

MONTHLY AIR QUALITY REPORT FOR DECEMBER 2003

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 December 2003*

*Preliminary data

SAMPLE POLLUTANT REPORTING BOX

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

| SUN | | MON | | TUES | | WED | | THU | | FRI | | SAT | | | | | | | | |
|-----|----|-----|----|------|----|-----|----|-----|----|-----|----|-----|----|----|----|----|----|----|----|-----|
| | 57 | 33 | 47 | 2 | 25 | 42 | 3 | 34 | 42 | 4 | 36 | 45 | 5 | 38 | 52 | 6 | 34 | 58 | | |
| | | 54 | 58 | | 66 | 62 | | 66 | 69 | | 71 | 73 | | 66 | 60 | | 62 | 55 | | |
| 7 | 27 | 57 | 8 | 33 | 25 | 9 | 31 | 28 | 10 | 29 | 34 | 11 | 27 | 41 | 12 | 30 | 22 | 13 | 25 | 34 |
| | 67 | 55 | | 71 | 28 | | 39 | 24 | | 68 | 47 | | 60 | 46 | | 22 | 43 | | 29 | n/a |
| 14 | 28 | 44 | 15 | 34 | 28 | 16 | 35 | 27 | 17 | 34 | 40 | 18 | 32 | 52 | 19 | 35 | 56 | 20 | 34 | 53 |
| | 27 | n/a | | 21 | 21 | | 35 | 20 | | 62 | 39 | | 87 | 56 | | 65 | 49 | | 47 | 53 |
| 21 | 27 | 59 | 22 | 32 | 23 | 23 | 35 | 22 | 24 | 30 | 36 | 25 | 33 | 43 | 26 | 32 | 16 | 27 | 30 | 13 |
| | 51 | 50 | | 56 | 40 | | 35 | 19 | | 40 | 44 | | 30 | 44 | | 22 | 15 | | 22 | 21 |
| 28 | 31 | 25 | 29 | 34 | 35 | 30 | 34 | 44 | 31 | 32 | 47 | | | | | | | | | |
| | 18 | 38 | | 43 | 56 | | 59 | 56 | | 56 | 58 | | | | | | | | | |

Exceedance days during DEC 2003-

Total= 0 Date Max AQI Pollutant Site/s

Health Watches issued during DEC 2003-

Total= 0 Date Max AQI Pollutant Site/s

High Pollution Advisories issued during DEC 2003-

Total= 0 Date Max AQI Pollutant Site/s

| | | |
|-----------------------------|---|----|
| <u>Concentration Recap:</u> | Days in the Good category: | 10 |
| | Days in the Moderate category: | 21 |
| | Days in the Unhealthy for Sensitive Groups category: | 0 |
| | Days in the Unhealthy category: | 0 |
| | Total Forecast Days: | 31 |

Narrative:

Maximum ozone concentrations were well within the good range the entire month and showed little variation from day to day irrespective of the percent of possible sunshine – which ranged from 47 to 100 percent – or the synoptic weather pattern. It is evident that practically no local ozone production occurs this time of year with background ozone the only real contributor.

For the first time this season maximum 8-hr carbon monoxide concentrations rose into the moderate category and did so on seven days. These occurred during two separate episodes which were a subset of a series during which concentrations exhibited a stair-step trend upward followed by a rapid drop-off (see graph below). The episodes began roughly every Monday (1st, 8th, 15th, 22nd, and 29th) with carry-over characteristics which continued until the weekends. The pattern is particularly identifiable during stagnant weather with interruptions during unsettled weather periods. Noteworthy also is that most of the peak concentrations occurred on days when the maximum temperatures were in the 75-80 deg F range, which during the winter months are usually accompanied by descending air due to ridging aloft.

PM-10 concentrations were in the moderate range the first eight days of the month with a persistent upper level ridge overhead. During this period the National Weather Service issued four Air Stagnation Advisories. The string was broken with the passage of a trough; associated gusty winds did produce some dust aloft. On the 10th reception of data from the Teom at Durango began (Maricopa County plans to close down the Teom at South Phoenix in a few months and Durango is its replacement). The highest 24-hr PM-10 concentration of the month and season thus far (127ug/m3) was reached at Durango on the 18th following the approach and arrival of a very warm ridge aloft. Temperatures at 850mb (5K feet) increased by nearly 25 deg F between the 16th and the 18th while at the surface the maximum temperature rose by only 13 deg F. During the same period the beat mixing depth fell from 6800' to 2600' and dispersion dropped from good to marginal. On the 18th the surface radiation inversion and subsidence inversion aloft merged to create a strong 10 deg C inversion which extended to nearly 5K feet. PM-10 readings were at their lowest during and following mid-latitude trough passages on the 12th and 26th, both of which produced measurable rain. 13 of the 17 days (76%) that readings were in the moderate range were on weekdays.

Elevated concentrations of PM-2.5 occurred on weekdays 75% of the time and all during two types of weather scenarios. The predominant scenario was a warm and stable ridge aloft with temperatures at 5K feet of 12 deg C or higher and maximum surface temperatures between 72-80 deg F. The other scenario was in the wake of troughs when very cold air at ground level lowered the mixing depths to <2500'; in all cases winds were relatively light. Lowest PM-2.5 concentrations occurred during two rain events. Representative 2.5 values were not obtainable on the 13th or 14th due to a very moist residual air mass which produced fog. The highest 24-hr PM-2.5 concentration of the month (26.5ug/m3) occurred on the 4th after a succession of warm days during which the mixing depth was 3500' or below, winds were relatively light, and dispersion was fair.

