



Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

MONTHLY AIR QUALITY REPORT FOR
JULY 2006

AQI COLOR SCALE

GOOD 0-50	MODERATE 51-100	UNHEALTHY FOR SENSITIVE GROUPS 101-150	UNHEALTHY 151-200
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Calendar of maximum AQI values & their corresponding color for July 2006*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

1 (day of month)	O3	CO
	PM10	PM2.5

SUN			MON			TUE			WED			THU			FRI			SAT		
																		1	124	08
																		8	63	49
2	79	06	3	87	06	4	49	03	5	77	07	6	90	14	7	47	06	8	97	08
	35	39		34	38		35	42		74	39		52	37		51	26		24	30
9	72	09	10	74	07	11	49	09	12	51	05	13	50	05	14	106	08	15	66	09
	25	31		54	33		60	36		62	33		65	36		71	46		83	43
16	72	05	17	111	06	18	100	05	19	129	06	20	74	06	21	95	10	22	79	09
	75	54		57	40		74	53		46	29		52	29		87	52		55	54
23	74	09	24	109	07	25	77	06	26	85	05	27	47	05	28	43	05	29	39	05
	59	48		54	44		69	53		28	31		30	19		25	27		22	30
30	35	05	31	41	05															
	18	28		32	31															

Calendar of High Pollution Advisories and Health Watches issued during July 2006

SUN	MON	TUE	WED	THU	FRI	SAT
2	F	3	F	4	5	6
9	F	10	11	12	F	13
16	F	17	F	18	F	19
23	F	24	25	F	26	27
30	31					

LEGEND

HIGH POLLUTION ADVISORIES

- A** = PM-10 High Pollution Advisory
- B** = PM-2.5 High Pollution Advisory
- C** = Ozone High Pollution Advisory

HEALTH WATCHES

- D** = PM-10 Health Watch
- E** = PM-2.5 Health Watch
- F** = Ozone Health Watch

Exceedance days during JUL 2006-

Total= 0 Date Max AQI Pollutant Site/s

High Pollution Advisories issued during JUL 2006-

Total= 0 Date Max AQI Pollutant Site/s

Health Watches issued during JUL 2006-

Total= 0 Date Max AQI Pollutant Site/s

Concentration Recap:

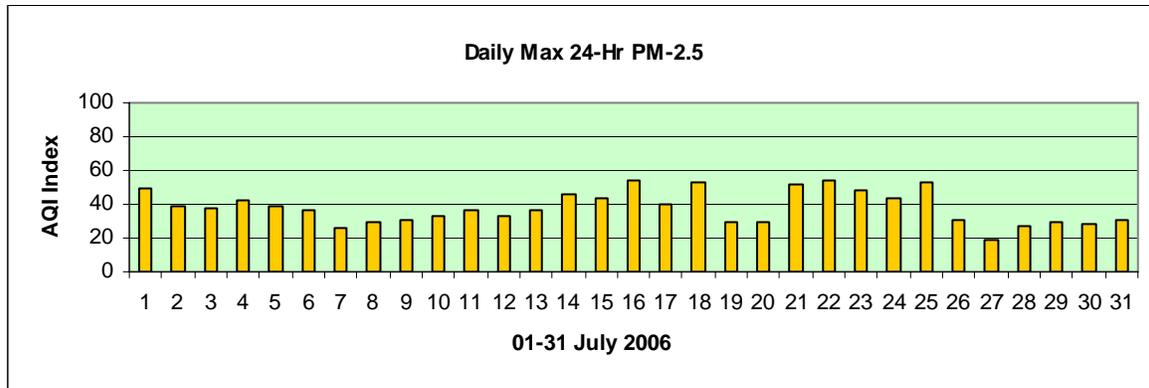
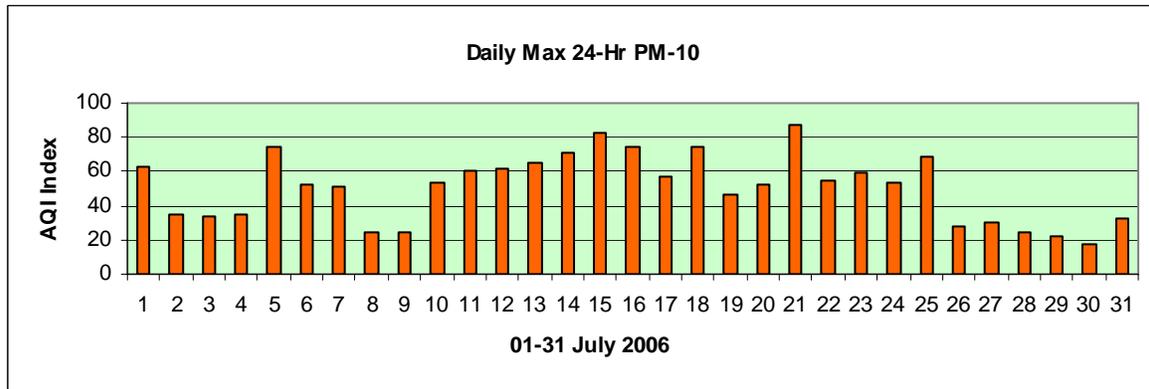
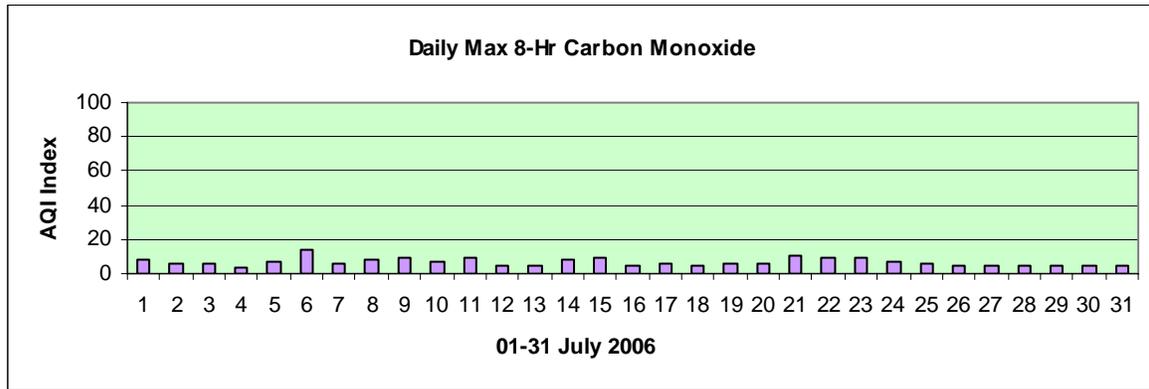
Days in the Good category:	6
Days in the Moderate category:	20
Days in the Unhealthy for Sensitive Groups category:	5
Days in the Unhealthy category:	0
Total Forecast Days:	31

Narrative:

July 2006 was the first month since November 2005 to not have an exceedance of the 24-hr PM-10 standard—despite numerous blowing dust events due to monsoon thunderstorm outflow boundaries. The graph below summarizes these dust events:

DAY	LOWEST REPORTED VISIBILITY	FOLLOWED BY RAIN?	PERIOD OF DAY
1ST	4 MILES	NO	PM
5TH	4 MILES	NO	AM
7TH	5 MILES	NO	PM
15TH	9 MILES/1 MILE	NO	AM/PM
16TH	2 MILES	NO	PM
18TH	2 1/2 MILES	NO	PM
19TH	5 MILES	NO	AM
21ST	2 1/2 MILES	NO	PM
23RD	1/4 MILE	YES	PM
29TH	5 MILES	YES	PM

The 2006 summer monsoon officially began in Phoenix on the 2nd but significant rainfall did not occur until late on the 25th; PM-10 levels were in the good range of the Air Quality Index thereafter. Meanwhile, highest concentrations of PM-2.5 were in the low-moderate range and those of carbon monoxide in the good range of the AQI. -Reith



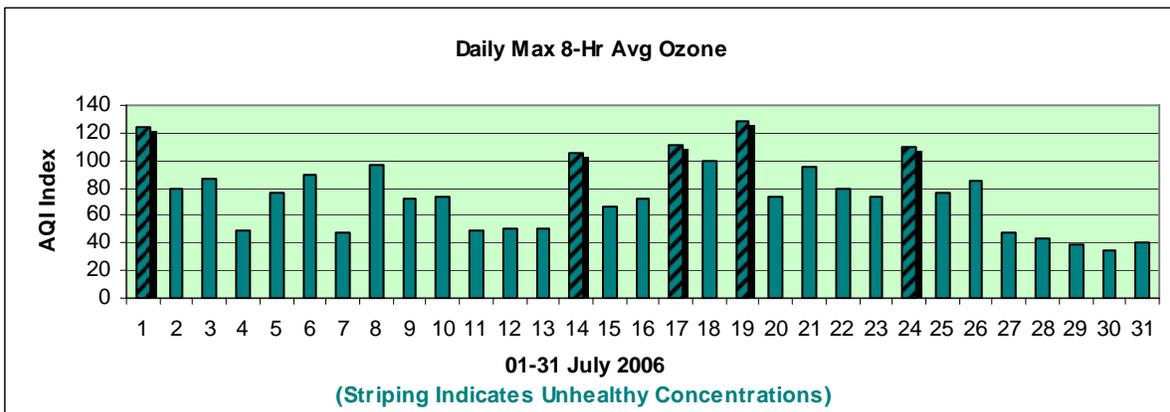
DETAILED OZONE SECTION

GOOD	MODERATE	UNHEALTHY FOR SENSITIVE GROUPS	UNHEALTHY
0-50	51-100	101-150	151-200

SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR JULY 2006*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
												1	124
2	79	3	87	4	49	5	77	6	90	7	47	8	97
9	72	10	74	11	49	12	51	13	50	14	106	15	66
16	72	17	111	18	100	19	129	20	74	21	95	22	79
23	74	24	109	25	77	26	85	27	47	28	43	29	39
30	35	31	41										



<u>8-hr Ozone exceedance days in JUL:</u>	Total= 5	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/01	94/124	North Phoenix
			90/114	Apache Junction
			89/111	West Chandler
			89/111	Central Phoenix
			87/106	Tempe
			85/101	Supersite
			85/101	West Phoenix
		7/14	88/109	Queen Valley
		7/17	89/111	Fountain Hills
			87/106	Apache Junction
			86/104	South Scottsdale
			85/101	Falcon Field
			85/101	North Phoenix
		7/19	96/129	West Phoenix
		7/24	88/109	Cave Creek

Total number of exceedance days since APR 01: 10
Total number of exceedance sites since APR 01: 25

<u>Ozone Health Watches in JUL:</u> (Forecast max value 80-84 ppb)	Total= 14	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/01	94/124	North Phoenix
		7/02	76/79	Apache Junction
		7/03	79/87	Tonto Nat'l Mon
		7/08	83/97	Central Phoenix
		7/09	73/72	Fountain Hills
				Rio Verde
		7/12	65/51	Apache Junction
				West Chandler
		7/13	64/50	Apache Junction
				Queen Valley
		7/14	87/106	Queen Valley
		7/15	71/66	West Chandler
		7/16	73/72	Fountain Hills
		7/17	89/111	Fountain Hills
		7/18	84/100	North Phoenix
		7/23	74/74	West Phoenix
		7/25	95/77	Apache Junction
				Queen Valley

Ozone Health Watches since APR 01: Total= 34

<u>High Pollution Advisories in JUL:</u> (Forecast max value 85+ppb)	Total= 3	7/19	96/129	West Phoenix
		7/20	74/74	West Chandler
		7/21	82/95	West Phoenix

High Pollution Advisories since APR 01: Total= 7

Concentration Recap:	Days in the Good category:	9
	Days in the Moderate category:	17
	Days in the Unhealthy for Sensitive Groups category:	5
	Days in the Unhealthy category:	0
	Total Forecast Days:	31

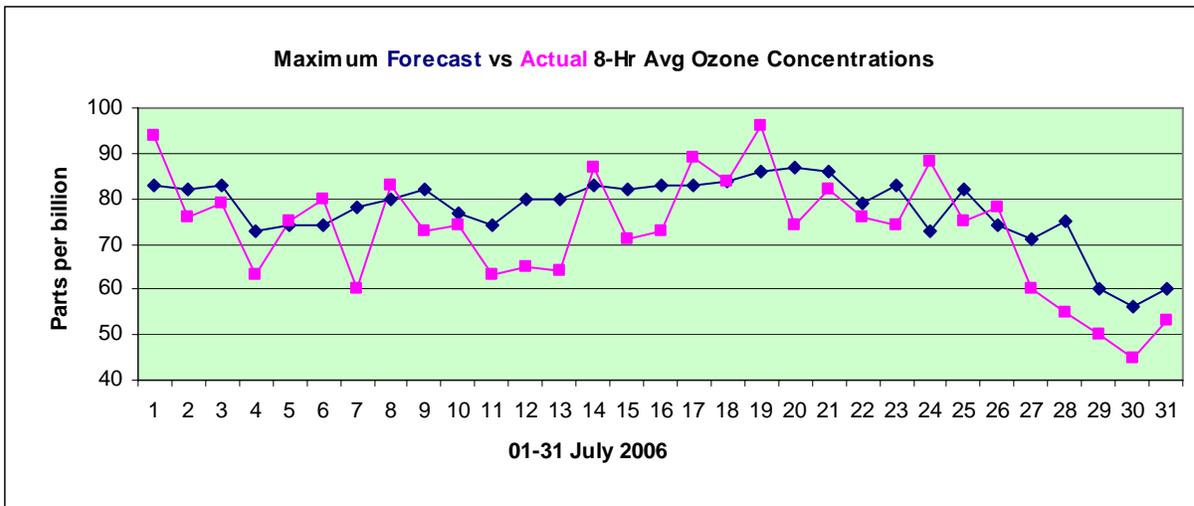
Maximum 8-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI DOW</u>
	7/19	1200	West Phoenix	96/129 Wed

Maximum 1-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI DOW</u>
	7/19	1700	West Phoenix	117/98 Fri

Average daily max 8-Hr concentration (ppb):	72.9
Deviation from the 1996-2005 average (ppb):	+1.2

JUL Climatology: (1996-2005)	Average number of 8-Hr exceedance days:	4.1
	Maximum number of 8-Hr exceedance days:	10 in 1996
	Minimum number of 8-Hr exceedance days:	0 in 1999
	Average daily max 8-Hr concentration (ppb):	71.7
	Record high max 8-Hr concentration (ppb):	107 on the 9th, 2002
	Record low max 8-Hr concentration (ppb):	40 on the 29th, 1997

Forecast Verification:	# of days maximum concentrations were over-forecast:	21
	# of days maximum concentrations were under-forecast:	9
	# of days maximum concentrations were correctly forecast:	1
	Jul average forecast accuracy (ppb):	+/-8.6
	Jul average forecast bias (ppb):	+6.7



Narrative:

As is usually the case, ozone levels peaked in the Phoenix metro area during July. The coincidence of local weather conditions, high sun angle, long day-length, and plentiful ozone precursor emissions resulted in 15 site exceedances of the 8-hour ozone standard spread out over five days. The local weather conditions that contributed to the unhealthy ozone levels included daytime temperatures in the 100-120 degree range, intense sunlight, increasing relative humidity, and easterly wind regimes & thunderstorm outflow boundaries associated with the summer monsoon. The latter factor seemed to play an especially critical role this month since nearly all outflow episodes—most of which also generated lots of blowing dust—were followed by a significant spike in ozone concentrations the following day. The chart below helps to track this relationship:

Spike Day	Spike Day Max 8-Hr AQI/Color	Prior Day's Outflow Boundary Occurrence	Prior Day's Max 8-Hr AQI/Color
7/01	124	North to northeast gust to 50 mph 2000-2300 hrs	124 (6/30)
7/05	77	South gust to 36 mph 2300-2400 hrs	49 (7/04)
7/08	97	N to 35 mph 1000-1500 hrs/S to 25 mph 1700 hrs	47 (7/07)
7/14	106	Southeast to 15 mph 2200 hrs	50 (7/13)
7/17	111	South gust to 30 mph 2300 hrs	72 (7/16)
7/19	129	Southeast to south gust to 35 mph 1900 hrs	100 (7/18)
7/24	109	Northeast to southeast gust to 56 mph 2100 hrs	74 (7/23)

In none of these instances was there enough variability in other factors—such as max daytime temperatures and degree of cloud cover—to account for such large increases in ozone concentrations. In fact, on more than one occasion, those two weather parameters were actually more favorable for ozone production on the day prior to the spike as detailed below in red type:

Spike Day	Spike Day Max Temperature (F)	Prior Day's Max Temperature (F)	Spike Day's Avg. Cloud Cover (in tenths)	Prior Day's Avg. Cloud Cover (in tenths)
7/01	110	108 (6/30)	0.7	0.7 (6/30)
7/05	96	106 (7/04)	0.7	0.8 (7/04)
7/08	105	99 (7/07)	0.4	0.7 (7/07)
7/14	114	113 (7/13)	0.3	0.3 (7/13)
7/17	106	109 (7/16)	0.7	0.5 (7/16)
7/19	112	113 (7/18)	0.6	0.7 (7/18)
7/24	114	114 (7/23)	0.7	0.8 (7/23)

This data clearly suggests that these outflow boundaries have a huge impact on subsequent ozone production; no known local studies have been launched to identify the connection but forecasters have hypothesized that the outflows modify the air mass chemistry by perhaps transporting additional biogenic VOCs (ozone pre-cursors) from vegetated areas located on the higher terrain from the north through southeast of the metro area. In the meantime, even though forecasters have incorporated the potential for these phenomena into their forecast values, the magnitude of their impact is unpredictable at the present time. As a result, forecasting accuracy took a sharp dip this month. Lastly, the low ozone readings from the 27th thru the 31st can be attributed to the dampening effect of thick and pervasive cloud cover on ozone production. -Reith