



**MONTHLY AIR QUALITY REPORT FOR
JULY 2009**

AOI COLOR SCALE

GOOD 0-50	MODERATE 51-100	UNHEALTHY FOR SENSITIVE GROUPS 101-150	UNHEALTHY 151-200
	VERY UNHEALTHY 201-300	HAZARDOUS 301-500	

Calendar of maximum AQI values & their corresponding color for July 2009*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN			MON			TUES			WED			THU			FRI			SAT		
								1	74	05	2	116	07	3	77	07	4	61	05	
								8	56	40		30	42		37	24		19	22	
5	48	05	6	51	07	7	49	07	9	50	06	10	61	07	11	77	08	12	77	06
	23	24		48	29		32	29		50	24		46	25		58	31		44	30
	54	05		51	06		51	07		61	07		87	09		84	07		90	06
	44	28		70	33		51	35		60	38		55	40		266	88		319	117
	87	06		67	07		64	08		90	08		67	05		97	07		64	06
	79	58		96	67		32	40		34	35		64	27		29	33		39	29
26	67	05	27	71	06	28	77	09	29	49	07	30	77	07	31	67	08			
	34	29		37	30		52	36		55	38		49	34		36	27			

Calendar of High Pollution Advisories and Health Watches issued during July 2009

SUN			MON			TUE			WED			THU			FRI			SAT					
									1						2			3			4		
											F									F			F
5			6			7			8			9			10					F	11		
																				C			
12			13			14			15			16			17						18		
																							F
19			20			21					F	22			23						24		F
26			27			28			29			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

Calendar of Meteorological Conditions observed in Metro Phoenix during July 2009

SUN			MON			TUE			WED			THU			FRI			SAT					
									1						2		B	3	A	B	4		B
											D												
5			6			7		E	8			9			10						11		
12			13			14			15	A	B	16	A		17		B				18	A	B
19	A	B	20	A	B	21	A	B	22	A	B	23	A	B	24	A	B				25		B
26			27			28		E	29		D	30			31								

LEGEND

ELECTROMETEORS
A = Thunderstorm

HYDROMETEORS
B = Rain/Drizzle/Hail/Snow
C = Fog

LITHOMETEORS
D = Blowing Dust
E = Haze (vsby <10SM)
F = Smoke

Non-Ozone Exceedance days during JUL 2009-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
2	8/17	266	PM-10	Buckeye
		161	PM-10	Higley
		114	PM-10	West Forty Third
		108	PM-10	South Phoenix
		104	PM-10	Durango
	8/18	319	PM-10	Buckeye
		182	PM-10	West Forty Third
		162	PM-10	Durango
		148	PM-10	South Phoenix
		138	PM-10	Greenwood
		129	PM-10	West Phoenix
		117	PM-2.5	Durango

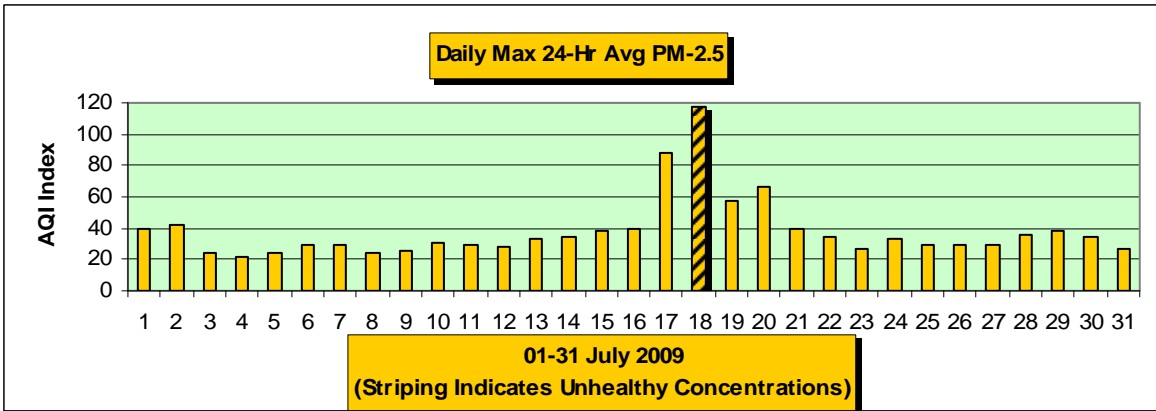
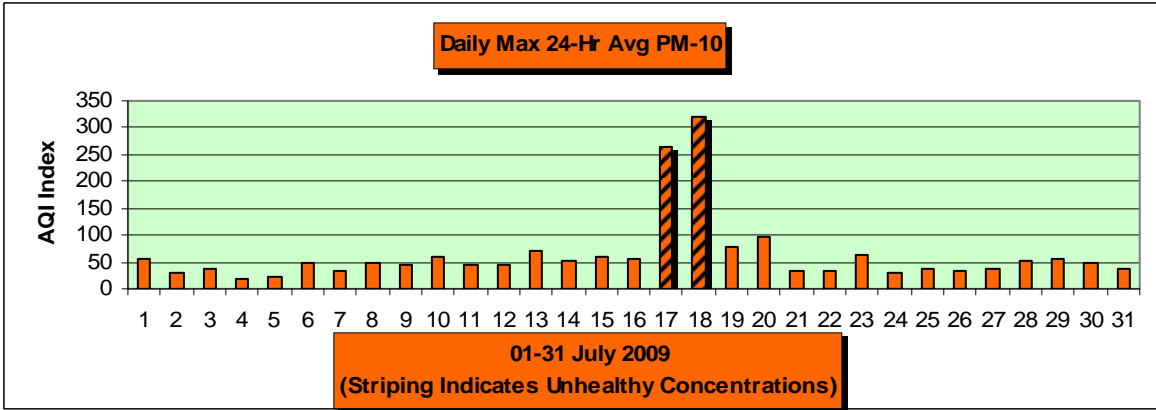
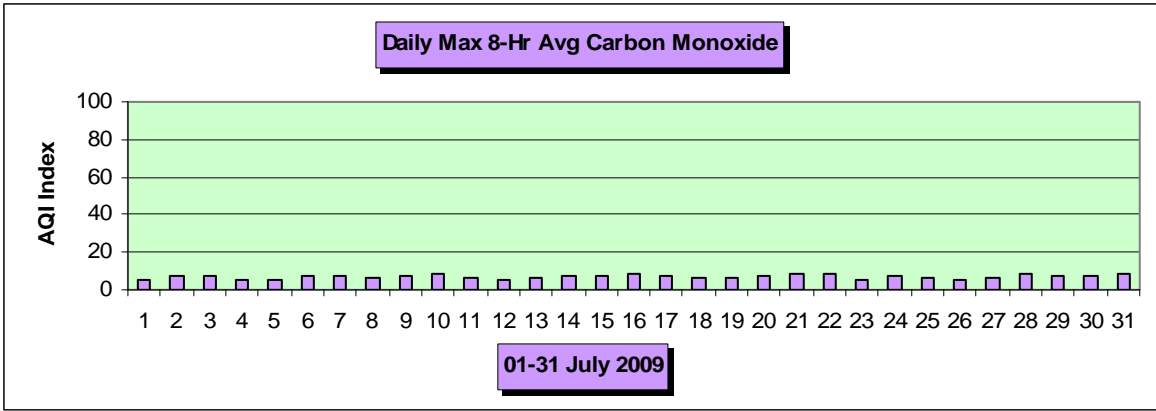
Non-Ozone Health Watches issued during JUL 2009-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
0				

Non-Ozone High Pollution Advisories issued during JUL 2009-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
0				

<u>Concentration Recap:</u>	Days in the Good category:	3
	Days in the Moderate category:	25
	Days in the Unhealthy for Sensitive Groups category:	1
	Days in the Unhealthy category:	0
	Days in the Very Unhealthy category:	1
	Days in the Hazardous Category:	<u>1</u>
	Total Forecast Days:	31



Narrative: The summer monsoon weather pattern became firmly established over Arizona during July. Since local precipitation during the months of May and June was rather sparse, desert soils had become quite desiccated. Thunderstorm outflow boundary winds brought several blowing dust episodes to the Valley thru the 16th, the most noteworthy occurring on the 13th when local visibilities dropped to low as 2 1/2 miles and PM-10 (coarse particle) levels reached 70 on the AQI scale. Significant and daily convective rainfall did occur in the Phoenix area from the 20th thru the 24th, but not in time to prevent or lessen the impacts from a pair of major wind and blowing dust events on the 17th and 18th. On the 17th a strong outflow boundary from the east and southeast from 6:00 to 9:00 p.m. resulted in wind gusts up to 44 mph and blowing dust from 6:00 to 10:00 p.m. along with visibilities as low as 1/8 mile. This resulted in five PM-10 exceedances in the metro area at monitoring sites that encompassed most of the Valley’s land area, with a “Very Unhealthy” 24-hour concentration at Buckeye. The highest hourly PM-10 concentration occurred at the Higley site with 3,591.7ug/m3 at 6:00 p.m. The graphics below show the July 17 hourly PM-10 concentration time series for Buckeye and Higley, and are followed by some images captured by the local VISNET web-camera network:



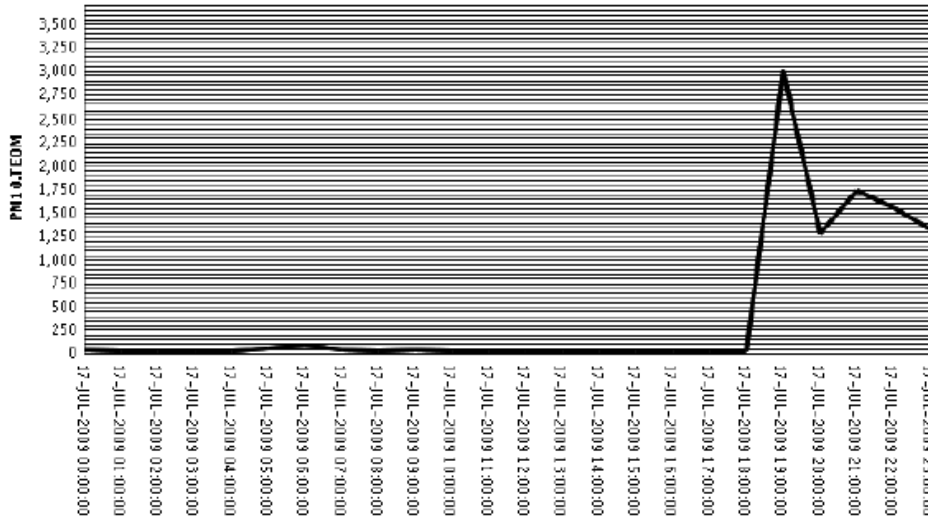
Arizona Department of Environmental Quality

AIR QUALITY DIVISION
PM10.TEOM Daily Concentration Report (ug/m3)
For 07/17/2009
Preliminary Data QA LEVEL - 2

AAATEOM_GRAPH

09/10/2009

Place ID: 21525
Name: BUCKEYE



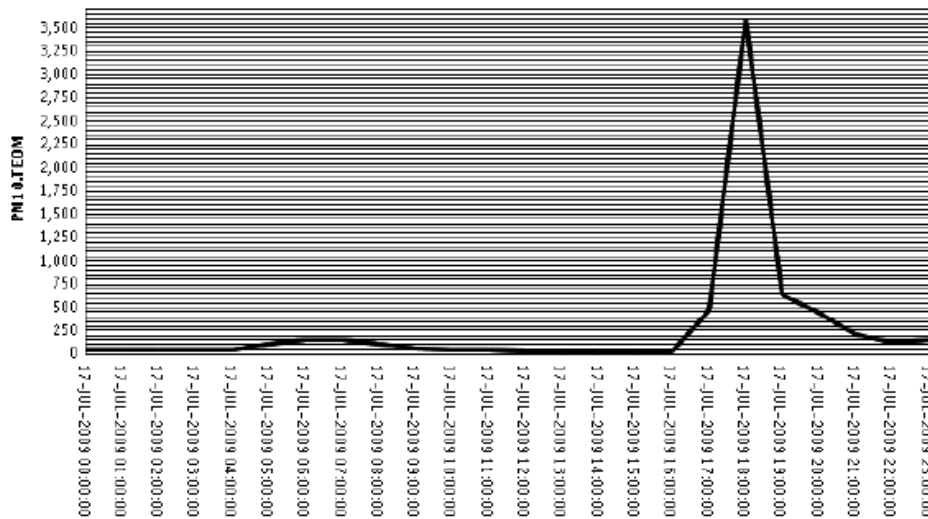
Arizona Department of Environmental Quality

AIR QUALITY DIVISION
PM10.TEOM Daily Concentration Report (ug/m3)
For 07/17/2009
Preliminary Data QA LEVEL - 2

AAATEOM_GRAPH

09/10/2009

Place ID: 16505
Name: HIGLEY



07/17/2009 07:00 PM



07/17/2009 08:00 PM



Thick dust then remained suspended over the metro area thru the overnight hours and into the early afternoon with visibilities during that period reported to be in the 2-7 mile range at times. As can be seen from the July 18 time series for Buckeye that follows, hourly PM-10 concentrations were near or above 900ug/m3 thru 7:00 a.m. with the highest hourly concentration for the entire day occurring at midnight – 1,320.5ug/m3. To add insult to injury, two separate outflow boundary/high wind/blowing dust events occurred that evening. The first arrived from the south and southwest between 6:00 and 7:00 a.m. with wind gusts to 33 mph, and the second from the east and northeast between 8:00 and 10:00 p.m. with wind gusts to 41 mph. Visibilities fell as low as 1/4 mile with the latter event. As can be seen below, these episodes produced secondary and tertiary PM-10 spikes, and ultimately led to a 24-hour average PM-10 concentration of 439.7ug/m3 at Buckeye – well into the “Hazardous” range! This series of events even contributed to an exceedance of the PM-2.5 (fine particle) standard at the Durango site with a 24-hour average concentration of 42.0ug/m3.

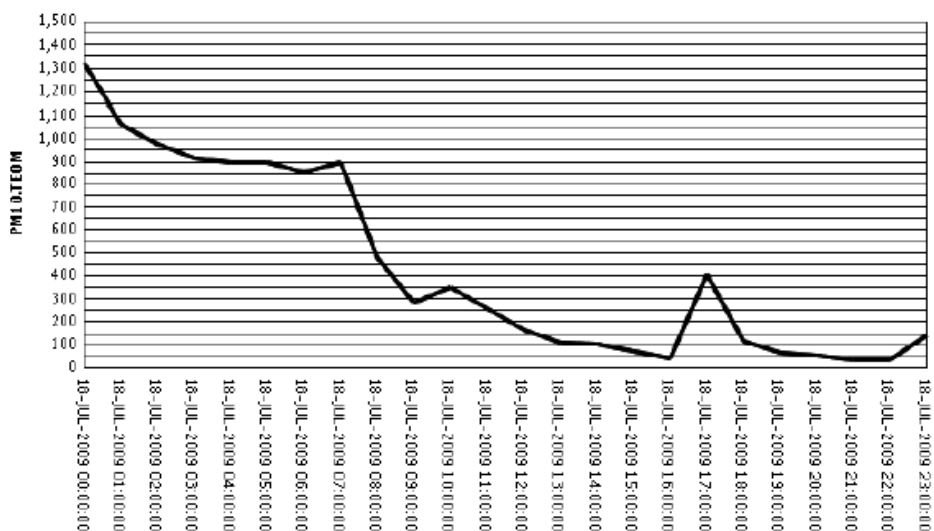


Arizona Department of Environmental Quality

AIR QUALITY DIVISION
PM10.TEOM Daily Concentration Report (ug/m3)
 For 07/18/2009
 Preliminary Data QA LEVEL - 2

AAATEOM_GRAPH
 09/10/2009

Place ID: 21525
 Name: BUCKEYE



Incredibly, dense blowing dust events also occurred on the 19th and 20th, with another PM-10 exceedance day narrowly missed on the 20th. During that evening wind gusts of up to 55 mph and visibilities as low as one mile were followed by showers that dropped up to 0.20” of rain. The blowing dust episodes that then followed on the 21st, 22nd and 23rd were also followed by rainfall – so despite high winds and reduced visibilities, highest PM-10 levels on those days were in the good to low-moderate range of the Air Quality Index. –Reith

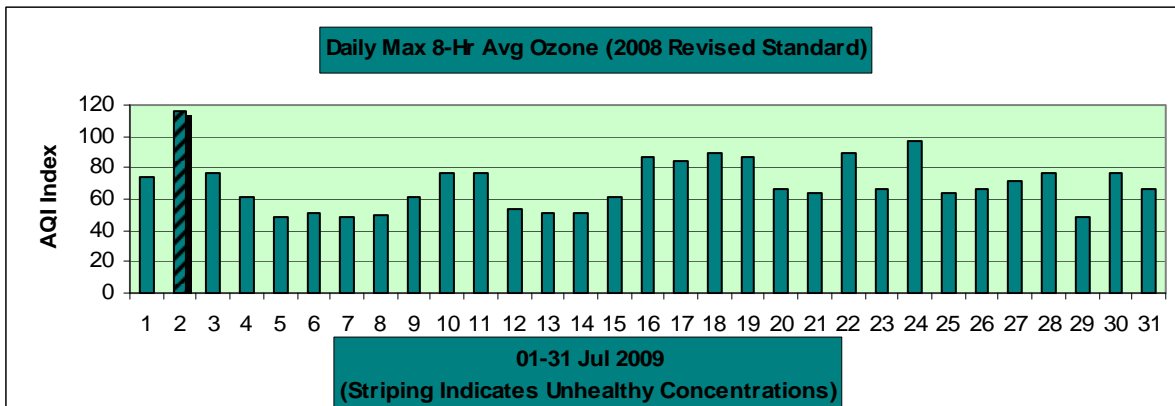
DETAILED OZONE SECTION
 (Based on the 2008 EPA Revised 8-Hour Ozone Standard)

GOOD 0-50	MODERATE 51-100	UNHEALTHY FOR SENSITIVE GROUPS 101-150	UNHEALTHY 151-200
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SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR JULY 2009*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
						1	74	2	116	3	77	4	61
5	48	6	51	7	49	8	50	9	61	10	77	11	77
12	54	13	51	14	51	15	61	16	87	17	84	18	90
19	87	20	67	21	64	22	90	23	67	24	97	25	64
26	67	27	71	28	77	29	49	30	77	31	67		



<u>8-hr Ozone exceedance days in JUL:</u>	Total= 1	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/02	82/116 77/104	West Phoenix Phx Supersite

Total number of exceedance days since APR 01: 4
Total number of exceedance sites since APR 01: 10

<u>Ozone Health Watches in JUL:</u> (Forecast max value 72-75 ppb)	Total= 8	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/01	67/74	Apache Junction
			67/74	Fountain Hills
			67/74	Queen Valley
		7/03	68/77	Fountain Hills
		7/04	63/61	Falcon Field
			63/61	Queen Valley
		7/10	68/77	Apache Junction
		7/18	72/90	Glendale
		7/21	64/64	Queen Valley
		7/23	65/67	Cave Creek
		7/24	74/97	South Scottsdale
			74/97	Phx Supersite

Ozone Health Watches since APR 01: Total= 24

<u>High Pollution Advisories in JUL:</u> (Forecast max value 76+ppb)	Total= 1	7/17	70/84 70/84	Cave Creek Pinnacle Peak
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High Pollution Advisories since APR 01: Total= 6

Concentration Recap: Days in the **Good** category: 4
Days in the **Moderate** category: 26
Days in the **Unhealthy for Sensitive Groups** category: 1
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</u>	<u>DOW</u>
	7/02	1200	West Phoenix	82/116	Thu

Maximum 1-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	7/28	1300	Fountain Hills	94/78	Tue

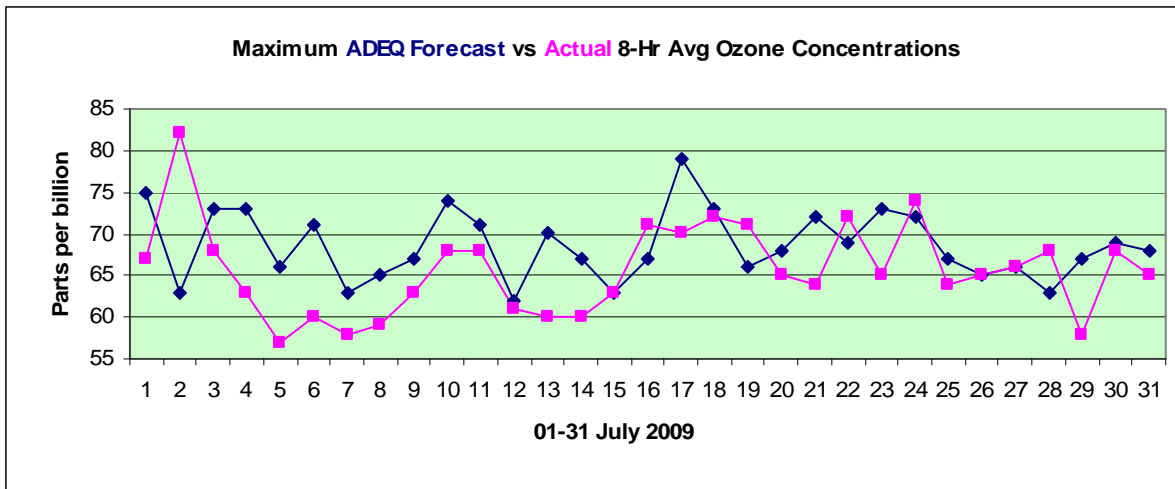
Average daily max 8-Hr concentration (ppb):	65.6
Deviation from the 1996-2008 average (ppb):	-5.7

JUL Climatology:
(Period 1996-2008
using 1997 85ppb
standard & 2008
using 76ppb
standard)

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 1997, 1999, 2007
 Average daily max 8-Hr concentration (ppb): 71.3
 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: 22
 # of days maximum concentrations were under-forecast: 6
 # of days maximum concentrations were correctly forecast: 3
 Jul average forecast accuracy (ppb): +/-5.5
 Jul average forecast bias (ppb): +3.0



Narrative:

If the month of July 2009 goes down as one of the most dusty (see preceding portion of this report), than it will also go down as extremely ozone deficient. This is even more unusual in light of the information below from the National Weather Service:

NWS PHOENIX EXCERPT:

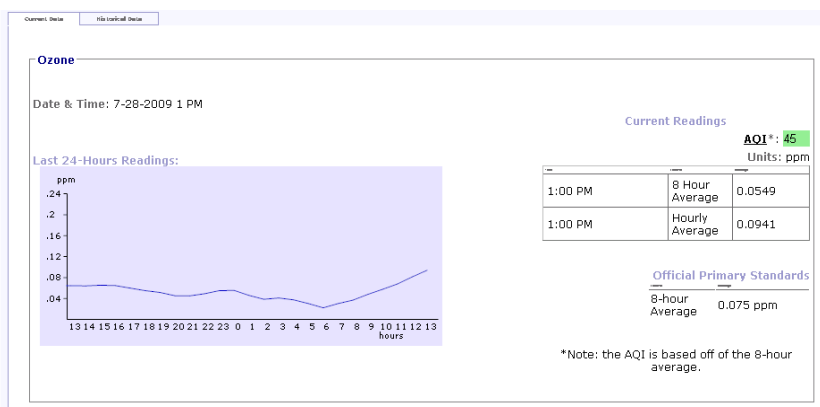
With July 2009 now over it will go down as not only the hottest July on record but the hottest month of all-time in Phoenix (as determined by average temperature, see table below). The data below represent the top ten warmest Julys for Phoenix by average high, mean, and low temperatures. Records for Phoenix began in 1896.

Rank	Average Max Temperature (°F)	Year	Average Temperature (°F)	Year	Average Min Temperature (°F)	Year
1	109.8	1989	98.3	2009	87.1	2009
2	109.5	2009	97.8	2003	86.6	2003
3	109.5	2005	97.4	1989	86.4	2006
4	108.7	2003	97.2	2005	85.0	2005
5	108.3	1978	96.5	2006	85.0	1989
6	108.1	1979	96.1	1988	84.8	2007
7	107.6	1980	96.0	2002	84.8	2002
8	107.5	1988	95.8	2007	84.8	1988
9	107.5	1933	95.6	1980	84.8	1981
10	107.5	1931	95.5	1983	84.2	1998

This temperature data is a timely illustration of how hot weather alone fails to determine ultimate ozone readings in the Phoenix metro area. Although the conditions for local ozone production are important, the conditions for local ozone accumulation are absolutely critical. The breezy to gusty westerly anabatic (upslope) afternoon winds that are the norm in the Valley during the summer months dissipates the local ozone plume. The graphs below from the Fountain Hills monitoring site – located northeast of the population center – show this process to good effect. On the first graph the ozone time series shows rapid and efficient production during the morning and early afternoon hours. The second graph includes the late afternoon and early evening periods during which westerly winds gusted up to 25 mph. As can be seen, ozone concentrations plummeted.

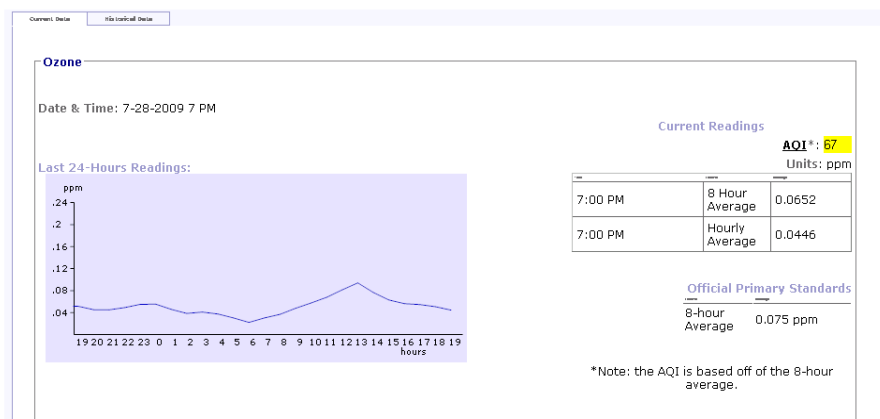
Site Name: **Fountain Hills**
 Site Location: **Palisades & Fountain Hills Blvd.**
 AQS Code: **04-013-9704**

Warning: These data have been obtained from automated instruments and have not been subjected to a quality assurance review to determine their awareness and should not be considered final. Conditions such as power outages and equipment malfunctions can produce invalid data. **Please note at every site.**



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A katabatic (down-slope) easterly wind regime – typical once the monsoon weather pattern becomes established with high pressure to the north of AZ – was nearly absent during this July. (It has been recognized for some time it is this easterly wind component that accentuates ozone accumulation in the metro area by halting the dispersion of the plume). Instead, the subtropical high was positioned east or south of AZ much of the month. Incidentally, rainfall totals over the entire state were much below average. -Reith