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ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM₁₀) Concentration Events in the Phoenix Area on April 30, 2008

Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts as part of the Natural Events Action Plan for the Phoenix area. On Tuesday, April 29, 2008, in response to a tightening pressure gradient associated with the tail end of a trough of low pressure and cold frontal passage through Arizona, ADEQ air quality forecasters issued the Maricopa County Dust Control Action Forecast calling for a moderate risk of wind-blown dust and thus a moderate risk for unhealthy PM₁₀ levels in the Phoenix area for Wednesday, April 30th. The Dust Control Action Forecast called for southwesterly winds of 15 to 25 mph with stronger gusts possible during the afternoon. In anticipation of the high winds and blowing dust, a PM₁₀ Health Watch was issued for April 30th (See Attachments). These forecasts/advisories satisfy the requirement in 40 CFR 51.930(a)(1).

This regional high-wind event created the potential for a wind-blown dust event with a moderate risk of exceeding the PM₁₀ National Ambient Air Quality Standards (NAAQS) in Maricopa County. Strong winds did occur and were observed throughout portions of Maricopa County and much of the Phoenix Metro area on April 30th, 2008. Beginning in the morning and continuing until the early evening hours of April 30th, strong southwesterly winds generated blowing dust which moved into portions of the Phoenix Metro area. All

appropriate State Implementation Plan (SIP) control measures were in place during the event, demonstrating per 40 CFR 50.1(j), that the event “is not reasonably controllable or preventable.” A discussion of commonly employed Best Available Control Measures (BACM) for dust in Maricopa and Yuma counties can be found in “High Wind Exceptional Events and Control Measures for PM₁₀ Areas” (see “References”).

The initialization of a wind-blown dust event is evident in the Phoenix visible camera images, as well as the Arizona Meteorological Network (AzMET), Maricopa County (MC), and National Weather Service (NWS) monitors (see Fig. 1). Strong winds gusting to 30 mph at the NWS Phoenix Sky Harbor station and as high as 41 mph at the NWS Deer Valley station were reported between 9:00 a.m. and 6:00 p.m., while many other Valley monitoring locations measured wind gusts over 20 mph. Due to the spatial variability of PM sources both within and outside of the Phoenix urban core, the PM₁₀ NAAQS was only exceeded at the West 43rd Ave. monitor operated by Maricopa County (see Section 2 for more detail). The fact that ambient concentrations exceeded the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event “affects air quality.” The following are the key PM₁₀ monitor readings for the monitors examined in this report:

Monitor (Operator/Type)	AQS ID	24-hr Avg PM ₁₀	1-hr Max PM ₁₀	Max Time	Flag**
PHOENIX METRO AREA					
West 43 rd Ave (MC/TEOM)	04-013-4009*	172	1065	1100	RJ
Durango Complex (MC/TEOM)	04-013-9812*	69	220	1100	None
Greenwood (MC/TEOM)	04-013-3010*	63	121	1100	None
Higley (MC/TEOM)	04-013-4006*	63	200	0600	None
West Phoenix (MC/TEOM)	04-013-0019*	55	96	1100	None
Central Phoenix (MC/TEOM)	04-013-3002*	51	78	1200	None
JLG Supersite (ADEQ/TEOM)	04-013-9997*	46	91	1100	None
Coyote Lakes (MC/TEOM)	04-013-4014*	53	165	0600	None
South Phoenix (MC/TEOM)	04-013-4003*	88	218	1600	None

* EPA Air Quality System Identification Number

** 24-hr PM₁₀ concentration influenced by natural or exceptional event to be flagged

Type Abbreviations: TEOM – Tapered Element Oscillating Microbalance Monitor (Continuous monitor)

The preliminary findings from this analysis were presented at stakeholders meetings on November 19, 2008, and March 19, 2009, in Phoenix, Arizona. Following the stakeholders meetings, ADEQ supplemented and finalized the analysis and

a public comment period was held from October 15, 2009 through November 13, 2009. This finalized document and any comments received are being submitted to EPA to satisfy the requirements in 40 CFR 50.14(c)(3)(i).

16659 (112.14Wx33.41N)

MC - WEST FORTY THIR

Hr	T(F)	PM	Spd	Max	Dir
1	78	36	2	13	NW
2	77	30	1	9	E
3	75	32	2	6	SE
4	76	35	4	9	S
5	72	51	2	13	NE
6	68	112	3	7	NE
7	68	109	3	7	NE
8	74	119	3	8	N
9	78	75	3	7	N
10	83	85	5	20	SW
11	87	404	13	23	SW
12	89	1065	16	33	W
1	90	359	15	28	W
2	92	222	13	27	SW
3	93	208	13	30	SW
4	93	365	15	27	SW
5	92	236	15	28	SW
6	89	212	13	25	W
7	85	133	12	23	W
8	81	77	6	12	W
9	79	62	6	19	W
10	80	46	9	21	SW
11	77	26	7	14	SW
12	74	30	3	9	SW

NWS-Phoenix Sky Harbor

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	83	10	0	0	0	N
2	76	10	0	0	0	N
3	76	10	0	6	6	SE
4	70	10	0	10	10	E
5	70	10	0	8	8	E
6	69	10	0	11	11	SE
7	70	10	0	8	8	E
8	74	10	0	6	6	E
9	79	10	0	0	0	N
10	82	10	0	8	8	SW
11	86	10	0	16	23	SW
12	88	10	0	18	30	W
1	89	10	0	20	26	W
2	91	10	0	18	29	W
3	91	10	0	14	20	SW
4	92	10	0	17	26	W
5	90	10	0	20	30	W
6	88	10	0	17	23	W
7	86	10	0	17	17	W
8	83	10	0	10	10	W
9	82	10	0	9	9	W
10	77	10	0	6	6	S
11	77	10	0	6	6	S
12	74	10	0	3	3	S

NWS-Deer Valley Airport

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	76	10	0	11	11	SW
2	74	10	0	8	8	S
3	72	10	0	7	7	E
4	68	10	0	7	7	E
5	68	10	0	6	6	E
6	68	10	0	9	9	E
7	70	10	0	7	7	E
8	73	10	0	9	9	SE
9	77	10	0	9	9	SW
10	79	10	0	11	21	SW
11	82	10	0	13	26	SW
12	84	10	0	21	34	SW
1	85	10	0	23	31	SW
2	87	10	0	15	41	SW
3	88	10	0	18	30	W
4	89	10	0	18	26	W
5	88	10	0	23	29	W
6	85	10	0	15	25	SW
7	83	10	0	15	29	SW
8	80	10	0	7	7	SW
9	77	10	0	3	3	S
10	77	10	0	11	11	SW
11	75	10	0	8	8	SW
12	72	10	0	8	8	SW

Event Contrib. Analysis
Hourly PM₁₀ Conc. (µg/m³)

MONITORS:	Hr	1
1-W43RD	1	36.6
2-Mon 2	2	30.5
3-Mon 3	3	32.8
	4	35
	5	51.4
	6	112
	7	109
	8	120
	9	75.3
	10	85
	11	404
	12	1065
	1	360
	2	223
	3	208
	4	366
	5	236
	6	212
	7	134
	8	77.4
	9	62.5
	10	46.8
	11	28.5
	12	30.6

24-Hr. Avg PM₁₀ with W/O: 51.4

Monitor: 1-W43RD 172 66

Conclusion: As shown above, the PM₁₀ concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).

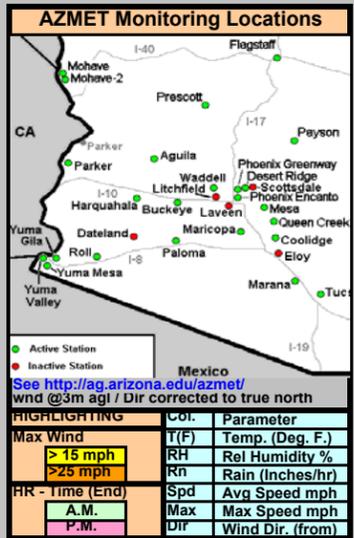
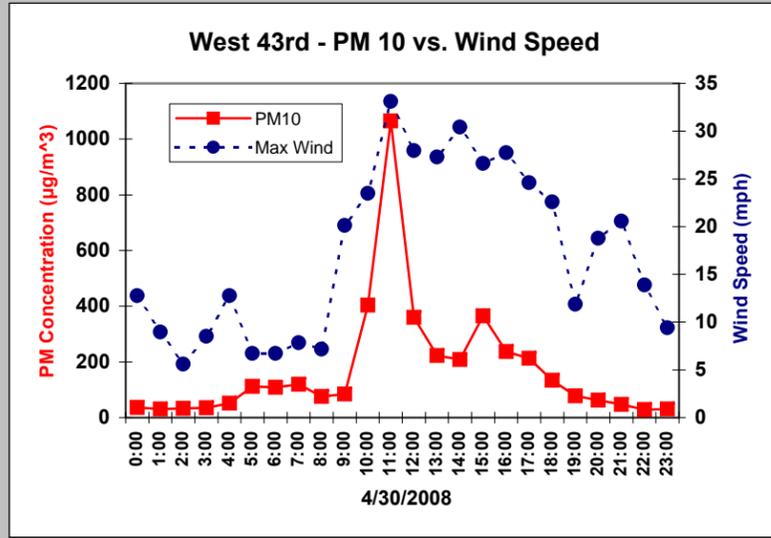


Figure 1. Key Data for Event of April 30, 2008

WIND & PM10 DATA	ECA HIST DIST	KEY Wx IMAGERY PHX VIS. CAMERAS	PM10 & WIND PLOT
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SUMMARY OF EVENT
Beginning at 11:00 am, Deer Valley Airport experienced gusts from the southwest up to 41 mph. By noon, widespread dust aloft was observed. The visibility at Goodyear was 7 statute miles and winds valley-wide were from the southwest between 12 to 28 mph with gusts between 18 to 41 mph.



16375 (112.12Wx33.43N)

MC - DURANGO COMPLEX

Hr	T(F)	PM	Spd	Max	Dir
1	76	30	5	10	W
2	78	35	5	17	SW
3	77	31	5	11	SW
4	74	34	3	10	S
5	70	46	3	9	NE
6	67	60	2	8	NE
7	70	83	3	9	NE
8	77	89	2	7	N
9	81	75	2	7	N
10	85	91	4	18	SW
11	86	83	11	23	SW
12	86	219	15	30	W
1	86	112	15	30	W
2	89	67	12	29	W
3	92	51	12	33	W
4	93	108	14	29	W
5	92	69	13	31	W
6	89	85	14	27	W
7	85	82	12	28	W
8	81	62	8	15	W
9	77	56	4	10	W
10	77	51	5	16	SW
11	75	38	5	10	W
12	73	32	3	8	W

16377 (112.08Wx33.40N)

MC - SOUTH PHOENIX

Hr	T(F)	PM	Spd	Max	Dir
1	80	49	2	11	SW
2	82	36	2	10	SW
3	78	35	2	7	SW
4	76	37	2	10	E
5	71	57	2	7	NE
6	69	72	2	5	E
7	70	135	2	5	E
8	76	82	2	7	N
9	80	73	3	9	NW
10	83	52	2	12	W
11	86	115	7	23	W
12	87	163	9	26	W
1	89	117	9	25	W
2	90	138	9	27	W
3	91	61	9	27	W
4	92	139	9	24	W
5	92	218	10	27	W
6	90	114	8	22	W
7	87	94	8	20	W
8	84	73	3	10	W
9	80	92	1	4	SW
10	80	74	2	9	W
11	78	40	2	7	SW
12	75	44	1	6	W

16329 (112.05Wx33.46N)

MC - CENTRAL PHOENIX

Hr	T(F)	PM	Spd	Max	Dir
1	77	37	2	7	NW
2	75	34	1	8	NE
3	72	40	2	7	E
4	72	37	4	10	E
5	68	45	3	9	E
6	66	53	4	9	E
7	69	58	5	12	E
8	75	65	4	7	NE
9	82	52	2	9	NE
10	85	42	4	12	W
11	85	62	11	27	SW
12	86	17	34	W	
1	87	77	16	32	W
2	89	57	14	29	W
3	90	41	13	27	W
4	91	53	15	31	W
5	91	73	15	35	W
6	89	59	14	27	W
7	85	70	14	27	W
8	81	47	9	20	W
9	78	48	6	11	W
10	78	53	7	16	W
11	78	36	10	19	W
12	75	33	3	13	W

Historical Distribution
5-Yr. Dist. of Values (µg/m³)

MONITORS:	Column Index
1-WEST 43RD AVE	Yr - All Data (5-Yrs)
	Sea - Data for Spring season only (5-Yrs)
Cum. Freq.	Mon 1
Min	5 8
0.5%	9 9
1.0%	11 11
2.5%	15 13
5%	19 19
10%	29 28
25%	44 46
50%	65 63
75%	91 82
90%	121 107
95%	139 125
97.5%	157 134
99.0%	192 194
99.5%	227 220
Max	313 313
Flagged Value	172

Conclusion: Flagged Value is exceptional in nature (ie greater than 95% of all data)



16398 (111.92Wx33.48N)

MC - SOUTH SCOTTSDAL

Hr	T(F)	RH	Spd	Max	Dir
1	74	16	1	7	W
2	68	20	0	3	SE
3	66	20	3	6	NE
4	66	18	4	9	SE
5	66	21	3	9	SE
6	63	24	2	6	E
7	65	25	2	8	E
8	71	26	2	8	SE
9	76	26	5	10	S
10	84	21	2	11	SW
11	88	17	4	22	SW
12	89	12	12	27	W
1	90	11	13	30	W
2	92	11	12	26	W
3	93	13	13	26	W
4	93	13	11	25	W
5	92	12	13	29	W
6	90	9	12	27	W
7	85	10	11	23	W
8	81	11	8	17	W
9	77	12	2	7	NW
10	74	14	2	6	W
11	73	18	3	12	SW
12	72	21	4	10	S

16478 (111.88Wx33.30N)

MC - WEST CHANDLER

Hr	T(F)	RH	Spd	Max	Dir
1	76	11	4	11	S
2	75	11	4	11	S
3	74	12	5	12	S
4	71	14	5	13	S
5	69	19	3	9	SE
6	66	21	3	11	E
7	69	23	5	13	S
8	72	23	7	15	S
9	76	21	6	14	S
10	80	12	9	19	SW
11	83	8	12	27	SW
12	85	9	11	23	SW
1	87	8	11	27	W
2	88	8	11	26</	

Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was a filter sampling date (1-in-6 run day), data from both the continuous analyzers and filter based monitors were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM₁₀ readings from the West 43rd Ave. monitoring site were valid for April 30, 2008. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode. Exceedances of the NAAQS were recorded by the continuous monitor located at the West 43rd Ave. monitoring site operated by Maricopa County.

2. Review suspected contributing sources. The NWS, AzMET, and MC surface data for Arizona, along with the visible camera images in Phoenix, provide a good explanation as to what meteorological conditions were in place on April 30th. Strong westerly to southwesterly winds occurred in the Phoenix area due to a low pressure system approaching from the west. The plot of hourly PM₁₀ concentration and max wind data in the upper right corner of Figure 1 confirms the nearly identical timing of the elevated PM₁₀ concentrations and the strong wind gusts recorded by the West 43rd Ave. monitor. The high wind event was a regional phenomenon that affected the entire Phoenix Metro area. However, PM sources are highly variable across space; therefore, the locations of higher PM₁₀ concentrations (namely the Salt River channel) are likely an indication that these locations (or areas upwind of these locations) contain greater sources of PM than other locations within the Phoenix Metropolitan area. While no specific source allocation can be determined for this particular day, the 2005 ADEQ revised PM₁₀ SIP for the Salt River area (attached) contains modeled source contributions on high wind days (see section 4.2 – Source Categories). Results estimate that approximately 76% of PM₁₀ concentrations can be attributed to windblown dust, of which 21% is from agricultural fields, 15% from alluvial channels, and 21% from vacant lots. It is not clear whether similar source allocations can be assumed for this April 30, 2008, high wind event.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the affected areas are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the “Historical Distribution” Table in Figure 1 has been included to demonstrate that the event is associated with a measured concentration in excess of normal historical fluctuations, including background (i.e., concentrations greater than the 95th percentile). Additionally, the winds associated with the elevated PM₁₀ concentrations

may be characterized as unusual as described in “Impact of Exceptional Events’ ‘Unusual Winds’ on PM₁₀ Concentrations” (see “References”).

4. Examine the meteorological conditions before and during the event. The MC and NWS meteorological data are summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. As can be seen in Figure 1, wind speeds did not pick up in central Arizona until approximately 9:00 a.m., when several stations reported gusty winds over 20 mph. This timing corresponds to the onset of elevated PM₁₀ concentrations recorded at the West 43rd Ave. monitoring site, which remained elevated through the afternoon hours until a time when winds, including those reported at Sky Harbor and Deer Valley airports, decreased to below 20 mph.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM₁₀ concentrations in the Phoenix area can be attributed to soil emissions that were transported over portions of the Phoenix Metro area in Maricopa County. No source specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the wind-blown dust event occurring on April 30, 2008. Visual evidence of reduced visibility can be seen in the images located in the lower right portion of Figure 1. These images, along with the graph of West 43rd wind gusts and PM₁₀ concentrations, provide proof that the elevated PM₁₀ concentrations in Phoenix were coincident with strong gusty winds and can be attributed to soil emissions.

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over central Arizona for which there is not an effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the “Event Contrib. Analysis” Table in Figure 1 has been included to demonstrate that there would have been no exceedance or violation but for the event (i.e., the contribution during the event overwhelmed the 24-hour average).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentration in West 43rd Ave. was attributed to a natural event.

Conclusion

Transport of dust from soils by high winds. The elevated PM₁₀ event on April 30, 2008, in Maricopa County was the result of the transport of dust and soils from high winds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be

flagged for air quality planning purposes. The “high wind” (RJ) flag should be applied to the monitor readings indicated in the table at the beginning of this report, as the monitor would have been below the NAAQS but for the contribution of the event.

ATTACHMENTS AND REFERENCES
FOR EXCEPTIONAL EVENTS ANALYSIS

The following are supplemental materials helpful in understanding the exceptional event summarized in the main report. In addition, the reader is referred to the following references.

REFERENCES

Arizona Department of Environmental Quality (ADEQ), *Air Quality Exceptional and Natural Events Policy*, Policy Number 2009.002 (April 28, 1999; revised January 10, 2006 and June 22, 2007).

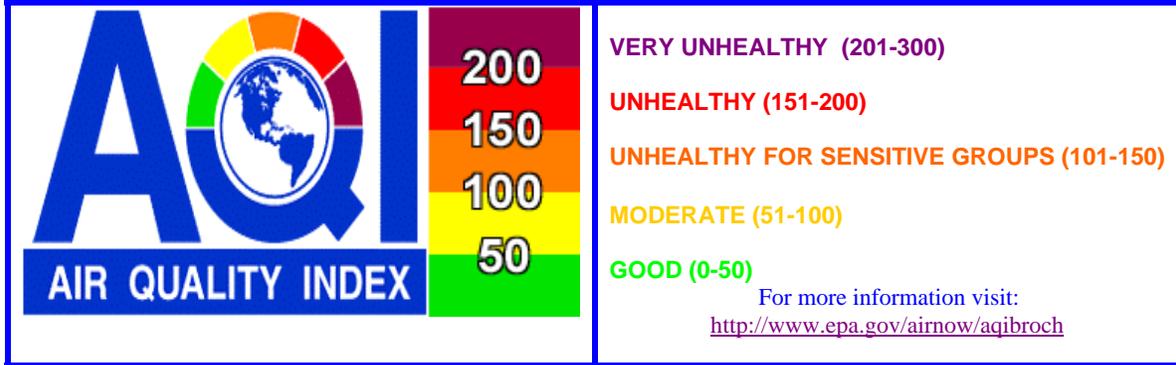
Arizona Department of Environmental Quality (ADEQ), *Technical Criteria Document for Determination of Natural Exceptional Events for Particulate Matter Equal to or Less Than Ten Microns in Aerodynamic Diameter (PM₁₀)* (May 31, 2000).

Arizona Department of Environmental Quality (ADEQ), *Technical Criteria Document for Determination of Natural and Exceptional Events* (December 12, 2005).

Arizona Department of Environmental Quality (ADEQ), *Impact of Exceptional Events 'Unusual Winds' on PM₁₀ Concentrations* (October 14, 2009).

Arizona Department of Environmental Quality (ADEQ), *High Wind Exceptional Events and Control Measures for PM₁₀ Areas* (October 14, 2009).

Environmental Protection Agency (EPA), *The Treatment of Data Influenced by Exceptional Events (Exceptional Event Rule)*, 73 FR 70597; 40 CFR Parts 50 and 51 (November 21, 2008).



NEW!!! CLICK HERE FOR UPDATED 2008 OZONE SEASON STATS NEW!!!
AIR QUALITY FORECAST FOR WEDNESDAY, APRIL 30, 2008

This report is updated by 1:00 p.m. Sunday thru Friday and is valid
for areas within and bordering Maricopa County in Arizona

FORECAST DATE	YESTERDAY MON 04/28/2008	TODAY TUE 04/29/2008	TOMORROW WED 04/30/2008	EXTENDED THU 05/01/2008
NOTICES (*SEE BELOW FOR DETAILS)	NONE	NONE	OZONE HEALTH WATCH PM-10 HEALTH WATCH	NONE
AIR POLLUTANT	Highest AQI Reading/Site (Preliminary data only)			
O3*	90 NORTH PHOENIX	84 MODERATE	97 MODERATE	87 MODERATE
CO*	13 WEST INDIAN SCHOOL	11 GOOD	8 GOOD	9 GOOD
PM-10*	59 BUCKEYE	68 MODERATE	90 MODERATE	57 MODERATE
PM-2.5*	65 DURANGO	58 MODERATE	54 MODERATE	51 MODERATE

* O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns

**"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.
 "PM-10 or PM-2.5 Health Watch" means that the highest concentration of PM-10 or PM-2.5 may approach the federal health standard.
 "High Pollution Advisory" means that the highest concentration of OZONE, PM-10, or PM-2.5 may exceed the federal health standard.
 "DUST" means that short periods of high PM-10 concentrations caused by outflow from thunderstorms are possible.

Health message for Tuesday, Apr 29: Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

Health message for Wednesday, Apr 30: Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

Synopsis and Discussion

An Ozone Health Watch AND a PM10 Health has been issued for Wednesday, April 30, 2008

Ozone levels continue to hold in the mid to upper “Moderate” range with little relief. It’s only going to get worse before it gets better as a trough of low pressure moves through the western U.S. the next couple of days. The tail end of the disturbance will impact Arizona Wednesday with winds increasing to 30 mph at times across the deserts, even stronger in higher elevations of Arizona. Yuma is already indicating that another transport situation is underway with Ozone in the upper “Moderate” range on Tuesday. That means that today and likely tomorrow should see some high levels across the Phoenix forecast. An increase in winds also means we could see areas of blowing dust across the dry deserts (now 65 consecutive days without measurable rain in Phoenix). As a result of this latest weather system and its potential impact on the Valley’s air quality, we are **issuing both an Ozone and PM10 Health Watch for Wednesday**. The situation will be re-evaluated tomorrow, but conditions should improve Thursday and Friday as the system exits the region. Check back then for the latest. Have a good day! –J.Paul

MONITORING SITE MAPS: STATIC MAP - <http://www.azdeq.gov/enviro/air/monitoring/images/map.jpg>
 INTERACTIVE MAPS - <http://aqwww.maricopa.gov/AirMonitoring/SitePollutionMap.aspx>
<http://www.airnow.gov/>



POLLUTION MONITOR READINGS FOR MONDAY, APRIL 28, 2008



O3 (OZONE)

For facts on new 8-hr ozone standard go to: http://www.epa.gov/air/ozonepollution/pdfs/2008_03_aqi_changes.pdf

For maps go to: <http://www.airnow.gov/index.cfm?action=airnow.currentconditions>

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Alamo Lake (La Paz County)	NOT AVBL	NOT AVBL	NOT AVBL
Apache Junction (Pinal County)	64	64	
Blue Point	50	42	
Buckeye	65	67	
Casa Grande (Pinal County)	67	74	
Cave Creek	71	87	
Central Phoenix	66	71	
Combs School (Pinal County)	62	58	
Dysart	67	74	
Falcon Field	61	54	
Fountain Hills	64	64	
Glendale	70	84	
Humboldt Mountain	66	71	
Maricopa (Pinal County)	65	67	
North Phoenix	72	90	
Phoenix Supersite	NOT AVBL	NOT AVBL	NOT AVBL
Pinal Air Park (Pinal County)	65	67	
Pinnacle Peak	67	74	
Queen Valley (Pinal County)	66	71	
Rio Verde	66	71	
South Phoenix	68	77	
South Scottsdale	64	64	
Tempe	67	74	
Tonto Nat'l Mon. (Gila County)	66	71	
West Chandler	65	67	
West Phoenix	71	87	
Yuma (Yuma County)	70	84	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Central Phoenix	0.8	9	
Greenwood	0.9	10	
Phoenix Supersite	NOT AVBL	NOT AVBL	NOT AVBL
West Indian School	1.1	13	
West Phoenix	1.0	11	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (ug/m3)	MAX AQI	AQI COLOR CODE
Buckeye	72.3	59	
Central Phoenix	39.9	36	
Combs School (Pinal County)	87.8	67	
Coyote Lakes	46.0	42	
Durango	59.1	53	
Greenwood	58.2	53	
Higley	62.0	54	
Maricopa (Pinal County)	73.6	60	
Phoenix Supersite	38.3	35	
South Phoenix	59.2	53	
West Forty Third	63.0	55	
West Phoenix	48.5	44	

PM-2.5 (PARTICLES)

(Some data derived from light-scattering equipment)

For maps go to: <http://www.airnow.gov/>

SITE NAME	MAX 24-HR VALUE (ug/m3)	MAX AQI	AQI COLOR CODE
Durango	21.3	65	
Dysart	6.5	21	
Estrella Mountain Park	10.5	34	
Phoenix Supersite	14.6	47	
Vehicle Emissions Lab	8.0	26	
West Phoenix	12.6	41	

LOCAL AIR POLLUTANTS IN DETAIL



O3 (OZONE):

Description – This is a secondary pollutant that is formed by the reaction of other primary pollutants (precursors) such as VOCs (volatile organic compounds) and NO_x (Nitrogen Oxides) in the presence of heat and sunlight.

Sources – VOCs are emitted from motor vehicles, chemical plants, refineries, factories, and other industrial sources. NO_x is emitted from motor vehicles, power plants, and other sources of combustion.

Potential health impacts – Exposure to ozone can make people more susceptible to respiratory infection, result in lung inflammation, and aggravate pre-existing respiratory diseases such as asthma. Other effects include decrease in lung function, chest pain, and cough.

Unit of measurement – Parts per billion (ppb).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight).

Reduction tips – Curtail daytime driving, refuel cars and use gasoline-powered equipment as late in the day as possible.

CO (CARBON MONOXIDE):

Description – A colorless, odorless, poisonous gas formed when carbon in fuels is not burned completely.

Sources – In cities, as much as 95 percent of all CO emissions emanate from automobile exhaust. Other sources include industrial processes, non-transportation fuel combustion, and natural sources such as wildfires. Peak concentrations occur in colder winter months.

Potential health impacts – Reduces oxygen delivery to the body's organs and tissues. The health threat is most serious for those who suffer from cardiovascular disease.

Unit of measurement – Parts per million (ppm).

Averaging interval – Highest eight-hour period within a 24-hour period (midnight to midnight)

Reduction tips – Keep motor vehicle tuned properly and minimize nighttime driving.

PM-10 & PM-2.5 (PARTICLES):

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations such as the “Valley Brown Cloud” (see <http://www.phoenixvis.net/>). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (ug/m³)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, slow down on dirt roads, carpool, and use public transit.

{Updated 08/14/2007}



ADEQ AIR POLLUTION HEALTH WATCH ISSUANCE NOTICE

Issuance Date and Time: Tuesday, April 29, 2008 11:30 a.m.

Valid for Date(s): Wednesday, April 30, 2007

Pollutant: Course Particulates (PM-10)

Message: Elevated particulate levels combined with breezy to windy conditions Wednesday may lead to concentrations approaching the health standard.

Detailed air quality forecast information is available on:

- The internet at www.azdeq.gov
- A telephone recording at 602-771-2367

Duty Forecaster: Christopher Reith 602-771-2360
Joe Paul 602-771-2363

CKR 01/18/2005



**MARICOPA COUNTY
DUST CONTROL ACTION FORECAST
ISSUED TUESDAY, APRIL 29, 2008**

Three-day weather outlook:

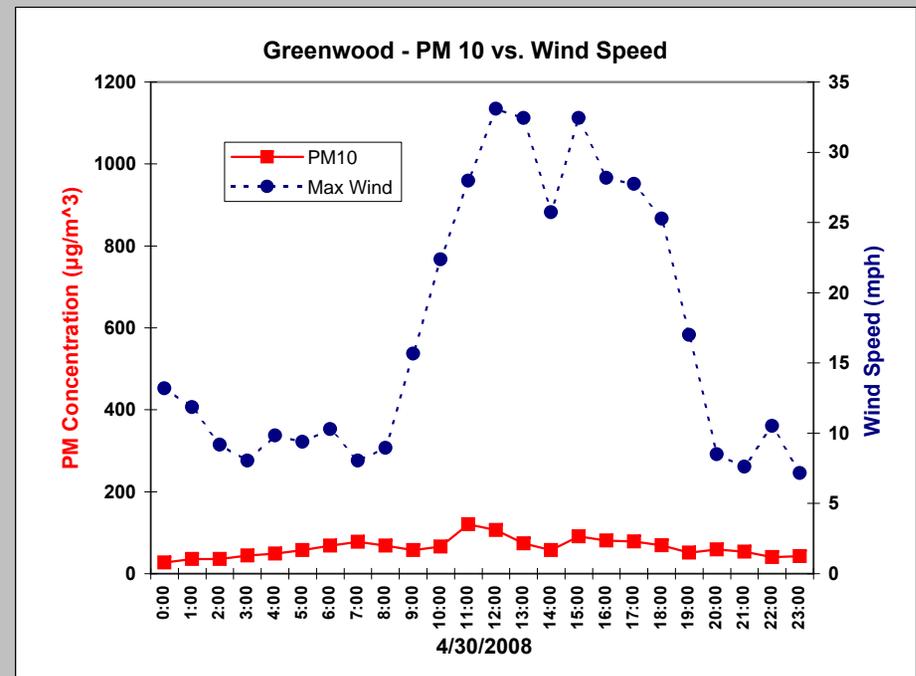
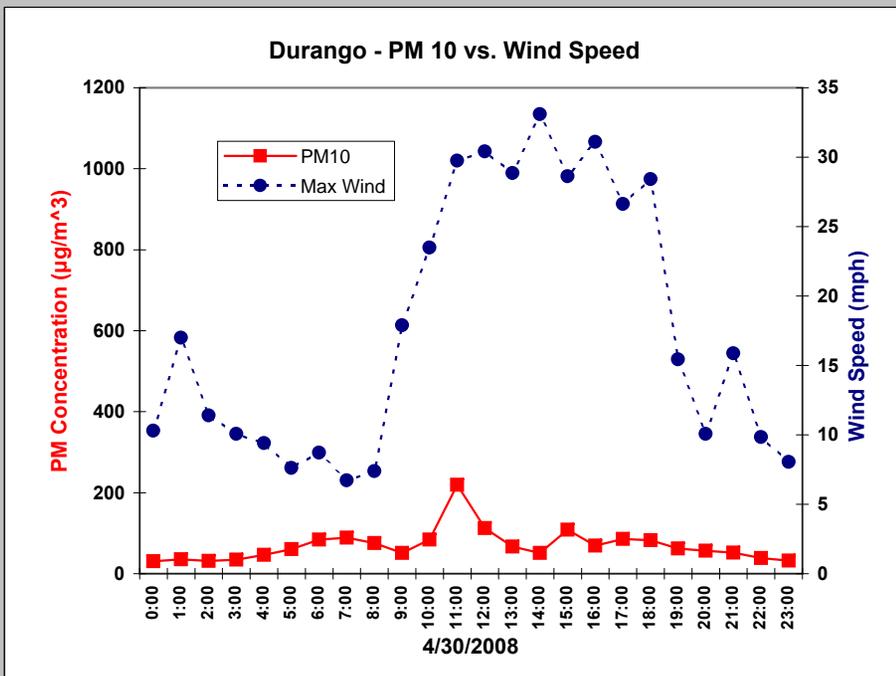
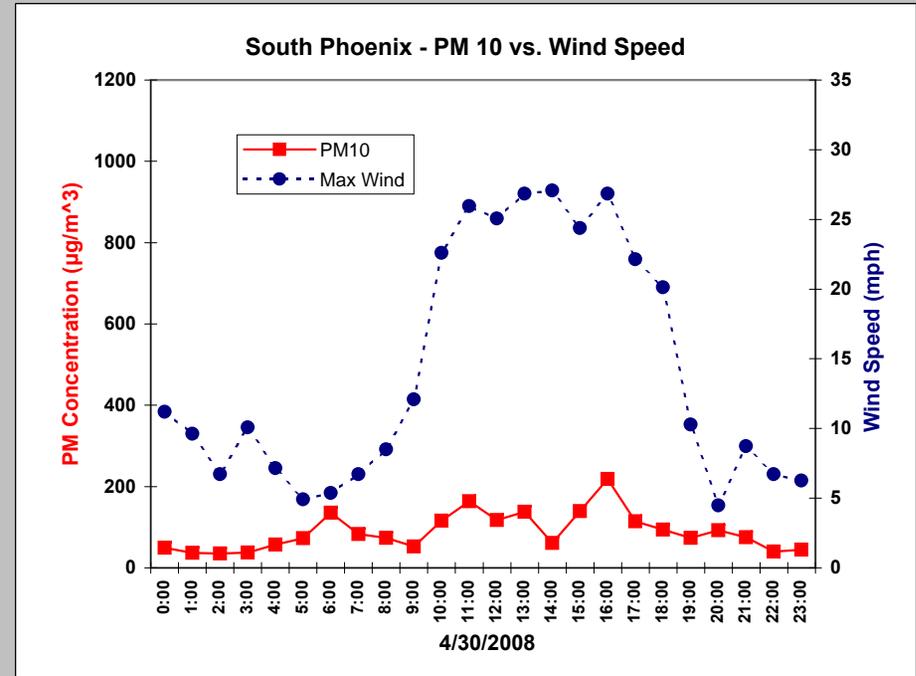
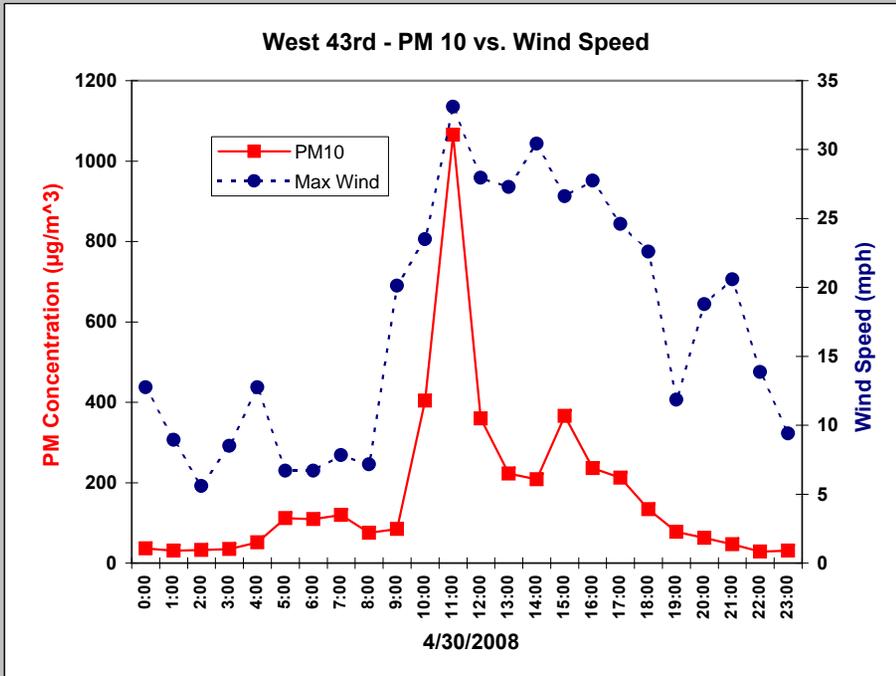
A trough of low pressure will move through the western U.S. the next several days with the tail end of the disturbance impacting Arizona Wednesday afternoon. Winds will increase out of southwest and west to around 30 mph at times across the deserts, lasting into early hours of Thursday before decreasing. Cooler air will filter in behind the system which means afternoon desert temperatures will only be in the upper 80s on Thursday. Winds will be much lighter Thursday afternoon through Friday. The risk of exceeding the 24-hr PM10 health standard in Phoenix will be "Moderate" on Wednesday, dropping back to "Low" by Thursday.

RISK FACTORS

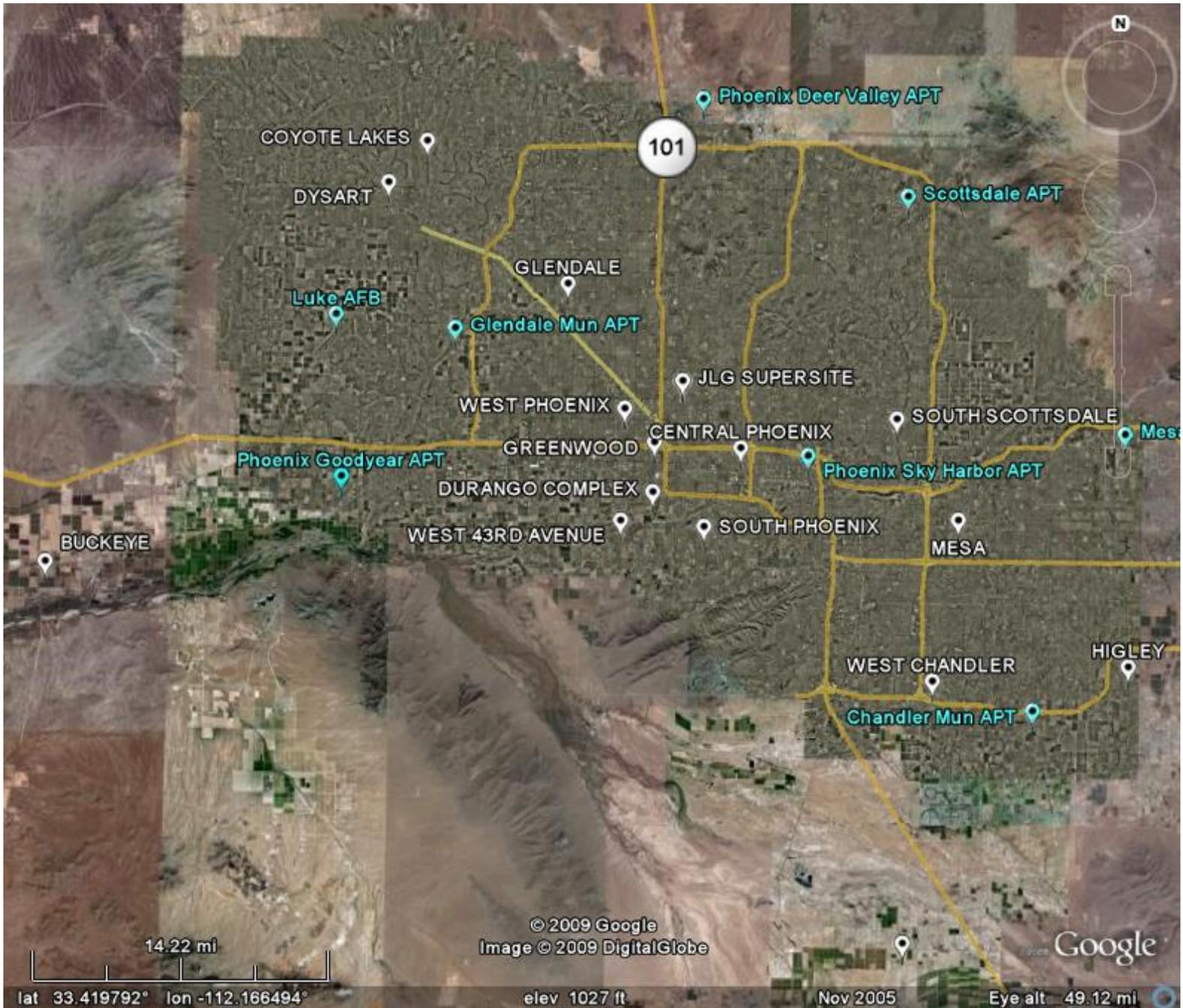
	<u>WINDS</u>	<u>STAGNATION</u>	<u>RISK LEVEL</u>
Day #1: Wed 04/30/2008	Southwest winds 15 to 25 mph with stronger gusts possible at times are expected during the afternoon hours.	Little to no stagnation is expected.	MODERATE
Day #2: Thu 05/01/2008	West winds 10 to 15 mph are expected during the afternoon hours.	Slightly stagnant conditions are expected early with improvement by the afternoon.	LOW
Day #3: Fri 05/02/2008	West winds 5 to 10 mph are likely much of the day.	Somewhat stagnant conditions are expected early with improvement by the afternoon.	LOW

To review the complete air quality forecast for the Phoenix metropolitan area visit www.azdeq.gov or call 602-771-2367 for recorded forecast information.

04/30/2008 - ADDITIONAL GRAPHS

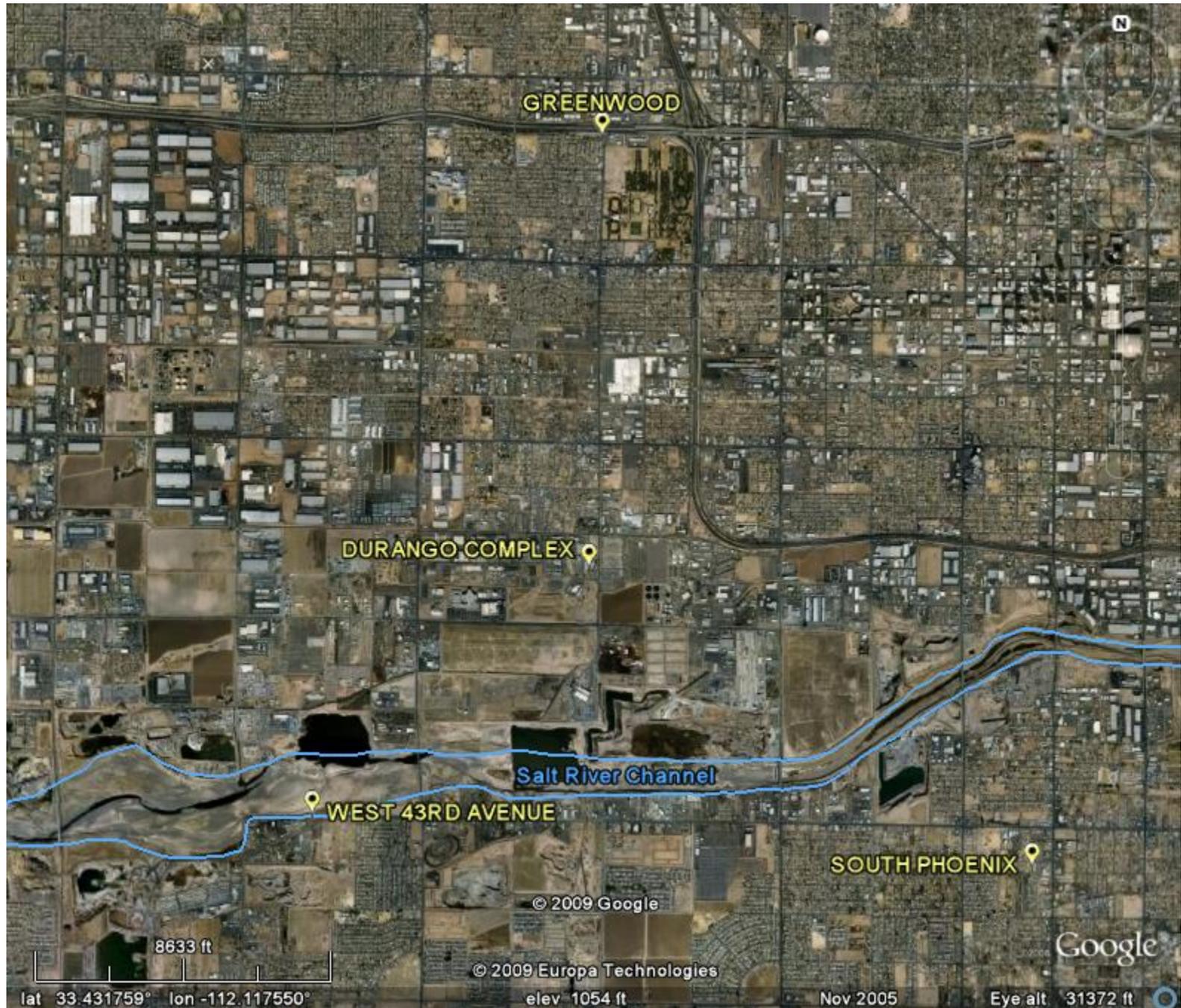


Phoenix Area PM₁₀ and Meteorological Monitors



Source: US EPA, ADEQ, & Google Earth

Salt River Area PM₁₀ and Meteorological Monitors



Source: US EPA, ADEQ, & Google Earth

CHAPTER 4: OVERVIEW OF PM₁₀ CONTROL MEASURES

4.1 INTRODUCTION

Chapter 1.2.2 of this SIP ("Regulatory History of the Metropolitan Maricopa PM₁₀ Nonattainment Area") notes that on July 25, 2002, EPA approved the Maricopa Serious PM₁₀ Nonattainment Area, and granted Arizona's request, in accordance with CAA § 188(e), to extend the CAA deadline for attainment of the annual and 24-hour PM₁₀ standards from December 31, 2001, to December 31, 2006 (67 FR 48718).

Because the attainment deadline for this plan revision is also December 31, 2006, and the measures must be applied to all similar sources throughout the Phoenix Nonattainment Area (see 67 FR 44369, July 2, 2002), the control strategies must meet the "Most Stringent Measures" test, as well as the "Best Available Control Measures/Technology" test. In its July 25, 2002, approval of the Maricopa County Plan, EPA defined "most stringent measures" (MSMs) as the most stringent measures included in any state implementation plan, or being implemented in any state, that are economically and technologically feasible for the nonattainment area in question. "Best Available Control Measures" (BACM) must be applied in serious nonattainment areas, also taking into account the economic and technological feasibility of each measure.

This chapter details the proposed BACM and MSM that were evaluated for each significant source category.

4.2 SOURCE CATEGORIES

The Salt River Study Area 2002 base year emissions inventory is described in Chapter 3.0 and the TSD's Chapter 4.0. The 2002 emissions source category contributions to ambient PM₁₀ are depicted in Table 4.2.1. The average concentrations are derived from the modeled concentrations outlined in the TSD, Chapter 6.

Assumptions used to calculate trackout emissions appear in Appendix K "Methodology for Weighting Trackout Emissions" and Appendix P "Mapping Weighted Trackout Emissions into Predicted Concentrations" of the October 2004 TSD. Calculation methodology for street sweeping emissions reductions appears in Appendix L "Street Sweeping Reductions" of the October 2004 TSD.

Source Category	Average Low Wind Day Contribution	Average High Wind Day Contribution	Highest Contribution(µg/m ³)	
	Percentage Contribution	Percentage Contribution	Low Wind Day	High Wind Day
Industrial Sources	25.9%	8.3%	60.2	31.8
Point Emissions	2.7%	1.1%	5.3	3.0
Area Emissions	23.2%	7.2%	54.9	28.8
Construction	5.8%	0.9%	6.0	4.4
Area Sources	4.2%	0.7%	8.0	3.1
Unpaved Parking Lots	1.7%	0.2%	0.8	1.4
Unpaved Shoulders	2.5%	0.4%	7.2	1.7

Source Category	Average Low Wind Day Contribution	Average High Wind Day Contribution	Highest Contribution(µg/m ³)	
	Percentage Contribution	Percentage Contribution	Low Wind Day	High Wind Day
Roads & Trackout	63.7%	13.5%	73.6	42.7
Freeway	0.4%	0.2%	0.7	0.4
Primary Roads	43.6%	9.3%	44.8	33.3
Secondary Roads	7.5%	1.5%	6.9	1.5
Trackout	12.1%	2.5%	21.2	7.5
Agricultural Tillage	0.4%	NA	0.2	NA
Windblown Dust	NA	76.7%	NA	290.1
Agricultural Fields	NA	21.3%	NA	84.9
Alluvial Channels	NA	14.9%	NA	79.5
Construction	NA	3.5%	NA	14.0
Industrial	NA	7.3%	NA	33.6
Disturbed Areas	NA	5.2%	NA	25.9
Stockpiles	NA	3.6%	NA	12.6
Vacant Lots	NA	20.9%	NA	39.6

Note: Bold concentrations exceed the 5 µg/m³ threshold for significant sources.

In Table 4.2.2, the modeled contributions for each of the source categories are given for the 2006 attainment case. These percentages are similar to the 2002 case, but with several significant differences. For example, the windblown contribution decreases from 77% to 59% from 2002 to 2006.

Source Category	Average Low Wind Day Contribution	Average High Wind Day Contribution
	Percentage Contribution	Percentage Contribution
Industrial Sources	29.7%	12.1%
Point Source Emissions	4.4%	3.1%
Area Emissions	25.2%	8.9%
Construction	5.2%	1.8%
Area Sources	7.1%	2.1%
Unpaved Parking Lots	0.5%	0.6%
Unpaved Shoulders	6.6%	1.5%
Roads & Trackout	58.0%	24.7%
Freeway	0.9%	0.4%
Primary Roads	48.3%	21.6%
Secondary Roads	6.8%	1.9%
Trackout	2.0%	0.7%
Agricultural Tillage	0.1%	NA
Windblown Dust	NA	59.4%
Agricultural Fields	NA	8.9%
Alluvial Channels	NA	15.4%
Construction	NA	4.2%
Industrial	NA	6.7%
Disturbed Areas	NA	10.1%
Stockpiles	NA	5.9%
Vacant Lots	NA	8.4%