Maricopa County Environmental Services Department

Air Quality Division

2003 Network Review

Acknowledgments

The Maricopa County Air Monitoring Unit maintains several ambient air monitoring networks within the borders of Maricopa County. There have been several changes to the networks, including new sites, new monitors, and dealing with equipment problems. The Air Monitoring Unit continues to be under the direct supervision of Warren Kosters. One new technician was hired this year (Hugh Tom). We would like to thank the other agencies that provided data and helpful comments. These include Arizona Department of Environmental Quality (ADEQ), Pinal County Air Quality Control District (PCAQCD), and Maricopa Association of Governments (MAG). We would especially like to thank all of the air monitoring staff for the excellent job they did in maintaining our air-monitoring network. They are Larry Seals, Tom Shorb, Gary Ensminger, Bill Searle, Dale Foster, Ben Davis, Hugh Tom, Del Hawkins, Robert Dyer, and Marilyn McGilberry

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Abstract

The 2003 Annual Air Monitoring Network Review is being submitted by the Maricopa County Environmental Services Department (MCESD), Air Quality Division to the United States Environmental Protection Agency (USEPA) Region 9. The network review evaluates the adequacy of the ambient air-monitoring network with respect to the monitoring objectives and spatial scales. This is required by 40 CFR Part 58, Appendix F. The National Air Monitoring Stations (NAMS) and State and Local Air Monitoring Stations (SLAMS) are evaluated for their location and adequacy. Network changes, special projects, and data summaries are also included in the review.

Network Design

The purpose of the ambient air monitoring network is to sample air pollution in a variety of settings, assess the health and welfare effects, and assist in determining sources of air pollution. In general, six basic monitoring objectives and five measuring scales are used to determine the network design (see Table -1, -2). Additional items such as availability of power, accessibility to site, security, geographic location, and fiscal and personnel resources are also used in determining feasibility of the network design.

Site Monitoring Objectives

(Table –1)

1. Determine highest concentrations expected to occur in the area covered by the network
2. Determine representative concentrations in areas of high population density
3. Determine the impact on ambient pollution levels of significant sources or source categories
4. Determine general background concentration levels
5. Determine the extent of regional pollutant transport from populated areas, with regards to the secondary standards (such as visibility impairment and effects on vegetation)
6. Determine the welfare-related impacts in more rural and remote areas

When establishing a new monitoring site or reviewing existing sites, one must link monitoring objectives to the physical location of the site. This can be done by correctly matching the spatial scale, which represents the sample of air around the monitor where pollutant concentrations are reasonably uniform, with the most appropriate monitoring objective. Thus, spatial scale represents the physical dimensions of the air parcel around the monitor, and monitoring objective represents the overall purpose of the monitor (see Tables -1, -2). Combining the spatial scale with the monitoring objective gives the how and why air-monitoring sites are located in particular areas.

Spatial Measurement Scale

(Table –2)

Name	**Define parameter (radius)**
Micro Scale	0 to 100 meters
Middle Scale	100 to 500 meters
Neighborhood Scale	0.5 to 4 kilometers
Urban Scale	4 to 50 kilometers
Regional Scale	10 to 100s of kilometers

Since it is physically and fiscally impossible to monitor the air in every location, representative samples must be obtained. These samples are determined by using the monitoring objectives and the spatial measurement scales. For example, there might be numerous locations where the highest concentration of carbon monoxide may occur. Using these principles, only one or two sites will be established to represent all of the high concentration areas. The same reasoning can be used for different types of pollutants. This does not mean that the number of monitoring sites is fixed. To the contrary, the network must be dynamic enough to maintain a current representative sample of the air quality.

One of the fundamental purposes of this review is to provide the citizens of Maricopa County with relevant information, so that they may make better decisions about their lives. This information is used in a variety of different ways. Most importantly it is used to determine the attainment status for parts of Maricopa County. Another way is determining permit conditions of new industries. Mathematical models are created using the data to determine the effectiveness of control programs on pollution levels. Also, other models are created to determine the possible locations of new sites and help in pollution forecasts. MCESD also provides public access to the data by posting it on the Internet in several different forms (see ADDITIONAL COMMENTS).

Special Projects and Network Changes

Air quality issues such as eight-hour ozone non-attainment boundaries and permits for new sources are diverse and controversial subjects for the citizens of Maricopa County. Since no policies can be made without quality data, the MCESD Air Monitoring Unit strives to provide the most reliable and relevant air monitoring data to the public. The following is a list of projects and changes that have occurred during the year 2003.

I. MCESD continues to run part of its carbon monoxide (CO) monitors and ozone (O_3) monitors on a seasonal basis (Table -3). Having part of the network operating seasonally allows us to upgrade instruments, perform preventive maintenance, expand the life expectancy of the instruments, reduce replacement costs, and better utilize our QA and QC resources on the remaining instruments.

Seasonal Monitors
(Table –3)

Seasonal Carbon Monoxide monitors (Sept. 1- Apr. 1)	**Seasonal Ozone monitors (Apr. 1 – Nov. 1)**
1. Dysart Site	1. Cave Creek Site
2. Glendale Site	2. Dysart Site
3. Maryvale Site	3. Falcon Field Site
4. Mesa Site	4. Glendale Site
5. North Phoenix Site	5. Humboldt Mountain Site
6. South Phoenix Site	6. Maryvale Site
7. South Scottsdale Site	7. Mesa Site
8. Surprise Site	8. Rio Verde Site
9. Tempe Site	9. Surprise Site
10. West Chandler Site	10. Tempe Site
	11. West Chandler Site

II. MCESD shut down the ozone monitor at the Mesa site (04-013-1003). This closure is a result of the evaluation of the ozone network by MCESD, ADEQ, and the EPA. The equipment will be used to better characterize underrepresented sections of the valley. The nearest active ozone monitor is at the Tempe site (04-013-4005) three miles to the west. Also the Maryvale site (04-013-3006) was determined to be a good candidate to move to a new site near Buckeye, AZ. The site will be shut down as of March 31, 2004

III. As of December 2003, MCESD has replaced all of the Dasibi multi-gas and ozone instruments. Obtaining and setting up the new multi-gas calibrators was problematic and resulted in the shutting down of the nitrogen dioxide monitors for several months (see ADDITIONAL COMMENTS)

IV. MCESD continues to participate in the Joint Air Toxic Assessment Project (JATAP) in conjunction with ADEQ and Phoenix area Urban Tribal Communities. We have been providing space at our existing sites (South Phoenix and West 43rd) for Hazardous Air Pollutants (HAP) monitoring. We have assisted in building an emission inventory and determining new monitoring sites.

V. ADEQ in corporation with MCESD have developed a year round air quality forecasting capability for the Phoenix Metro Area. ADEQ will take the lead on the forecasting and issuing of High Pollution Advisories. MCESD will provide pollution data and will issue No Burn Days.

VI. MCESD participated in the Salt River Monitoring Study. The study was conceived to provide sufficient data to correct the inadequacy of the PM-10 SIP (see ADDITIONAL COMMENTS).

VII. MCESD is continuing its distribution of pollution data to the public by posting one-hour continuous data on the Internet. Additionally, MCESD participates in the EPA Ozone Mapping AIRNOW website (see ADDITIONAL COMMENTS). The corresponding websites are as follows.

- http://www.maricopa.gov/envsvc/air/ozair_map.asp
- http://www.epa.gov/airnow

VIII. MCESD continues to evaluate the PM-10 network for possible additional sites for determining the impact on ambient pollution levels of significant sources or source categories. The significant sources would include industry and agriculture. Resource allocation, both financial and personnel, continue to remain an obstacle in establishing new monitoring sites

Data Summaries

CRITERIA AIR POLLUTANTS

A few air pollutants, called "criteria air pollutants," are common throughout the United States. These pollutants can cause health problems, pollute the environment, and cause property damage. The EPA calls these pollutants criteria air pollutants because they have regulated them by first developing health-based criteria as the basis for setting allowable levels. One set of limits, called primary standards, protects health, while the other, called secondary standards, protects property and the environment.

The MCESD Air Monitoring Unit maintained twenty-six ambient air-monitoring sites throughout Maricopa County (Table -4). The dates that the sites were established range from 1961 (Central Phoenix) to 2003 (Dysart). Land use patterns around these sites vary from heavy populated urban areas to sparsely populated rural settings. Site elevation ranges from near the Salt River channel to the top of Humboldt Mountain. MCESD operates monitors for the following criteria pollutants: Carbon Monoxide, Ozone, Particulates, Nitrogen Dioxide, and Sulfur Dioxide. Since the levels have been consistently below national levels, MCESD has been allowed to stop monitoring for lead. Table –5 lists what monitors are operated at what sites.

The following discussion focuses on Maricopa County's Ambient Air Monitoring Network as it relates to the criteria pollutants and monitoring objectives of the National Air Monitoring Stations (NAMS), State and Local Air Monitoring Stations (SLAMS), and Special Purpose Monitors (SPM).

Maricopa County Ambient Air Monitoring Sites for 2003
(Table -4)

Sites	Site Abbr.	AQS Code
Blue Point	BP	04-013-9702
Cave Creek	CC	04-013-4008
Chandler	CH	04-013-0021
Central Phoenix	CP	04-013-3002
Durango Complex	DC	04-013-9812
Dysart	DY	04-013-4010
Falcon Field	FF	04-013-1010
Fountain Hills	FH	04-013-9704
Glendale	GL	04-013-2001
Greenwood	GR	04-013-3010
Higley	HI	04-013-4006
Humboldt Mountain	HM	04-013-9508
Maryvale	MA	04-013-3006

Sites	Site Abbr.	AQS Code
Mesa	ME	04-013-1003
North Phoenix	NP	04-013-1004
Pinnacle Peak	PP	04-013-2005
Rio Verde	RV	04-013-9706
Salt River	SA	04-013-3007
South Phoenix	SP	04-013-4003
South Scottsdale	SS	04-013-3003
Surprise	SU	04-013-4007
Tempe	TE	04-013-4005
West Chandler	WC	04-013-4004
West 43rd Ave.	WF	04-013-4009
W. Indian School Rd.	WI	04-013-0016
West Phoenix	WP	04-013-0019

Criteria Pollutants by Sites
(Table -5)

O3		CO		PM-10		NO2	SO2
BP (n)	NP (s)	CP (n)	WC (s)	CH (n)	SA (sp)	CP. (n)	CP (n)
CC (sp)	PP (s)	**DY (s)**	WI (n)	CP (n)	SP (n)	GR (s)	SS (n)
CP (n)	RV (s)	GL (s)	WP (n)	**DC** (s)	SS (n)	SS (n)	
DY (s)	SP (s)	GR (s)	SU (sp)	**DY (s)**	SU (sp)	TE (sp)	
FF (s)	SS (n)	TE (sp)		HI (sp)	WC (s)	WP (s)	
FH (n)	SU (sp)	MA (s)		GL (n)	WF (s)		
GL (s)	TE (sp)	ME (s)		GR (s)	WP (n)	(s) = SLAMS (n) = NAMS	
HM (s)	WC (s)	NP (s)		MA (s)		(sp) = Special Purpose Monitor	
MA (s)	WP (s)	SP (s)		ME (s)		**Bold = changes to site**	
ME (s)		SS (s)		NP (s)		Underline = changes to site are pending	

CARBON MONOXIDE (CO)

During 2003, fourteen CO monitors were reported as operational to the USEPA Air Quality System (AQS). Three of the monitors were classified as NAMS, nine as SLAMS, and two reported as a Special Purpose Monitor (SPM) (Table -5). For Calendar Year 2003, no exceedances of the CO 1-hour or 8-hour standards were recorded at any MCESD monitoring sites (see Table -6).

2003 1-HR AND 8-HR AVERAGE CARBON MONOXIDE SUMMARY
(Table -6)

Site	CO 1-HR AVG. MAX. (PPM) Date: Time	CO 1-HR AVG. 2nd High (PPM) Date: Time	Number of Samples	CO 8–HR AVG. MAX (PPM) Date: Time	CO 8–HR AVG. 2nd High (PPM) Date: Time	Number of Exceedances of 1/8-HR AVG.
C. Phoenix	5.9 01/01: 00	5.4 01/01: 01	8474	4.6 01/01: 05	3.8 12/19: 02	0/0
Dysart	1.8 12/10: 07	1.6 11/26: 07	2623	1.2 11/10: 22	1.1 12/05: 21	0/0
Glendale	5.7 12/26: 11	3.5 01/27: 21	4800	2.4 12/21: 05	2.3 01/15: 01	0/0
Greenwood	6.8 01/01: 02	6.8 01/17: 08	8599	5.4 01/01: 05	5.1 01/04: 03	0/0
Maryvale	5.8 12/25: 00	5.7 12/18: 08	4503	4.2 12/05: 08	4.1 02/02: 02	0/0
Mesa	3.5 01/27: 22	3.4 01/19: 21	4683	2.5 01/28: 02	2.2 01/05: 02	0/0
N. Phoenix	4.0 01/17: 07	4.0 12/18: 08	4767	2.3 12/05: 11	2.1 01/15: 00	0/0
S. Phoenix	5.8 12/18: 19	5.5 01/17: 20	4698	3.6 01/01: 05	3.3 01/04: 01	0/0
South Scottsdale	4.1 12/05: 08	4.0 12/03: 20	4754	2.3 12/03: 23	2.2 01/05: 02	0/0
Surprise	3.6 03/20: 11	1.8 03/24: 08	2124	1.2 03/20: 13	0.8 01/15: 19	0/0
Tempe	3.8 01/07: 08	3.7 01/04: 23	4594	2.9 01/05: 02	2.4 02/02: 01	0/0
West Chandler	3.9 12/18: 22	3.3 12/06: 21	4799	2.6 01/01: 05	2.6 12/19: 01	0/0
W. Indian School	6.8 01/23: 07	6.8 01/24: 07	8611	5.4 01/01: 05	5.3 01/04: 01	0/0
W. Phoenix	7.5 12/17: 07	7.3 12/18: 07	8424	6.2 01/01: 05	5.5 01/04: 02	0/0

CO is the most widely distributed and most commonly occurring air pollutant. Total emissions of CO to the atmosphere exceed all other pollutants combined, on a weight basis. Fortunately, CO does not persist in the atmosphere, but is quickly converted to Carbon Dioxide (CO_2). CO can reach dangerous levels in localized areas or hotspots such as heavily traveled intersections or city streets. In addition, CO has been implicated in ozone formation. Most people are familiar with CO and are aware that automobiles produce this deadly odorless and colorless gas. In Maricopa County, more than 70% of the entire manmade CO comes from vehicle emissions. In fact, this gas is produced almost anytime something is burned. All substances that are living (plants, animals) or that were once living (wood, coal, oil, gasoline) are composed of carbon compounds. If these substances are burned in the presence of sufficient oxygen, the carbon is converted to CO_2 gas. If, as is often the case, not enough oxygen is present, carbon monoxide gas is produced.

Carbon monoxide's danger lies in the extremely strong affinity that hemoglobin has for it. Hemoglobin, the special oxygen-transporting material in the red blood cell, has approximately 200 times stronger affinity for CO than for oxygen. Therefore, if both CO and O_2 are present the bonding between the CO and hemoglobin will prevent the O_2 from exchanging with your body. This puts a heavy burden on people with heart disease and can

aggravate angina, but even healthy people can suffer from harmful side effects from CO. In 2003 Maricopa County achieved its seventh year of compliance with the eight-hour CO standard.

OZONE (O_3)

During 2003, eighteen ozone monitors were reported as operational in AQS. Four of the monitors were identified as NAMS, eleven were identified as SLAMS, and three were identified as a SPM (Table -5). For Calendar Year 2003, no exceedances of the ozone 1-hour average standard were recorded at Maricopa County monitoring sites (Table -7).

2003 ONE HOUR AVERAGE OZONE SUMMARY
(Table -7)

Site	Max. (PPM) Date: Time	2nd High (PPM) Date: Time	3rd High (PPM) Date: Time	4th High (PPM) Date: Time	Number of Exceed.	Number of Samples
Blue Point	.122 07/22: 18	.116 07/21: 15	.101 07/14: 15	.100 06/30: 15	0	8518
Cave Creek	.102 05/22: 15	.098 05/11: 17	.097 05/27: 17	.097 07/30: 14	0	4922
C. Phoenix	.102 07/24: 14	.097 07/22: 15	.093 08/16: 15	.092 08/17: 16	0	8482
Dysart	.090 08/16: 15	.089 08/14 :16	.087 08/17: 15	.085 07/22: 14	0	2284
Falcon Field	.111 07/22: 17	.104 07/21: 15	.102 07/24: 16	.099 08/12: 15	0	5001
Fountain Hills	.117 07/22: 17	.106 07/21: 15	.102 08/20: 17	.100 09/27: 16	0	8606
Glendale	.107 08/16: 15	.098 08/17: 16	.096 07/22: 14	.094 05/11: 15	0	4990
Humboldt Mt.	.104 05/22: 17	.099 05/27: 18	.099 07/30: 17	.097 05/11: 19	0	4864
Maryvale	.099 07/22: 14	.098 08/17: 15	.095 08/16: 14	.093 05/11: 15	0	5065
N. Phoenix	.113 08/16: 16	.105 07/22: 16	.099 09/04: 14	.098 07/16: 13	0	8531
Pinnacle Peak	.103 07/22: 16	.098 05/27: 18	.097 05/11: 17	.097 07/21: 15	0	8371
Rio Verde	.113 07/22: 18	.102 08/20: 18	.099 07/21: 15	.097 08/12: 15	0	4903
S. Phoenix	.095 07/24: 14	.089 05/11: 15	.089 07/22: 15	.087 08/12: 13	0	8589
S. Scottsdale	.107 07/22: 16	.099 07/19: 14	.099 07/24: 15	.099 08/16: 17	0	8474
Surprise	.088 05/11: 16	.078 05/09: 19	.075 05/12: 17	.074 05/10: 17	0	2442
Tempe	.109 08/12: 14	.099 05/31: 13	.098 07/24: 15	.096 07/22: 16	0	4992
W. Chandler	.101 05/31: 14	.099 08/07: 14	.098 09/28: 14	.096 07/06: 14	0	5027
West Phoenix	.099 07/22: 15	.091 05/11: 15	.091 07/24: 13	.091 08/16: 14	0	8254

# indicates <75% data available

In 2003 Maricopa County achieved its seventh year of compliance with the one-hour standard. However, the urbanized area of Maricopa County currently retains its designation as a serious non-attainment area. MAG has prepared a maintenance plan for submission to the USEPA to allow Maricopa County to be re-designated to an attainment area for the one-hour ozone standard.

On July 18, 1997 the Environmental Protection Agency promulgated a new ozone standard to ensure a more effective and efficient protection of public health and the environment. The new purposed Primary Standard for ozone is 0.08 ppm. Compliance with the standard is determined by averaging the 4th highest eight-hour average over a three-year period. This three-year average must be less than or equal to 0.08 ppm. It should be noted that the US Supreme Court has recently allowed the USEPA to implement the new ozone standard.

For Calendar Year 2003, there were twelve sites that exceeded the eight-hour primary standard for ozone. The following is the 2003 data summary for eight-hour ozone at MCESD monitoring sites (Table -8). Additionally, two sites violated the eight-hour primary standard (Table -22)

2003 PROPOSED 8-HR AVERAGE OZONE SUMMARY
(Table -8)

Site	8-HR MAX (PPM) Date: Time	2nd HIGH (PPM) Date: Time	3rd HIGH (PPM) Date: Time	4th HIGH (PPM) Date: Time	Number of DAYS ≥ .085
Blue Point	.103 07/22: 13	.088 07/21: 11	.087 07/23: 12	.086 05/27: 10	4
Cave Creek	.088 05/27: 11	.087 05/11: 11	.083 05/22: 11	.083 07/30: 12	2
Central Phoenix	.084 08/16: 12	.083 07/22: 11	.080 05/11: 10	.079 08/17: 11	0
Dysart	.082 08/16: 11	.075 07/22: 11	.075 08/17: 11	.073 08/14: 11	0
Falcon Field	.099 07/22: 12	.079 07/21: 10	.079 07/23: 11	.079 08/12: 10	1
Fountain Hills	.099 07/22: 13	.083 05/11: 11	.083 07/21: 11	.083 07/23: 12	1
Glendale	.092 08/16: 12	.088 05/11: 11	.088 08/17: 11	.085 05/21: 11	4
Humboldt Mt.	.089 05/11: 14	.089 05/27: 14	.087 05/22: 13	.087 07/30: 11	5
Maryvale	.087 08/17: 11	.086 05/11: 11	.083 05/21: 11	.083 07/22: 11	2
North Phoenix	.093 07/22: 11	.092 08/16: 12	.088 05/11: 11	.086 07/16: 11	4
Pinnacle Peak	.093 07/22: 12	.089 05/11: 14	.085 05/27: 12	.083 07/30: 12	3
Rio Verde	.096 07/22: 13	.085 07/21: 10	.084 05/11: 11	.083 07/23: 12	2
South Phoenix	.083 05/11: 11	.079 07/22: 11	.077 08/17: 11	.076 05/27: 11	0
South Scottsdale	.097 07/22: 10	.085 05/11: 11	.085 08/16: 12	.079 07/23: 10	3
Surprise	.079 05/11: 12	.070 05/09: 14	.067 05/01: 12	.066 05/10: 11	0
Tempe	.086 07/22: 11	.083 05/11: 10	.080 07/23: 10	.080 08/12: 10	1
West Chandler	.082 05/11: 11	.079 05/31: 10	.080 07/23: 10	.080 08/12: 10	0
West Phoenix	.081 05/11: 10	.081 07/22: 11	.080 08/16: 11	.077 05/21: 11	0

# Indicates <75% data available

Ozone is a naturally occurring compound in which three oxygen atoms combine together. This is an unstable combination, and ozone is continually going through a natural cycle of being formed and then converting back to the more stable "normal" double oxygen compound. The cycle occurs fairly rapidly. In the stratosphere (6 miles and more above the earth), natural ozone has a beneficial effect of screening out harmful ultraviolet light from the sun. Ozone is a major component of the brown haze smog in our breathing air. Ozone is not directly emitted into the air, but rather forms in a complex reaction that involves heat, sunlight, and a "soup" of toxic pollutants, especially Volatile Organic Compounds (VOCs). Some of the most common sources of VOCs are gasoline vapors, chemical solvents, and combustion products of fuels and consumer products. Ozone is created by sunlight acting on nitrates (NO_X) and VOCs from motor vehicles and stationary sources, and can be carried

hundreds of miles from their origins. Ozone affects the respiratory system in people and animals, and also affects the growth of plants.

PARTICULATE MATTER (PM-10)

During 2003, seventeen PM-10 monitors were reported as operational in AQS. Six monitors were identified as NAMS, eight were identified as SLAMS, and three were identified as SPM (Table -5). The Central Phoenix site (CP) has both a continuous particulate monitor and a 6-day SSI High Volume Monitor.

For Calendar Year 2003, there were twelve sites that exceeded the PM-10 twenty-four hour standard. Additionally, there were five sites that exceeded the PM-10 annual standard (Table -9). For Calendar Year 2003, there were ten sites that violated the PM-10 24-hour standard and five sites that violated the PM-10 annual standard (Table –20, -21).

2003 PARTICULATE SUMMARY
(Table -9)

Site	24hr Avg. Max (µg/m3)	24hr Avg. 2nd High (µg/m3)	Number of Exceedances	Expected Exceedances	Annual Avg. (µg/m3)	Number of Samples
Central Phoenix	114	87	0	0	40	59 of 61
Central Phoenix (continuous)	* 183	* 175	3	3.1	43	7887 of 8760
Chandler	* 240	126	1	6	50	60 of 61
Durango Complex	* 195	128	1	6	* 62	61 of 61
Dysart	133	86	0	0	#	29 of 29
Glendale	151	129	0	0	36	61 of 61
Greenwood	* 166	126	1	6	* 51	60 of 61
Higley	* 225	151	1	6	* 62	58 of 61
Maryvale	151	137	0	0	42	61 of 61
Mesa	* 176	112	1	6	34	61 of 61
North Phoenix	* 155	132	1	6	34	59 of 61
South Phoenix	* 164	135	1	6	* 52	60 of 61
South Scottsdale	* 172	124	1	6	36	61 of 61
Surprise	42	32	0	0	#	22 of 22
West Chandler	* 206	* 197	2	13.7	42	59 of 61
West Forty Third	* 157	154	1	6	* 62	60 of 61
West Phoenix	* 158	136	1	6.4	46	60 of 61

* Indicates an Exceedance of the Standard. # indicates <75% data available

Particulate Matter is the term for solid or liquid particles found in the air. While some particles are large or dark enough to be seen as soot or smoke, others can only be seen through an electron microscope. In 1987 the EPA replaced the TSP (Total Suspended Particulates) air quality standard with a PM-10 (particles measuring less than ten microns) Standard. Research found that PM-10 has the ability to reach the lower regions of the respiratory tract. PM-10 affects the respiratory system in people and animals. Particulates that have high acid levels can cause damage to man-made materials and reduce visibility.

On July 2, 2002 (67 FR 44369), EPA found the state implementation plan (SIP) for the Metropolitan Phoenix (Maricopa County), Arizona serious PM-10 non-attainment area to be inadequate to attain the 24-hour particulate (PM-10) air quality standard at the Salt River monitoring site. Under authority from the Clean Air Act, EPA has required a SIP revision to be submitted by the State of Arizona to correct the inadequacy.

Particulate Matter (PM-2.5)

Since attainment designations for the new particulate standard (PM-2.5) will soon be announced, MCESD has started to implement its own PM-2.5 network. Currently, MCESD operates two collocated PM 2.5 monitors at the West Phoenix site. Future locations for PM-2.5 monitors include South Phoenix and North Phoenix sites. However, the Arizona Department of Environmental Quality (ADEQ) will still prepare, analysis, and report the data. ADEQ operates several other PM 2.5 monitors in the county including Estella, Palo Verde, Supersite, and Tempe Community Center. ADEQ reports the PM-2.5 data in their annual report.

NITROGEN DIOXIDE (NO_2)

All parts of Maricopa County are in attainment for nitrogen dioxide. During 2003, five NO_2 monitors were operational and were reported in AQS. Two monitors were designated as NAM's monitors, two designated as SLAMS, and one was designated as SPM (see Table -5).

For Calendar Year 2003, no exceedances of the NO_2 annual standard were recorded at MCESD monitoring sites (Table -10).

2003 NITROGEN DIOXIDE SUMMARY
(Table -10)

Site	NO2 Avg. 1-HR Max. (PPM) Date: Time	NO2 Avg. 1-HR 2^{ND} High (PPM) Date: Time	Number of 1-hr Samples	Annual Avg. (PPM)
Central Phoenix	.082 10/19: 21	.081 05/21: 20	7031	.0293
Greenwood	.101 01/16: 10	.097 01/16: 08	7164	.0343
South Scottsdale	.076 05/16: 20	.071 01/30: 18	5590	#
Tempe	.062 01/03: 17	.060 01/16: 19	1885	#
West Phoenix	.084 12/02: 10	.077 01/02: 09	4362	#

* Indicates an Exceedance of the Standard # Indicates <75% data available

MCESD continued to suffer reliability problems with our new multi-gas calibrators. This was the major factor in having three sites with less than 75% data recovery.

NO_2 belongs to a family of highly reactive gases called nitrogen oxides. These gases are formed when fuel is burned at high temperatures, and are emitted primarily from automobile exhaust and power plants. Exposure to nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections, particularly in people with existing respiratory illness such as asthma.

SULFUR DIOXIDE (SO_2)

Maricopa County is in attainment for SO_2. During 2003, two SO_2 monitors were operational and were reported in AQS. Both of these monitors were designated NAMS sites (see Table -5). For Calendar Year 2003 no exceedances of the SO_2 annual, 24-hour, or 3-hour standard were recorded at Maricopa County monitoring sites (see Table -11).

2003 SULFUR DIOXIDE SUMMARY

(Table -11)

Site	1-HR MAX (PPM) Date: Time	1-HR 2nd (PPM) Date: Time	3-HR MAX (PPM) Date: Time	3-HR 2nd (PPM) Date: Time	24-HR MAX (PPM) Date: Time	24-HR 2nd (PPM) Date: Time	Annual Avg. (PPM)	Number of Samples
Central Phoenix	.015 01/16: 08	.015 12/18: 22	.014 12/18: 23	.013 01/03: 23	.007 01/16: 23	.007 01/17: 23	.003	8493
South Scottsdale	.030 12/13: 11	.020 12/13: 12	.012 01/16: 23	.012 01/17: 02	.005 12/13: 23	.004 01/24: 23	.002	8430

* Indicates an Exceedance of the Standard

SO_2 is emitted largely from burning high-sulfur coal, oil, and diesel fuel. Because this gas is usually found in association with particulate pollution, as SO_2 is the precursor for fine sulfate particles, separating the health effects of these two pollutants is difficult. Together SO_2 and PM-10 make up a major portion of the pollutant load in many cities, acting separately and in concert to damage public health.

LEAD / TSP

The monitoring of Lead/TSP. was discontinued in 1997.

REQUIRED INFORMATION

The following are tables (12 -16) of summary data required by the 40 CFR Part 58 App. F.

CONCENTRATION RANGES

Carbon Monoxide Ranges (PPM)

(Table –12)

Number of 8-hr Avg. Values	0 to 4	5 to 8	9 to 12	13 to 16	17 to 20	21 to 24	25 to 28	Greater than 28
Central Phoenix	8522	0	0	0	0	0	0	0
Dysart	2645	0	0	0	0	0	0	0
Glendale	4847	0	0	0	0	0	0	0
Greenwood	8669	16	0	0	0	0	0	0
Maryvale	4547	0	0	0	0	0	0	0
Mesa	4739	0	0	0	0	0	0	0
North Phoenix	4821	0	0	0	0	0	0	0
South Phoenix	4735	0	0	0	0	0	0	0
South Scottsdale	4816	0	0	0	0	0	0	0
Surprise	2149	0	0	0	0	0	0	0
Tempe	4625	0	0	0	0	0	0	0
West Chandler	4855	0	0	0	0	0	0	0
W. Indian School	8657	55	0	0	0	0	0	0
West Phoenix	8464	45	0	0	0	0	0	0

Ozone Ranges (PPM)

(Table –13)

Number of 1-hr Avg. Values	0.00 to 0.04	0.05 to 0.08	0.09 to 0.12	0.13 to 0.16	0.17 to 0.20	0.21 to 0.24	0.25 to 0.28	Greater than .28
Blue Point	5750	2691	77	0	0	0	0	0
Cave Creek	2048	2840	34	0	0	0	0	0
Central Phoenix	6815	1642	25	0	0	0	0	0
Dysart	586	8	0	0	0	0	0	0
Falcon Field	2960	1994	27	0	0	0	0	0
Fountain Hills	5816	2729	61	0	0	0	0	0
Glendale	3536	1424	30	0	0	0	0	0
Humboldt Mt.	475	4340	49	0	0	0	0	0
Maryvale	3296	1741	28	0	0	0	0	0
North Phoenix	6433	2051	47	0	0	0	0	0
Pinnacle Peak	4607	3713	51	0	0	0	0	0
Rio Verde	2464	2375	64	0	0	0	0	0
South Phoenix	6756	1821	12	0	0	0	0	0
South Scottsdale	6641	1799	34	0	0	0	0	0
Surprise	1524	916	2	0	0	0	0	0
Tempe	3337	1625	30	0	0	0	0	0
West Chandler	3197	1807	23	0	0	0	0	0
West Phoenix	6568	1670	16	0	0	0	0	0

Nitrogen Dioxide Ranges (PPM)

(Table –14)

Number of 1-hr Avg. Values	0.00 to 0.04	0.05 to 0.08	0.09 to 0.12	0.13 to 0.16	0.17 to 0.20	0.21 to 0.24	0.25 to 0.28	Greater than .28
Central Phoenix	5660	1371	0	0	0	0	0	0
Greenwood	4955	2198	11	0	0	0	0	0
South Scottsdale	5186	404	0	0	0	0	0	0
Tempe	1799	86	0	0	0	0	0	0
West Phoenix	3781	581	0	0	0	0	0	0

Sulfur Dioxide Ranges (PPM)

(Table –15)

Number of 24-hr Avg. Values	0.00 to 0.04	0.05 to 0.08	0.09 to 0.12	0.13 to 0.16	0.17 to 0.20	0.21 to 0.24	0.25 to 0.28	Greater than .28
Central Phoenix	8661	0	0	0	0	0	0	0
South Scottsdale	8561	0	0	0	0	0	0	0

PM- 10 Ranges (ug/m^3)

(Table –16)

Number of 24-hr Avg. Values	0 to 50	51 to 100	101 to 150	151 to 200	201 to 250	251 to 300	301 to 400	Greater than 400
Central Phoenix	46	12	1	0	0	0	0	0
Chandler	38	16	5	0	1	0	0	0
Durango	28	24	8	1	0	0	0	0
Dysart	24	4	1	0	0	0	0	0
Glendale	53	6	2	0	0	0	0	0
Greenwood	33	25	1	1	0	0	0	0
Higley	26	24	6	1	1	0	0	0
Maryvale	48	11	2	0	0	0	0	0
Mesa	54	5	1	1	0	0	0	0
North Phoenix	53	4	1	1	0	0	0	0
South Phoenix	34	23	2	1	0	0	0	0
South Scottsdale	52	6	2	1	0	0	0	0
Surprise	22	0	0	0	0	0	0	0
West Chandler	48	8	1	1	1	0	0	0
West 43rd Ave.	25	28	5	2	0	0	0	0
West Phoenix	38	20	1	1	0	0	0	0

DATA COMPLETENESS

Before any data set can be considered valid it must first pass the data recovery test. This test consists of determining the ratio of actual samples to scheduled samples by quarter. This ratio must be greater than 75% for a data set to be considered valid. After validation the data can be used to determine compliance with the NAAQS.

The following is a summary of the annual data completeness for all of the criteria pollutants (Table –17).

2003 CRITERIA POLLUTANT DATA COMPLETENESS
(Table –17)

	Number of Actual Samples	**Number of Scheduled Samples**	**Data Completeness (Actual/Schedule)**
Carbon Monoxide	76,453	80,404	95.1%
Ozone	112,315	116,376	96.5%
PM-10 (1in 6 day)	891	905	98.5%
PM-10 (continuous)	7887	8760	90.0%
Nitrogen Dioxide	26,032	42,336	61.5%
Sulfur Dioxide	16,923	17,520	96.6%
Total	**240,501**	**266,301**	**90.3%**

COMPLIANCE - NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

The EPA Office of Air Quality Planning and Standards OAQPS manages programs to improve air quality in areas where the current quality is unacceptable and to prevent deterioration in areas where the air is relatively free of contamination. To accomplish this task, OAQPS establishes the National Ambient Air Quality Standard (NAAQS) for each of the criteria pollutants.

There are two types of standards. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Because different pollutants have different effects, the NAAQS are also different. Some pollutants have standards for both long-term and short-term averaging times. The short-term standards are designed to protect against acute, or short-term, health effects, while the long-term standards are established to protect against chronic health effects.

The following is a table of the NAAQS for six criteria pollutants (Table –18).

NATIONAL AMBIENT AIR QUALITY STANDARDS
(Table –18)

Pollutant	Primary Standards	Averaging Times	Secondary Standard
Carbon Monoxide	9 ppm	8-hour[1]	None
	35 ppm	1-hour[1]	None
Lead	1.5 µg/m^3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm	Annual (Arithmetic Mean)	Same as Primary
PM_{10}	50 µg/m^3	Annual[2] (Arithmetic. Mean)	Same as Primary
	150 µg /m^3	24-hour[1]	
$PM_{2.5}$	15 µg/m^3	Annual[3] (Arithmetic Mean)	Same as Primary
	65 µg/m^3	24-hour[4]	
Ozone	0.08 ppm	8-hour[5]	Same as Primary
	0.12 ppm	1-hour[6]	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic. Mean)	-------
	0.14 ppm	24-hour[1]	-------
	-------	3-hour[1]	0.5 ppm

[1] Not to be exceeded more than once per year.

[2] To attain this standard, the expected annual arithmetic mean PM10 concentration at each monitor within an area must not exceed 50 ug/m^3.

[3] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15 ug/m^3.

[4] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 ug/m^3.

[5] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

[6] (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is <= 1,
(b) The 1-hour standard is applicable to all areas notwithstanding the promulgation of 8-hour ozone standards under Sec. 50.10. On June 2, 2003, (68 FR 32802) EPA proposed several options for when the 1-hour standard would no longer apply to an area.

2003 NAAQS EXCEEDANCE AND VIOLATION SUMMARY

The following is a summary of the number, types and dates of exceedances of the NAAQS for 2003 (Table – 19).

(Table –19)

Carbon Monoxide	No Exceedances of the 1-hr or 8hr NAAQS standard were logged		
Ozone	No Exceedances of 1-hr NAAQS were logged. See Table -8 - for 8-hr summary		
Nitrogen Dioxide	No Exceedances of NAAQS were logged		
Sulfur Dioxide	No Exceedances of NAAQS were logged		
Particulates	**There were four days when at least one monitor exceeded the 24 hr.**		
	Site	Date	Value
	CP (continuous)	7/14/03	175 ug/m^3
	CP (continuous)	7/15/03	155 ug/m^3
	CP (continuous)	7/16/03	183 ug/m^3
	CH	7/14/03	240 ug/m^3
	DC	7/14/03	195 ug/m^3
	GR	7/14/03	166 ug/m^3
	HI	7/14/03	225 ug/m^3
	ME	7/14/03	176 ug/m^3
	NP	7/14/03	155 ug/m^3
	SP	7/14/03	164 ug/m^3
	SS	7/14/03	172 ug/m^3
	WC	7/14/03	206 ug/m^3
	WC	8/13/03	197 ug/m^3
	WF	7/14/03	157 ug/m^3
	WP	7/14/03	158 ug/m^3
	Five sites exceeded the PM-10 Annual standard		
	Site	Value	
	DC	62 ug/m^3	
	GR	51 ug/m^3	
	HI	62 ug/m^3	
	SP	52 ug/m^3	
	WF	62 ug/m^3	

VIOLATIONS OF THE 24HR PARTICULATE STANDARD

The 24hr NAAQS for particulates is violated when the expected occurrence of exceedances (samples greater than or equal to 150 ug/m^3) is greater than one over three consecutive years (Table –20) (40 CFR Part 50.6 (a)).

(Table –20)

Site	2001		2002		2003		Rate of Expected Exceedances
	Max. 24hr	No. of Exp. Exc.	Max. 24hr	No. of Exp. Exc.	Max. 24hr	No. of Exp. Exc.	
Central Phoenix	124	0	81	0	114	0	0
Central Phoenix (continuous)	133	0	96	0	183	3.1	1
Chandler	146	0	128	0	240	6	■ 2
Durango Complex	189	6	232	12	195	6	■ 8
Dysart	NA	NA	NA	NA	# 133	0	#
Glendale	111	0	88	0	151	0	0
Greenwood	145	0	116	0	166	6	■ 2
Higley	176	6	138	0	225	6	■ 4
Maryvale	123	0	142	0	151	0	0
Mesa	98	0	102	0	176	6	■ 2
North Phoenix	99	0	80	0	155	6	■ 2
Salt River	281	36.9	249	12	Shutdown	Shutdown	#
South Phoenix	143	0	137	0	164	6	■ 2
South Scottsdale	110	0	64	0	172	6	■ 2
Surprise	107	0	81	0	42	0	#
West Chandler	135	0	80	0	206	14	■ 4.6
West Forty Third	NA	NA	172	6	157	6	#
West Phoenix	142	0	122	0	158	6.4	■ 2.1

■ Indicates violation of standard # Indicates <75% data available

VIOLATIONS OF THE ANNUAL PARTICULATE STANDARD

The Annual NAAQS for particulates is violated when the three-year average of the annual averages is more than or equal to 50 ug/m^3 (Table -21) (40 CFR Part 50.6 (b)).

(Table –21)

Site	2001 Annual Avg. ug/m^3	2002 Annual Avg. ug/m^3	2003 Annual Avg. ug/m^3	Three Year Average (ug/m^3)
Central Phoenix	38	43	40	40
Central Phoenix (continuous)	38	42	43	41
Chandler	48	56	50	51
Durango Complex	59	70	62	64
Dysart	Not Operating	Not Operating	#	#
Glendale	33	40	36	36
Greenwood	49	55	51	52
Higley	50	62	62	58
Maryvale	38	45	42	42
Mesa	30	36	34	33
North Phoenix	30	37	34	34
Salt River	94	81	Shut down	#
South Phoenix	50	60	52	54
South Scottsdale	33	37	36	35
Surprise	27	32	Shut down	#
West Chandler	34	39	42	38
West Forty Third	Not Operating	68	62	#
West Phoenix	43	53	46	47

■ Indicates violation of standard # Indicates <75% data available

VIOLATIONS OF THE PROPOSED 8-HR OZONE STANDARD 2003 SUMMARY

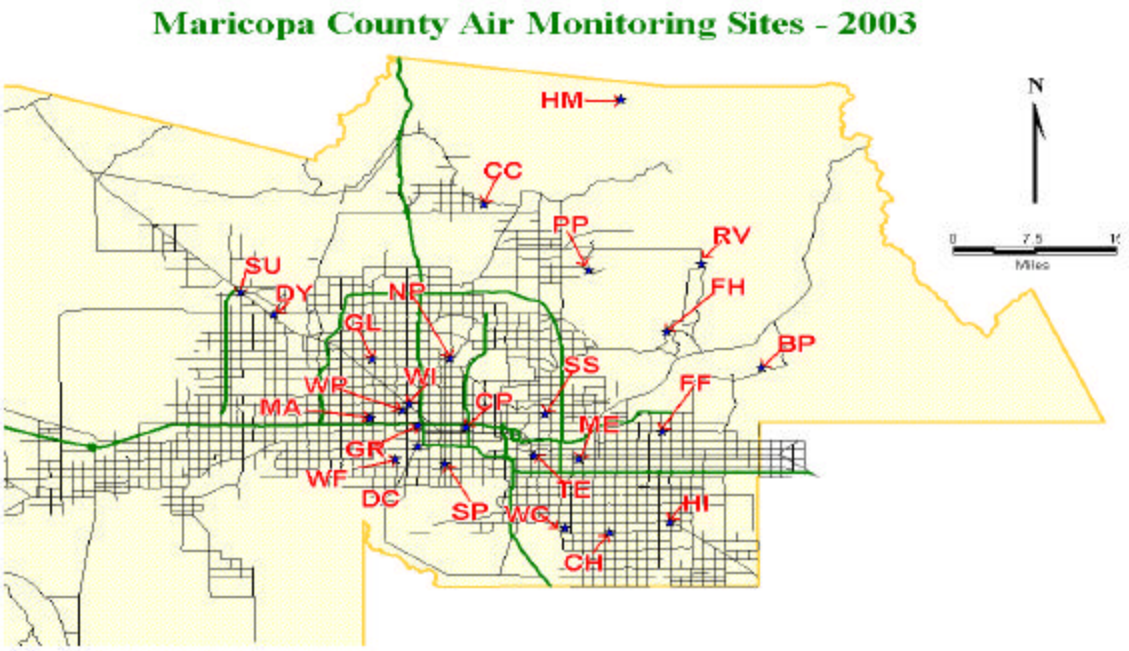
The 8-hour average NAAQS for ozone is violated when the three-year average of the fourth high is greater than 0.08 ppm. Because of mathematical rounding the value is actually 0.085 PPM or greater (Table –22) (40 CFR Part 50.10 (a)).

(Table –22)

Site	2001 4th High (PPM)	2002 4th High (PPM)	2003 4th High (PPM)	3 Yr. Avg. of 4th High (PPM)
Blue Point	0.080	0.086	0.086	0.084
Cave Creek	0.083	0.086	0.083	0.084
Central Phoenix	0.075	0.076	0.079	0.076
Falcon Field	0.081	0.084	0.079	0.081
Fountain Hills	0.083	0.086	0.083	0.084
Glendale	0.078	0.083	0.085	0.082
Humboldt Mt.	0.085	0.090	0.087	■ 0.087
Maryvale	0.074	0.084	0.074	0.080
North Phoenix	0.086	0.085	0.086	■ 0.085
Pinnacle Peak	0.085	0.084	0.083	0.084
Rio Verde	0.083	0.085	0.083	0.083
South Phoenix	0.076	0.081	0.076	0.077
South Scottsdale	0.079	0.079	0.079	0.079
Tempe	0.079	0.080	0.080	0.079
West Chandler	0.078	0.083	0.078	0.079
West Phoenix	0.075	0.084	0.077	0.078

■ Indicates violation of standard

MONITORING SITES INFORMATION



http://www.maricopa.gov/sbeap/AIR_MONI.HTM

Site Abbr.	Site Name	Site Location
BP	Blue Point	Usery Pass & Bush Highway
CC	Cave Creek	32nd St. & Carefree Highway
CH	Chandler	Pecos & McQueen
CP	Central Phoenix	19th St & Roosevelt
DC	Durango Comple x	27th Ave. & Durango St.
DY	Dysart	Bell Rd. & Dysart Rd.
FF	Falcon Field	McKellips & Greenfield
FH	Fountain Hills	Palisades & Fountain Hills Blvd.
GL	Glendale	59th Ave & W. Olive
GR	Greenwood	27th Ave. & Interstate 10
HI	Higley Site	Chandler Blvd. & Higley Rd.
HM	Humboldt Mountain	Top of Humboldt Mountain
MA	Maryvale	61st Ave. & Encanto Blvd.
ME	Mesa	Broadway Rd. & Alma School Rd.
NP	North Phoenix	7th St & Dunlap Ave.
PP	Pinnacle Peak	Pima Rd & Pinnacle Peak Rd.
RV	Rio Verde	Forest Rd & De l Ray Ave.
SP	South Phoenix	Central Ave. & Broadway
SS	South Scottsdale	Scottsdale Rd. & Thomas Rd.
SU	Surprise	Reems Rd. and Grand Ave.
TE	Tempe Site	Apache Blvd. & College Ave.
WC	West Chandler	Ellis Rd. & Frye Blvd.
WF	West Forty Third	43rd Ave. & Broadway Rd.
WI	W. Indian School	33rd Ave. & W. Indian School. Rd.
WP	West Phoenix	39th Ave. & Earll Dr.

Site Specifications

Site	Latitude	Longitude	Site Location	AIRS ID
BP	33: 33' 09.263"	-111: 36' 25.465"	Usery Pass & Bush Highway	04-013-9702
CC	33: 49.32'	-112: 1.02'	32nd St. & Carefree Highway	04-013-4008
CH	33: 17' 09.630"	-111: 49' 03.691"	Pecos & McQueen	04-013-0021
CP	33: 27' 29.130"	-112: 02' 28.809"	19th St & Roosevelt	04-013-3002
DC	33: 25' 60"	-112: 07' 12"	27th Ave. & Durango St.	04-013-9812
DY	33.6370	-112.3394	Bell Rd. & Dysart Rd.	04-013-4010
FF	33: 27' 09.371"	-111:43' 58.462"	McKellips & Greenfield	04-013-1010
FH	33: 36' 39.545"	-111: 40' 16.368"	Palisades & Fountain Hills Blvd.	04-013-9704
GL	33: 34' 09.487"	-112: 11' 26.855"	59th Ave & W. Olive	04-013-2001
GR	33: 27' 38.872"	-112: 07' 00.526"	27th Ave. & Interstate 10	04-013-3010
HI	33: 18.47'	-111: 43.33'	Higley Rd. & Chandler Blvd	04-013-4006
HM	33: 58' 53.255"	-111: 47' 50.478"	Top of Humboldt Mountain	04-013-9508
MA	33: 28' 28.611"	-112: 11' 32.055"	61st Ave. & Encanto	04-013-3006
ME	33: 24' 37.798"	-111: 51' 51.518"	Broadway Rd. & Alma School Rd.	04-013-1003
NP	33: 33' 37.055"	-112: 03' 55.797"	7th Street & Dunlap Avenue	04-013-1004
PP	33: 42' 43.440"	-111: 51' 05.644"	Pima Rd & Pinnacle Peak	04-013-2005
RV	33: 43' 06.418"	-111: 40' 16.142"	Forest Rd & Del Ray Ave.	04-013-9706
SA	33: 25' 03.788"	-112: 06' 12.194"	22nd Ave. & Lower Buckeye	04-013-3007
SP	33: 24' 12.410"	-112: 04' 23.196"	Central Ave. & Broadway	04-013-4003
SS	33: 28' 46.049"	-111: 54' 59.250"	Scottsdale Rd. & Thomas Rd.	04-013-3003
SU	33: 39.18'	-112: 22.65'	Reems Rd & Grand Ave	04-013-4007
TE	33: 24.67'	-111:56.10'	College Ave. & Apache Blvd.	04-013-4005
WC	33: 17.93'	-111: 53.04'	Ellis St. & Frye Rd.	04-013-4004
WF	33: 24.37'	-112: 88.66'	43rd Ave. & Broadway Rd.	04-013-4009
WI	33: 29' 40.950"	-112: 07' 48.825"	33rd Ave. & Indian School Rd.	04-013-0016
WP	33: 29' 01.280"	-112: 08' 31.463"	39th Ave. & Earll Dr.	04-013-0019

Site Instrument Setup

AIR MONITORING NETWORK OPERATIONS

Sites	WS/WD		O3		CO		NOX		SO2		Press	Del-T		TEOM		Temp	R-Hum	Room	Rain	PM-10		Multi-Gas	AQS Code	Logger	Total
BP	1	s	1	n												1		1					04-013-9702	1	5
CC	1	s	1	s *												1	1	1					04-013-4008	1	6
CH	1	s																		2	n		04-013-0021	1	4
CP	1	s	1	n	1	n	1	n	1	n	1			1	s	1		1		1	n	1	04-013-3002	1	12
DC	1	s									1			1	sp	1				2	s		04-013-9812	1	7
DY	1	s	1	s *	1	s *										1	1			1	s		04-013-4010	1	6
FF	1	s	1	s *														1					04-013-1010	1	4
FH	1	s	1	n							1					1	1	1					04-013-9704	1	7
GL	1	s	1	s *	1	s *					1							1		1	n		04-013-2001	1	6
GR	1	s			1	s	1	s										1	1	1	s	1	04-013-3010	1	7
HI	1	s														1	1			1	sp		04-013-4006	1	5
HM			1	s *														1					04-013-9508	1	3
MA			1	s *	1	s *														1	s		04-013-3006	1	4
ME	1	s			1	s *					1					1	1	1		2	s		04-013-1003	1	8
NP	1	s	1	s	1	s *					1	1	s			1		1		1	s		04-013-1004	1	8
PP	1	s	1	s														1					04-013-2005	1	4
RV			1	s *																			04-013-9706	1	1
SP	1	s	1	s	1	s *								1	sp			1		1	n		04-013-4003	1	6
SS	1	s	1	n	1	s *	1	n	1	n	1					1	1	1		1	n	1	04-013-3003	1	11
TE	1	sp	1	sp *	1	sp *	x 1	sp				1	sp			1		1	1			x1	04-013-4005	1	7
WC	1	s	1	s *	1	s *						1	sp			1		1		1	s		04-013-4004	1	7
WF	1	sp									1	1	sp			1				1	sp		04-013-4009	1	6
WI	1	s			1	n												1					04-013-0016	1	4
WP	1	s	1	s	1	n	1	s			1	1	s			1		1		2	n	1	04-013-0019	1	12
Total	21		16		5		4		2		9	5		3		14	6	17	2	19		4		24	

n = NAMS	s = SLAMS	sp =SPM	x = inactive instruments	* = seasonal monitor	Total # of Active Sites = **24**	Total # of Active Instruments = **150**

Maricopa County Blue Point Air Monitoring Site

Blue Point (BP) (04-013-9702)
Location: Bush Highway and Usery Pass Road
Spatial Scale: Urban
Monitoring Objective: High down wind maximum concentrations, category (a)

Site Description: The Blue Point site became operational in July 1995 and is located in a Maricopa County Sheriff's Sub-Station in Tonto National Forest. This site represents the maximum ozone concentration, and urban scale down wind transport conditions. This site is located approximately 40 miles east of the Phoenix metropolitan area. Ozone is the only criteria pollutant monitored at this NAMS station. Wind speed and direction are also monitored at the site.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.111	0.110	0.122
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.085	0.091	0.103
Number of Daily Exceedances >0.08	1	5	4
Three year avg. of 4th High	* 0.085	0.084	0.084

*Indicates an Exceedance of the Standard

Maricopa County Cave Creek Air Monitoring Site

Cave Creek (CC) (04-013-4008)
Location: 32nd St. & Carefree Highway
Spatial Scale: Urban
Monitoring Objective: Down Wind Maximum Concentrations

Site Description*:* The Cave Creek site became operational in August 2001 and is located in the Maricopa County Cave Creek Recreation Area (Park Office). This site was chosen through discussions on modifying the ozone network for the new 8-hr ozone standard (see ADDITIONAL COMMENTS). Ozone is the only criteria pollutant monitored at this SLAMS station. Wind speed and direction are also monitored at the site.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.112	0.102	0.102
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	.099	0.090	0.088
Number of Daily Exceedances >0.08	2	4	2
Three year avg. of 4th High	NA	NA	0.084

Maricopa County Central Phoenix Air Monitoring Site

Central Phoenix (CP) (04-013-3002)
Location: 1845 E. Roosevelt
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure category (b)

Site Description: The Central Phoenix site has been in existence for over three decades and has provided a long-term historical database with high data recovery. The site is representative of high population exposure (greater than 5000 people per square mile) in the central Phoenix area. This site is a NAMS location for Carbon Monoxide, Ozone, PM-10, SO_2 and NO_2 criteria pollutants. MCESD also maintains a continuous (TEOM) monitor for PM10 daily forecasts during the winter season.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	4.8	4.4	4.6
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.091	0.123	0.102
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.079	0.088	0.084
Number of Daily Exceedances >0.08	0	1	0
Three year avg. of 4th High	0.077	0.075	0.076
Max. 24-hr PM-10 Avg. (ug/m3)	124	81	114
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	38	43	40
Max. 24-hr PM-10 Avg. Continuous (ug/m3)	NA	NA	* 183
Number exceedances Continuous 24-hr PM-10	NA	NA	3
Annual PM-10 Avg. Continuous (ug/m3)	NA	NA	43
Annual NO2 Avg. (PPM)	0.028	0.029	0.029
Max. 24-hr SO2 Avg. (PPM)	0.010	0.012	0.007
Number of Exceedances	0	0	0
Annual SO2 Avg. (PPM)	.003	0.003	0.003

*Indicates an Exceedance of the Standard

Maricopa County Chandler Air Monitoring Site

Chandler (CH) (04-013-0021)
Location: 1475 E. Pecos
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure, category (b)

Site Description: The Chandler site is located on the property of the City of Chandler's Wastewater Treatment Plant (CWTP). The area immediately surrounding the CWTP was a low population density area; however, it is experiencing rapid residential growth. The site is a NAMS (category b) location for PM10 Particulates. Future air quality data from this location may be threatened since the CWTP has given notice of proposed expansion plans where the platform presently stands. Additionally, the site has become a storage location for street signs, water valves, and other municipal equipment. The site often measures a higher than expected particulate value, which has become more indicative of yard activity than reliable ambient air quality data. The present Higley site is being considered as a replacement.

	2001	2002	2003
Max. 24-hr PM-10 Avg. (ug/m3)	146	128	* 240
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	59	*56	50

*Indicates an Exceedance of the Standard

Maricopa County Durango Complex Air Monitoring Site

Durango Complex (DC) (04-013-9812)
Location: 2702 AC Esterbrook Blvd.
Spatial Scale: Middle
Monitoring Objective: Maximum Concentration

Site Description: This site is located one mile northwest from the former Salt River site in the Maricopa County Flood Control District storage yard. Sampling began on January 6,1999 with the intent to replace the Salt River site. However, in 2000 the USEPA determined that the site is not equivalent to the Salt River site. Particulates (SLAMS PM-10) and wind speed and direction are monitored at the site. This site is part of the Salt River Monitoring Study (see ADDITIONAL COMMENTS).

	2001	2002	2003
Max. 24-hr PM-10 Avg. (ug/m3)	* 189	* 232	* 195
Number exceedances 24-hr PM-10	1	2	1
Annual PM-10 Avg. (ug/m3)	* 58	* 70	* 62

*Indicates an exceedance of the Standard

Maricopa County Dysart Air Monitoring Site

Dysart (DY) (04-013-4010)
Location: Bell Rd. & Dysart Rd.
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: The Dysart site was established in July 2003. It is located at the Maricopa County Facility Maintenance Yard at the corner of Bell rd. and Dysart Rd. The site is in a growing population area in the northwest valley. The land use around the site consists of subdivisions of single family homes, commercial, and industrial. The site is approx. one mile west of the Agua Fria Riverbed. The site will take over for the shutdown Surprise site (04-013-4007) 2.3 miles to the north northwest. Seasonal Carbon Monoxide, Seasonal Ozone, (SLAMS) and PM-10 (SLAMS) are the criteria pollutants monitored at this station.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	Not Operating	Not Operating	1.2
Number exceedances 8-hr CO	Not Operating	Not Operating	0
Max. 1-hr O3 Avg. (PPM)	Not Operating	Not Operating	0.090
Number exceedances 1-hr O3	Not Operating	Not Operating	0
Max. 8-hr O3 Avg. (PPM)	Not Operating	Not Operating	0.082
Number of Daily Exceedances >0.08	Not Operating	Not Operating	0
Three year avg. of 4th High	Not Operating	Not Operating	#
Max. 24-hr PM-10 Avg. (ug/m3)	Not Operating	Not Operating	133
Number exceedances 24-hr PM-10	Not Operating	Not Operating	0
Annual PM-10 Avg. (ug/m3)	Not Operating	Not Operating	#

# Indicates <75% Data Recovery

Maricopa County Falcon Field Air Monitoring Site

Falcon Field (FF) (04-013-1010)
Location: 4530 E. McKellips
Spatial Scale: Urban
Monitoring Objective: High Down Wind Concentrations

Site Description: Ozone is the seasonal SLAMS criteria pollutant monitored at this station. Monitoring began in June of 1989. It is located near an airfield in a fire station with the area having a growing residential area.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.111	0.113	0.111
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.089	0.093	.099
Number of Daily Exceedances >0.08	2	3	1
Three year avg. of 4th High	.079	0.080	0.081

Maricopa County Fountain Hills Air Monitoring Site

Fountain Hills (FH) (04-013-9704)
Location: 16426 E. Palisades
Spatial Scale: Neighborhood
Monitoring Objective: High Down Wind Concentrations, category (b)

Site Description: The site is located at a Fountain Hills fire station. This site became operational in April of 1996. The site monitors ozone (NAMS category b) and wind speed and direction. This site is located approximately 15 miles downwind from the Phoenix metropolitan area. This site represents the high down wind concentrations on the fringes of the central basin district along the predominant summer/fall daytime wind direction.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.110	0.114	0.117
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.087	0.092	0.099
Number of Daily Exceedances >0.08	3	5	1
Three year avg. of 4th High	* 0.085	* 0.085	0.084

***** Indicates Violation of Standard

Maricopa County Glendale Air Monitoring Site

Glendale (GL) (04-013-2001)
Location: 6000 W. Olive
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: The Glendale site was established over two decades ago and is located on the grounds of Glendale Community College in a growing residential area. Homes, various strip malls, food establishments, and parks surround the site. Seasonal Carbon Monoxide, Seasonal Ozone, (SLAMS) and PM-10 (NAMS category b) are the criteria pollutants monitored at this station.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	3.1	3.2	2.4
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.116	0.101	0.107
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.092	0.094	0.092
Number of Daily Exceedances >0.08	2	2	4
Three year avg. of 4th High	0.080	0.080	0.082
Max. 24-hr PM-10 Avg. (ug/m3)	111	88	151
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	33	40	36

Maricopa County Greenwood Air Monitoring Site

Greenwood (GR) (04-013-3010)
Location: 27th Avenue and I-10
Spatial Scale: Middle Scale
Monitoring Objective: High Population Exposure

Site Description: Monitoring began at this site in December 1993. The station is bordered on the north by Interstate-10, on the west and south by neighborhood homes, and to the east by Greenwood cemetery. Interstate-17 is approximately one mile to the east of the site. Carbon Monoxide, NO_2, and PM-10 are the criteria pollutants monitored at this SLAMS facility.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	4.7	5.4	5.4
Number exceedances 8-hr CO	0	0	0
Max. 24-hr PM-10 Avg. (ug/m3)	145	116	* 166
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	49	* 55	* 51
Annual NO2 Avg. (PPM)	0.037	0.035	0.034

* Indicates an Exceedance of the Standard

Maricopa County Higley Air Monitoring Site

Higley (HI) (04-013-4006)
Location: 15400 S. Higley Rd. Gilbert AZ
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure with High Concentration

Site Description: Originally, in 1994 ADEQ set up this site to monitor for background particulate concentrations near the urban limits of Maricopa County. Since then, urban expansion has enveloped the site, so it no longer serves their purpose. MCESD installed a PM-10 HI-VOL in the second quarter of 2000. The data from this site was compared to the Chandler Site and was found to be comparable. If the City of Chandler requests MCESD to remove the Chandler Site it is our intention for the Higley site to replace the Chandler site).

	2001	2002	2003
Max. 24-hr PM-10 Avg. (ug/m3)	* 176	138	* 225
Number exceedances 24-hr PM-10	1	0	1
Annual PM-10 Avg. (ug/m3)	50	* 63	* 62

* Indicates an Exceedance of the Standard # Indicates <75% Data Recovery

Maricopa County Humboldt Mountain Air Monitoring Site

Humboldt Mountain (HM) (04-013-9508)
Location: Humboldt Mountain Summit
Spatial Scale: Regional
Monitoring Objective: High Downwind Concentrations

Site Description: This site became operational in May 1996. The Humboldt Mountain site is located on Federal Aviation Agency property, in a National Forest Service building, in the Tonto National Forest. This site is located approximately 40 miles north- northeast of the Phoenix metropolitan area at an elevation of 5230 feet. Ozone is the only criteria pollutant that is monitored at this seasonal SLAMS site.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.098	0.124	0.104
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.088	0.102	0.089
Number of Daily Exceedances >0.08	4	8	5
Three year avg. of 4th High	* 0.085	* 0.085	* 0.087

***** Indicates Violation of Standard

Maricopa County Maryvale Air Monitoring Site

Maryvale (MA) (04-013-3006)
Location: 6180 W. Encanto Blvd.
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: Monitoring began at this site in November 1993. This monitoring station is located at the Maryvale Phoenix Police Station. The site is surrounded by residentia l neighborhoods with a City of Phoenix park to the West. Carbon Monoxide, Ozone, (seasonal), and PM-10 are the criteria pollutants monitored at this SLAMS station. This site will be shut down as of April 1, 2004 and the equipment moved to far west valley.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	7.6	5.0	4.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.097	0.119	0.099
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.083	0.107	0.087
Number of Daily Exceedances >0.08	0	3	2
Three year Avg. of 4th High	0.078	0.079	0.080
Max. 24-hr PM-10 Avg. (ug/m3)	123	142	151
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	38	45	42

Maricopa County Mesa Air Monitoring Site

Mesa (ME) (04-013-1003)
Location: 370 S. Brooks
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: This site is located at Brooks Reservoir at the western edge of the city near the Tempe border. It is centered in an area that is residential, industrial, and a small amount of agricultural. An open field borders the site on the west with, commercial development to the north, and light industry east and south of the site. Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants monitored at this SLAMS site. To help conserve personnel and equipment resources the ozone monitor was permanently shut down as of November 1, 2002 (see ADDITIONAL COMMENTS)

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	2.9	3.5	2.5
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.093	0.097	Not Operating
Number exceedances 1-hr O3	0	0	Not Operating
Max. 8-hr O3 Avg. (PPM)	0.078	.082	Not Operating
Number of Daily Exceedances >0.08	0	0	Not Operating
Three year Avg. of 4th High	0.078	0.073	NA
Max. 24-hr PM-10 Avg. (ug/m3)	98	102	* 176
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	30	36	34

* Indicates an Exceedance of the Standard

Maricopa County North Phoenix Air Monitoring Site

North Phoenix (NP) (04-013-1004)
Location: 601 E. Butler
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: This site is located in the Sunnyslope area of North Phoenix. Sunnyslope is an old established neighborhood, primarily residential. High-density population surrounds the site. CO, Ozone, and PM-10 (SLAMS) are monitored at this site, along with temperature inversion.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	2.5	3.2	2.3
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.110	0.111	0.113
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.094	0.093	0.093
Number of Daily Exceedances >0.08	4	5	4
Three year Avg. of 4th High	* 0.085	* 0.085	0.085
Max. 24-hr PM-10 Avg. (ug/m3)	99	80	* 155
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	30	37	34

***** Indicates Violation of Standard

Maricopa County Pinnacle Peak Air Monitoring Site

Pinnacle Peak (PP) (04-013-2005)
Location: 25000 Windy Walk Way
Spatial Scale: Urban
Monitoring Objective: High Down Wind Concentrations

Site Description: This SLAMS site for ozone is located at a golf course country club and is surrounded by residential homes. It is located in a geographic area of low-density population (less than 2500 people per square mile). In previous years, ozone exceedances have been recorded due to transport of ozone and precursors from more urbanized areas of metro-Phoenix.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.107	0.115	0.103
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.095	0.089	0.093
Number of Daily Exceedances >0.08	4	3	3
Three year Avg. of 4th High	* 0.085	* 0.085	.084

***** Indicates Violation of Standard

Maricopa County Rio Verde Air Monitoring Site

Rio Verde (RV) (04-013-9706)
Location: 25608 N. Forest Rd.
Spatial Scale: Urban
Monitoring Objective: High Downwind Concentrations

Site description: This seasonal ozone site became operational in spring of 1997. The monitor is located at the fire station / County Sheriff's office sub-station located in a residential area surrounded by the desert of Tonto National Forest. The site is eight miles north of the Fountain Hills NAMS station, on the edge of a Class I Wilderness Area.

	2001	2002	2003
Max. 1-hr O3 Avg. (PPM)	0.102	0.101	0.113
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.084	0.089	0.096
Number of Daily Exceedances >0.08	0	4	2
Three year Avg. of 4th High	0.084	0.084	.083

Maricopa County South Phoenix Air Monitoring Site

South Phoenix (SP) (04-013-4003)
Location: **Central and Broadway Rd.**
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: The site was opened at its current location October 1999. The site is at the edge of a high population area, but also borders on a mixture of residential and commercial (retail stores, food establishments, and office parks) land use. The station has two high population areas (> 5000 people per square miles) north and west of the site. Carbon Monoxide, Ozone, and PM-10 (SLAMS) are the criteria pollutants monitored at this station.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	3.4	3.8	3.6
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.098	0.104	0.095
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.086	0.090	0.083
Number of Daily Exceedances >0.08	1	2	0
Three year Avg. of 4th High	0.078	.080	0.077
Max. 24-hr PM-10 Avg. (ug/m3)	143	137	* 164
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	50	* 60	* 52

* Indicates an Exceedance of the Standard

Maricopa County South Scottsdale Air Monitoring Site

South Scottsdale (SS) (04-013-3003)
Location: 2857 N. Miller
Spatial Scale: Urban Neighborhood
Monitoring Objective: High Population Exposure, category (b)

Site Description: The South Scottsdale site is located at the City of Scottsdale Fire Station. The area surrounding the site is residential with a density of 2500 to 5000 persons per square mile. This site is located 12 miles east of metropolitan Central Phoenix. Carbon Monoxide, (SLAMS) Ozone, NO_2, SO_2, and PM-10 (all NAMS) are the criteria pollutants monitored at this station.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	3.2	3.0	2.3
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.102	0.102	0.107
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.089	0.087	0.097
Number of Daily Exceedances >0.08	1	1	3
Three year Avg. of 4th High	0.077	0.078	0.078
Max. 24-hr PM-10 Avg. (ug/m3)	110	64	* 172
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	33	37	36
Annual NO2 Avg. (PPM)	0.021	0.024	#
Max. 24-hr SO2 Avg. (PPM)	0.006	0.004	0.005
Number of Exceedances	0	0	0
Annual SO2 Avg. (PPM)	0.002	0.002	0.002

* Indicates an Exceedance of the Standard # Indicates <75% Data Recovery

Maricopa County Surprise Air Monitoring Site

Surprise (SU) (04-013-4007)
Location: 18600 N. Reems Rd
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: The site is located at the City of Surprise Fire and Police Station #2. The site is at the edge of a growing population area in the northwest valley. The land use around the site consists of high-density housing, subdivisions of single family homes and light commercial (strip malls). The site started operations November 2000. Due to power and access problems the site was permanently shut down as of July 16, 2003 and moved 2.3 miles southeast to the Dysart Site (04-013-4010). Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants monitored at this station.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	1.2	1.2	1.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.093	0.098	0.088
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.073	0.083	.079
Number of Daily Exceedances >0.08	0	0	0
Three year Avg. of 4th High	NA	NA	#
Max. 24-hr PM-10 Avg. (ug/m3)	107	81	42
Number exceedances 24-hr PM-10	0	0	0
Annual PM-10 Avg. (ug/m3)	27	32	#

* Indicates an Exceedance of the Standard # Indicates <75% data recovery

Maricopa County Tempe Air Monitoring Site

Tempe (TE) (04-013-4005)
Location: Apache Blvd. & College Ave.
Spatial Scale: Neighborhood Scale
Monitoring Objective: High Population Exposure

Site Description: The site was established in 2000. The site was established to fill in a spatial gap between the metropolitan Phoenix area and the city of Mesa. Ozone (SPM), Carbon Monoxide (SPM), and Nitrogen Dioxide (SPM) are monitored at the site. The NO_2 monitor was shutdown as of June 2002 because of the availability of calibration equipment (see ADDITIONAL COMMENTS).

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	3.3	3.4	2.9
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.099	0.100	0.109
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.088	0.086	0.086
Number of Daily Exceedances >0.08	1	2	1
Three year Avg. of 4th High	NA	0.079	0.079
Annual NO2 Avg. (PPM)	.022	#	#

# Indicates <75% data recovery

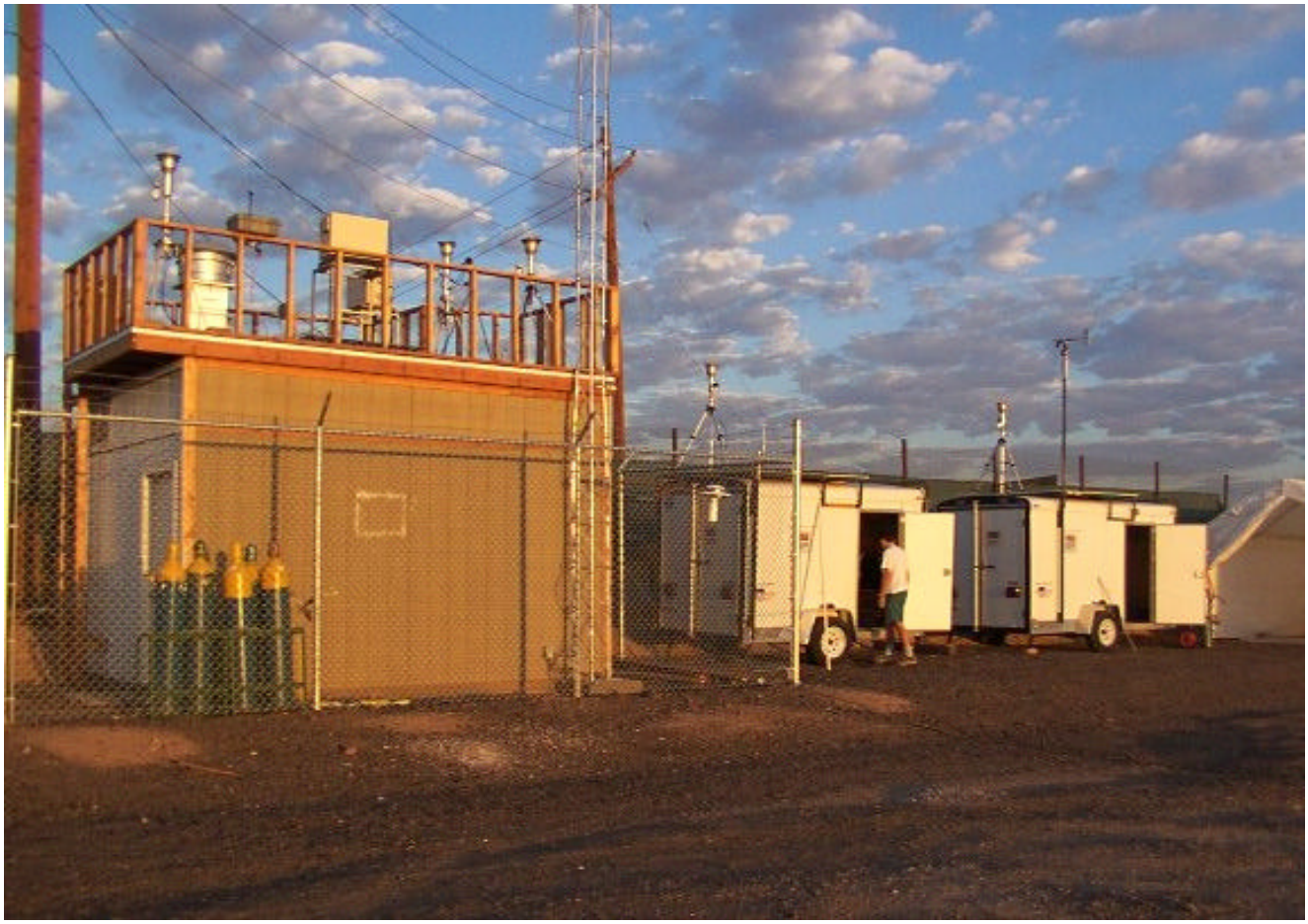
Maricopa County West Chandler Air Monitoring Site

West Chandler (WC) (04-013-4004)
Location: Frye Rd & Ellis
Spatial Scale: Neighborhood Scale
Monitoring Objective: High Population Exposure

Site Description: This site was set up in January 1995. The site was moved to its current location in May 2000. The site is located ½ mile south of the pervious site. A wide range of land uses surrounds the site. They include residential, agriculture, and heavy industry (semi conductor plants and liquid air storage). Carbon Monoxide, Ozone, and PM-10 are the criteria pollutants monitored at this SLAMS site.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	2.2	2.2	2.6
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.105	0.110	0.101
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.086	0.094	0.082
Number of Daily Exceedances >0.08	1	2	0
Three year Avg. of 4th High	NA	NA	0.079
Max. 24-hr PM-10 Avg. (ug/m3)	135	80	* 206
Number exceedances 24-hr PM-10	0	0	2
Annual PM-10 Avg. (ug/m3)	34	39	42

* Indicates an Exceedance of the Standard



Maricopa County West Forty Third Air Monitoring Site

West Forty Third (WF) (04-013-4009)
Location: 43rd Ave. & Broadway Rd.
Spatial Scale: Middle Scale
Monitoring Objective: Maximum Concentration

Site Description: Monitoring began at the site in the 2nd quarter of 2002. This site is located at a Maricopa County Department of Transportation storage lot. The site is surrounded by a combination of heavy industry and residential homes. The site has one 6-day SS HI-VOL. particulate monitor. The main purpose of the monitor is to measure maximum concentration PM-10 and to determine the impact on ambient pollution levels of significant sources or source categories. The sources around the site include sand and gravel operations, auto and metal recycling, landfills, paved and unpaved haul roads, and cement casting (see ADDITIONAL COMMENTS section).

	2001	2002	2003
Max. 24-hr PM-10 Avg. (ug/m3)	not operating	# 172	* 157
Number exceedances 24-hr PM-10	not operating	1	1
Annual PM-10 Avg. (ug/m3)	not operating	# 68	* 62

* Indicates an Exceedance of the Standard # Indicates <75% data available

Maricopa County West Indian School Road Air Monitoring Site

West Indian School Rd. (WI) (04-013-0016)
Location: 3315 West Indian School Road
Spatial Scale: Micro-scale
Monitoring Objective: Maximum Pollutant Concentration and Impact of Significant Sources, category (a)

Site Description: The site is located at the City of Phoenix, Wellness Evaluation Center. This site is used to monitor micro-scale maximum concentrations and is based on high vehicular traffic. The Average Weekday Traffic (AWT) volume past this location on Indian School Road estimates 55,000 vehicles. The site is also in close proximity to Grand Ave. and 35th Ave., which have AWT volumes of about 35,000 vehicles. Carbon Monoxide is monitored at this NAMS site.

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	6.6	5.5	5.4
Number exceedances 8-hr CO	0	0	0

Maricopa County West Phoenix Air Monitoring Site

West Phoenix (WP) (04-013-0019)
Location: 3847 W. Earll
Spatial Scale: Neighborhood
Monitoring Objective: High Population Exposure

Site Description: This site became operational in 1984. It is located about one-mile southwest of the West Indian School Road micro-scale CO monitor. The spatial scale for the West Phoenix site is neighborhood. It is located in an area of stable, high population density. Carbon Monoxide (NAMS), PM-10 (NAMS), Ozone (SLAMS), and NO_2 (SLAMS) are the criteria pollutants monitored at this site. The NO_2 monitor was shutdown for several months because of the lack of calibration equipment (see ADDITIONAL COMMENTS).

	2001	2002	2003
Max. 8-hr CO Avg. (PPM)	6.7	5.5	6.2
Number exceedances 8-hr CO	0	0	0
Max. 1-hr O3 Avg. (PPM)	0.099	0.123	0.099
Number exceedances 1-hr O3	0	0	0
Max. 8-hr O3 Avg. (PPM)	0.081	0.102	0.081
Number of Daily Exceedances >0.08	0	2	0
Three year Avg. of 4th High	0.082	0.080	0.078
Max. 24-hr PM-10 Avg. (ug/m3)	142	122	* 158
Number exceedances 24-hr PM-10	0	0	1
Annual PM-10 Avg. (ug/m3)	43	* 53	46
Annual NO2 Avg. (PPM)	0.025	#	#

* Indicates an Exceedance of the Standard # Indicates <75% data available

ADDITIONAL COMMENTS

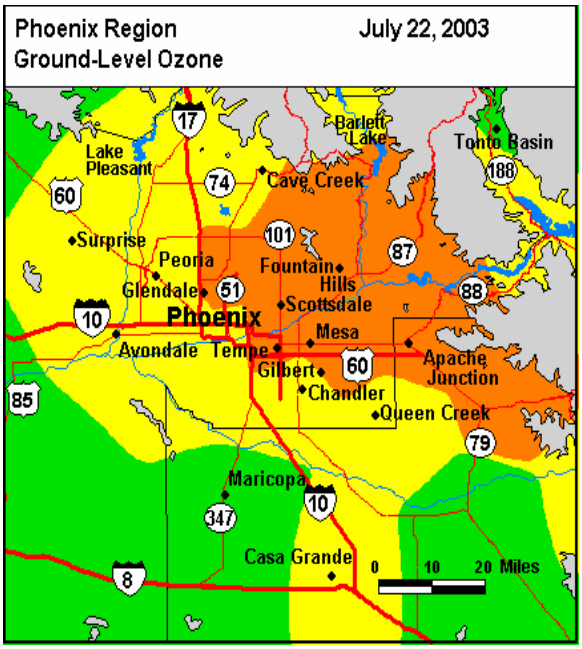
Multi-gas Calibrators and NO_2 Monitors

MCESD continued to suffer reliability problems with our new multi-gas calibrators. We continued to work with the manufacturer and other agencies to correct the problems. Since each NO_2 instrument requires a calibrator at the site, MCESD had to shut down all of the NO_2 monitors for several months because of no operating calibrators. The Central Phoenix, Greenwood, South Scottsdale and West Phoenix sites were brought back online in October-November of 2003. Only the Central Phoenix and Greenwood sites were able to obtain greater than 75% data recovery for the year. To help us better maintain the NO_2 network, the Tempe NO_2 (Special Purpose Monitor) was shut down as of November 1, 2003. We will bring the monitor back online when we have solved our reliability problem.

EPA Ozone Mapping

AIRNOW website http://www.epa.gov/airnow provides real time air pollution (ozone) maps for major metropolitan areas around the United States, including the Phoenix Metropolitan Area. MCESD has participated in the program since 2001

MCESD in cooperation with ADEQ and Pinal County Air Pollution Control District has expanded the area in which the map covers. This includes sites as far east as Queen Valley, as far south as Casa Grande, and as far west as Palo Verde.



Map -1

This website can be used as a tool for which the public can plan their daily activities and limit their exposure to air pollution. Eight-hour average peak ozone concentration maps (Map -1) and real-time eight-hour ozone animation maps are provided. Colors on the map indicate different concentrations of ozone pollution. The one-hour average values are given in parts per billion. The eight-hour averages are converted into Air Quality Index (AQI) numbers. The AQI is based on the NAAQS. The index was developed to convert pollution measurements into a common index that the general public can more easily understand. Different colors on the map correspond to different categories of air quality and health impacts (Table -23).

Air Quality Index
(Table -23)

Index	Color	Air Quality	Health Impact
0 - 50	Green	Good	No harmful effects expected.
51 - 100	Yellow	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion.
101 - 150	Orange	Unhealthy for Sensitive Groups	Active children & adults, people with respiratory disease (i.e. asthma) should limit prolonged outdoor exertion.
151 - 200	Red	Unhealthy	Everyone should observe caution. Avoid prolonged outdoor exertion
201 - 300	Purple	Very Unhealthy	Avoid all outdoor exertion. Use extreme caution outdoors
301 - 500	Maroon	Hazardous	Everyone should avoid all outdoor exertion.

The animated map is updated every hour from 8am to 8pm seven days a week. Updates to the site will be made during the ozone season (April through October). Archived maps of the 2000-2003 ozone seasons are available. MCESD plans to continue with the project for the 2004 Ozone Season.

Maricopa County's Interactive Pollution Map

In keeping with our mission statement of "Ensuring a Safe and Healthy Environment" MCESD has brought real-time pollution data to the Internet. All of the MCESD continuous data will be available to the public through an interactive map. The air pollutants that are available include CO, Ozone, NO_2, SO_2, and Particulates. All of the values are currently one-hour averages. The information is updated on an hourly basis at half past the hour. Data can be accessed at this web address http://www.maricopa.gov/envsvc/air/ozair_map.asp

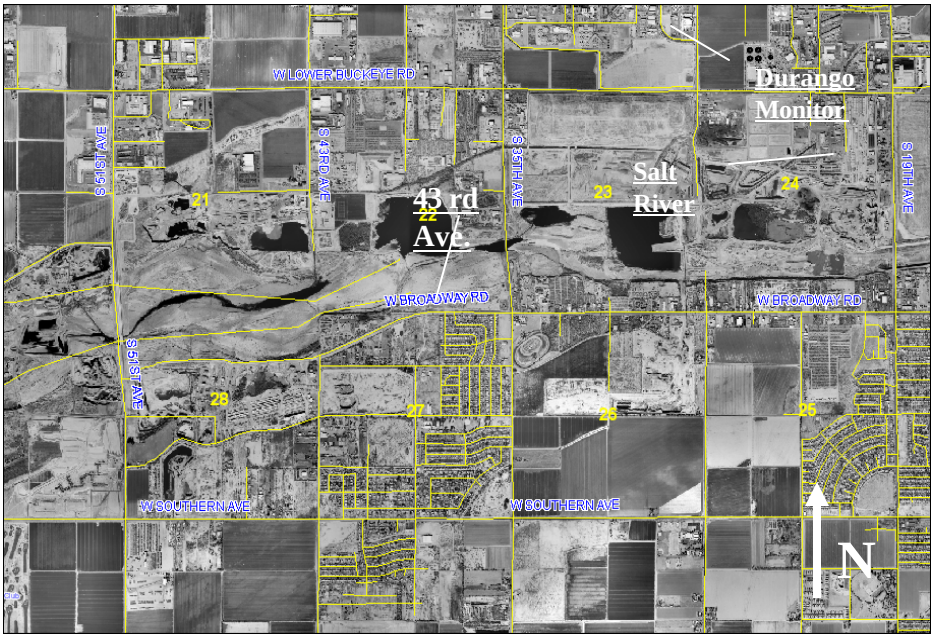
One of the major problems in providing "real-time" pollution data to a public medium is providing quality data. The data available on the Internet goes through an automated quality assurance check program before it is released; however, some invalid data can slip through. Normal quality assurance checks take between 1-3 months. Consequently, information provided at this site should be used for informational purposes only and should not be relied on for comparison with NAAQS.

Salt River PM-10 Study

The Metropolitan Phoenix Area, which has not attained the annual or 24-hr standards for PM-10, is under a State Implementation Plan (SIP) to achieve this standard by 2006 (MAG, 1999) for all monitoring sites. This plan included a technical analysis of the elevated 24-hour PM10 concentrations recorded in the Salt River PM10 Study area in southwest Phoenix. Since monitoring began in 1994, the Salt River PM10 monitoring site near 19th Avenue and Lower Buckeye Road has recorded violations of the 24-hour and annual PM10 standard every year. The site was supposed to attain the standard by 1998. The fact that it did not achieve the standard has led the EPA to take action. This action came in the form of a SIP call in December 2001. This "SIP call" means that the State must submit within 18 months a demonstration that the 24-hr PM10 standard can be attained by the end of 2006.

An additional issue concerns the historical Salt River monitoring site itself, which had been located on City of Phoenix property. The site was relocated from its original location in the southeast corner of the compound to a site closer to the center part of the compound in January 2002. After the study, the site was discontinued altogether at the end of year. Removal of the site had been requested by the City

Study Area



(Fig. 1)

due to substantial construction on and near the property. Efforts to find a suitable replacement site with comparable PM10 concentrations and industrial emissions were conducted by the MCESD and staff from the Assessment Section of ADEQ. Such a site was identified and established, with the name of "West 43rd Avenue." (Fig. 1) MCESD has agreed to long-term PM-10 data collection at this site as a component of the SIP. As part of this SIP demonstration, the Assessment Section has shown that the PM10 concentrations and source contributions between this new site and the Salt River site are equivalent.

You can visit the following websites to obtain more information on proposed revisions to ADEQ Plan for Attainment of the 24-Hour PM10 Standard for the Maricopa County PM10 Non-attainment Area.

- http://www.adeq.state.az.us/environ/air/plan/download/srsip.pdf
- http://www.adeq.state.az.us/environ/air/plan/download/finaltsd.pdf

To become involved in the Salt River Study Area plan revision stakeholder process in 2004, please contact: Catherine Jordan

Evaluation of Ozone Network for the New Eight-Hour Standard

Since the EPA will soon be implementing the new eight-hour ozone standard, environmental agencies around the Phoenix Metropolitan Area held a workshop in 2000 on modifying the existing ozone network. ADEQ provided several suggestions on modifying the network to maximize coverage and better utilize resources. Some of the major ideas for the MCESD ozone network are as follows:

1. The Lake Pleasant site should be moved to the Cave Creek area to better monitor ozone formation.
2. The Emergency Management site should be shutdown because it was determined to be redundant.
3. The Mesa ozone monitor should be shutdown because it was determined to be redundant.
4. An ozone monitor should be established in the area around the old Perryville site (west valley).
5. The Roosevelt Lake ozone monitor should be reestablished in the Cave Creek Area.
6. An ozone monitor should be established in the Gila Bend area southwest of the Phoenix Metro Area.

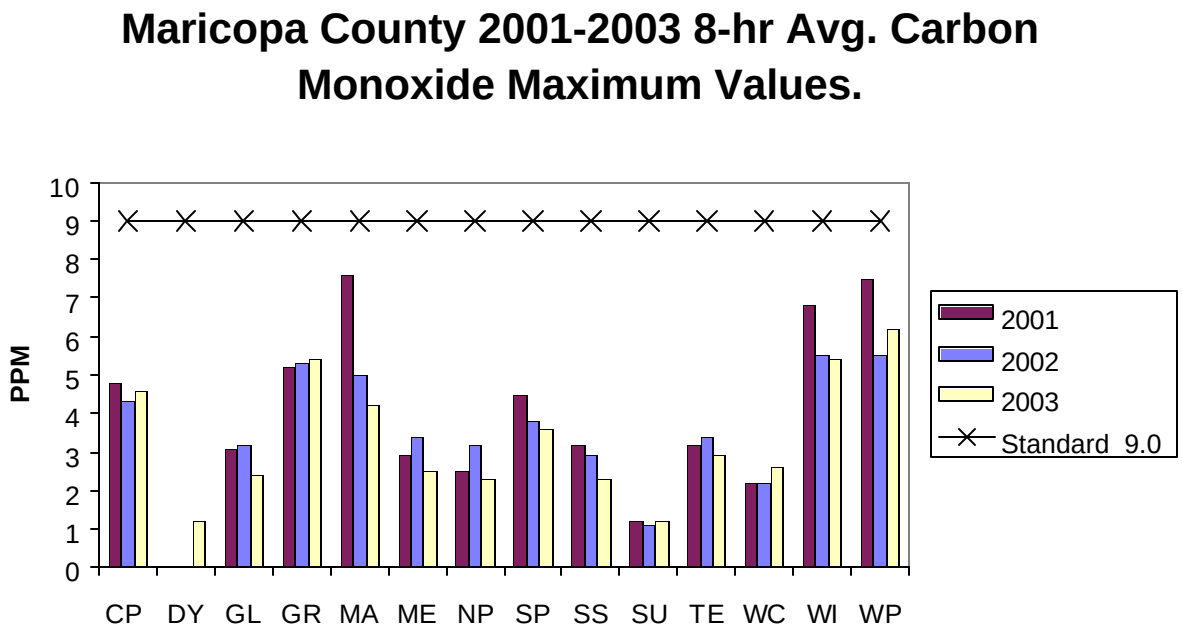
MCESD has moved the Lake Pleasant site to The Cave Creek Recreational Area. The Emergency Management site was shutdown in 2001. The Mesa ozone monitor was shut down as of November 1, 2002 to help conserve our resources. There is another ozone monitor three miles to the west at the Tempe site.

MCESD will establish a new site in the town of Buckeye (far west Valley) in 2004. To help conserve resources the Maryvale site (04-013-3006) will be shut down and moved to the Buckeye area. An NO_2 monitor will also be installed at the site to monitor the impacts of the new power plants in the area.

POLLUTION TRENDS

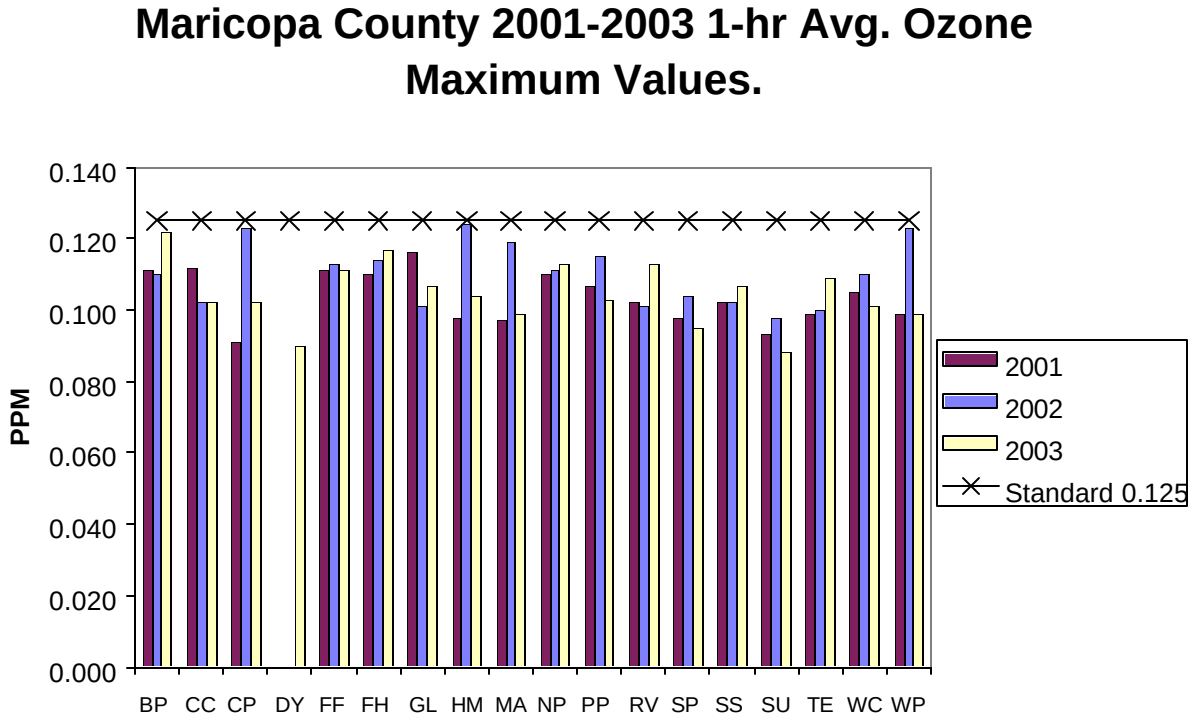
The following charts are three-year trends for the criteria pollutants:

Carbon Monoxide



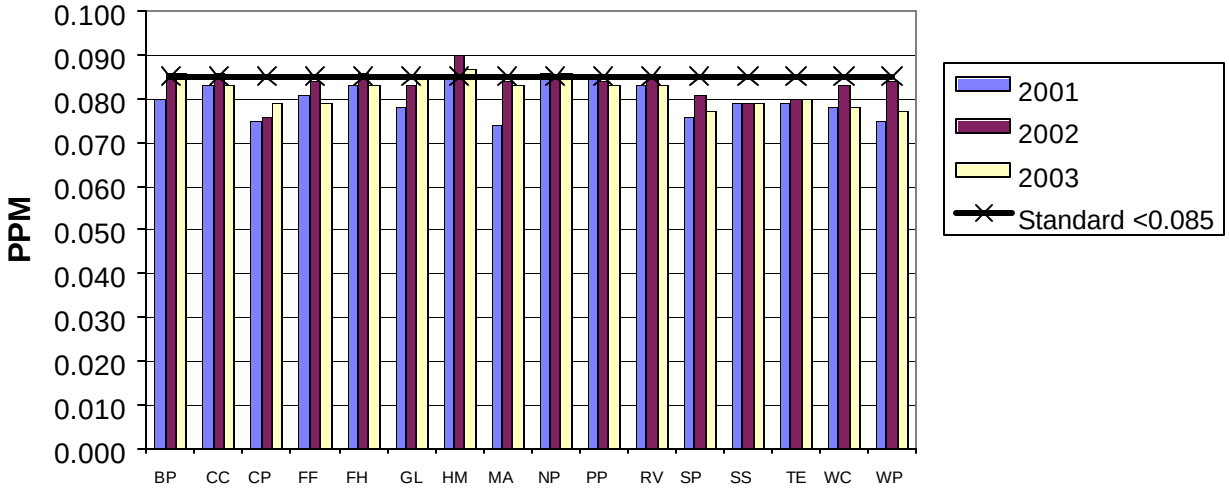
(Chart -1)

Ozone



(Chart –2)

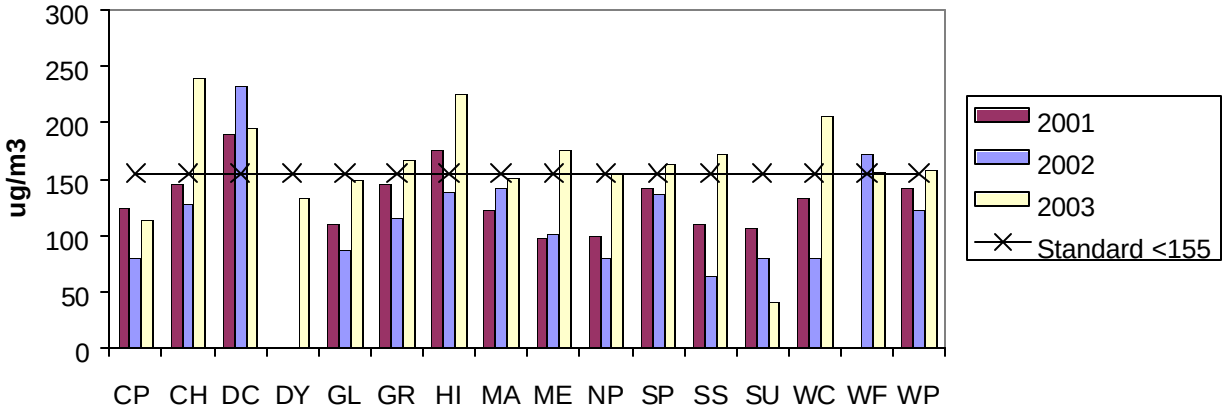
Maricopa County 2001-2003 Ozone 4th high 8-hr Avg.



(Chart –3)

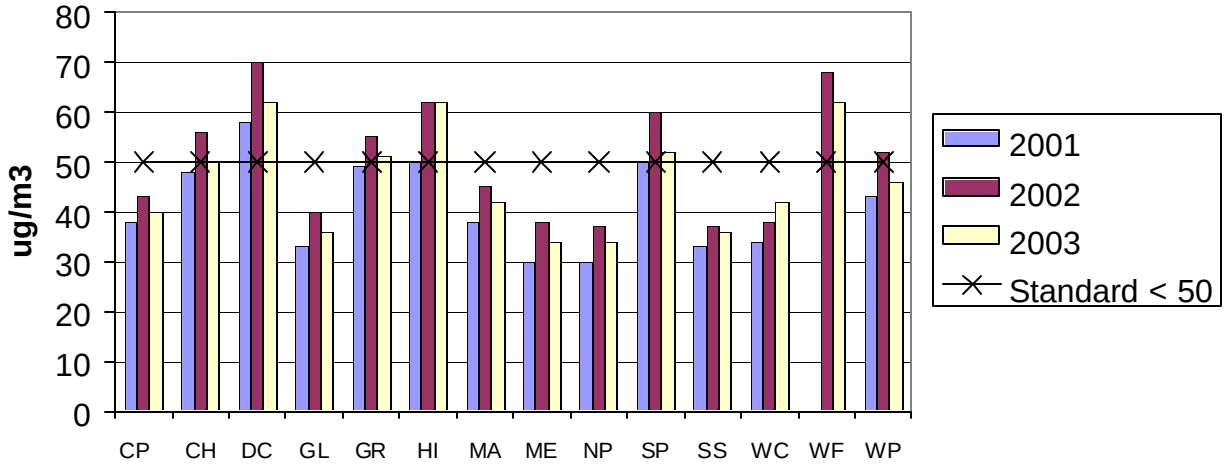
Particulates

Maricopa County 2001-2003 PM-10 24-hr Avg. Maximum Values



(Chart –4)

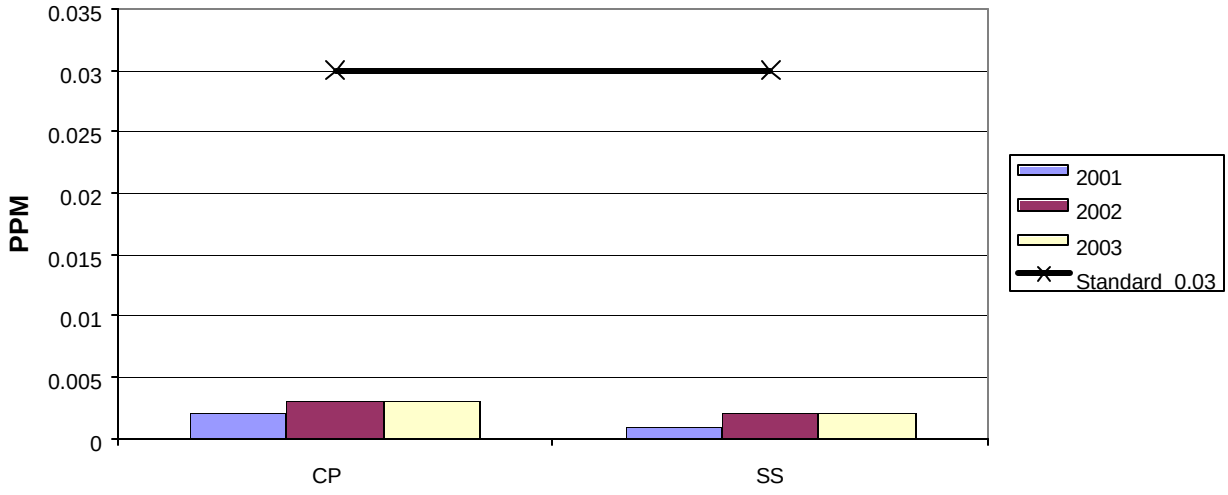
Maricopa County 2001-2003 PM-10 Annual Avg.



(Chart – 5)

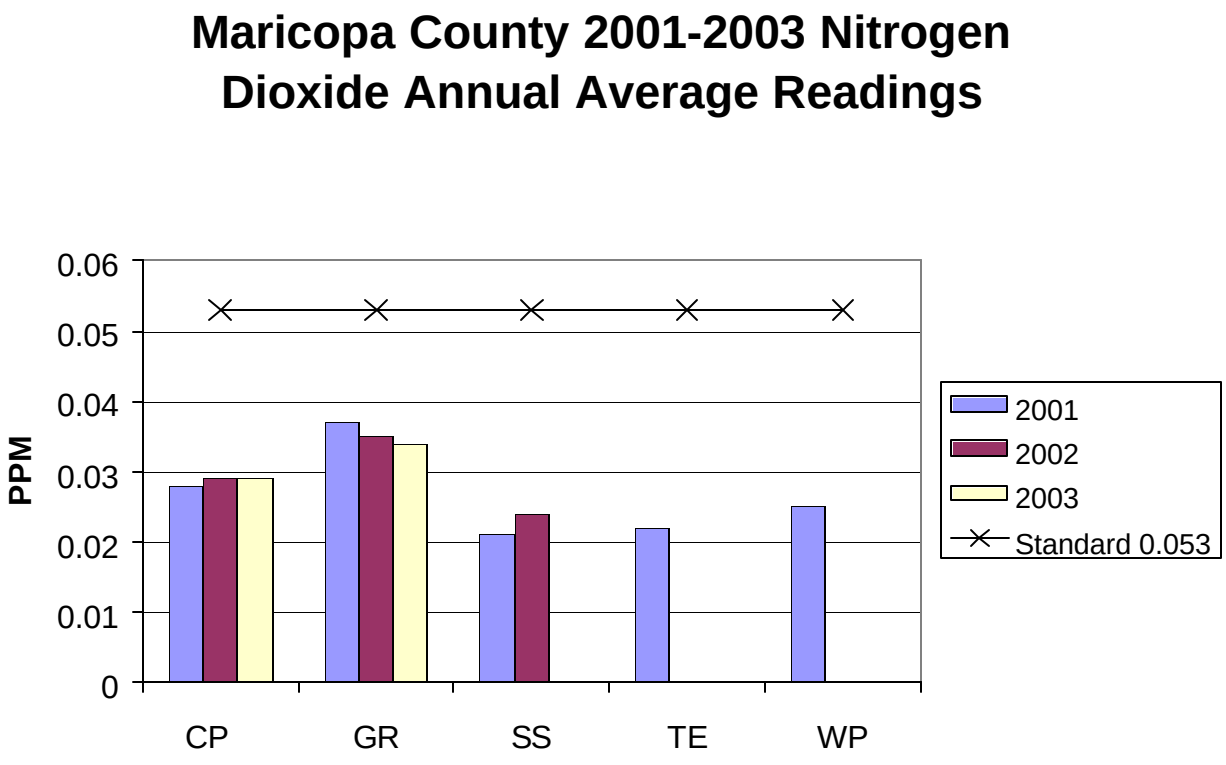
Sulfur Dioxide

Maricopa County 2001 - 2003 Sulfur Dioxide Annual Avg.



(Chart – 6)

Nitrogen Dioxide



(Chart – 7)

Acronyms and Abbreviations

Acronym or Abbreviation	Definition
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
CFR	Code of Federal Regulations
Class I	Federally designated park or wilderness area with mandated visibility protection
CO	Carbon monoxide
Delta T	Difference between two levels of temperature measurements
EPA	U. S. Environmental Protection Agency
HAPs	Hazardous air pollutants
km	Kilometers
m	Meters
MCESD	Maricopa County Environmental Services Department
$\mu g/m^3$	Microgram per cubic meter
NAAQS	National Ambient Air Quality Standards
NAMS	National Air Monitoring Station
NO_2	Nitrogen dioxide
NO_X	Sum of NO and NO_2
O_3	Ozone
Pb	Lead
PM	Particulate matter
PM-2.5	Particulate matter $\leq$ 2.5 microns
PM-10	Particulate matter $\leq$ 10 microns
PPB	Parts per billion
PPM	Parts per million
SIP	State implementation plan
SLAMS	State and local air monitoring station
SO_2	Sulfur dioxide
SPM	Special purpose monitor
TEOM	Tapered element oscillating Microbalance
TSP	Total suspended particulate
USFS	U.S. Forest Service
VOC	Volatile organic compounds

REFERENCES

1. Phase 1 Recommendations for Maricopa County Air Quality Monitoring Network, Final Report, AV-R-93/6008, Aero-Vironment, Inc., Monrovia, CA, March 1993

2. Phase II Recommendations for Maricopa County Air Quality Monitoring Network, AV-R-93/6025, Aero-Vironment, Inc., Monrovia, CA, March 1993

3. Air Quality Modeling of Carbon Monoxide Concentrations in Support of the Federal Implementation Plan for Phoenix, AZ, SYSAPP-93/039, Systems Application International, San Rafael, CA, April 30, 1993.

4. Code of Federal Regulations, Chapter 40, Part 58, Appendix D, 1997.

5. Maricopa Association of Governments, Transportation Planning Office, Average Weekday Traffic Analysis for 1998 (Map dated August 1999).

6. Maricopa Association of Governments, Total Resident Population Density, 1994, by Traffic Analysis Zone (Map dated 1998).

7. http://www.adeq.state.az.us/environ/air/plan/index.html

8. http://www.epa.gov/rgytgrnj/programs/artd/air/quality/quality.htm

9. http://www.maricopa.gov/sbeap/airday.htm

10. http://www.maricopa.gov/sbeap/AIR_MONI.HTM

11. http://www.epa.gov/empact

12. http://www.epa.gov/oar/aqtrnd00/sixpoll.html

13. MCESD 2001 Network Review (http://www.maricopa.gov/envsvc/AIR/AIRDAY/review1a.pdf)

14. SLAMS / NAMS / PAMS Network Review Guidance--EPA-454/R-98-003

15. Guideline on data handling conventions of the PM NAAQS