



Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

MONTHLY AIR QUALITY REPORT FOR
JUNE 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 June 2006*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN			MON			TUE			WED			THU			FRI			SAT		
												1	95	23	2	90	22	3	97	10
													85	65		103	67		59	52
4	92	10	5	90	05	6	69	09	7	87	07	8	51	08	9	50	09	10	50	07
	53	51		61	52		101	60		70	43		41	33		46	37		32	28
11	51	07	12	45	11	13	50	18	14	54	07	15	87	13	16	90	09	17	92	10
	46	27		72	29		69	41		61	36		79	43		58	38		47	39
18	104	15	19	90	14	20	79	10	21	66	09	22	61	10	23	64	11	24	82	10
	45	45		68	52		65	44		64	55		69	41		70	58		82	62
25	59	11	26	97	10	27	79	08	28	109	09	29	106	08	30	124	06			
	93	70		85	75		69	41		55	59		62	32		71	53			

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

SUN			MON			TUE			WED			THU			FRI			SAT		
												1					C	3		
4		F	5		F	6			7			8		F	9			10		F
11			12			13			14			15	D	F	16		F	17		
18			19			20		F	21		F	22		F	23		F	24		C
25		C	26		C	27		F	28		F	29		F	30		F			

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 JUN 2006-

Total= 2	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
	6/02	103	PM-10	West Forty Third
	6/06	101	PM-10	Higley

High Pollution Advisories issued during JUN 2006-

Total= 0	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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Health Watches issued during JUN 2006-

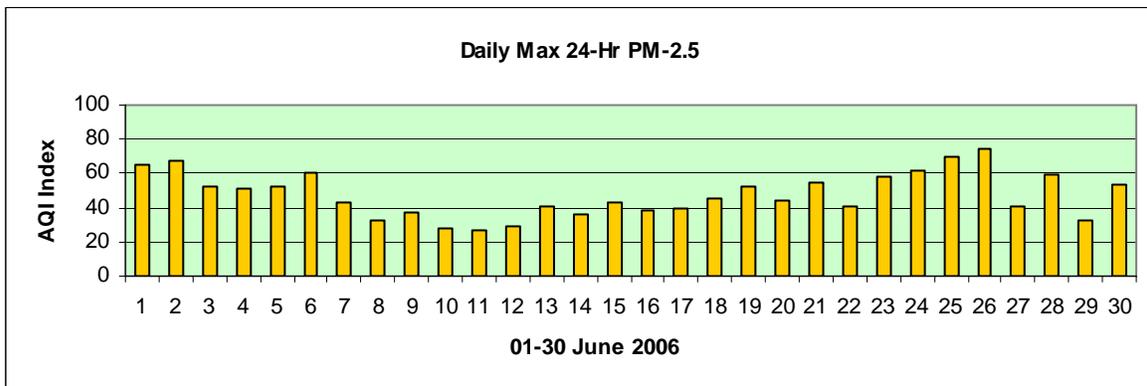
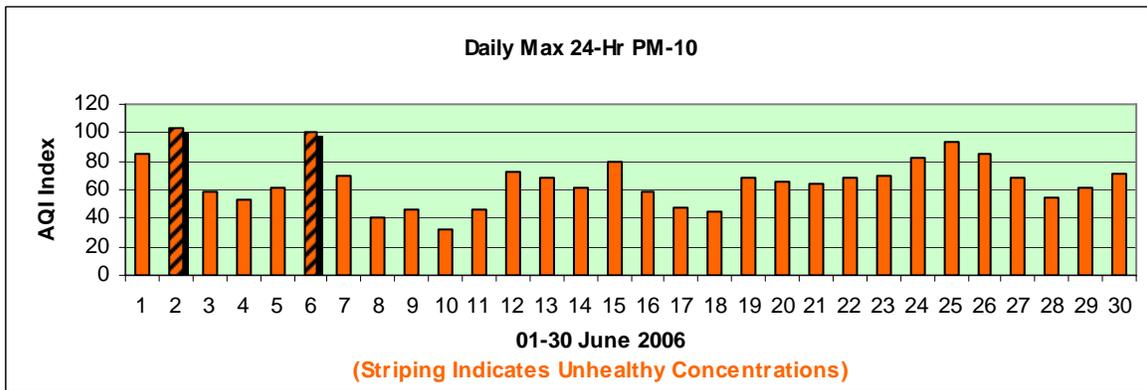
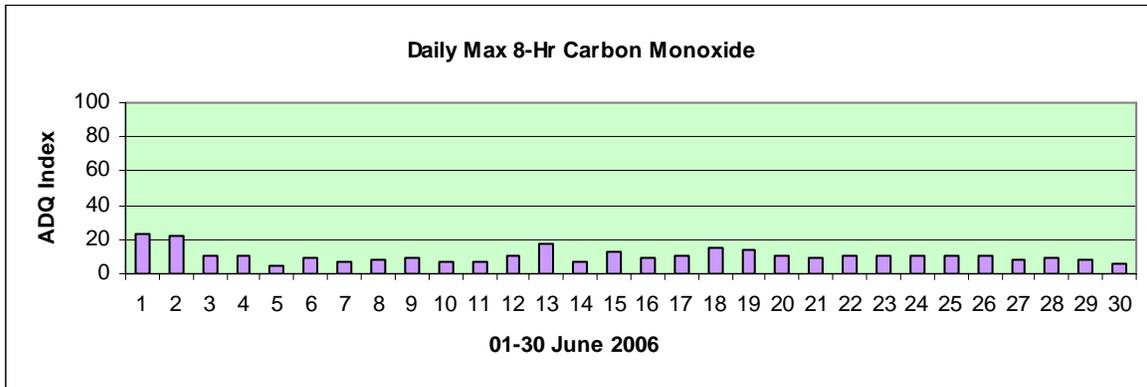
Total= 1	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
	6/15	79	PM-10	West Forty Third

Concentration Recap:

Days in the Good category:	2
Days in the Moderate category:	22
Days in the Unhealthy for Sensitive Groups category:	6
Days in the Unhealthy category:	0
Total Forecast Days:	30

Narrative:

June 2006 was yet another month during which a wide variety of atmospheric and weather phenomena occurred over the Phoenix area including smoke from forest fires, blowing dust, thick haze, thunderstorm outflow boundaries, trough and frontal passages, and even some occasional light rain. When all was said and done two more exceedances of the PM-10 standard were logged on the 2nd and 6th—the seventh consecutive month with at least one such exceedance. These episodes were both due to blowing dust generated by moderate downburst winds from convective storms that developed to the east thru south of the metro area during the late afternoon and evening hours. On the 2nd east to southeast winds gusted up to 32 mph, local visibilities dropped to as low as three miles, and at 2000 hrs the West Forty Third had a PM-10 concentration of 533ug/m³. On the 6th winds gusted up to 40 mph, local visibilities dropped as low as 1/4 mile, and at 1800 hrs the Higley site had a PM-10 reading of 660ug/m³. Meanwhile, carbon monoxide levels were seasonably low but PM-2.5 concentrations were unseasonably high due to periodic influxes of smoke from large wildfires within the state. This situation peaked on the 25th and 26th when PM-2.5 AQI values of 70 and 75 were attained. On those days the visibility was rather poor over much of central Arizona due to the transport of smoke from the 50K+ acre “Warm Fire” near the Grand Canyon. -Reith



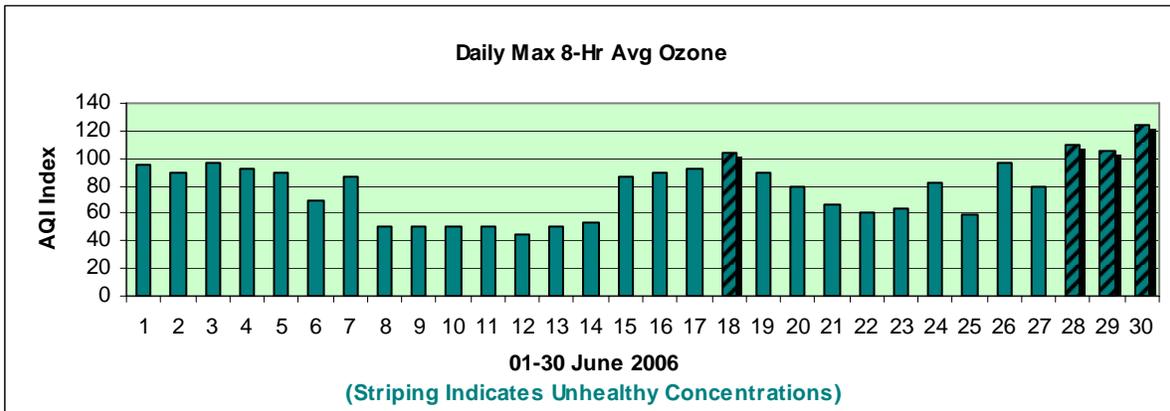
DETAILED OZONE SECTION

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

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

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
								1	95	2	90	3	97
4	92	5	90	6	69	7	87	8	51	9	50	10	50
11	51	12	45	13	50	14	54	15	87	16	90	17	92
18	104	19	90	20	79	21	66	22	61	23	64	24	82
25	59	26	97	27	79	28	109	29	106	30	124		



<u>8-hr Ozone exceedance days in JUN:</u>	Total= 4	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		6/18	86/104	Fountain Hills
			85/101	Tonto Nat'l Mon
		6/28	88/109	West Phoenix
			86/104	North Phoenix
		6/29	87/106	North Phoenix
		6/30	94/124	Apache Junction
			90/114	Queen Valley
			86/104	Fountain Hills
			86/104	Rio Verde

Total number of exceedance days since APR 01: 5
Total number of exceedance sites since APR 01: 10

<u>Ozone Health Watches in JUN:</u> (Forecast max value 80-84 ppb)	Total= 14	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		6/01	82/95	Humboldt
		6/03	83/97	North Phoenix
		6/04	81/92	West Chandler
		6/05	80/90	Tonto Nat'l Mon
		6/15	79/87	West Phoenix
		6/16	80/90	Tonto Nat'l Mon
		6/20	76/79	Fountain Hills
		6/21	71/66	North Phoenix
		6/22	69/61	Tonto Nat'l Mon
		6/23	70/64	Tonto Nat'l Mon
		6/27	79/87	North Phoenix
		6/28	88/109	West Phoenix
		6/29	87/106	North Phoenix
		6/30	94/124	Apache Junction

Ozone Health Watches since APR 01: Total= 20

<u>High Pollution Advisories in JUN:</u> (Forecast max value 85+ppb)	Total= 4	6/02	80/90	Cave Creek
		6/24	77/82	West Chandler
		6/25	68/59	North Phoenix
		6/26	83/97	West Chandler

High Pollution Advisories since APR 01: Total= 4

Concentration Recap: Days in the **Good** category: 4
 Days in the **Moderate** category: 22
 Days in the **Unhealthy for Sensitive Groups** category: 4
 Days in the **Unhealthy** category: 0
 Total Forecast Days: 30

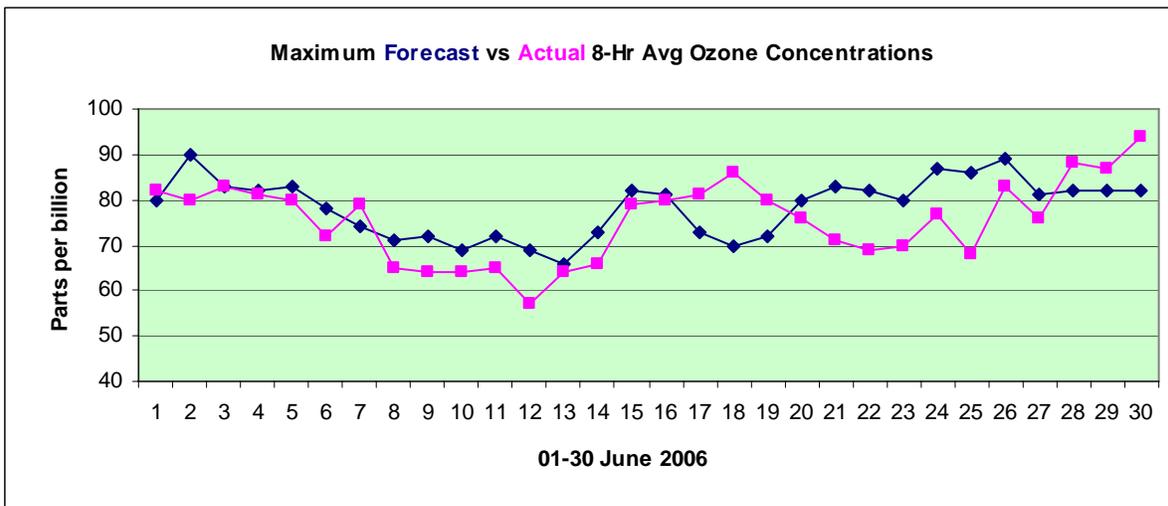
Maximum 8-Hr value: Date Hour Site ppb/AQI DOW
 6/30 1100 Apache Junction 94/124 Fri

Maximum 1-Hr value: Date Hour Site ppb/AQI DOW
 6/30 1500 Queen Valley 110/92 Fri

Average daily max 8-Hr concentration (ppb): 75.6
 Deviation from the 1996-2005 average (ppb): +3.6

JUN Climatology: Average number of 8-Hr exceedance days: 3.2
 (1996-2005) Maximum number of 8-Hr exceedance days: 9 in 1998 and 2002
 Minimum number of 8-Hr exceedance days: 0 in 2003 and 2004
 Average daily max 8-Hr concentration (ppb): 72.0
 Record high max 8-Hr concentration (ppb): 102 on the 1st, 1996
 Record low max 8-Hr concentration (ppb): 45 on the 10th, 2003

Forecast Verification: # of days maximum concentrations were over-forecast: 21
 # of days maximum concentrations were under-forecast: 8
 # of days maximum concentrations were correctly forecast: 1
 Jun average forecast accuracy (ppb): +/-7.0
 Jun average forecast bias (ppb): +2.9



Narrative:

The Phoenix and vicinity ozone levels during June 2006 were in part a function of local weather conditions, with each of the four weekly periods possessing its own distinctive synoptic regime. From the 1st thru the 7th of the month a “false monsoon” of sorts became established when a 500mb high height center anomaly became situated to the north of Arizona. This resulted in not only record heat on the 2nd and 3rd, an average maximum high of 109 degrees, and the issuance of Heat Advisories by the National Weather Service for the 2nd and Excessive Heat Warnings for the 3rd thru the 5th, but also the advection of enough mid-level moisture to produce thunderstorms over the higher terrain. Outflow boundaries from these storms affected the area on the 2nd, 6th, and 7th but dew pts were only in the 30’s and 40’s. These outflow boundaries have been suspected of “ozone priming” by delivering additional biogenic VOCs from forested areas east of the valley. All of these factors contributed to near-unhealthy ozone levels from the 1st thru the 5th. The weather pattern changed on the 8th when a mid-latitude trough developed over the West; its main impact was to increase the gradients aloft over the forecast area enough to cause breezy to gusty southwesterly surface winds each afternoon thru the 14th. This trajectory brings relatively clean desert air over the valley and ozone levels dropped into or close to the good range of the Air Quality Index from the 8th thru the 14th. From the 15th thru the 21st the trough was positioned in such a way that the flow aloft upstream from Arizona became west to northwesterly. In the past this trajectory has frequently transported ozone and/or its precursors from central and southern California over Arizona and once again this phenomenon had an impact: highest ozone concentrations were close to or above the 8-hour standard from the 15th thru the 19th. The final week (23rd to 30th) was characterized by the evolution of the true summer monsoon circulation and its associated easterly wind regime aloft and increasing moisture levels. This regime typically coincides with the highest ozone levels of the season in Phoenix and this episode was no exception with exceedances of the ozone standard on the 28th, 29th, and 30th. There were thunderstorm outflow boundary events from the 24th thru the 27th and again on the 29th and 30th. As mentioned earlier, it is believed that these events can set the stage for high ozone production the following day by increasing precursors and relative humidity; however, the exact correlation, interaction, or role played by each is unknown at this time. -Reith