



**MONTHLY AIR QUALITY REPORT FOR
JULY 2012**

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 2012*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN		MON		TUES		WED		THU		FRI		SAT	
1	93 05 48 36	2	84 05 57 37	3	50 06 72 52	4	37 05 31 41	5	48 06 24 46	6	48 05 45 30	7	61 05 34 21
8	77 03 29 28	9	90 05 36 27	10	119 06 55 35	11	111 06 166 67	12	129 07 63 35	13	100 08 27 16	14	67 06 39 20
15	87 06 74 40	16	67 06 21 23	17	48 07 36 29	18	64 03 53 26	19	58 05 42 33	20	90 07 61 37	21	67 03 96 61
22	64 05 54 26	23	90 05 70 36	24	58 03 30 21	25	54 03 28 21	26	50 06 42 27	27	74 06 37 31	28	64 07 64 27
29	64 08 54 31	30	48 07 17 24	31	61 07 25 24								

Calendar of High Pollution Advisories and Health Watches issued during July 2012

SUN			MON			TUE			WED			THU			FRI			SAT		
1			2			3			4			5		F	6		F	7		F
8		F	9			10		F	11			12		F	13			14		
15			16			17		F	18			19			20		C	21		
22			23			24			25			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 2012

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

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 JULY 2012-

<u>Total=</u>	<u>1</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
		7/11	166	PM-10	South Phoenix
			132	PM-10	Durango
			129	PM-10	Greenwood
			110	PM-10	West Forty Third
			101	PM-10	Buckeye

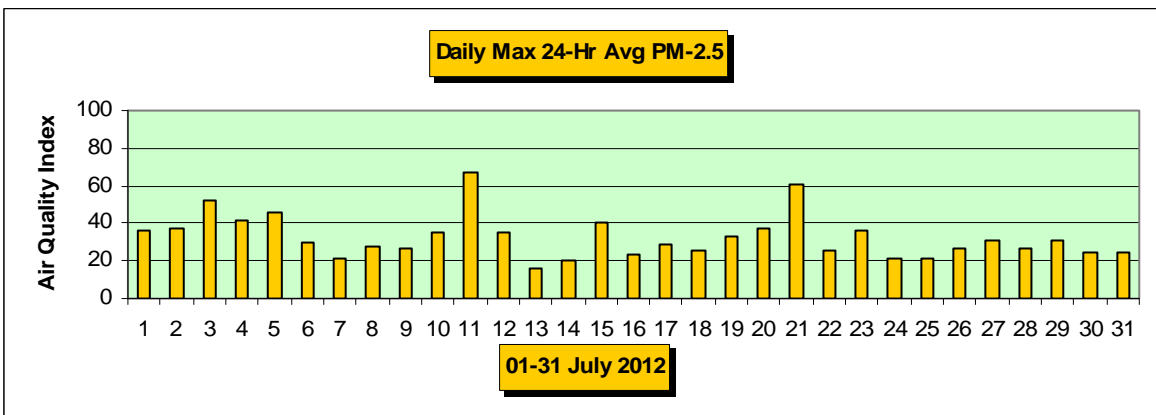
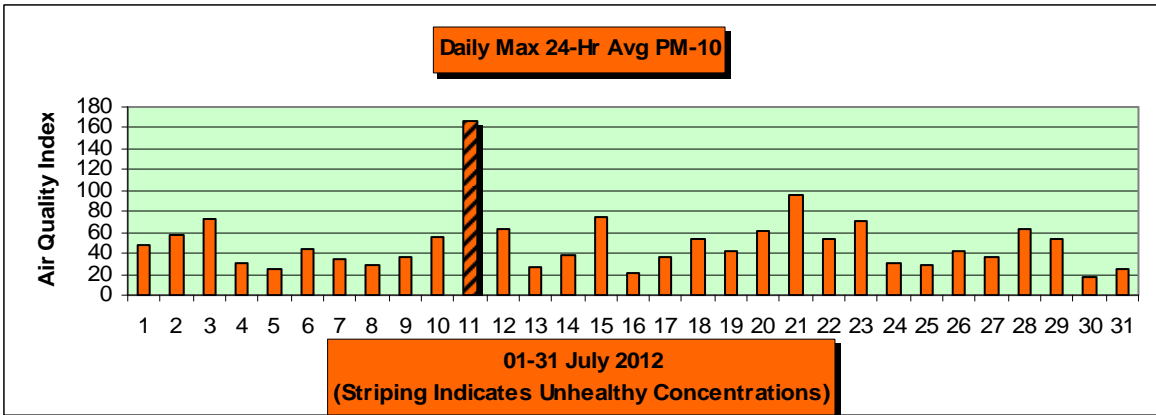
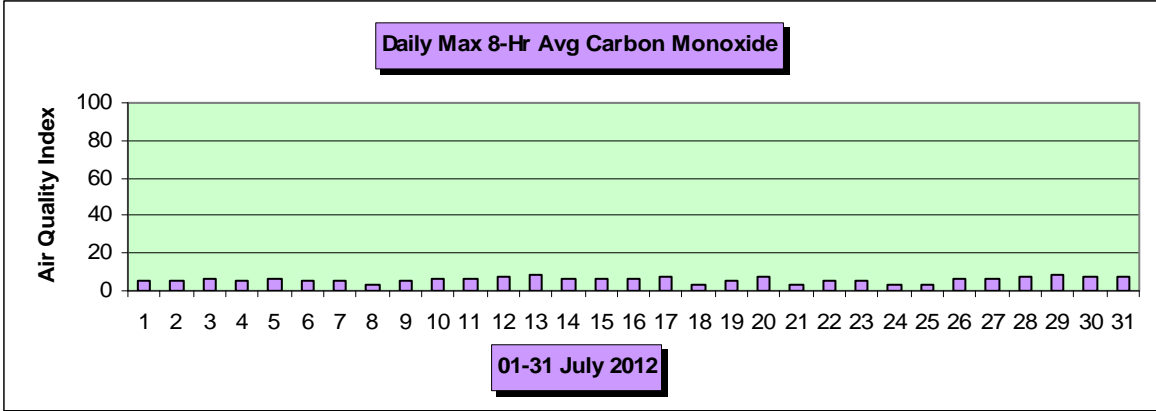
Non-Ozone Health Watches issued during JULY 2012-

<u>Total=</u>	<u>0</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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Non-Ozone High Pollution Advisories issued during JULY 2012-

<u>Total=</u>	<u>0</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
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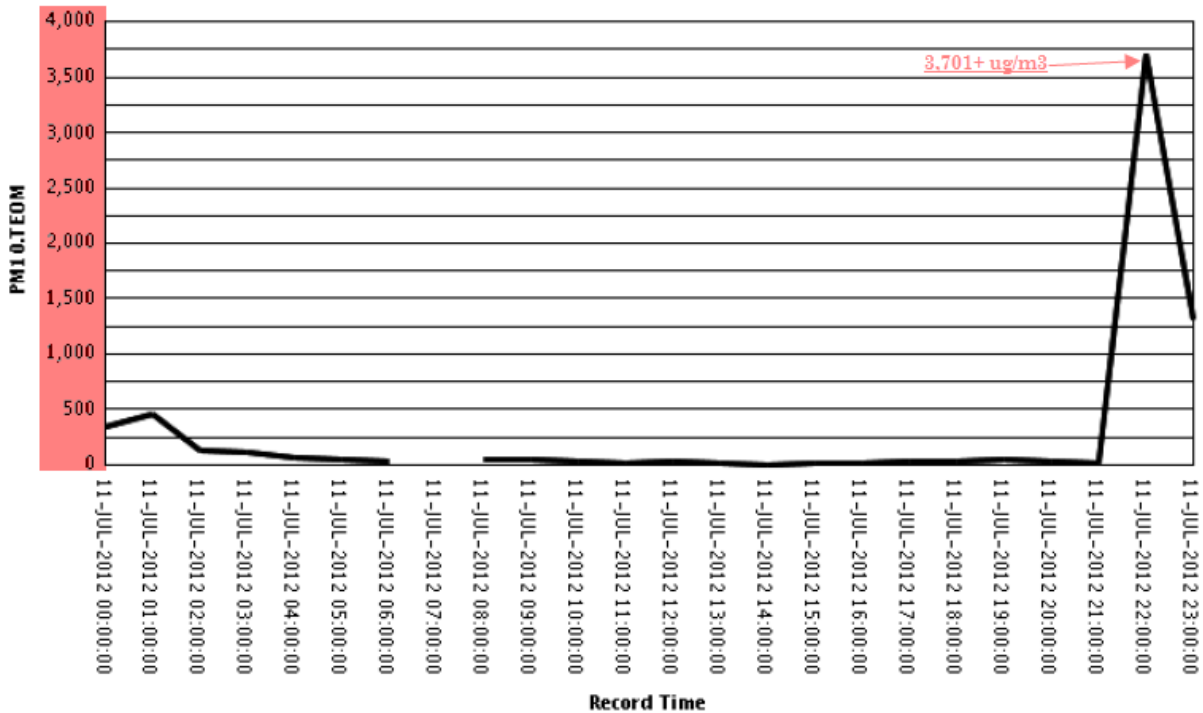
<u>Concentration Recap:</u>	Days in the Good category:	6
	Days in the Moderate category:	22
	Days in the Unhealthy for Sensitive Groups category:	2
	Days in the Unhealthy category:	1
	Days in the Very Unhealthy category:	0
	Days in the Hazardous category:	0
	Total Forecast Days:	31



Narrative: The summer monsoon weather pattern was in full swing over Arizona in general during July and in the Phoenix metro area in particular. Along with an increase in dew points and humidity, this weather pattern can also produce widespread thunderstorm activity capable of producing heavy rain and strong outflow winds that frequently generate significant blowing dust (PM-10). This month was no exception in that rainfall was recorded in the Valley on 20 days during the month while blowing dust was reported on 12 days. One would think so many days with precipitation would preclude the frequency of blowing dust but this was obviously not the case this month. However, it does appear possible that the rainfall helped to reduce the volume of blowing dust since coarse particle (PM-10) concentrations reached unhealthy levels just once during July. The date of that event was July 11 and during the late evening hours thunderstorm outflow winds gusted up to 33 mph and visibilities dropped to as low as 1 3/4 miles in dense blowing dust. PM-10 concentrations rose so high that exceedances were recorded at five monitoring sites with the highest 24-hour average concentration at South Phoenix. At 10:00 p.m. the hourly concentration at this site reach 3,701ug/m³ as shown in the PM-10 time series graph below (Figure 1). Although summer dust storms and unhealthy PM-10 levels are not uncommon in Phoenix during July, what made this event rather peculiar was that there were also strong wind and blowing dust episodes on both the day before and after this event. On the 10th wind gusts of up to 39 mph were recorded with visibilities as low as seven miles. On the 12th wind gusts of up to 47 mph were recorded with visibilities as low as 1 3/4miles. On both of those days highest PM-10 Air Quality Index readings only reached 55 and 63 in the moderate range, respectively, whereas on the 11th the highest AQI reading was 166 – in the unhealthy range. On top of this rainfall was recorded in the Valley on all three days. It is unknown what circumstance was so different about the wind/dust event on the 11th that resulted in such high PM-10 concentrations compared to those of the days prior and after, but it does illustrate the difficulties in both forecasting and mitigating such events. -Reith

Figure 1

Place ID: 16377
 Name: SOUTH PHOENIX



DETAILED OZONE SECTION

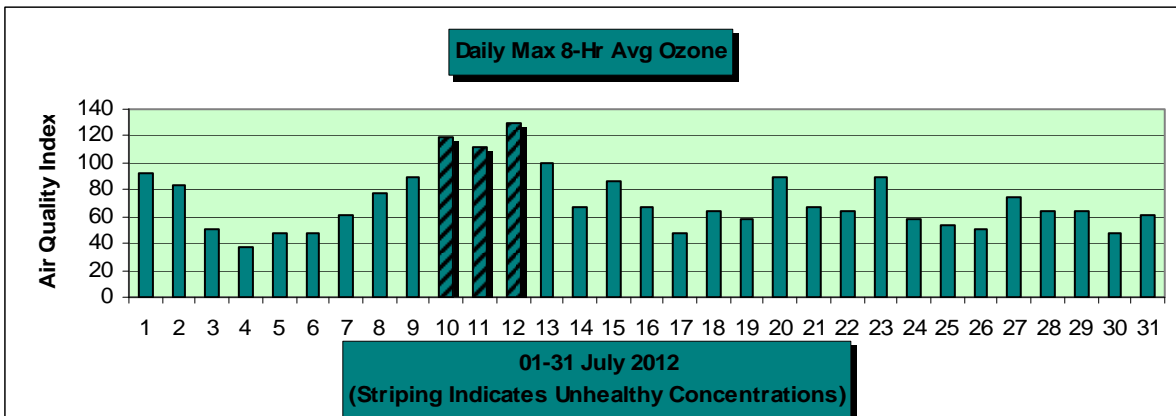
(Based on the 2008 EPA Revised 8-Hour Ozone Standard)

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 2012*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
1	93	2	84	3	50	4	37	5	48	6	48	7	61
8	77	9	90	10	119	11	111	12	129	13	100	14	67
15	87	16	67	17	48	18	64	19	58	20	90	21	67
22	64	23	90	24	58	25	54	26	50	27	74	28	64
29	64	30	48	31	61								



<u>8-hr Ozone exceedance days in JULY:</u>	Total= 3	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/10	83/119	North Phoenix
			81/114	Phx Supersite
			79/109	Glendale
			78/106	West Phoenix
		7/11	80/111	West Phoenix
			79/109	Phx Supersite
			77/104	North Phoenix
			76/101	Central Phoenix
			76/101	South Phoenix
		7/12	87/129	North Phoenix
			87/129	West Phoenix
			86/127	South Scottsdale
			84/122	Glendale
			84/122	Phx Supersite
			82/116	Pinnacle Peak
			82/116	West Chandler
			81/114	Central Phoenix
			81/114	South Phoenix
			79/109	Queen Valley
			78/106	Tempe
			77/104	Blue Point
			76/101	Cave Creek

Total number of exceedance days since APR 01: 20
Total number of exceedance sites since APR 01: 87

<u>Ozone Health Watches in JULY:</u> (Forecast max value 72-75 ppb)	Total= 7	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/05	57/48	Pinnacle Peak
		7/06	57/48	Queen Valley
				Tonto Nat'l Mon
		7/07	63/61	Queen Valley
		7/08	72/90	Pinnacle Peak
		7/10	83/119	North Phoenix
		7/12	87/129	North Phoenix
				West Phoenix
		7/17	57/48	Humboldt Mtn.

Ozone Health Watches since APR 01: Total= 28

<u>High Pollution Advisories in JULY:</u> (Forecast max value 76+ppb)	Total= 1	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		7/20	72/90	Blue Point

High Pollution Advisories since APR 01: Total= 5

Concentration Recap:	Days in the Good category:	7
	Days in the Moderate category:	21
	Days in the Unhealthy for Sensitive Groups category:	3
	Days in the Unhealthy category:	0
	Total Forecast Days:	31

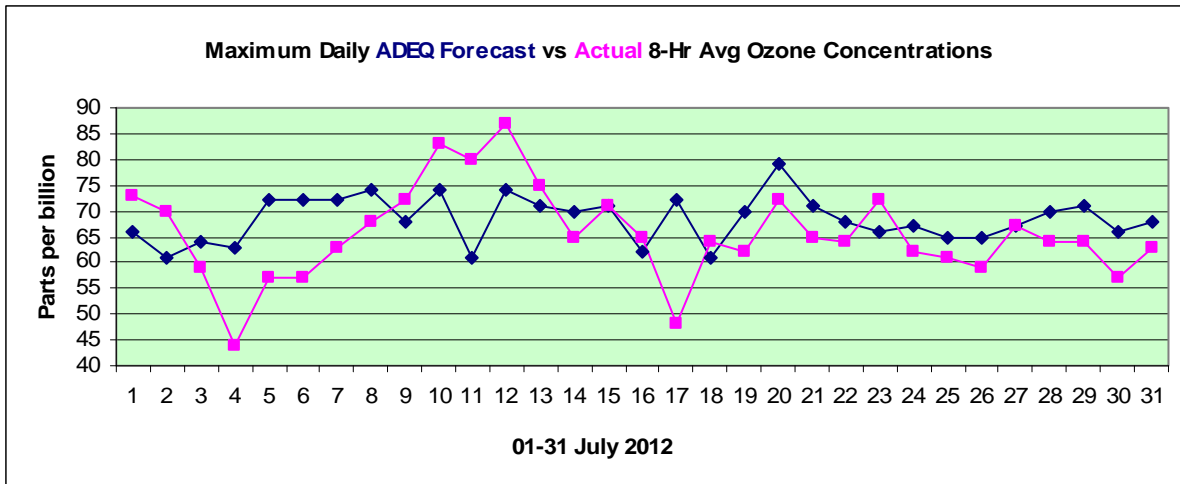
Maximum 8-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	7/12	1100	North Phoenix West Phoenix	87/129	Thu

Maximum 1-Hr value:	<u>Date</u>	<u>Hour</u>	<u>Site</u>	<u>ppb/AQI</u>	<u>DOW</u>
	7/12	1600	North Phoenix 1300 West Phoenix	102/85	Thu

Average daily max 8-Hr concentration (ppb):	65.6
Deviation from the 1996-2011 average (ppb):	-4.5

JULY Climatology: (Period 1996-2007 using 1997 85ppb standard & 2008- 2011 using 76ppb standard)	Average number of 8-Hr exceedance days:	3.6
	Maximum number of 8-Hr exceedance days:	10 in 1996
	Minimum number of 8-Hr exceedance days:	0 in 1997, '99, 2007, 2010
	Average daily max 8-Hr concentration (ppb):	70.1
	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:	19
	# of days maximum concentrations were under-forecast:	10
	# of days maximum concentrations were correctly forecast:	2
	July average forecast accuracy (ppb):	+/-7.8
	July average forecast bias (ppb):	+2.8



Narrative: As far as the summer ozone “season” goes, by or during July the transition between ozone transport episodes and ozone accumulation episodes is usually complete. As mentioned earlier, the summer monsoon can bring a plethora of weather conditions as moisture and thunderstorm activity increases. But the same easterly wind shift that

ushers in monsoonal moisture often contributes to what are typically the highest local ozone concentrations of the year. During the summer months a westerly upslope wind field develops over the metro area during the afternoons as a result of strong and uneven daytime heating – the latter due to local terrain. These winds can gust to over 20 mph and will increase ozone dispersion by moving the local ozone plume to the east. Even on days with temperatures above 115 degrees F maximum ozone levels can remain in the good range of the Air Quality Index. But local studies have shown that when a near-surface flow assumes an easterly component that it can delay, inhibit, or prevent the ozone plume from dispersing. This in turn can contribute to much above average ozone accumulation and unhealthy ozone concentrations. Such was the case this month during the multiple ozone exceedance-day episode that lasted from the 10th thru the 12th. During this period an east to southeasterly wind regime from the surface to nearly 20K' was over the Phoenix metro area. Another signature of such a “blocking” wind flow is that the highest ozone levels typically occur over the central or even western portions of the Valley as horizontal dispersion virtually stops. During this particular three-day episode the West Phoenix monitoring site had or shared the highest 8-hour ozone concentration on the 11th and 12th and shared the highest hourly concentration on the 12th. –Reith