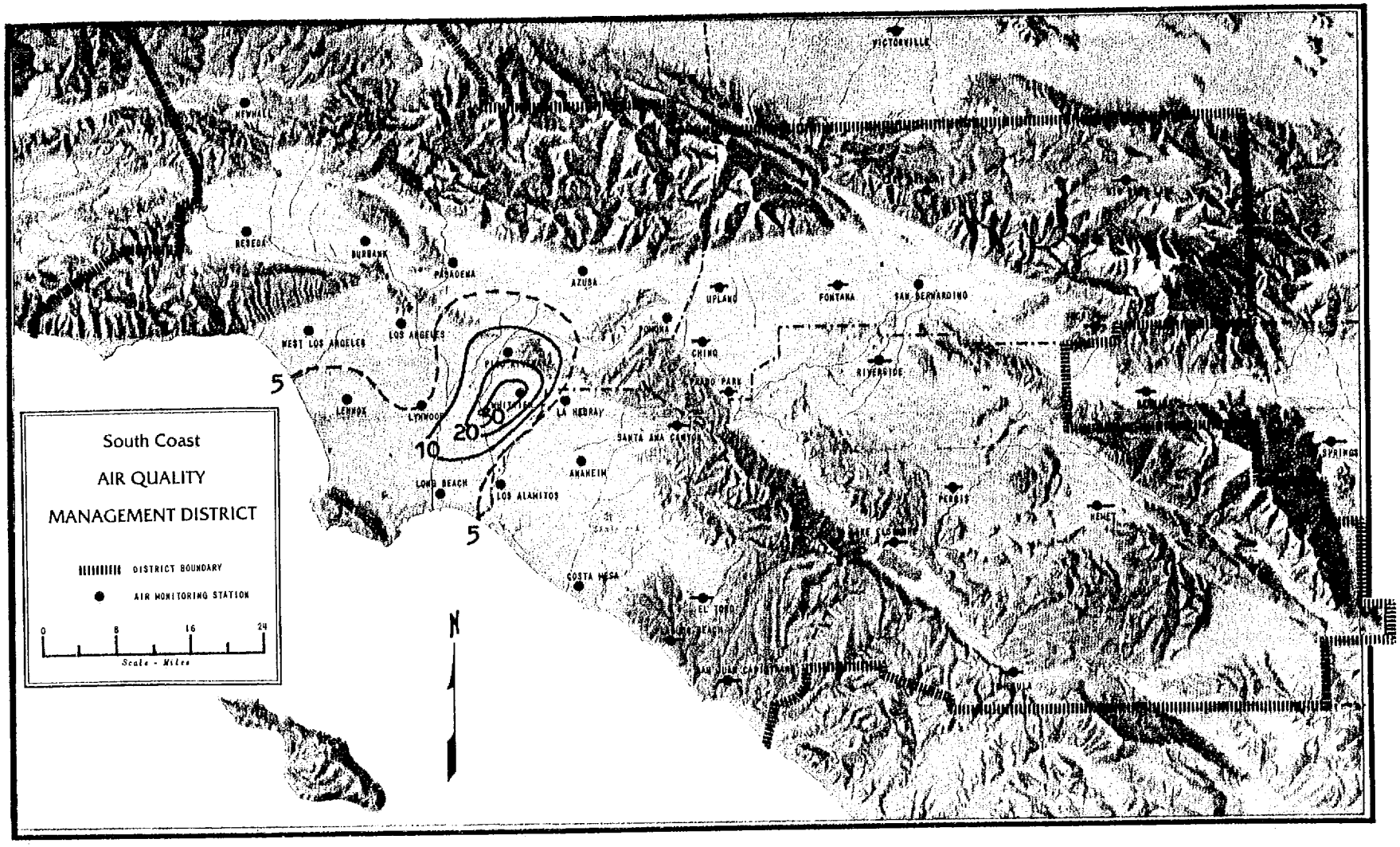
Less than 9 months of data.

Figure IV.D-7

SULFUR DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (24-HR. AVG. $SO_2 \geq 0.04$ PPM)

1974



Less than 9 months of data.

Solid lines are intervals of 10 violations.

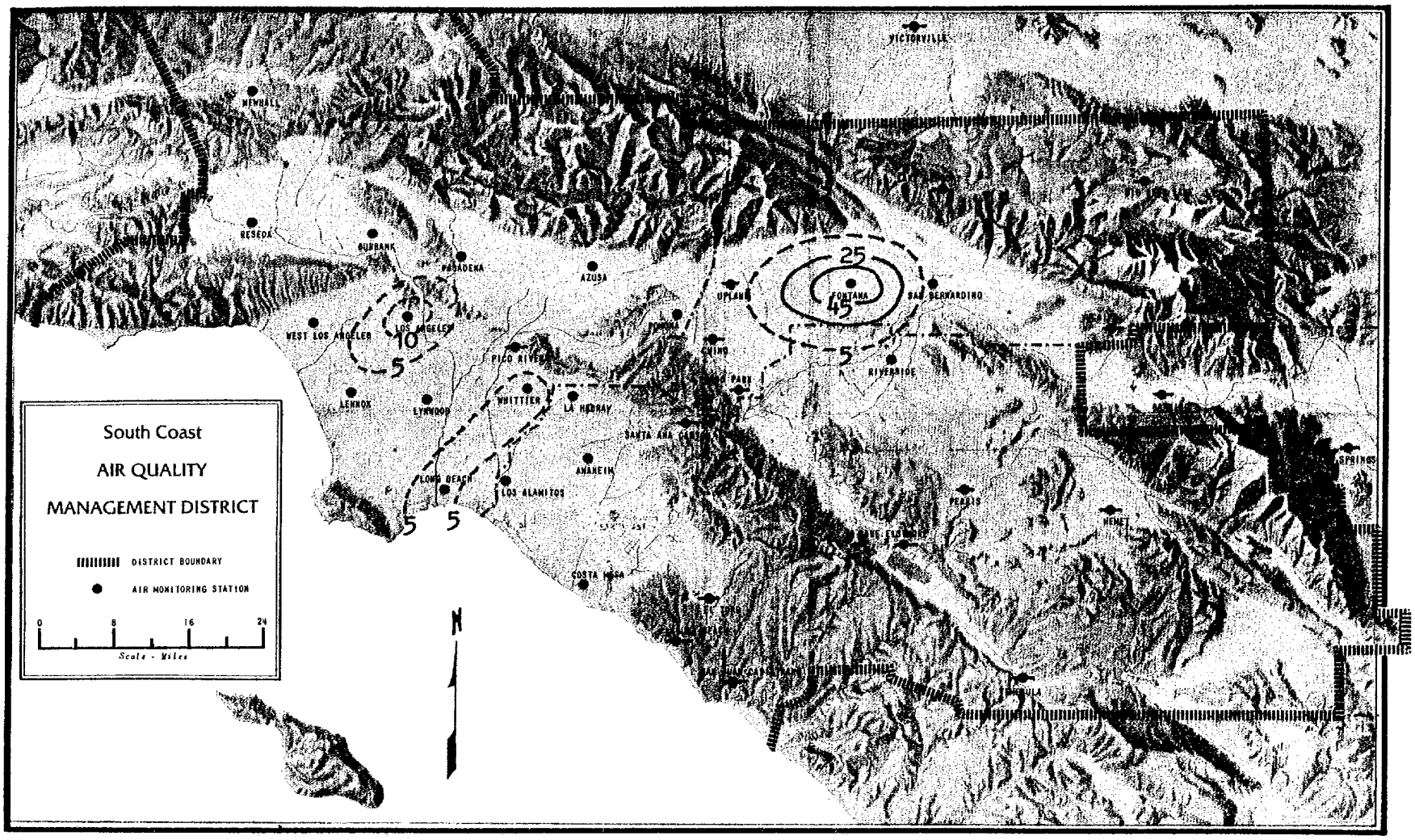
Dashed lines are intervals of 5 violations.

Figure IV.D-8

SULFUR DIOXIDE

NUMBER OF DAYS VIOLATING STATE STANDARD (24-HR. AVG. $SO_2 \geq 0.04$ PPM)

1976



Less than 9 months of data.

Solid lines are intervals of 20 violations.

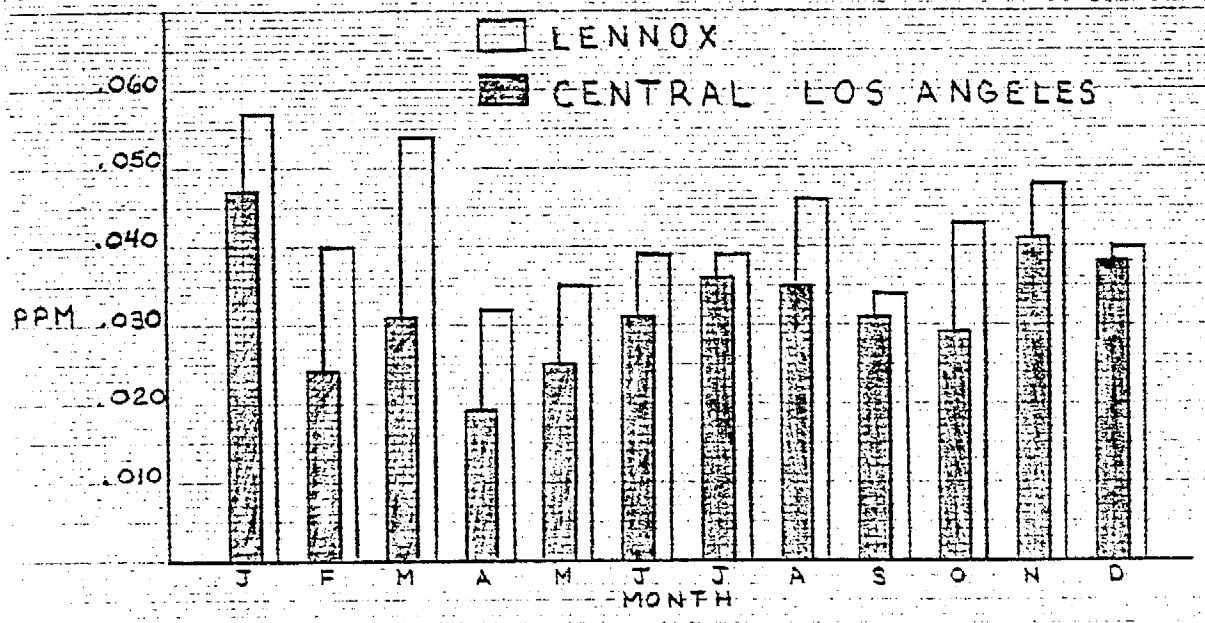
Dashed lines are intervals of 5 violations.

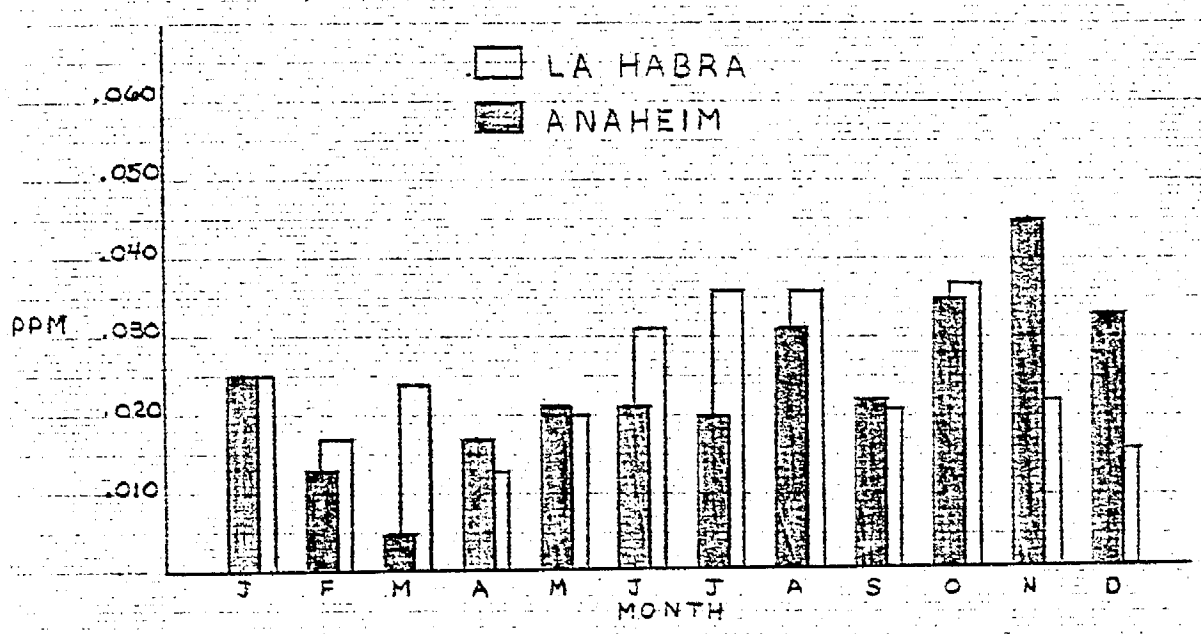
Figure IV.D-9

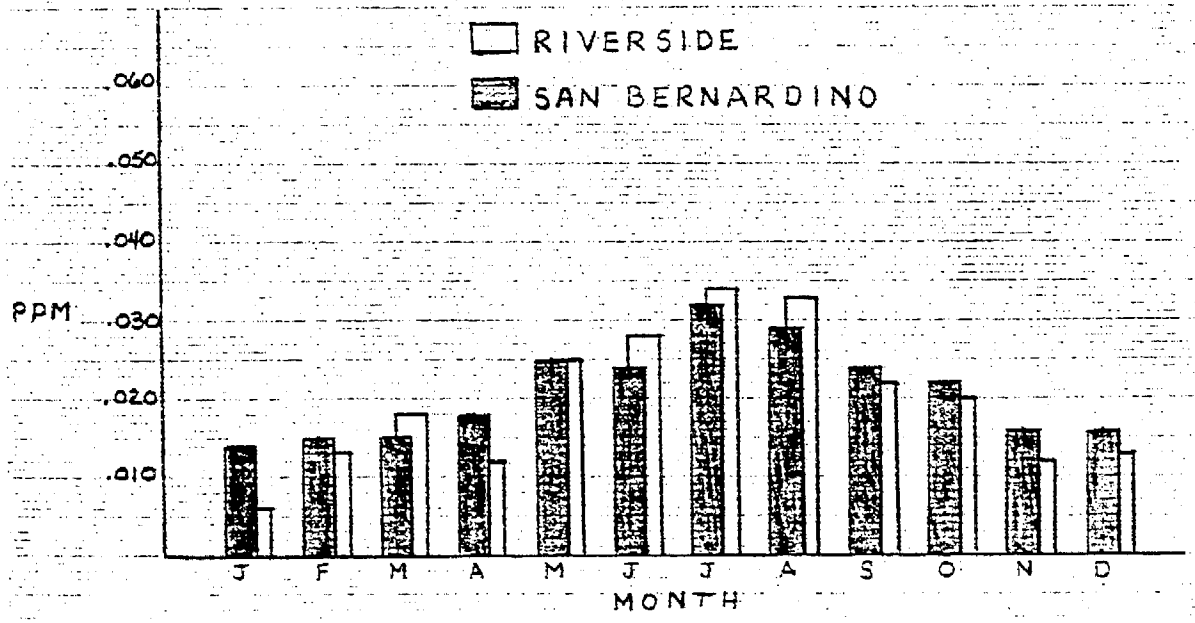
SULFUR DIOXIDE

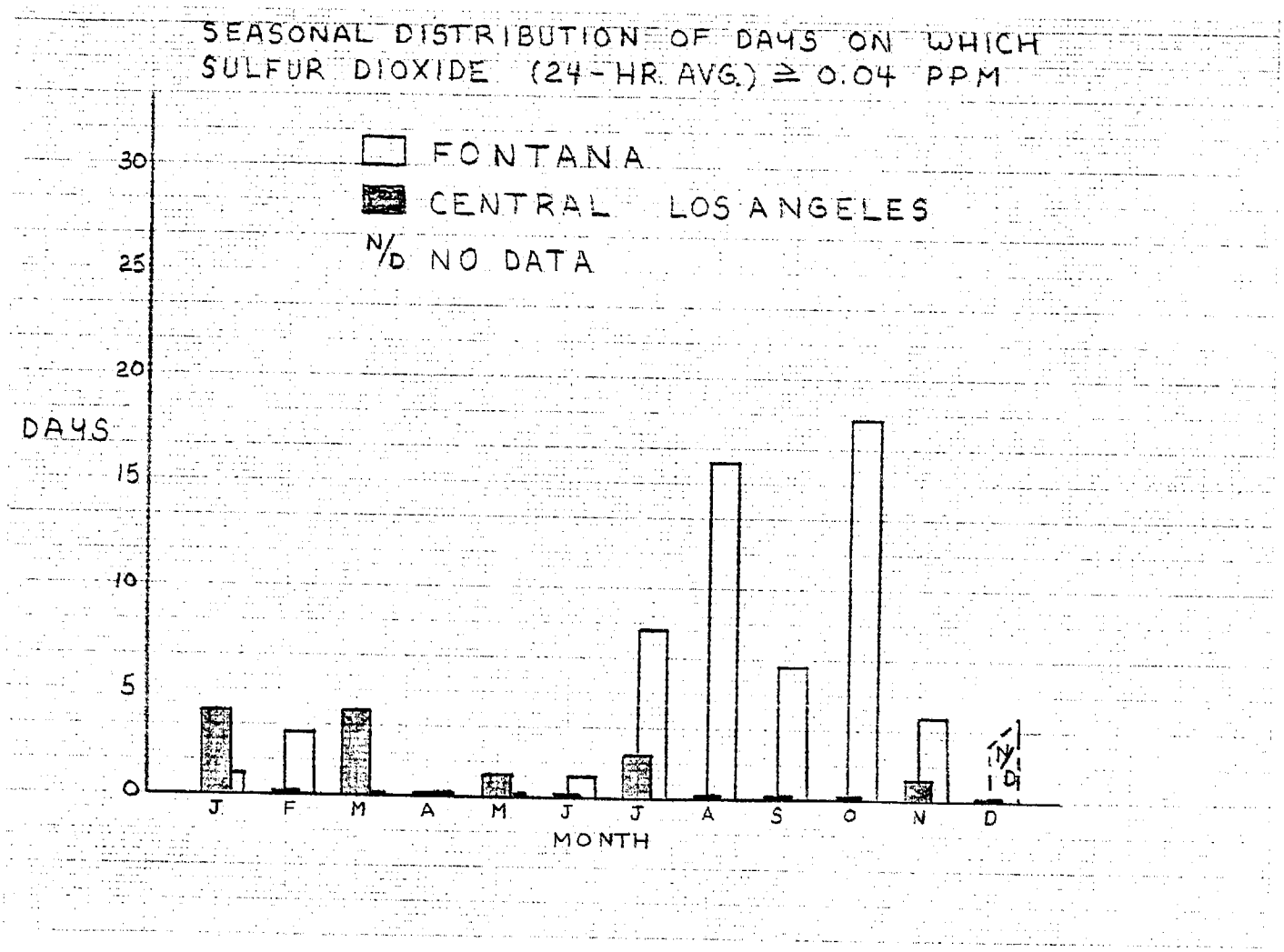
MONTHLY MEAN OF DAILY MAX. 1-HR., PPM

1976

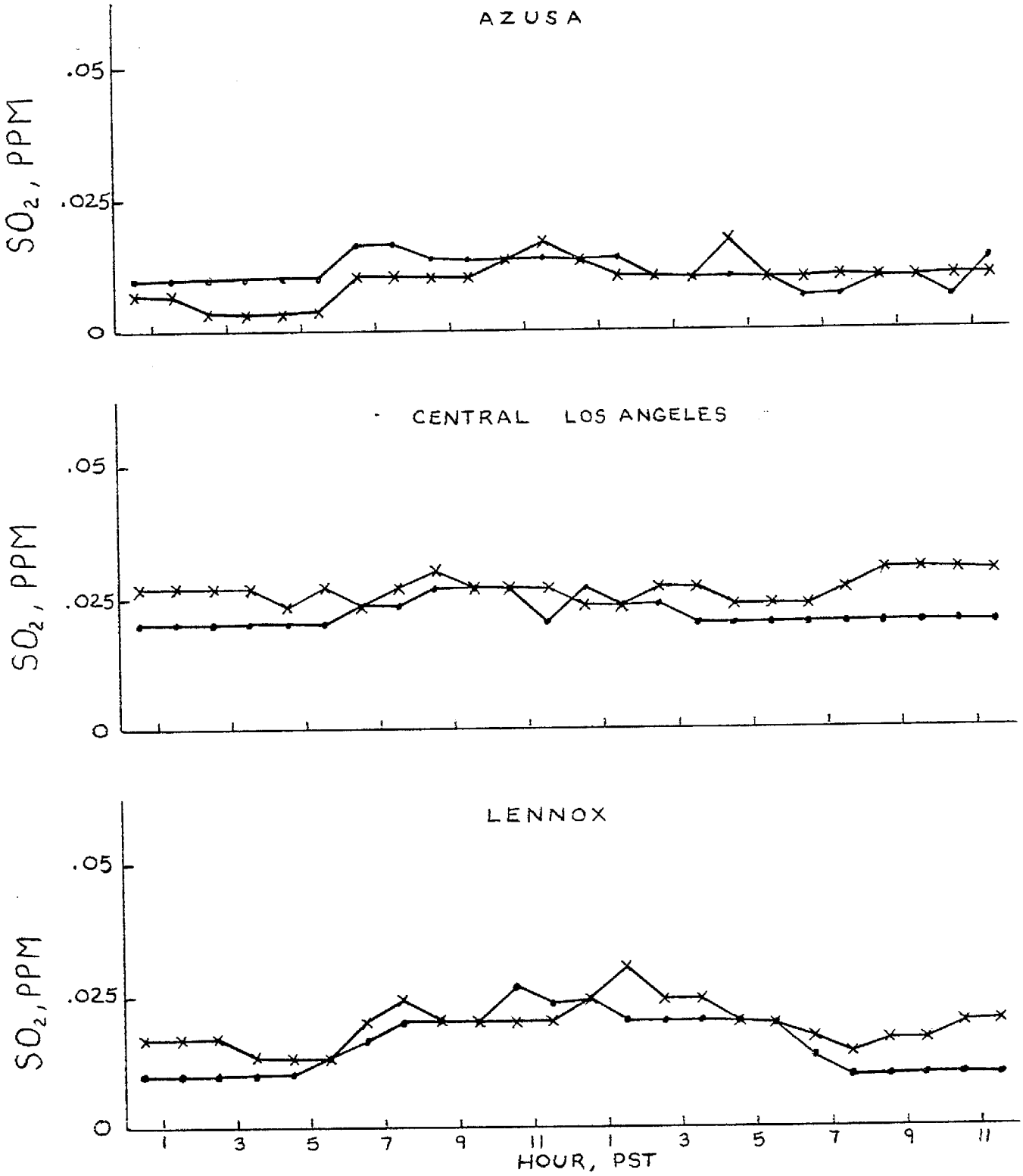







SEASONAL DISTRIBUTION OF DAYS ON WHICH
SULFUR DIOXIDE (24-HR. AVG.) ≥ 0.04 PPM
FONTANA
CENTRAL LOS ANGELES
N/D NO DATA
DAYS
30
25
20
15
10
5
0
J
F
M
A
M
J
J
A
S
O
N
D
N/D
MONTH

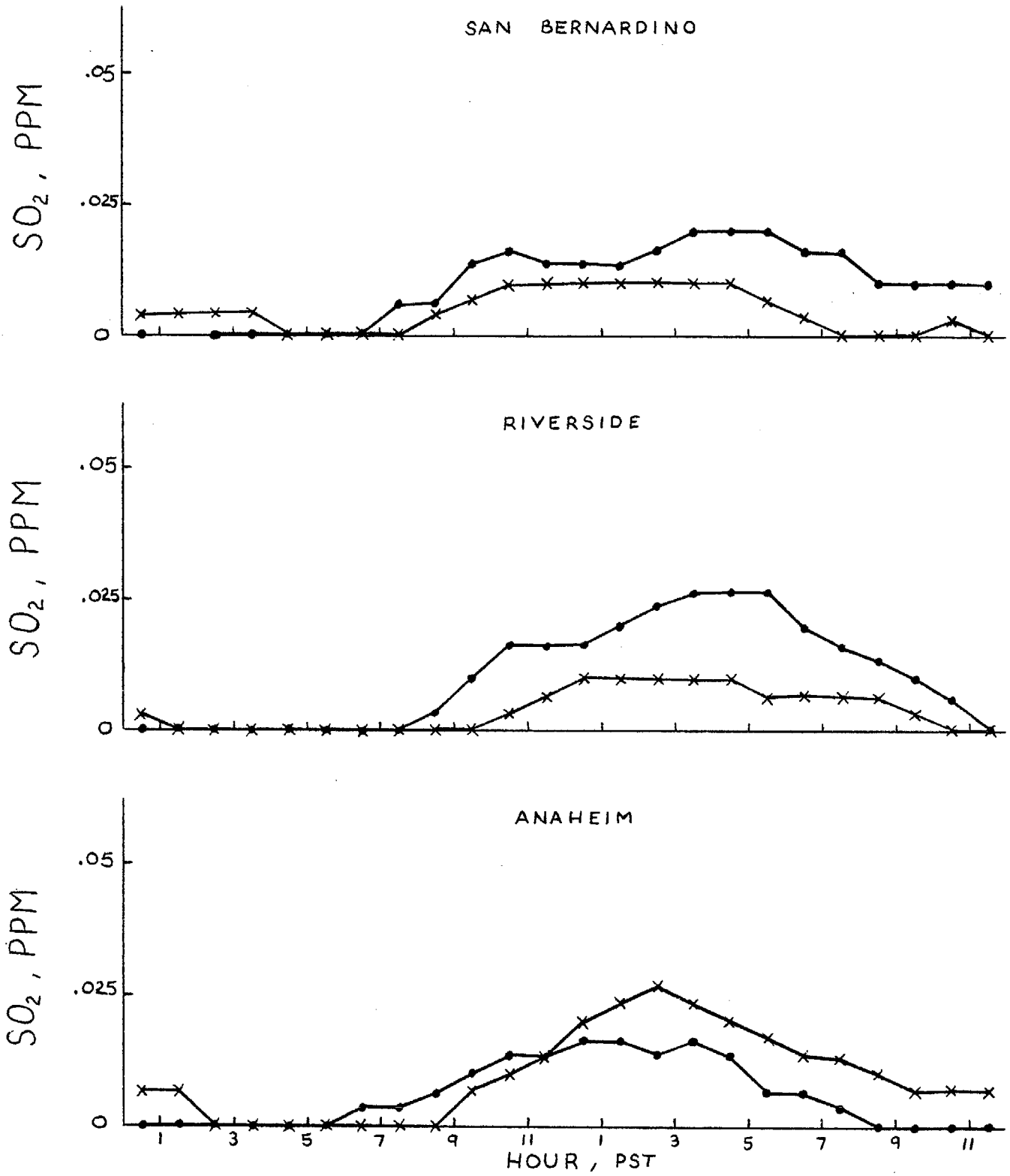
DIURNAL SULFUR DIOXIDE CONCENTRATIONS SUMMER[A] vs. WINTER[B]



A. JUL.-SEP. AVERAGE 1976 ●——●

B. NOV.-JAN. AVERAGE 1976-77 ×——×

DIURNAL SULFUR DIOXIDE CONCENTRATIONS SUMMER[A] VS. WINTER[B]



A. JUL. - SEP. AVERAGE 1976 ●——●

B. NOV. - JAN. AVERAGE 1976-77 ×——×

SULFUR DIOXIDE

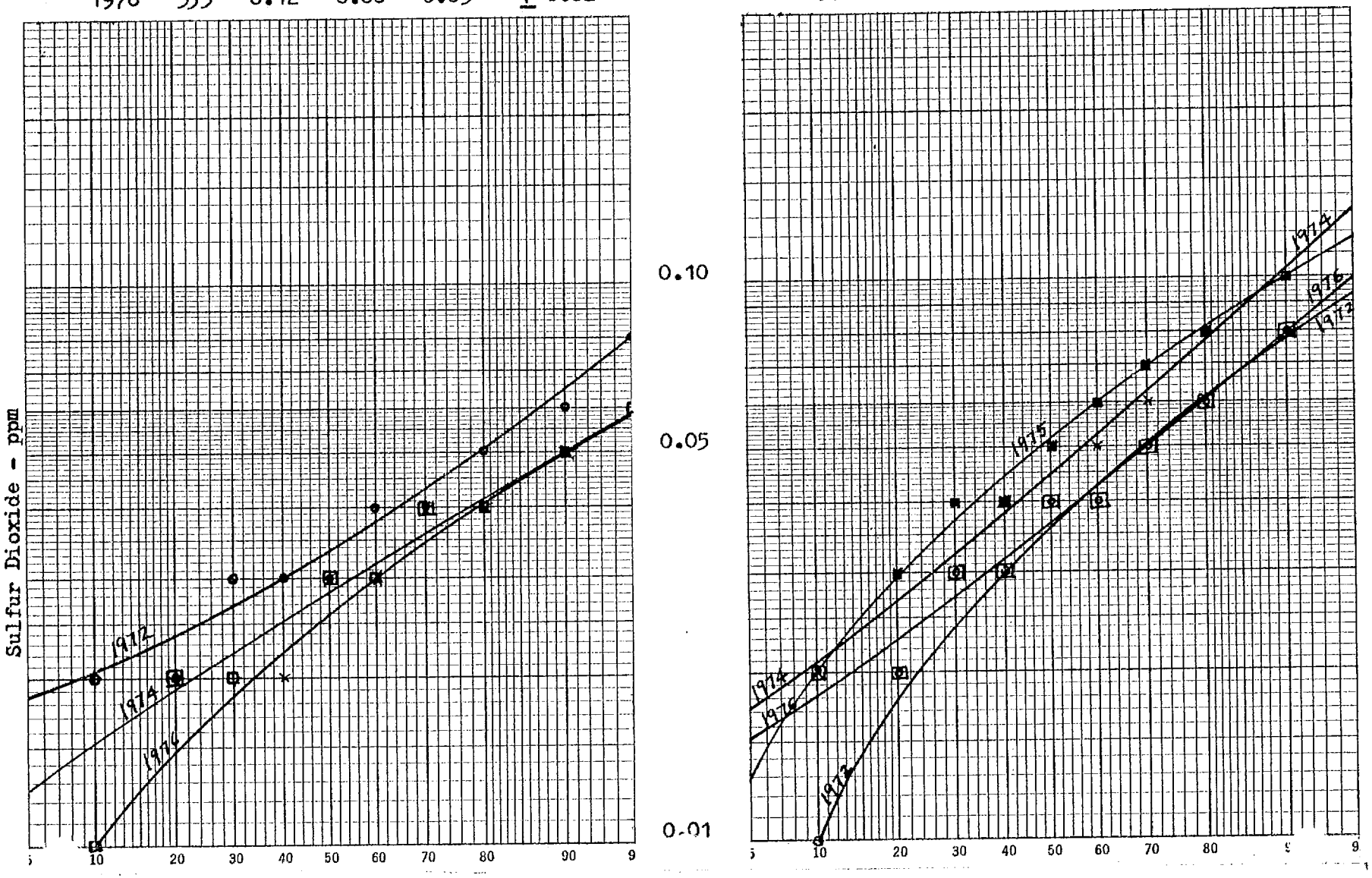
Daily Max. 1-Hour Average - ppm

DOWNTOWN L.A.

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	358	0.12	0.01	0.04	± 0.02
1973	362	0.12	0.01	0.03	± 0.02
1974	365	0.08	0.01	0.03	± 0.01
1975	363	0.12	0.01	0.03	± 0.02
1976	355	0.12	0.00	0.03	± 0.02

WHITTIER

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	363	0.25	0.01	0.04	± 0.03
1973	361	0.28	0.01	0.06	± 0.04
1974	361	0.28	0.01	0.06	± 0.04
1975	363	0.27	0.01	0.06	± 0.03
1976	351	0.15	0.01	0.04	± 0.03



Concentration equal to or less than stated percentage

Figure IV.D-14

SULFUR DIOXIDE

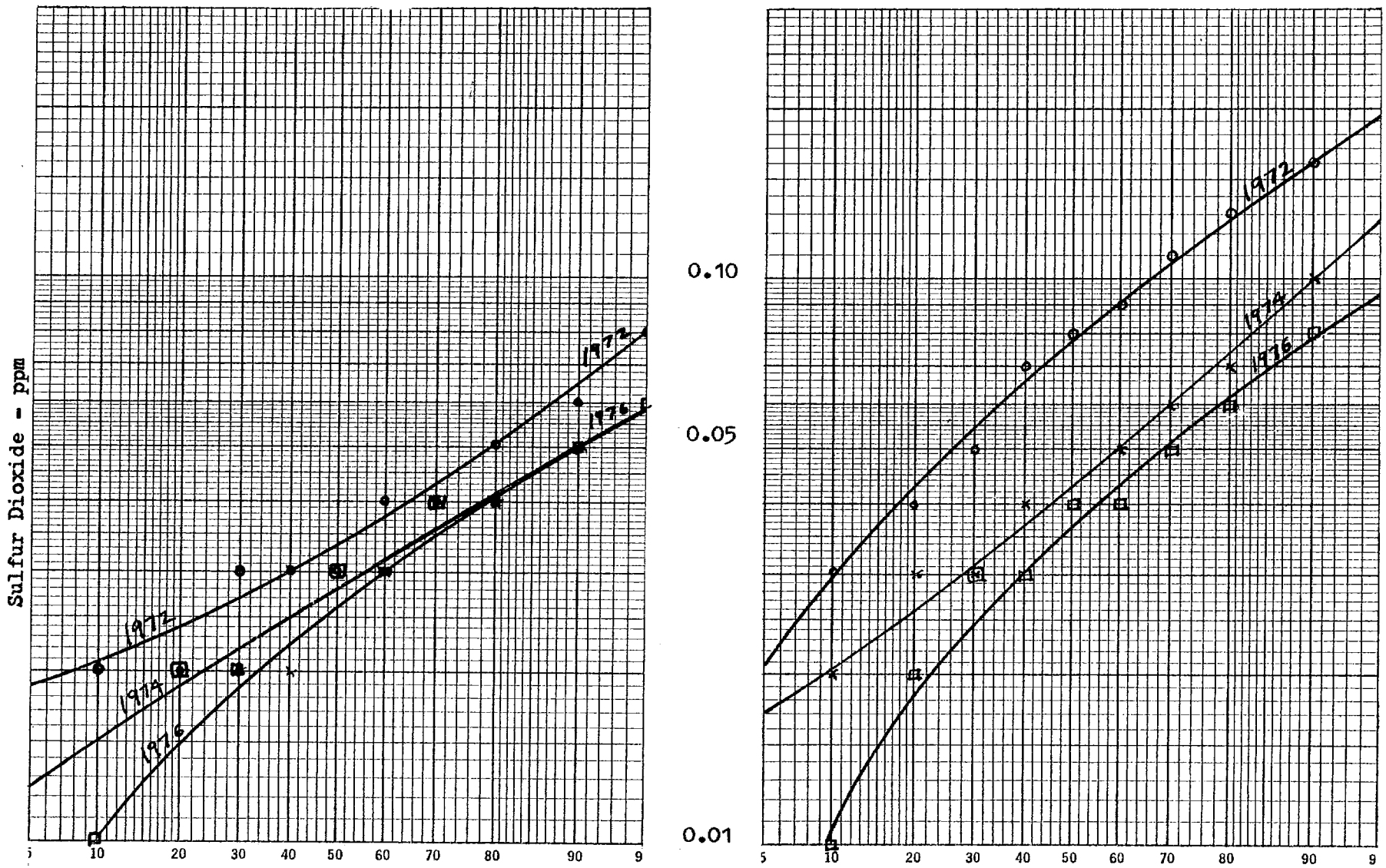
Daily Max. 1-Ho. Average - ppm

DOWNTOWN L.A.

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Std.Dev.
1972	358	0.12	0.01	0.04	± 0.02
1973	362	0.12	0.01	0.03	± 0.02
1974	365	0.08	0.01	0.03	± 0.01
1975	363	0.12	0.01	0.03	± 0.02
1976	355	0.12	0.00	0.03	± 0.02

LENNOX

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Std.Dev.
1972	363	1.00	0.01	0.09	± 0.08
1973	364	0.28	0.01	0.07	± 0.04
1974	365	0.17	0.01	0.05	± 0.03
1975	364	0.19	0.01	0.05	± 0.03
1976	366	0.18	0.00	0.04	± 0.03



Concentration equal to or less than stated percentage

Figure IV.D-15

SULFUR DIOXIDE

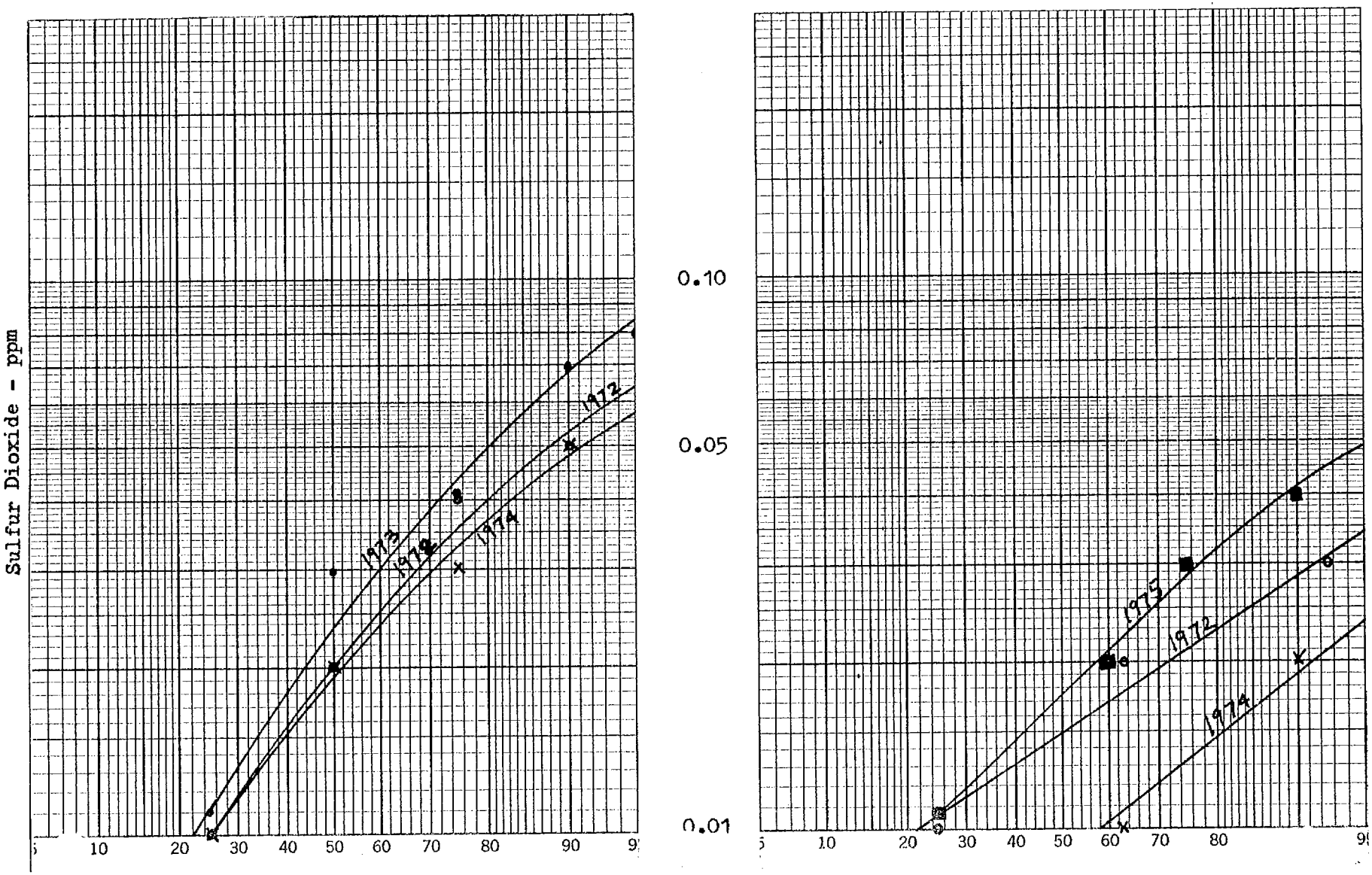
(Daily Max. 1-Hour Average - ppm)

ANAHEIM

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	363	0.16	-	0.03	± 0.02
1973	359	0.13	-	0.03	± 0.03
1974	349	0.08	-	0.02	± 0.02
1975	349	0.12	-	0.02	± 0.02

RIVERSIDE-RUBIDOUX

Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	50	0.04	-	0.02	± 0.01
1973	99	0.04	-	0.01	± 0.01
1974	179	0.03	-	0.01	± 0.01
1975	205	0.06	-	0.02	± 0.01



Concentration equal to or less than stated percentage

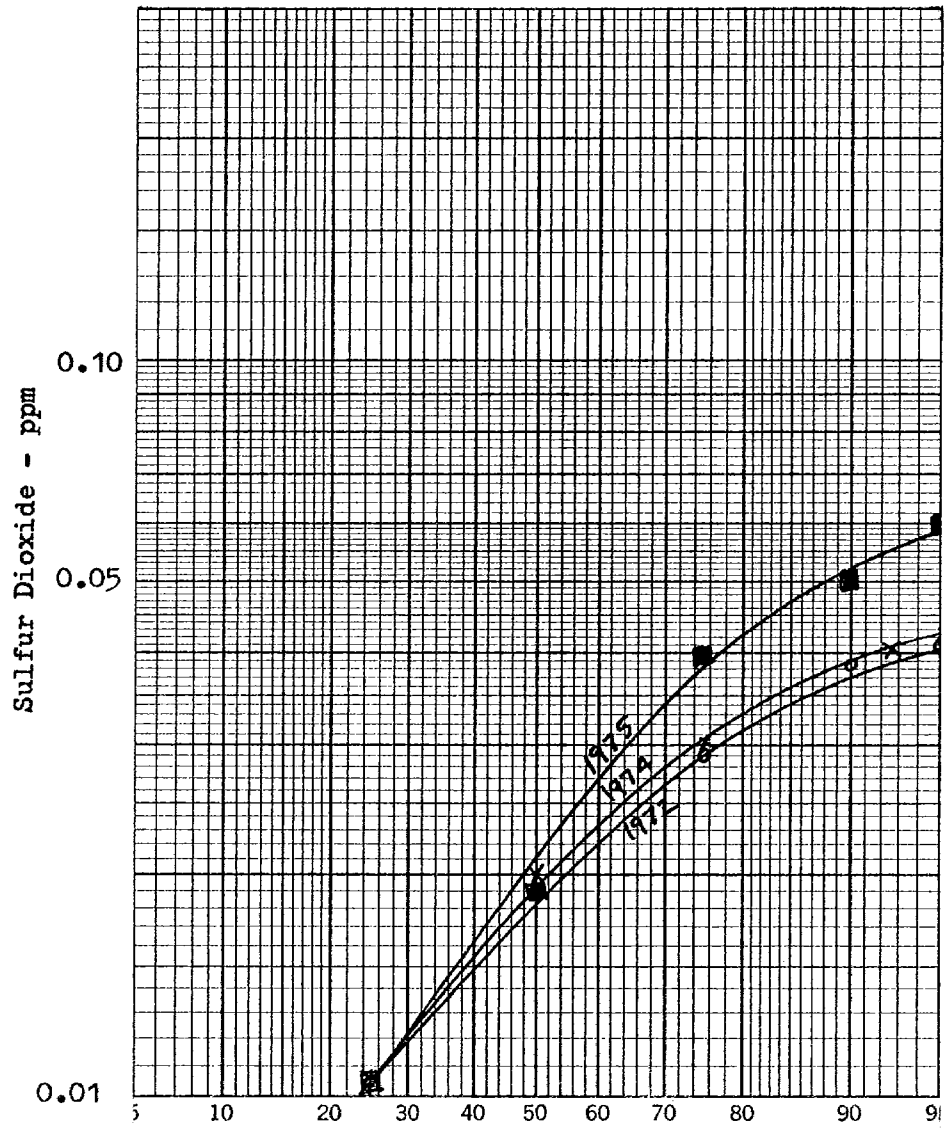
Figure IV.D-6

SULFUR DIOXIDE

(Daily Max. 1-Hour Average - ppm)

SAN BERNARDINO

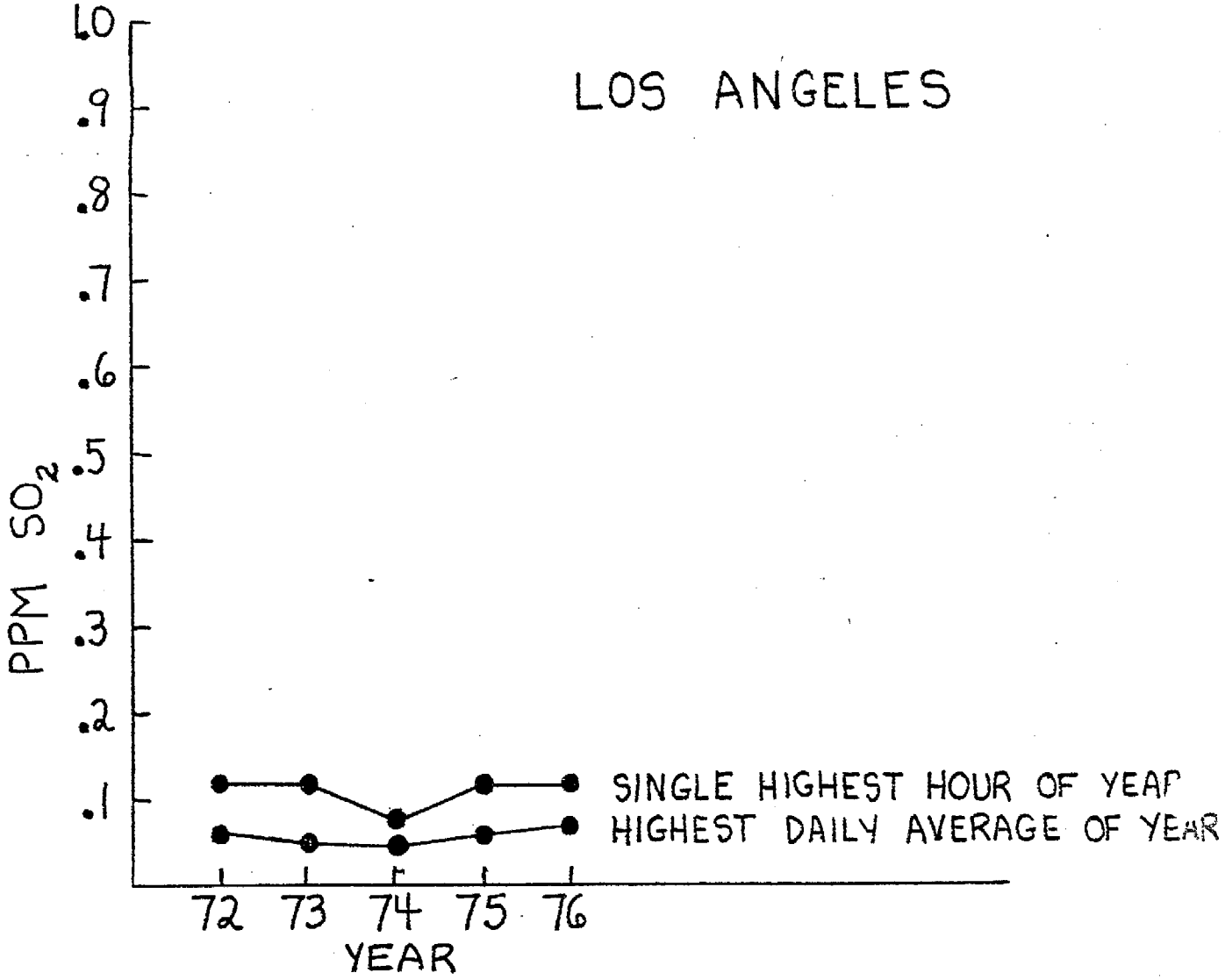
Year	N	Max. ppm	Min. ppm	Arithmetic Mean	Arithmetic Std.Dev.
1972	356	0.06	-	0.02	± 0.01
1973	362	0.09	-	0.02	± 0.02
1974	356	0.06	-	0.02	± 0.01
1975	359	0.10	-	0.02	± 0.02

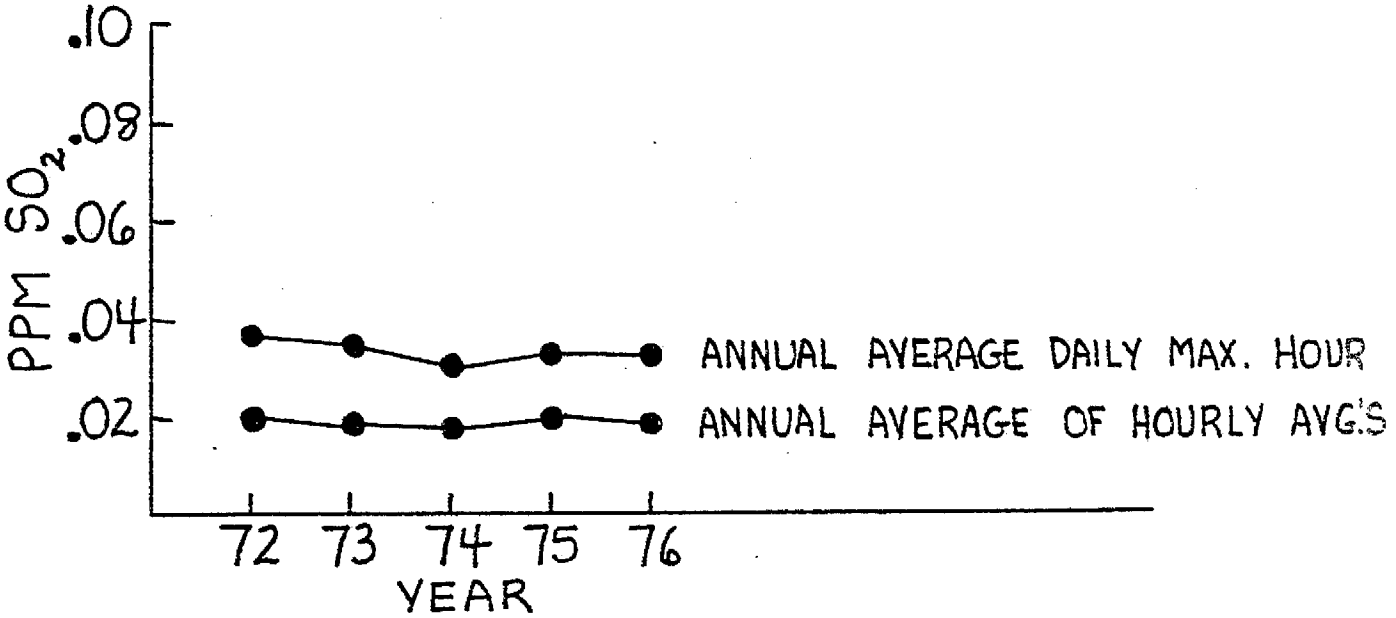


Concentration equal to or less than stated percentage

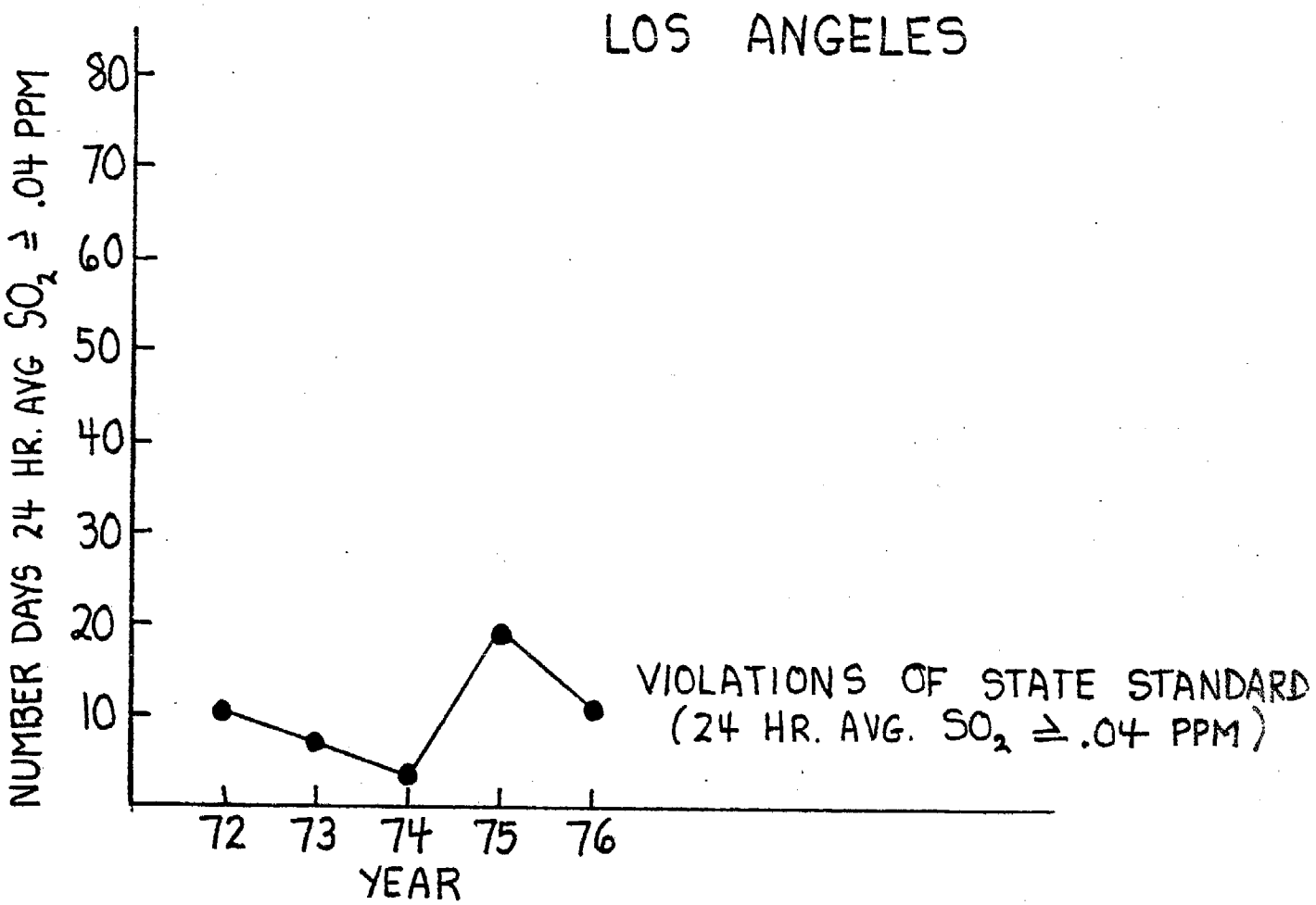
Figure IV.D-17

SULFUR DIOXIDE

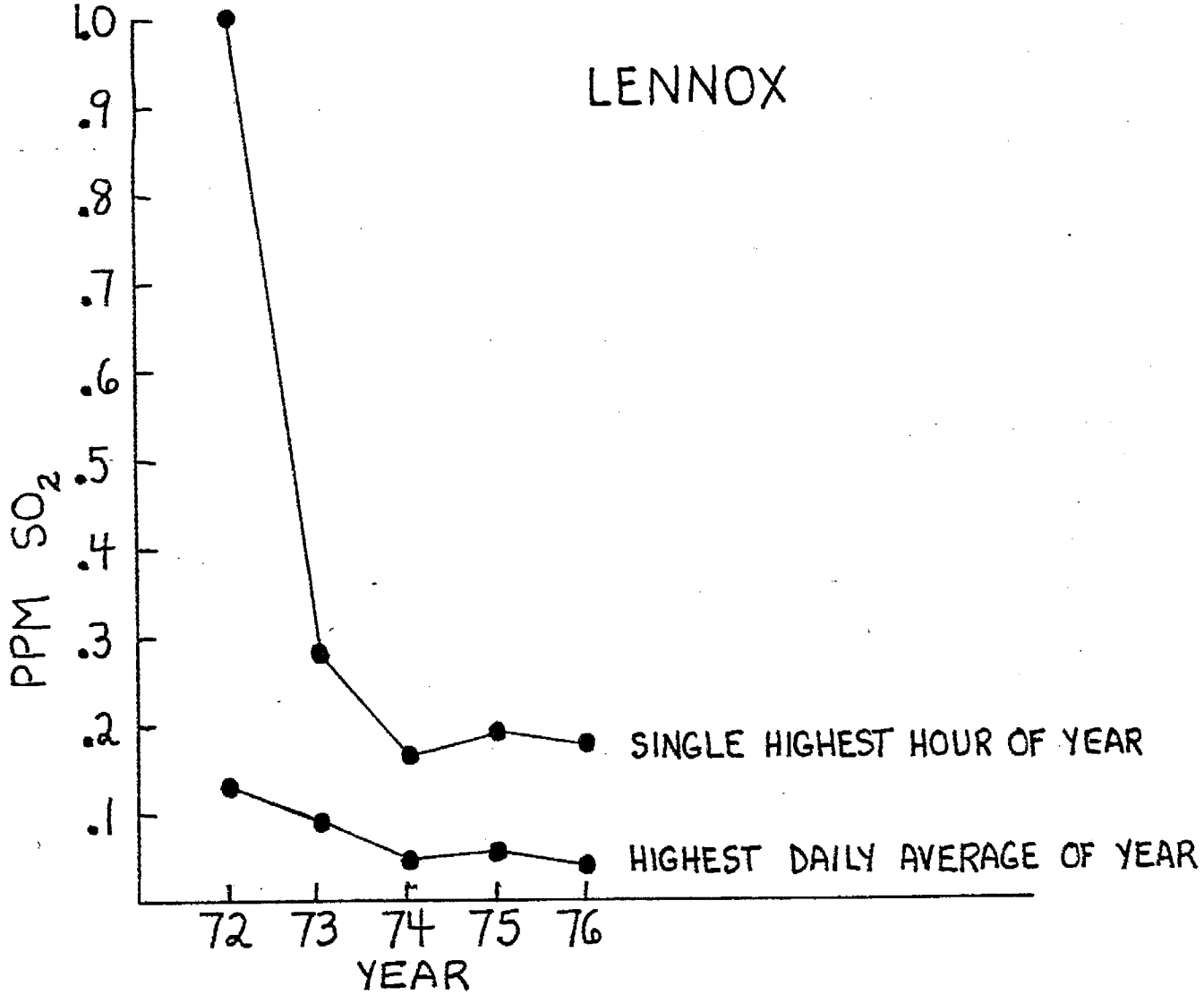


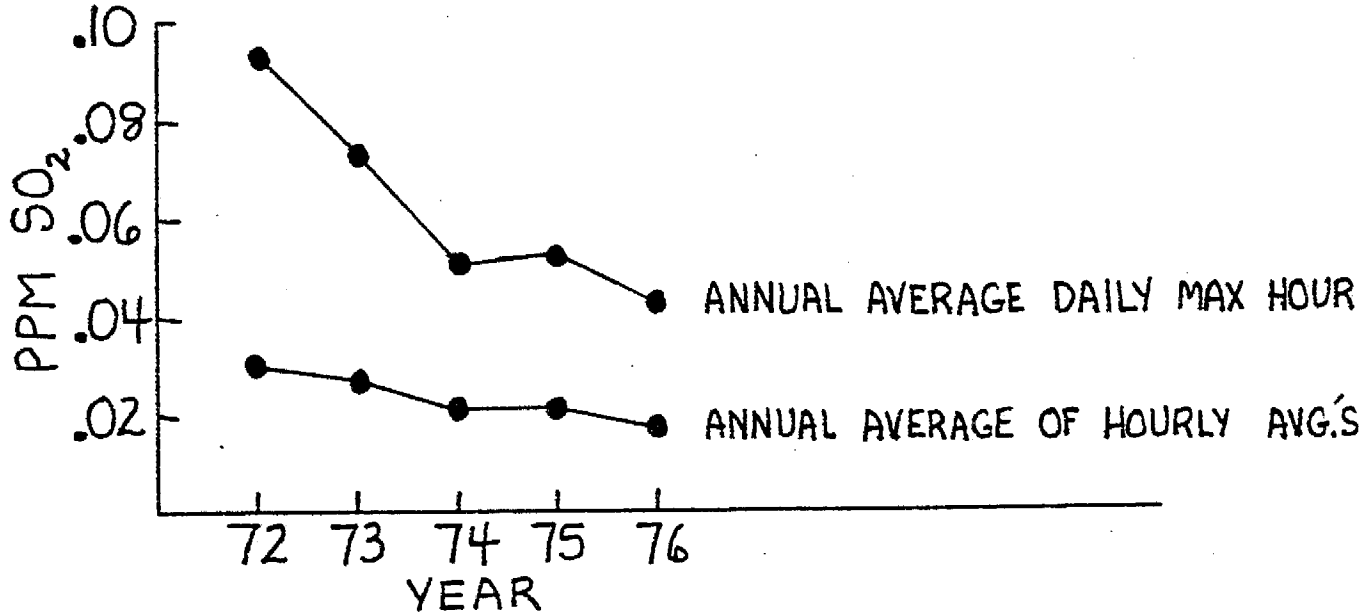


SULFUR DIOXIDE

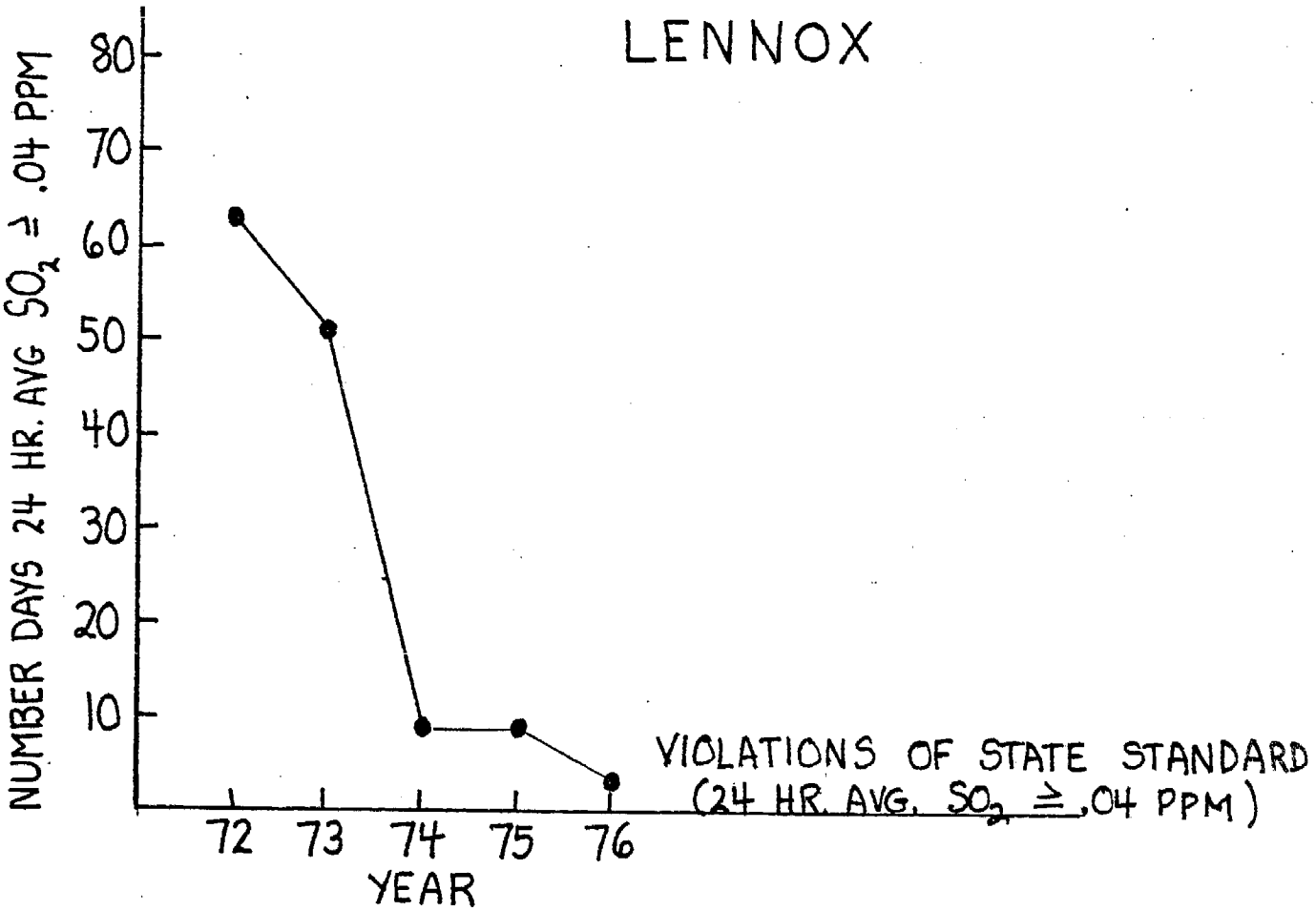


SULFUR DIOXIDE

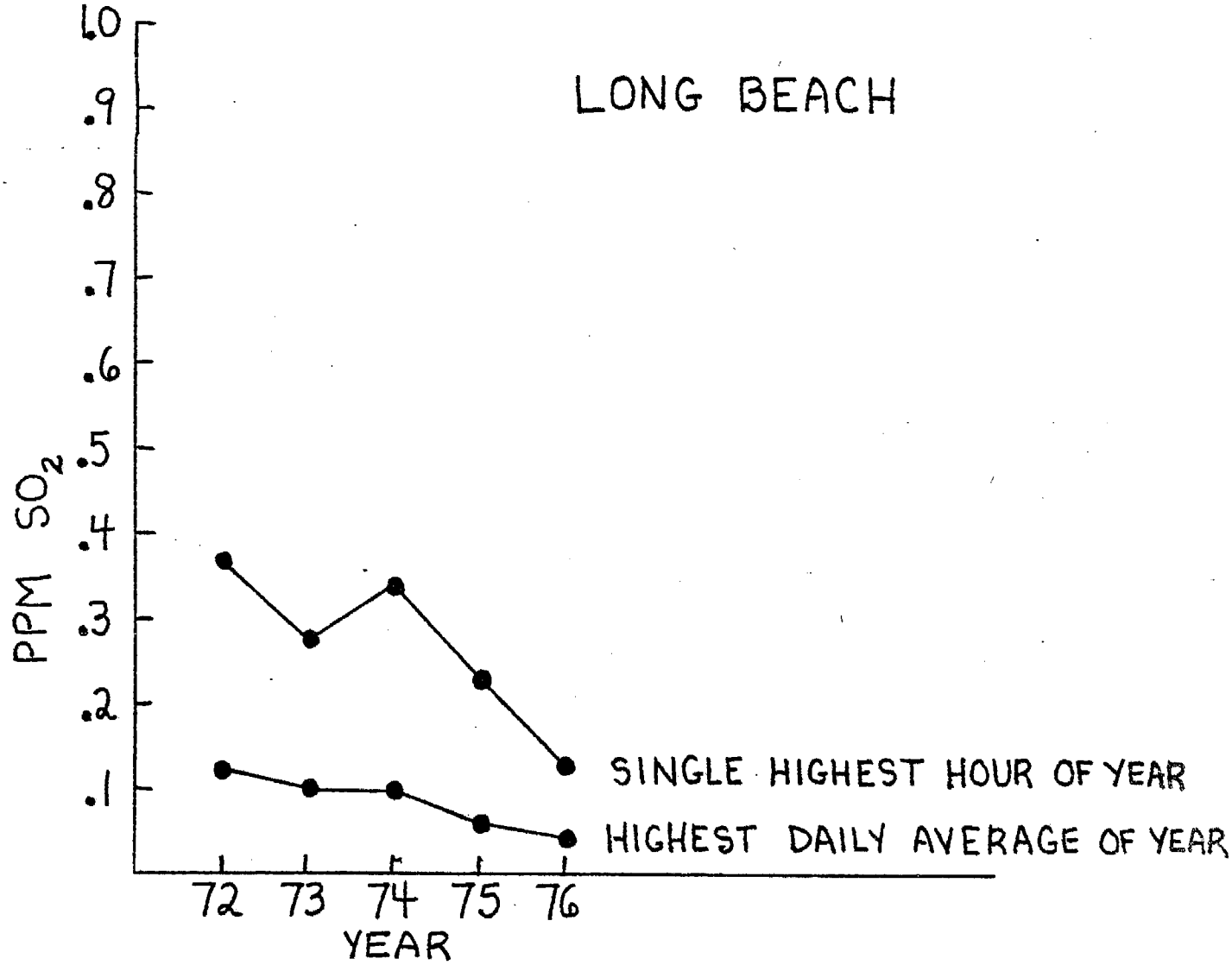


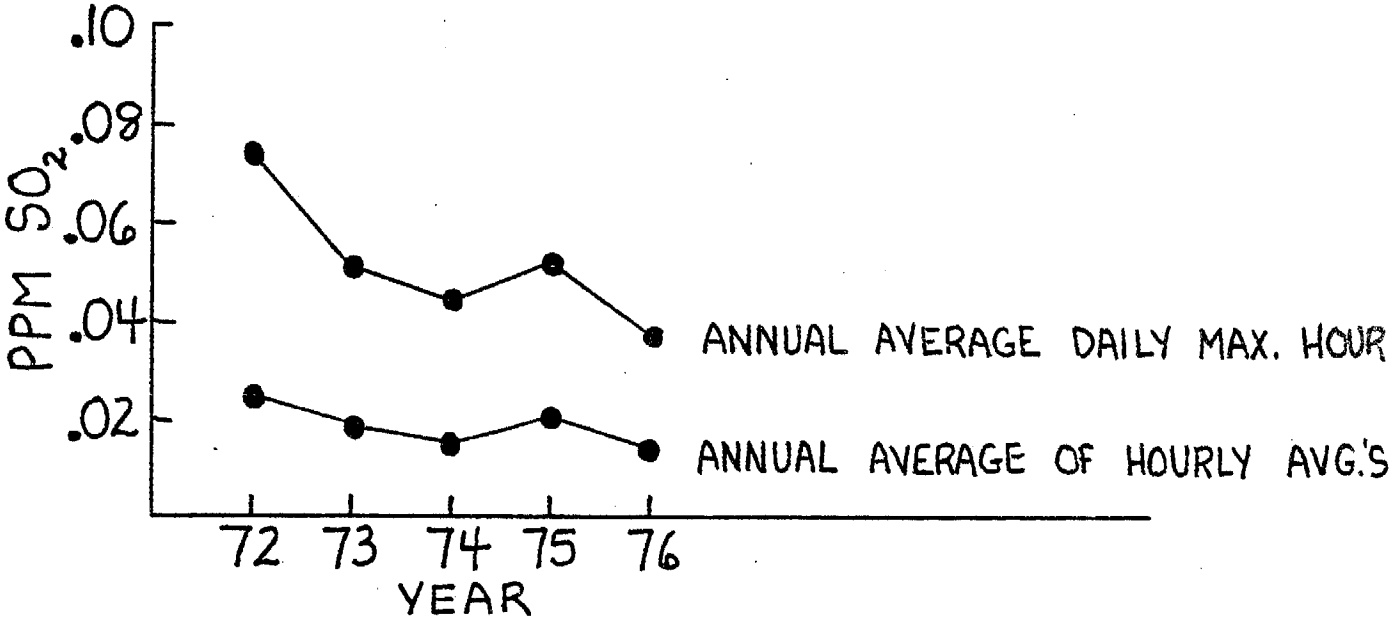


SULFUR DIOXIDE

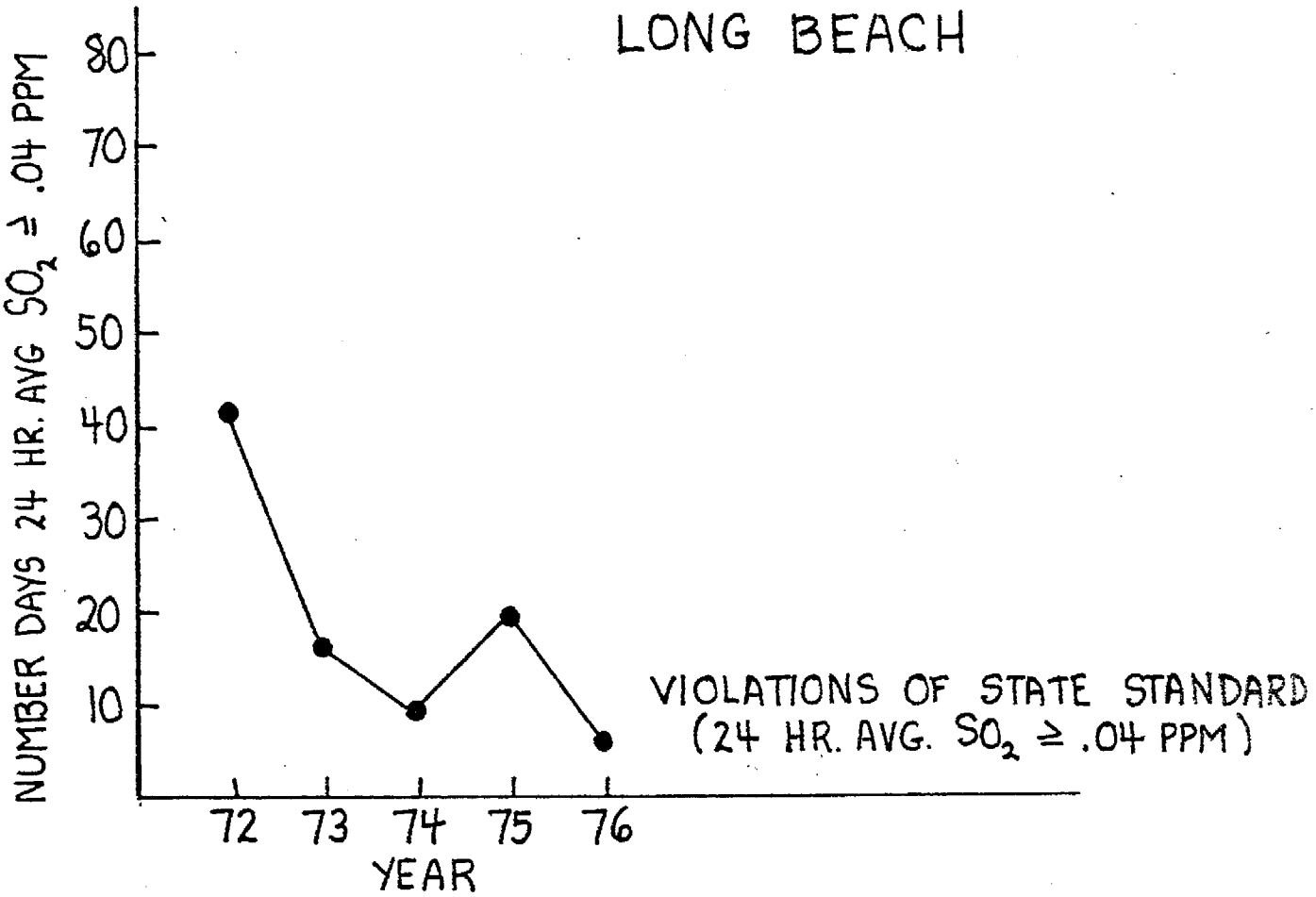


SULFUR DIOXIDE

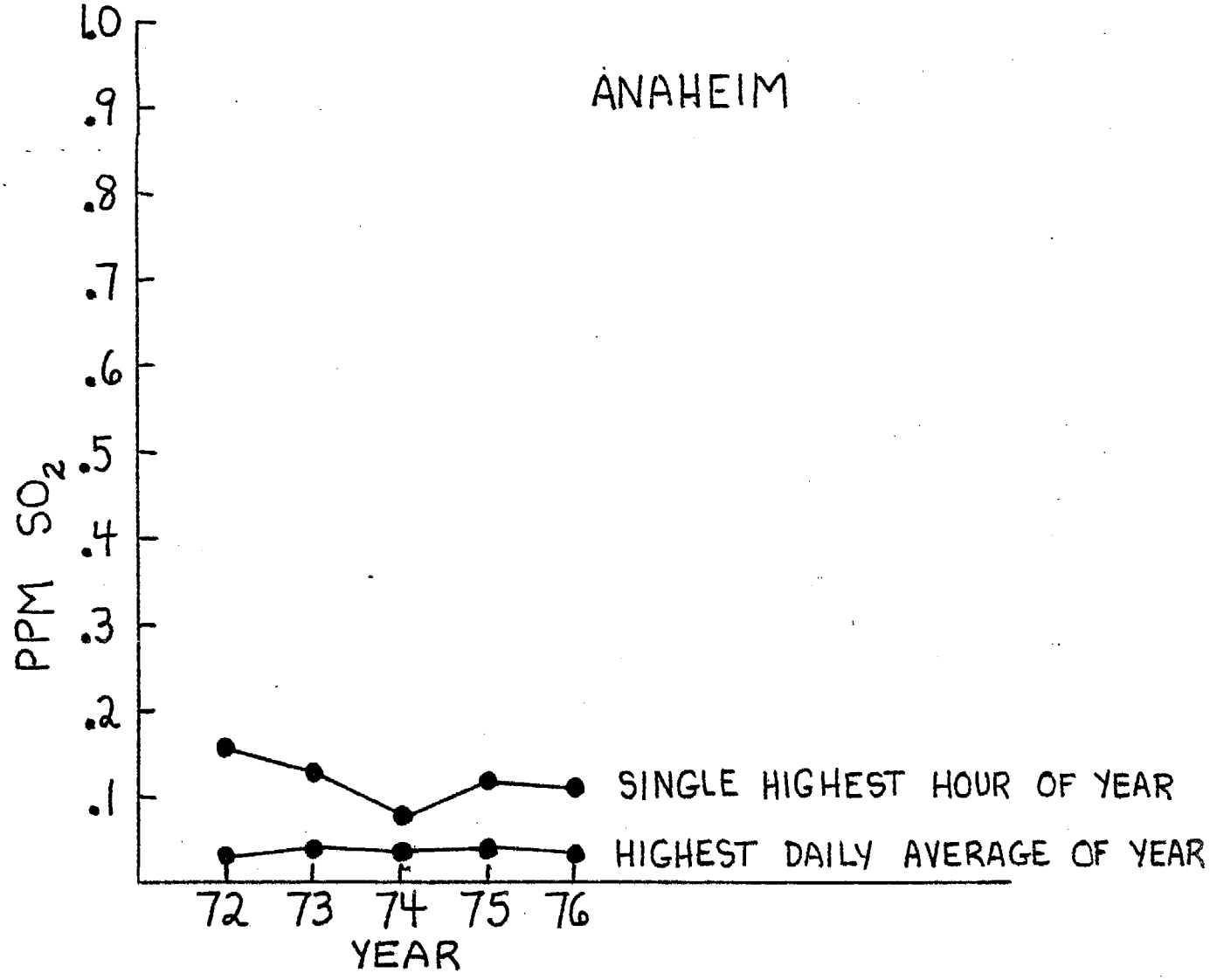


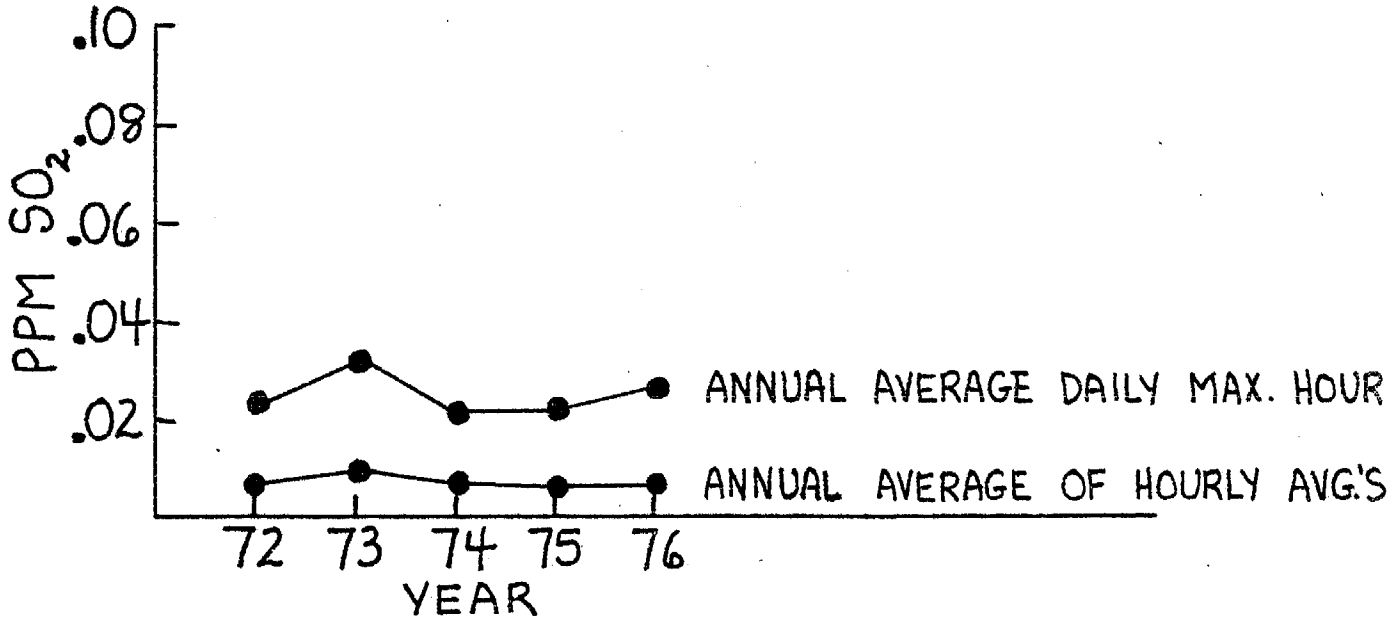


SULFUR DIOXIDE



SULFUR DIOXIDE





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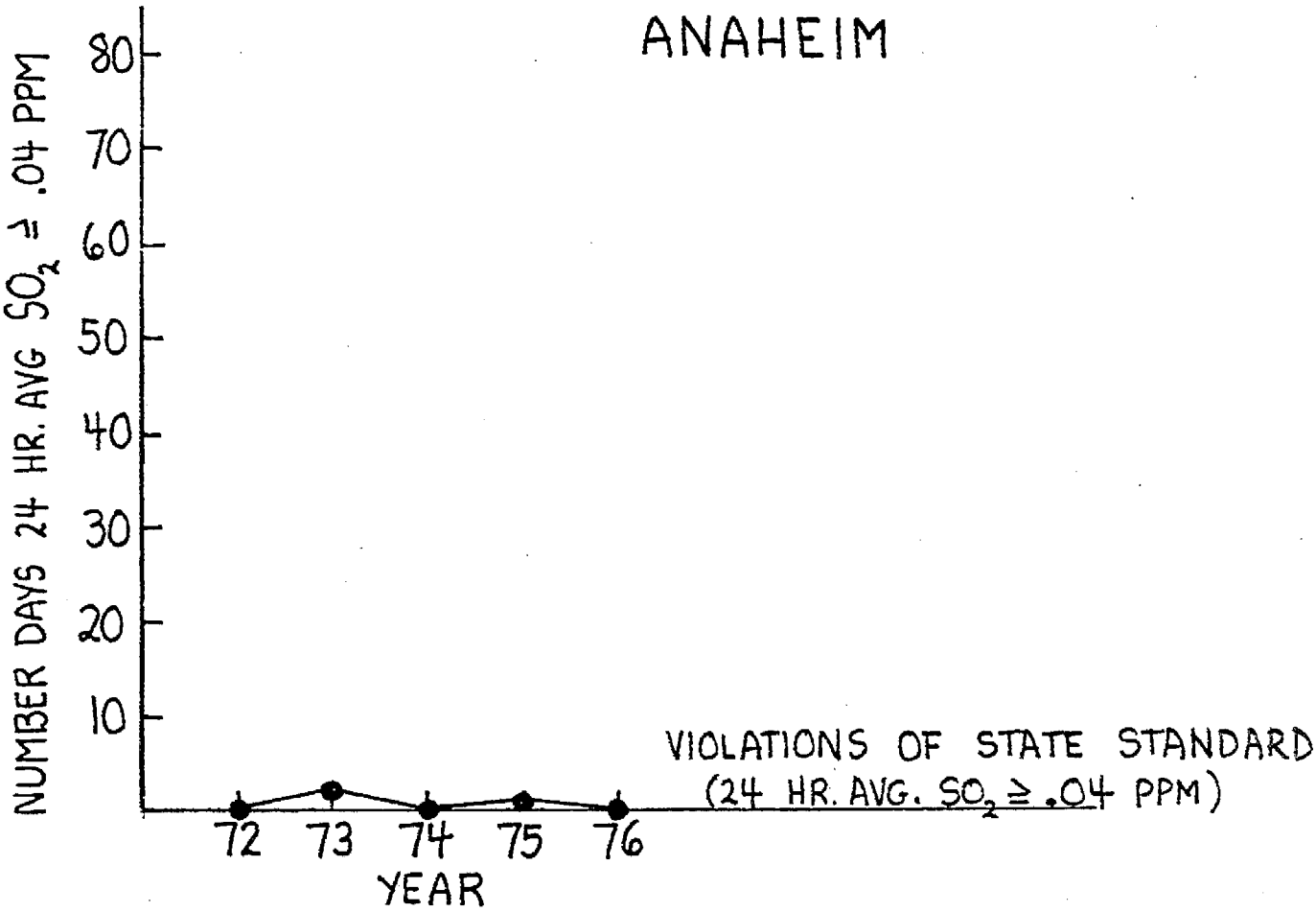

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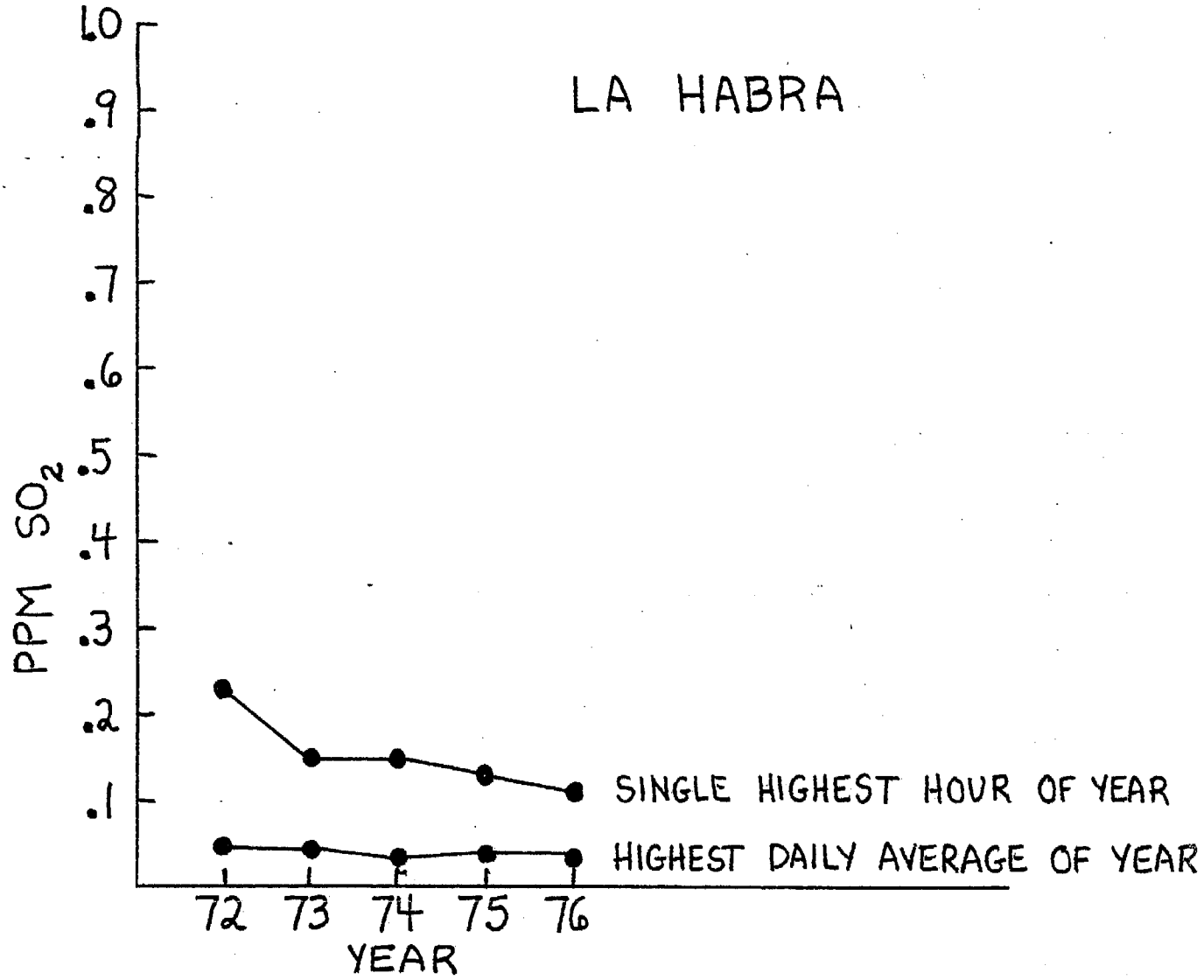

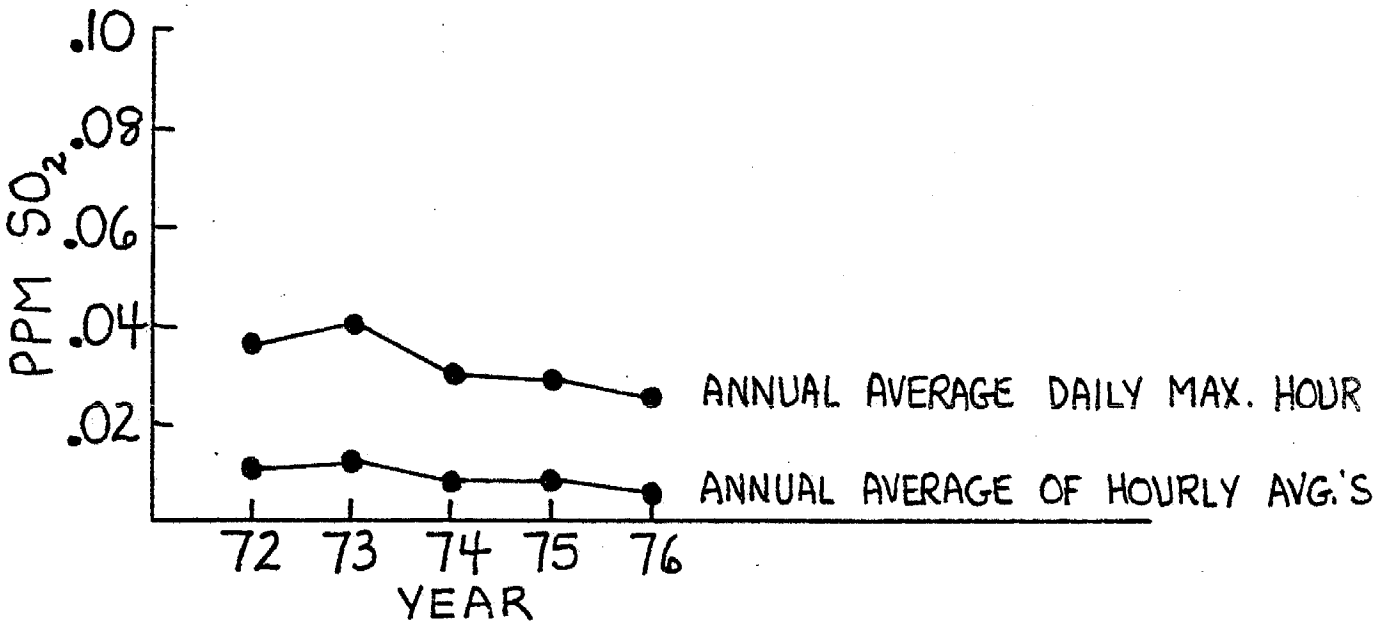

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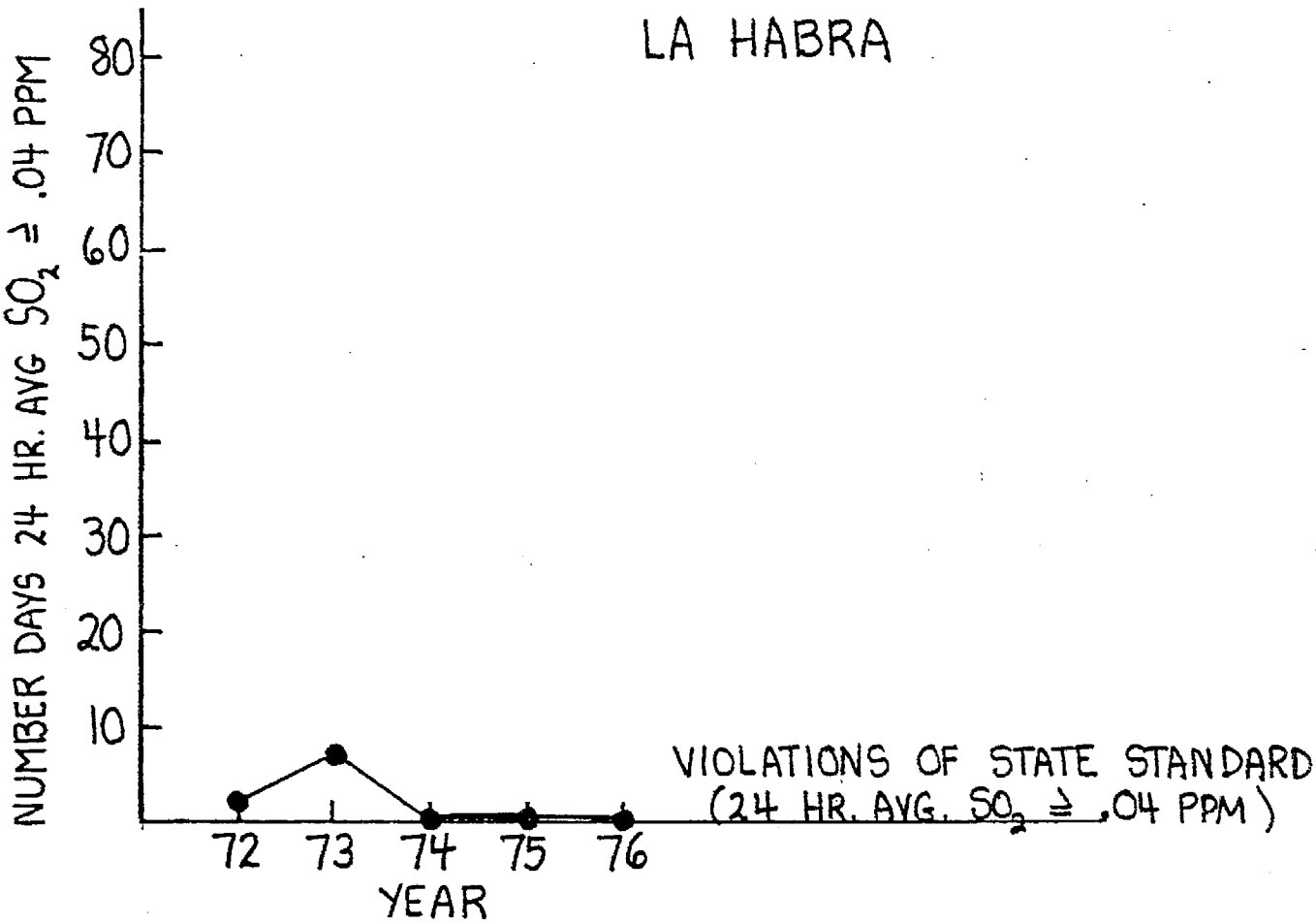

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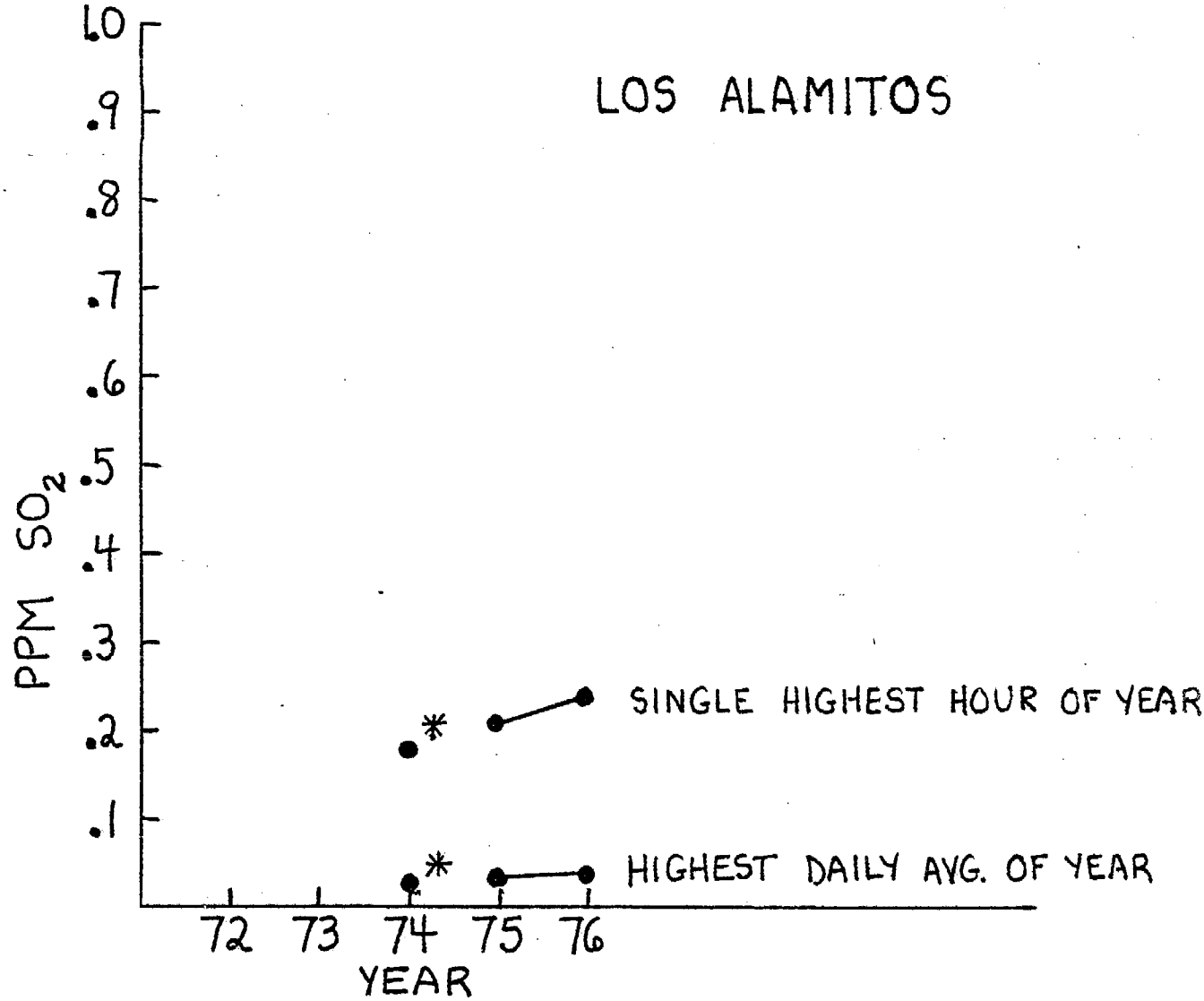
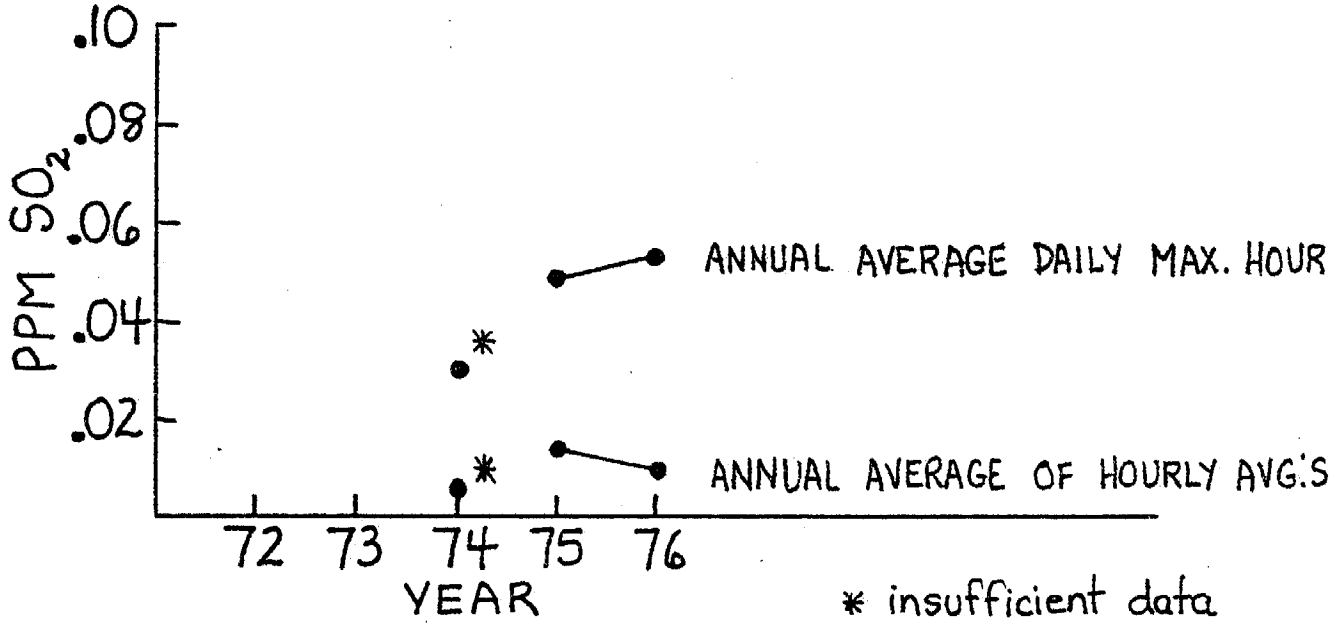
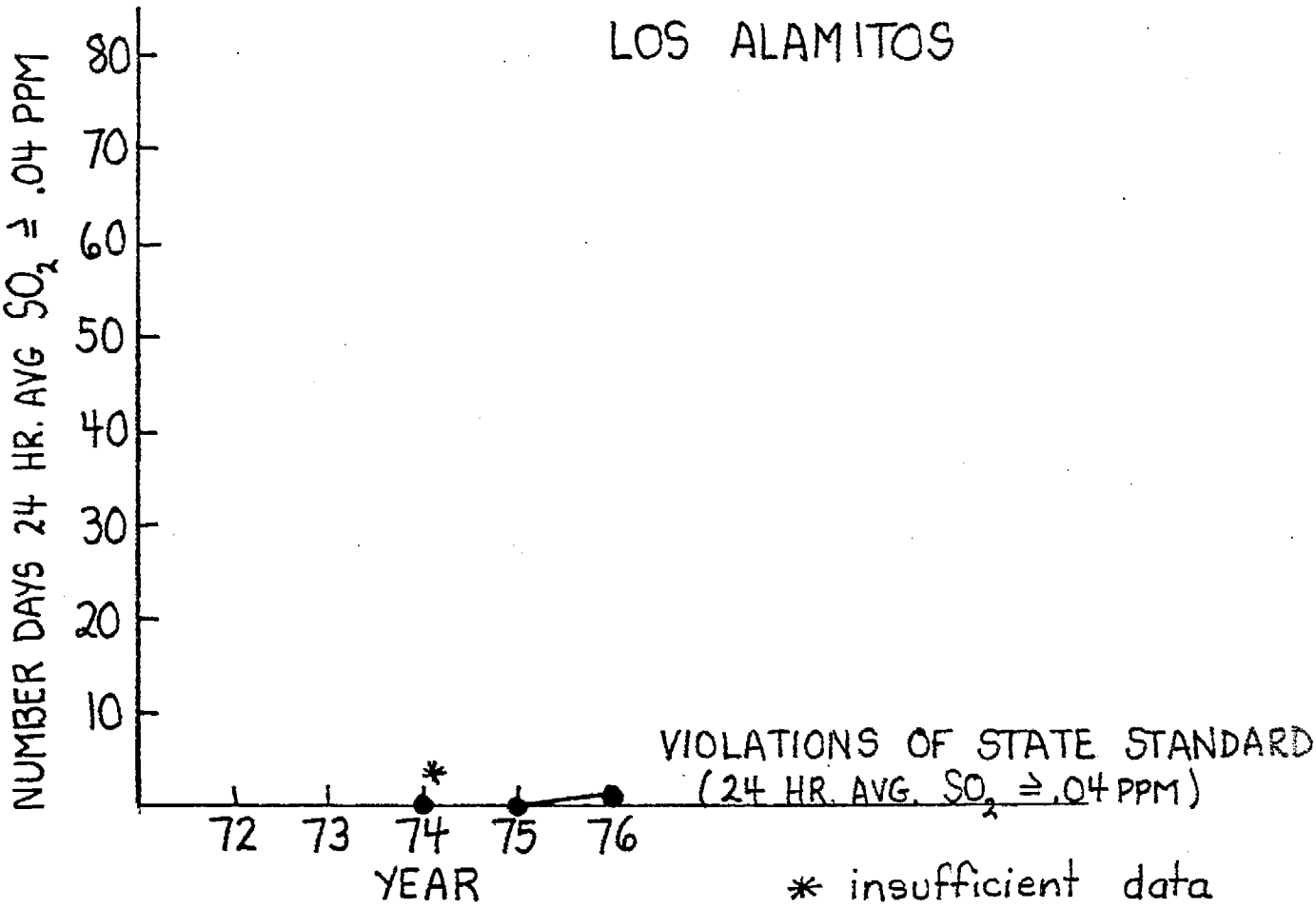




* insufficient data

SULFUR DIOXIDE



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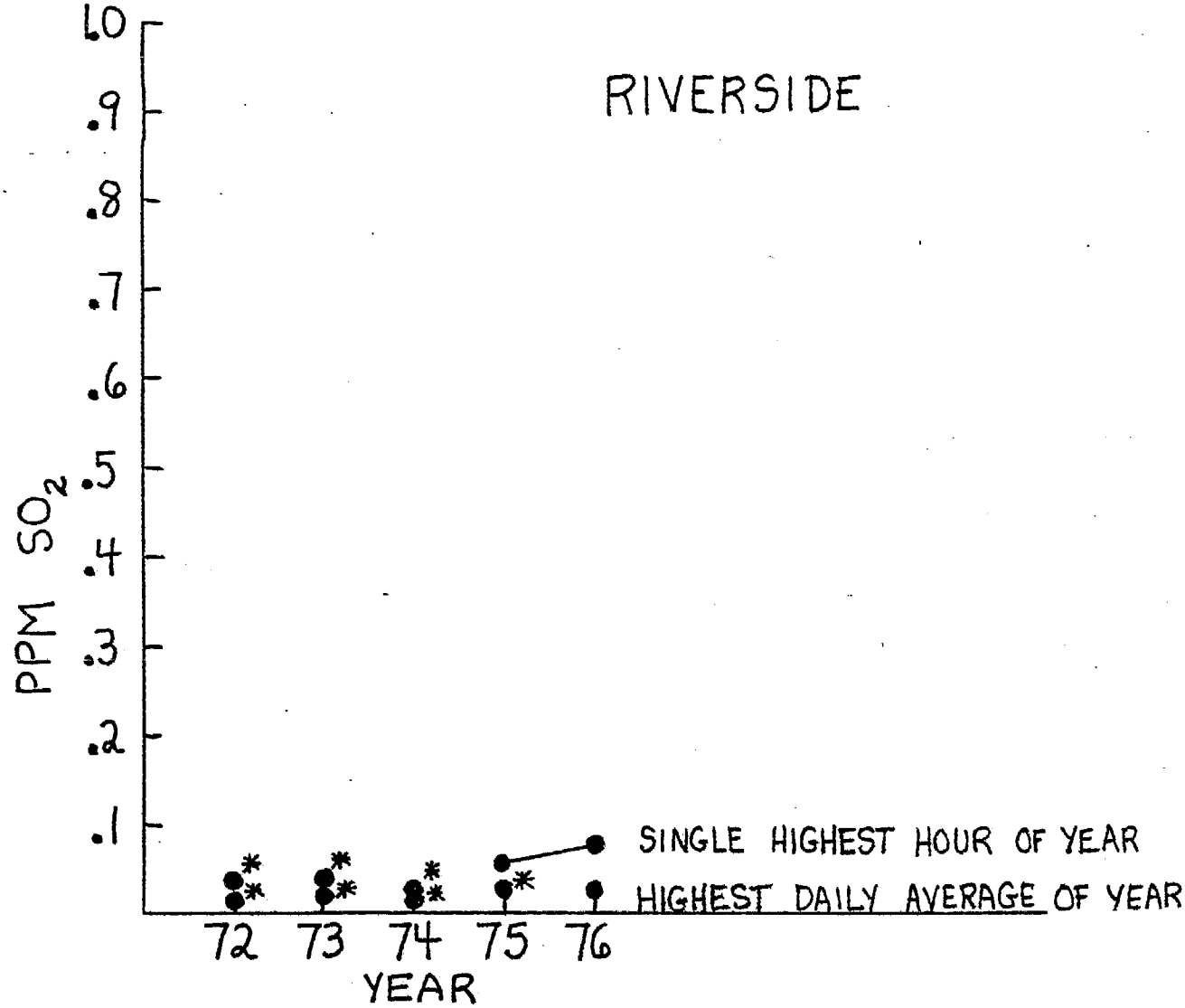

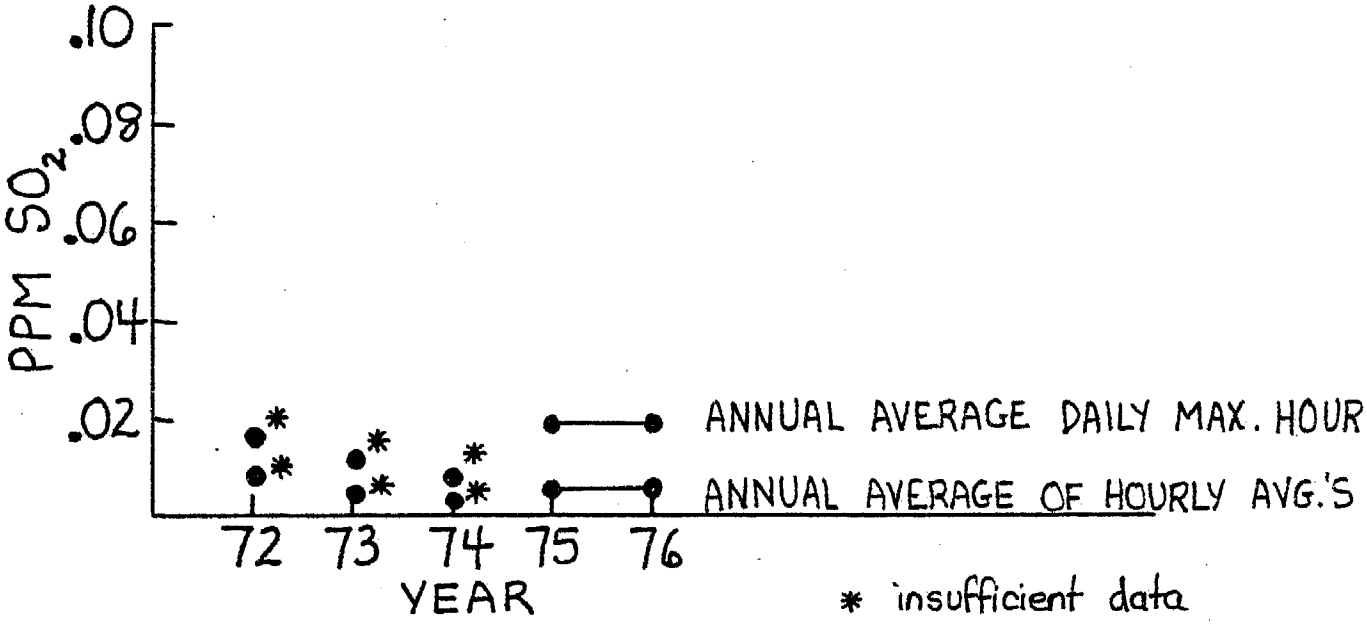

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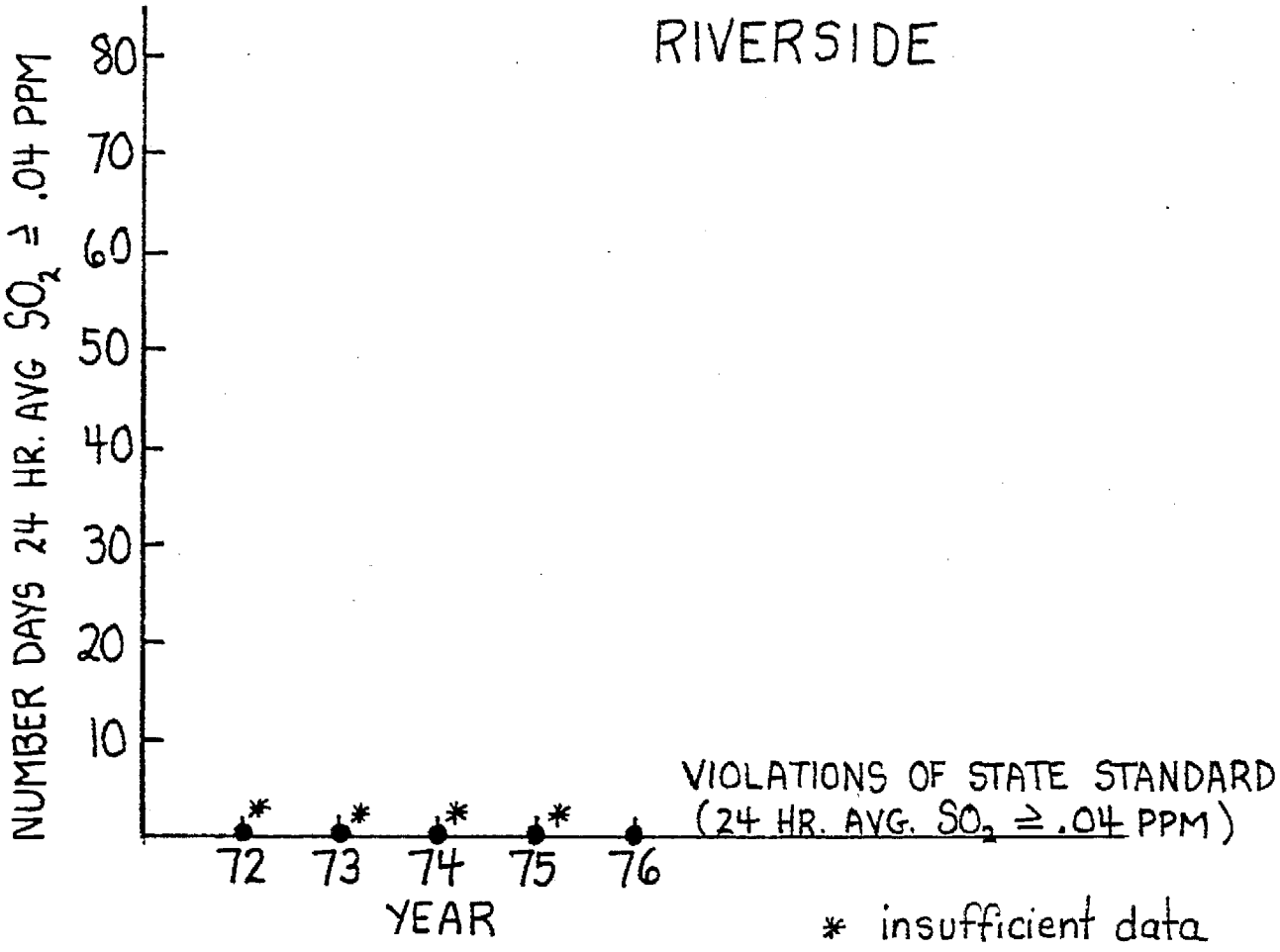

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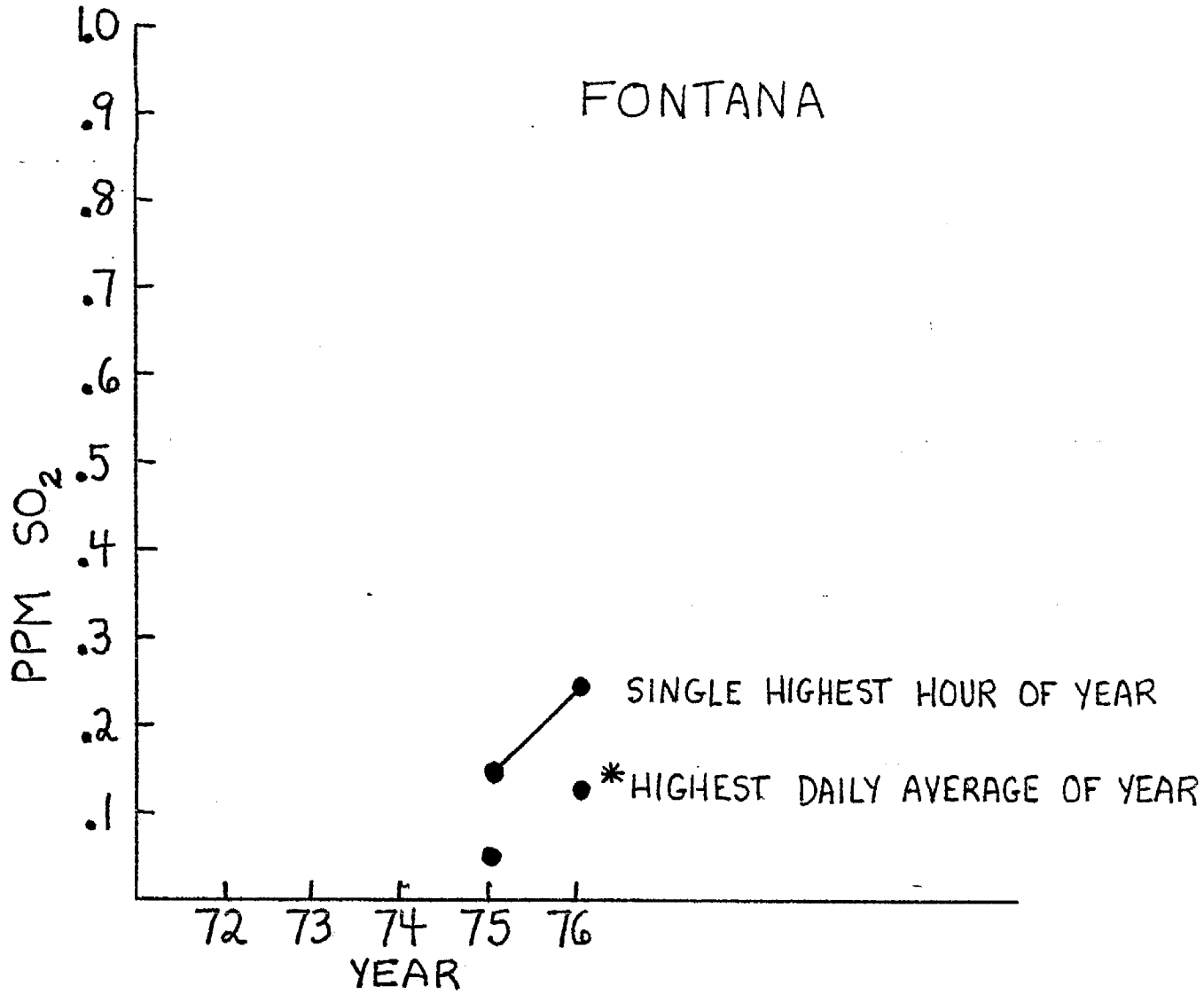
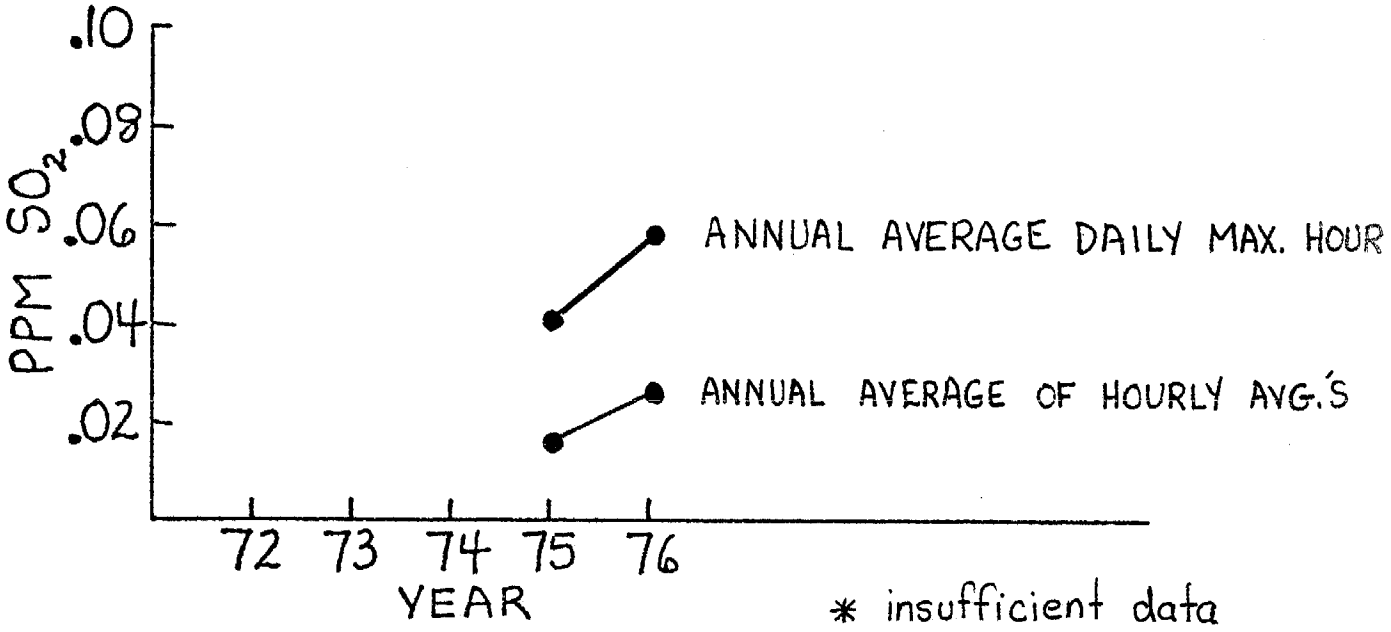
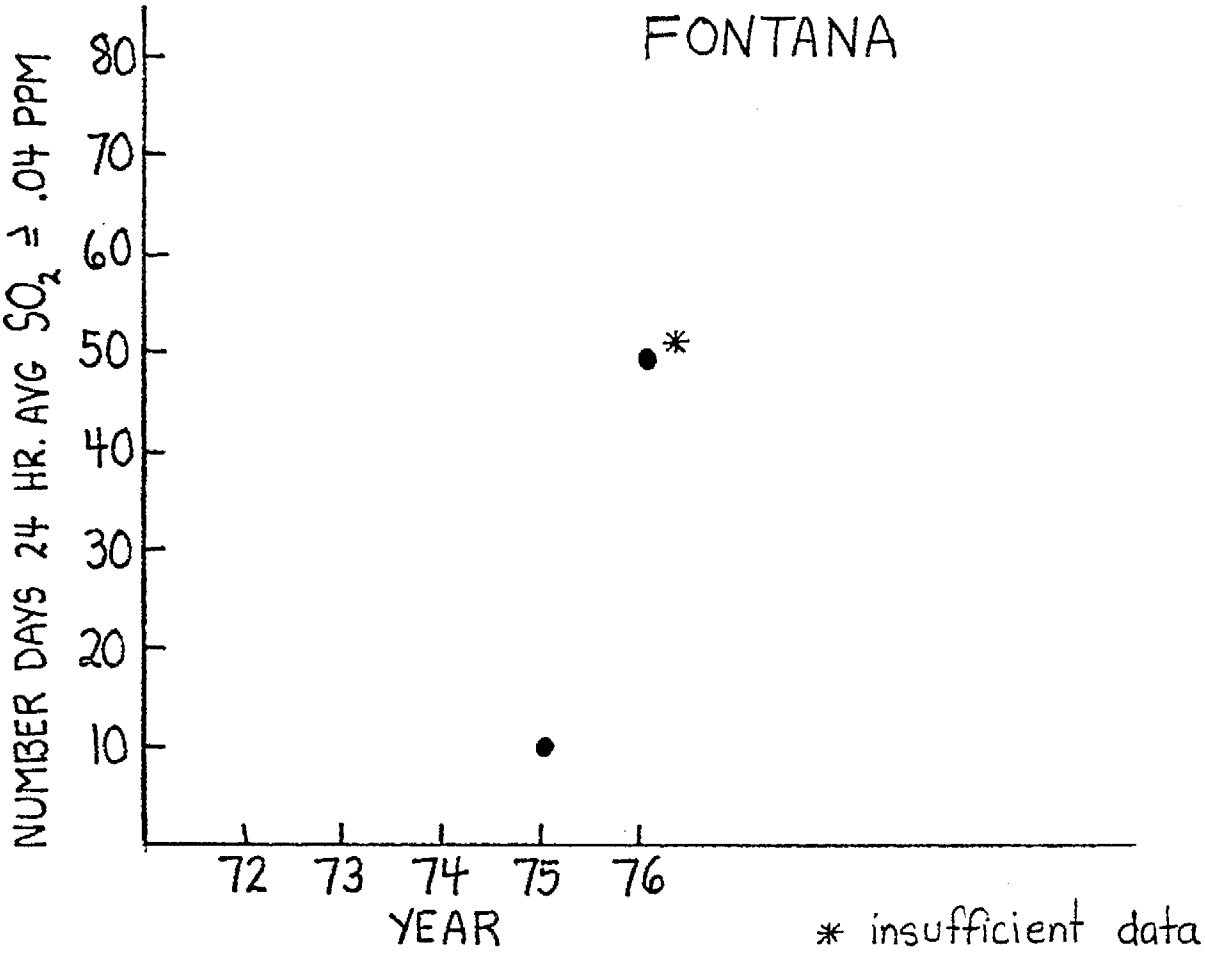


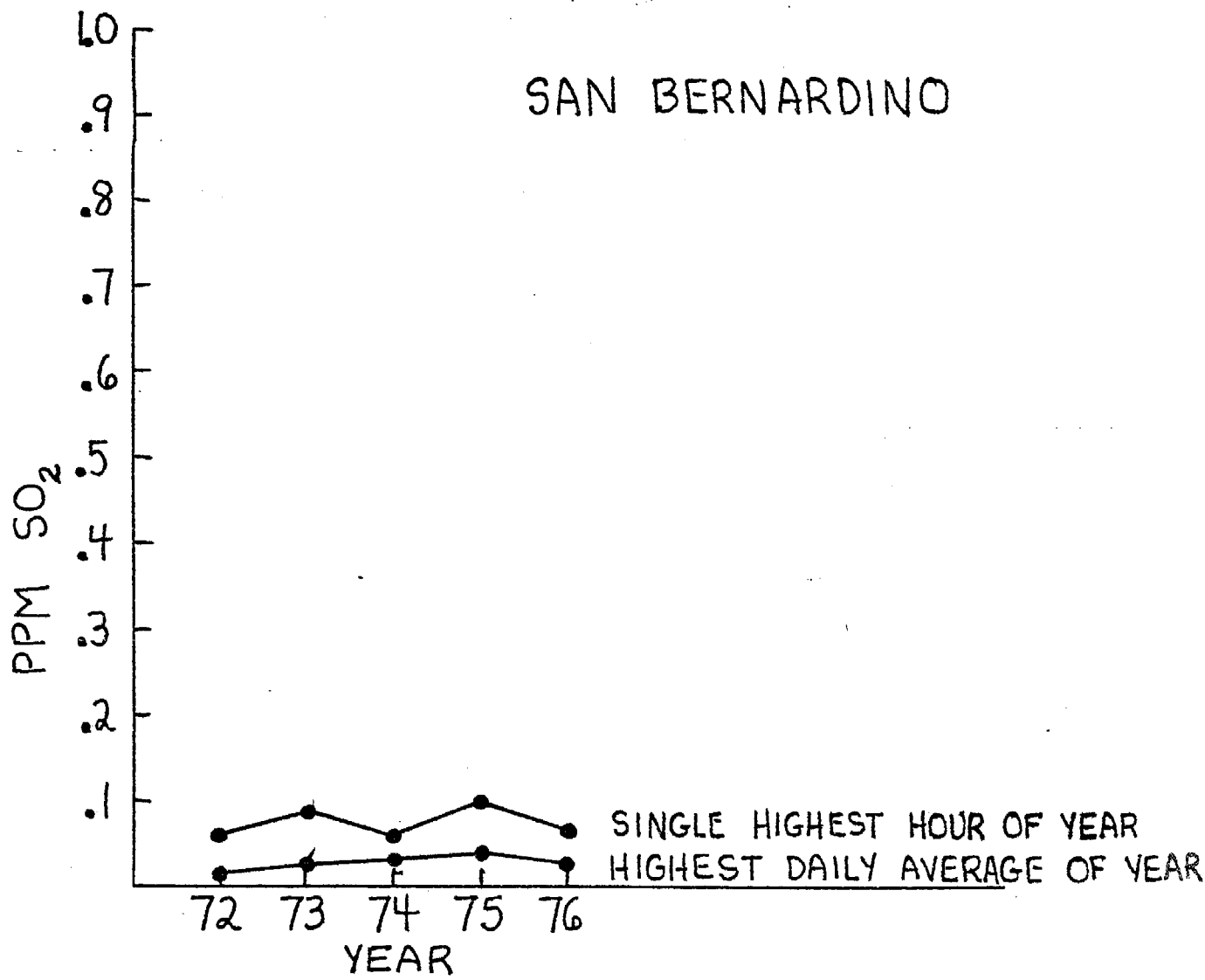


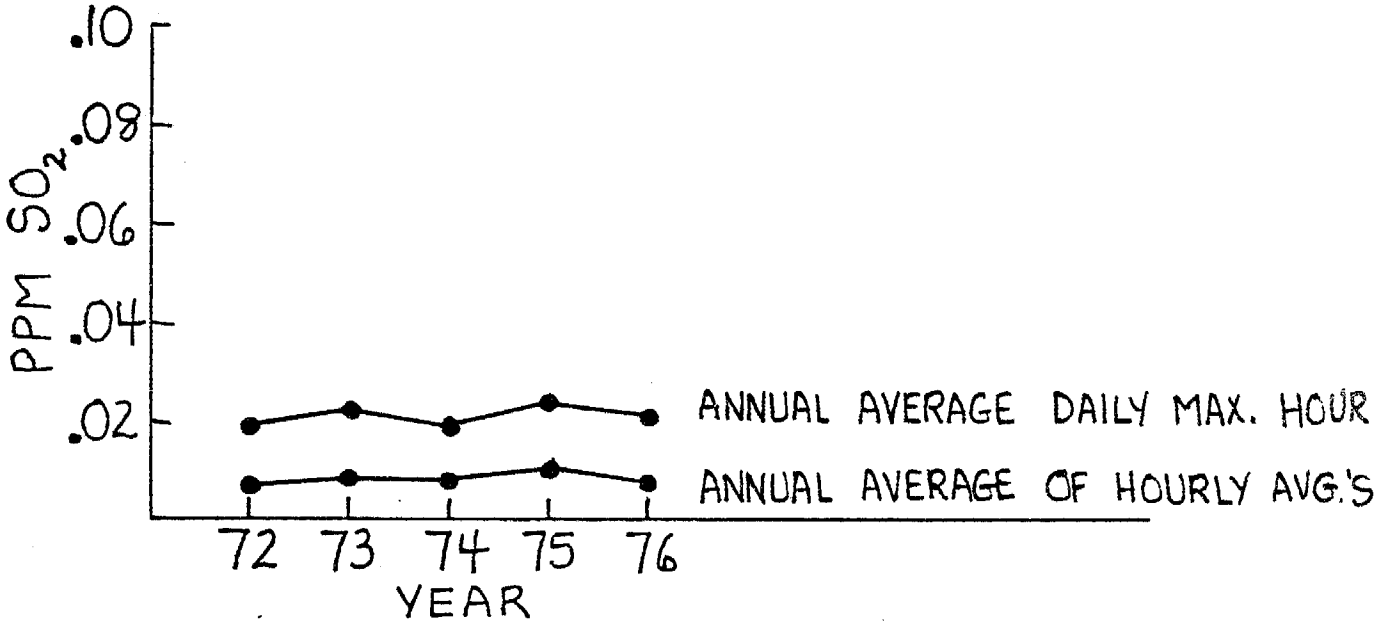
* insufficient data

SULFUR DIOXIDE



SULFUR DIOXIDE





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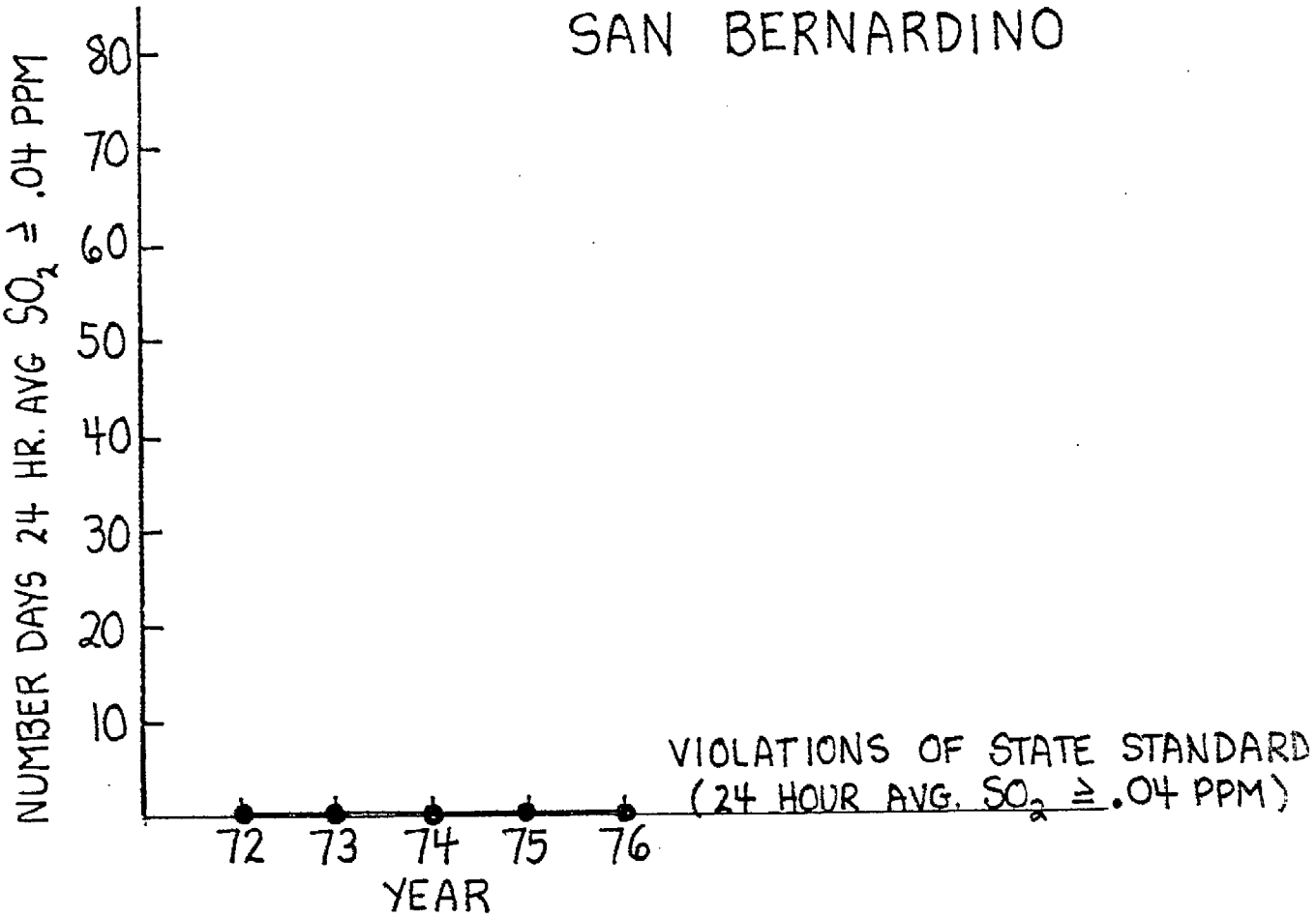

ANNUAL ARITHMETIC MEAN, PPM

ZONE #	STATION Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	0.020	0.018	0.020	0.019	0.018	0.020	0.019
060	Azusa	0.018	0.016	0.017	0.018	0.015	0.015	0.010
069	Burbank	0.017	0.014	0.014	0.019	0.016	0.015	0.008
071	WLA	0.014	0.014	0.014	0.016	0.015	0.015	0.008
072	L. B.	0.024	0.025	0.025	0.019	0.017	0.021	0.015
074	Reseda	0.012	0.013	0.012	0.011	0.011	0.011	0.008
075	Pomona	0.014	0.014	0.015	0.015	0.014	0.014	0.010
076	Lennox	0.026	0.021	0.029	0.026	0.020	0.020	0.017
080	Whittier			0.018	0.020	0.024	0.025	0.019
081	Newhall				0.012	0.015	0.012	0.011
082	Lancaster							0.006
083	Pasadena				0.015	0.016	0.016	0.015
084	Lynwood					0.021	0.019	0.012
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	0.005	0.006	0.007	0.010	0.007	0.006	0.007
3177	La Habra	0.010	0.008	0.011	0.012	0.008	0.008	0.006
3185	Costa Mesa			0.008	0.010	0.009	0.009	0.006
3186	El Toro					0.002		
3188	San Juan Capistrano							
3189	Laguna					0.006		
3190	Los Alamitos					0.006	0.012	0.010
3191	Santa Ana Canyon							
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs							
4139	Indio							
4140	Prado Park							
4141	Hemet							
4144	Riverside						0.007	0.007
4149	Perris							
4150	Banning							
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino	0.007	0.008	0.007	0.008	0.008	0.010	0.008
5155	Barstow							
5165	Redlands							
5168	Victorville							
5173	Chino							
5174	Upland							
5175	Upland (ARB)							
5176	Fontana							
5177	Big Bear						0.016	0.027
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							

NUMBER OF DAYS VIOLATING STATE STANDARD (1-HR. AVG. $SO_2 \geq 0.50$ PPM)

ZONE #	STATION Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	0	0	0	0	0	0	0
060	Azusa	0	0	0	0	0	0	0
069	Burbank	0	0	0	0	0	0	0
071	WLA	0	0	0	0	0	0	0
072	L. B.	0	1	0	0	0	0	0
074	Reseda	0	0	0	0	0	0	0
075	Pomona	0	0	0	0	0	0	0
076	Lennox	1	1	1	0	0	0	0
080	Whittier			0	0	0	0	0
081	Newhall				0	0	0	0
082	Lancaster							0
083	Pasadena				0	0	0	0
084	Lynwood					0	0	0
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	0	0	0	0	0	0	0
3177	La Habra	0	0	0	0	0	0	0
3185	Costa Mesa			0	0	0	0	0
3186	El Toro					0		
3188	San Juan Capistrano							
3189	Laguna					0		
3190	Los Alamitos					0	0	0
3191	Santa Ana Canyon							
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs							
4139	Indio							
4140	Prado Park							
4141	Hemet							
4144	Riverside						0	0
4149	Perris							
4150	Banning							
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino	0	0	0	0	0	0	0
5155	Barstow							
5165	Redlands							
5168	Victorville							
5173	Chino							
5174	Upland							
5175	Upland (ARB)							
5176	Fontana						0	0
5177	Big Bear							
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							

NUMBER OF DAYS VIOLATING STATE STANDARD (24 HR. AVG. $SO_2 \geq 0.04$ PPM)

ZONE STATION #	Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	11	1	10	7	3	19	11
060	Azusa	4	0	4	5	0	1	0
069	Burbank	7	0	0	4	0	1	0
071	WLA	1	0	0	2	0	1	0
072	L. B.	36	47	41	16	9	19	6
074	Reseda	0	2	0	0	0	0	0
075	Pomona	0	0	0	0	0	0	0
076	Lennox	52	15	63	51	9	9	3
080	Whittier			14	22	34	34	7
081	Newhall			0	0	2	0	0
082	Lancaster							0
083	Pasadena				0	0	0	0
084	Lynwood					5	4	0
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	0	0	0	2	0	1	0
3177	La Habra	0	0	0	0	0	0	0
3185	Costa Mesa			0	1	0	0	0
3186	El Toro					0		
3188	San Juan Capistrano							
3189	Laguna							
3190	Los Alamitos					0	0	1
3191	Santa Ana Canyon						0	0
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs							
4139	Indio							
4140	Prado Park							
4141	Hemet							
4144	Riverside						0	0
4149	Perris							
4150	Banning							
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino	0	0	0	0	0	0	0
5155	Barstow							
5165	Redlands							
5168	Victorville							
5173	Chino							
5174	Upland							
5175	Upland (ARB)							
5176	Fontana						10	49
5177	Big Bear							
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							

SULFUR DIOXIDE

MONTHLY MEAN OF DAILY MAX. 1-HOUR, PPM

- 1976 -

MONTH	AREA					
	CENTRAL LOS ANGELES	LENNOX	ANAHEIM	LA HABRA	RIVERSIDE	SAN BERNARDINO
JANUARY	0.047	0.057	0.025	0.025	0.006	0.014
FEBRUARY	0.024	0.040	0.013	0.017	0.013	0.015
MARCH	0.031	0.054	0.005	0.024	0.018	0.015
APRIL	0.019	0.032	0.017	0.013	0.012	0.018
MAY	0.025	0.035	0.021	0.020	0.025	0.025
JUNE	0.031	0.039	0.021	0.031	0.028	0.024
JULY	0.036	0.039	0.020	0.036	0.034	0.032
AUGUST	0.035	0.046	0.031	0.036	0.033	0.029
SEPTEMBER	0.031	0.034	0.022	0.021	0.022	0.024
OCTOBER	0.029	0.043	0.035	0.037	0.020	0.022
NOVEMBER	0.041	0.048	0.045	0.022	0.012	0.016
DECEMBER	0.038	0.040	0.033	0.016	0.013	0.016

SCAQMD - E & P Div.
MFB 10/6/77

DATA SUMMARY - SULFUR DIOXIDE, ppm

STATION YEAR	ANNUAL MAXIMUM		ANNUAL ARITHMETIC MEAN		NUMBER OF DAYS IN VIOLATION OF STANDARDS	
	1-HOUR AVERAGE	24-HOUR AVERAGE	HOURLY AVERAGES	DAILY MAX. HOURLY AVERAGE	1-HR.AVERAGE ≧ 0.5 PPM	24-HR.AVERAGE ≧ 0.04 PPM
LOS ANGELES COUNTY						
LENNOX						
1972	1.00	0.128	0.029	0.092	1	63
1973	0.28	0.092	0.026	0.072	0	51
1974	0.17	0.046	0.020	0.050	0	9
1975	0.19	0.055	0.020	0.051	0	9
1976	0.18	0.043	0.017	0.042	0	3
LONG BEACH						
1972	0.37	0.123	0.025	0.074	0	41
1973	0.28	0.100	0.019	0.051	0	16
1974	0.34	0.108	0.017	0.044	0	9
1975	0.23	0.064	0.021	0.052	0	19
1976	0.13	0.049	0.015	0.037	0	6
LOS ANGELES						
1972	0.12	0.064	0.020	0.037	0	10
1973	0.12	0.053	0.019	0.034	0	7
1974	0.08	0.049	0.018	0.030	0	3
1975	0.12	0.061	0.020	0.033	0	19
1976	0.12	0.072	0.019	0.032	0	11
ORANGE COUNTY						
ANAHEIM						
1972	0.16	0.030	0.007	0.025	0	0
1973	0.13	0.043	0.010	0.032	0	2
1974	0.08	0.038	0.007	0.021	0	0
1975	0.12	0.043	0.006	0.022	0	1
1976	0.11	0.035	0.007	0.026	0	0

Table IV.D-V

DATA SUMMARY - SULFUR DIOXIDE, ppm

STATION YEAR	ANNUAL MAXIMUM		ANNUAL ARITHMETIC MEAN		NUMBER OF DAYS IN VIOLATION OF STANDARDS	
	1-HOUR AVERAGE	24-HOUR AVERAGE	HOURLY AVERAGES	DAILY MAX. HOURLY AVERAGE	1-HR.AVERAGE ≧ 0.5 PPM	24-HR.AVERAGE ≧ 0.04 PPM
LA HABRA						
1972	0.23	0.047	0.011	0.036	0	2
1973	0.15	0.043	0.012	0.040	0	7
1974	0.15	0.032	0.008	0.031	0	0
1975	0.13	0.039	0.008	0.029	0	0
1976	0.11	0.036	0.006	0.025	0	0
LOS ALAMITOS						
1972						
1973						
1974	0.18*	0.032*	0.006*	0.031*	0*	0*
1975	0.21	0.039	0.012	0.049	0	0
1976	0.24	0.043	0.010	0.053	0	1
RIVERSIDE COUNTY						
RIVERSIDE						
1972	0.04*	0.023*	0.009*	0.017*	0*	0*
1973	0.04*	0.024*	0.005*	0.012*	0*	0*
1974	0.03*	0.019*	0.004*	0.008*	0*	0*
1975	0.06	0.028*	0.007	0.019	0	0*
1976	0.08	0.029	0.007	0.019	0	0
SAN BERNARDINO COUNTY						
FONTANA						
1972						
1973						
1974						
1975	0.15	0.053	0.016	0.041	0	10
1976	0.25	0.138*	0.027	0.059	0	49*

Table IV.D-V

DATA SUMMARY - SULFUR DIOXIDE, ppm

STATION YEAR	ANNUAL MAXIMUM		ANNUAL ARITHMETIC MEAN		NUMBER OF DAYS IN VIOLATION OF STANDARDS	
	1-HOUR AVERAGE	24-HOUR AVERAGE	HOURLY AVERAGES	DAILY MAX. HOURLY AVERAGE	1-HR.AVERAGE ≧ 0.5 PPM	24-HR.AVERAGE ≧ 0.04 PPM
SAN BERNARDINO						
1972	0.06	0.021	0.007	0.019	0	0
1973	0.09	0.032	0.008	0.022	0	0
1974	0.06	0.034	0.008	0.019	0	0
1975	0.10	0.038	0.010	0.024	0	0
1976	0.07	0.029	0.008	0.021	0	0

* Yearly statistics may not be representative, due to insufficient data.

Table IV.D-V

SUMMARY OF ANNUAL AVERAGES OF DAILY

ONE-HOUR SULFUR DIOXIDE MAXIMA, 1955-1976

Year	Annual[a] Averages of Daily One-Hour Sulfur Dioxide Maxima, ppm, By Basin and Station													
	Los Angeles Basin, by Station[b]												USCRV Basin	AV[c] Basin
	1	60	69[d]	71	72	74	75[e]	76[f]	78[g]	80	83	84	81	82
1955	.042[6]				.065[6]									
1956	.059				.095						.040			
1957	.060		.046[10]		.076			.085[8]			.063			
1958	.054		.035	.050[5]	.087			.060[4]			.045			
1959	.038		.033	.028	.058		.025[2]				.028			
1960	.038		.026	.023	.059						.024			
1961	.033		.023	.024	.059						.028			
1962	.026		.016	.019	.043			.060[2]			.026			
1963	.030		.017	.023	.033			.074[10]			.024			
1964	.021		.022	.022	.034			.070[5]			.023			
1965	.028		.029	.026	.058	.030[3]	.030[4]	.073			.026			
1966	.029		.035	.033	.073	.023	.033	.085			.037			
1967	.036		.037	.034	.063	.024	.030	.072			.033			
1968	.045		.033	.030	.082	.021	.028	.068	.047[10]		.024			
1969	.037		.027	.023	.061	.018	.025	.053	.057		.027			
1970	.038	.038[9]	.029	.026	.058	.017	.028	.090	.036[7]		.026			
1971	.036	.033	.026	.028	.073	.022	.023	.069	.073[6]	.045[2]	.026			
1972	.038	.034	.027	.029	.073	.019	.028	.093	.054[9]	.043	.023		.023[3]	
1973	.033	.031	.031	.028	.053	.016	.028	.073	.044[10]	.055	.026	.070[3]	.018	
1974	.031	.024	.027	.025	.044	.016	.026	.051	.031[11]	.055	.023	.042	.021	
1975	.033	.025	.025	.026	.053	.015	.028	.051	.036[10]	.058	.026	.038	.018	
1976	.032	.021	.019	.017	.037	.016	.021	.042	--	.043	.024	.030	.017	.009

a) Data are for currently operated Stations or for their predecessors in the same areas. If less than a full year's data are available, averages are provided for available months. Note that when only partial years of data are involved, the averages will tend to reflect only seasonal and not annual trends.

b) Exponents indicate number of months of data in the year involved. Unless otherwise noted (underlined), the number indicates the last "n" months of a fractional year.

c) Antelope Valley - no SO_2 Analyzer as yet.

d) Data for Station 69 in 1957 are for February and March and the last 8 months.

e) Data for Station 75 in 1959 are for January and February only.

f) Data for Station 76 in 1958 are for the first 4 months. Data for 1963 are for the first 10 months.

g) Data for Station 78 in 1970 are for the first 7 months. Data for 1971 are for the months May through October. Data for 1973 are for the first 10 months. No data were available for September 1974. Data for 1975 are for the first 10 months.

SULFUR DIOXIDE - ANNUAL MAXIMUM 1-HOUR, PPM

STATION	- YEAR -																					
	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
LOS ANGELES	.15*	.19 /	.20	.18	.10* /	.12	.17	.14	.22	.10	.08	.10	.13	.30	.09	.12	.11	.12	.12	.08	.12	.12
AZUSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.10	.09	.11	.09	.11	.09	.10
BURBANK	-	-	.17	.14	.30	.11	.20 /	.15	.11	.15	.16	.57	.30	.23	.14	.17	.07	.08	.10	.12	.15	.09
WEST LOS ANGELES	-	-	-	-	-	-	-	.15*	.10	.25	.08	.14	.20	.14	.13	.20	.11	.17	.10	.09	.12	.07
LONG BEACH	-	-	-	.68	.32	.27	.43	.20 /	.27	.25	.18	.33	.40	.51	.55	.40	.55	.37	.28	.34	.23	.13
RESEDA	-	-	-	-	-	-	-	-	-	-	.07*	.10	.09	.05	.05	.05	.08	.05	.07	.07	.07	.04
POMONA	-	-	-	-	-	-	-	-	-	-	.08*	.13	.15	.17	.07	.07	.08	.09	.08	.07	.09	.06
LENNOX	-	-	-	-	-	-	-	-	-	-	.30	.34	.47	.45	.32	.53	.50	1.00	.28	.17	.19	.18
WHITTIER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.15*	.25	.28	.18	.27	.15
NEWHALL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.06*	.05	.12	.09	.10
LANCASTER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.02
PASADENA	-	.11	.20 /	.16*	.15	.12	.07	.13	.17	.10	.09	.14	.11	.09 /	.20	.10	.10	.07 /	.07	.06	.07	.06
LYNWOOD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22*	.15	.14	.09
ANAHEIM	-	-	-	-	-	-	-	-	.12	.13	.17	.25	.17	.16	.11	.15	.15	.16	.13	.08	.12	.11
LA HABRA	-	-	-	-	-	-	-	-	-	-	-	-	.18*	.27	.14	.16	.11	.23	.15	.15	.13	.11
COSTA MESA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.07*	-	.14	.17	.14	.13	.13
EL TORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.12*	.05	.03*	.05*
SAN JUAN CAPISTRANO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAGUNA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.08	.06*	-
LOS ALAMITOS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.25*	.25 /	-	.18	.21	.24
SANTA ANA CANYON	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0*	.03	.07
PALM SPRINGS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INDIO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.04*	-	-	-	-
PIRU PARK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.06*	-	-	-	-
HEMET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RIVERSIDE	-	-	-	-	-	-	-	-	-	-	-	.25*	.10	.10	.06	.08	.09	.06* /	.04*	.03*	.06	.08
PERRIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BANNING	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.03*	-	-
TEMECULA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ELSINORE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAN BERNARDINO	-	-	-	-	-	-	-	-	-	.09*	.04*	.26*	.07	.05	.10	.10	.08	.06	.09	.06	.10	.07
BARSTOW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
REDLANDS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VICTORVILLE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CHINO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UPLAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UPLAND-ARB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FONTANA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.11*	.12*	.15	.25
BIG BEAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LAKE GREGORY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
YUCAIPA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Data may not be representative. / Station location change.

Table IV.D-VII

SECTION IV.E. TOTAL SUSPENDED PARTICULATE

SOURCES

Total suspended particulate, for purposes of this discussion, is all of the solid matter in the atmosphere which is in the right size range to be trapped on a filter by a high volume sampler. It is a mixture of natural dust and materials generated by human activities such as sulfate, nitrate, lead, and organic matter. Because of the complexity of the mixture, it is difficult to correlate changes in TSP with emissions or meteorology.

GEOGRAPHICAL DISTRIBUTION

In Figures IV.E-1 to IV.E-3, the annual average total suspended particulate (TSP) is plotted for 1972, 1974, and 1976 for the South Coast Air Basin. Compare these maps to Figures IV.E-4 to IV.E-6, in which the percent of days violating the state standard for TSP has been plotted for the same years. Both sets of maps show the problem to be greatest in the area extending from East San Gabriel Valley eastward into the Riverside/San Bernardino area. Concentrations decrease in all directions from this area until the desert areas are reached, where an increase begins. These desert stations probably have greater than normal amounts of wind-blown dust.

Tables IV.E-I through IV.E-II list the supporting data, 1970-1976, inclusive.

SEASONAL VARIATION

The monthly averages of total suspended particulate for 1976 for several stations are shown in Figures IV.E-7 and IV.E-8 and in Table IV.E-III. A clear seasonal trend throughout the South Coast Air Basin does not seem to be present.

DIURNAL

Since the usual samples for total suspended particulate are of 24 hour duration, diurnal patterns are not available. The ACHEX study indicated that diurnal particulate patterns in the South Coast Air Basin are affected by direct emission patterns, by photochemical reactions, and predominantly by meteorological factors. During this study, "detailed data were taken over 24-hour periods for aerosols on a time resolution of 2-hour averages, which are compatible with significant gas chemistry changes."

FREQUENCY DISTRIBUTION

In Figures IV.E-9 to IV.E-11, frequency distributions of total suspended particulate for selected stations are given for 1972, 1974, and 1975. (Frequency distributions haven't been done for 1976.) There is no clear trend visible for the South Coast Air Basin. (See following section on "Trend Data".)

TREND DATA

Figures IV.E-12 to IV.E-18 and Table IV.E-IV show selected statistics for total suspended particulates for the period 1972-1976 at several representative stations. Azusa, Lennox, and Los Angeles have gone downward during the period. Little or no change occurred at Anaheim, La Habra, Riverside, and San Bernardino. For the South Coast Air Basin as a whole no change, or perhaps a slight downtrend, took place from 1966 to 1976 (see Table IV.E-V).

SUMMARY

The highest concentrations of total suspended particulate (TSP) and the greatest number of violations of the state standard occur in an area extending from the East San Gabriel Valley into the Riverside/San Bernardino area. Overall, concentrations have not changed much since 1972 in this high area. A downtrend was observed in the western portion (Azusa). The coastal and central areas of Los Angeles County apparently have also gone downward.

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Total Suspended Particulates

Figure No.	Title
IV.E-1	Total Suspended Particulate Annual Geometric Mean ug/m^3 - 1972
IV.E-2	Total Suspended Particulate Annual Geometric Mean ug/m^3 - 1974
IV.E-3	Total Suspended Particulate Annual Geometric Mean ug/m^3 - 1976
IV.E-4	Total Suspended Particulate Percent of Days Violating State Standard (24-Hr. Avg. TSP $\geq$100 ug/m^3) - 1972
IV.E-5	Total Suspended Particulate Percent of Days Violating State Standard (24-Hr. Avg. TSP $\geq$100 ug/m^3) - 1974
IV.E-6	Total Suspended Particulate Percent of Days Violating State Standard (24-Hr. Avg. TSP $\geq$100 ug/m^3) - 1976
IV.E-7	Total Suspended Particulate, Orange, L.A. Counties Monthly Arithmetic Mean, ug/m^3 - 1976
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IV.E-9	Total Suspended Particulate, Frequency Distribution (24-Hr. Sample ug/m^3)
IV.E-10	Total Suspended Particulate, Frequency Distribution (24-Hr. Sample ug/m^3)
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IV.E-12	Trends: Total Suspended Particulate - Azusa

LIST OF FIGURES

Total Suspended Particulate

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IV.E-13	Trends: Total Suspended Particulate - Lennox
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Total Suspended Particulates

Table No.	Title
IV.E-I	Total Suspended Particulate Annual Geometric Mean, ug/m^3
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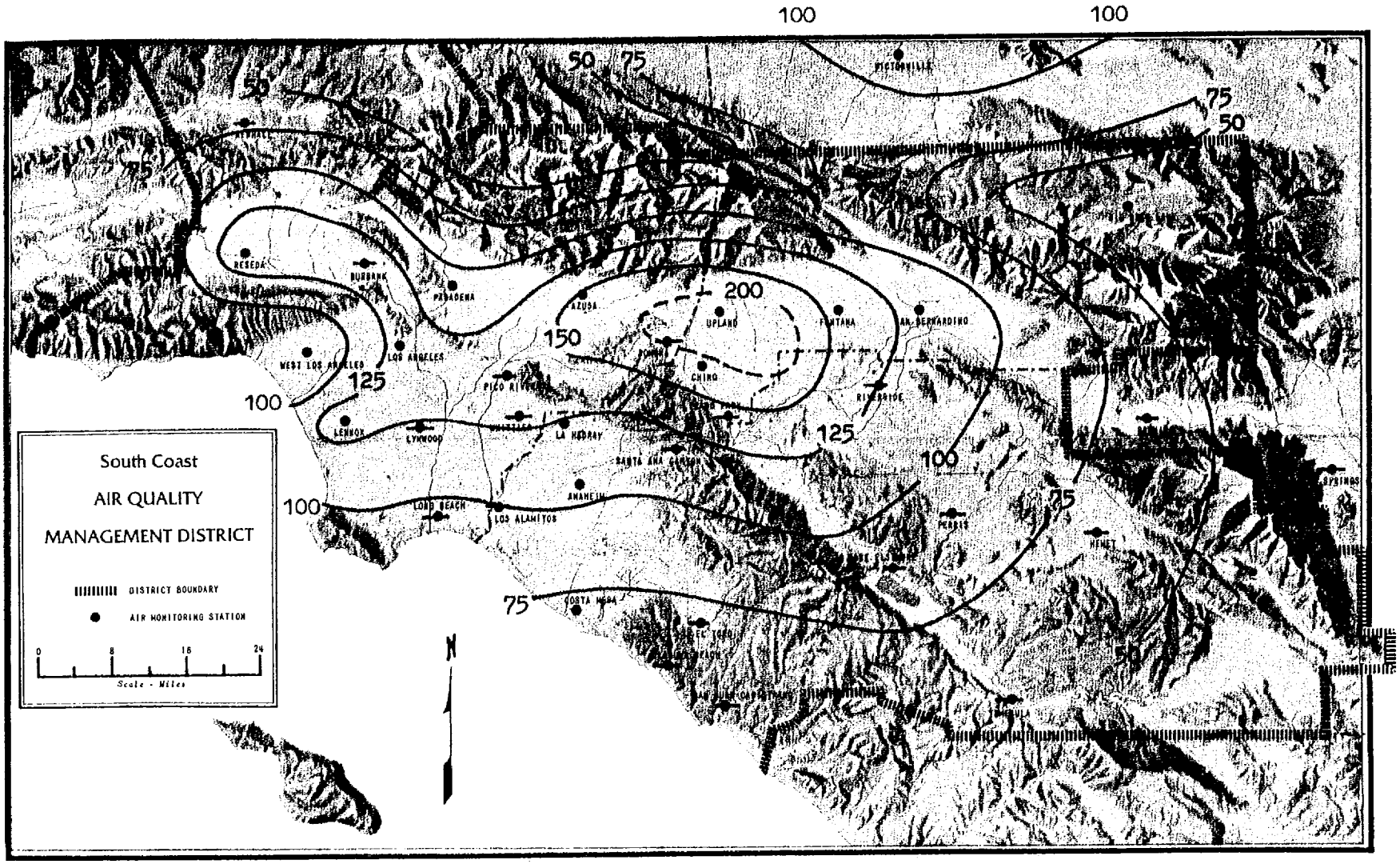
IV.E-IV	Data Summary - Total Suspended Particulate, ug/m^3
IV.E-V	Annual Averages of Airborne Particulate Matter Concentrations 1965 - 1976

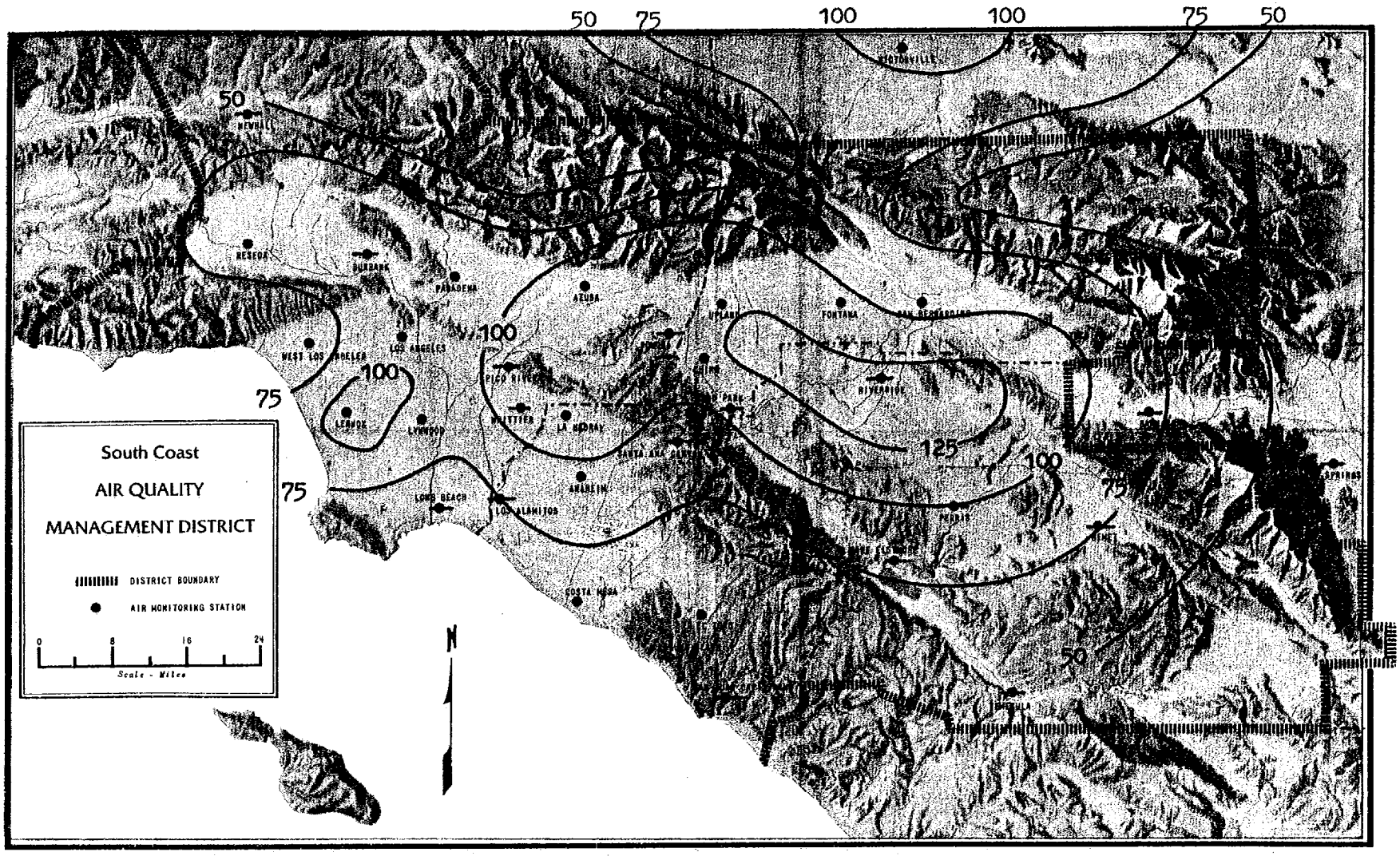
TOTAL SUSPENDED PARTICULATE
ANNUAL GEOMETRIC MEAN, ug/m^3
1972



Less than 9 months of data.
Solid lines are intervals of 25 ug/m^3
Dashed lines are intervals of 50 ug/m^3

Figure IV.E-1

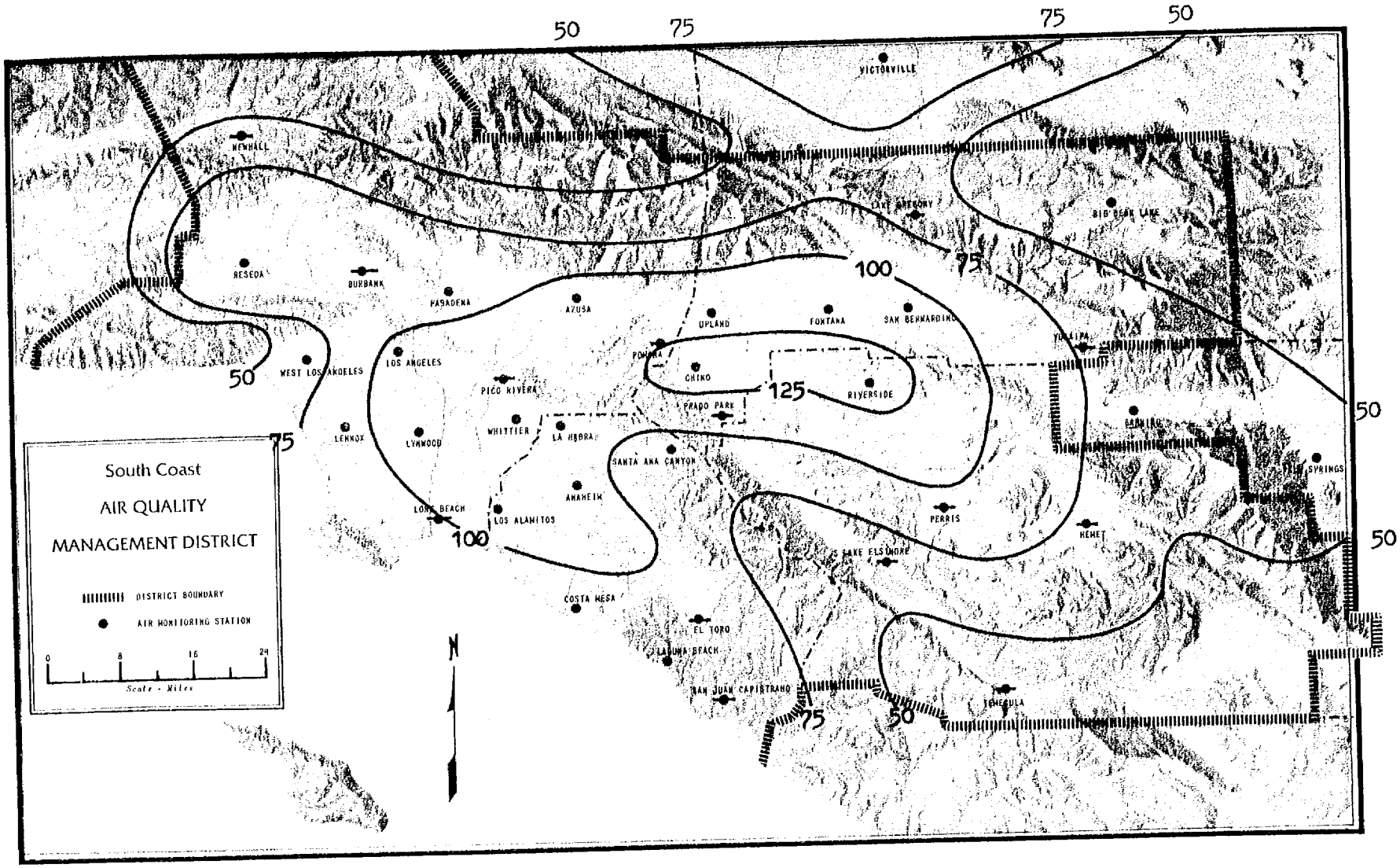
TOTAL SUSPENDED PARTICULATE
ANNUAL GEOMETRIC MEAN, ug/m^3
1974



-●- Less than 9 months of data.

Figure IV.E-2

TOTAL SUSPENDED PARTICULATE
ANNUAL GEOMETRIC MEAN, ug/m^3
1976



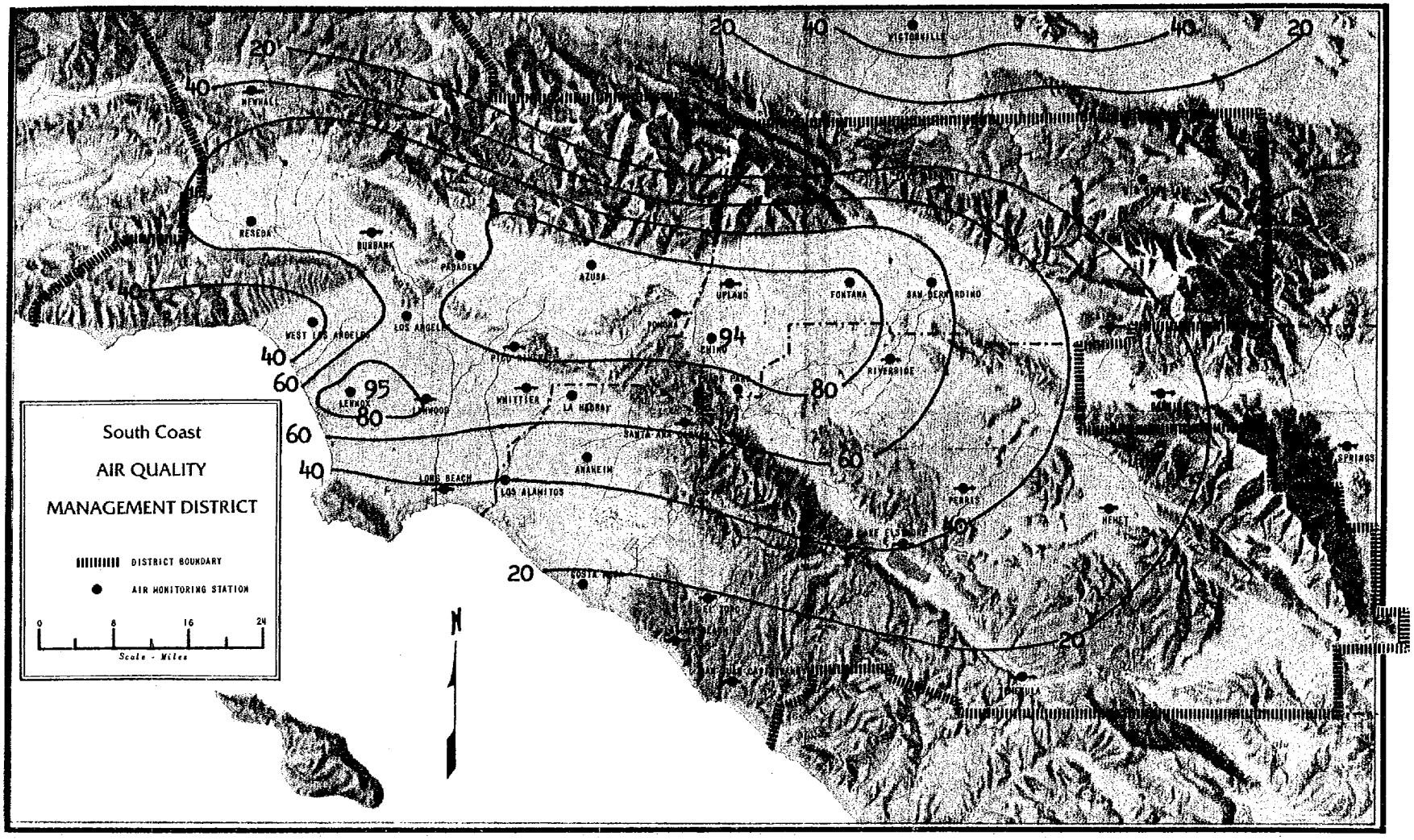
Less than 9 months of data.

Figure IV.E-3

TOTAL SUSPENDED PARTICULATE

PERCENT OF DAYS VIOLATING STATE STANDARD (24-HR. AVG.TSP ≧ 100 ug/m^3)

1972



Less than 9 months of data.

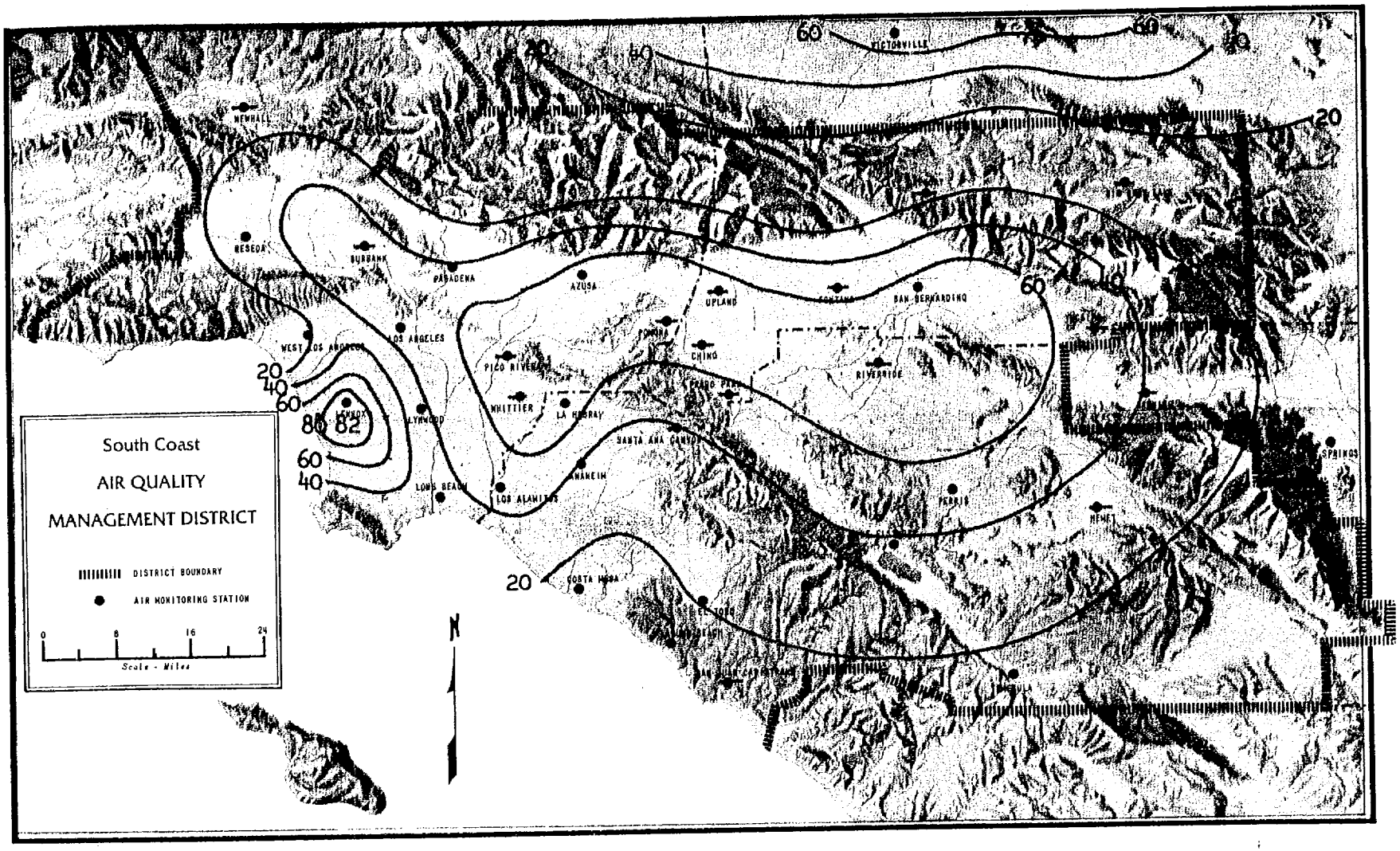
RPG 9/07/77

Figure IV.E-4

TOTAL SUSPENDED PARTICULATE

PERCENT OF DAYS VIOLATING STATE STANDARD (24-HR. AVG. TSP ≧ 100 ug/m^3)

1974



Less than 9 months of data.

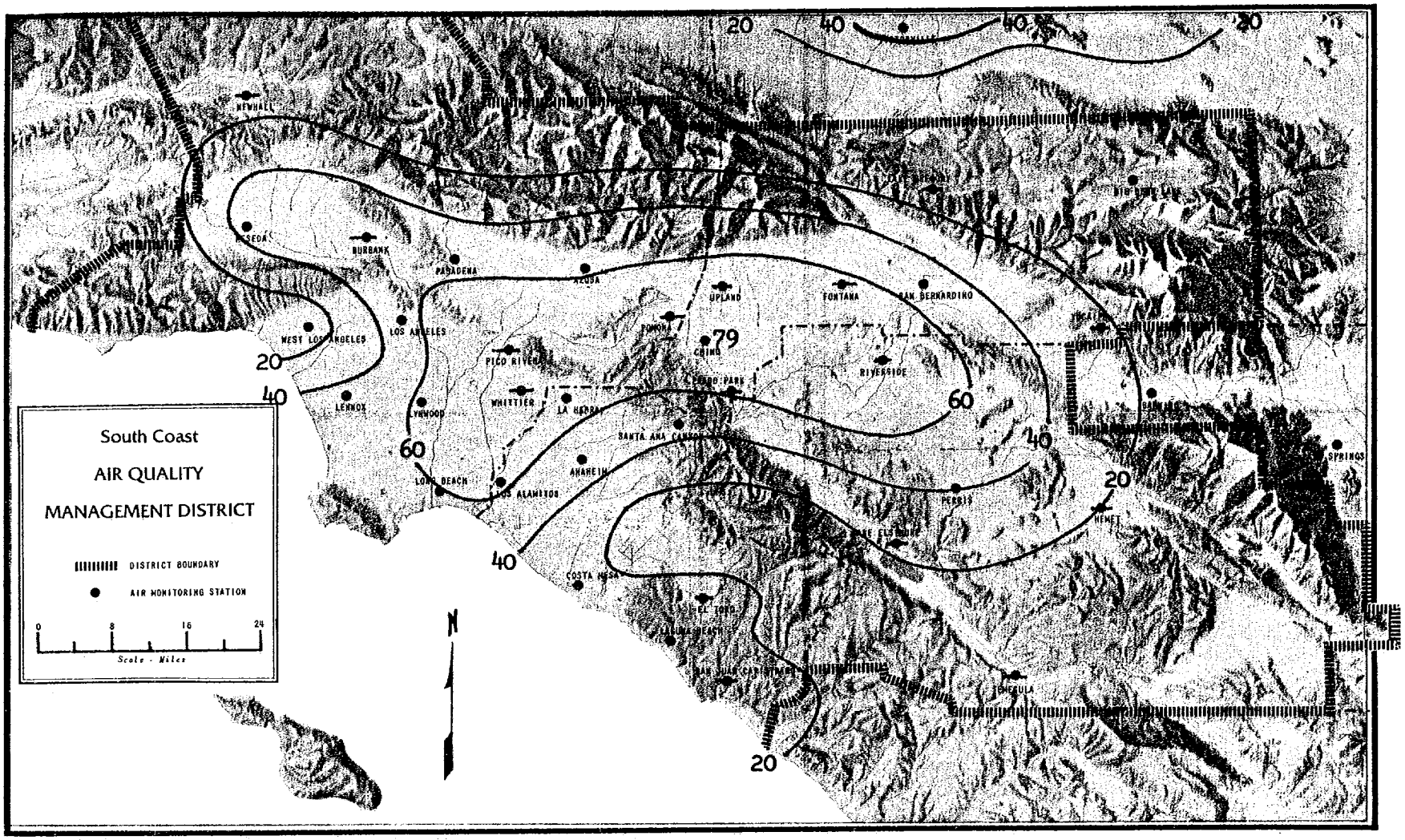
RPG 9/07/77

Figure IV.E-5

TOTAL SUSPENDED PARTICULATE

PERCENT OF DAYS VIOLATING STATE STANDARD (24-HR. AVG.TSP $\geq$ 100 ug/m^3)

1976

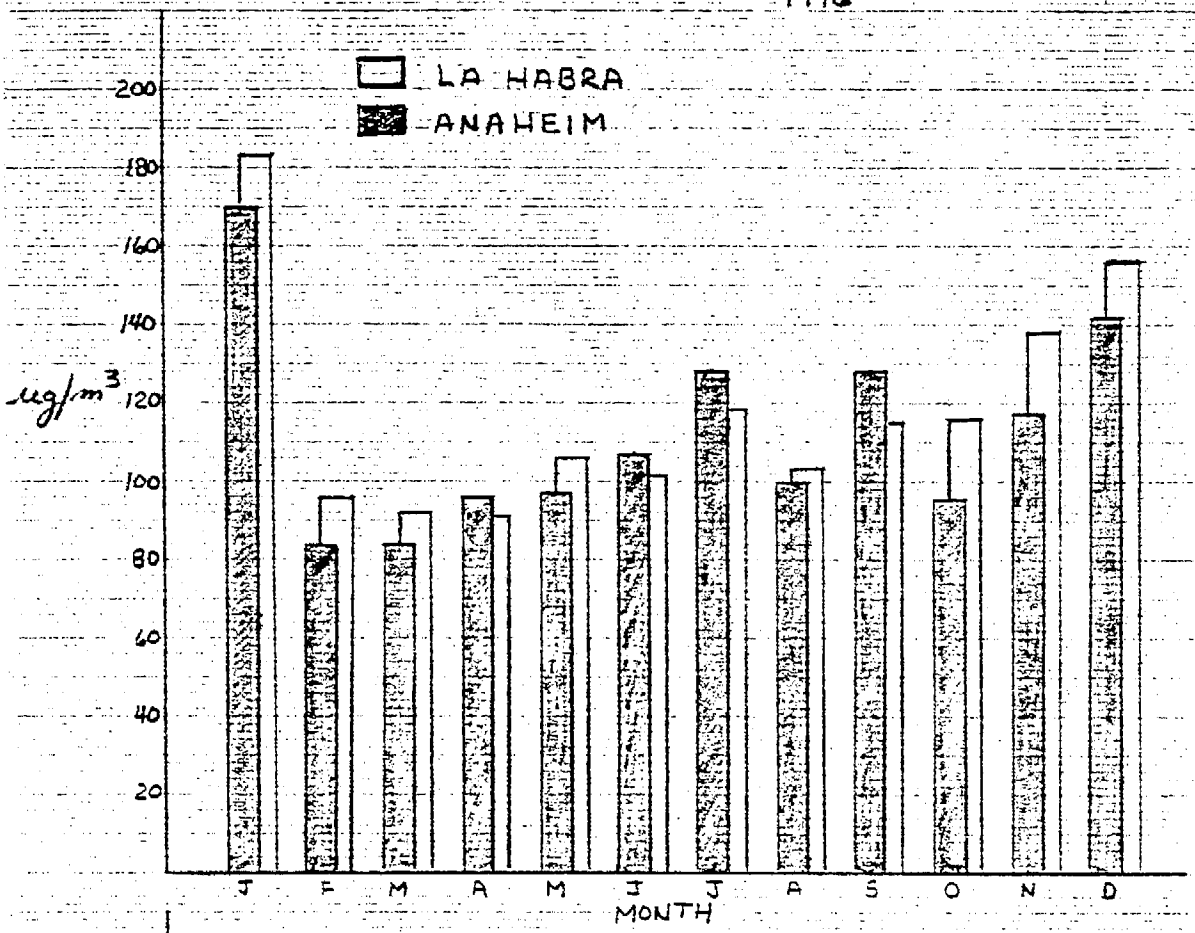


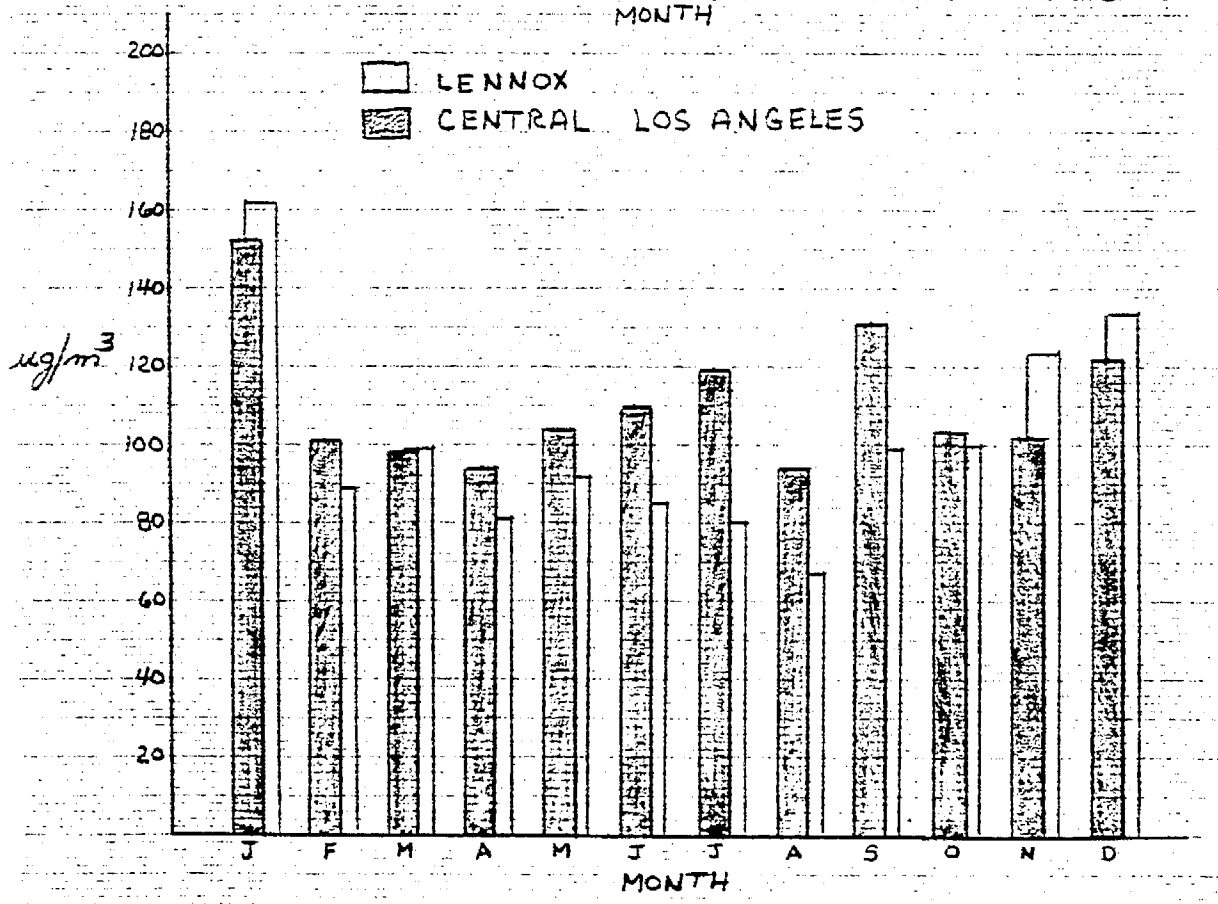
Less than 9 months of data.

RPG 9/07/77

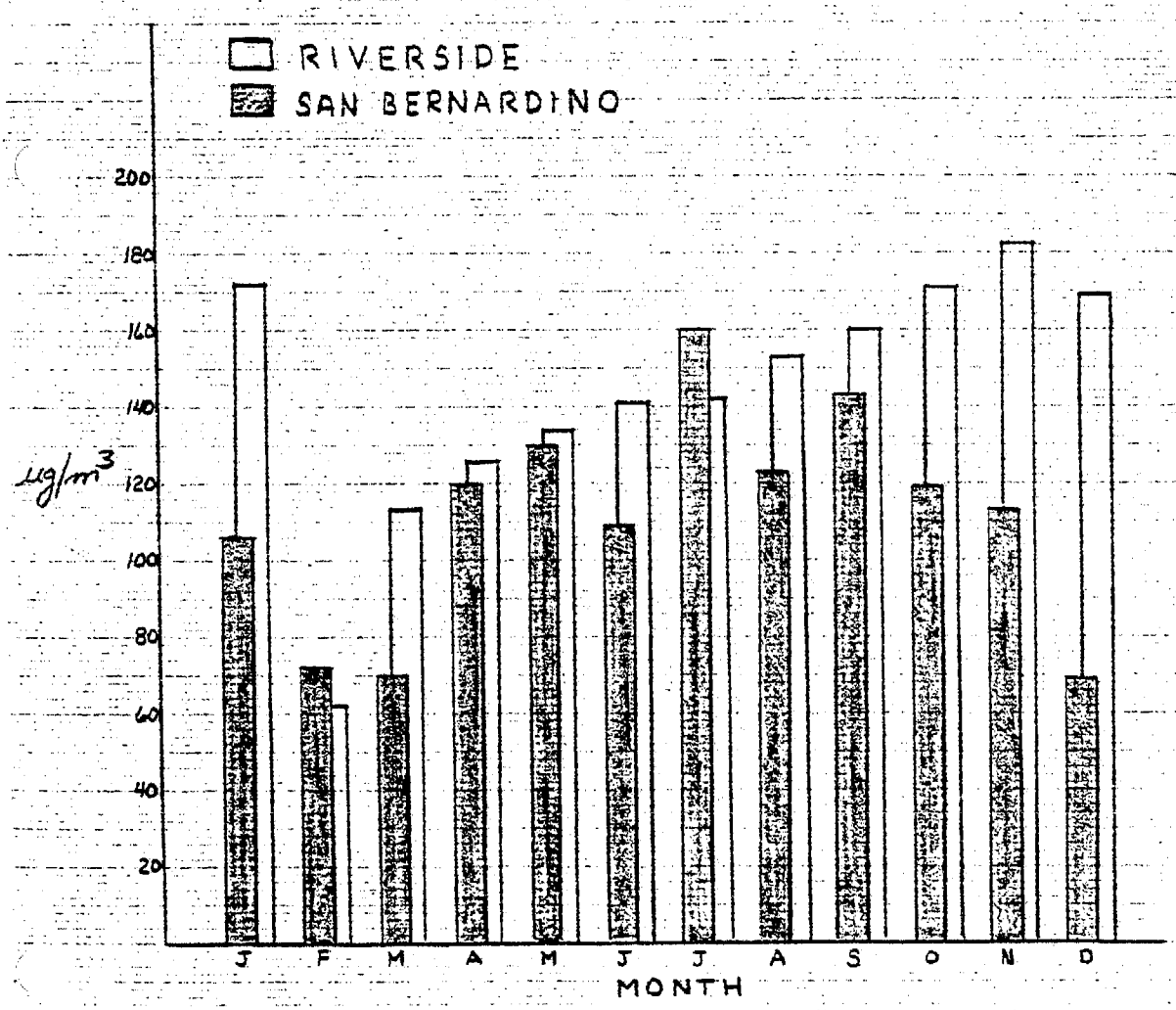
Figure IV.E-6

TOTAL SUSPENDED PARTICULATE
MONTHLY ARITHMETIC MEAN, ug/m3
1976





TOTAL SUSPENDED PARTICULATE
MONTHLY ARITHMETIC MEAN, $\mu g/m^3$
1976



TOTAL SUSPENDED PARTICULATE

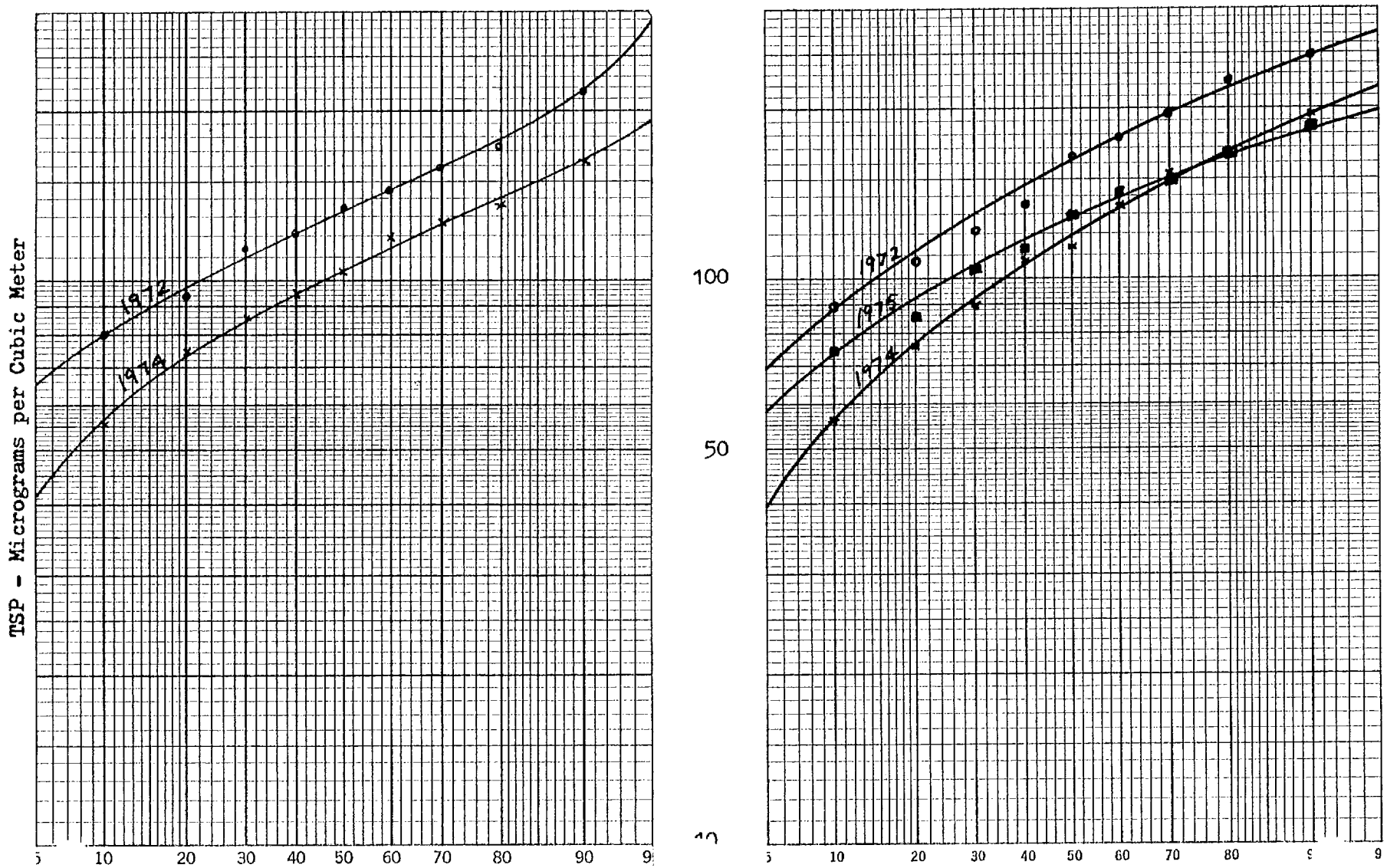
24-Hour Sample - Micrograms per Cubic Meter

DOWNTOWN L.A.

Year	N	Max.	Min.	Geometric Mean	Std.Dev.
1972	68	302	46	130.6	± 1.5
1973	73	412	39	114.6	± 1.6
1974	65	262	25	98.5	± 1.6
1975	61	258	28	105.8	± 1.5
1976	60	206	32	102.0	± -

AZUSA

Year	N	Max.	Min.	Geometric Mean	Std.Dev.
1972	71	342	36	150.4	± 1.6
1973	72	686	21	122.2	± 1.9
1974	64	230	10	104.7	± 1.8
1975	61	213	18	116.2	± 1.6
1976	61	226	28	109.0	± -



Concentration equal to or less than stated percentage.

Figure IV.E-

TOTAL SUSPE D PARTICULATE

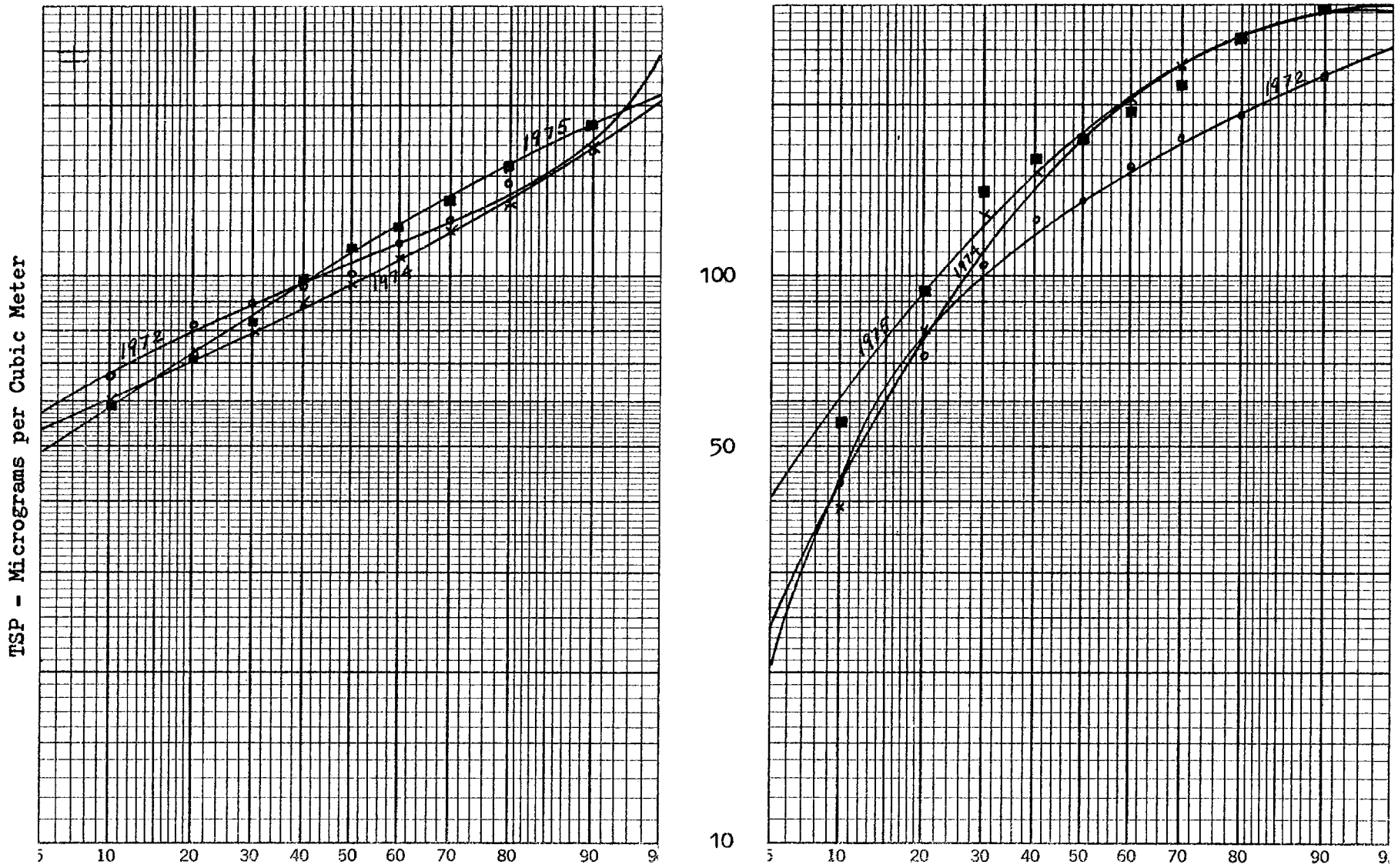
24-Hour Sample - Micrograms per Cubic Meter

ANAHEIM

Year	N	Max.	Min.	Geometric Mean	Geometric Std.Dev.
1972	85	259	13	103.0	1.5
1973	89	345	41	97.9	1.5
1974	82	223	14	95.1	1.6
1975	60	249	28	101.4	1.6
1976	61	252	24	102.0	-

RIVERSIDE-RUBIDOUX

Year	N	Max.	Min.	Geometric Mean	Geometric Std.Dev.
1972	15	268	38	119.0	1.8
1973	66	370	13	127.3	2.0
1974	47	420	7	135.6	2.3
1975	55	467	17	149.0	2.0
1976	53	276	23	131.0	1.7



Concentration equal to or less than stated percentage.

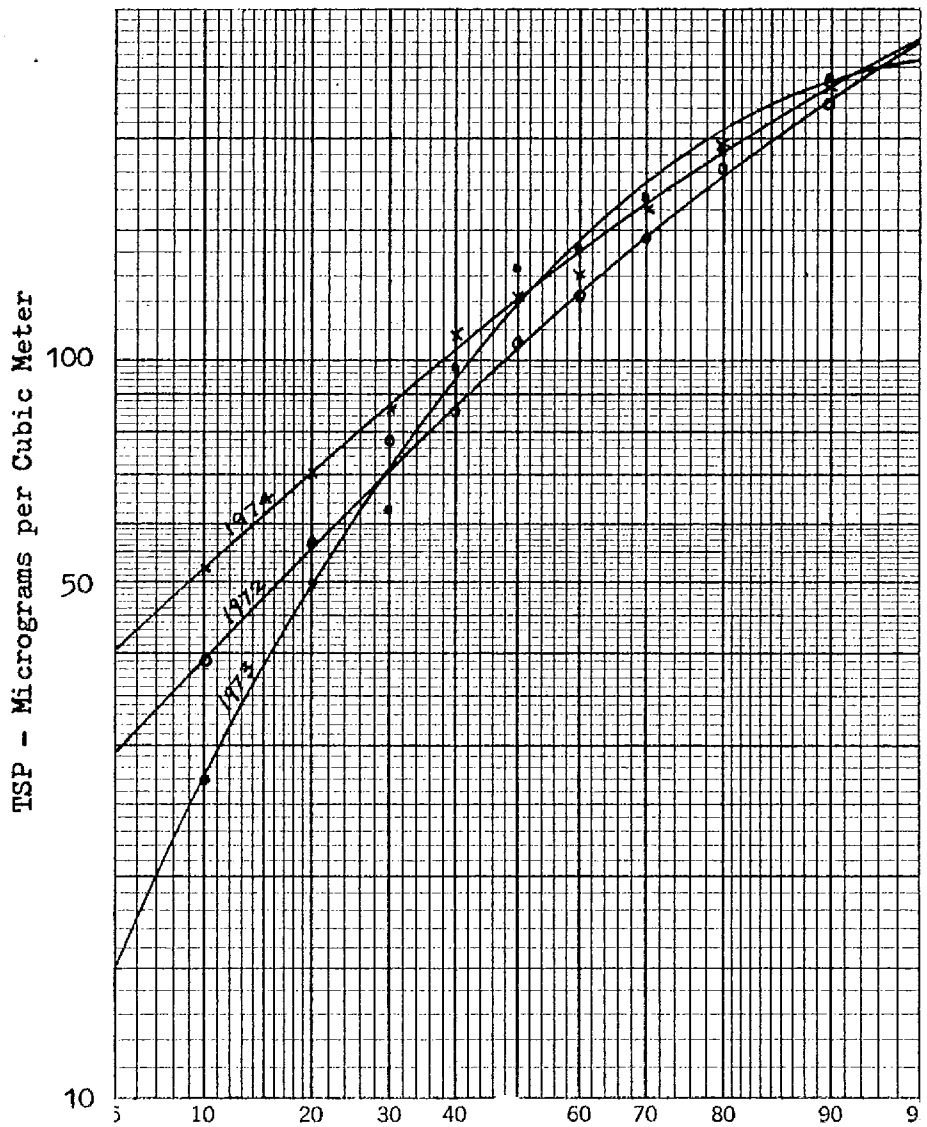
Figure IV-B-10

TOTAL SUSPENDED PARTICULATE

(24-Hour Sample - Micrograms per Cubic Meter)

SAN BERNARDINO

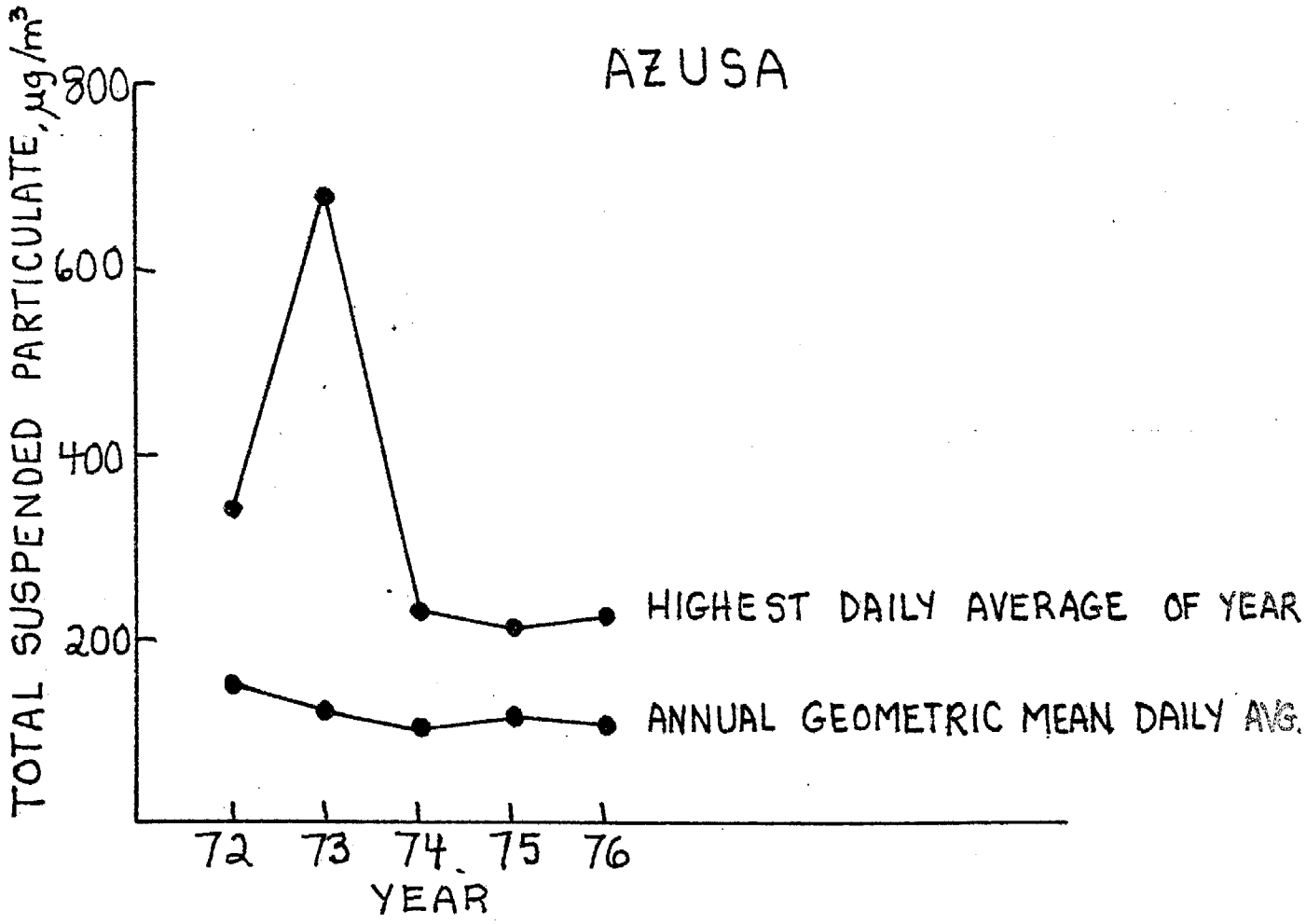
Year	N	Max.	Min.	Geometric Mean	Geometric Std.Dev.
1972	69	437	20	99.5	1.9
1973	52	360	15	100.2	2.2
1974	51	304	34	114.8	1.8
1975	60	264	14	103.3	1.9
1976	58	242	38	102.4	1.6

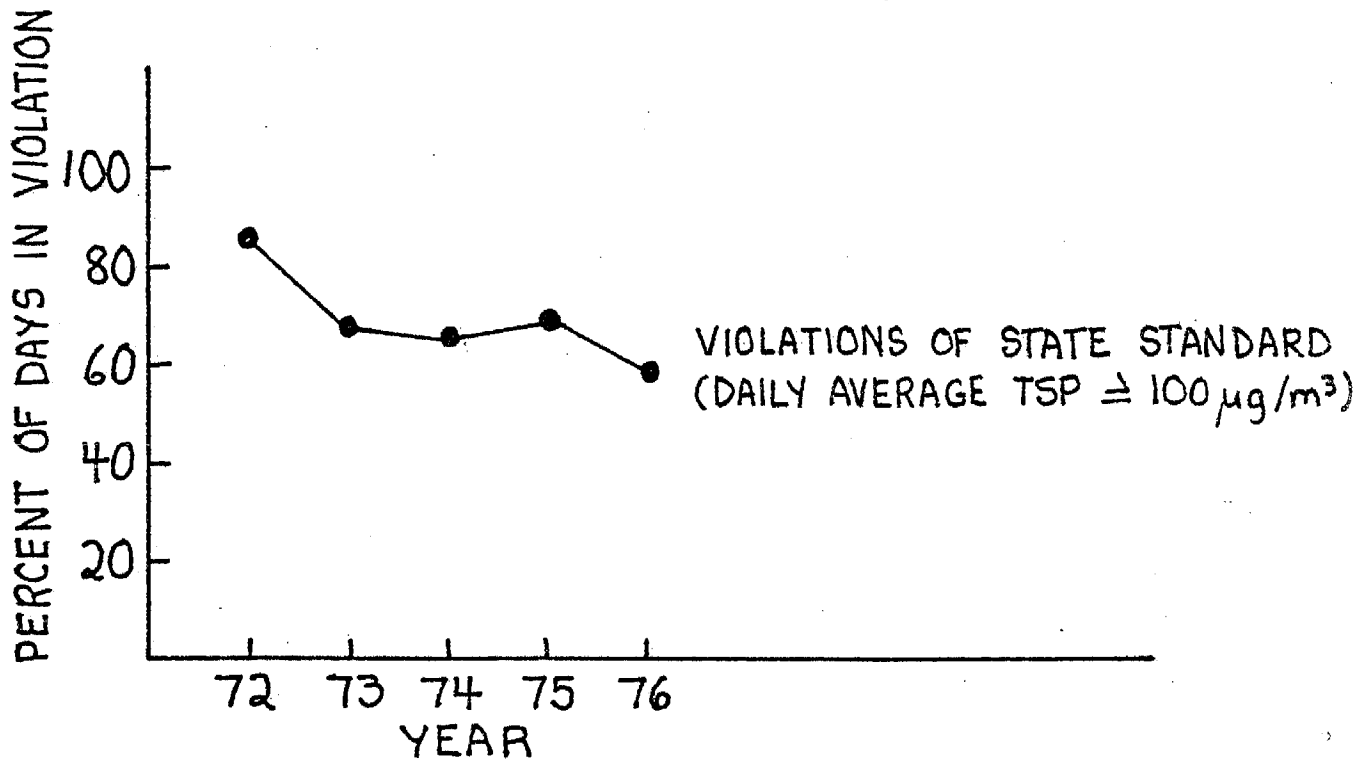


Concentration equal to or less than stated percentage.

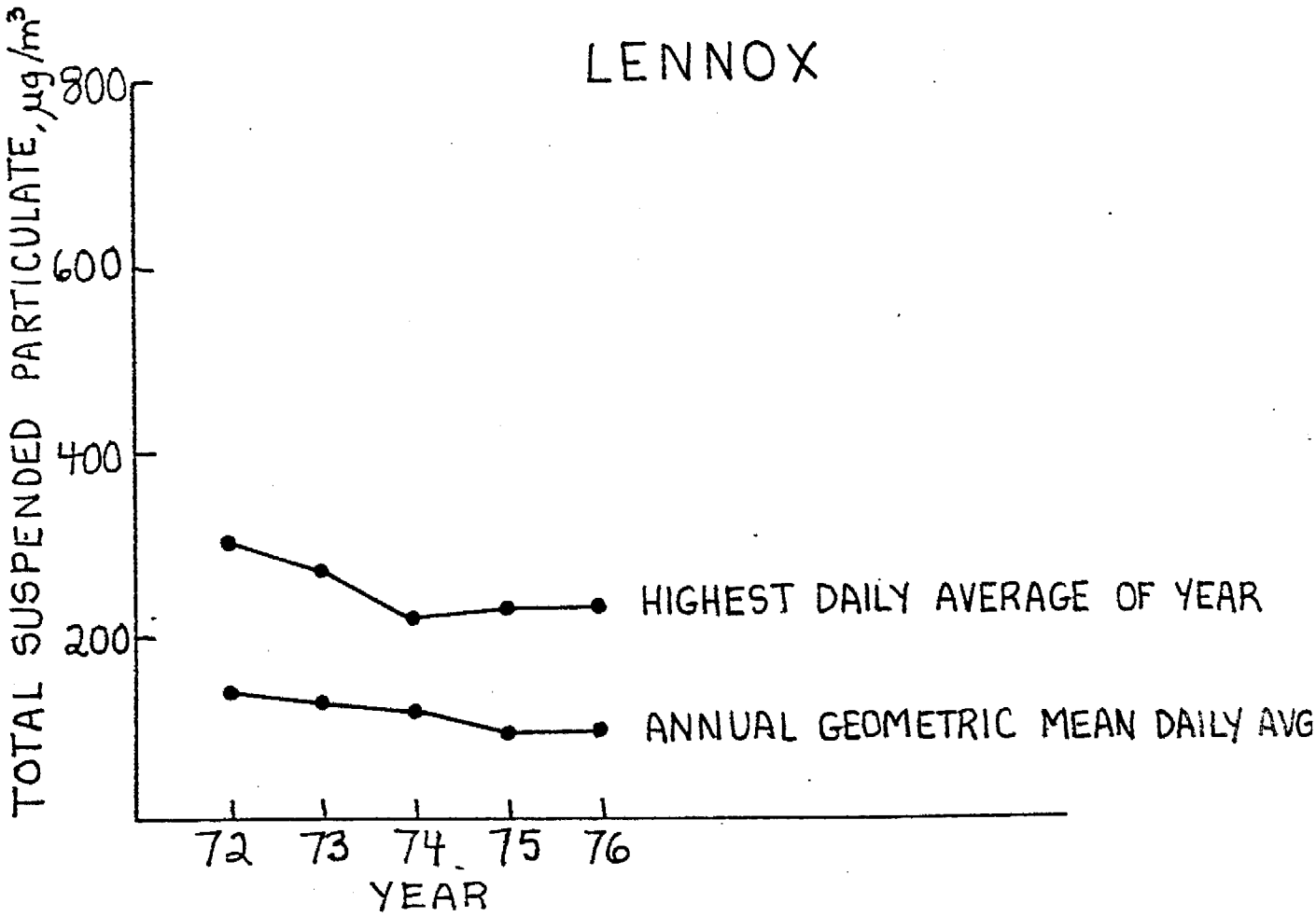
Figure IV.E-11

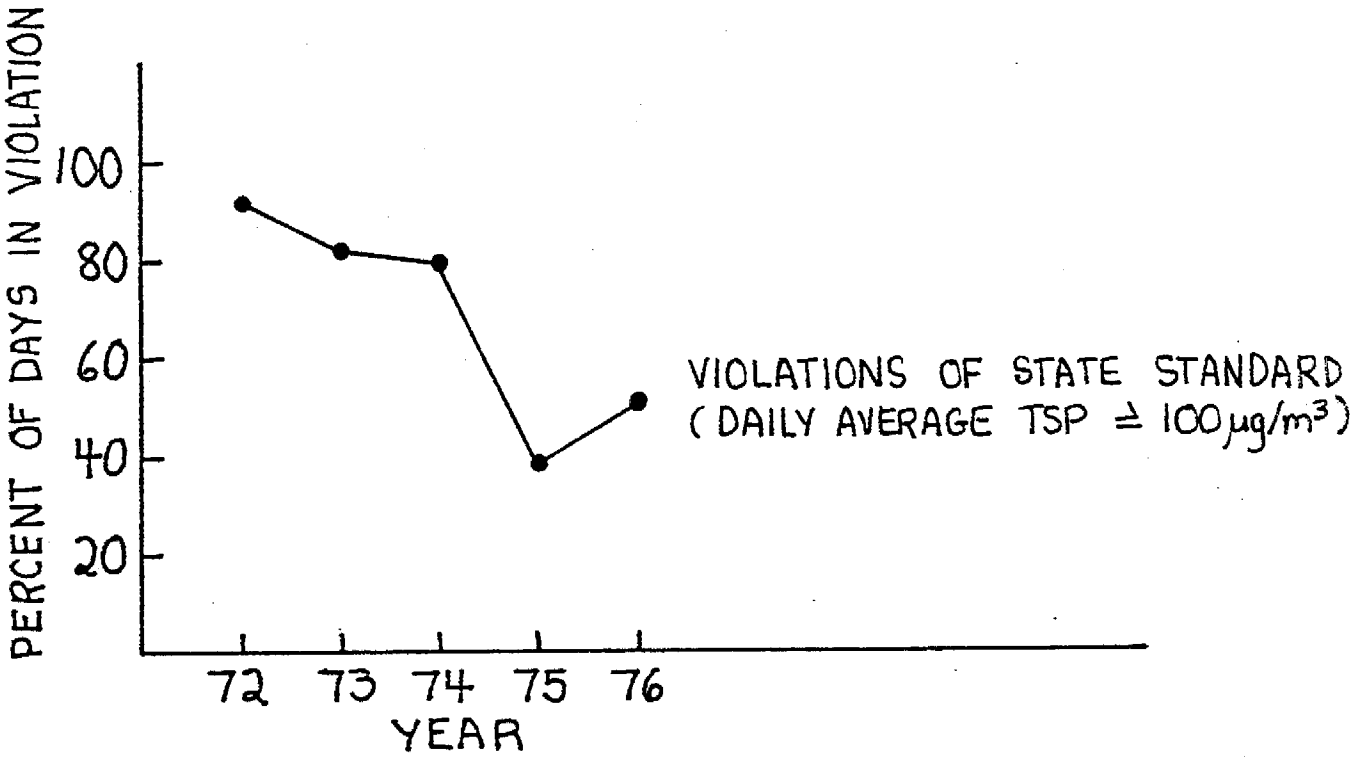
TOTAL SUSPENDED PARTICULATE



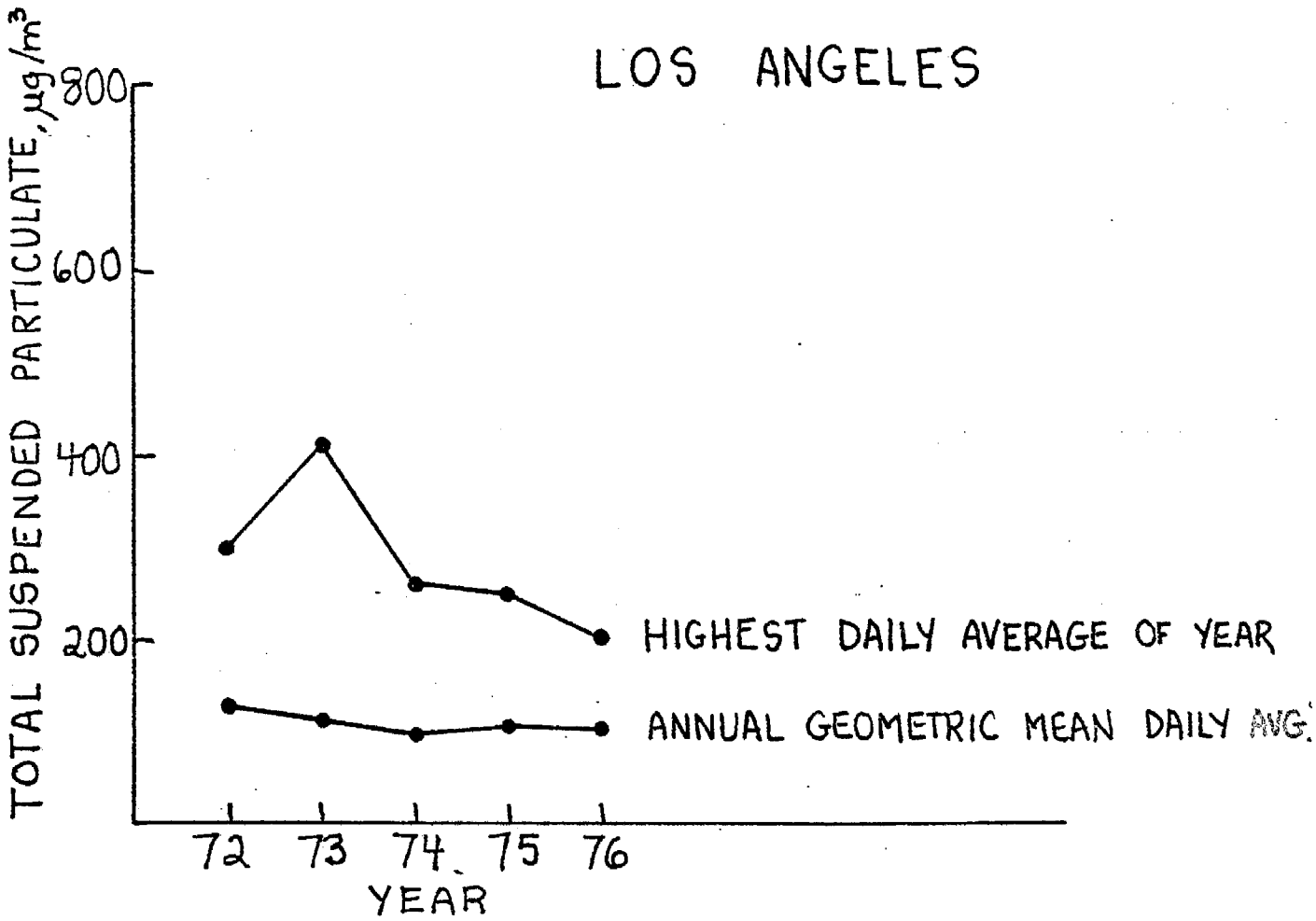


TOTAL SUSPENDED PARTICULATE





TOTAL SUSPENDED PARTICULATE



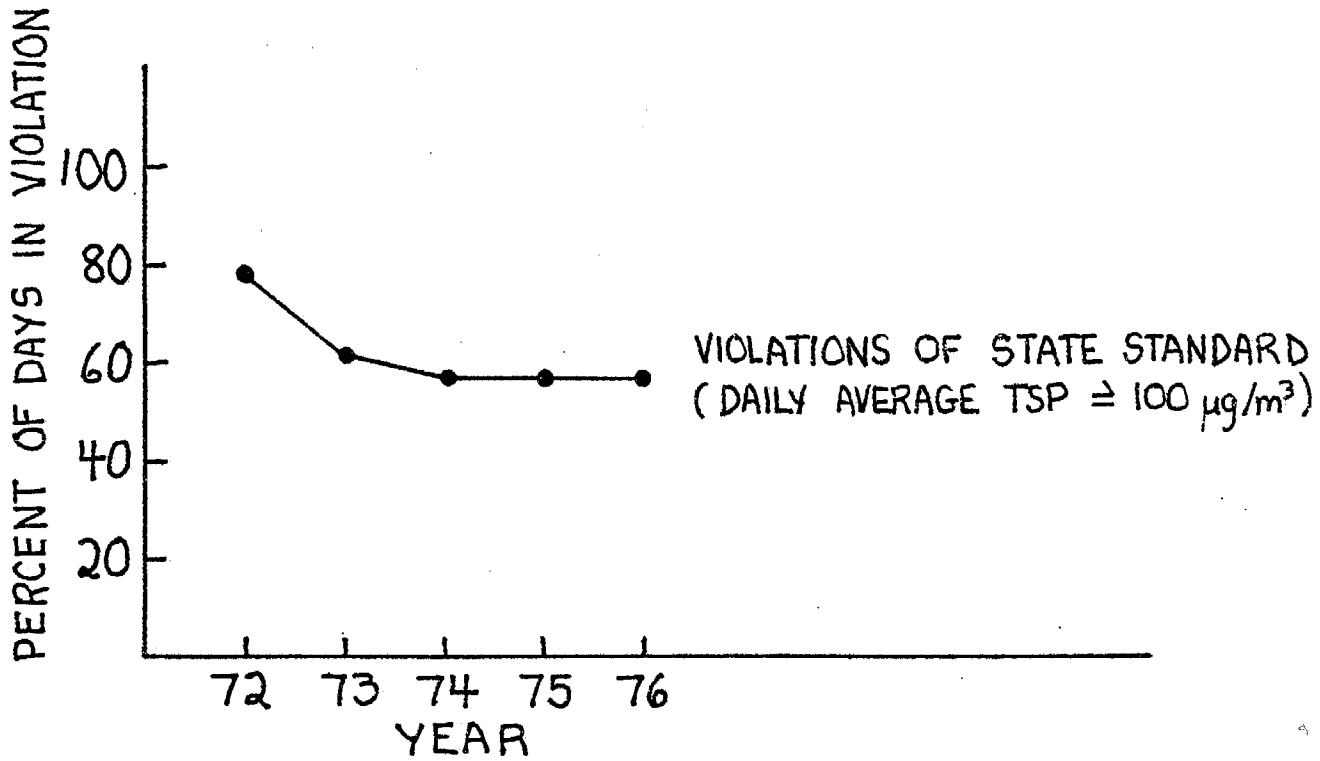
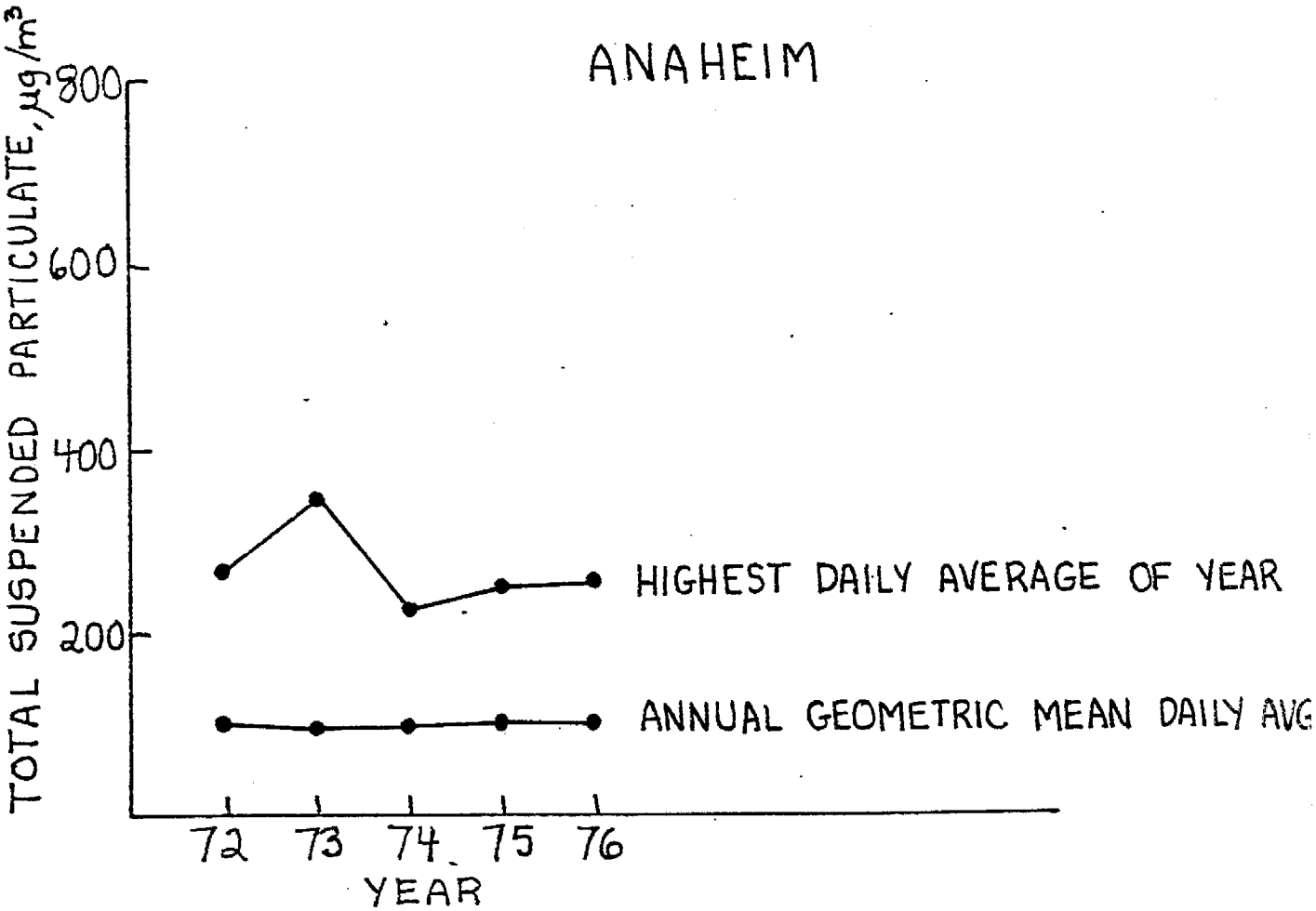
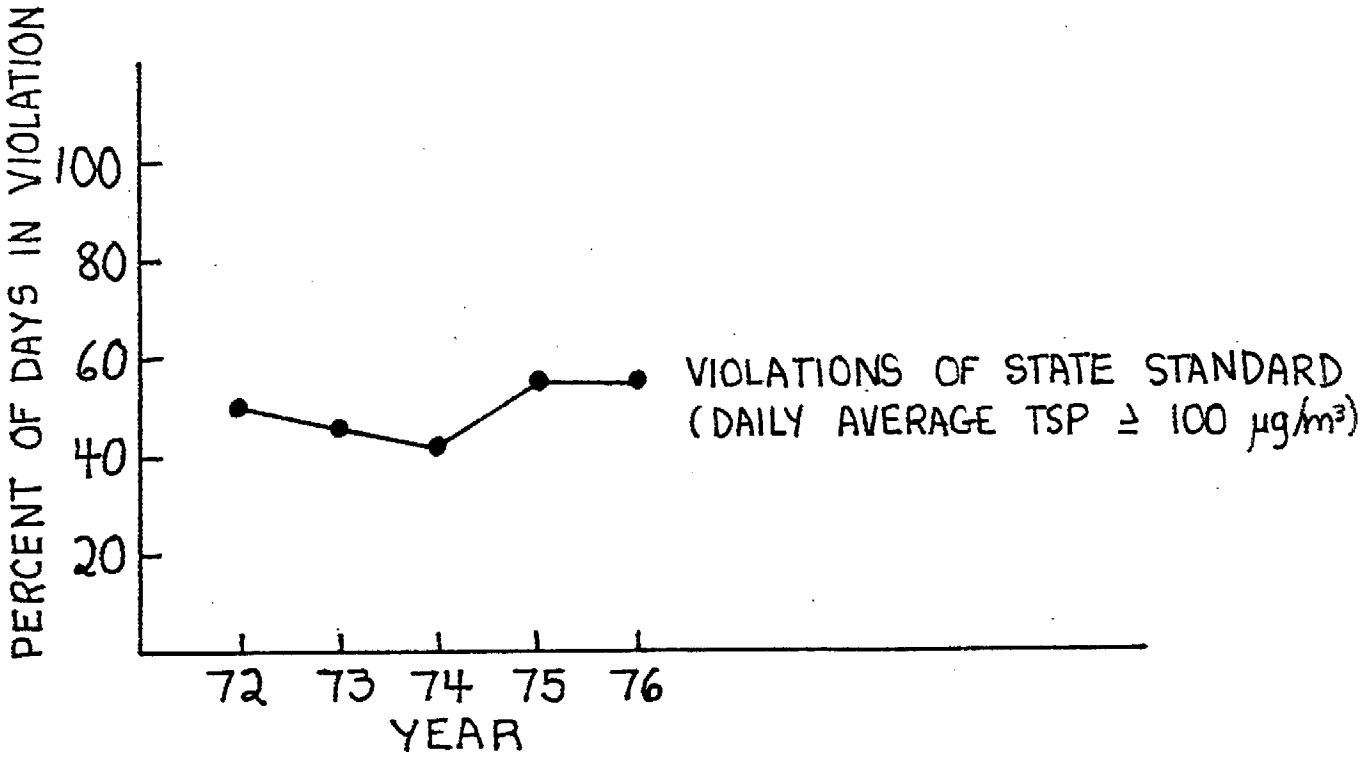


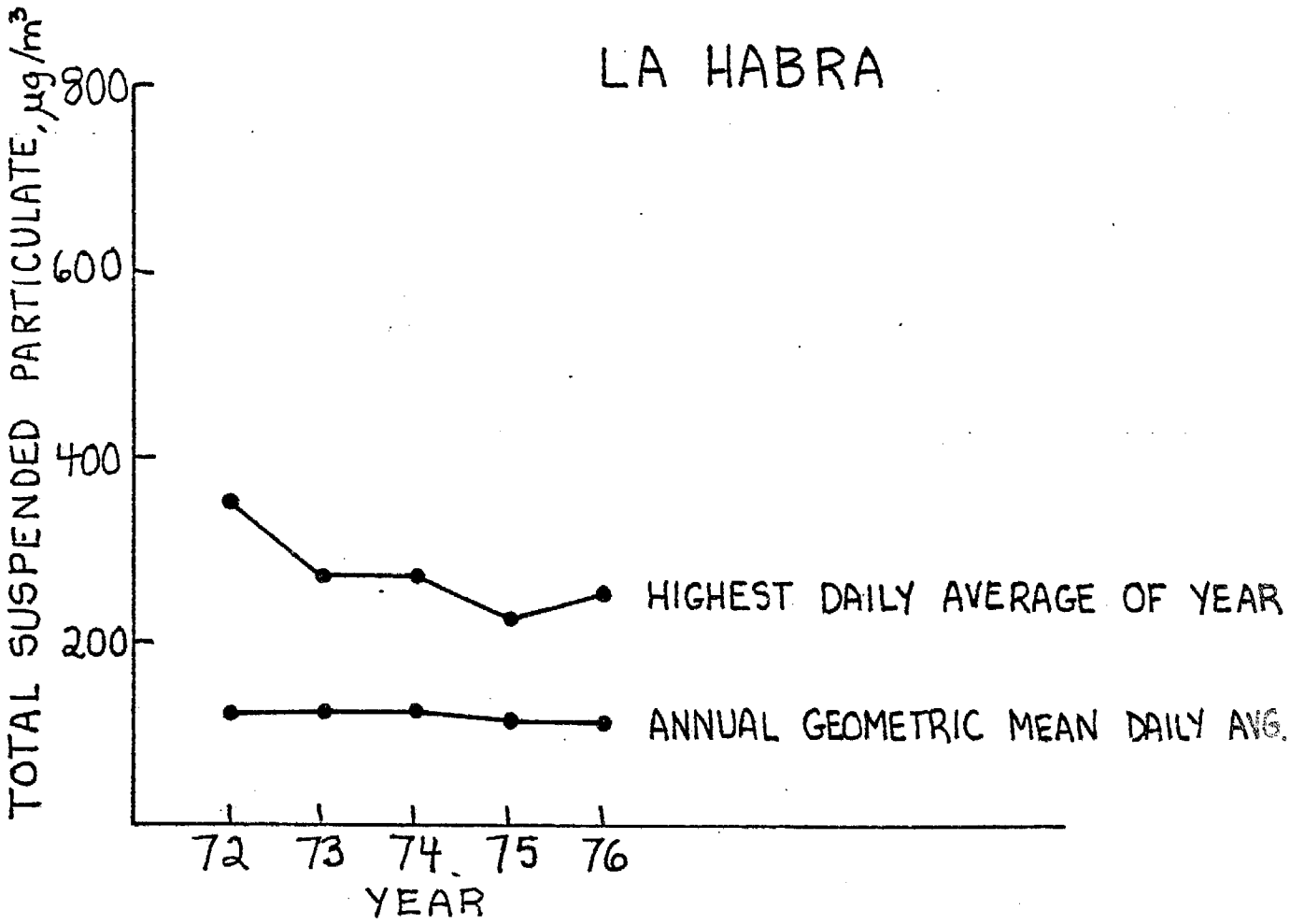
Figure IV.E-15

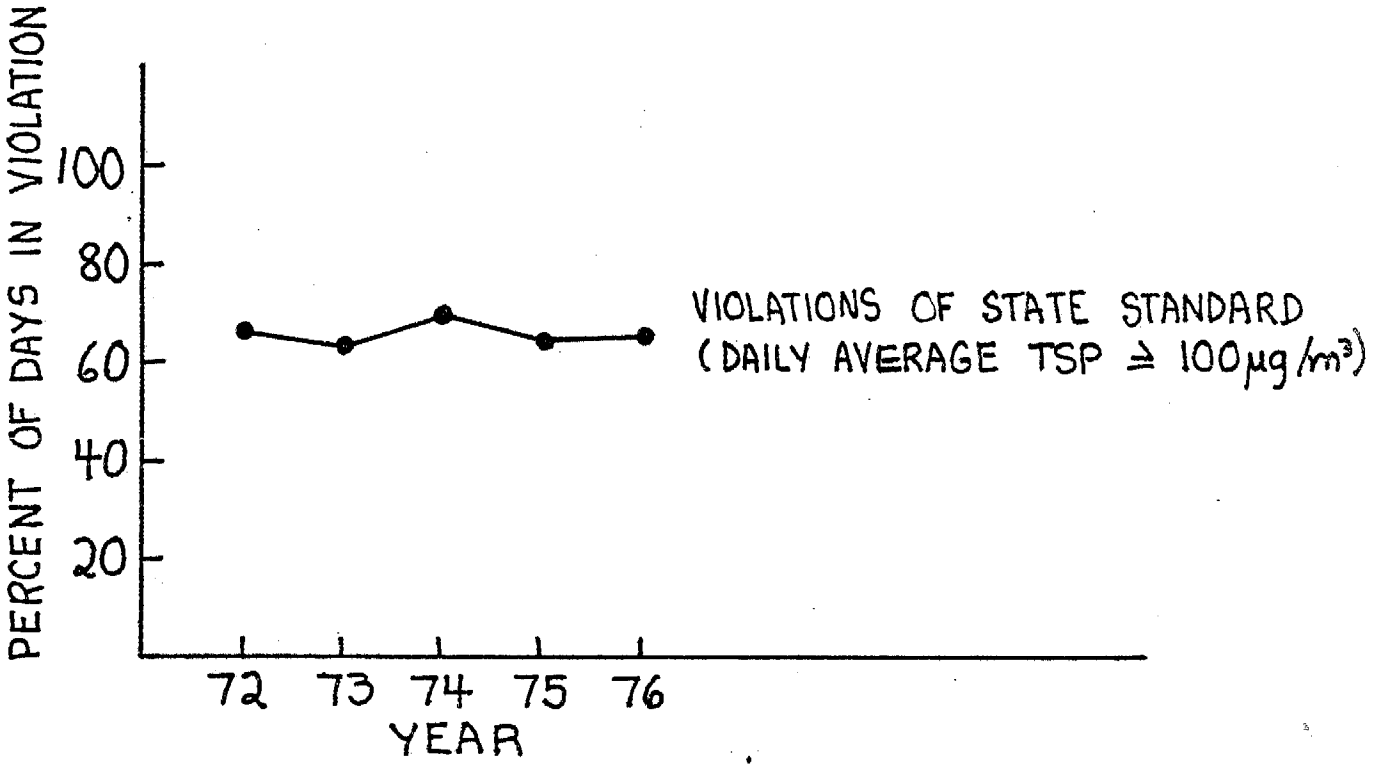
TOTAL SUSPENDED PARTICULATE



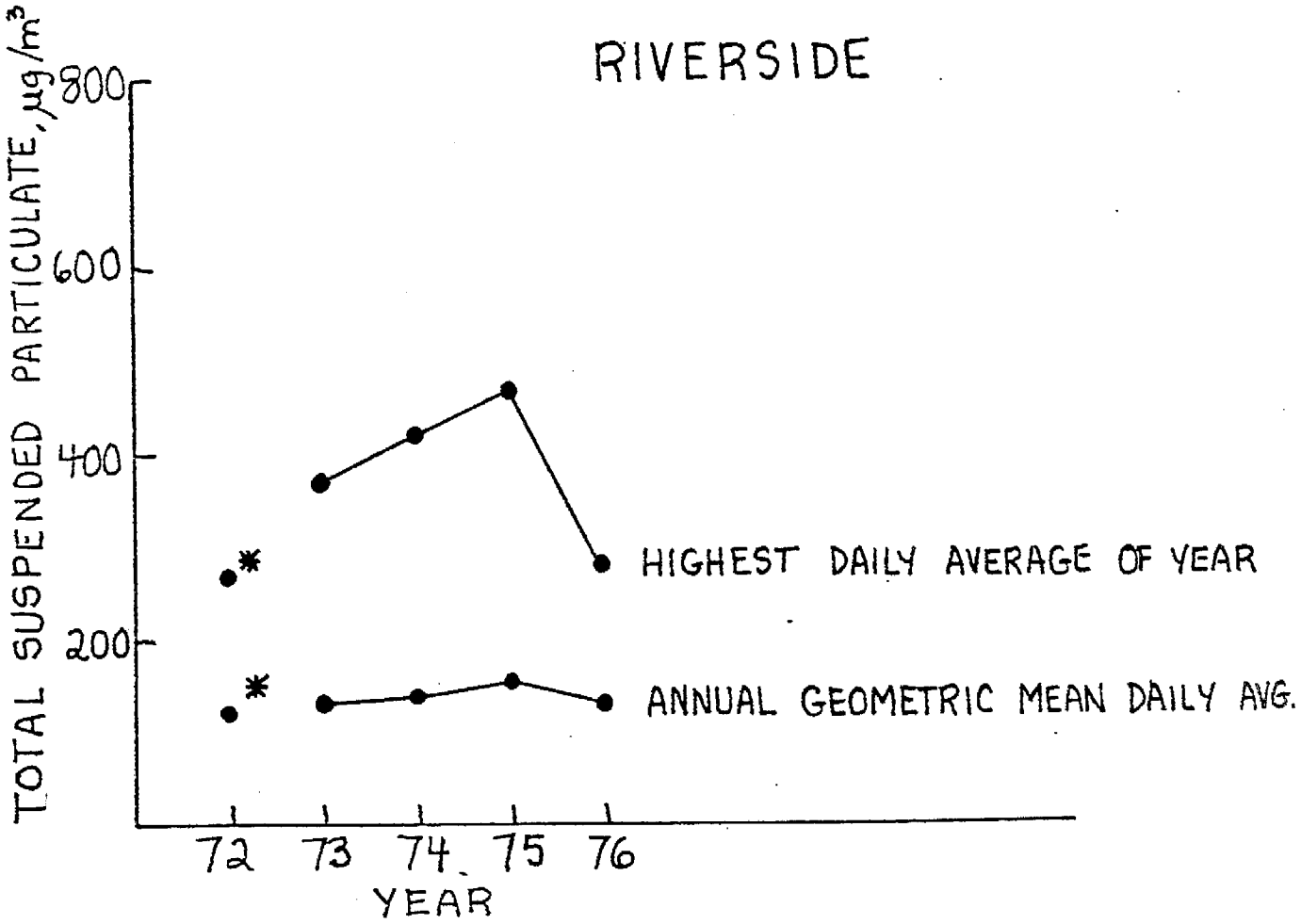


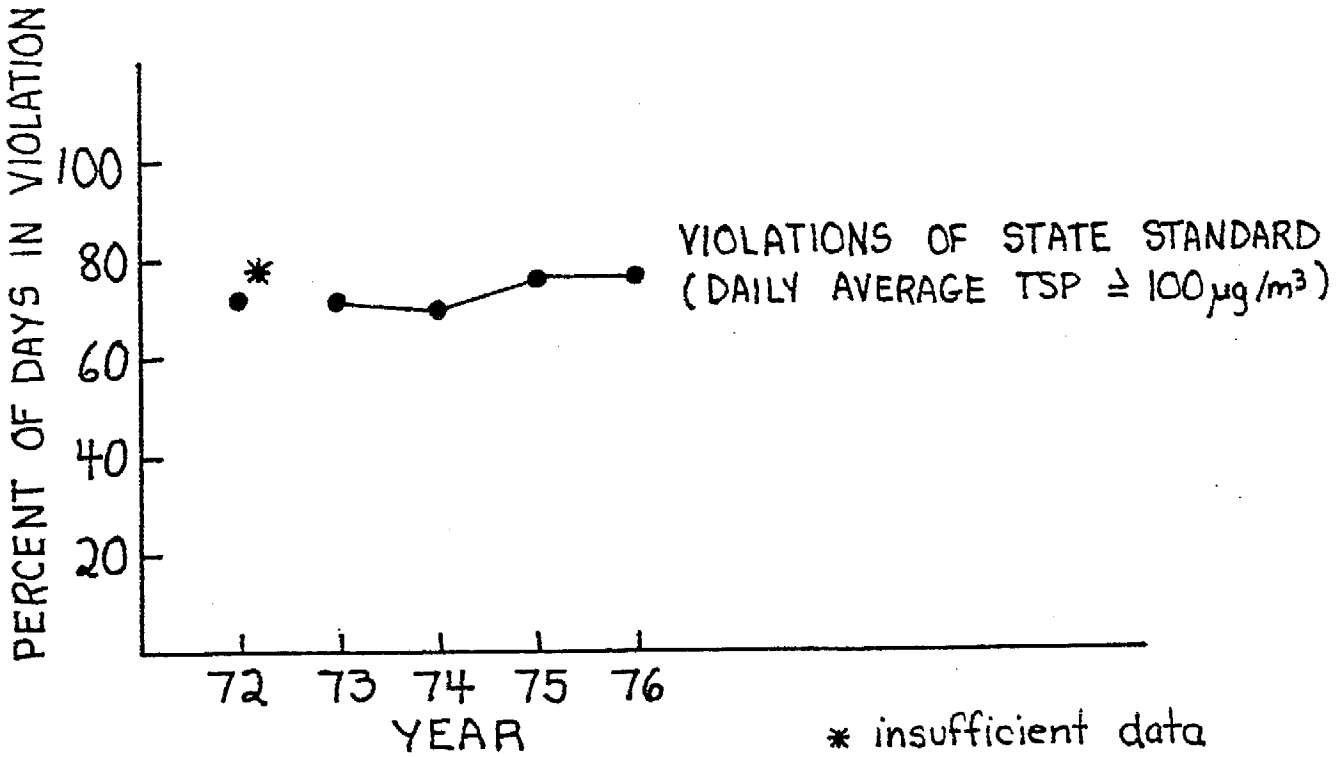
TOTAL SUSPENDED PARTICULATE





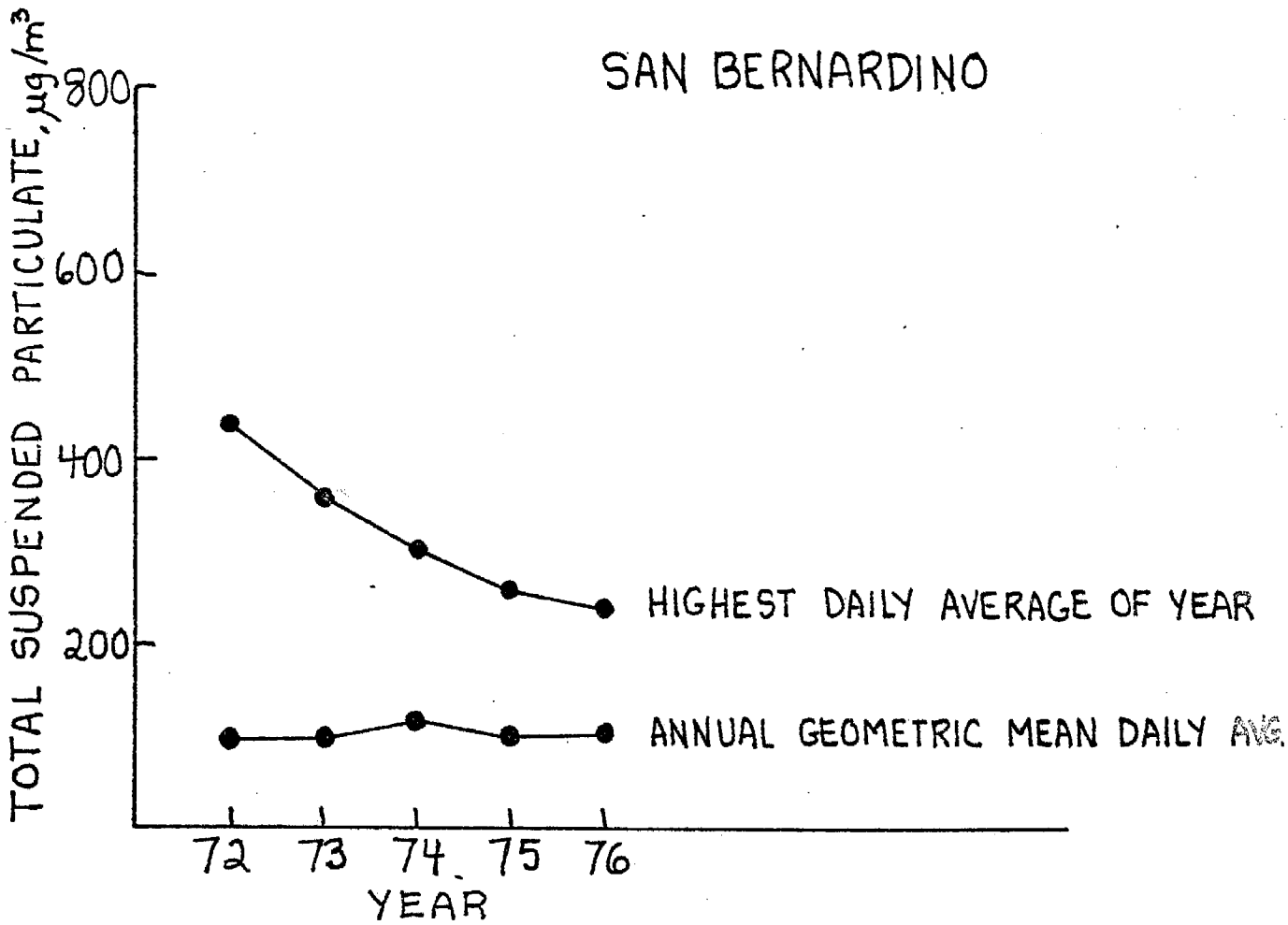
TOTAL SUSPENDED PARTICULATE





* insufficient data

TOTAL SUSPENDED PARTICULATE



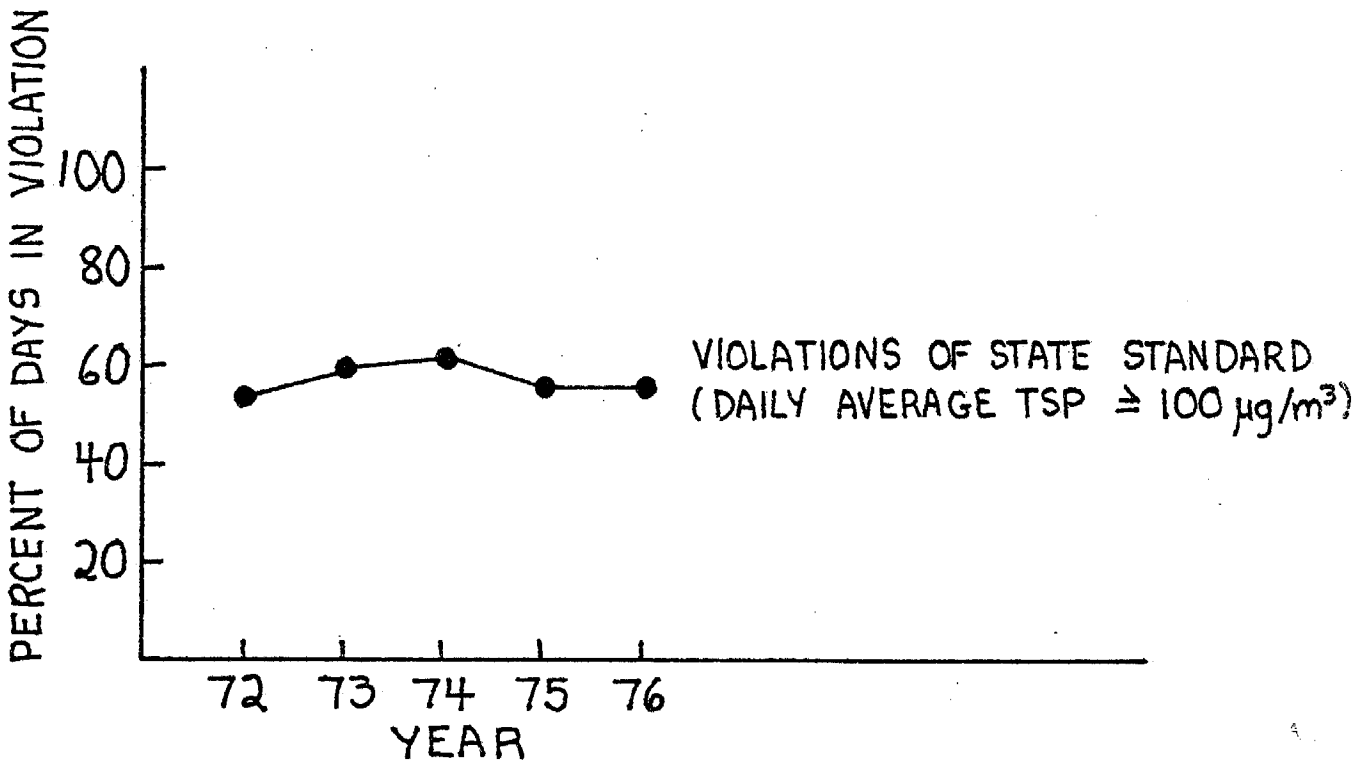


Table IV.E-I

TOTAL SUSPENDED PARTICULATE
ANNUAL GEOMETRIC MEAN, ug/m^3

ZONE #	STATION Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	135	151	130	114	97	106	102
060	Azusa			150	121	106	117	109
069	Burbank							
071	WLA	90	83	86	74	69	77	64
072	L. B.							
074	Reseda	111	109	143	103	84	91	89
075	Pomona							
076	Lennox	145	150	137	124	117	93	94
080	Whittier							
081	Newhall							
082	Lancaster					82	90	91
083	Pasadena			110	101	81	100	94
084	Lynwood					87	88	109
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	97	87	103	98	95	101	102
3177	La Habra		114	120	117	116	111	107
3185	Costa Mesa			67	65	66	74	73
3186	El Toro				75	69	58	
3188	San Juan Capistrano							
3189	Laguna					70	73	74
3190	Los Alamitos		87	85	71	103	99	110
3191	Santa Ana Canyon						88	86
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs		84			56	54	52
4139	Indio				117	120	116	102
4140	Prado Park							
4141	Hemet							
4144	Riverside			119	127	136	149	131
4149	Perris							
4150	Banning	63	63			53	50	63
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino	119*	131*	100*	100*	115*	103	102
5155	Barstow	87*	74*	75*	104*	88*	67	114
5165	Redlands	102*	94*	96*	89*	109*	76	69
5168	Victorville	74*	89*	102*	119*	113*	83	94
5173	Chino		179*	194*	118*	118*	138	149
5174	Upland		178*	209*	127*	121*	128	118
5175	Upland (ARB)							
5176	Fontana		100*	136*	111*	106*	120	115
5177	Big Bear		39*	39*			45	45
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							
	Ontario Airport	107*	111*	110*	88*	128*		166
	Rialto	139*	130*	170*	153*	144*	98	101
	Crestline		48*	56*	70*	92*	72	

* Data for San Bernardino County for years prior to 1975 is a twelve month average running from December of the previous year through November of the indicated year.

TOTAL SUSPENDED PARTICULATE

PERCENT OF DAYS VIOLATING STATE STANDARD(24-HR.AVG.TSP ≧ 100 ug/m^3)

ZONE #	STATION Area	1971 V/N*	1971 %	1972 V/N*	1972 %	1973 V/N*	1973 %
METROPOLITAN ZONE							
001	L. A.	76/86	88	54/68	79	49/73	67
060	Azusa			62/71	87	49/72	67
069	Burbank						
071	WLA	15/61	25	27/71	38	13/71	18
072	L. B.						
074	Reseda	34/59	58	57/72	79	42/72	58
075	Pomona						
076	Lennox	79/86	92	69/73	95	65/73	89
080	Whittier						
081	Newhall						
082	Lancaster						
083	Pasadena			50/70	71	44/73	60
084	Lynwood						
085	Pico Rivera						
SOUTHERN ZONE							
3176	Anaheim	32/88	36	44/86	51	41/89	46
3177	La Habra	55/82	67	59/88	67	55/88	63
3185	Costa Mesa			15/80	19	14/87	16
3186	El Toro					26/75	35
3188	San Juan Capistrano						
3189	Laguna						
3190	Los Alamitos			34/87	39		
3191	Santa Ana Canyon						
EASTERN ZONE, RIVERSIDE							
4137	Palm Springs						
4139	Indio					46/72	64
4140	Prado Park						
4141	Hemet						
4144	Riverside					48/67	72
4149	Perris						
4150	Banning						
4151	Temecula						
4152	Elsinore						
EASTERN ZONE, SAN BERNARDINO							
5151	San Bernardino			35/57	61	30/59	51
5155	Barstow			13/53	24	31/57	54
5165	Redlands			30/54	55	29/56	52
5168	Victorville			31/56	55	34/50	68
5173	Chino			49/52	94	34/46	74
5174	Upland						
5175	Upland (ARB)						
5176	Fontana			47/57	82	28/51	55
5177	Big Bear			1/56	2	10/44	23
5181	L. Gregory						
5182	Yucaipa						
5187	Needles						
5188	Trona						
	Ontario Airport			36/55	65	24/48	50
	Rialto			39/52	75	33/50	66
	Crestline			5/56	8	23/52	44

* V = number days in violation. N = total number days sample taken.

Table IV.E-II

TOTAL SUSPENDED PARTICULATE

PERCENT OF DAYS VIOLATING STATE STANDARD(24-HR.AVG.TSP ≥ 100 ug/m^3)

ZONE #	STATION Area	1974 V/N*	1974 %	1975 V/N*	1975 %	1976 V/N*	1976 %
METROPOLITAN ZONE							
001	L. A.	41/71	56	36/61	59	34/60	57
060	Azusa	50/71	70	43/61	70	36/61	59
069	Burbank						
071	WLA	8/73	11	16/59	27	7/59	12
072	L. B.						
074	Reseda	26/70	37	29/57	51	24/59	41
075	Pomona						
076	Lennox	60/73	82	25/61	41	31/61	51
080	Whittier						
081	Newhall						
082	Lancaster	32/73	44	27/60	45	27/60	45
083	Pasadena	29/72	40	36/61	59	32/61	52
084	Lynwood	26/69	38	26/59	44	36/59	61
085	Pico Rivera						
SOUTHERN ZONE							
3176	Anaheim	36/90	40	34/60	57	34/61	56
3177	La Habra	61/90	68	37/60	62	40/61	66
3185	Costa Mesa	17/88	19	20/54	37	17/61	28
3186	El Toro	18/83	22				
3188	San Juan Capistrano						
3189	Laguna	12/71	17	7/46	15	16/60	27
3190	Los Alamitos	38/74	51	22/46	48	38/60	63
3191	Santa Ana Canyon			23/47	49	29/61	48
EASTERN ZONE, RIVERSIDE							
4137	Palm Springs	10/58	17	5/60	8	5/61	8
4139	Indio	42/60	70	39/58	67	29/60	48
4140	Prado Park						
4141	Hemet						
4144	Riverside	33/47	70	39/56	65	41/53	77
4149	Perris						
4150	Banning	17/49	35	5/49	10	11/61	18
4151	Temecula						
4152	Elsinore						
EASTERN ZONE, SAN BERNARDINO							
5151	San Bernardino	35/55	64	34/57	60	32/58	55
5155	Barstow	26/45	58	30/54	56	37/55	67
5165	Redlands			23/45	51	10/56	18
5168	Victorville	35/55	64	21/58	36	27/55	49
5173	Chino	35/48	73	41/54	76	45/57	79
5174	Upland	40/53	75	40/51	78	35/53	66
5175	Upland (ARB)						
5176	Fontana	29/51	57	39/55	71	31/47	66
5177	Big Bear					4/59	7
5181	L. Gregory						
5182	Yucaipa						
5187	Needles						
5188	Trona						
	Ontario Airport						
	Rialto	39/51	76	27/48	56	30/48	63
	Crestline	21/46	46				

* V = number days in violation. N = total number days sample taken.

TOTAL SUSPENDED PARTICULATE

MONTHLY ARITHMETIC MEAN, ug/m^3

- 1976 -

MONTH	AREA					
	CENTRAL LOS ANGELES	LENNOX	ANAHEIM	LA HABRA	RIVERSIDE	SAN BERNARDINO
JANUARY	152	162	170	183	172	106
FEBRUARY	101	89	84	96	62	72
MARCH	98	99	84	92	113	70
APRIL	94	81	96	91	126	120
MAY	104	92	97	106	134	130
JUNE	110	85	107	101	141	109
JULY	119	80	128	118	142	160
AUGUST	94	67	100	103	153	123
SEPTEMBER	131	99	128	115	160	143
OCTOBER	103	100	95	116	171	119
NOVEMBER	102	124	117	138	182	113
DECEMBER	122	134	142	156	169	69

SCAQMD - E & P Div.
MFB 10/6/77

Table IV.E-III

DATA SUMMARY - TOTAL SUSPENDED PARTICULATE, ug/m^3

STATION YEAR	ANNUAL MAXIMUM DAILY AVERAGE	ANNUAL GEOMETRIC MEAN DAILY AVERAGES	VIOLATIONS OF STANDARD (DAILY AVERAGE $\geq$ 100 ug/m^3) NUMBER OF SAMPLING DAYS	NUMBER OF DAYS IN VIOLATION	PERCENT IN VIOLATION
LOS ANGELES COUNTY					
AZUSA					
1972	342[a)]	150	71	61	86
1973	686[b)]	122	72	49	68
1974	230	105	64	42	66
1975	213	116	61	43	70
1976	226[c)]	109	61	36	59
LENNOX					
1972	303	137	73	67	92
1973	270	125	73	60	82
1974	218	119	66	53	80
1975	227	93	61	24	39
1976	230	94	61	31	51
LOS ANGELES					
1972	302	131	68	53	78
1973	412	115	73	46	63
1974	262	98	65	37	57
1975	258	106	61	35	57
1976	206	102	60	34	57
ORANGE COUNTY					
ANAHEIM					
1972	259	103	85	43	51
1973	345	98	89	41	46
1974	223	95	82	35	43
1975	249	101	60	34	57
1976	252	102	61	34	56

Table IV.E-IV

DATA SUMMARY - TOTAL SUSPENDED PARTICULATE, ug/m^3

STATION YEAR	ANNUAL MAXIMUM DAILY AVERAGE	ANNUAL GEOMETRIC MEAN DAILY AVERAGES	VIOLATIONS OF STANDARD (DAILY AVERAGE $\geq$ 100 ug/m^3) NUMBER OF SAMPLING DAYS	NUMBER OF DAYS IN VIOLATION	PERCENT IN VIOLATION
LA HABRA					
1972	352	120	88	59	67
1973	270	117	88	55	63
1974	273	116	82	57	70
1975	220	111	60	39	65
1976	253	107	61	40	66
RIVERSIDE COUNTY					
RIVERSIDE					
1972	268*	119*	15*	11*	73*
1973	370	127	66	47	71
1974	420	136	47	33	70
1975	467	149	55	42	76
1976	276	131	53	41	77
SAN BERNARDINO COUNTY					
SAN BERNARDINO					
1972	437	99	69	37	54
1973	360	100	52	31	60
1974	304	115	51	32	63
1975	264	103	60	34	57
1976	242	102	58	32	55

* Yearly statistics may not be representative, due to insufficient data.

a) All statistics for 1972 is from "Ten Year Summary of California Air Quality Data 1963-1972", Air Resources Board, January 1974.

b) All statistics for 1973, 1974, 1975 is from "Three Year Summary of California Air Quality Data 1973-1975", Air Resources Board, January 1977.

c) Statistics for 1976 obtained by hand reduction of data by District personnel.

ANNUAL AVERAGES OF AIRBORNE PARTICULATE MATTER CONCENTRATIONS

1965 - 1976

Year	Annual Geometric Mean (AGM) of Total Particulate Matter Concentrations, ug/m³, By Zone and Station[a]																
	Metropolitan Zone									Southern Zone							
	CENT	ESGV[b]	NWCO	73[c]	WSFV[d]	SWCO	WSGV[e]	SCLA[f]	ANVA[g]	ANAH	LAHB	COST	TORO	SJCA	LGNA	LSAL	SACN
1965[h]	132		86	132		118											
1966	142		88	135		143											
1967	145		71	103	135	139											
1968	157		92		109	146				105							
1969	154		99		117	150				96							
1970[i]	135		90		111	145				88	115					87	
1971[i]	157	139	83		109	150	100			105	137	67	--			85	
1972	130	150	86		143	137	110			98	117	65	75			71	
1973	114	121	74		103	124	101		94	95	116	66	69		70	103	
1974	97	106	69		84	117	80	67	82	101	111	74	58		73	99	86
1975	106	115	78		91	93	99	88	89	102	107	73	82	82	74	110	86
1976	102	109	64		89	94	94	109	91								

a) For Station designations, see Table X. For Station locations, see the map at the end of this report.

b) Sampling began in July 1971 (6-month average for 1971).

c) Station 73 was discontinued in June 1967 (6-month average for 1967). It was located at 608 North Heliotrope Drive, Los Angeles, between the eastbound and westbound lanes of the Hollywood Freeway.

d) Station opened in September 1967 (4-month average for 1967).

e) Sampling began in July 1971 (6-month average for 1971). This West San Gabriel Valley Station replaced its predecessor in May 1972.

f) Sampling began January 7, 1974.

g) Sampling began July 1973 (6-month average for 1973).

h) All 1965 samples were single samples taken August through December.

i) The values for these years have been recalculated and differ slightly from the values published in the 1974 edition of this report.

ANNUAL AVERAGES OF AIRBORNE PARTICULATE MATTER CONCENTRATIONS

1965 - 1976

Year	Annual Geometric Mean (AGM) of Total Particulate Matter Concentrations, ug/m^3, In the Eastern Zone[a], By Station[b]														
	SNBO	REDL	VCVL	CHIN	UPLA	FONT	BGBE	BARS	PLSP	INDO	RIVR	BANN	ONTR[c]	RIAL[c]	CTLN[c]
1965															
1966	(124)	(124)	(121)	(137)				(105)					(128)	(100)	
1967	(109)	(88)	(97)	(139)				(78)					(137)	(115)	
1968	(110)	(98)	(99)	(138)				(80)					(133)	(119)	
1969	(91)	(94)	(71)	(172)				(69)					(134)	—	
1970	(119)	(102)	(74)	—				(87)			112	63	(107)	(139)	
1971	131	(94)	(89)	(178)		(100)	(39)	(74)	84		—	63	(111)	(130)	(48)
1972	100	(95)	(102)	(194)		(136)	(39)	(75)	—		119	—	(110)	(170)	(56)
1973	100	(89)	(119)	(118)	(127)	(111)	—	(104)	—	117	127	—	(88)	(153)	(70)
1974	115	(109)	(113)	(118)	(121)	(106)	—	(88)	56	120	136	53	(128)	(144)	(92)
1975	102	76	93	138	128	120	45	87	54	116	149	50	—	98	72
1976	102	69	94	149	118	115	45	114	52	102	131	63	166	101	56

a) Values in parentheses averaged from December 1 through November 30 data periods.

b) For Station designations, see Table X. For Station locations, see the map at the end of this report.

c) Ontario, Rialto and Crestline Stations monitor only Total Particulate Concentrations. They are not regular air monitoring stations.

SECTION IV.F. LEAD

SOURCES

Atmospheric lead is almost entirely derived from combustion of leaded fuels by motor vehicles. Lead concentrations should be highest immediately downwind of large concentrations of vehicular traffic. Meteorological conditions which limit dispersion or transport would be expected to result in higher lead concentrations.

GEOGRAPHICAL DISTRIBUTION

In Figures IV.F-1 to IV.F-3 the number of violations of the state lead standard for 1972, 1974, and 1976 have been shown on maps of the South Coast Air Basin. The greatest number of violations occur in Los Angeles County, where there is the greatest concentration of motor vehicles. Table IV.F-I lists supporting data, 1970-1976.

In Figures IV.F-4 to IV.F-6 the annual arithmetic mean lead concentration is shown. The highest means occur in Los Angeles County. Additional data is given in Table IV.F-II.

SEASONAL DISTRIBUTION

In Figures IV.F-7 and IV.F-8 and Table IV.F-III, the monthly average lead concentrations for a few representative stations are shown. The highest monthly

averages generally occurred in the late fall and winter months and the lowest readings in the late spring and summer months.

The greatest seasonal difference occurred at the two coastal stations, Lennox and Los Alamitos, where winter concentrations were five or six times higher than summer. A less marked difference was present further inland at Anaheim and Central Los Angeles with a winter to summer ratio of about two to three. Still further inland, Riverside had a ratio of about two, and San Bernardino even less.

A study made by the Evaluation and Planning Division of the South Coast Air Quality Management District showed that lead concentrations are inversely related to wind speed and inversion base height. In addition, it was found that high readings at the Lennox station could be related to wind direction. The observed seasonal concentration differences are probably simply the result of seasonal variation of these meteorological conditions.

TRENDS

In Figures IV.F-9 to IV.F-17, five annual statistics for lead concentration are given. The statistics selected were highest daily average of year, highest monthly average of year, annual average of daily averages, and number of violations of standard.

Los Angeles County and Orange County lead concentrations show a definite downward trend for the period 1972-1976 at four of the five sites selected for this area. The four sites in Riverside and San Bernardino show little change (see Table IV.F-IV).

Long term (1965-1976) annual average lead concentrations are shown in Figure IV.F-18 for Lennox, Los Angeles and West Los Angeles. Since 1970, there has been a steady, and fairly rapid downtrend, probably attributable to the phase-out of lead in gasolines in this area. Figure IV.F-19 shows similar data for Anaheim and San Bernardino. The apparent high in Anaheim in 1972 is unexplained. Table IV.F-V presents similar data for other SCAQMD stations. The few stations which show slight increases in recent years may reflect increasing motor vehicle population in these areas.

SUMMARY

The overall picture for lead concentrations in the South Coast Air Basin is a downward trend. An unpublished SCAQMD study on the Los Angeles County lead data concluded that the weather did not cause the observed downtrend in the data. Rather, the data correlated nicely with the decreasing lead in the gasoline pool. The downtrend apparently is due to decreasing emissions of lead by automobiles.

LIST OF FIGURES

Lead

Figure No.	Title
IV.F-1	Lead, Number of Months Violating State Standard (30-day Avg. Pb $\geq$ 1.50 ug/m^3) - 1972
IV.F-2	Lead, Number of Months Violating State Standard (30-day Avg. Pb $\geq$ 1.50 ug/m^3) - 1974
IV.F-3	Lead, Number of Months Violating State Standard (30-day Avg. Pb $\geq$ 1.50 ug/m^3) - 1976
IV.F-4	Lead, Annual Arithmetic Mean, ug/m^3 - 1972
IV.F-5	Lead, Annual Arithmetic Mean, ug/m^3 - 1974
IV.F-6	Lead, Annual Arithmetic Mean, ug/m^3 - 1976
IV.F-7	Lead, Monthly Arithmetic Mean - 1976
IV.F-8	Lead, Monthly Arithmetic Mean - 1976
IV.F-9	Lead, Los Angeles, Annual Statistics
IV.F-10	Lead, Lennox, Annual Statistics
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IV.F-13	Lead, La Habra, Annual Statistics
IV.F-14	Lead, Riverside, Annual Statistics
IV.F-15	Lead, Chino, Annual Statistics
IV.F-16	Lead, San Bernardino, Annual Statistics
IV.F-17	Lead, Upland, Annual Statistics
IV.F-18	Lead, Annual Average, ug/m^3, Los Angeles County
IV.F-19	Lead, Annual Average, ug/m^3, Other Counties

LIST OF TABLES

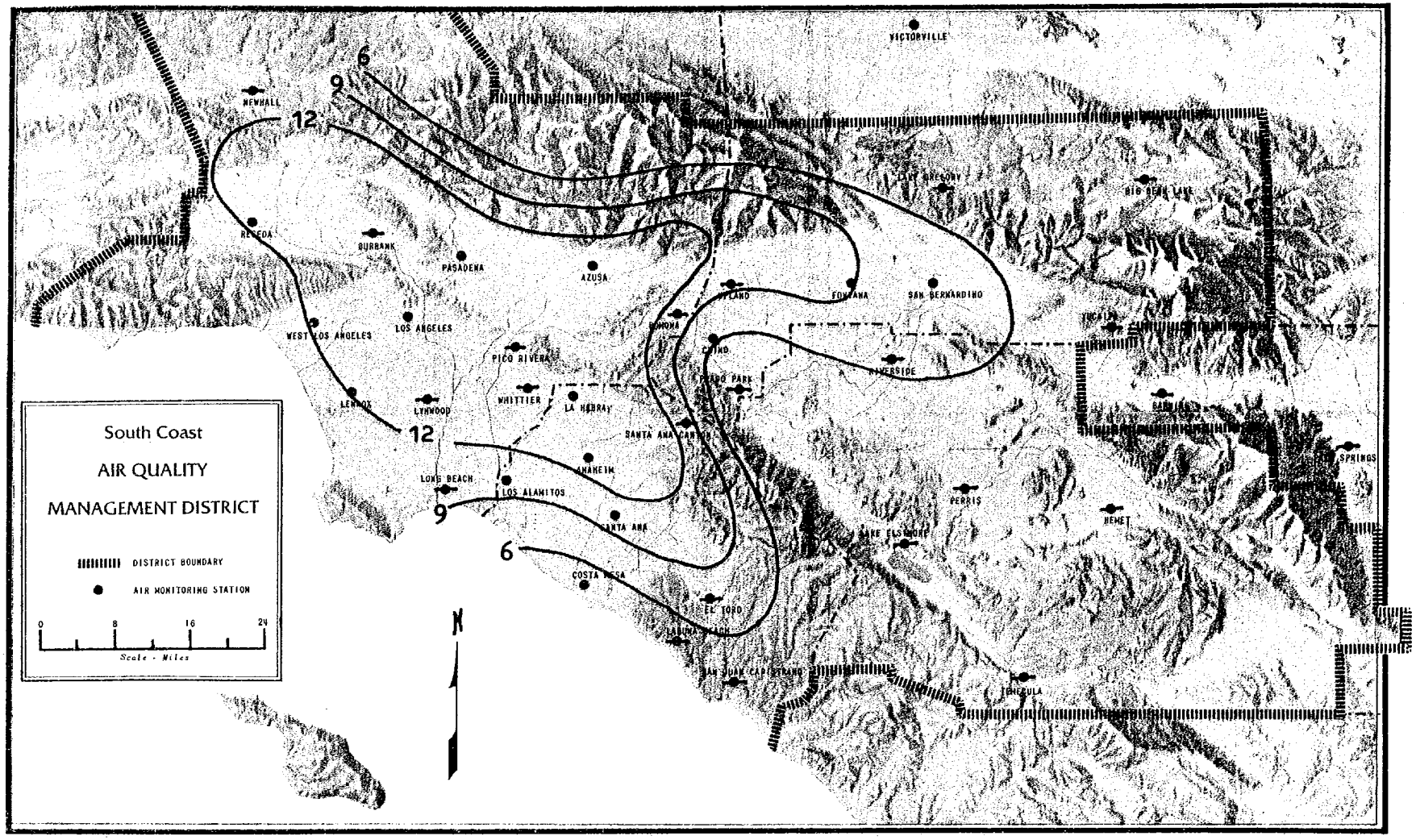
Lead

Table No.	Title
IV.F-I	Lead, Number of Months Violating State Standard (30-day Avg. Pb ≥ 1.50 ug/m^3)
IV.F-II	Lead, Annual Arithmetic Mean, ug/m^3
IV.F-III	Lead, Monthly Arithmetic Mean, ug/m^3 - 1976
IV.F-IV	Data Summary - Lead, ug/m^3
IV.F-V	Annual Averages of Lead Content in Airborne Particulates 1965 - 1976

LEAD

NUMBER OF MONTHS VIOLATING STATE STANDARD (30-DAY AVG. Pb $\geq$ 1.50 ug/m^3)

1972



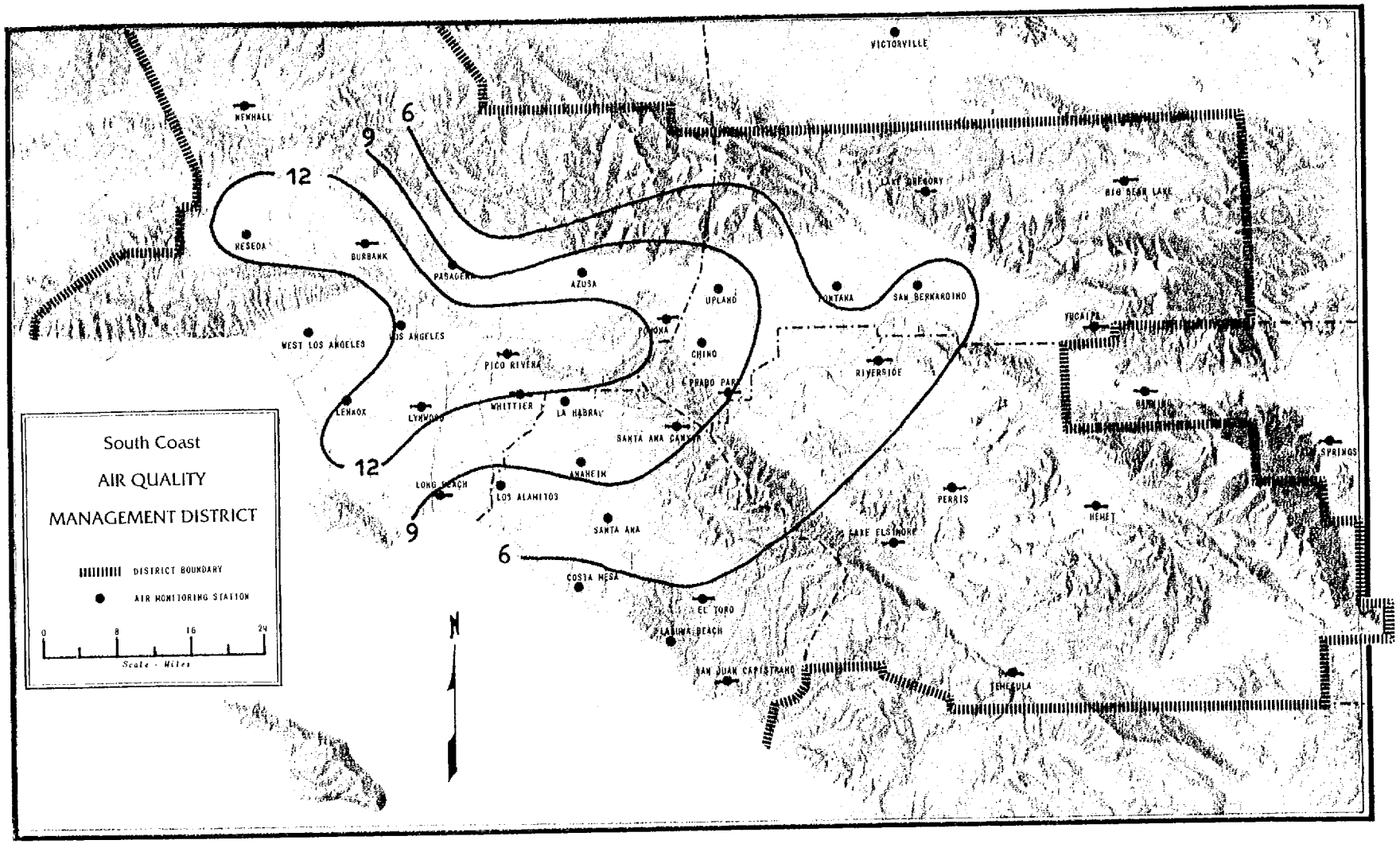
-●- Less than 9 months of data.

Figure IV.F-1

LEAD

NUMBER OF MONTHS VIOLATING STATE STANDARD (30-DAY AVG. Pb ≧ 1.50 ug/m^3)

1974



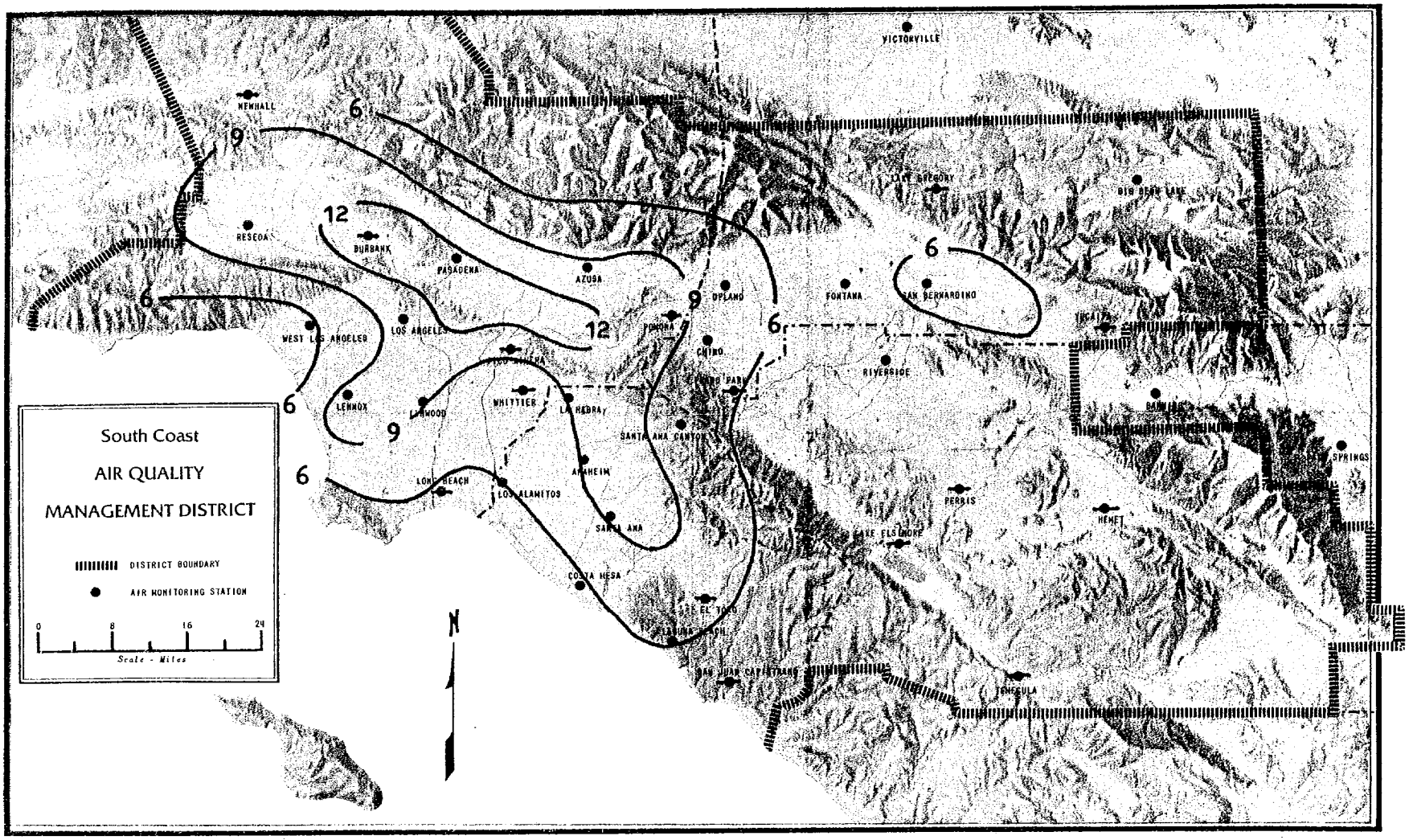
Less than 9 months of data.

Figure IV.F-2

LEAD

NUMBER OF MONTHS VIOLATING STATE STANDARD (30-DAY AVG. Pb $\geq$ 1.50 ug/m^3)

1976



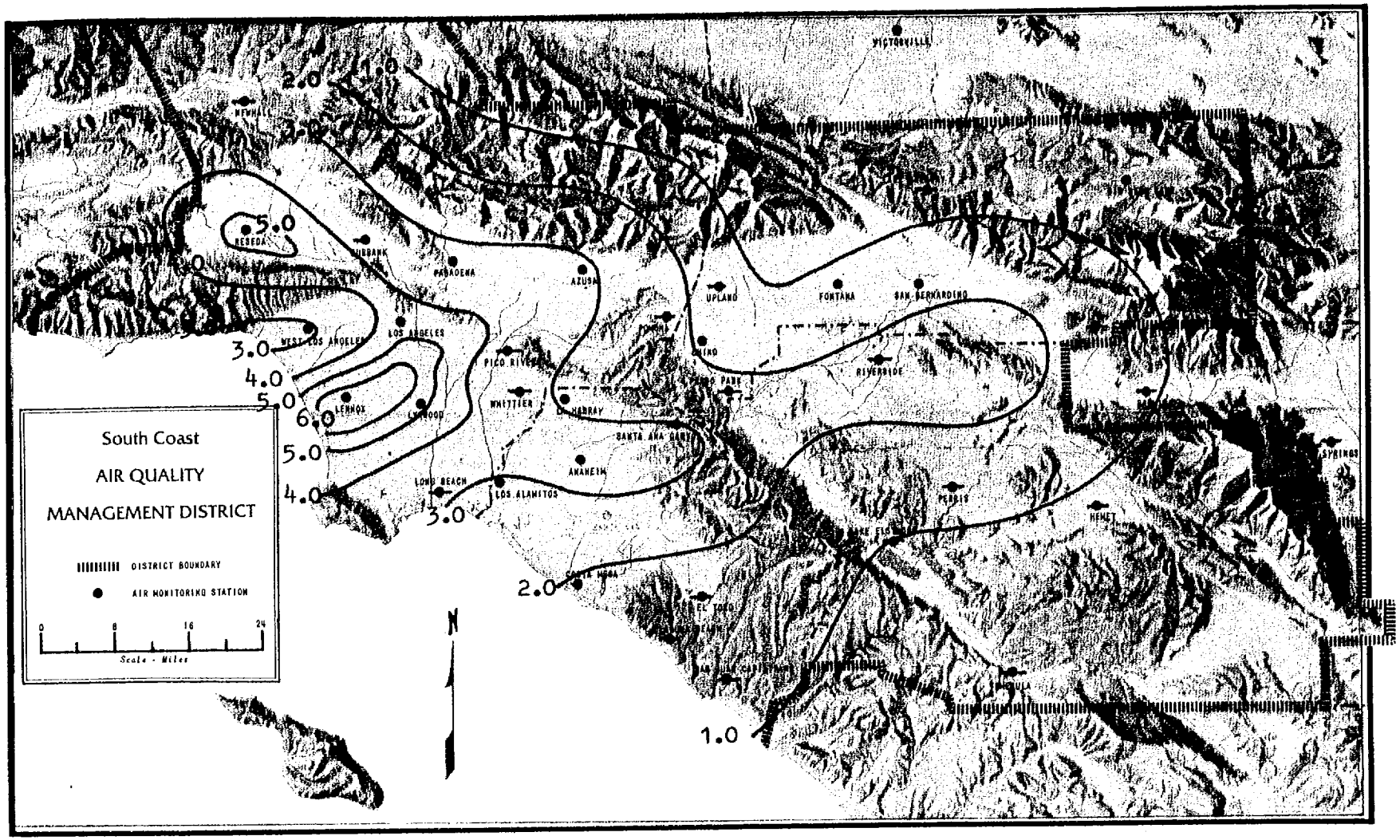
Less than 9 months of data.

Figure IV.F-3

LEAD

ANNUAL ARITHMETIC MEAN, ug/m^3

1972



-◆- Less than 9 months of data.

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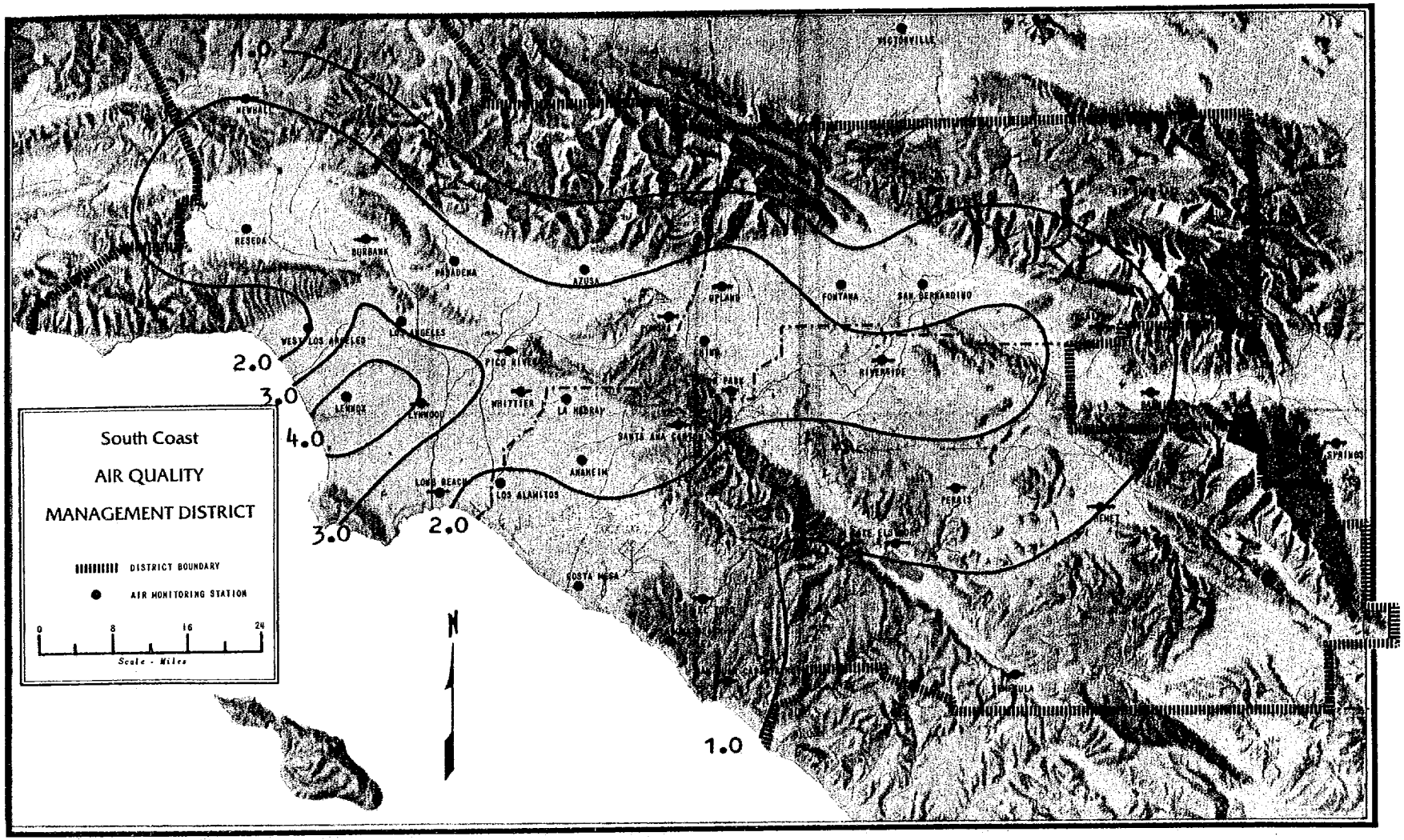
Figure IV.F-4

LEAD

ANNUAL ARITHMETIC MEAN, ug/m^3

1974



Less than 9 months of data.

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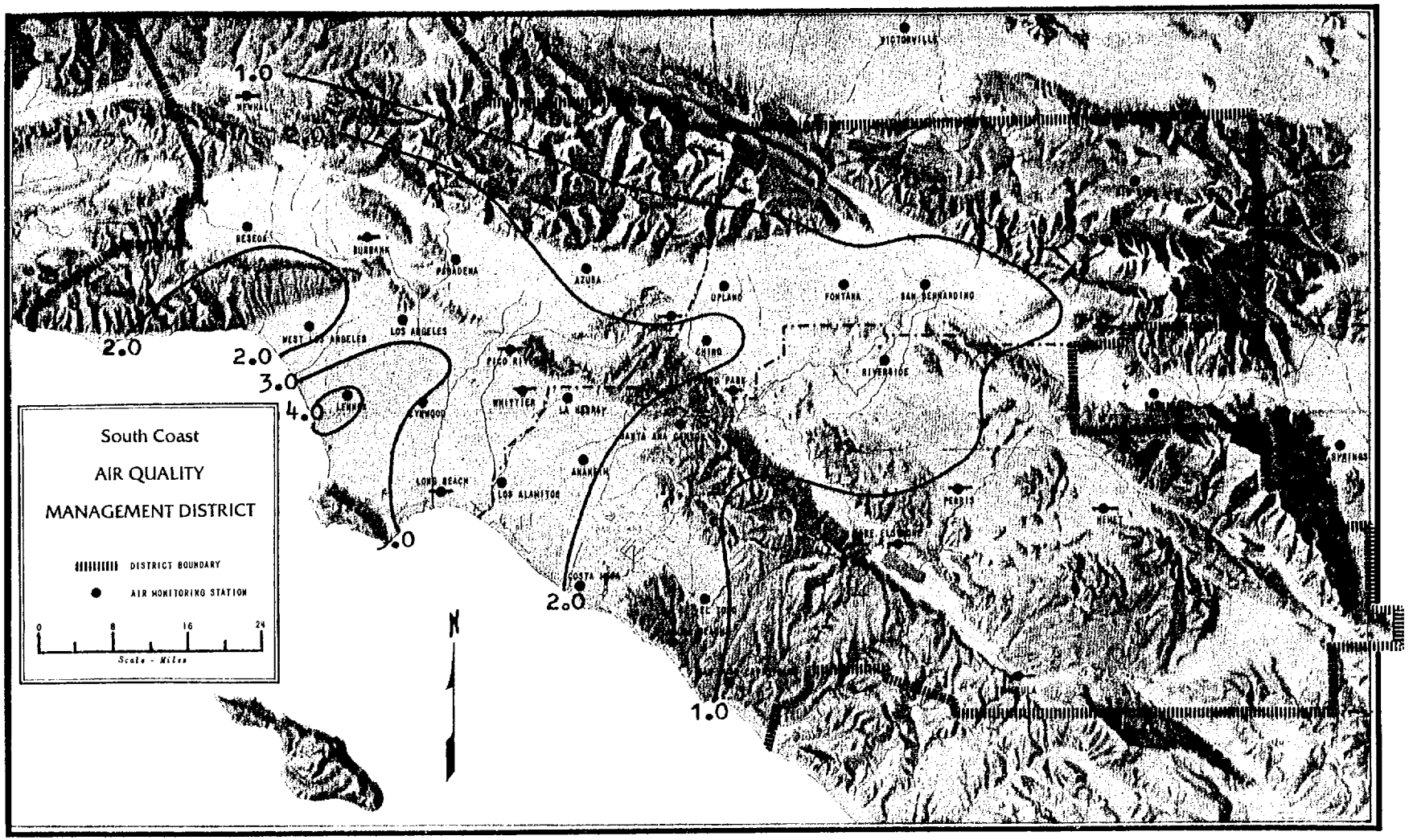
Figure IV.F-5

LEAD

ANNUAL ARITHMETIC MEAN, ug/m^3

1976



Less than 9 months of data.

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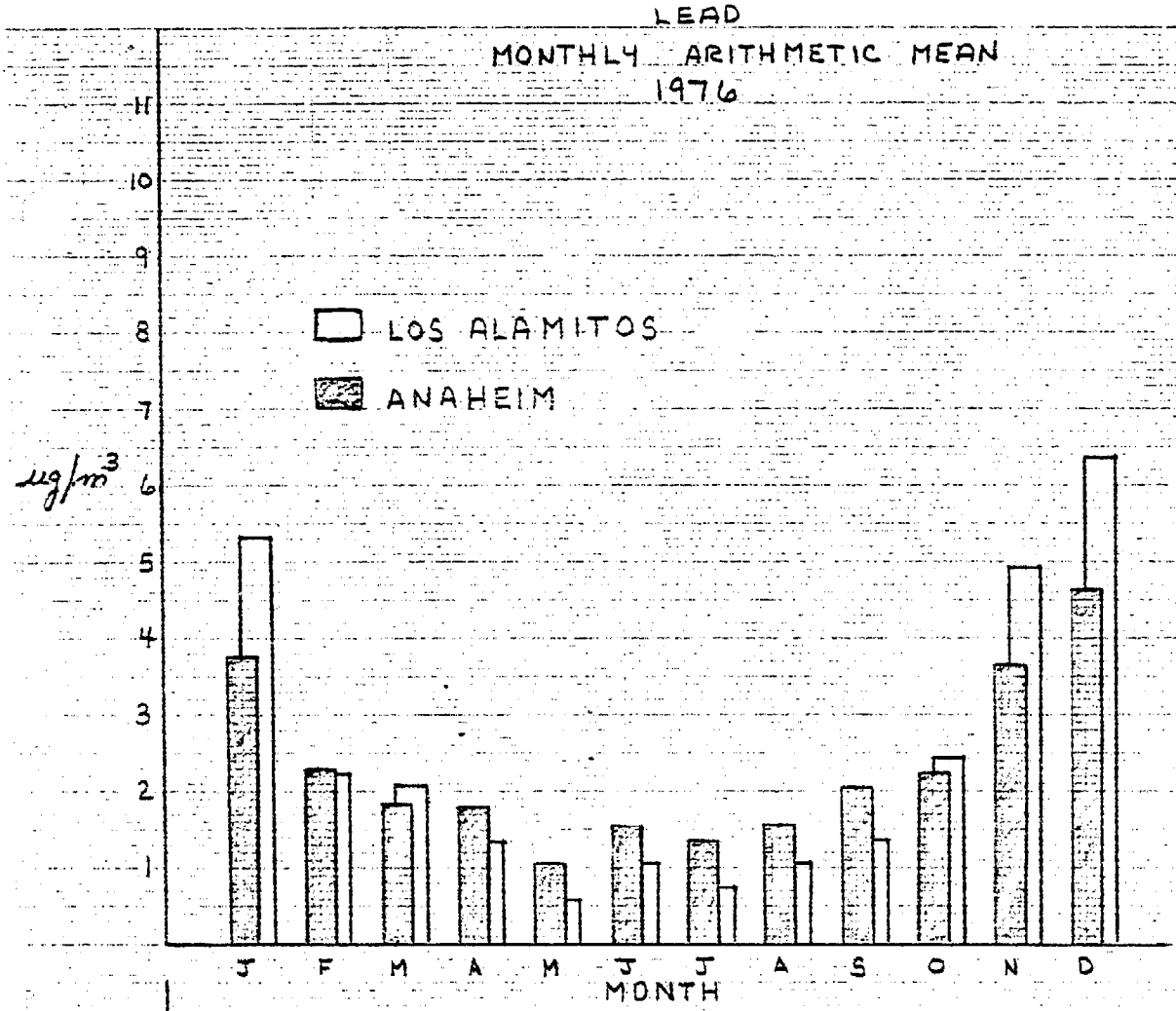
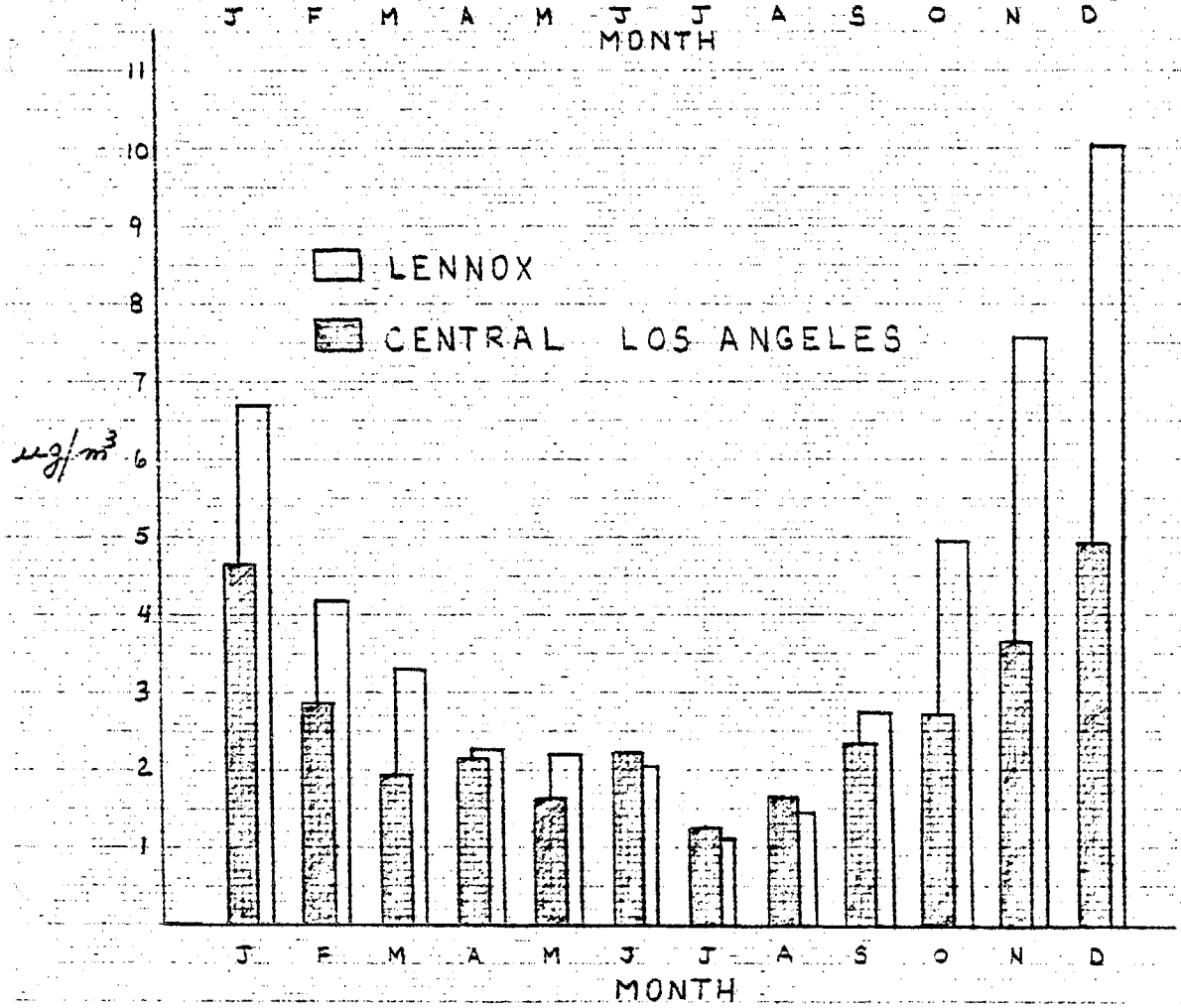
Figure IV.F-6

LEAD

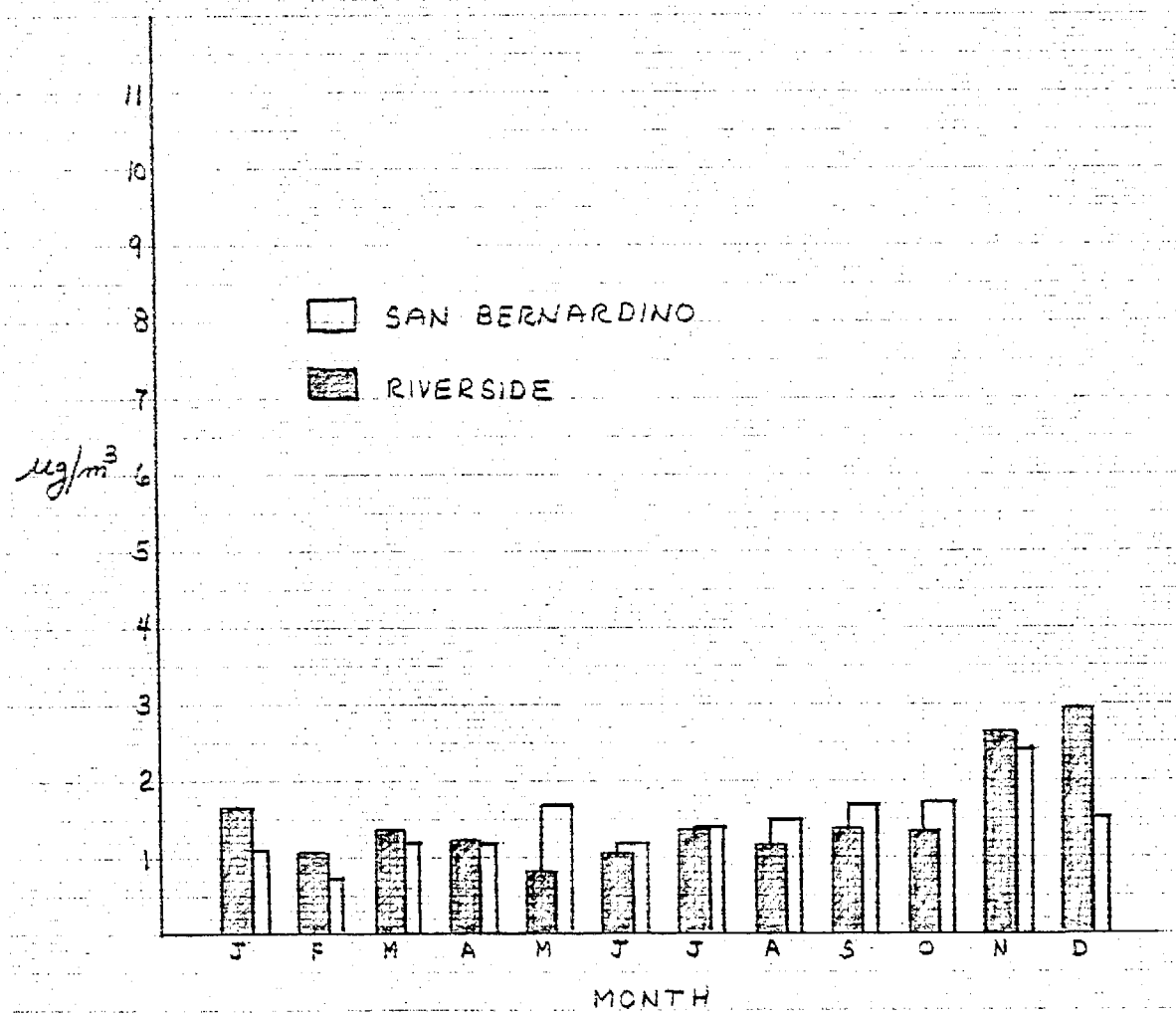
MONTHLY ARITHMETIC MEAN

1976

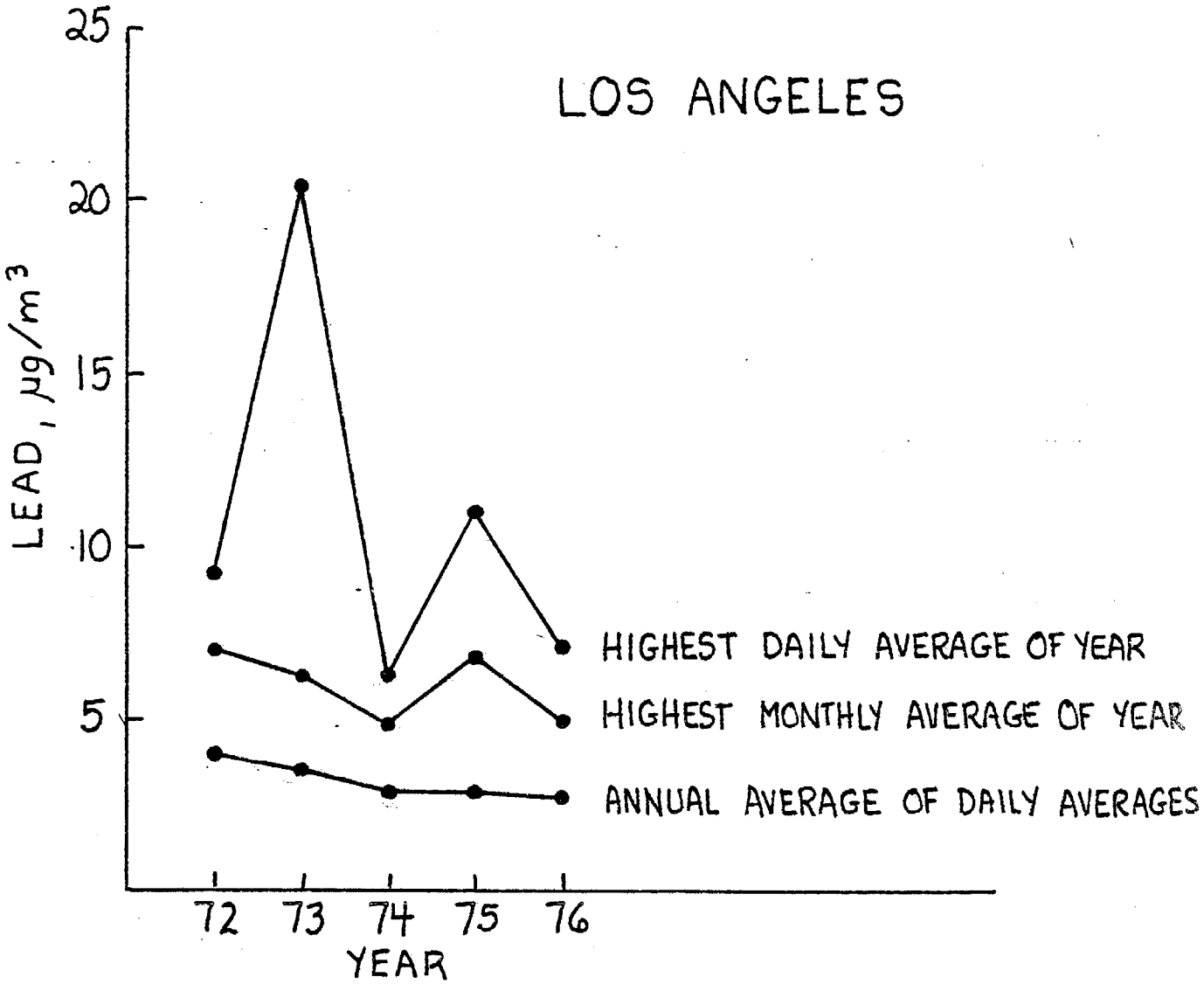


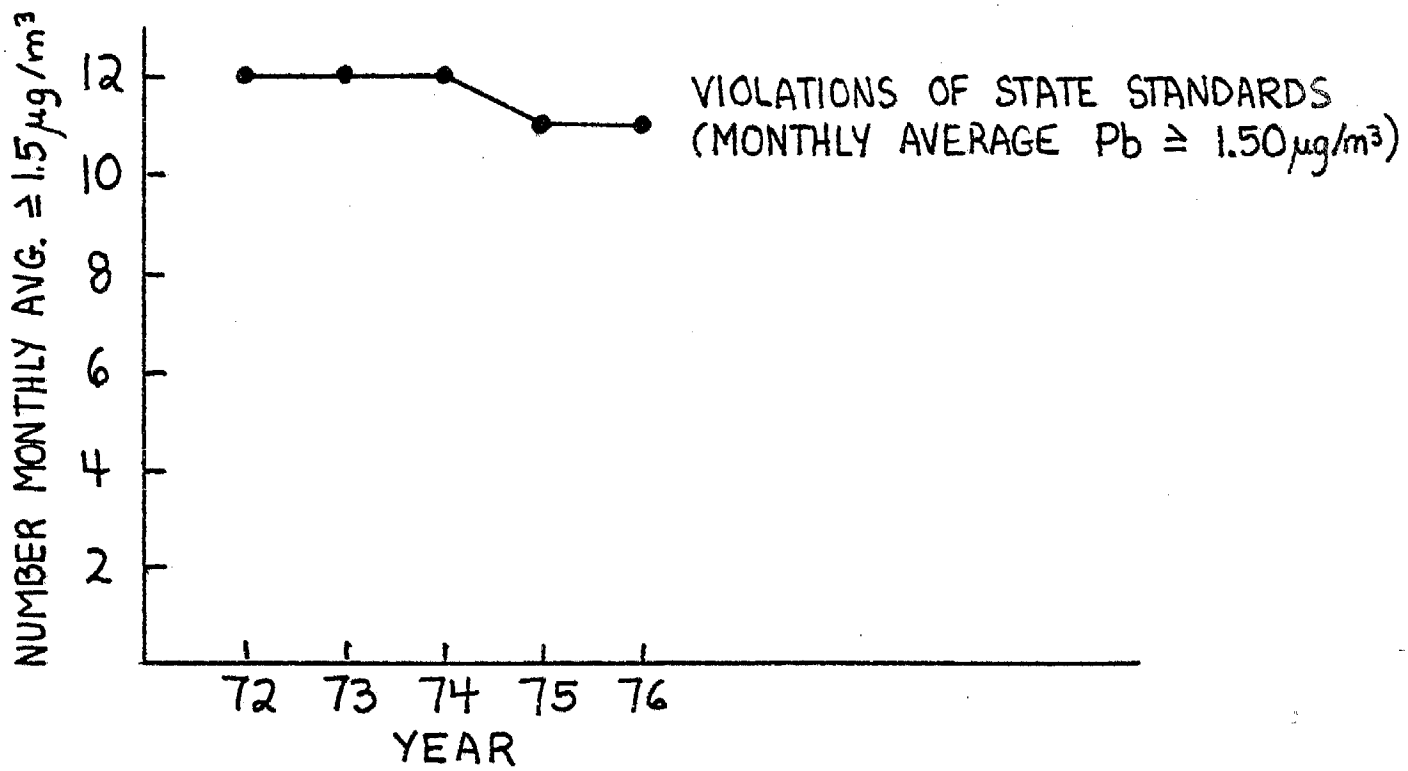


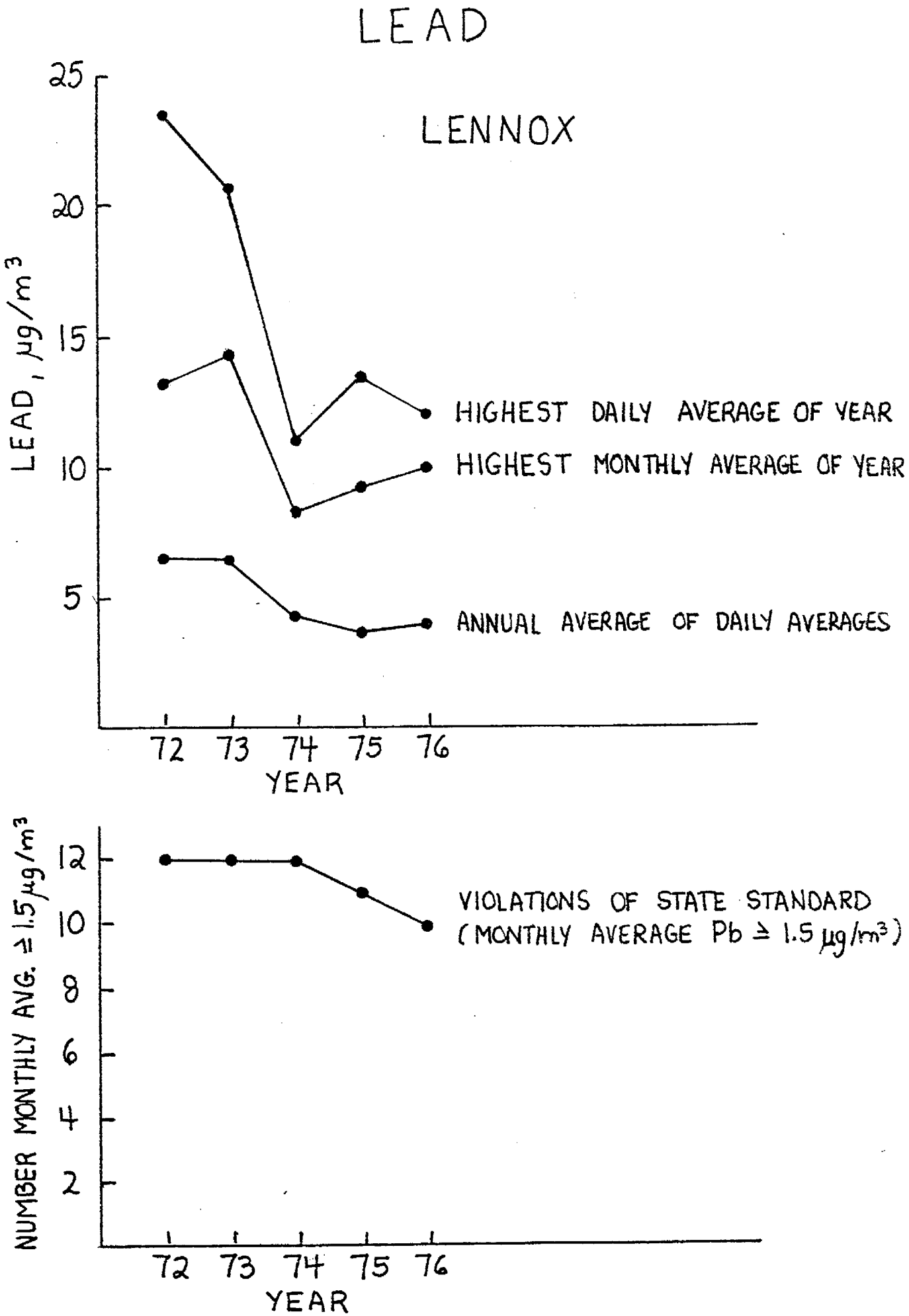
LEAD
MONTHLY ARITHMETIC MEAN
1976



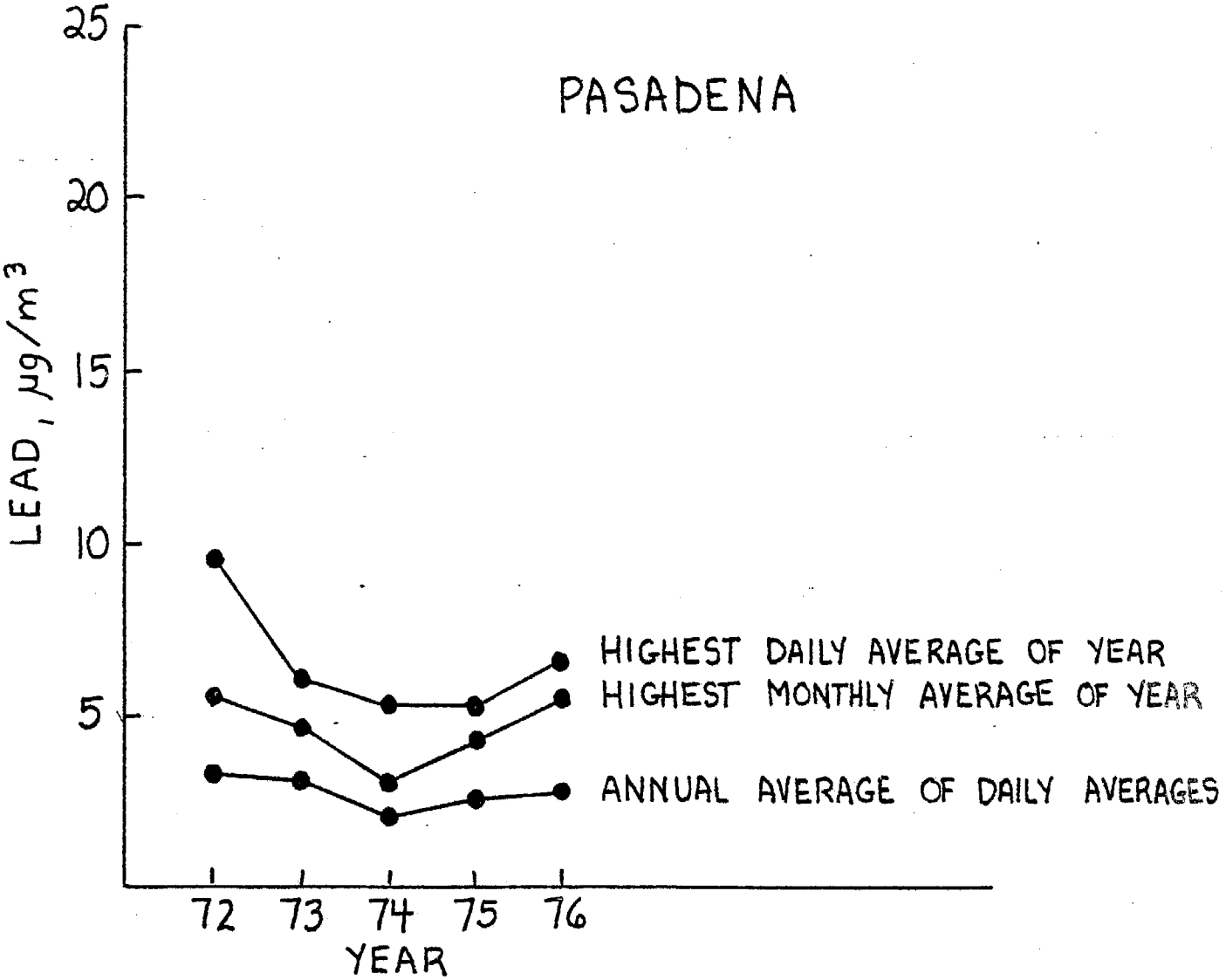
LEAD

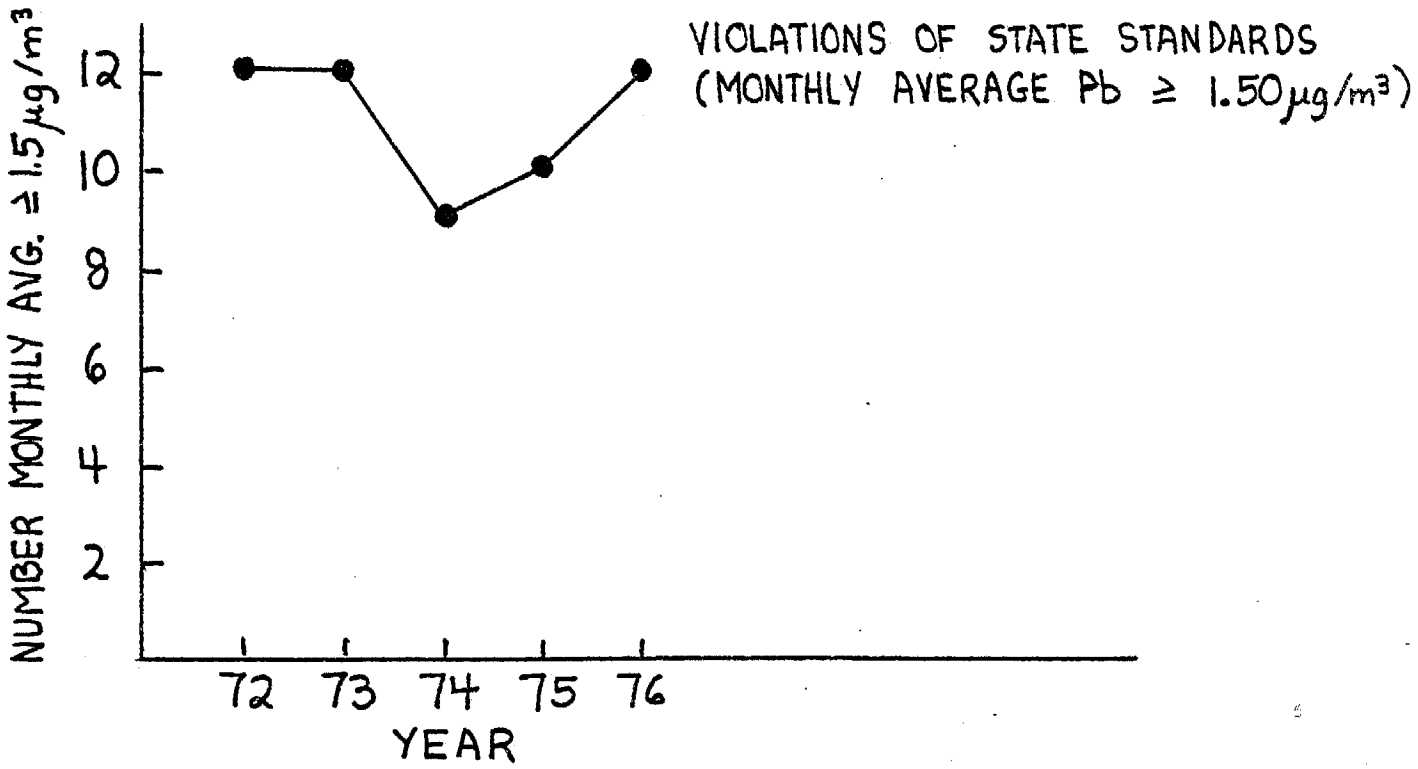

LOS ANGELES
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGE OF DAILY AVERAGES
72
73
74
75
76
YEAR


NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARDS
(MONTHLY AVERAGE Pb ≥ 1.50 μg/m³)
72
73
74
75
76
YEAR

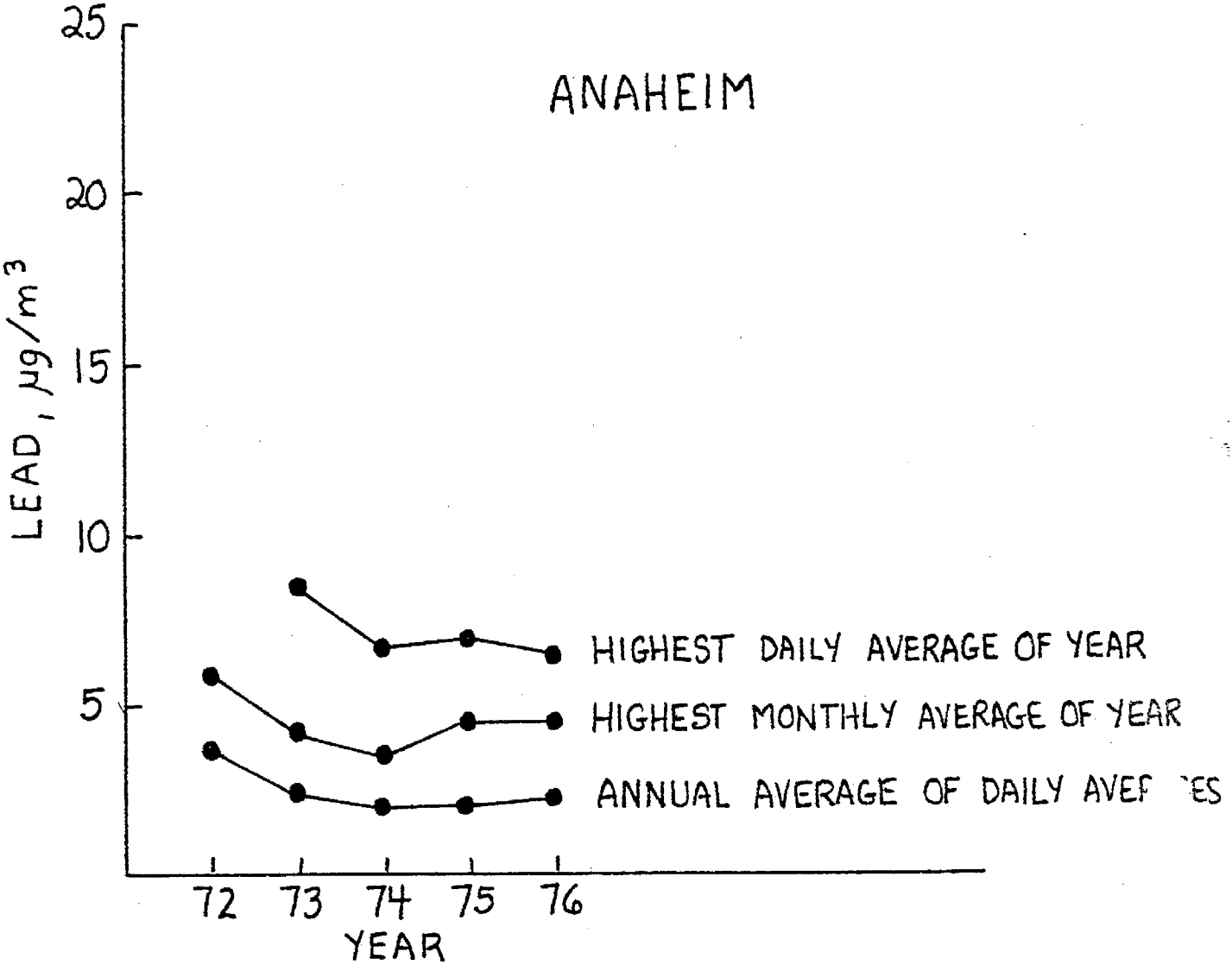

LEAD
LENNOX
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGE OF DAILY AVERAGES
72 73 74 75 76
YEAR
NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARD
(MONTHLY AVERAGE Pb ≥ 1.5 μg/m³)
72 73 74 75 76
YEAR

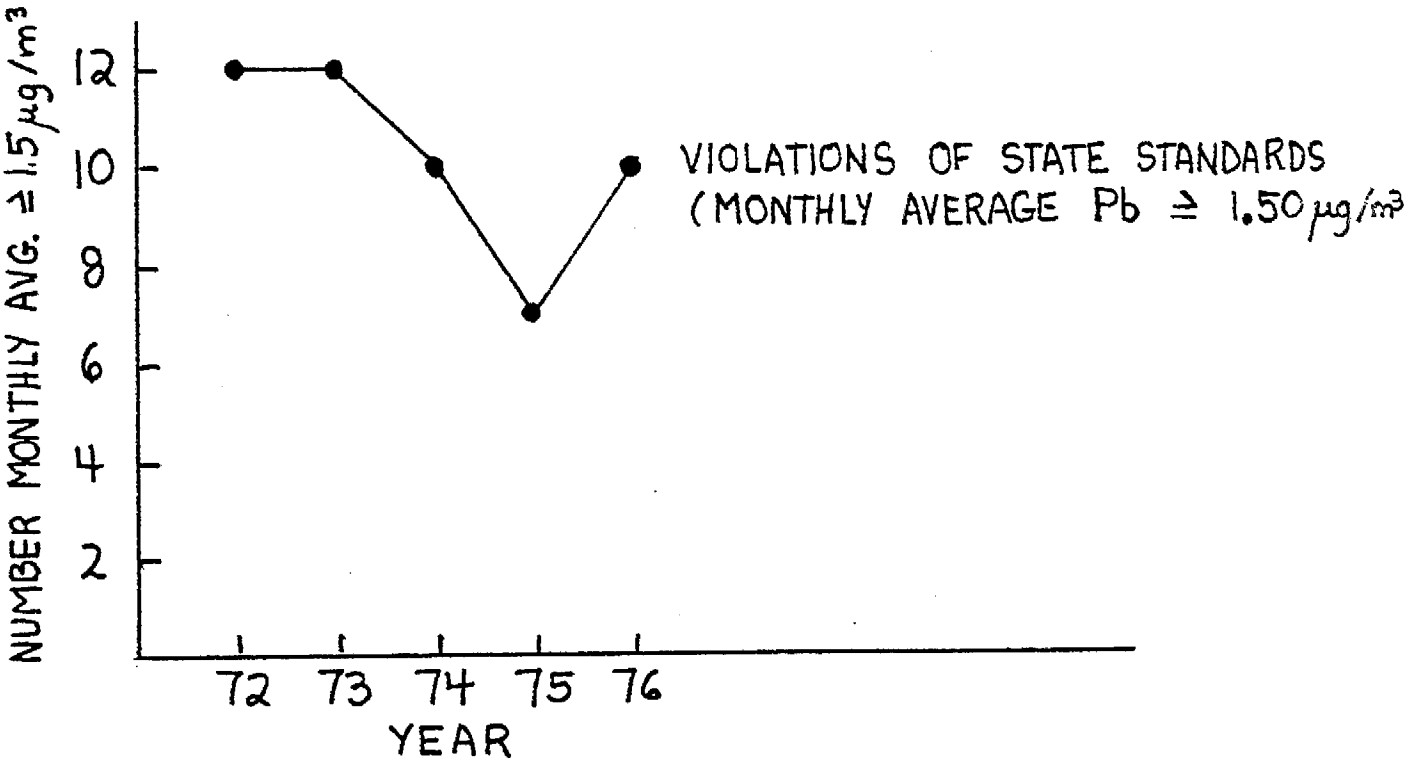
LEAD


PASADENA
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGE OF DAILY AVERAGES
72
73
74
75
76
YEAR

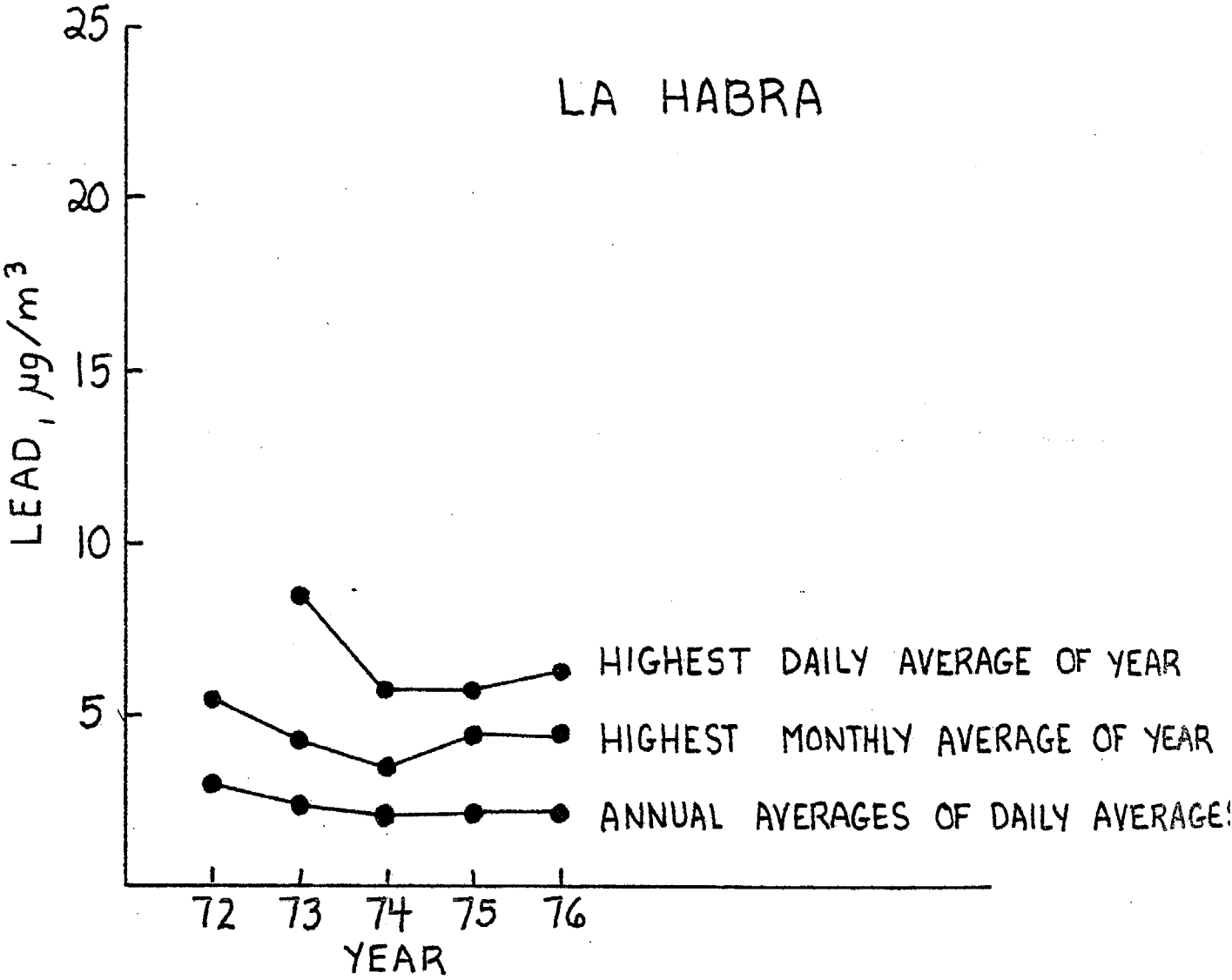

NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARDS
(MONTHLY AVERAGE Pb ≥ 1.50 μg/m³)
72
73
74
75
76
YEAR

LEAD


ANAHEIM
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGE OF DAILY AVEF ES
72
73
74
75
76
YEAR


NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARDS
(MONTHLY AVERAGE Pb ≥ 1.50 μg/m³
72
73
74
75
76
YEAR

LEAD


LA HABRA
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGES OF DAILY AVERAGES
72
73
74
75
76
YEAR

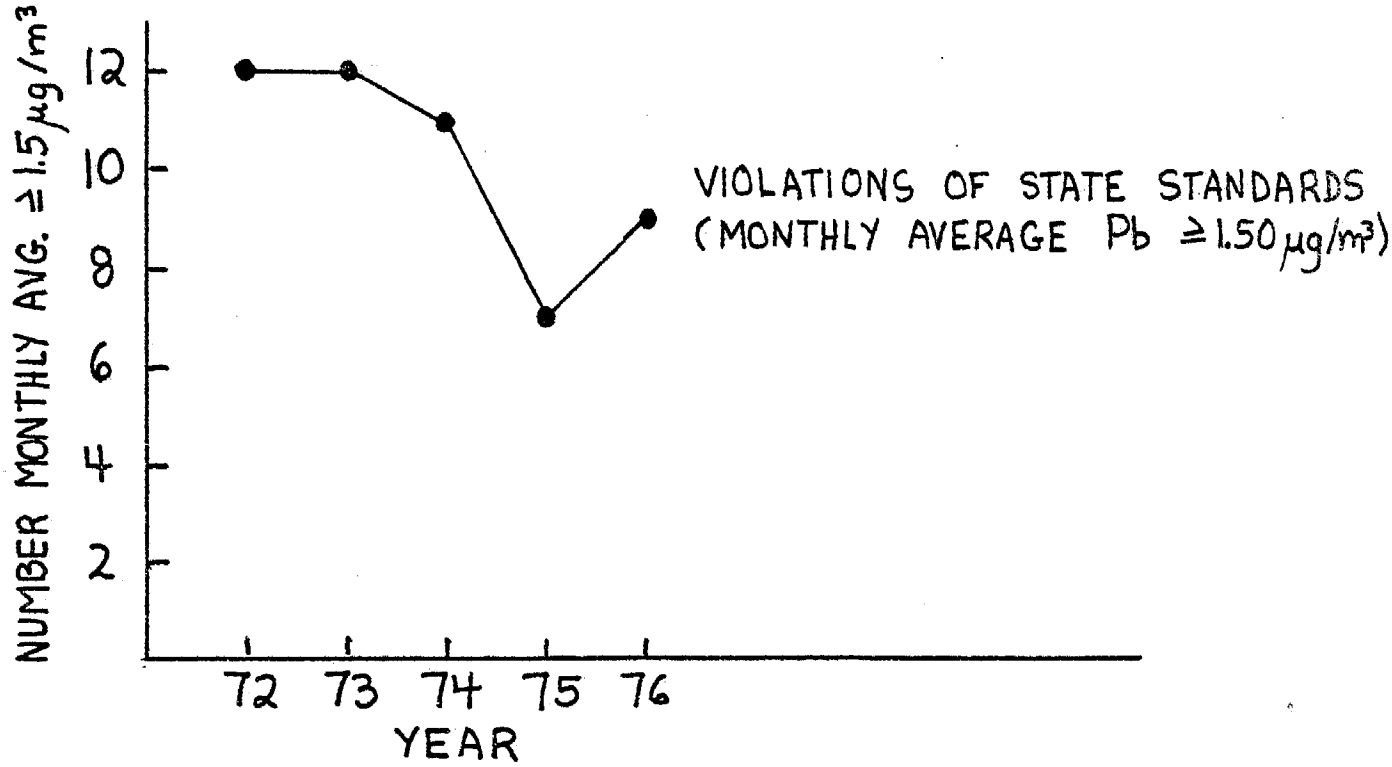
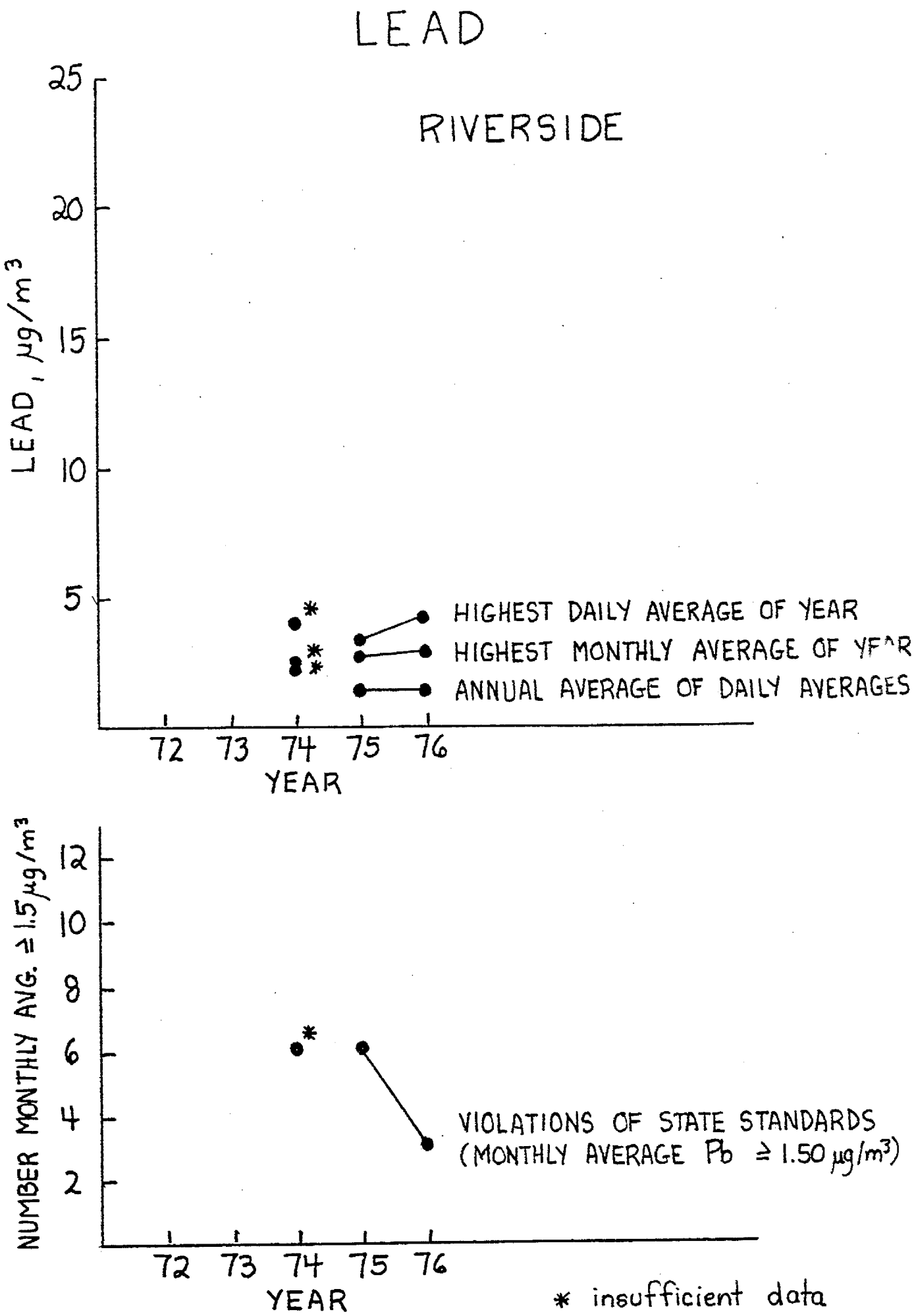
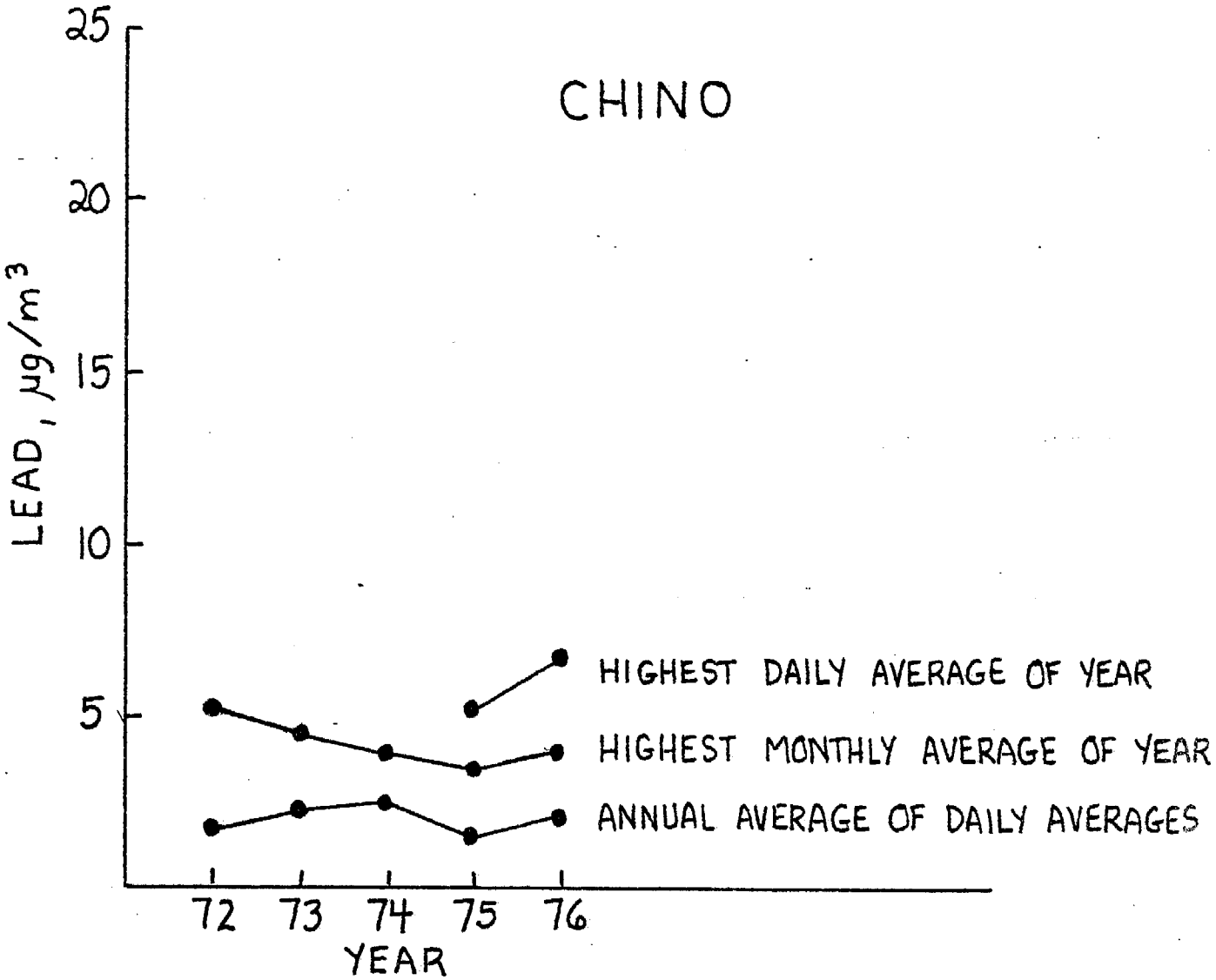
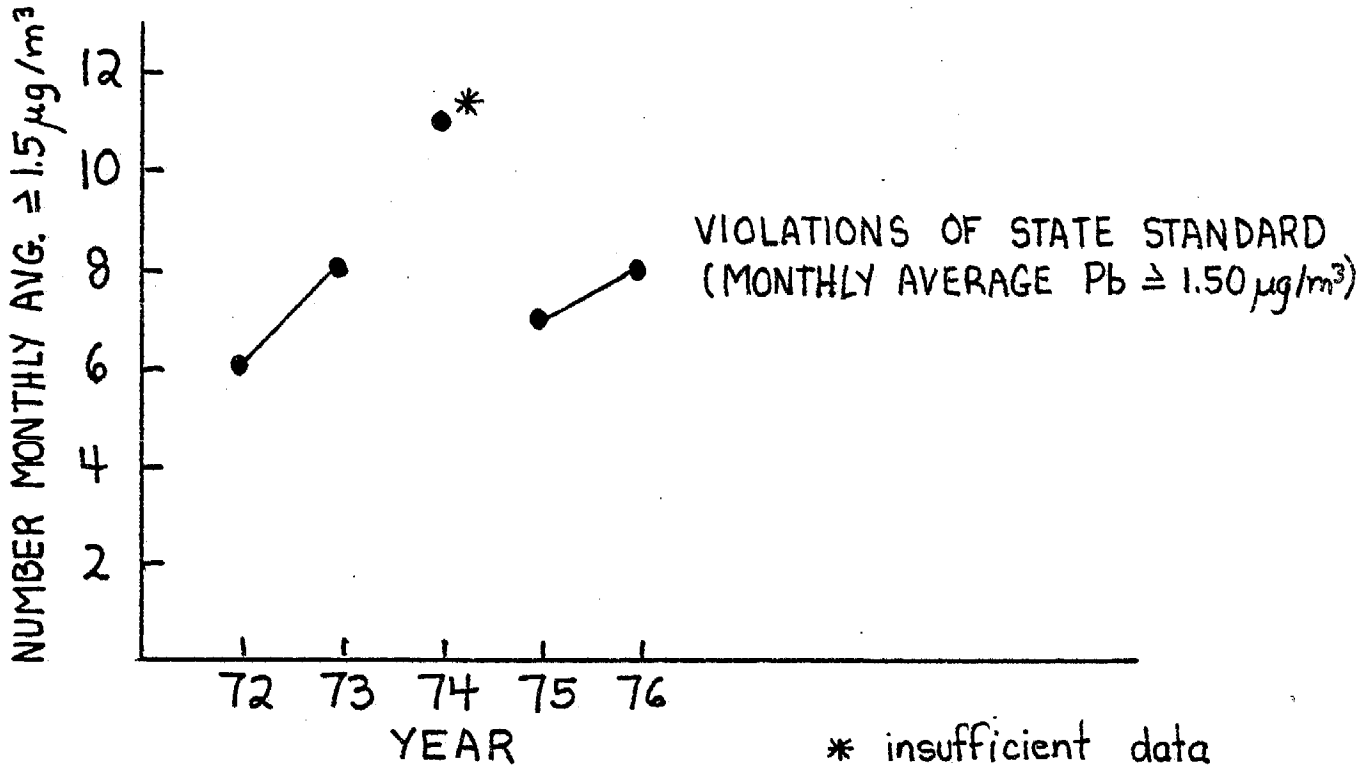

NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARDS
(MONTHLY AVERAGE Pb ≥ 1.50 μg/m³)
72
73
74
75
76
YEAR

Figure IV.F-14



LEAD

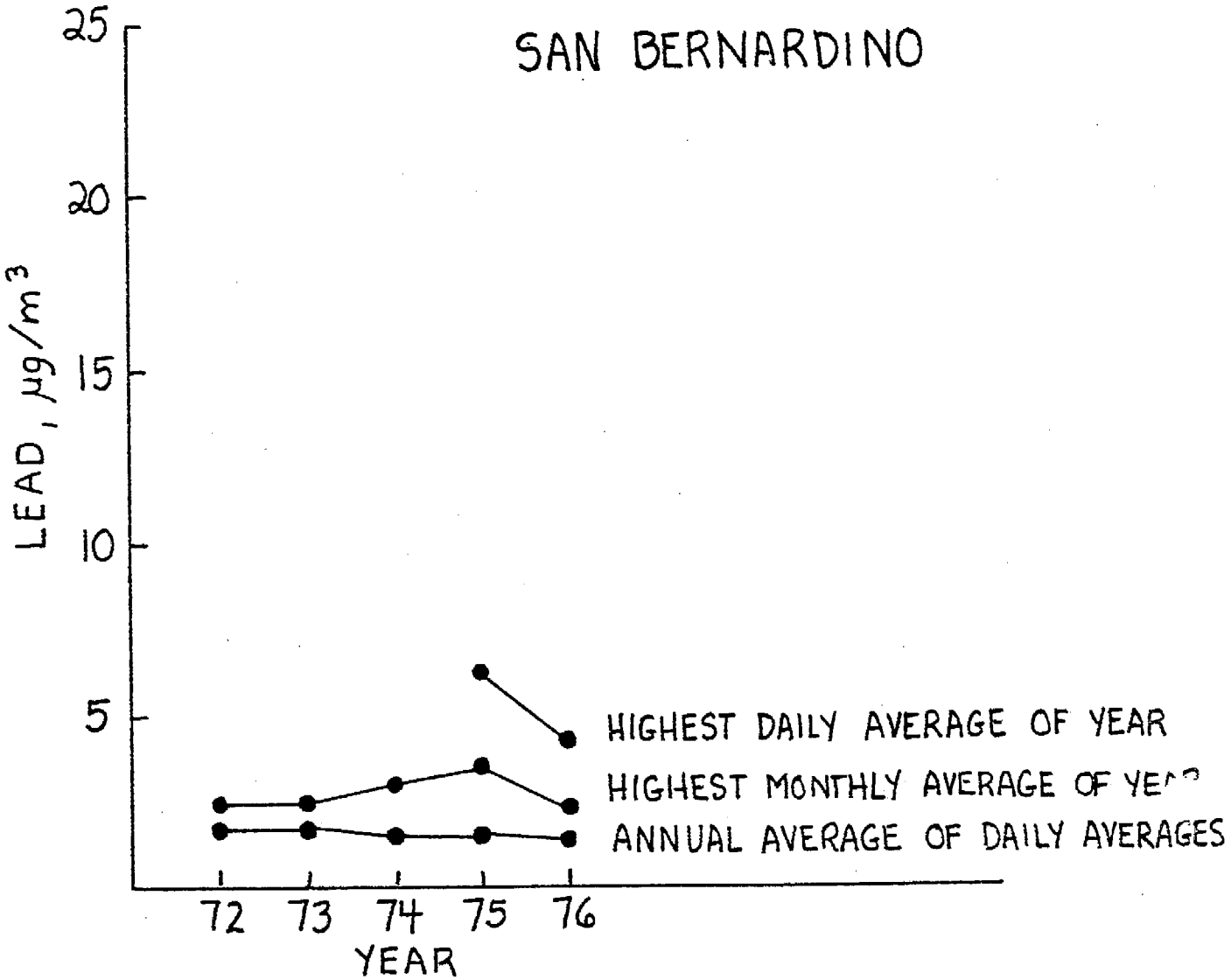


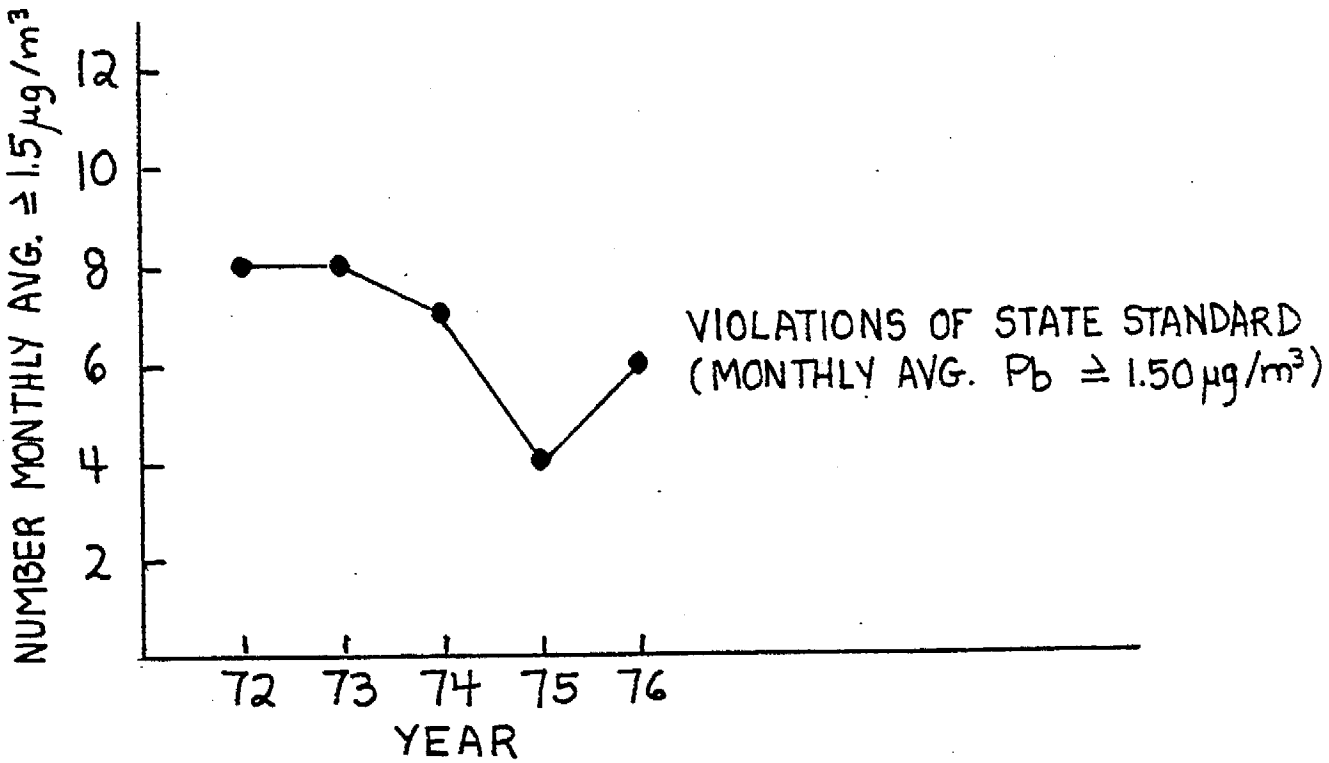


* insufficient data

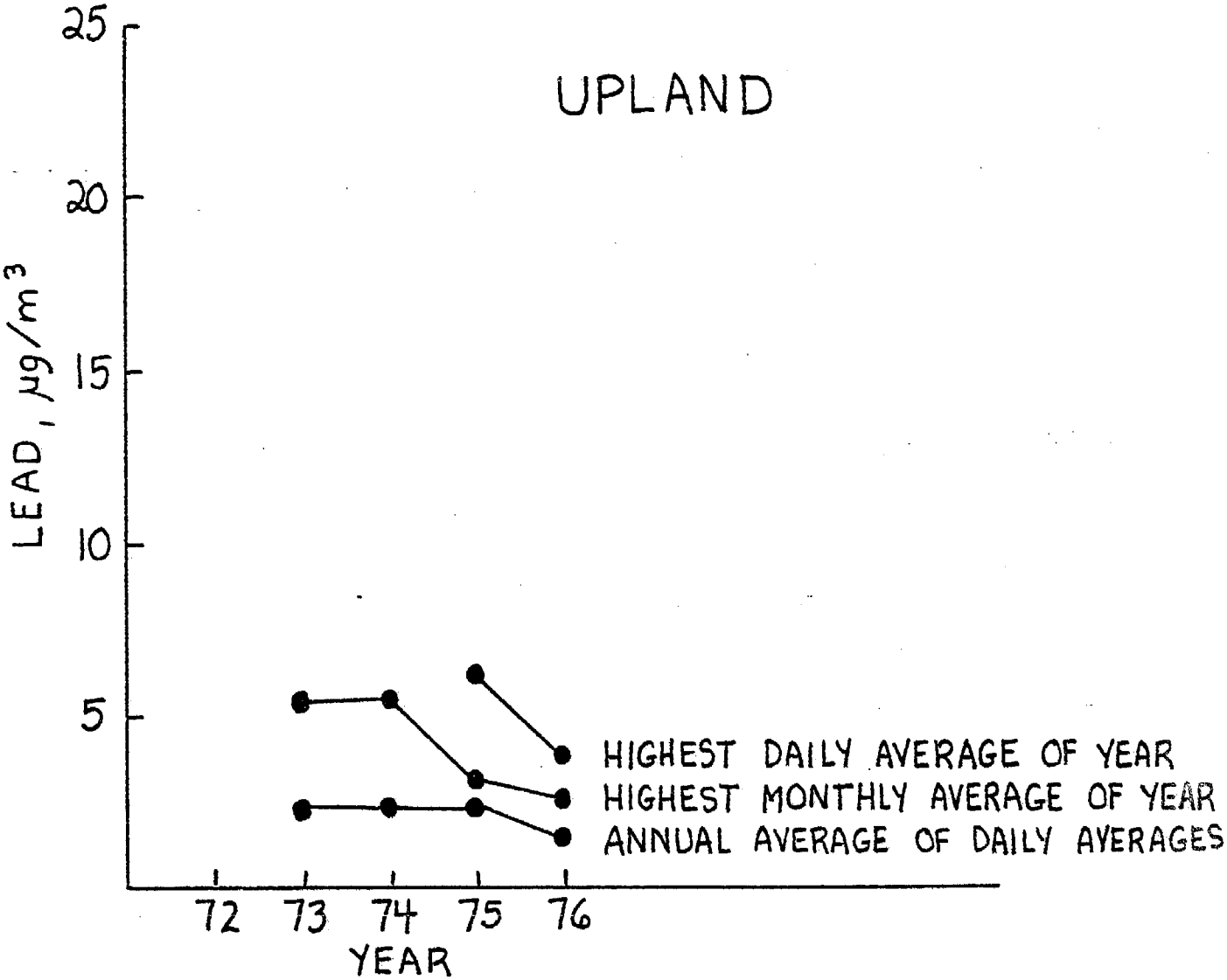
LEAD

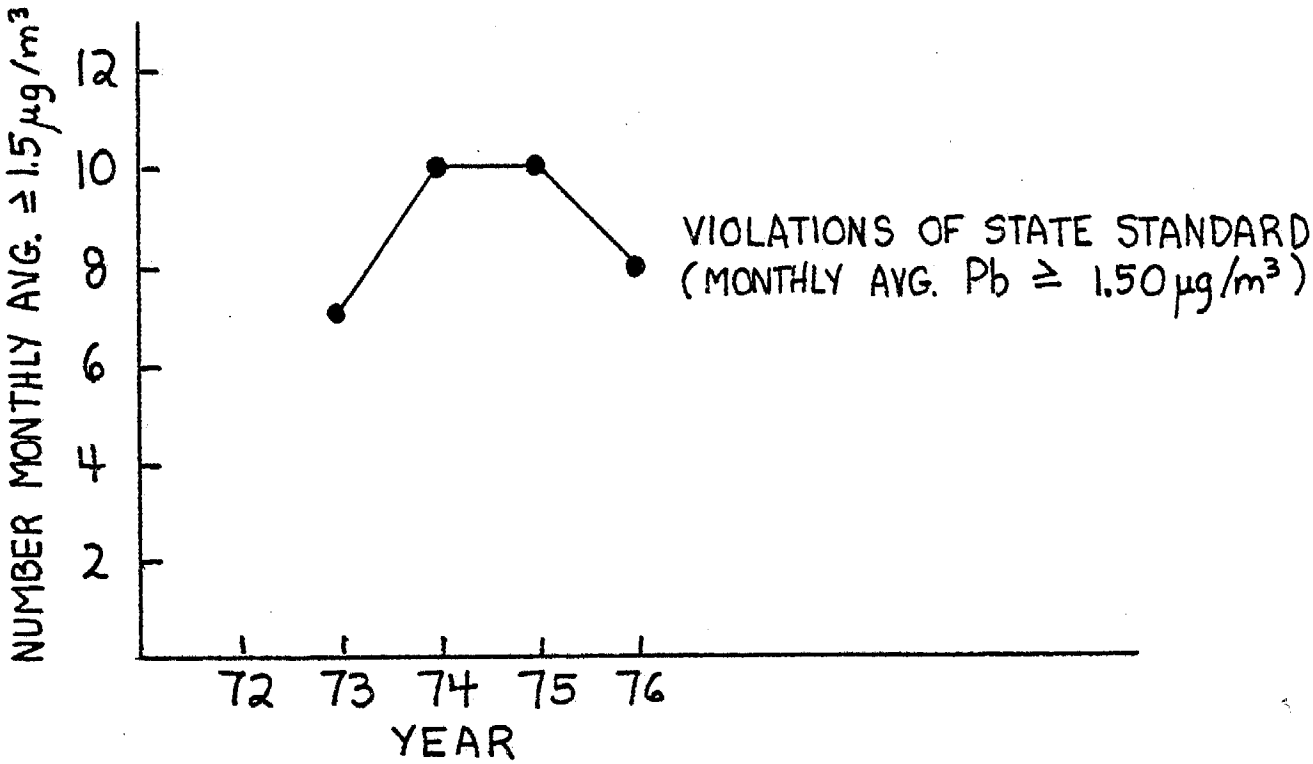
SAN BERNARDINO





LEAD


UPLAND
LEAD, μg/m³
25
20
15
10
5
HIGHEST DAILY AVERAGE OF YEAR
HIGHEST MONTHLY AVERAGE OF YEAR
ANNUAL AVERAGE OF DAILY AVERAGES
72
73
74
75
76
YEAR


NUMBER MONTHLY AVG. ≥ 1.5 μg/m³
12
10
8
6
4
2
VIOLATIONS OF STATE STANDARD
(MONTHLY AVG. Pb ≥ 1.50 μg/m³)
72
73
74
75
76
YEAR

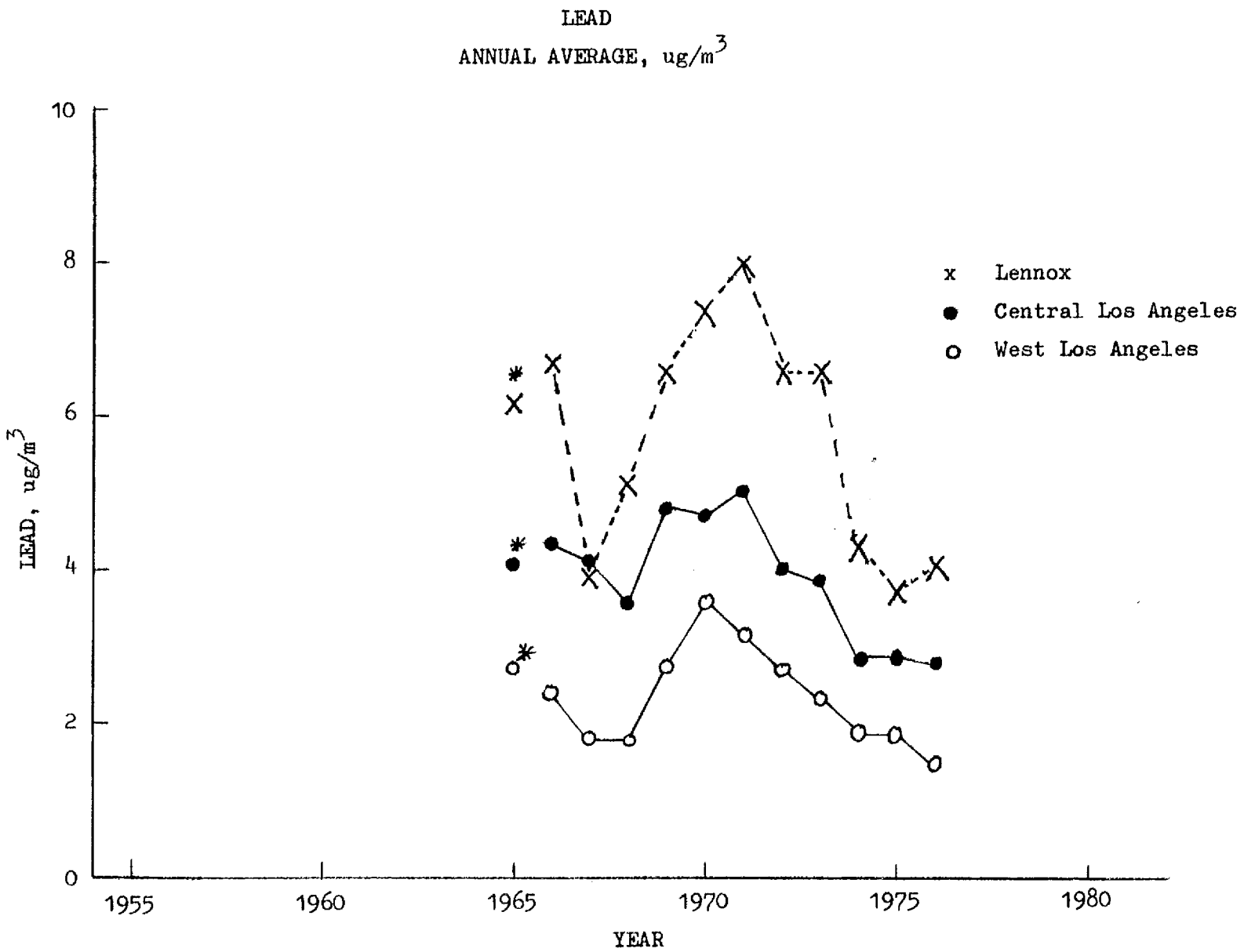


Figure IV.F-18

LEAD

ANNUAL AVERAGE, ug/m^3

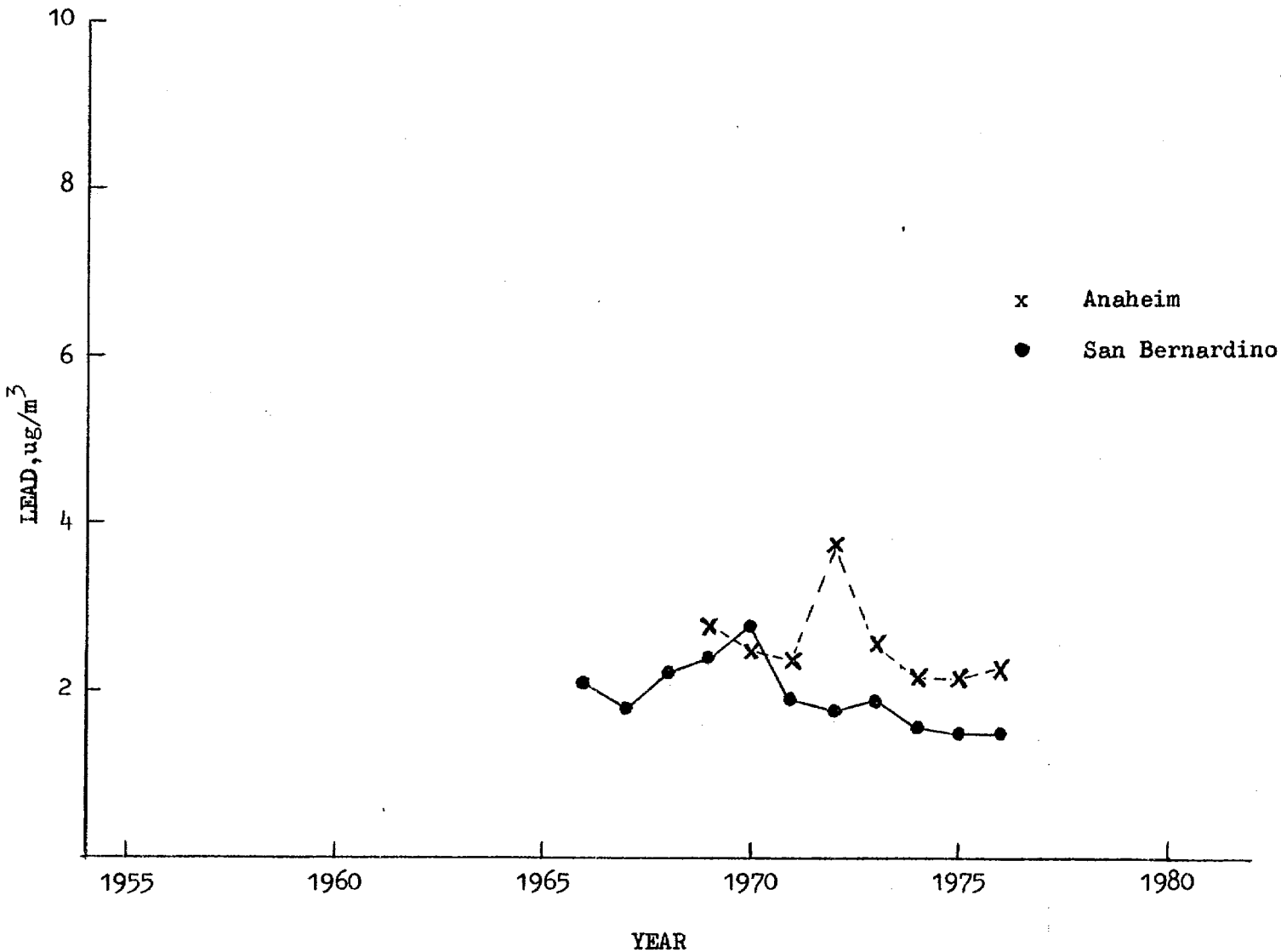


Figure IV.F-19

Table IV.F-I

LEAD

NUMBER OF MONTHS VIOLATING STATE STANDARD (30-DAY AVG. Pb ≥ 1.50 ug/m^3)

ZONE STATION #	Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	12	12	12	12	12	11	11
060	Azusa			12	12	11	9	9
069	Burbank							
071	WLA	12	12	12	11	7	5	4
072	L. B.							
074	Reseda	11	11	12	12	12	12	11
075	Pomona							
076	Lennox	12	12	12	12	12	11	10
080	Whittier							
081	Newhall							
082	Lancaster						1	1
083	Pasadena			12	12	9	10	12
084	Lynwood						5	9
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	12	11	12	12	10	7	10
3177	La Habra		11	12	12	11	7	9
3185	Costa Mesa			5	5	4	5	5
3186	El Toro				0			
3188	San Juan Capistrano							
3189	Laguna					5	4	6
3190	Los Alamitos			10		4	4	6
3191	Santa Ana Canyon						4	7
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs							0
4139	Indio						0	0
4140	Prado Park							
4141	Hemet							
4144	Riverside						6	3
4149	Perris							
4150	Banning							0
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino			8	8	7	4	6
5155	Barstow			1	1	0	0	1
5165	Redlands			8	8	8	2	3
5168	Victorville			0	0	0		0
5173	Chino			6	8	11	6	8
5174	Upland				7	10	10	8
5175	Upland (ARB)							
5176	Fontana			9	2	4	5	3
5177	Big Bear			0	0		0	0
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							
	Ontario Airport			9	6	7		
	Rialto			8	10	8	1	1
	Crestline			0	0	0	1	

LEAD

ANNUAL ARITHMETIC MEAN, ug/m^3

ZONE #	STATION Area	1970	1971	1972	1973	1974	1975	1976
METROPOLITAN ZONE								
001	L. A.	4.77	5.12	4.06	3.89	2.92	2.93	2.72
060	Azusa			3.22	2.19	1.84	1.86	1.68
069	Burbank							
071	WLA	3.63	3.19	2.75	2.34	1.90	1.87	1.50
072	L. B.							
074	Reseda	4.33	4.12	5.09	3.71	2.63	2.81	2.30
075	Pomona							
076	Lennox	7.40	8.04	6.61	6.61	4.36	3.75	4.08
080	Whittier							
081	Newhall							
082	Lancaster					0.64	0.72	0.75
083	Pasadena			3.36	3.01	2.16	2.65	2.88
084	Lynwood					2.16	2.32	2.96
085	Pico Rivera							
SOUTHERN ZONE								
3176	Anaheim	2.50	2.44	3.84	2.58	2.18	2.18	2.33
3177	La Habra		2.17	2.96	2.38	2.22	2.19	2.23
3185	Costa Mesa			1.72	1.73	1.47	1.71	1.68
3186	El Toro				0.90			1.28
3188	San Juan Capistrano							0.89
3189	Laguna					1.62	1.90	1.98
3190	Los Alamitos			2.67		1.94	2.33	2.53
3191	Santa Ana Canyon						1.69	1.71
EASTERN ZONE, RIVERSIDE								
4137	Palm Springs							0.37
4139	Indio						0.80	0.56
4140	Prado Park							
4141	Hemet							
4144	Riverside						1.57	1.47
4149	Perris							
4150	Banning							0.58
4151	Temecula							
4152	Elsinore							
EASTERN ZONE, SAN BERNARDINO								
5151	San Bernardino	2.8	1.9	1.8	1.9	1.6	1.5	1.5
5155	Barstow	1.1	0.4	0.7	0.9	0.7	0.5	0.7
5165	Redlands	3.1	2.1	1.9	1.7	1.6	1.1	1.1
5168	Victorville	1.1	0.6	0.8	0.9	0.9	0.6	0.8
5173	Chino		1.8	1.9	2.2	2.4	1.6	2.1
5174	Upland				2.4	2.2	2.3	1.7
5175	Upland (ARB)							
5176	Fontana		1.2	1.6	1.6	1.5	1.4	1.2
5177	Big Bear		0.2	0.3	0.2		0.3	0.2
5181	L. Gregory							
5182	Yucaipa							
5187	Needles							
5188	Trona							
	Ontario Airport	2.8	1.9	1.7	1.5		1.9	2.5
	Rialto	3.3	1.9	1.9	2.2	2.1	1.1	1.0
	Crestline		0.2	0.5	0.4	0.7	0.9	0.2

LEAD

MONTHLY ARITHMETIC MEAN, ug/m^3

-1976-

MONTH	AREA					
	LOS ANGELES	LENNOX	ANAHEIM	LOS ALAMITOS	RIVERSIDE	SAN BERNARDINO
JAN.	4.67	6.70	3.78	5.32	1.66	1.10
FEB.	2.88	4.20	2.29	2.21	1.08	0.74
MAR.	1.92	3.30	1.82	2.09	1.34	1.20
APR.	2.15	2.26	1.80	1.32	1.22	1.20
MAY	1.64	2.20	1.07	0.58	0.83	1.70
JUNE	2.24	2.07	1.57	1.03	1.07	1.20
JULY	1.28	1.10	1.38	0.74	1.34	1.40
AUG.	1.69	1.46	1.54	1.06	1.18	1.50
SEPT.	2.35	2.73	2.03	1.35	1.39	1.70
OCT.	2.71	4.95	2.21	2.42	1.37	1.70
NOV.	3.67	7.57	3.64	4.92	2.61	2.40
DEC.	4.90	10.04	4.62	6.38	2.94	1.50

Table IV.F-III

DATA SUMMARY - LEAD, ug/m^3

STATION YEAR	ANNUAL MAXIMUM				ANNUAL ARITHMETIC MEAN		NUMBER OF MONTHS IN VIOLATION OF STANDARD	
	DAILY AVERAGE		MONTHLY ARITHMETIC MEAN		DAILY AVERAGES		MONTHLY ARITHMETIC MEAN ≥ 1.5 ug/m^3	
LOS ANGELES COUNTY								
LENNOX								
1972	23.79	A	13.33	B	6.61	B	12	B
1973	20.94	A	14.47	B	6.61	B	12	B
1974	11.08	A	8.30	B	4.36	B	12	B
1975	13.64	A	9.39	C	3.75	C	11	C
1976	12.12	A	10.04	A	4.08	A	10	A
LOS ANGELES								
1972	9.24	A	7.02	B	4.06	B	12	B
1973	20.46	A	6.46	B	3.89	B	12	B
1974	6.60	A	4.85	B	2.92	B	12	B
1975	11.17	A	6.84	C	2.93	C	11	C
1976	7.25	A	4.90	A	2.72	A	11	A
PASADENA								
1972	9.56	A	5.70	B	3.36	B	12	B
1973	6.14	A	4.80	B	3.01	B	12	B
1974	5.37	A	3.19	B	2.16	B	9	B
1975	5.24	A	4.44	C	2.65	C	10	C
1976	6.79	A	5.61	A	2.88	A	12	A
ORANGE COUNTY								
ANAHEIM								
1972	Composite	A	6.0	A	3.84	A	12	A
1973	8.70	A	4.4	A	2.58	A	12	A
1974	6.92	A	3.76	A	2.18	A	10	A
1975	7.00	A	4.77	A	2.18	A	7	A
1976	6.71	A	4.62	A	2.33	A	10	A

Table IV.F-IV

DATA SUMMARY - LEAD, ug/m^3

STATION YEAR	ANNUAL MAXIMUM				ANNUAL ARITHMETIC MEAN		NUMBER OF MONTHS IN VIOLATION OF STANDARD	
	DAILY AVERAGE		MONTHLY ARITHMETIC MEAN		DAILY AVERAGES		MONTHLY ARITHMETIC MEAN $1.5\ ug/m^3$	
LA HABRA								
1972	Composite	A	5.5	A	2.96	A	12	A
1973	8.5	A	4.40	A	2.40	A	12	A
1974	5.9	A	3.67	A	2.22	A	11	A
1975	5.85	A	4.58	A	2.19	A	7	A
1976	6.31	A	4.55	A	2.22	A	9	A
RIVERSIDE COUNTY								
RIVERSIDE								
1972								
1973								
1974	4.12*	A	2.54*	D	2.34*	D	6*	D
1975	3.41	A	2.86	D	1.57	D	6	D
1976	4.48	A	2.94	A	1.54	F, A	3	F, A
SAN BERNARDINO COUNTY								
CHINO								
1972	Composite	E	5.3	E	1.9	E	6	E
1973	Composite	E	4.6	E	2.2	E	8	E
1974	Composite	E,A	4.1	E,A	2.6	E,A	11	E,A
1975	5.4	A	3.7	A	1.7	A	7	A
1976	6.9	A	4.1	A	2.1	A	8	A
SAN BERNARDINO								
1972	Composite	E	2.7	E	1.8	E	8	E
1973	Composite	E	2.7	E	1.9	E	8	E
1974	Composite	E,A	3.1	E,A	1.6	E,A	7	E,A
1975	6.4	A	3.6	A	1.6	A	4	A
1976	4.4	A	2.4	A	1.5	A	6	A

DATA SUMMARY - LEAD, ug/m^3

STATION YEAR	ANNUAL MAXIMUM				ANNUAL ARITHMETIC MEAN		NUMBER OF MONTHS IN VIOLATION OF STANDARD	
	DAILY AVERAGE		MONTHLY ARITHMETIC MEAN		DAILY AVERAGES		MONTHLY ARITHMETIC MEAN 1.5 ug/m^3	
UPLAND								
1972								
1973	Composite	E	5.4	E	2.4	E	7	E
1974	Composite	E,A	5.7	E,A	2.5	E,A	10	E,A
1975	6.4	A	3.2	A	2.4	A	10	A
1976	3.8	A	2.6	A	1.7	A	8	A

A. Derived from original data.
B. "Suspended Particulate Matter in the Atmosphere of Los Angeles County 1965-1974".
C. "Suspended Particulate Matter in the Atmosphere of Los Angeles County 1975".
D. "Semi-Annual Air Monitoring Report" January-June and July-December, 1975 issues, Riverside County A.P.C.D. This data was obtained by analysis of cellulose filters and has been multiplied by 1.3 to allow comparison to data obtained by analysis of glass fiber filters.
E. "1971 Annual Report","1972 Annual Report", "1973 Annual Report", "1974 Annual Report". San Bernardino County.
F. Data for the first three months of 1976 for Riverside was obtained by analysis of cellulose filters. Data for these three months was multiplied by 1.3 to allow comparison to data obtained by analysis of glass fiber filters. Data from all locations except Riverside is for glass fiber filters. Riverside data is for glass fiber filters during the last 9 months of 1976.
"Composite" indicates all filters collected during a given month were combined prior to analysis.
* Yearly statistics may not be representative due to insufficient data.

ANNUAL AVERAGES OF LEAD CONTENT IN AIRBORNE PARTICULATES

1965 - 1976

Year	Annual Arithmetic Mean (AAM) Concentrations of Lead[a] in Particulate Matter, ug/m^3, By Zone and Station[b]																
	Metropolitan Zone									Southern Zone							
	CENT	ESGV[c]	NWCO	73[d]	ESFV[e]	SWCO	ANVA[f]	WSGV[g]	SCLA[h]	ANAH	LAHB	COST	TORO	SJCA	LGNA	LSAL	SACN
1965	4.06		2.75	8.33		6.17											
1966	4.44		2.43	7.22		6.67											
1967	4.15		1.81	4.47	3.92	3.92											
1968	3.63		1.78		2.81	5.29											
1969	4.85		2.75		3.39	6.64				2.86							
1970	4.77		3.63		4.33	7.40				2.50							
1971	5.12	3.45	3.19		4.12	8.04		3.25		2.44	2.17						
1972	4.06	3.22	2.75		5.09	6.61		3.36		3.84	2.96	1.72				2.67	
1973	3.89	2.19	2.34		3.71	6.61	0.88	3.01		2.58	2.38	1.73	0.90			—	
1974	2.92	1.84	1.90		2.63	4.36	0.64	2.16	2.16	2.18	2.22	1.47	—		1.62	1.94	
1975	2.93	1.86	1.87		2.81	3.75	0.72	2.65	2.32	2.18	2.19	1.71	—		1.90	2.33	1.69
1976	2.72	1.68	1.50		2.30	4.08	0.75	2.88	2.96	2.33	2.23	1.68	1.28	0.89	1.98	2.53	1.71

a) These concentrations are reported on the basis of the results obtainable by the method of direct acid extraction and atomic absorption spectrophotometry.

b) For Station designations, see Table X. For Station locations, see the map at the end of this report.

c) Sampling began in July 1971 (6-month average for 1971).

d) Station 73 was discontinued in June 1967 (6-month average for 1967). It was located at 608 North Heliotrope Drive, Los Angeles, between the eastbound and westbound lanes of the Hollywood Freeway.

e) Station opened in September 1967 (4-month average for 1967).

f) Sampling began in July 1973 (6-month average for 1973).

g) Sampling began in July 1971 (6-month average for 1971). This West San Gabriel Valley Station replaced its predecessor in May 1972.

h) Sampling began January 7, 1974.

Table IV.F-V

ANNUAL AVERAGES OF LEAD CONTENT IN AIRBORNE PARTICULATES

1965 - 1976

Year	Annual Arithmetic Mean (AAM) Concentrations of Lead[a] in Particulate Matter, ug/m^3, In the Eastern Zone[b], By Station[c]														
	SNBD	REDL	VCVL	CHIN	UPLA	FONT	BGBE	BARS	PLSP	INDO	RIVR	BANN	ONTR[d]	RIAL[d]	CTLN[d]
1965															
1966	2.1	0.8	1.3	1.3				0.6					1.9	0.8	
1967	1.8	1.1	0.6	2.7				0.5					2.6	0.6	
1968	2.2	1.6	0.7	1.9				0.7					2.6	1.6	
1969	2.4	2.1	0.6	3.1				0.5					3.6	2.4	
1970	2.8	3.1	1.1	—				1.1					2.8	3.3	
1971	1.9	2.1	0.6	1.8	1.8	1.2	0.2	0.4					1.9	1.9	0.2
1972	1.8	1.9	0.8	1.9	—	1.6	0.3	0.7					1.7	1.9	0.5
1973	1.9	1.7	0.9	2.2	2.4	1.6	0.2	0.9					1.5	2.2	0.4
1974	1.6	1.6	0.9	2.4	2.2	1.5	—	0.7					—	2.1	0.7
1975	1.5	1.1	0.6	1.6	2.3	1.4	0.3	0.5		0.80	1.57		1.9	1.1	0.9
1976	1.5	1.1	0.8	2.1	1.7	1.2	0.2	0.7	0.37	0.56	1.47	0.58	2.5	1.0	0.2

a) These concentrations are reported on the basis of the results obtainable by the method of direct acid extraction and atomic absorption spectrophotometry.

b) Prior to 1972, annual averages were based upon December 1 through November 30 data periods.

c) For Station designations, see Table X. For Station locations, see the map at the end of this report.

d) Ontario, Rialto and Crestline Stations monitor only Total Particulate Concentrations. They are not regular air monitoring stations.

SECTION IV.G. SULFATE

SOURCES

Sulfate is formed by oxidation of SO_2. Most SO_2 is from power plants, petroleum processing, and sulfur recovery operations.

As with all contaminants, atmospheric concentrations of sulfate depend on meteorology as well as emissions. Sulfate is affected by conditions which facilitate dispersal or transport of SO_2 and sulfate. In addition, the sulfate forming reaction apparently is sensitive to humidity.

GEOGRAPHICAL DISTRIBUTION

In Figure IV.G-1 the annual arithmetic mean sulfate concentration for 1976 has been plotted on a map of South Coast Air Quality Management District. The highest annual mean occurred in the coastal and central areas of Los Angeles County. Lennox had the highest mean of any station in 1976.

Figure IV.G-2, which shows the highest day of the year, demonstrated that isolated high days may occur in a much broader area. The year's high is found at Riverside. An examination of Figure IV.G-3, which shows the percent of days violating the SO_4 standard in 1976, shows a peak in approximately the same area as the AAM (Figure IV.G-1).

Data for 1972 and 1974 were too limited to allow preparation of maps for those years. The 1976 data are shown in Tables IV.G-I through IV.G-III.