



MONTHLY AIR QUALITY REPORT FOR
JANUARY 2012

AOI COLOR SCALE

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

Calendar of maximum AQI values & their corresponding color for January 2012*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

	SUN			MON			TUES			WED			THU			FRI			SAT	
1	35	45	2	35	14	3	34	22	4	37	26	5	40	22	6	40	28	7	38	26
	80	164		44	40		56	56		61	61		53	43		60	67		45	55
8	37	08	9	36	15	10	37	18	11	36	23	12	35	25	13	37	24	14	37	23
	27	19		52	41		55	53		59	66		72	79		66	66		56	63
15	36	17	16	36	10	17	38	15	18	39	19	19	40	23	20	42	23	21	40	18
	59	62		38	32		45	45		49	51		53	60		52	49		128	53
22	35	10	23	35	14	24	34	09	25	37	17	26	37	24	27	36	19	28	37	15
	105	58		54	40		26	20		46	31		59	55		61	58		33	24
29	39	17	30	41	19	31	40	19												
	45	44		57	53		57	47												

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

SUN		MON		TUE		WED		THU		FRI		SAT	
1	B	2		3		4		5		6		7	
8		9		10		11		12		13		14	
15		16		17		18		19		20		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 January 2012

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

LEGEND

ELECTROMETEORS

- A** = Thunderstorm

HYDROMETEORS

- B** = Rain/Drizzle/Hail/Snow
- C** = Fog

LITHOMETEORS

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

Exceedance days during JAN 2012-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
3	1/01	164	PM-2.5	West Phoenix
		161	PM-2.5	Durango
		159	PM-2.5	South Phoenix
		152	PM-2.5	Glendale
		151	PM-2.5	Phoenix Supersite
	1/21	128	PM-10	West Forty Third
	1/22	105	PM-10	Higley

Health Watches issued during JAN 2012-

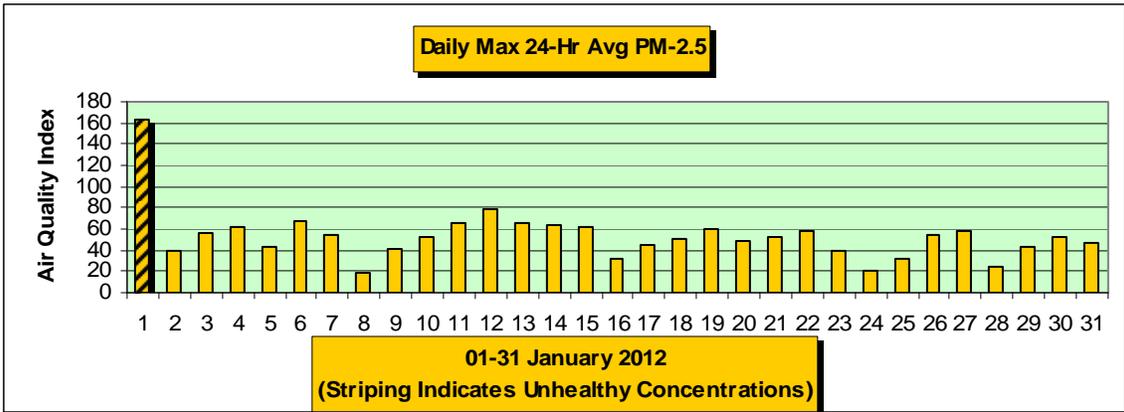
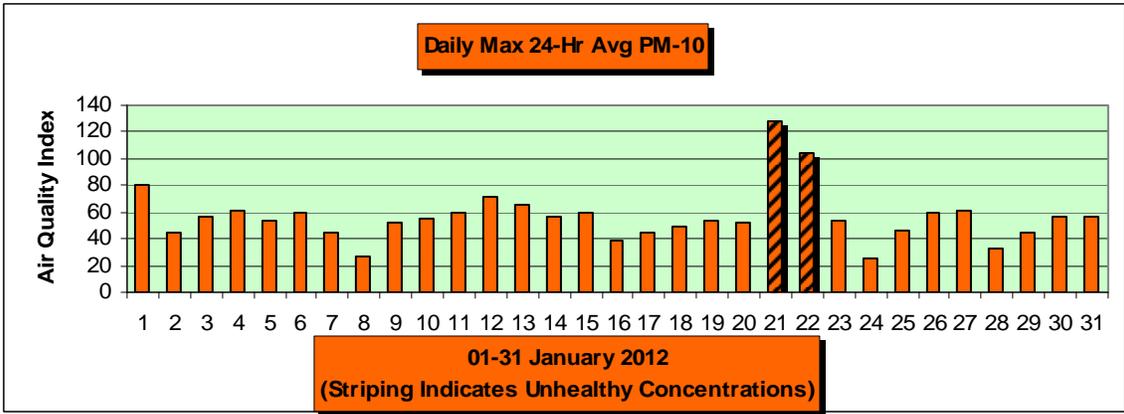
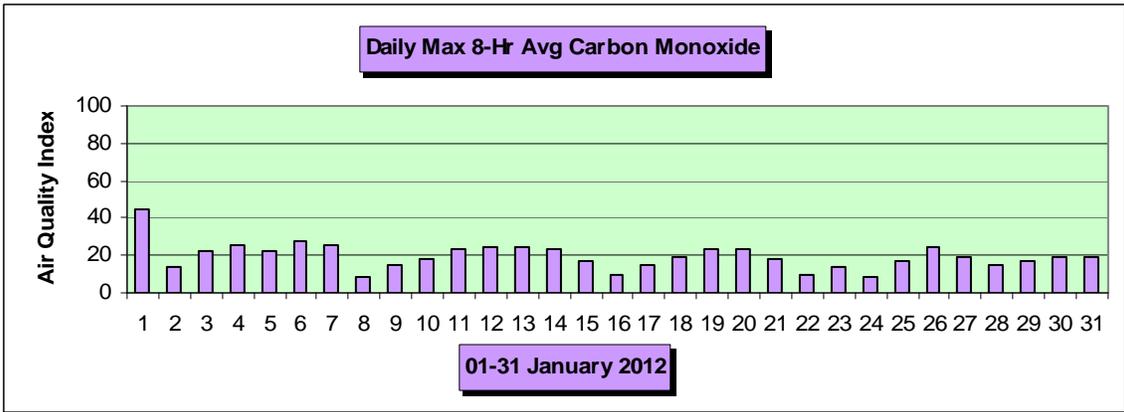
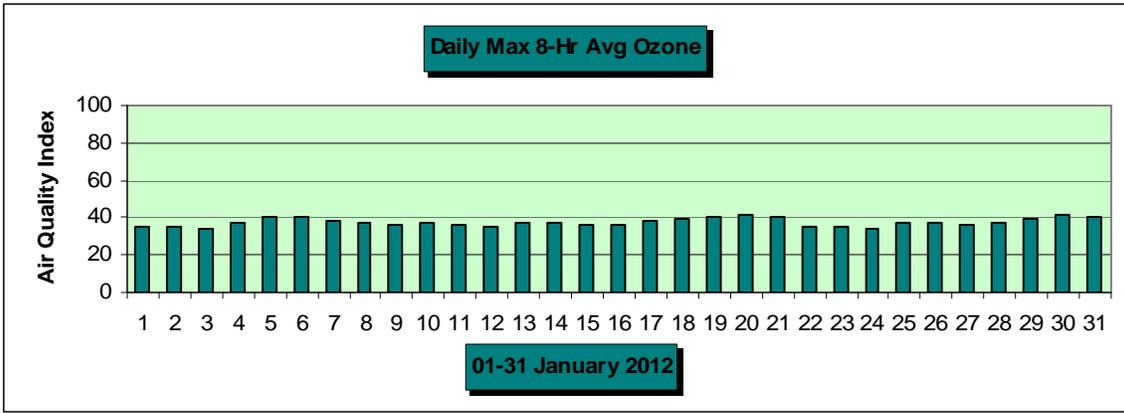
Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
0				

High Pollution Advisories issued during JAN 2012-

Total=	<u>Date</u>	<u>Max AQI</u>	<u>Pollutant</u>	<u>Site/s</u>
1	1/01	164	PM-2.5	West Phoenix

Concentration Recap:

Days in the Good category:	8
Days in the Moderate category:	20
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:	<u>0</u>
Total Forecast Days:	31



Narrative: Unfortunately for Valley of the Sun residents, the year 2012 took up where the year 2011 left off – with unhealthy levels of fine particulate matter (PM-2.5) at five metro area monitoring sites on January 1. As has been the case during four of the past six years, unhealthy levels of fine particles have occurred on New Year’s Day (Figure 1). In each case this outcome was the direct result of vast amounts of smoke being emitted overnight from residential wood-burning fireplace and appliance use – and to a lesser degree fireworks – to celebrate the holiday. Compounding the problem on most days was a stagnant weather regime and 2012 was no exception. Local ACARS sounding data indicated that a very strong (20+ degree F) surface-based radiation inversion that extended to just over 2700’ was present during the morning hours and that the mixing depth was only 2700’. Despite the issuances of an Air Pollution Advisory by ADEQ and a No-Burn Day declaration by the Maricopa County Air Quality Department, residents still chose to light fires in many parts of the Valley. Figures 2-10 are images from the local VISNET camera array and show the extent of the trapped smoke over the Phoenix metro area as the morning progressed.

Figure 1

RECENT VALLEY PM-2.5 MAX AQI CLIMATOLOGY						
(**preliminary data**)						
Date	2006	2007	2008	2009	2010	2011
1-Jan	97	167	70	167	152	174
HIGHEST HOURLY PM-2.5 CONCENTRATIONS						
(UG/M3)/time & 24-hour Average AQI color (**preliminary data**)						
Date	2006	2007	2008	2009	2010	2011
1-Jan	105.5/0100	180.1/2400	66.3/1900	249.1/0200	191.1/0100	377.0/0100

Figure 2



Figure 3

ADEQ
Arizona Department
of Environmental Quality

Live Camera Sites

- South Mountain
- Estrella Mountains
- White Tank Mountains
- Camelback Mountain
- Superstition Mountains

Phoenix Region Visibility Index

Current Index 33

[? Details](#)

EXCELLENT
GOOD
FAIR
POOR
VERY POOR

Image Updated Every 15 Minutes



01/01/2012 07:50 AM

Figure 4



[Figure 5](#)



[Figure 6](#)



Figure 7



Figure 8



[Figure 9](#)



[Figure 10](#)



The stagnant weather pattern then persisted thru the first two weeks of the month with elevated coarse (PM-10) and fine (PM-2.5) particle concentrations on most days during that period. It was briefly interrupted from about the 14th thru the 17th as a weak trough in the mid-latitude storm track managed to pass overhead and in the process dropped mostly light amounts of rain on the parched desert landscape. No strong winds were encountered with this feature although on the 14th outflow winds from showers produced some blowing dust over the east Valley with visibility briefly dropping to seven miles at Williams Gateway Airport at 10:15 p.m. Following the trough passage a strong ridge again built overhead and another spell of stagnant weather conditions occurred that lasted thru the 20th. [Figure 11](#) below illustrates the visible impacts of an accumulation of suspended particle pollution and also describes the boundary layer conditions over the metro area the morning of January 19.

[Figure 11](#)



Another change in the weather pattern contributed to one more poor air quality episode in the Valley during January 21 and 22. This was in the form of an upper level major short wave trough (Figure 12) and surface cold front in the mid-latitude storm track that approached and passed over Arizona from the northwest on the 21st. Gradient winds increased during the late afternoon and evening hours with gusts up to 40 mph at times. As can be seen in Figures 13 & 14, these winds began to generate dust by 5:00 p.m. which culminated in a severe blowing dust episode that lasted until midnight and lowered local visibilities to as low as one mile in some areas.

Figure 12

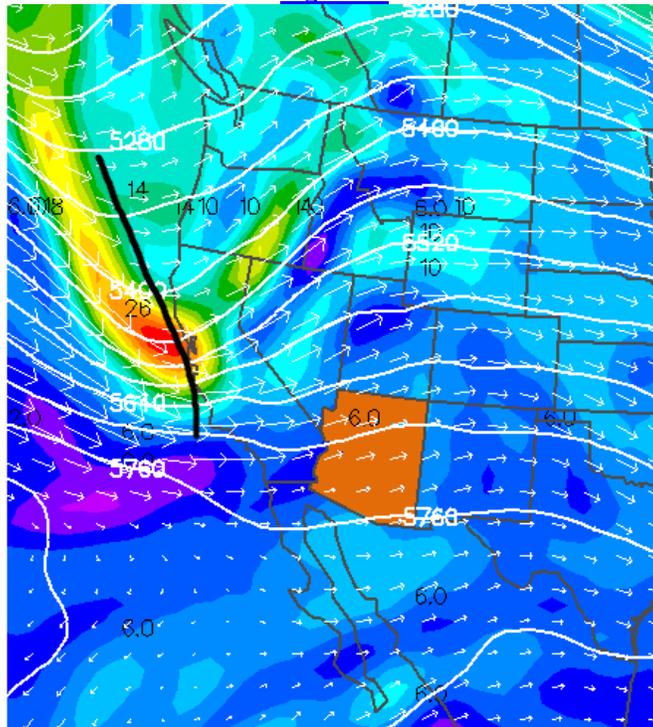


Figure 13



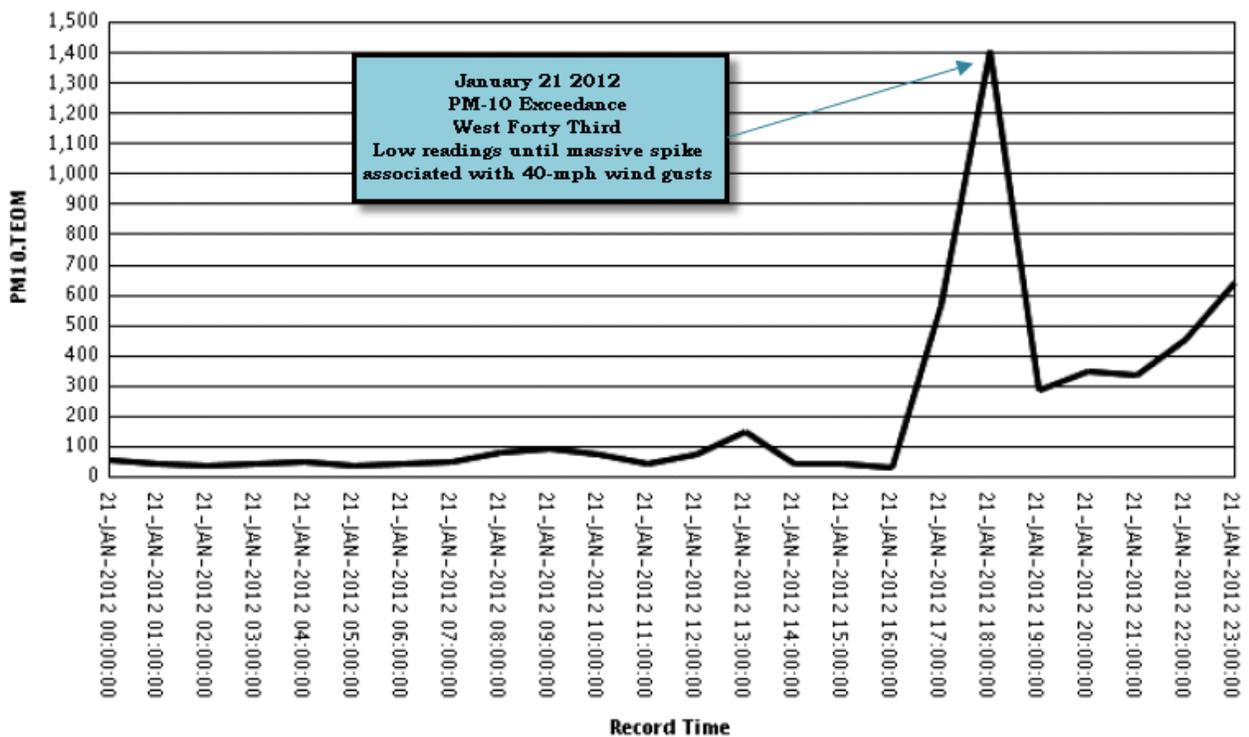
Figure 14



Unfortunately, this wind and dust event contributed to the first PM-10 exceedance of 2012 due to unhealthy coarse particle levels at the West Forty Third monitoring site. [Figure 15](#) shows the PM-10 time-series graph for West Forty Third on the 21st.

Figure 15

Name: WEST FORTY THIRD



Equally unwelcome was that on the following day so much dust remained aloft during the morning hours that PM-10 concentrations remained high enough to register the second PM-10 exceedance in two days – this one at the Higley monitoring site. The lingering dust levels were aggravated by the presence of a shallow inversion that formed overnight as well as a relatively low mixing depth of 4100' per Sky Harbor Airport ACARS sounding data. [Figures 16 thru 19](#) show the extent of the dust cloud that morning and [Figure 20](#) shows the PM-10 time-series graph for Higley.

[Figure 16](#)



[Figure 17](#)



[Figure 18](#)

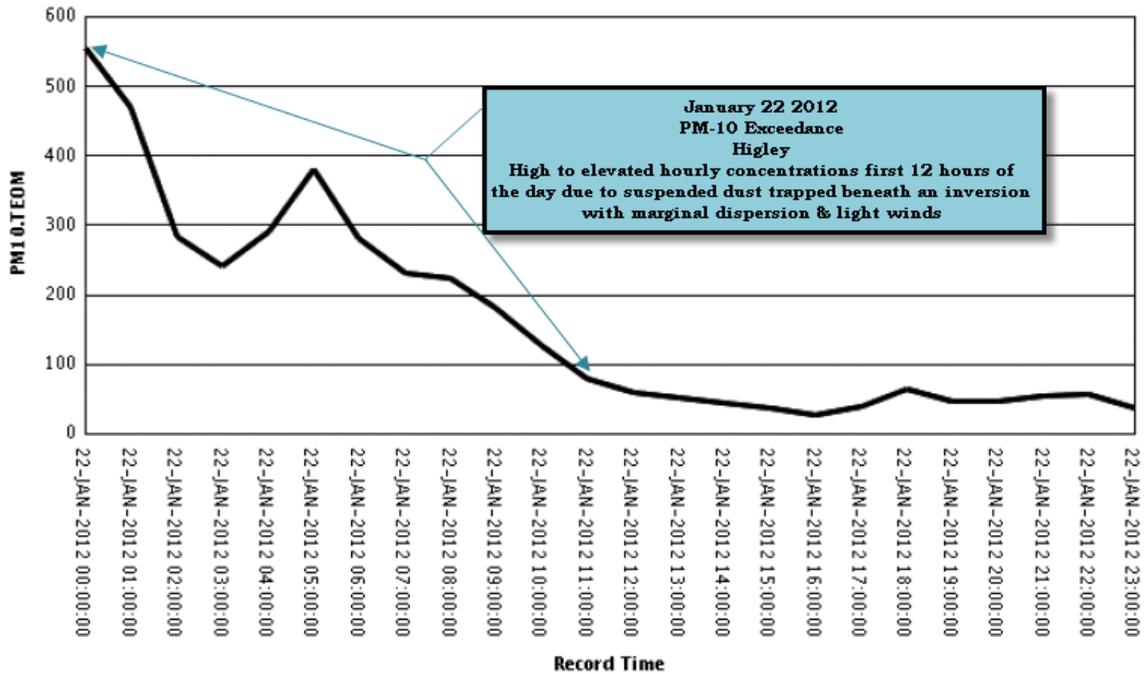


[Figure 19](#)



Figure 20

Name: **HIGLEY**



Back-to back wind-related PM-10 exceedance days in the Valley are extremely rare – especially so during the month of January. [Figure 21](#) indicates that during the month of January there were only two other wind-generated PM-10 exceedance days since 2004.

Figure 21

January wind-generated PM-10 exceedance days										
DATE	2004	2005	2006	2007	2008	2009	2010	2011	2012	
1-Jan										
2-Jan										
3-Jan										
4-Jan										
5-Jan										
6-Jan										
7-Jan										
8-Jan										
9-Jan										
10-Jan										
11-Jan										
12-Jan										
13-Jan										
14-Jan										
15-Jan										
16-Jan										
17-Jan										
18-Jan										
19-Jan				X						
20-Jan										
21-Jan									X	
22-Jan									X	
23-Jan										
24-Jan				X						
25-Jan										
26-Jan										
27-Jan										
28-Jan										
29-Jan										
30-Jan										
31-Jan										

By January 26 another ridge aloft had arrived overhead and the month ended under a stagnant weather regime characterized by strong overnight inversion formation, rather low mixing depths, and mostly unfavorable dispersion. Even so, particle pollution levels rose no higher than the low-moderate range of the Air Quality Index. Figure 22 is the air quality summary graph for January 2012 in the Phoenix Metro area. -Reith

Figure 22

