



**MONTHLY AIR QUALITY REPORT FOR
AUGUST 2011**

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 August 2011*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

	SUN	MON	TUES	WED	THU	FRI	SAT
		1 100 06 25 26	2 116 07 35 26	3 101 05 148 56	4 114 06 40 38	5 58 06 102 53	6 64 03 47 32
7	50 03 80 51	8 90 03 60 44	9 71 07 33 23	10 46 05 65 24	11 42 05 64 42	12 45 05 42 25	13 50 06 33 31
14	71 07 25 27	15 58 06 44 25	16 58 05 60 33	17 104 07 47 33	18 61 08 171 71	19 61 05 55 37	20 49 05 42 31
21	48 05 31 23	22 74 08 56 31	23 80 07 51 29	24 97 07 57 32	25 122 05 501 111	26 80 05 98 38	27 90 05 174 119
28	104 03 111 79	29 93 06 53 51	30 80 06 54 53	31 93 07 58 41			

Calendar of High Pollution Advisories and Health Watches issued during August 2011

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

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 August 2011

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
			A B			
			D			
7	8	9	10	11	12	13
D			D		A B	A B
14	15	16	17	18	19	20
	B	B	A B	A B		
		D	D	D		
21	22	23	24	25	26	27
			B	B	A B	A B
				D	D	D
28	29	30	31			
			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 AUG 2011-

<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
6	8/03	148	PM-10	West Chandler
	8/05	102	PM-10	Buckeye
	8/18	172	PM-10	Buckeye
		139	PM-10	Central Phoenix
		116	PM-10	West Chandler
		113	PM-10	South Phoenix
	8/25	501	PM-10	West Phoenix
		316	PM-10	Durango
		295	PM-10	South Phoenix
		249	PM-10	Greenwood
		223	PM-10	West Forty Third
		177	PM-10	Central Phoenix
		163	PM-10	West Chandler
		160	PM-10	Dysart
		144	PM-10	Phx Supersite
		143	PM-10	Glendale
		141	PM-10	Buckeye
		129	PM-10	Zuni Hills
		111	PM-2.5	Durango
	8/27	174	PM-10	South Phoenix
		169	PM-10	West Forty Third
		154	PM-10	Durango
		140	PM-10	Central Phoenix
		137	PM-10	West Chandler
		136	PM-10	Buckeye
		133	PM-10	Glendale
		127	PM-10	Greenwood
		106	PM-10	West Phoenix
		119	PM-2.5	Durango
		119	PM-2.5	Glendale
	8/28	111	PM-10	Higley

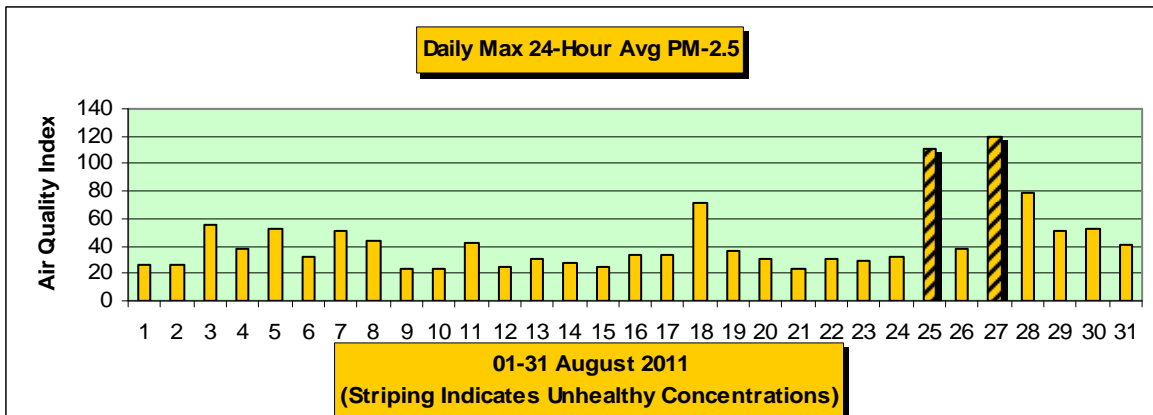
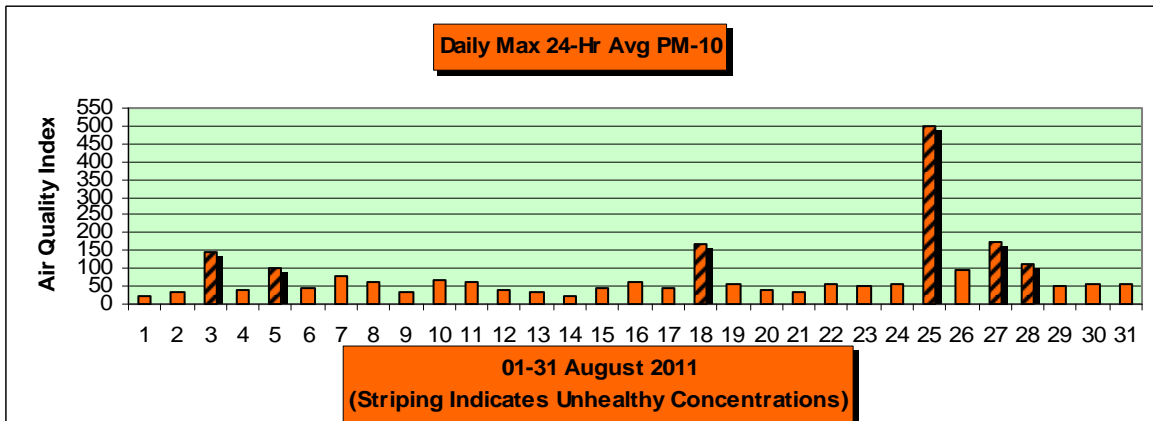
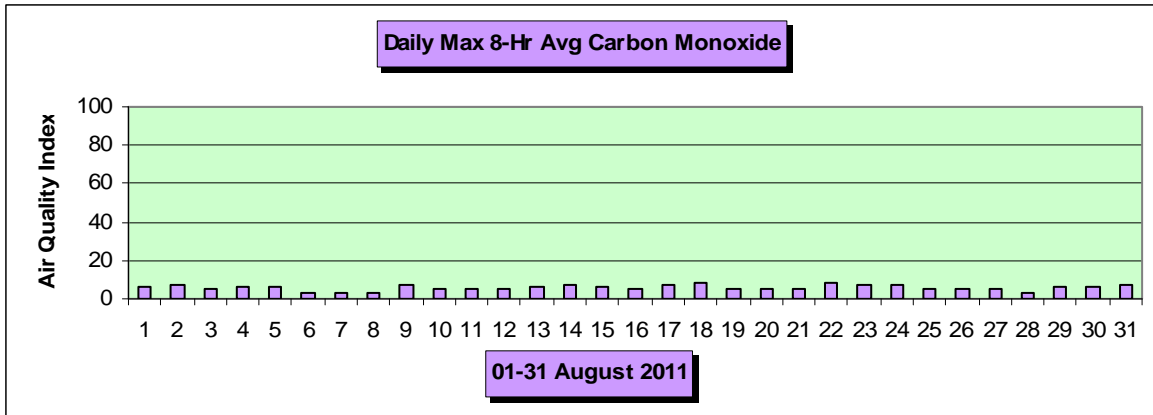
Non-Ozone Health Watches issued during AUG 2011-

<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
1	8/28	111	PM-10	Higley

Non-Ozone High Pollution Advisories issued during AUG 2011-

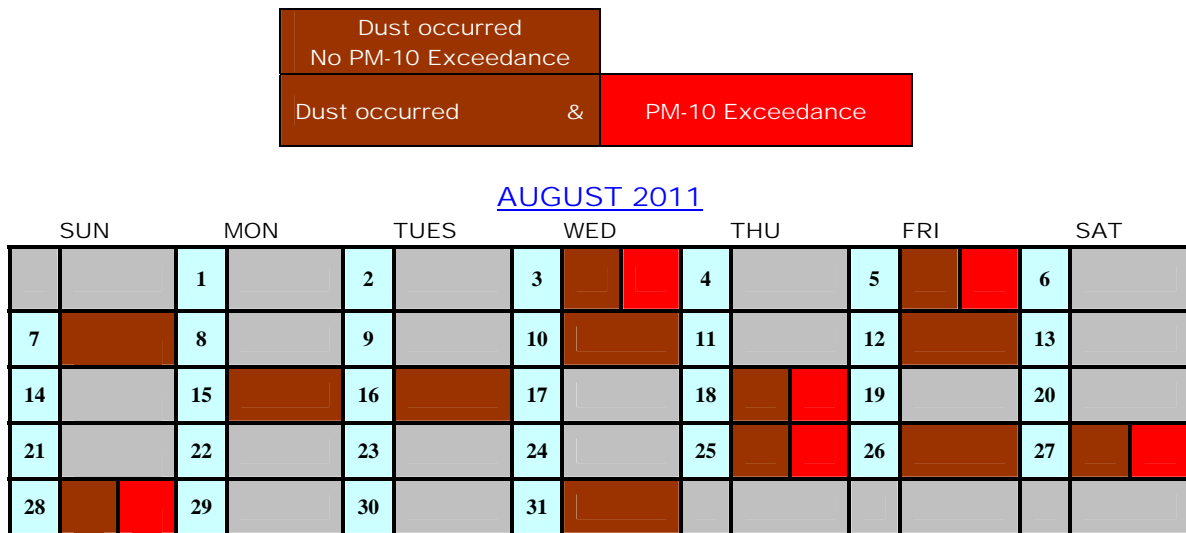
<u>Total=</u>	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
2	8/25	501	PM-10	West Phoenix
	8/26	98	PM-10	Higley

Concentration Recap:	Days in the Good category:	3
	Days in the Moderate category:	19
	Days in the Unhealthy for Sensitive Groups category:	6
	Days in the Unhealthy category:	2
	Days in the Very Unhealthy category:	0
	Days in the Hazardous category:	1
	Total Forecast Days:	31



Narrative: July, August, and September 2011 may forever be remembered in the Phoenix metro area as the “Summer of Dust”. As [Figure 1](#) below shows, during August 2011 there were 13 days during which blowing or suspended dust was reported. On six of these days PM-10 (coarse particle) exceedances occurred and on two of those days unhealthy levels of PM-2.5 (fine particle) were also measured. The severity of these dust events can not be understated; during five of the six days (3rd, 18th, 25th, 27th, and 28th) **30** site exceedances occurred between the two pollutants. The PM-10 exceedance that occurred at one site on the 5th is believed to be related to dust produced by untimely agricultural plowing.

Figure 1



The origins of the dust episodes began with a very dry spring season with only four local rainfall events during the months of April, May and June, record heat during late June, and lots of open and disturbed desert areas and farm fields southeast and south of the Phoenix metro area. Although monsoon rainfall events did occur during the month of August, they were sporadic, light, and not particularly widespread. By far the worst of the blowing dust events during August occurred on the 25th of the month. This was a very unusual incident because the thunderstorm outflow-boundary that produced the strong southeast to southerly straight-line winds that in turn transported enormous volumes of dust toward and over the metro area was generated during the early morning hours. [Figure 2](#) (next page) is an illustration of a preliminary PM-10 concentration report for August that shows the monitoring sites within the jurisdiction of ADEQ. Highlighted in lavender are those sites located within the Phoenix metropolitan area that exceeded the PM-10 standard on that date (highlighted in yellow). As can be seen highest hourly concentrations occurred between 1:00 and 3:00 a.m. at all 13 sites that exceeded the standard. The highest hourly concentration was an incredible 9,262.8ug/m3 at West Phoenix. This contributed to a 24-hour average concentration of 589.7ug/m3 which is in the **HAZARDOUS** range of the Air Quality Index. [Figures 3-5](#) (following pages) are images from the local VISNET camera that show the dust that was still lingering over the Valley many hours later. -Reith



Figure 2
Arizona Department of Environmental Quality
AIR QUALITY DIVISION

AAATMDAILY
 01/10/2012 03:15:39

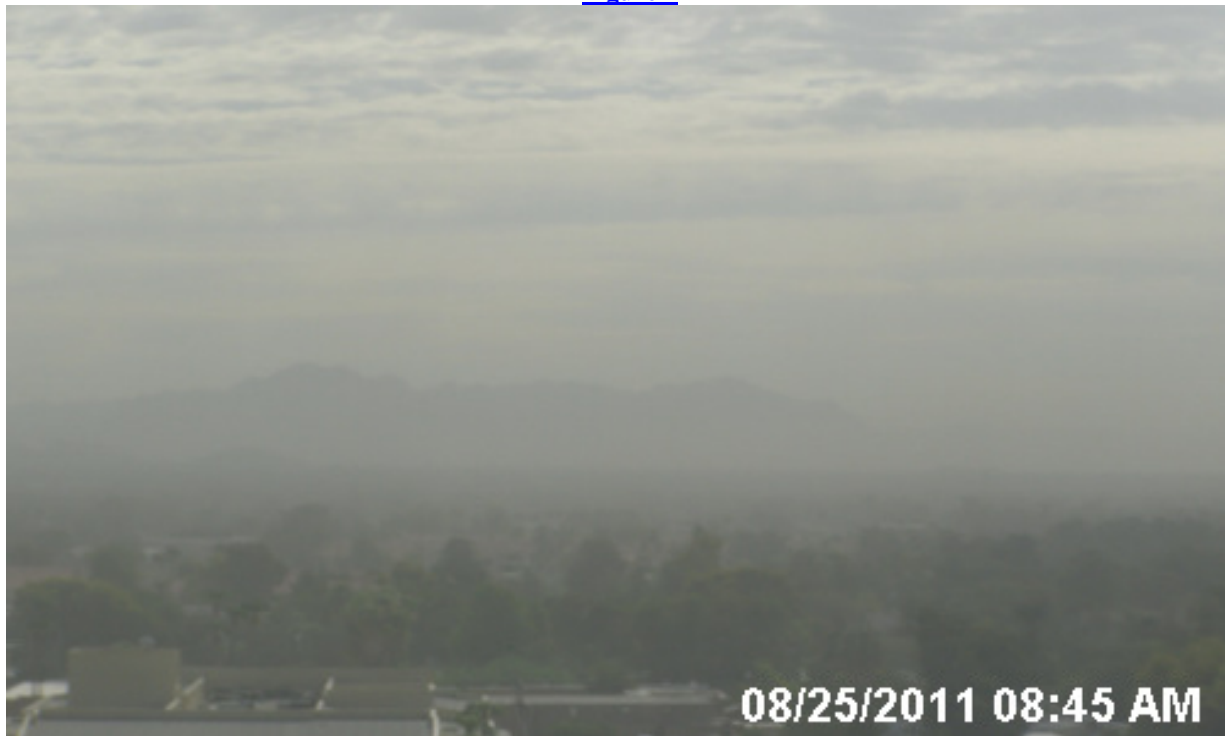
MAXIMUM OBSERVED CONTINUOUS PM10 (ug/m3)
FOR 08/25/2011
Preliminary Data QA LEVEL - 2
Ordered by PLACE ASC

Place ID	Name	Network	Instrument Type	POC	* Hour	1-Hour Average	24-Hour Average	24-Hour Exc	Category	24-Hour AQI
16316	AJO	ADEQ	TEOM - PM10	3	0100	157	50.5		Good	46
21525	BUCKEYE	MARICOPA	TEOM - PM10	3	0300	943.1	235.9	Y	Unhealthy for Sensitive Groups	141
16329	CENTRAL PHOENIX	MARICOPA	TEOM - PM10	3	0200	2822.3	308.7	Y	Unhealthy	177
16375	DURANGO COMPLEX	MARICOPA	TEOM - PM10	3	0200	4240.7	437.5	Y	Hazardous	316
19550	DYSART	MARICOPA	TEOM - PM10	3	0300	2057.5	273.7	Y	Unhealthy	160
16378	GLENDALE	MARICOPA	TEOM - PM10	3	0200	2477	241.2	Y	Unhealthy for Sensitive Groups	143
16372	GREENWOOD	MARICOPA	TEOM - PM10	3	0200	4104	388.6	Y	Very Unhealthy	249
16326	HAYDEN OLD JAIL	ADEQ	TEOM - PM10	3	0000	62.9	24.0		Good	22
16505	HIGLEY	MARICOPA	TEOM - PM10	3	0700	379.2	131.4		Moderate	88
16328	JLG SUPERSITE	ADEQ	BAM - PM10	3	0200	985	207.0	Y	Unhealthy for Sensitive Groups	127
16328	JLG SUPERSITE	ADEQ	TEOM - PM10	3	0200	2785.8	242.2	Y	Unhealthy for Sensitive Groups	144
16511	NOGALES POST OFFICE	ADEQ	BAM - PM10	3	2100	97	30.5		Good	28
16390	NORTH PHOENIX	MARICOPA	TEOM - PM10	3	0400	419.1	69.4		Moderate	58
16499	RILLITO	ADEQ	TEOM - PM10	3	0000	438.6	49.8		Good	45
16377	SOUTH PHOENIX	MARICOPA	TEOM - PM10	3	0200	3592.7	421.5	Y	Very Unhealthy	295
16478	WEST CHANDLER	MARICOPA	TEOM - PM10	3	0100	2116.8	278.6	Y	Unhealthy	163
16659	WEST FORTY THIRD	MARICOPA	TEOM - PM10	3	0200	2915.1	370.3	Y	Very Unhealthy	223
16477	WEST PHOENIX	MARICOPA	TEOM - PM10	3	0200	9262.8	589.7	Y	Hazardous	501
113219	YUMA SUPERSITE	ADEQ	TEOM - PM10	3	1800	59	23.6		Good	21
138246	ZUNI HILLS AQD	MARICOPA	TEOM - PM10	3	0300	1749.5	212.8	Y	Unhealthy for Sensitive Groups	129

Figure 3



[Figure 4](#)



[Figure 5](#)



DETAILED OZONE SECTION

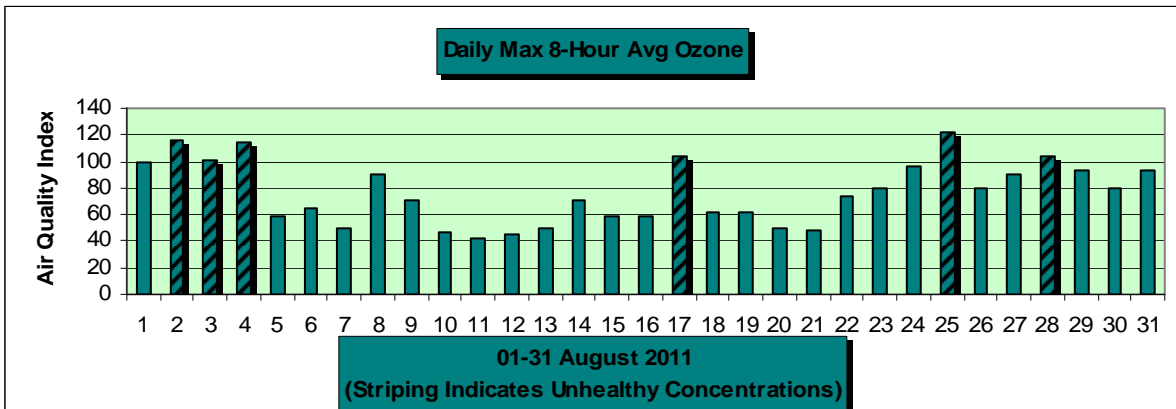
(Based on the 2008 EPA Revised 8-Hour Ozone Standard)

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 AUGUST 2011*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
	1	100		2	116	3	101	4	114	5	58	6	64
7	50	8	90	9	71	10	46	11	42	12	45	13	50
14	71	15	58	16	58	17	104	18	61	19	61	20	49
21	48	22	74	23	80	24	97	25	122	26	80	27	90
28	104	29	93	30	80	31	93						



<u>8-hr Ozone exceedance days in AUG:</u>	Total= 6	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		8/02	82/116	Queen Valley
			79/109	West Chandler
			76/101	South Phoenix
		8/03	76/101	Queen Valley
		8/04	81/114	Queen Valley
			77/104	North Phoenix
			77/104	West Chandler
		8/17	77/104	North Phoenix
			77/104	Phx Supersite
		8/25	84/122	Phx Supersite
			82/116	Cave Creek
			82/116	Glendale
			82/116	North Phoenix
			80/111	West Phoenix
			77/104	Fountain Hills
		8/28	77/104	Queen Valley

Total number of exceedance days since APR 01: 22
Total number of exceedance sites since APR 01: 85

<u>Ozone Health Watches in AUG:</u> (Forecast max value 72-75 ppb)	Total= 7	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		8/02	82/116	Queen Valley
		8/03	76/101	Queen Valley
		8/05	62/58	Fountain Hills
				Queen Valley
		8/20	58/49	North Phoenix
		8/21	57/48	North Phoenix
		8/26	69/80	Glendale
		8/27	72/90	Cave Creek

Ozone Health Watches since APR 01: Total= 27

<u>High Pollution Advisories in AUG:</u> (Forecast max value 76+ppb)	Total= 2	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		8/02	81/114	Queen Valley
		8/25	84/122	Phx Supersite

High Pollution Advisories since APR 01: Total= 11

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

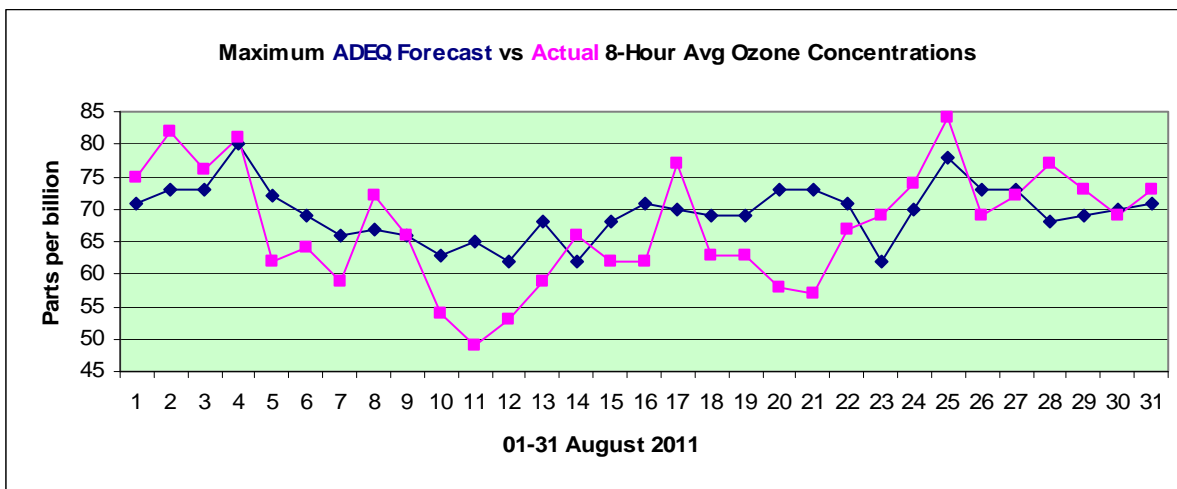
Maximum 8-Hr value: Date Hour Site ppb/AQI DOW
 8/25 1000 Phx Supersite 84/122 Thu

Maximum 1-Hr value: Date Hour Site ppb/AQI DOW
 8/25 1400 Glendale 104/87 Thu

Average daily max 8-Hr concentration (ppb): 67.3
 Deviation from the 1996-2010 average (ppb): -2.7

AUG Climatology: Average number of 8-Hr exceedance days: 3.1
 (Period 1996-2007 using 1997 85ppb standard & 2008-2010 using 76ppb standard) Maximum number of 8-Hr exceedance days: 10 in 1998 & 2000
 Minimum number of 8-Hr exceedance days: 0 in 1997, 2002/04/07/10
 Average daily max 8-Hr concentration (ppb): 70.0
 Record high max 8-Hr concentration (ppb): 100 on the 10th, 2001
 Record low max 8-Hr concentration (ppb): 41 on the 6th, 2007

Forecast Verification: # of days maximum concentrations were over-forecast: 16
 # of days maximum concentrations were under-forecast: 14
 # of days maximum concentrations were correctly forecast: 1
 Aug average forecast accuracy (ppb): +/-6.5
 Aug average forecast bias (ppb): +2.0



Narrative: The six 8-hour ozone pollution exceedance days in the Valley during August was the most since 2001. This was due to not only an increase in the stringency of the standard in 2008, but likely also due to very hot temperatures. In addition, the 84 parts per billion 8-hour average concentration recorded on the 25th was the highest for the month since the 89 ppb reading on August 09 2006. Maximum afternoon high temperatures recorded at Sky Harbor Airport reached 110 degrees F or higher on 13 days during the month and seven of those were record highs for the day. Other pertinent temperature data can be seen in the tables below ([Figure 6](#)) courtesy of the National Weather Service office in Phoenix:

Figure 6

Phoenix, AZ				Daily Records	
	2011	Normal 1981-2010	Record 1895-2010		
Average High Temperature	109.0 °F Warmest on Record	104.4 °F	Warmest 107.3 °F in 1962 Coolest 97.0 °F in 1955		113 °F on Aug 2 Tied Record High 112 °F on Aug 18 Set Record High 113 °F on Aug 22 Set Record High 114 °F on Aug 23 Set Record High 113 °F on Aug 25 Set Record High 117 °F on Aug 26 Set Record High 113 °F on Aug 30 Set Record High
Average Temperature	98.3 °F Warmest on Record, Ties July 2009 as All-Time Warmest Month on Record	93.6 °F	Warmest 96.2 °F in 2007 Coolest 84.6 °F in 1918		90 °F on Aug 15 Tied Record High Low 90 °F on Aug 24 Tied Record High Low 92 °F on Aug 25 Set Record High Low 93 °F on Aug 26 Set Record High Low 90 °F on Aug 27 Set Record High Low 89 °F on Aug 28 Set Record High Low 91 °F on Aug 31 Tied Record High Low
Average Low Temperature	87.5 °F Warmest on Record	82.7 °F	Warmest 86.1 °F in 2007 Coolest 71.3 °F in 1900		
Precipitation	0.17" Tied 19th Driest	1.00"	Wettest 5.33" in 1951		

- The average temperature of 98.3 F in Phoenix ties July 2009 as the hottest month (of any month) on record.
- The average high temperature in Phoenix of 109.0 F makes August 2011 the fourth warmest month (of any month) on record as measured by average high temperature.
- The average low temperature in Phoenix of 87.5 F makes August 2011 the warmest month (of any month) on record as measured by average low temperature
- The high temperature of 117 F on 26 August 2011 set a new record as the hottest temperature ever recorded during the month of August in Phoenix (previous record was 116 F).
- There were 13 days with a high temperature of at least 110 F in Phoenix, breaking the old record of 11 set in 1995 and 2009 for the month of August.
- There have been 31 days so far this year in Phoenix with a high temperature of at least 110 F. The record is 32 set in 2007.
- There were 8 days with a low temperature of at least 90 F in Phoenix, breaking the old record of 7 set in 2007 for the month of August.
- The coolest temperature during August 2011 in Phoenix was the low of 81 F on August 2, making August 2011 the first month on record to not have a low temperature of at least 80 F or lower.

The month of August 2011 had one more dubious distinction. On the 25th of the month not only did six monitoring sites record 8-hour ozone (O3) exceedances, but 13 sites exceeded the PM-10 (coarse particle) standard and one site exceeded the PM-2.5 (fine particle) standard; see the previous section of this report for details. This means that three different criteria pollutants reached unhealthy levels during the same calendar day – an extremely rare and unwelcome event (Figure 7). –Reith

[Figure 7](#)

Phoenix Metro Air Pollution Exceedance Days & Pollutant Type

