ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

MONTHLY AIR QUALITY REPORT FOR JUL 2005

AQI 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 Jul 2005*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

SUN			MON			TUES			WED			THU			FRI			SAT	
														1	104	18	2	54	09
															69	42		44	39
3	49	10	4	51	16	5	51	25	6	50	16	7	46	11	8	61	11	9	101	09
	45	43		55	34		78	48		86	40		66	38		59	38		51	32
10	50	15	11	50	18	12	64	14	13	106	15	14	92	09	15	92	11	16	85	09
	47	28		73	37		83	38		78	44		61	43		61	43		64	54
17	74	08	18	122	09	19	132	13	20	135	10	21	116	09	22	47	09	23	54	06
	99	52		86	60		66	56		66	53		83	61		79	50		42	37
24	64	06	25	47	07	26	45	08	27	85	09	28	69	10	29	82	13	30	45	08
	16	33		38	28		62	29		73	31		44	18		54	30		43	25
31	42	08																		
	36	25																		

PM Exceedance days during JUL 2005-

Total= 0	Date	Max AQI	Pollutant	Site/s

PM Health Watches issued during JUL 2005-

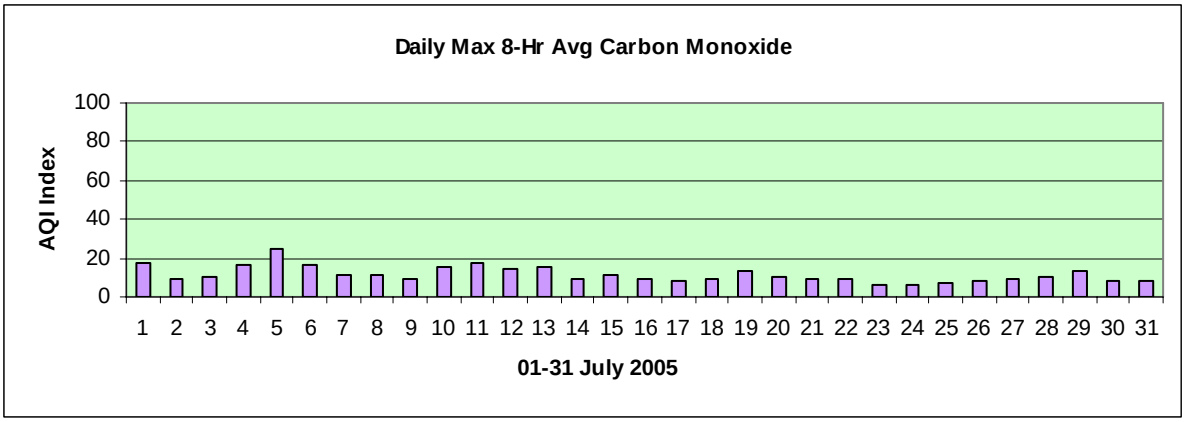
Total= 3	Date	Max AQI	Pollutant	Site/s
	7/01	69	PM-10	West Forty Third
	7/02	44	PM-10	Higley
	7/03	45	PM-10	Buckeye

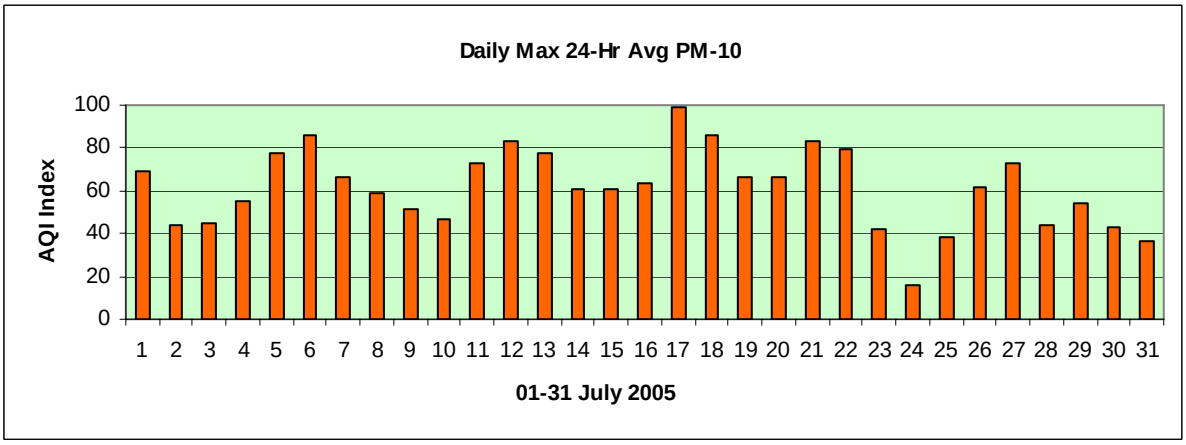
PM High Pollution Advisories issued during JUL 2005-

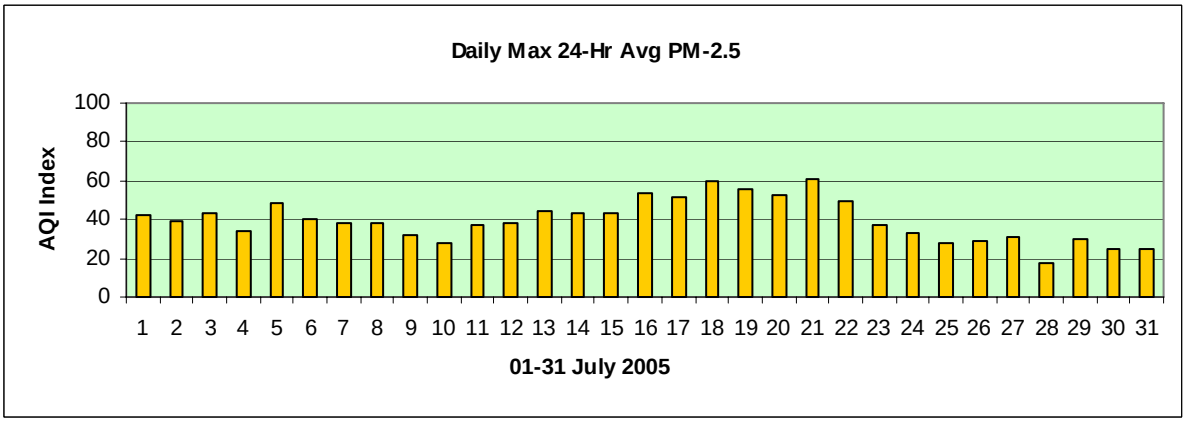
Total= 0	Date	Max AQI	Pollutant	Site/s

Narrative:

Carbon monoxide levels were very low during July 2005, which is typical due to seasonal hot temperatures, excellent dispersion, extremely high mixing depths, and weak or absent nocturnal inversions. On the other hand, it was an active month for particle pollutant concentrations due to smoke and haze as well as dust from thunderstorm-generated outflow boundaries. PM-10 Health Watches were issued on the 1st thru the 3rd solely due to smoke concerns from large wildfires within the airshed. Weather conditions during the first two weeks of the month were characterized by hot and dry days during which time the sub-tropical ridge axis was positioned to the south of Arizona – resulting in dry westerly flow aloft. From the 1st thru the 14th local average dew point temperatures were in the 30's and 40's and maximum temperatures at Sky Harbor Airport ranged from 108 to 115 deg F; there were a total of eight days with 110 deg F or higher and two days when record high maximums were recorded. No rain fell during this period, so soil moisture and hence its stabilization was minimized and a latent source of PM-10 emissions. Hazy conditions existed each day with local visibility routinely in the 15-25 mile range during the a.m. period. On at least four days smoke was also observed over the valley. Daily maximum coarse particle (PM-10) concentrations were in the low to mid-moderate range of the Air Quality Index the majority of the period. A change in the weather pattern then began that saw the flow aloft shift to an east to southeasterly direction – the summer monsoon officially began on the 18th after three consecutive days of dew points at Sky harbor that averaged 55 deg F or higher. Average dew points were in the 50's and 60's from the 15th thru the 31st. The ongoing transport of atmospheric moisture resulted in daily thunderstorms over the nearby higher terrain that at times produced strong downburst winds. These winds caused episodes of blowing dust over all or portions of the metro area on the 17th, 18th, 21st, 22nd, 23rd, 27th, and 29th thru the 31st with visibility reported to be as low as one mile at one airport on the 21st. One such blowing dust event contributed to a near-exceedance of the PM-10 standard at the Buckeye monitoring site on the 17th when the 24-hr average concentration reached 152.6ug/m3; the peak hourly concentration was 898ug/m3 at 1800 hrs. The combination of smoke, haze, and airborne dust eventually impacted fine particle (PM-2.5) pollutant levels when they rose into the low-moderate range of the Air Quality Index from the 16th thru the 21st. Fortunately, a line of strong storms brought a significant rain event to the area on the 23rd and both coarse and fine particle pollutant concentrations were greatly reduced for the remainder of the month. --Reith


Daily Max 8-Hr Avg Carbon Monoxide
AQI Index
100
80
60
40
20
0
1 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
01-31 July 2005


Daily Max 24-Hr Avg PM-10
AQI Index
100
80
60
40
20
0
1 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
01-31 July 2005


Daily Max 24-Hr Avg PM-2.5
AQI Index
100
80
60
40
20
0
1 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
01-31 July 2005

DETAILED OZONE SECTION

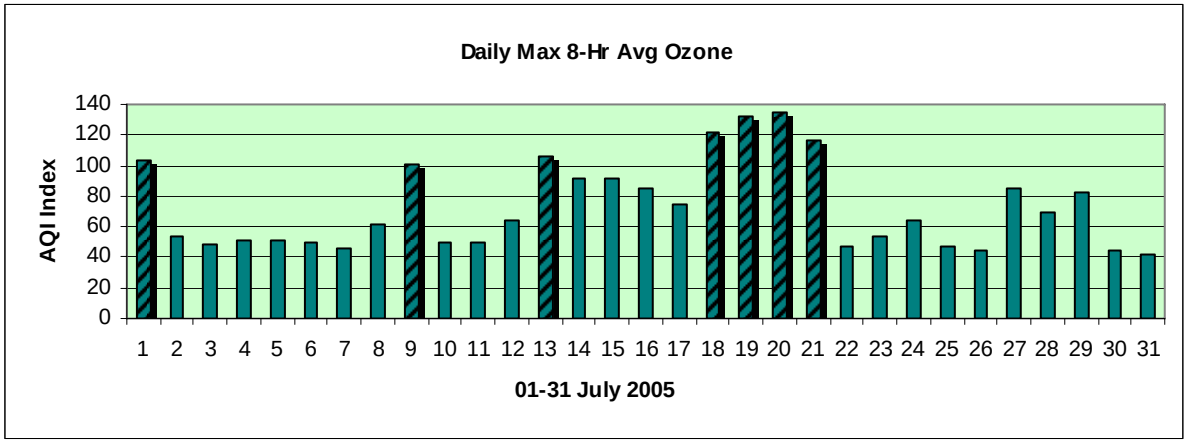
GOOD	MODERATE	UNHEALTHY FOR SENSITIVE GROUPS	UNHEALTHY
0-50	51-100	101-150	151-200

SUMMARY OF MAXIMUM 8-HR OZONE AQI VALUES FOR JUL 2005*

*Preliminary data

SUN		MON		TUES		WED		THU		FRI		SAT	
										1	104	2	54
3	49	4	51	5	51	6	50	7	46	8	61	9	101
10	50	11	50	12	64	13	106*	14	92	15	92	16	85
17	74	18	122	19	132	20	135	21	116	22	47	23	54
24	64	25	47	26	45	27	85	28	69	29	82	30	45
31	42												

*Occurred at Pinal Air Park



8-hr Ozone exceedance days in JUL: Total= 7

Date	Max ppb/AQI	Site/s
7/01	86/104	Cave Creek
	86/104	Rio Verde
7/09	85/101	North Phoenix
7/18	93/122	Rio Verde
	89/111	Blue Point
	88/109	Fountain Hills
	88/109	Humboldt
7/19	97/132	Tonto Nat'l Mon
	96/129	Fountain Hills
	96/129	Queen Valley
	89/111	South Scottsdale
	88/109	North Phoenix
	87/106	Rio Verde
	86/104	Tempe
7/20	98/135	Tonto Nat'l Mon
	95/127	Queen Valley
	89/111	Fountain Hills
	88/109	Blue Point
	87/106	Rio Verde
7/21	91/116	Fountain Hills
	89/111	North Phoenix
	88/109	Rio Verde

Total number of exceedance days since APR 01: 13
Total number of exceedance sites since APR 01: 28

Ozone Health Watches in JUL: Total= 13
(Forecast max value 80-84 ppb)

Date	Max ppb/AQI	Site/s
7/01	86/104	Cave Creek
	86/104	Rio Verde
7/02	66/54	Tonto Nat'l Mon
7/03	63/49	North Phoenix
		South Scottsdale
		Tempe
7/11	64/50	Rio Verde
		Tonto Nat'l Mon
7/13	87/106	Pinal Air Park
7/14	81/92	Tonto Nat'l Mon
7/15	81/92	Rio Verde
7/16	78/85	Rio Verde
7/17	74/74	Tonto Nat'l Mon
7/18	93/122	Rio Verde
7/19	97/132	Tonto Nat'l Mon
7/22	60/47	Queen Valley
7/29	77/82	North Phoenix

Ozone Health Watches since APR 01: Total= 22

High Pollution Advisories in JUL: (Forecast max value 85+ppb)	Total=	3	7/12	70/63	Tonto Nat'l Mon
			7/20	98/135	Tonto Nat'l Mon
			7/21	91/116	Fountain Hills
High Pollution Advisories since APR 01:	Total=	9			

Concentration Recap:

Days in the Good AQI category:	10
Days in the Moderate AQI category:	14
Days in the Unhealthy for Sensitive Groups AQI category:	7
Days in the Unhealthy AQI category:	0
Total Forecast Days:	31

Maximum 8-Hr value:	Date	Hour	Site	ppb/AQI	DOW
	7/20	1400	Tonto Nat'l Mon	98/135	Wed

Maximum 1-Hr value:	Date	Hour	Site	ppb/AQI	DOW
	7/19	1500	Fountain Hills	129/106	Thu

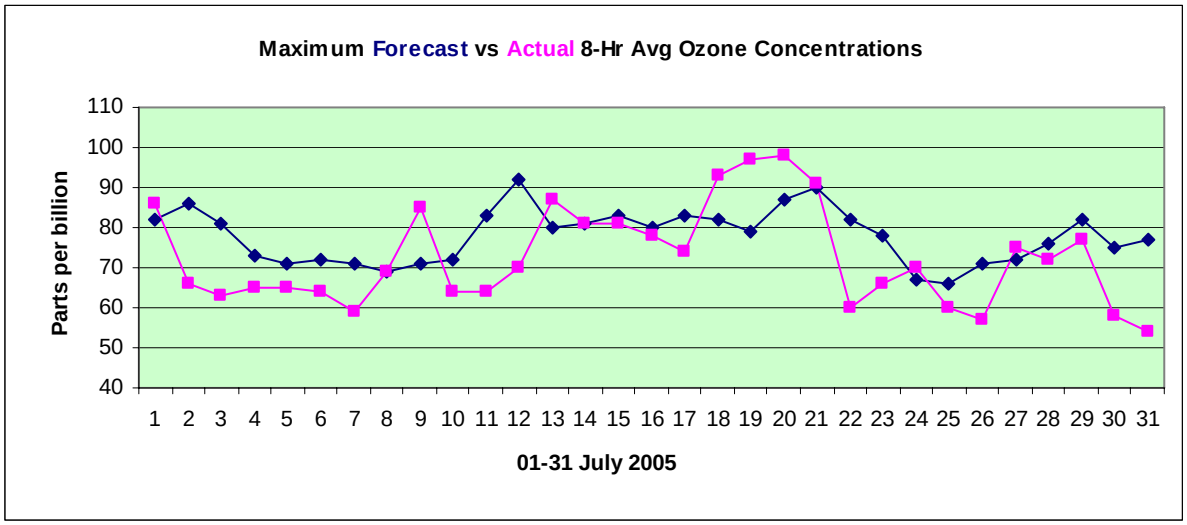
Average daily max 8-Hr concentration (ppb):	72.5
Deviation from1996-2004 average (ppb):	+0.8

JUL Climatology: (1996-2004)

Average number of 8-Hr exceedances:	3.9
Maximum number of 8-Hr exceedances:	10 in 1996
Minimum number of 8-Hr exceedances:	0 in 1997 and 1999
Average daily max 8-Hr concentration (ppb):	71.7
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
Jul average forecast accuracy (ppb):	+/-10.0
Jul average forecast bias (ppb):	+5.0



Narrative: Ozone production escalated significantly during the month with a total of 22 local sites that exceeded the 8-hr average ozone standard over a period of six days, not including one exceedance in Pinal County located well south of the Phoenix metropolitan area. This prompted the issuance of three High Pollution Advisories and 13 Ozone Health watches for the local forecast area between the 11th and the 22nd. Exceedances on the 1st and 6th of the month were just over the standard, but the major ozone episode took place from the 18th thru the 21st; during that four-day period 19 site exceedances occurred. This included the highest 8-hr concentration (98 parts per billion) since July 22 2003 on the 20th, and the highest 1-hr concentration (129 ppb) since 1996 on the 19th. The catalyst for this episode was, as it has been on numerous other occasions, the onset of the large-scale summer monsoon circulation – due to the 500mb ridge axis moving north of the state – along with the local effects that accompany it. This circulation was present from the 11th thru the 24th. The local effects include increasing low-level moisture; evening and nighttime thunderstorm outflow boundaries that are believed to transport biogenic VOC emissions over the area; hot afternoon temperatures; and a generally easterly wind regime aloft that tends to suppress the onset, magnitude, and duration of the diurnal westerly valley surface winds that typically develop. Details of these phenomena are included in the table below:

Date	Max Temp	Winds Aloft	Avg. Dew Pt Temp	Most Recent Outflow Boundary Occurrence
7/18	113	Easterly above 7K'	55	From NW-N to 51 mph at 1800 hrs on 17th
7/19	111	NE-E surface to 18K'	57	From E to 77 mph at 2200 hrs on 18th
7/20	109	Easterly above 7300'	59	From N-NE to 35 mph at 2100 hrs on 19th
7/21	111	Easterly above 2700'	60	From the E<15 mph at 2300 hrs on the 20th

In addition, the National Weather Service had issued an Excessive Heat Warning for the 18th and a Heat Advisory for the 19th. On the 19th and 20th smoke from large wild land fires that were still in progress in the state could be seen at times over the local area. Its degree of impact on local ozone production has not been determined as of this writing. This high ozone episode would have undoubtedly continued but ozone production was sharply curtailed on the 22nd by the combination of very breezy southeasterly winds and partly cloudy to mostly cloudy skies. These weather conditions were associated with an inverted trough moving to the northwest that was the remains of Hurricane Emily. -Reith