

MONTHLY 8-HR OZONE FORECAST PROGRAM REPORT FOR MAY 2003

[AQI COLOR SCALE \(ppb\)](#)

GOOD 0-64	MODERATE 65-84	UNHEALTHY FOR SENSITIVE GROUPS 85-104	UNHEALTHY 105-124
---------------------	--------------------------	---	-----------------------------

[Calendar of maximum 8-Hr values for May 2003 \(ppb\) B](#)

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1 68	2 65	3 56
4 60	5 63	6 68	7 56	8 56	9 71	10 78
11 90	12 78	13 78	14 67	15 73	16 81	17 79
18 67	19 76	20 83	21 85	22 87	23 72	24 75
25 77	26 78	27 89	28 70	29 71	30 78	31 79

<u>Exceedance Days in May B</u>	Total:	4	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
			5/11	90/114	Humboldt
				89/111	Pinnacle Peak
				88/109	Glendale
				88/109	North Phoenix
				87/106	Cave Creek
				86/104	Maryvale
				85/101	S. Scottsdale
			5/21	85/101	Glendale
			5/22	87/106	Humboldt
			5/27	89/111	Humboldt
				88/109	Cave Creek
				86/104	Blue Point
				85/101	Pinnacle Peak

Total number of days with exceedances since April 1 B **4**
Total number of sites with exceedances since April 1 B **13**

Health Watches issued ^B (expected max value 80-84 ppb)	Total: 7	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		5/12	78/85	Tonto Natl Mon
		5/13	78/85	Tonto Natl Mon
		5/17	79/87	Rio Verde
		5/18	67/56	Rio Verde/Humboldt
		5/21	85/101	Glendale
		5/27	89/111	Humboldt
		5/30	78/85	Blue Point/Tonto

[Health Watches issued since April 1](#) ^B Total: 7

Health Warnings issued ^B (expected max value 85+ ppb)	Total: 5	<u>Date</u>	<u>Max ppb/AQI</u>	<u>Site/s</u>
		5/16	81/92	Rio Verde
		5/22	87/106	Humboldt
		5/23	72/73	Humboldt
		5/28	70/64	Cave Creek
		5/29	71/66	Maricopa

[Health Warnings issued since April 1](#) ^B Total: 5

Concentration Recap ^B	Days in Good range:	5			
	Days in Moderate range:	22			
	Days in Unhealthy for Sensitive Groups range:	4			
	Days in Unhealthy range:	0			
	Total Forecast Days:	31			
Maximum 8-HR value:	<u>Date</u>	<u>PPB/AQI</u>	<u>DOW</u>	<u>Site</u>	<u>Hour</u>
	5/11	90/114	Sun	Humboldt Mtn	1900
Maximum 1-HR value:	5/22	104/87	Thu	Humboldt Mtn	1700
Average daily max 8-Hr concentration (ppb):	73.3				
Deviation from 1996-2002 average (ppb):	-0.5				

May Climatology (1996-2002) ^B	Avg number of 8-Hr exceedances:	4
	Maximum number of 8-Hr exceedances:	10 in 1996
	Minimum number of 8-Hr exceedances:	0 in 1997 & 2001
	Avg daily maximum 8-Hr concentration (ppb):	73.8
	Record high maximum 8-Hr concentration (ppb):	105 on the 21 st , 1996
	Record low maximum 8-Hr concentration (ppb):	46 on the 20 th , 1997

Forecast Verification ^B	Days maximum value was over-forecast:	20
	Days maximum value was under-forecast:	11
	May forecast accuracy (ppb):	7.2
	May forecast bias (ppb):	+1.9

Narrative B The first eight days of May were a carryover from April B low ozone values due to an active storm track which kept winds up and temperatures down. As the last in the series of upper troughs departed the area on the 9th the winds aloft were configured for rapid import of ozone from California, the verification of which was identified by the significant increase in background ozone levels at Hillside B 25 ppb in two days. At the same time, the air mass over the local area was in the process of warming and stabilizing. This culminated in the first exceedance episode of 2003 which occurred on Mother's Day, Sunday, May 11. On a day when the maximum temperature was only 90 degrees seven widely separated sites registered 85+ ppb 8-hr readings. It appears that a combination of meteorological factors led to this event although the aforementioned increase in background ozone was no doubt crucial: 1.) Day-long light winds (<10 mph) which reduced dispersion, 2) a fairly strong surface-based radiation inversion which inhibited and delayed boundary layer/mixing depth evolution, and 3) strong warming below 15K feet B as much as 6 deg C at 10k feet in 24 hours. The maximum 8-hr concentration rose from 56ppb on May 8 to 90ppb on May 11. Forecasters did not do a good job of predicting this episode. The next exceedance came ten days later B May 21 B and continued on May 22. This episode was accurately anticipated with a Health Watch issued for May 21 and a Warning for May 22. A strong surface high that built over the southern plains produced an easterly wind flow regime from the surface to about 10K feet. This type of flow has been identified as one that readily increases local ozone concentrations by minimizing or eliminating "clean" westerly afternoon winds. The highest 8-hr ozone reading obtained on May 21 was at Glendale while at Sky Harbor a record high maximum temperature of 107 degrees was recorded. Background ozone levels at Hillside rose only 11ppb during this period. Ozone concentrations fell off for a few days but a fourth exceedance day took place on May 27 when another easterly flow situation developed. An adequate call was made on this with the issuance of a Health Watch. Warnings issued for the next two days, however, were not since unexpectedly strong and persistent daytime surface winds kept ozone levels well within the moderate category. These winds trumped the maximum temperatures near 110 degrees May 27-29. As noted above, four exceedance days in May is the average during the 1996-2002 period of record.