Appendices – Volume II
Event Specific Material

For March 14, 2008

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Appendix I
Event Air Quality Advisories

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

VERY UNHEALTHY (201-300)

UNHEALTHY (151-200)

UNHEALTHY FOR SENSITIVE GROUPS (101-150)

MODERATE (51-100)

GOOD (0-50)

For more information visit:
http://www.epa.gov/airnow/aqibroch

LINK TO EXCEEDANCE & HEALTH STATEMENT INFO FOR THE 2006-07 & 2007-08 FORECAST SEASONS

AIR QUALITY FORECAST FOR FRIDAY, MARCH 14, 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 WED 03/12/2008	TODAY THU 03/13/2008	TOMORROW FRI 03/14/2008	EXTENDED SAT 03/15/2008
NOTICES (*SEE BELOW FOR DETAILS)	**NONE**	**NONE**	**PM-10 HEALTH WATCH**	**NONE**
AIR POLLUTANT	Highest AQI Reading/Site (Preliminary data only)			
O3*	**42 APACHE JUNCTION**	**51 MODERATE**	**47 GOOD**	**35 GOOD**
CO*	**16 GREENWOOD**	**15 GOOD**	**11 GOOD**	**09 GOOD**
PM-10*	**58 WEST FORTY THIRD**	**68 MODERATE**	**94 MODERATE**	**74 MODERATE**
PM-2.5*	**38 PHOENIX SUPERSITE**	**31 GOOD**	**27 GOOD**	**24 GOOD**

* 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 Thursday, Mar 13: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Health message for Friday, Mar 14: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Synopsis and Discussion

A PM-10 HEALTH WATCH HAS BEEN ISSUED FOR FRIDAY MARCH 14

Major changes in local weather conditions are on tap the next few days as the mid-latitude storm track migrates south over the area. Westerly winds aloft over the Valley are advertised to reach 50+ mph at the 10K' level and near 100 mph at the 18K' level on Friday; since the predicted mixing depth is near 9K', some of this momentum will have an avenue for reaching the surface. Areas of blowing and suspended dust are therefore likely as is the potential for transported dust from desert areas upwind of the metro area. Since PM-10 (coarse particle) levels may approach unhealthy levels, a PM-10 Health Watch has been issued for Friday. After a very breezy day on Saturday, an upper level trough and surface cold frontal passage are forecast to occur on Sunday and will be accompanied by showers and a few thunderstorms – along with gusty winds and much colder temperatures. -Reith

MONITORING SITE MAPS: STATIC MAP – **http://www.azdeq.gov/environ/air/monitoring/images/winter.jpg**
INTERACTIVE MAPS – **http://aqwww.maricopa.gov/AirMonitoring/SitePollutionMap.aspx**
http://www.airnow.gov/

POLLUTION MONITOR READINGS FOR WEDNESDAY, MARCH 12, 2008

O3 (OZONE)

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Apache Junction	54	42	
Blue Point	42	33	
Central Phoenix	43	34	
Fountain Hills	49	38	
North Phoenix	32	25	
Phoenix Supersite	47	37	
Pinnacle Peak	45	35	
South Phoenix	50	39	
South Scottsdale	43	34	
West Phoenix	45	35	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Buckeye	0.3	04	
Central Phoenix	0.8	09	
Dysart	0.4	05	
Glendale	0.6	07	
Greenwood	1.4	16	
Mesa	0.5	06	
North Phoenix	0.6	07	
Phoenix Supersite	1.2	14	
South Phoenix	0.8	09	
South Scottsdale	0.4	05	
Tempe	0.7	08	
West Chandler	0.5	06	
West Indian School	1.3	15	
West Phoenix	1.0	11	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (ug/m3)	MAX AQI	AQI COLOR CODE
Buckeye	48	44	
Central Phoenix	35	32	
Coyote Lakes	22	20	
Durango	56	51	
Greenwood	48	44	
Higley	42	39	
Maricopa (Pinal County)	70	58	
Phoenix Supersite	31	29	
Queen Creek (Pinal County)	54	50	
South Phoenix	46	43	
West Forty Third	70	58	
West Phoenix	40	37	

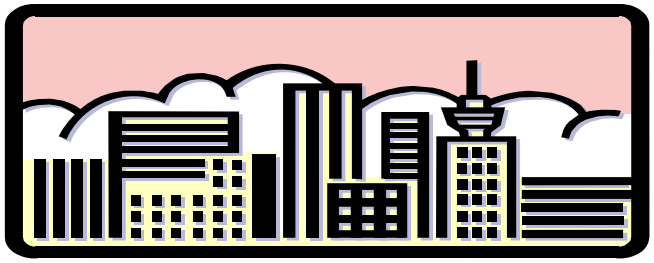
PM-2.5 (PARTICLES)

(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	11.2	36	
Dysart	3.4	11	
Estrella Mountain Park	6.1	20	
Phoenix Supersite	11.8	38	
Vehicle Emissions Lab	NOT AVBL	NOT AVBL	NOT AVBL
West Phoenix	11.4	37	

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 NOx (Nitrogen Oxides) in the presence of heat and sunlight.

Sources – VOCs are emitted from motor vehicles, chemical plants, refineries, factories, and other industrial sources. NOx 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 09/24/2007**}

ADEQ
Arizona Department of Environmental Quality
Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

ADEQ AIR POLLUTION HEALTH WATCH ISSUANCE NOTICE

Issuance Date and Time:	Thursday, March 13, 2008 10:00 a.m.
Valid for Date(s):	Friday, March 14, 2008
Pollutant:	COARSE PARTICLES (PM-10)
Message:	Blowing and suspended dust due to strong and gusty winds may cause concentrations of coarse particles to approach unhealthy levels on Friday.

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	520-770-3172
	Joe Paul	602-771-2363
	Bryan Paris	602/771-7665

CKR 12/06/2007

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

MARICOPA COUNTY
DUST CONTROL ACTION FORECAST
ISSUED THURSDAY, MARCH 13, 2008

Three-day weather outlook:

The broad low-amplitude ridge aloft currently over the local forecast area will give way to a strengthening and then amplifying mid-latitude storm track on Friday and thru the weekend. A strong westerly wind event looks likely on Friday and areas of blowing dust are possible by early afternoon; a MODERATE risk has been posted. A breezy to marginally windy day is expected on Saturday ahead of a strong trough and cold front; showers and thunderstorms are possible on Sunday with the frontal and trough passage.

R I S K F A C T O R S

	WINDS		STAGNATION		RISK LEVEL
Day #1: Fri 03/14/2008	Westerly 20-30 mph with gusts near 40 mph.	+	Little if any stagnation expected.	=	**MODERATE**
Day #2: Sat 03/15/2008	South to southwesterly 15-25 mph.	+	Little if any stagnation expected.	=	**LOW**
Day #3: Sun 03/16/2008	Southwest to westerly 10-20 mph except strong and gusty near thunderstorms.	+	Little if any stagnation expected.	=	**MODERATE**

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. To review the complete air quality forecast for the Phoenix metropolitan area and the health effects of air pollution, please see ADEQ's Air Quality Forecast at http://www.azdeq.gov/environ/air/ozone/ensemble.pdf, or call 602-771-2367 for recorded forecast information.

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Appendix J
Event National Weather Service Advisories & Events

Event Record Details

Event: **High Wind**
Begin Date: **14 Mar 2008, 16:00:00 PM PST**
Begin Location: **Not Known**
End Date: **14 Mar 2008, 16:00:00 PM PST**
End Location: **Not Known**
Magnitude: **57**
Fatalities: **0**
Injuries: **0**
Property Damage: **$ 0.0K**
Crop Damage: **$ 0.0K**

State: **California**
Map of Counties

Zones affected: **Eastern Sierra Slopes Of Inyo**

Description:
EVENT NARRATIVE: This gust occurred 5 miles WSW of Independence. EPISODE NARRATIVE: A series of Pacific storms brought high winds and locally heavy snow to portions of southeast California and southern Nevada.

WWUS75 KPSR 142121
NPWPSR

URGENT - WEATHER MESSAGE
NATIONAL WEATHER SERVICE PHOENIX AZ
221 PM MST FRI MAR 14 2008

AZZ020-025-CAZ030>033-151300-
/O.NEW.KPSR.WI.Y.0014.080315T2000Z-080316T0500Z/
LOWER COLORADO RIVER VALLEY AZ-YUMA/MARTINEZ LAKE AND VICINITY-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
INCLUDING THE CITIES OF...EHRENBERG...PARKER...SAN LUIS...
SOMERTON...YUMA...FORTUNA FOOTHILLS...COTTONWOOD VISITOR CENTER...
LOST HORSE-KEYS VIEW JTNP...BLYTHE...CHIRIACO SUMMIT...
DESERT CENTER...EAGLE MTN...MIDLAND...BRAWLEY...CALEXICO...
EL CENTRO...GLAMIS...IMPERIAL...AND THE SALTON SEA
221 PM MST FRI MAR 14 2008 /221 PM PDT FRI MAR 14 2008/

...WIND ADVISORY IN EFFECT FROM 1 PM MST /1 PM PDT/ TO 10 PM MST
/10 PM PDT/ SATURDAY FOR THE LOWER COLORADO RIVER VALLEY...SOUTHEAST
CALIFORNIA DESERTS...AND JOSHUA TREE NATIONAL PARK FOR STRONG GUSTY
WEST WINDS...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A WIND
ADVISORY...WHICH IS IN EFFECT FROM 1 PM MST /1 PM PDT/ TO 10 PM
MST /10 PM PDT/ SATURDAY FOR STRONG GUSTY WEST WINDS ALONG THE
COLORADO RIVER VALLEY...SOUTHEAST CALIFORNIA DESERTS...AND JOSHUA
TREE NATIONAL PARK.

A LOW PRESSURE SYSTEM ALONG THE WEST COAST WILL SLOWLY MOVE THROUGH
CALIFORNIA AND ARIZONA THIS WEEKEND. AHEAD OF THE WEATHER
SYSTEM...THE PRESSURE GRADIENT WILL TIGHTEN FOR STRONG AND GUSTY WEST
WINDS SATURDAY. WINDS WILL BE STRONGEST ALONG THE COLORADO RIVER
VALLEY...JOSHUA TREE NATIONAL PARK...AND THE SOUTHEAST CALIFORNIA
DESERTS. A WIND ADVISORY HAS BEEN ISSUED FOR THESE AREAS...WITH
SUSTAINED WINDS ON THE ORDER OF 30 TO 40 MPH...AND GUSTS IN EXCESS
OF 45 MPH POSSIBLE.

WINDS THIS STRONG CAN MAKE DRIVING DIFFICULT...ESPECIALLY FOR HIGH
PROFILE VEHICLES. IN ADDITION...STRONG WINDS OVER DESERT AREAS COULD
RESULT IN BRIEFLY LOWERED VISIBILITIES TO WELL UNDER A MILE AT TIMES

IN BLOWING DUST OR BLOWING SAND. USE EXTRA CAUTION.

$$

WANEK

Appendix K
Event Related News Stories

APPENDIX K

EVENT RELATED NEWS STORIES

Normally, Appendix K would contain information on Event Related News Stories for the day being evaluated as an Exceptional Event. However, since there are no archived Event Related News Stories reported for March 14, 2008, this Appendix does not contain this information.

Appendix L
Event Air Quality Data

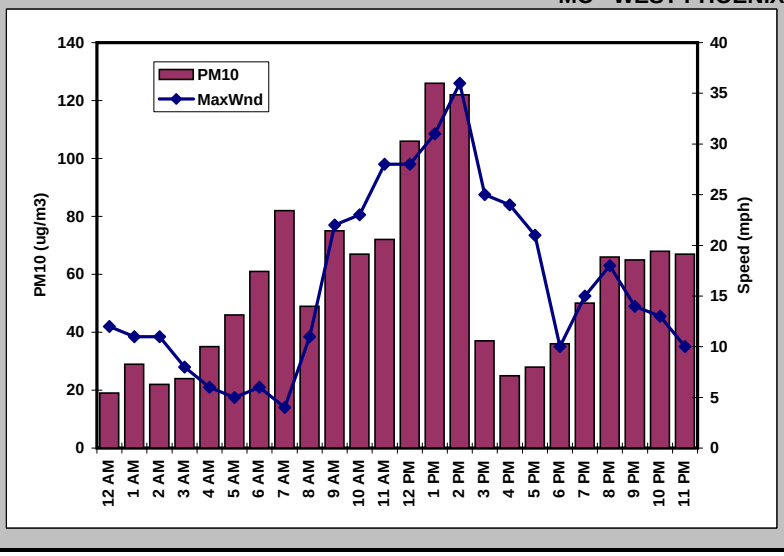
For March 14, 2008

Appendix L: EVENT AIR QUALITY DATA

16477 (112.14Wx33.48N)

MC - WEST PHOENIX

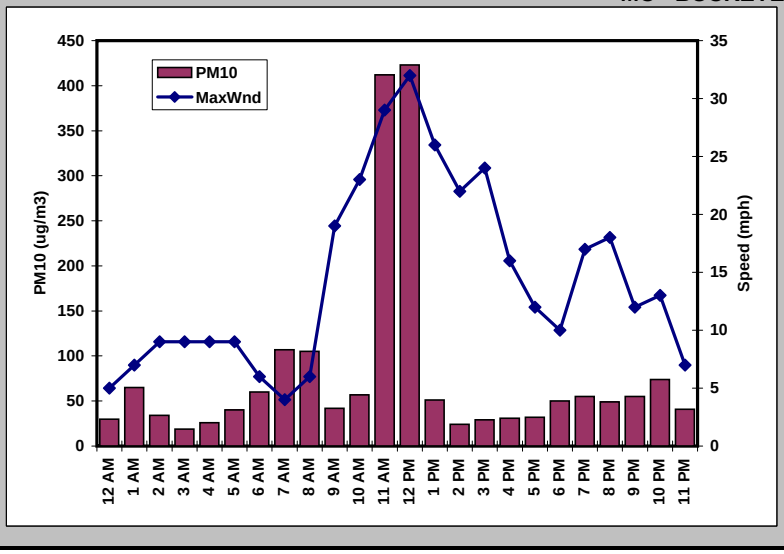
03/14/08	PM10	WndDir	MaxWnd
12 AM	19	237	12
1 AM	29	208	11
2 AM	22	233	11
3 AM	24	221	8
4 AM	35	84	6
5 AM	46	85	5
6 AM	61	99	6
7 AM	82	129	4
8 AM	49	219	11
9 AM	75	241	22
10 AM	67	254	23
11 AM	72	254	28
12 PM	106	265	28
1 PM	126	266	31
2 PM	122	261	36
3 PM	37	254	25
4 PM	25	247	24
5 PM	28	252	21
6 PM	36	264	10
7 PM	50	238	15
8 PM	66	247	18
9 PM	65	275	14
10 PM	68	256	13
11 PM	67	248	10



21525 (112.62Wx33.37N)

MC - BUCKEYE

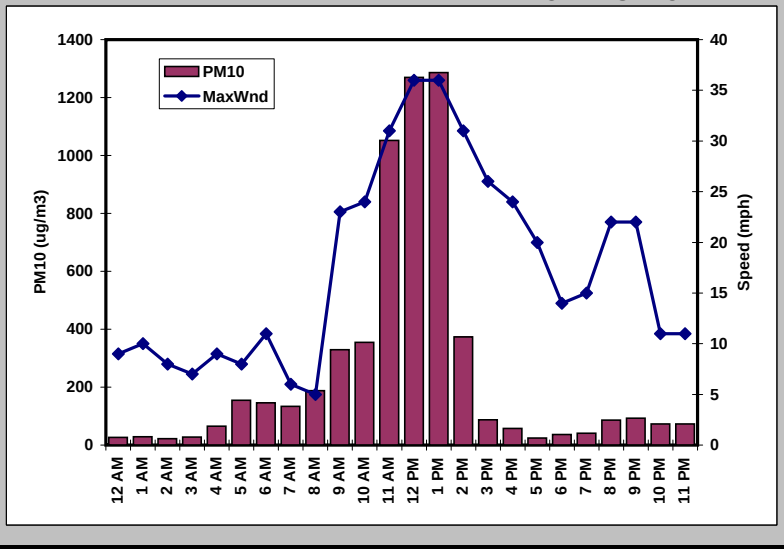
03/14/08	PM10	WndDir	MaxWnd
12 AM	30	274	5
1 AM	65	333	7
2 AM	34	318	9
3 AM	19	325	9
4 AM	26	323	9
5 AM	40	318	9
6 AM	60	306	6
7 AM	107	7	4
8 AM	105	259	6
9 AM	42	248	19
10 AM	57	255	23
11 AM	412	272	29
12 PM	423	275	32
1 PM	51	261	26
2 PM	24	248	22
3 PM	29	249	24
4 PM	31	253	16
5 PM	32	282	12
6 PM	50	281	10
7 PM	55	242	17
8 PM	49	248	18
9 PM	55	279	12
10 PM	74	295	13
11 PM	41	277	7



16659 (112.14Wx33.41N)

MC - WEST FORTY THIR

03/14/08	PM10	WndDir	MaxWnd
12 AM	26	241	9
1 AM	29	238	10
2 AM	22	269	8
3 AM	28	246	7
4 AM	65	67	9
5 AM	155	78	8
6 AM	146	81	11
7 AM	134	95	6
8 AM	188	56	5
9 AM	329	251	23
10 AM	355	267	24
11 AM	1052	260	31
12 PM	1270	260	36
1 PM	1286	267	36
2 PM	374	274	31
3 PM	87	267	26
4 PM	57	265	24
5 PM	24	261	20
6 PM	37	249	14
7 PM	41	238	15
8 PM	86	234	22
9 PM	93	240	22
10 PM	73	250	11
11 PM	73	224	11

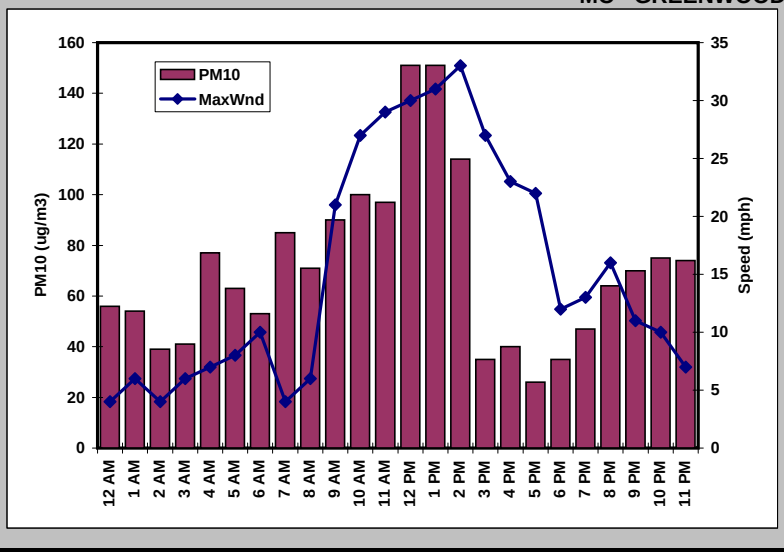


Appendix L: EVENT AIR QUALITY DATA

16372 (112.12Wx33.46N)

MC - GREENWOOD

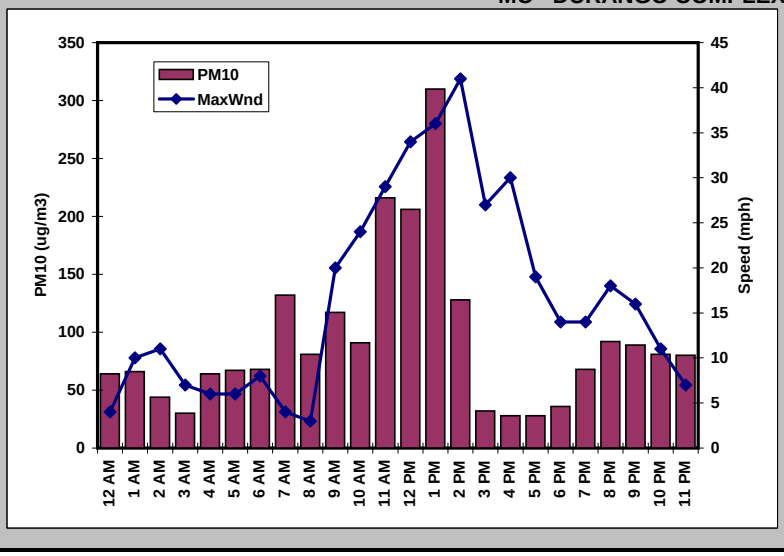
03/14/08	PM10	WndDir	MaxWnd
12 AM	56	135	4
1 AM	54	76	6
2 AM	39	232	4
3 AM	41	176	6
4 AM	77	64	7
5 AM	63	43	8
6 AM	53	85	10
7 AM	85	112	4
8 AM	71	241	6
9 AM	90	243	21
10 AM	100	254	27
11 AM	97	258	29
12 PM	151	259	30
1 PM	151	263	31
2 PM	114	268	33
3 PM	35	254	27
4 PM	40	256	23
5 PM	26	255	22
6 PM	35	257	12
7 PM	47	241	13
8 PM	64	239	16
9 PM	70	264	11
10 PM	75	262	10
11 PM	74	257	7



16375 (112.12Wx33.43N)

MC - DURANGO COMPLEX

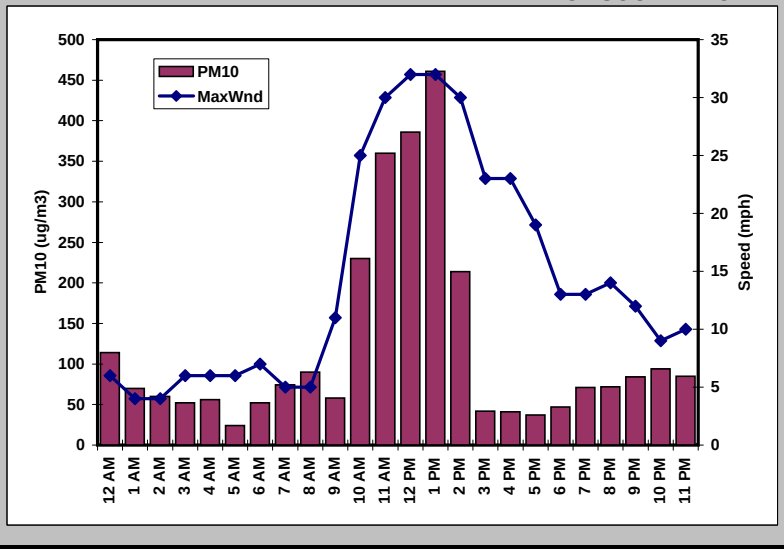
01/00/00	PM10	WndDir	MaxWnd
12 AM	64	283	4
1 AM	66	230	10
2 AM	44	264	11
3 AM	30	236	7
4 AM	64	100	6
5 AM	67	82	6
6 AM	68	89	8
7 AM	132	104	4
8 AM	81	59	3
9 AM	117	256	20
10 AM	91	268	24
11 AM	216	271	29
12 PM	206	264	34
1 PM	310	275	36
2 PM	128	283	41
3 PM	32	273	27
4 PM	28	271	30
5 PM	28	270	19
6 PM	36	261	14
7 PM	68	248	14
8 PM	92	245	18
9 PM	89	255	16
10 PM	81	263	11
11 PM	80	253	7



16377 (112.08Wx33.40N)

MC - SOUTH PHOENIX

01/00/00	PM10	WndDir	MaxWnd
12 AM	114	83	6
1 AM	70	117	4
2 AM	60	80	4
3 AM	52	117	6
4 AM	56	96	6
5 AM	24	101	6
6 AM	52	101	7
7 AM	74	97	5
8 AM	90	83	5
9 AM	58	249	11
10 AM	230	270	25
11 AM	360	269	30
12 PM	386	270	32
1 PM	461	271	32
2 PM	214	283	30
3 PM	42	273	23
4 PM	41	275	23
5 PM	37	274	19
6 PM	47	249	13
7 PM	71	251	13
8 PM	72	234	14
9 PM	84	239	12
10 PM	94	256	9
11 PM	85	251	10

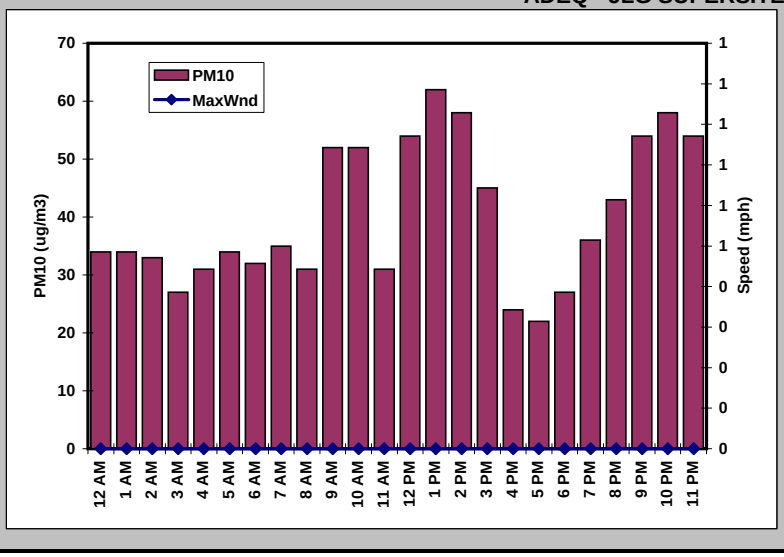


Appendix L: EVENT AIR QUALITY DATA

16328 (112.10Wx33.50N)

ADEQ - JLG SUPERSITE

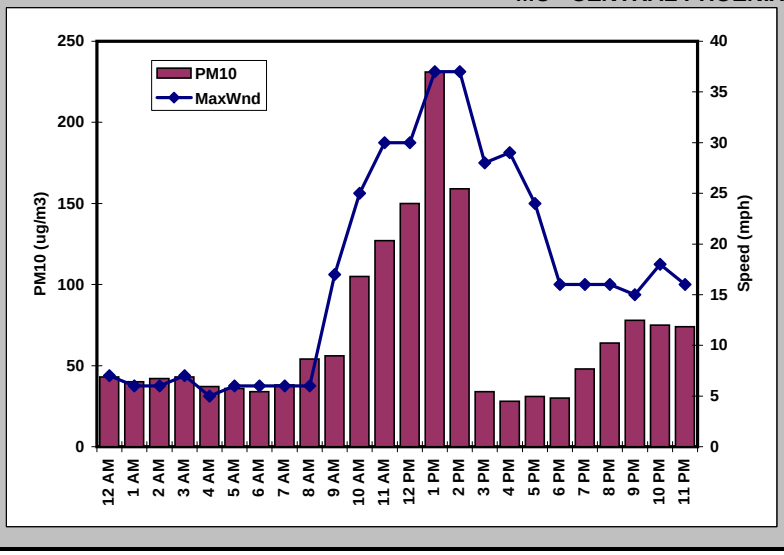
03/14/08	PM10	WndDir	MaxWnd
12 AM	34	97	
1 AM	34	148	
2 AM	33	137	
3 AM	27	110	
4 AM	31	76	
5 AM	34	64	
6 AM	32	110	
7 AM	35	142	
8 AM	31	142	
9 AM	52	216	
10 AM	52	256	
11 AM	31	256	
12 PM	54	263	
1 PM	62	258	
2 PM	58	270	
3 PM	45	253	
4 PM	24	254	
5 PM	22	251	
6 PM	27	262	
7 PM	36	251	
8 PM	43	251	
9 PM	54	269	
10 PM	58	250	
11 PM	54	248	



16329 (112.05Wx33.46N)

MC - CENTRAL PHOENIX

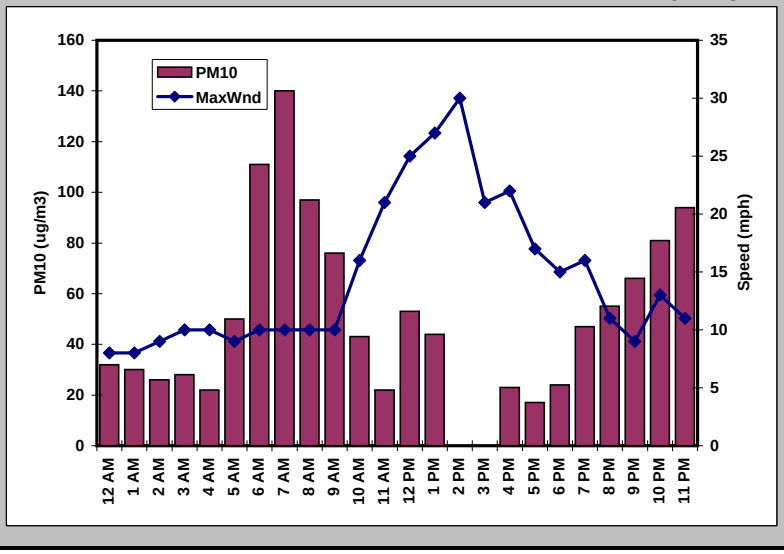
03/14/08	PM10	WndDir	MaxWnd
12 AM	43	81	7
1 AM	40	84	6
2 AM	42	71	6
3 AM	43	92	7
4 AM	37	72	5
5 AM	36	81	6
6 AM	34	85	6
7 AM	38	125	6
8 AM	54	109	6
9 AM	56	216	17
10 AM	105	268	25
11 AM	127	271	30
12 PM	150	270	30
1 PM	231	269	37
2 PM	159	280	37
3 PM	34	270	28
4 PM	28	270	29
5 PM	31	273	24
6 PM	30	262	16
7 PM	48	250	16
8 PM	64	241	16
9 PM	78	270	15
10 PM	75	266	18
11 PM	74	261	16



16505 (111.72Wx33.31N)

MC - HIGLEY

03/14/08	PM10	WndDir	MaxWnd
12 AM	32	104	8
1 AM	30	101	8
2 AM	26	104	9
3 AM	28	109	10
4 AM	22	108	10
5 AM	50	100	9
6 AM	111	95	10
7 AM	140	112	10
8 AM	97	103	10
9 AM	76	166	10
10 AM	43	252	16
11 AM	22	298	21
12 PM	53	265	25
1 PM	44	264	27
2 PM		286	30
3 PM		272	21
4 PM	23	249	22
5 PM	17	251	17
6 PM	24	239	15
7 PM	47	217	16
8 PM	55	193	11
9 PM	66	199	9
10 PM	81	217	13
11 PM	94	192	11

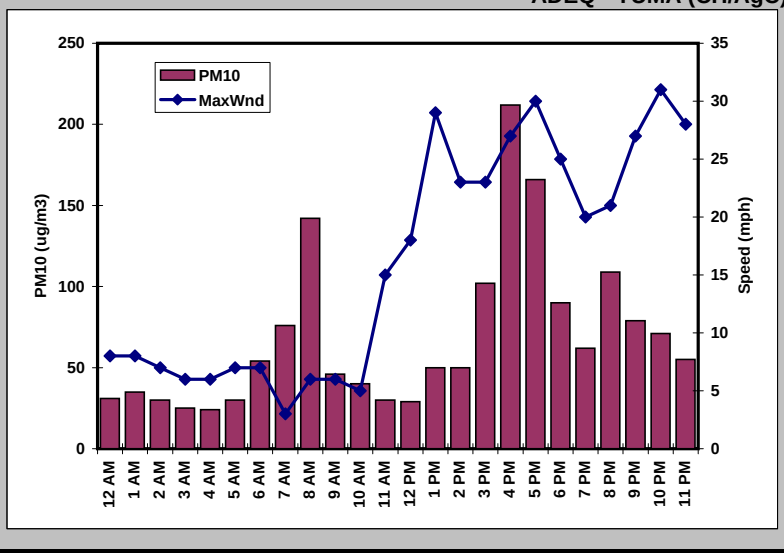


Appendix L: EVENT AIR QUALITY DATA

17027 (114.65Wx32.68N)

ADEQ - YUMA (CH/AgC)

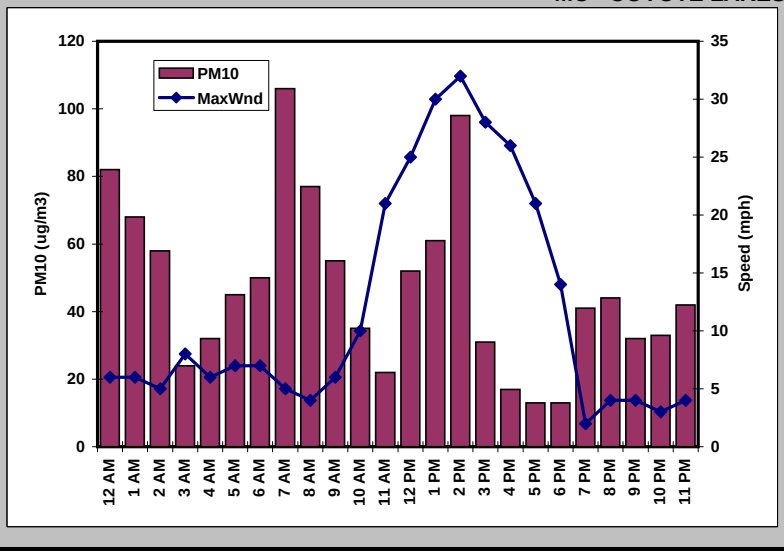
01/00/00	PM10	WndDir	MaxWnd
12 AM	31	181	8
1 AM	35	204	8
2 AM	30	205	7
3 AM	25	214	6
4 AM	24	228	6
5 AM	30	228	7
6 AM	54	93	7
7 AM	76	273	3
8 AM	142	67	6
9 AM	46	73	6
10 AM	40	96	5
11 AM	30	187	15
12 PM	29	226	18
1 PM	50	228	29
2 PM	50	231	23
3 PM	102	283	23
4 PM	212	274	27
5 PM	166	269	30
6 PM	90	272	25
7 PM	62	267	20
8 PM	109	277	21
9 PM	79	286	27
10 PM	71	294	31
11 PM	55	297	28



127530 (112.31Wx33.67N)

MC - COYOTE LAKES

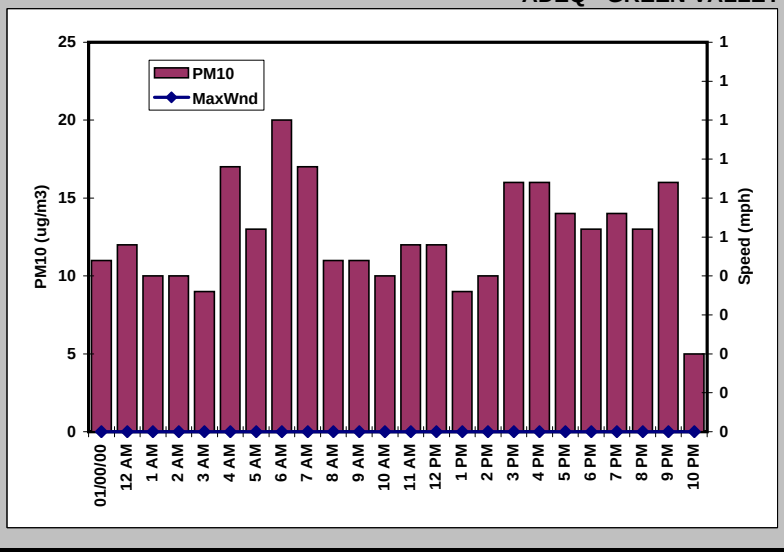
01/00/00	PM10	WndDir	MaxWnd
12 AM	82	15	6
1 AM	68	16	6
2 AM	58	7	5
3 AM	24	9	8
4 AM	32	6	6
5 AM	45	23	7
6 AM	50	14	7
7 AM	106	11	5
8 AM	77	41	4
9 AM	55	7	6
10 AM	35	221	10
11 AM	22	242	21
12 PM	52	258	25
1 PM	61	280	30
2 PM	98	274	32
3 PM	31	259	28
4 PM	17	252	26
5 PM	13	281	21
6 PM	13	288	14
7 PM	41	316	2
8 PM	44	186	4
9 PM	32	41	4
10 PM	33	4	3
11 PM	42	359	4



128562 (111.01Wx31.83N)

ADEQ - GREEN VALLEY

01/00/00	PM10	WndDir	MaxWnd
12 AM	11	238	
1 AM	12	248	
2 AM	10	238	
3 AM	10	247	
4 AM	9	261	
5 AM	17	240	
6 AM	13	242	
7 AM	20	237	
8 AM	17	230	
9 AM	11	224	
10 AM	11	227	
11 AM	10	233	
12 PM	12	269	
1 PM	12	253	
2 PM	9	237	
3 PM	10	237	
4 PM	16	241	
5 PM	16	241	
6 PM	14	247	
7 PM	13	242	
8 PM	14	247	
9 PM	13	245	
10 PM	16	231	
11 PM	5	246	



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Appendix M
Event Meteorological / Air Quality Tables

For March 14, 2008

Note: The enclosed tables summarize the meteorological and air quality data for the March 14, 2008, high wind event. Highlighting is applied to the data in the tables. When the reported wind gust or maximum wind speed is greater than 15 miles per hour, the hourly data record is highlighted yellow. If the wind gust or maximum wind speed exceeds 25 mph, the hourly data record is highlighted orange. Stations prefixed with a 2 digit number are AzMet stations. All AzMet wind speed data were adjusted from 3-meters to 10-meters by applying a correction factor for height as discussed in the AzMet network description contained in Appendix B of this document.

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

23179 (114.62Wx34.77N) 03/14/08

NWS-NEEDLES

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-NEEDLES	12	69	10		6		*VR
	1	69	10		28	37	W
	2	68	10		24		W
	3	68	10		28	38	NW
	4	67	10		25	33	NW
	5	66	10		23	31	NW
	6	67	10		29	37	NW
	7	69	10		22	29	NW
	8	73	10		23	34	W
	9	74	10		15	31	NW
	10	75	10		16	28	W
	11	78	10		22	31	W
	12	78	10		23	32	NW
	1	77	10		20	30	W
	2	77	10		21	26	W
	3	77	10		17	29	W
	4	74	10		21		W
	5	71	10		20		W
	6	69	10		20	28	W
	7	66	10		16		W
	8	63	10		8		S
	9	62	10		22	31	W
	10	59	10		5		*VR
	11	61	10		10	21	W

93167 (113.94Wx35.26N) 03/14/08

NWS-KINGMAN

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-KINGMAN	12	57	10		18		SW
	1	55	10		11		SW
	2	54	10		0		-
	3	51	10		3		N
	4	56	10		7		*VR
	5	51	10		6		S
	6	52	10		8		SW
	7	53	10		8		SW
	8	56	10		5		W
	9	58	10		9		SW
	10	60	10		11	22	SW
	11	62	10		17	22	SW
	12	63	10		13	20	SW
	1	65	10		15		SW
	2	65	10		21	25	SW
	3	65	10		14	20	SW
	4	64	10		11	25	SW
	5	61	10		15		SW
	6	57	10		15		SW
	7	55	10		16		S
	8	53	10		17		S
	9	48	10		10		S
	10	47	10		13		S
	11	47	10		11		S

20 (114.61Wx34.97N) 03/14/08

20-MOHAVE

	Hr	T(F)	RH	Rn	Spd	Max	Dir
20-MOHAVE	12	71	22	0	17	32	SW
	1	71	22	0	17	32	W
	2	70	19	0	14	27	S
	3	68	21	0	12	27	S
	4	67	22	0	11	30	SE
	5	68	20	0	14	26	W
	6	65	29	0	9	19	W
	7	66	30	0	9	19	SW
	8	66	30	0	12	21	S
	9	70	22	0	10	25	S
	10	74	14	0	10	23	S
	11	77	10	0	17	28	W
	12	78	10	0	21	29	SW
	1	79	10	0	23	34	SW
	2	80	11	0	20	30	W
	3	80	11	0	17	27	W
	4	78	11	0	21	29	SW
	5	76	12	0	19	30	W
	6	72	13	0	16	23	W
	7	69	13	0	15	24	W
	8	67	13	0	9	23	W
	9	62	17	0	10	17	S
	10	61	18	0	14	20	SW
	11	59	20	0	11	18	SW

23158 (114.72Wx33.62N) 03/14/08

NWS-BLYTHE

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-BLYTHE	12	64	10		0		-
	1	66	10		3		SW
	2	64	10		3		NW
	3	63	10		0		-
	4	60	10		6		SW
	5	59	10		6		S
	6	63	10		5		SW
	7	67	10		7		SW
	8	70	10		5		S
	9	74	10		7		S
	10	77	10		3		SE
	11	78	10		3		SW
	12	83	10		5		*VR
	1	85	10		9		NW
	2	83	10		0		-
	3	83	10		3		*VR
	4	82	10		10		W
	5	77	10		7		N
	6	73	10		13		N
	7	69	10		9		N
	8	68	10		11		N
	9	64	10		7		N
	10	65	10		0		-
	11	60	10		3		S

08 (114.45Wx33.88N) 03/14/08

08-PARKER

	Hr	T(F)	RH	Rn	Spd	Max	Dir
08-PARKER	12	68	24	0	5	13	S
	1	71	20	0	14	22	SW
	2	69	22	0	9	21	SW
	3	65	29	0	5	10	SE
	4	67	30	0	10	27	W
	5	68	34	0	19	31	W
	6	66	36	0	12	20	NW
	7	67	36	0	16	26	W
	8	68	37	0	12	24	W
	9	70	33	0	15	22	NW
	10	73	27	0	12	22	NW
	11	76	24	0	6	13	NW
	12	78	20	0	5	11	W
	1	80	16	0	11	23	NW
	2	80	14	0	16	22	NW
	3	80	14	0	16	24	NW
	4	79	14	0	15	23	NW
	5	76	13	0	14	21	NW
	6	72	13	0	11	15	NW
	7	69	13	0	13	18	NW
	8	68	13	0	14	20	NW
	9	67	13	0	20	32	NW
	10	66	14	0	23	32	NW
	11	64	15	0	24	33	NW

28 (114.56Wx34.93N) 03/14/08

28-MOHAVE-2

	Hr	T(F)	RH	Rn	Spd	Max	Dir
28-MOHAVE-2	12	72	22	0	13	26	W
	1	70	24	0	12	26	W
	2	70	18	0	17	31	W
	3	69	19	0	14	30	W
	4	65	26	0	9	22	SW
	5	67	25	0	13	27	W
	6	66	29	0	11	20	W
	7	66	31	0	15	30	W
	8	68	29	0	15	27	SW
	9	71	21	0	15	24	W
	10	74	15	0	12	20	W
	11	76	11	0	21	32	W
	12	77	10	0	20	31	W
	1	78	11	0	19	27	SW
	2	79	12	0	17	28	W
	3	79	12	0	16	26	SW
	4	78	12	0	18	26	SW
	5	76	12	0	17	23	SW
	6	72	13	0	13	23	W
	7	69	13	0	9	18	W
	8	64	16	0	3	8	S
	9	62	17	0	9	18	SW
	10	61	18	0	9	18	SW
	11	58	24	0	10	20	SW

23199 (115.67Wx32.82N) 03/14/08

NWS-EL CENTRO

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-EL CENTRO	12	65	10		5		N
	1	68	10		15		W
	2	68	10		20		SW
	3	66	10		14		W
	4	66	10		5		N
	5	64	10		3		NW
	6	62	10		5		SE
	7	73	10		0		-
	8	79	10		6		W
	9	84	10		8		NW
	10	88	10		20	25	W
	11	88	10		21	28	NW
	12	89	7	BLDU	18	25	NW
	1	87	10		22	30	NW
	2	86	10		15	23	W
	3	83	10		16	24	W
	4	78	10		20	31	W
	5	71	10		26	34	W
	6	67	10		24	31	W
	7	64	10		26		W
	8	62	10		25	31	W
	9	62	10		26	33	W
	10	61	10		28	38	W
	11	60	10		29	36	W

03144 (115.58Wx32.83N) 03/14/08

NWS-IMPERIAL CO

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-IMPERIAL CO	12	65	10		7		NW
	1	66	10		6		W
	2	66	10		3		*VR
	3	66	10		14		W
	4	64	10		7		S
	5	62	10		5		SW
	6	65	10		0		-
	7	72	10		0		-
	8	76	10		0		-
	9	82	10		8		NW
	10	86	9		23	29	W
	11	88	9		17	25	W
	12	88	10		17	24	W
	1	87	9		22	31	W
	2	86	10		21	29	W
	3	83	10		18	26	W
	4	79	10		14	31	W
	5	71	10		20	28	W
	6	67	10		25	32	W
	7	64	10		26	32	W
	8	61	10		21	26	W
	9	61	10		22	30	W
	10	61	10		25	33	W
	11	59	10		22	32	W

17027 (114.65Wx32.68N) 03/14/08

ADEQ - YUMA (CH/AgC)

	Hr	T(F)	RH	PM	Spd	Max	Dir
ADEQ - YUMA (CH/AgC)	12	60	61	31	5	8	S
	1	58	63	35	6	8	SW
	2	57	64	30	5	7	SW
	3	56	66	25	4	6	SW
	4	55	70	24	4	6	SW
	5	55	69	30	4	7	SW
	6	53	74	54	2	7	E
	7	54	72	76	1	3	W
	8	61	63	142	2	6	NE
	9	69	44	46	2	6	E
	10	76	29	40	2	5	E
	11	78	25	30	6	15	S
	12	81	19	29	11	18	SW
	1	83	15	50	11	29	SW
	2	85	12	50	12	23	SW
	3	84	11	102	13	23	W
	4	83	11	212	17	27	W
	5	81	12	166	17	30	W
	6	78	11	90	13	25	W
	7	74	13	62	12	20	W
	8	69	22	109	12	21	W
	9	66	25	79	14	27	W
	10	65	27	71	21	31	NW
	11	62	33	55	19	28	NW

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

24 (113.96Wx32.74N) 03/14/08

24-ROLL

	Hr	T(F)	RH	Rn	Spd	Max	Dir
24-ROLL	12	62	52	0	8	10	SW
	1	61	54	0	4	8	W
	2	61	55	0	4	7	W
	3	58	58	0	2	5	SW
	4	54	69	0	1	4	SW
	5	51	77	0	2	6	SE
	6	48	79	0	2	5	E
	7	51	75	0	2	10	E
	8	61	61	0	2	4	SE
	9	69	42	0	3	6	SE
	10	74	31	0	3	7	SW
	11	77	29	0	7	13	SW
	12	**81**	**22**	**0**	**13**	**25**	**W**
	1	**84**	**13**	**0**	**18**	**29**	**W**
	2	**84**	**13**	**0**	**16**	**26**	**W**
	3	**83**	**15**	**0**	**16**	**27**	**W**
	4	**81**	**16**	**0**	**16**	**26**	**W**
	5	**79**	**13**	**0**	**17**	**26**	**W**
	6	**74**	**17**	**0**	**12**	**22**	**W**
	7	69	22	0	5	12	W
	8	64	29	0	6	12	W
	9	58	40	0	5	8	W
	10	**61**	**36**	**0**	**5**	**17**	**W**
	11	**64**	**36**	**0**	**10**	**18**	**W**

07 (113.19Wx33.95N) 03/14/08

07-AGUILA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
07-AGUILA	**12**	**56**	**34**	**0**	**5**	**21**	**NW**
	1	**64**	**22**	**0**	**14**	**22**	**W**
	2	**62**	**23**	**0**	**9**	**16**	**W**
	3	**60**	**22**	**0**	**9**	**16**	**W**
	4	58	23	0	7	12	W
	5	54	26	0	7	11	W
	6	54	25	0	9	12	W
	7	57	25	0	6	11	W
	8	**64**	**24**	**0**	**12**	**23**	**W**
	9	**68**	**16**	**0**	**17**	**24**	**W**
	10	**70**	**13**	**0**	**20**	**28**	**W**
	11	**72**	**13**	**0**	**23**	**32**	**W**
	12	**73**	**13**	**0**	**21**	**31**	**W**
	1	**73**	**12**	**0**	**23**	**33**	**W**
	2	**74**	**9**	**0**	**22**	**32**	**W**
	3	**74**	**10**	**0**	**20**	**28**	**W**
	4	**73**	**13**	**0**	**16**	**26**	**W**
	5	**71**	**15**	**0**	**14**	**21**	**W**
	6	**66**	**18**	**0**	**6**	**15**	**W**
	7	62	18	0	5	9	W
	8	58	19	0	5	8	W
	9	58	17	0	5	10	W
	10	52	24	0	5	10	W
	11	50	24	0	5	9	W

23 (113.12Wx33.48N) 03/14/08

23-HARQUAHALA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
23-HARQUAHALA	12	61	44	0	3	5	NW
	1	55	56	0	4	6	SE
	2	56	50	0	5	9	S
	3	54	52	0	4	8	SW
	4	53	50	0	2	7	NW
	5	50	55	0	4	8	SW
	6	47	63	0	2	6	SE
	7	53	47	0	4	10	NE
	8	64	34	0	6	13	W
	9	**72**	**22**	**0**	**12**	**20**	**W**
	10	**76**	**15**	**0**	**22**	**32**	**W**
	11	**79**	**12**	**0**	**23**	**33**	**NW**
	12	**80**	**10**	**0**	**23**	**28**	**NW**
	1	**81**	**10**	**0**	**20**	**31**	**NW**
	2	**81**	**10**	**0**	**17**	**26**	**W**
	3	**81**	**10**	**0**	**17**	**30**	**NW**
	4	**80**	**10**	**0**	**15**	**23**	**NW**
	5	**79**	**12**	**0**	**9**	**17**	**NW**
	6	73	19	0	8	12	NW
	7	65	25	0	8	10	NW
	8	60	28	0	7	11	W
	9	58	28	0	7	9	W
	10	54	32	0	5	9	NW
	11	53	27	0	5	9	N

02 (114.75Wx32.71N) 03/14/08

02-YUMA VALLEY

	Hr	T(F)	RH	Rn	Spd	Max	Dir
02-YUMA VALLEY	12	58	61	0	4	7	SE
	1	57	64	0	4	10	S
	2	55	63	0	2	6	S
	3	54	69	0	3	6	SW
	4	52	74	0	3	5	SW
	5	52	73	0	3	6	SW
	6	50	76	0	2	8	E
	7	53	72	0	1	4	NE
	8	62	55	0	2	7	E
	9	69	42	0	2	6	E
	10	76	28	0	3	8	SE
	11	78	25	0	7	14	S
	12	**80**	**20**	**0**	**12**	**20**	**SW**
	1	**82**	**16**	**0**	**13**	**23**	**SW**
	2	**84**	**13**	**0**	**13**	**21**	**SW**
	3	**84**	**12**	**0**	**15**	**25**	**W**
	4	**82**	**12**	**0**	**22**	**32**	**W**
	5	**79**	**13**	**0**	**21**	**28**	**W**
	6	**76**	**12**	**0**	**18**	**27**	**W**
	7	**72**	**14**	**0**	**14**	**23**	**W**
	8	**67**	**23**	**0**	**13**	**20**	**W**
	9	**64**	**26**	**0**	**13**	**23**	**W**
	10	**64**	**27**	**0**	**20**	**31**	**NW**
	11	**61**	**32**	**0**	**20**	**31**	**NW**

14 (114.53Wx32.74N) 03/14/08

14-YUMA NORTH GILA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
14-YUMA NORTH GILA	12	61	53	0	6	10	S
	1	59	62	0	5	8	S
	2	59	60	0	7	9	S
	3	57	62	0	4	11	S
	4	56	64	0	4	7	SW
	5	53	72	0	3	11	NW
	6	52	74	0	3	5	SE
	7	54	71	0	1	4	E
	8	65	52	0	2	5	SE
	9	72	36	0	2	5	S
	10	76	26	0	3	6	SW
	11	**79**	**22**	**0**	**7**	**16**	**SW**
	12	**81**	**21**	**0**	**12**	**19**	**SW**
	1	**83**	**14**	**0**	**14**	**24**	**SW**
	2	**85**	**13**	**0**	**13**	**23**	**SW**
	3	**85**	**11**	**0**	**15**	**24**	**W**
	4	**84**	**10**	**0**	**17**	**26**	**W**
	5	**81**	**13**	**0**	**14**	**22**	**W**
	6	**77**	**14**	**0**	**13**	**24**	**W**
	7	**73**	**14**	**0**	**13**	**22**	**W**
	8	**69**	**20**	**0**	**13**	**19**	**W**
	9	**67**	**26**	**0**	**17**	**26**	**W**
	10	**66**	**27**	**0**	**13**	**24**	**NW**
	11	**63**	**32**	**0**	**9**	**16**	**NW**

19040 (114.63Wx32.61N) 03/14/08

ADEQ - YUMA MESA

	Hr	T(F)	RH		Spd	Max	Dir
ADEQ - YUMA MESA	12	59	51		4	7	S
	1	59	54		4	7	SW
	2	57	56		4	7	SW
	3	56	58		3	6	SW
	4	52	69		2	5	SE
	5	51	70		3	6	E
	6	52	62		5	8	S
	7	54	62		3	8	SE
	8	64	52		2	4	S
	9	72	33		3	6	NE
	10	77	25		2	6	S
	11	79	21		6	11	SW
	12	**81**	**18**		**8**	**18**	**W**
	1	**83**	**14**		**9**	**19**	**W**
	2	**84**	**12**		**10**	**21**	**SW**
	3	**85**	**12**		**11**	**21**	**W**
	4	**83**	**13**		**13**	**24**	**W**
	5	**79**	**16**		**14**	**25**	**W**
	6	**74**	**17**		**9**	**19**	**W**
	7	**71**	**15**		**9**	**22**	**W**
	8	**66**	**22**		**7**	**21**	**NW**
	9	**63**	**27**		**7**	**15**	**NW**
	10	61	29		7	13	NW
	11	**60**	**33**		**6**	**16**	**NW**

03145 (114.62Wx32.65N) 03/14/08

NWS-YUMA MCAS

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-YUMA MCAS	12	65	10		3		S
	1	66	10		6		SW
	2	63	10		3		S
	3	64	10		0		-
	4	61	10		0		-
	5	60	10		3		SW
	6	61	10		0		-
	7	63	8		0		-
	8	69	10		0		-
	9	76	10		0		-
	10	81	10		0		-
	11	83	10		7		SW
	12	86	10		9		W
	1	**89**	**10**		**16**	**22**	**W**
	2	**89**	**10**		**10**	**22**	**W**
	3	**90**	**10**		**17**	**24**	**W**
	4	**87**	**8**	**DU**	**16**	**26**	**W**
	5	**83**	**5**	**DU**	**13**	**21**	**W**
	6	78	6	DU	13		W
	7	75	10		16		W
	8	70	10		9		NW
	9	69	10		17		NW
	10	**67**	**10**		**15**	**26**	**NW**
	11	64	10		16		W

19 (112.90Wx32.93N) 03/14/08

19-PALOMA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
19-PALOMA	12	57	38	0	6	10	SW
	1	60	32	0	7	11	SW
	2	61	28	0	8	13	S
	3	53	52	0	4	8	W
	4	50	55	0	4	9	SW
	5	46	70	0	3	8	N
	6	46	70	0	2	6	W
	7	51	66	0	2	4	W
	8	61	57	0	3	6	SW
	9	68	44	0	7	12	SW
	10	73	34	0	7	12	W
	11	75	27	0	6	11	W
	12	**78**	**22**	**0**	**6**	**17**	**SW**
	1	**80**	**20**	**0**	**10**	**26**	**SW**
	2	**80**	**20**	**0**	**12**	**23**	**W**
	3	**80**	**21**	**0**	**10**	**20**	**W**
	4	**78**	**20**	**0**	**14**	**24**	**SW**
	5	**75**	**17**	**0**	**14**	**23**	**SW**
	6	**72**	**14**	**0**	**12**	**18**	**SW**
	7	68	19	0	9	14	SW
	8	61	29	0	8	13	SW
	9	61	27	0	9	14	SW
	10	58	30	0	8	13	SW
	11	54	35	0	7	11	SW

03148 (112.72Wx32.89N) 03/14/08

NWS-GILA BEND

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-GILA BEND	12						
	1						
	2						
	3						
	4						
	5						
	6						
	7	63	20		3		S
	8	73	20		9		W
	9	75	20		10		NW
	10	79	20		11		W
	11	82	20		9		W
	12	**84**	**20**		**13**	**17**	**W**
	1	**86**	**20**		**10**	**21**	**W**
	2	86	20		9		SW
	3	86	20		16		W
	4	84	20		16		SW
	5	81	20		18		W
	6	77	20		11		W
	7	73	20		6		W
	8	73	20		9		W
	9	68	20		7		SW
	10	68	20		10		W
	11	68	20		13		W

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

10 (112.46Wx33.62N) 03/14/08

10-WADDELL

	Hr	T(F)	RH	Rn	Spd	Max	Dir
10-WADDELL	12	67	29	0	5	11	SW
	1	67	28	0	7	12	S
	2	66	29	0	5	10	S
	3	64	29	0	5	13	S
	4	58	43	0	2	10	S
	5	48	65	0	1	3	NW
	6	46	69	0	1	5	N
	7	51	57	0	1	4	E
	8	60	41	0	2	4	NE
	9	67	32	0	4	8	NE
	10	72	22	0	5	14	E
	11	**77**	**13**	**0**	**7**	**15**	**W**
	12	**80**	**10**	**0**	**8**	**17**	**W**
	1	**80**	**9**	**0**	**11**	**23**	**W**
	2	**80**	**8**	**0**	**10**	**26**	**W**
	3	**81**	**10**	**0**	**7**	**16**	**W**
	4	**80**	**11**	**0**	**7**	**17**	**W**
	5	79	11	0	5	14	W
	6	73	14	0	2	8	W
	7	64	21	0	1	3	W
	8	60	27	0	1	4	W
	9	57	33	0	1	4	NW
	10	54	37	0	1	4	W
	11	54	39	0	1	3	SW

127530 (112.31Wx33.67N) 03/14/08

MC - COYOTE LAKES

	Hr	T(F)		PM	Spd	Max	Dir
MC - COYOTE LAKES	12	58		82	2	6	N
	1	57		68	2	6	N
	2	55		58	2	5	N
	3	53		24	3	8	N
	4	52		32	2	6	N
	5	51		45	3	7	NE
	6	50		50	2	7	N
	7	54		106	1	5	N
	8	66		77	1	4	NE
	9	71		55	1	6	N
	10	76		35	1	10	SW
	11	**79**		**22**	**6**	**21**	**SW**
	12	**81**		**52**	**11**	**25**	**W**
	1	**82**		**61**	**11**	**30**	**W**
	2	**82**		**98**	**14**	**32**	**W**
	3	**82**		**31**	**12**	**28**	**W**
	4	**82**		**17**	**10**	**26**	**W**
	5	**81**		**13**	**10**	**21**	**W**
	6	74		13	4	14	W
	7	66		41	0	2	NW
	8	62		44	0	4	S
	9	61		32	0	4	NE
	10	57		33	0	3	N
	11	55		42	2	4	N

16378 (112.19Wx33.57N) 03/14/08

MC - GLENDALE

	Hr	T(F)	RH		Spd	Max	Dir
MC - GLENDALE	12	69	25		4	11	SW
	1	67	24		4	10	SW
	2	65	27		3	13	SW
	3	65	26		4	11	SW
	4	61	32		2	4	NE
	5	60	34		2	5	SE
	6	60	37		3	6	S
	7	60	39		4	8	S
	8	64	34		5	12	SW
	9	**68**	**27**		**11**	**24**	**SW**
	10	**71**	**22**		**12**	**22**	**SW**
	11	**75**	**16**		**12**	**25**	**SW**
	12	**78**	**11**		**13**	**25**	**W**
	1	**79**	**9**		**15**	**28**	**W**
	2	**80**	**8**		**16**	**36**	**W**
	3	**80**	**12**		**13**	**26**	**W**
	4	**79**	**13**		**11**	**23**	**SW**
	5	**79**	**13**		**10**	**20**	**SW**
	6	77	13		5	13	W
	7	74	14		3	8	W
	8	72	14		2	6	W
	9	68	18		2	6	W
	10	66	19		3	6	W
	11	64	20		4	10	SW

26 (112.68Wx33.40N) 03/14/08

26-BUCKEYE

	Hr	T(F)	RH	Rn	Spd	Max	Dir
26-BUCKEYE	12	62	36	0	3	6	W
	1	61	36	0	5	8	NW
	2	59	38	0	5	8	NW
	3	56	39	0	5	6	N
	4	54	44	0	5	7	NW
	5	54	45	0	5	8	N
	6	51	53	0	4	7	NW
	7	54	51	0	4	7	NW
	8	60	57	0	6	12	W
	9	**67**	**39**	**0**	**11**	**16**	**W**
	10	**72**	**30**	**0**	**13**	**26**	**W**
	11	**74**	**21**	**0**	**20**	**29**	**W**
	12	**76**	**16**	**0**	**21**	**31**	**NW**
	1	**77**	**20**	**0**	**16**	**27**	**W**
	2	**77**	**24**	**0**	**12**	**22**	**SW**
	3	**77**	**24**	**0**	**11**	**20**	**W**
	4	**77**	**24**	**0**	**8**	**18**	**SW**
	5	76	19	0	9	14	NW
	6	71	22	0	5	9	W
	7	66	25	0	5	9	SW
	8	60	32	0	5	9	W
	9	63	27	0	5	8	NW
	10	58	30	0	3	6	N
	11	54	39	0	2	4	NW

21525 (112.62Wx33.37N) 03/14/08

MC - BUCKEYE

	Hr	T(F)	RH	PM	Spd	Max	Dir
MC - BUCKEYE	12	60	55	30	0	5	-
	1	58	56	65	3	7	NW
	2	58	54	34	6	9	NW
	3	54	60	19	6	9	NW
	4	53	60	26	6	9	NW
	5	55	56	40	6	9	NW
	6	52	65	60	2	6	NW
	7	56	57	107	0	4	-
	8	62	57	105	2	6	W
	9	**71**	**38**	**42**	**11**	**19**	**W**
	10	**76**	**26**	**57**	**14**	**23**	**W**
	11	**80**	**18**	**412**	**17**	**29**	**W**
	12	**82**	**14**	**423**	**18**	**32**	**W**
	1	**83**	**16**	**51**	**14**	**26**	**W**
	2	**83**	**18**	**24**	**14**	**22**	**W**
	3	**83**	**19**	**29**	**13**	**24**	**W**
	4	**82**	**20**	**31**	**8**	**16**	**W**
	5	80	21	32	6	12	W
	6	75	23	50	4	10	W
	7	**70**	**23**	**55**	**10**	**17**	**SW**
	8	**67**	**22**	**49**	**11**	**18**	**W**
	9	65	26	55	6	12	W
	10	62	34	74	5	13	NW
	11	58	41	41	2	7	W

16477 (112.14Wx33.48N) 03/14/08

MC - WEST PHOENIX

	Hr	T(F)		PM	Spd	Max	Dir
MC - WEST PHOENIX	12	70		19	5	12	SW
	1	68		29	4	11	SW
	2	67		22	4	11	SW
	3	64		24	3	8	SW
	4	60		35	2	6	E
	5	58		46	2	5	E
	6	56		61	2	6	E
	7	59		82	1	4	SE
	8	65		49	2	11	SW
	9	**70**		**75**	**9**	**22**	**SW**
	10	**73**		**67**	**12**	**23**	**W**
	11	**76**		**72**	**12**	**28**	**W**
	12	**79**		**106**	**13**	**28**	**W**
	1	**81**		**126**	**15**	**31**	**W**
	2	**81**		**122**	**15**	**36**	**W**
	3	**81**		**37**	**12**	**25**	**W**
	4	**80**		**25**	**11**	**24**	**SW**
	5	**80**		**28**	**9**	**21**	**W**
	6	78		36	4	10	W
	7	**75**		**50**	**5**	**15**	**SW**
	8	**73**		**66**	**6**	**18**	**SW**
	9	70		65	4	14	W
	10	68		68	5	13	W
	11	67		67	5	10	W

23111 (112.38Wx33.54N) 03/14/08

NWS-LUKE AFB

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-LUKE AFB	12						
	1						
	2						
	3						
	4						
	5						
	6						
	7	57	10		0		-
	8	67	10		17		S
	9	70	10		18		SW
	10	74	10		18		S
	11	**78**	**10**		**20**	**28**	**W**
	12	**80**	**10**		**17**	**24**	**W**
	1						
	2	**82**	**10**		**17**	**24**	**W**
	3	**81**	**10**		**10**	**22**	**W**
	4	**81**	**10**		**15**	**21**	**W**
	5	79	10		9		W
	6	73	10		6		W
	7	69	10		0		-
	8	66	10		0		-
	9	63	10		7		SW
	10	57	10		0		-
	11	60	10		9		SW

03186 (112.38Wx33.42N) 03/14/08

NWS-GOODYEAR

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-GOODYEAR	12						
	1						
	2						
	3						
	4						
	5						
	6						
	7	61	60		9		W
	8	66	40		9		SW
	9	70	30		7		W
	10	73	20		6		SW
	11	**82**	**15**		**14**	**29**	**W**
	12	**86**	**10**		**18**	**34**	**W**
	1	**86**	**15**		**25**	**43**	**W**
	2	**84**	**20**		**14**	**23**	**W**
	3	84	20		17		SW
	4	82	40		17		SW
	5	81	40		11		W
	6	75	40		6		*VR
	7						
	8	70	20		11		SW
	9						
	10						
	11						

16659 (112.14Wx33.41N) 03/14/08

MC - WEST FORTY THIR

	Hr	T(F)		PM	Spd	Max	Dir
MC - WEST FORTY THIR	12	69		26	5	9	SW
	1	68		29	7	10	SW
	2	66		22	5	8	W
	3	64		28	5	7	SW
	4	58		65	4	9	E
	5	57		155	5	8	E
	6	57		146	5	11	E
	7	59		134	3	6	E
	8	64		188	2	5	NE
	9	**73**		**329**	**8**	**23**	**W**
	10	**77**		**355**	**12**	**24**	**W**
	11	**79**		**1052**	**16**	**31**	**W**
	12	**82**		**1270**	**18**	**36**	**W**
	1	**83**		**1286**	**20**	**36**	**W**
	2	**84**		**374**	**14**	**31**	**W**
	3	**84**		**87**	**12**	**26**	**W**
	4	**83**		**57**	**12**	**24**	**W**
	5	**81**		**24**	**10**	**20**	**W**
	6	77		37	6	14	W
	7	**75**		**41**	**8**	**15**	**SW**
	8	**74**		**86**	**12**	**22**	**SW**
	9	**72**		**93**	**10**	**22**	**SW**
	10	67		73	6	11	W
	11	66		73	5	11	SW

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

16372 (112.12Wx33.46N) 03/14/08

MC - GREENWOOD

MC - GREENWOOD

Hr	T(F)		PM	Spd	Max	Dir
12	63		56	1	4	SE
1	62		54	2	6	E
2	61		39	0	4	-
3	59		41	1	6	S
4	59		77	2	7	NE
5	59		63	3	8	NE
6	58		53	4	10	E
7	64		85	0	4	-
8	69		71	2	6	SW
9	**72**		**90**	**8**	**21**	**SW**
10	**75**		**100**	**11**	**27**	**W**
11	**77**		**97**	**12**	**29**	**W**
12	**79**		**151**	**13**	**30**	**W**
1	**81**		**151**	**14**	**31**	**W**
2	**81**		**114**	**13**	**33**	**W**
3	**82**		**35**	**12**	**27**	**W**
4	**82**		**40**	**10**	**23**	**W**
5	**80**		**26**	**9**	**22**	**W**
6	77		35	5	12	W
7	74		47	5	13	SW
8	**73**		**64**	**6**	**16**	**SW**
9	70		70	4	11	W
10	67		75	5	10	W
11	64		74	3	7	W

03184 (112.08Wx33.69N) 03/14/08

NWS-DEER VALLEY

NWS-DEER VALLEY

Hr	T(F)	VR	Dust	Spd	Max	Dir
12	64	10		0		-
1	62	10		6		SW
2	62	10		6		SW
3	61	10		0		-
4	59	10		3		SE
5	52	10		3		E
6	50	10		0		-
7	58	10		5		E
8	64	10		6		*VR
9	67	10		9		SW
10	69	10		5		NW
11	**74**	**10**		**8**	**17**	**SW**
12	**79**	**10**		**15**	**26**	**W**
1	**81**	**10**		**25**	**34**	**W**
2	**80**	**10**		**26**	**34**	**W**
3	**80**	**10**		**18**	**25**	**W**
4	**79**	**10**		**16**	**25**	**W**
5	**77**	**10**		**17**	**22**	**W**
6	71	10		5		NW
7	69	10		5		NE
8	66	10		0		-
9	60	10		0		-
10	58	10		3		NE
11	52	10		0		-

16390 (112.07Wx33.56N) 03/14/08

MC - NORTH PHOENIX

MC - NORTH PHOENIX

Hr	T(F)			Spd	Max	Dir
12	65			2	8	W
1	64			1	6	S
2	62			1	4	NE
3	61			2	4	SE
4	59			1	6	SW
5	56			1	3	E
6	55			1	3	SE
7	58			2	5	S
8	63			3	10	S
9	68			5	14	SW
10	**72**			**6**	**17**	**W**
11	**75**			**7**	**18**	**SW**
12	**78**			**9**	**25**	**W**
1	**79**			**10**	**26**	**W**
2	**80**			**12**	**31**	**W**
3	**80**			**9**	**22**	**W**
4	**79**			**8**	**21**	**W**
5	**78**			**8**	**21**	**W**
6	76			4	14	W
7	71			2	8	W
8	69			3	10	W
9	67			2	7	W
10	64			1	4	NW
11	61			1	3	S

16375 (112.12Wx33.43N) 03/14/08

MC - DURANGO COMPLEX

MC - DURANGO COMPLEX

Hr	T(F)		PM	Spd	Max	Dir
12	63		64	2	4	W
1	64		66	3	10	SW
2	66		44	6	11	W
3	62		30	3	7	SW
4	58		64	2	6	E
5	56		67	2	6	E
6	56		68	3	8	E
7	62		132	2	4	E
8	71		81	1	3	NE
9	**74**		**117**	**8**	**20**	**W**
10	**76**		**91**	**14**	**24**	**W**
11	**78**		**216**	**16**	**29**	**W**
12	**80**		**206**	**16**	**34**	**W**
1	**81**		**310**	**19**	**36**	**W**
2	**82**		**128**	**16**	**41**	**W**
3	**84**		**32**	**13**	**27**	**W**
4	**83**		**28**	**12**	**30**	**W**
5	**81**		**28**	**10**	**19**	**W**
6	77		36	6	14	W
7	73		68	7	14	W
8	**72**		**92**	**9**	**18**	**SW**
9	**70**		**89**	**7**	**16**	**W**
10	66		81	6	11	W
11	62		80	4	7	W

16328 (112.10Wx33.50N) 03/14/08

ADEQ - JLG SUPERSITE

ADEQ - JLG SUPERSITE

Hr			PM	Spd		Dir
12			34	3		E
1			34	2		SE
2			33	2		SE
3			27	3		E
4			31	2		E
5			34	2		NE
6			32	2		E
7			35	2		SE
8			31	2		SE
9			52	6		SW
10			52	8		W
11			31	8		W
12			54	10		W
1			62	11		W
2			58	10		W
3			45	8		W
4			24	8		W
5			22	7		W
6			27	4		W
7			36	3		W
8			43	5		W
9			54	3		W
10			58	3		W
11			54	3		W

16329 (112.05Wx33.46N) 03/14/08

MC - CENTRAL PHOENIX

MC - CENTRAL PHOENIX

Hr	T(F)		PM	Spd	Max	Dir
12	63		43	4	7	E
1	61		40	3	6	E
2	59		42	3	6	E
3	58		43	4	7	E
4	57		37	3	5	E
5	56		36	4	6	E
6	56		34	3	6	E
7	64		38	2	6	SE
8	71		54	3	6	E
9	**76**		**56**	**3**	**17**	**SW**
10	**78**		**105**	**12**	**25**	**W**
11	**80**		**127**	**16**	**30**	**W**
12	**81**		**150**	**16**	**30**	**W**
1	**82**		**231**	**20**	**37**	**W**
2	**82**		**159**	**19**	**37**	**W**
3	**83**		**34**	**14**	**28**	**W**
4	**83**		**28**	**14**	**29**	**W**
5	**81**		**31**	**13**	**24**	**W**
6	**77**		**30**	**7**	**16**	**W**
7	**74**		**48**	**6**	**16**	**W**
8	**73**		**64**	**7**	**16**	**SW**
9	**71**		**78**	**6**	**15**	**W**
10	**69**		**75**	**8**	**18**	**W**
11	**68**		**74**	**8**	**16**	**W**

16377 (112.08Wx33.40N) 03/14/08

MC - SOUTH PHOENIX

MC - SOUTH PHOENIX

Hr	T(F)		PM	Spd	Max	Dir
12	66		114	2	6	E
1	63		70	2	4	SE
2	62		60	2	4	E
3	60		52	2	6	SE
4	58		56	2	6	E
5	57		24	3	6	E
6	57		52	4	7	E
7	60		74	2	5	E
8	66		90	2	5	E
9	72		58	3	11	W
10	**76**		**230**	**11**	**25**	**W**
11	**78**		**360**	**13**	**30**	**W**
12	**81**		**386**	**14**	**32**	**W**
1	**82**		**461**	**16**	**32**	**W**
2	**83**		**214**	**15**	**30**	**W**
3	**83**		**42**	**11**	**23**	**W**
4	**83**		**41**	**11**	**23**	**W**
5	**82**		**37**	**9**	**19**	**W**
6	80		47	4	13	W
7	76		71	4	13	W
8	76		72	4	14	SW
9	74		84	4	12	SW
10	70		94	3	9	W
11	68		85	3	10	W

15 (112.10Wx33.48N) 03/14/08

15-PHOENIX ENCANTO

15-PHOENIX ENCANTO

Hr	T(F)	RH	Rn	Spd	Max	Dir
12	58	55	0	1	4	E
1	56	57	0	1	2	NE
2	54	61	0	1	2	E
3	53	65	0	1	4	E
4	52	60	0	0	3	N
5	51	64	0	0	2	NE
6	50	59	0	1	3	E
7	57	46	0	1	3	E
8	65	35	0	1	4	E
9	**69**	**27**	**0**	**8**	**21**	**SW**
10	**72**	**21**	**0**	**12**	**19**	**W**
11	**75**	**17**	**0**	**11**	**21**	**W**
12	**78**	**13**	**0**	**12**	**25**	**W**
1	**79**	**11**	**0**	**14**	**22**	**W**
2	**80**	**10**	**0**	**14**	**24**	**W**
3	**79**	**13**	**0**	**11**	**22**	**W**
4	**79**	**13**	**0**	**10**	**19**	**W**
5	**78**	**13**	**0**	**9**	**16**	**W**
6	76	14	0	4	11	W
7	73	14	0	4	10	SW
8	73	12	0	5	14	SW
9	69	14	0	3	8	W
10	67	15	0	4	9	SW
11	65	18	0	3	8	SW

23183 (111.99Wx33.44N) 03/14/08

NWS-PHX SKY HARBOR

NWS-PHX SKY HARBOR

Hr	T(F)	VR	Dust	Spd	Max	Dir
12	63	10		6		E
1	62	10		6		E
2	60	10		6		E
3	59	10		7		E
4	59	10		5		E
5	57	10		8		E
6	57	10		0		-
7	61	10		0		-
8	65	10		6		E
9	70	10		5		SW
10	**77**	**10**		**11**	**20**	**W**
11	**79**	**10**		**21**	**29**	**W**
12	**81**	**10**		**21**	**30**	**W**
1	**82**	**10**		**25**	**30**	**W**
2	82	10		23		W
3	**82**	**10**		**17**	**24**	**W**
4	**81**	**10**		**13**	**23**	**W**
5	80	10		14		W
6	77	10		7		W
7	76	10		9		SW
8	72	10		11		SW
9	73	10		10		W
10	69	10		10		W
11	67	10		7		W

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

12 (112.11Wx33.62N) 03/14/08

12-PHOENIX GREENWAY

	Hr	T(F)	RH	Rn	Spd	Max	Dir
12-PHOENIX GREENWAY	12	66	30	0	3	7	S
	1	64	30	0	2	6	S
	2	64	28	0	2	6	S
	3	62	31	0	3	6	S
	4	59	33	0	1	3	S
	5	57	38	0	1	3	N
	6	54	48	0	2	7	S
	7	60	41	0	5	9	S
	8	63	36	0	7	13	S
	9	**67**	**28**	**0**	**9**	**16**	**SW**
	10	70	24	0	8	13	SW
	11	**74**	**17**	**0**	**9**	**21**	**SW**
	12	**76**	**12**	**0**	**9**	**18**	**W**
	1	**78**	**9**	**0**	**13**	**22**	**SW**
	2	**79**	**8**	**0**	**14**	**26**	**W**
	3	**79**	**8**	**0**	**13**	**26**	**SW**
	4	**78**	**12**	**0**	**10**	**17**	**SW**
	5	**78**	**12**	**0**	**10**	**17**	**SW**
	6	76	12	0	6	14	W
	7	71	15	0	1	5	NW
	8	63	30	0	1	5	S
	9	61	30	0	1	6	SW
	10	58	43	0	1	4	N
	11	56	43	0	1	8	S

16368 (112.02Wx33.82N) 03/14/08

MC - CAVE CREEK

	Hr	T(F)	RH		Spd	Max	Dir
MC - CAVE CREEK	12	65	38		4	9	E
	1	63	42		4	9	E
	2	61	43		4	7	E
	3	59	46		4	9	E
	4	57	49		4	9	NE
	5	57	51		7	13	NE
	6	56	53		7	11	NE
	7	58	52		4	9	E
	8	62	47		4	9	SE
	9	65	43		4	9	SE
	10	69	35		7	13	S
	11	**71**	**28**		**7**	**16**	**SW**
	12	**75**	**21**		**7**	**27**	**SW**
	1	**77**	**15**		**16**	**29**	**W**
	2	**78**	**14**		**16**	**31**	**W**
	3	**77**	**14**		**20**	**34**	**W**
	4	**76**	**15**		**16**	**31**	**W**
	5	**75**	**17**		**13**	**25**	**W**
	6	**70**	**19**		**4**	**18**	**W**
	7	68	20		4	9	N
	8	64	25		2	7	N
	9	58	34		2	4	NE
	10	56	37		2	4	NE
	11	58	33		4	9	NE

27 (111.97Wx33.73N) 03/14/08

27-DESERT RIDGE

	Hr	T(F)	RH	Rn	Spd	Max	Dir
27-DESERT RIDGE	12	64	32	0	3	7	S
	1	63	32	0	3	6	S
	2	58	49	0	1	5	SE
	3	55	53	0	1	3	SE
	4	54	58	0	1	3	E
	5	51	56	0	2	6	E
	6	49	63	0	2	4	E
	7	56	45	0	3	6	S
	8	62	35	0	6	13	S
	9	65	31	0	6	11	SW
	10	**68**	**27**	**0**	**8**	**15**	**SW**
	11	**71**	**22**	**0**	**9**	**18**	**SW**
	12	**74**	**16**	**0**	**12**	**23**	**W**
	1	**77**	**11**	**0**	**15**	**29**	**W**
	2	**77**	**9**	**0**	**18**	**38**	**W**
	3	**77**	**9**	**0**	**17**	**30**	**W**
	4	**77**	**11**	**0**	**13**	**24**	**NW**
	5	**76**	**12**	**0**	**11**	**22**	**W**
	6	**73**	**11**	**0**	**6**	**16**	**NW**
	7	66	16	0	4	7	NE
	8	59	32	0	2	6	E
	9	56	35	0	3	6	NE
	10	53	41	0	4	7	NE
	11	50	44	0	4	7	NE

16393 (112.13Wx33.49N) 03/14/08

MC - WEST INDIAN SCH

	Hr				Spd	Max	Dir
MC - WEST INDIAN SCH	12				7	13	SW
	1				2	7	S
	2				4	11	SW
	3				4	11	SW
	4				2	4	E
	5				0	4	E
	6				2	7	SE
	7						N
	8				2	13	SW
	9				**11**	**25**	**W**
	10				**13**	**25**	**W**
	11				**11**	**25**	**W**
	12				**13**	**29**	**W**
	1				**13**	**31**	**W**
	2				**13**	**31**	**W**
	3				**13**	**27**	**W**
	4				**11**	**25**	**W**
	5				**9**	**22**	**W**
	6				4	11	W
	7				4	13	W
	8				**7**	**16**	**W**
	9				4	13	W
	10				4	9	W
	11				4	11	W

15 (112.10Wx33.48N) 03/14/08

15-PHOENIX ENCANTO

	Hr	T(F)	RH	Rn	Spd	Max	Dir
15-PHOENIX ENCANTO	12	58	55	0	1	4	E
	1	56	57	0	1	2	NE
	2	54	61	0	1	2	E
	3	53	65	0	1	4	E
	4	52	60	0	0	3	N
	5	51	64	0	0	2	NE
	6	50	59	0	1	3	E
	7	57	46	0	1	3	E
	8	65	35	0	1	4	E
	9	**69**	**27**	**0**	**8**	**21**	**SW**
	10	**72**	**21**	**0**	**12**	**19**	**W**
	11	**75**	**17**	**0**	**11**	**21**	**W**
	12	**78**	**13**	**0**	**12**	**25**	**W**
	1	**79**	**11**	**0**	**14**	**22**	**W**
	2	**80**	**10**	**0**	**14**	**24**	**W**
	3	**79**	**13**	**0**	**11**	**22**	**W**
	4	**79**	**13**	**0**	**10**	**19**	**W**
	5	**78**	**13**	**0**	**9**	**16**	**W**
	6	76	14	0	4	11	W
	7	73	14	0	4	10	SW
	8	73	12	0	5	14	SW
	9	69	14	0	3	8	W
	10	67	15	0	4	9	SW
	11	65	18	0	3	8	SW

16398 (111.92Wx33.48N) 03/14/08

MC - SOUTH SCOTTSDAL

	Hr	T(F)	RH		Spd	Max	Dir
MC - SOUTH SCOTTSDAL	12	58	37		2	4	NE
	1	56	46		2	4	E
	2	55	46		2	4	NE
	3	53	51		2	4	NE
	4	52	48		2	4	NE
	5	52	48		2	7	NE
	6	52	49		0	4	N
	7	58	46		2	4	NE
	8	66	39		2	9	SE
	9	71	37		2	7	SE
	10	**76**	**31**		**2**	**18**	**S**
	11	**81**	**19**		**9**	**20**	**W**
	12	**83**	**15**		**13**	**29**	**W**
	1	**84**	**13**		**13**	**31**	**W**
	2	**85**	**11**		**16**	**29**	**W**
	3	**83**	**13**		**13**	**29**	**W**
	4	**83**	**16**		**11**	**25**	**W**
	5	**80**	**16**		**11**	**22**	**W**
	6	**76**	**18**		**4**	**16**	**W**
	7	**71**	**20**		**4**	**18**	**SW**
	8	**72**	**17**		**7**	**16**	**SW**
	9	**70**	**17**		**4**	**18**	**W**
	10	66	18		4	13	W
	11	66	19		4	13	W

03192 (111.91Wx33.62N) 03/14/08

NWS-SCOTTSDALE

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-SCOTTSDALE	12	61	10		0		-
	1	60	10		0		-
	2	62	10		3		S
	3	57	10		5		S
	4	57	10		0		-
	5	56	10		0		-
	6	55	7		3		S
	7	60	10		3		S
	8	64	10		5		SE
	9	68	10		6		*VR
	10	71	10		3		*VR
	11	74	10		5		SW
	12	**77**	**10**		**13**	**21**	**W**
	1	**79**	**10**		**11**	**20**	**W**
	2	**80**	**10**		**16**	**26**	**W**
	3	**80**	**10**		**11**	**24**	**W**
	4	**79**	**10**		**15**	**18**	**SW**
	5	**78**	**10**		**10**	**18**	**SW**
	6	75	10		0		-
	7	71	10		0		-
	8	68	10		0		-
	9	67	10		0		-
	10	64	10		3		NW
	11	58	10		0		-

53128 (111.80Wx33.27N) 03/14/08

NWS-CHANDLER

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-CHANDLER	12						
	1						
	2						
	3						
	4						
	5						
	6						
	7	54	40		6		E
	8	64	40		8		S
	9	72	40		3		SE
	10	**75**	**35**		**17**	**23**	**SW**
	11	77	25		28		SW
	12	79	25		23		SW
	1	**81**	**25**		**25**	**33**	**SW**
	2	81	0		18		W
	3						
	4	**81**	**25**		**16**	**30**	**W**
	5	77	30		18		SW
	6	73	30		15		SW
	7						
	8	**68**	**15**		**11**	**21**	**SW**
	9						
	10						
	11						

23104 (111.65Wx33.31N) 03/14/08

NWS-WILLIAMS FLD

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-WILLIAMS FLD	12	55	10		9		E
	1	55	10		9		E
	2	55	10		8		E
	3	57	10		10		E
	4	55	10		8		E
	5						
	6						
	7	59	30		8		E
	8	64	30		8		SE
	9	68	30	nulls	3		*VR
	10	73	30		7		NW
	11	**77**	**30**		**9**	**17**	**NW**
	12	**79**	**30**		**16**	**26**	**W**
	1	**79**	**20**		**10**	**17**	**NW**
	2	**81**	**20**		**17**	**29**	**NW**
	3	**81**	**30**		**8**	**15**	**NW**
	4	**79**	**30**		**10**	**16**	**W**
	5	79	30		15		W
	6	73	30		8		W
	7	72	10		10		SW
	8	66	10		8		SW
	9	64	10		10		SW
	10	64	10		9		SW
	11						

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

16406 (111.85Wx33.71N) 03/14/08

MC - PINNACLE PEAK

	Hr				Spd	Max	Dir
MC - PINNACLE PEAK	12				4	13	W
	1				4	11	SW
	2				7	13	W
	3				7	16	W
	4				2	9	SW
	5				2	4	S
	6				2	9	SW
	7				4	16	SW
	8				9	16	SW
	9				9	16	W
	10				7	16	W
	11				7	22	W
	12				9	27	W
	1				11	27	NW
	2				13	29	NW
	3				16	34	NW
	4				11	27	NW
	5				9	20	NW
	6				4	16	NW
	7				4	9	N
	8				2	7	SE
	9				0	4	SE
	10				0	4	SE
	11				2	4	SE

16376 (111.73Wx33.61N) 03/14/08

MC - FOUNTAIN HILLS

	Hr	T(F)	RH		Spd	Max	Dir
MC - FOUNTAIN HILLS	12	59	46		0	4	W
	1	58	48		0	2	NW
	2	56	52		0	4	NW
	3	56	51		0	7	W
	4	56	49		2	11	NW
	5	57	46		2	9	W
	6	56	48		0	9	NE
	7	56	52		0	4	NW
	8	64	38		2	13	S
	9	68	30		4	16	SW
	10	71	24		7	16	SW
	11	74	22		9	18	SW
	12	77	16		7	22	SW
	1	79	12		11	25	SW
	2	80	11		9	25	W
	3	80	10		11	29	W
	4	80	13		9	22	SW
	5	78	14		9	25	SW
	6	76	16		7	18	SW
	7	73	18		2	9	W
	8	67	24		0	7	NW
	9	65	25		2	9	W
	10	68	17		4	16	SW
	11	60	28		2	13	S

16417 (111.61Wx33.55N) 03/14/08

MC - BLUE POINT

	Hr	T(F)			Spd	Max	Dir
MC - BLUE POINT	12	52			2	4	E
	1	50			0	4	N
	2	50			0	4	SE
	3	48			2	4	E
	4	46			0	4	SW
	5	46			2	7	S
	6	45			2	7	E
	7	49			0	7	NE
	8	58			2	4	N
	9	69			4	13	S
	10	71			4	13	S
	11	73			9	20	SW
	12	76			9	22	SW
	1	79			13	27	W
	2	80			16	34	W
	3	80			16	31	W
	4	79			13	29	W
	5	77			11	27	W
	6	73			4	18	SW
	7	66			2	7	SE
	8	67			4	13	SW
	9	65			4	9	SW
	10	58			4	4	E
	11	62			7	13	S

16405 (111.93Wx33.41N) 03/14/08

MC - TEMPE

	Hr	T(F)			Spd	Max	Dir
MC - TEMPE	12	58			2	4	NE
	1	57			2	4	NE
	2	56			2	7	NE
	3	54			2	7	NE
	4	53			2	4	NE
	5	54			2	7	NE
	6	51			0	4	NE
	7	55			0	4	SE
	8						N
	9	69			2	7	E
	10	74			2	18	W
	11	77			7	25	SW
	12	79			9	29	SW
	1	80			11	31	SW
	2	81			9	34	W
	3	81			7	22	SW
	4	81			7	20	W
	5	79			7	20	SW
	6	77			4	16	SW
	7	73			2	9	SW
	8	74			4	18	SW
	9	73			4	13	SW
	10	69			2	11	SW
	11	66			2	9	SW

03185 (111.73Wx33.46N) 03/14/08

NWS-MESA FF

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-MESA FF	12						
	1						
	2						
	3						
	4						
	5						
	6	57	40		9		SE
	7	59	40		10		SE
	8	63	40		10		S
	9	66	30		10		S
	10						
	11						
	12	77	20		16	25	W
	1						
	2						
	3						
	4	79	30		17	23	W
	5	77	30		17	23	W
	6	73	30		9		W
	7	72	30		9		S
	8						
	9						
	10						
	11						

16381 (111.73Wx33.45N) 03/14/08

MC - FALCON FIELD

	Hr	T(F)	RH		Spd	Max	Dir
MC - FALCON FIELD	12	64	28		7	11	SE
	1	64	26		7	11	SE
	2	63	26		7	13	E
	3	62	26		7	11	SE
	4	60	28		7	11	SE
	5	59	30		2	9	E
	6	59	29		4	11	SE
	7	61	29		7	11	SE
	8	64	26		7	11	SE
	9	67	25		7	13	SE
	10	71	21		2	11	SW
	11	74	16		4	20	SW
	12	77	10		11	25	SW
	1	78	9				NE
	2	79	7		16	29	W
	3	79	8		13	34	W
	4	79	10		11	25	W
	5	78	11		9	22	W
	6	76	12		7	18	W
	7	74	13		4	11	S
	8	71	12		4	9	S
	9	69	12		4	9	S
	10	66	15		4	9	S
	11	64	15		4	11	SE

16478 (111.88Wx33.30N) 03/14/08

MC - WEST CHANDLER

	Hr	T(F)	RH		Spd	Max	Dir
MC - WEST CHANDLER	12	66	25		5	14	S
	1	63	30		2	9	SE
	2	58	40		3	4	NE
	3	56	44		3	5	NE
	4	54	46		4	7	NE
	5	53	46		4	9	NE
	6	53	45		4	6	NE
	7	55	42		3	7	E
	8	61	35		3	7	SE
	9	67	30		2	7	SE
	10	73	21		6	17	W
	11	76	12		10	26	W
	12	78	10		14	28	W
	1	80	8		14	29	W
	2	80	7		12	27	W
	3	81	9		12	26	W
	4	80	10		11	23	W
	5	80	10		10	20	SW
	6	77	12		6	14	SW
	7	72	12		7	13	SW
	8	70	12		7	15	SW
	9	69	12		5	13	SW
	10	67	14		6	11	S
	11	64	16		4	10	S

16380 (111.87Wx33.41N) 03/14/08

MC - MESA

	Hr	T(F)	RH		Spd	Max	Dir
MC - MESA	12	63	35		2	7	SE
	1	61	36		2	7	SE
	2	62	32		7	9	SE
	3	61	31		4	9	SE
	4	59	33		4	11	SE
	5	58	35		2	7	E
	6	58	34		2	7	SE
	7	59	33		4	9	SE
	8	63	30		4	9	SE
	9	67	28		4	9	SE
	10	71	24		0	9	W
	11	76	14		11	27	W
	12	78	11		16	34	W
	1	80	8		20	38	W
	2	80	8		18	36	W
	3	80	10		13	27	W
	4	80	12		13	25	W
	5	79	12		11	27	W
	6	77	13		7	18	W
	7	74	14		7	13	SW
	8	72	12		7	16	SW
	9	72	12		7	16	SW
	10	68	14		2	7	SW
	11	65	16		2	9	SW

16505 (111.72Wx33.31N) 03/14/08

MC - HIGLEY

	Hr	T(F)		PM	Spd	Max	Dir
MC - HIGLEY	12	55		32	4	8	E
	1	54		30	4	8	E
	2	53		26	5	9	E
	3	52		28	5	10	E
	4	51		22	6	10	E
	5	51		50	5	9	E
	6	52		111	4	10	E
	7	53		140	6	10	E
	8	60		97	6	10	E
	9	66		76	5	10	S
	10	71		43	4	16	W
	11	74		22	7	21	NW
	12	78		53	12	25	W
	1	79		44	12	27	W
	2	80			14	30	W
	3	80			9	21	W
	4	79		23	9	22	W
	5	78		17	8	17	W
	6	76		24	7	15	SW
	7	72		47	7	16	SW
	8	70		55	6	11	S
	9	67		66	5	9	S
	10	64		81	6	13	SW
	11	64		94	5	11	S

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

30 (111.58Wx35.21N) 03/14/08

30-FLAGSTAFF

	Hr	T(F)	RH	Rn	Spd	Max	Dir
30-FLAGSTAFF	12	41	54	0	5	10	SW
	1	40	55	0	5	9	SW
	2	39	57	0	5	12	SW
	3	41	53	0	5	11	SW
	4	39	56	0	5	10	SW
	5	38	59	0	5	11	W
	6	37	61	0	5	11	W
	7	38	57	0	5	13	W
	8	44	38	0	11	22	SW
	9	46	30	0	14	26	SW
	10	48	27	0	14	26	SW
	11	50	26	0	14	27	SW
	12	51	23	0	14	26	SW
	1	53	17	0	17	34	W
	2	53	15	0	18	34	W
	3	53	16	0	20	34	W
	4	52	16	0	16	32	W
	5	50	14	0	14	26	SW
	6	46	14	0	11	24	SW
	7	43	15	0	8	14	SW
	8	40	15	0	6	12	SW
	9	38	18	0	5	10	W
	10	37	19	0	7	14	W
	11	35	24	0	5	10	SW

31 (112.42Wx34.59N) 03/14/08

31-PRESCOTT

	Hr	T(F)	RH	Rn	Spd	Max	Dir
31-PRESCOTT	12	51	40	0	9	15	SW
	1	52	40	0	9	14	SW
	2	52	41	0	11	22	SW
	3	50	41	0	11	19	SW
	4	50	32	0	12	22	W
	5	48	33	0	10	19	SW
	6	47	32	0	11	18	SW
	7	48	30	0	14	23	SW
	8	50	28	0	18	26	SW
	9	52	28	0	19	29	W
	10	55	24	0	18	28	W
	11	57	20	0	19	31	W
	12	58	14	0	23	37	W
	1	59	12	0	23	39	W
	2	59	10	0	25	36	W
	3	59	11	0	23	34	W
	4	58	9	0	24	37	W
	5	57	10	0	20	32	W
	6	53	13	0	13	24	W
	7	50	17	0	7	17	SW
	8	42	36	0	0	4	SW
	9	41	34	0	2	8	S
	10	39	42	0	1	6	S
	11	37	42	0	3	11	S

32 (111.34Wx34.23N) 03/14/08

32-PAYSON

	Hr	T(F)	RH	Rn	Spd	Max	Dir
32-PAYSON	12	39	70	0	1	2	NE
	1	38	71	0	1	4	NE
	2	37	74	0	1	4	NE
	3	36	77	0	1	3	NE
	4	34	80	0	1	4	N
	5	34	82	0	1	4	NE
	6	33	83	0	1	4	NE
	7	38	75	0	1	4	E
	8	53	42	0	2	13	SW
	9	55	27	0	12	24	W
	10	57	24	0	12	25	SW
	11	57	23	0	15	25	SW
	12	59	22	0	14	25	SW
	1	60	20	0	18	30	SW
	2	61	17	0	16	29	SW
	3	62	11	0	17	31	SW
	4	61	11	0	17	27	W
	5	60	14	0	14	23	SW
	6	57	13	0	10	21	SW
	7	54	14	0	8	15	SW
	8	49	18	0	1	9	NW
	9	41	32	0	1	3	W
	10	40	34	0	0	2	E
	11	37	42	0	1	5	N

29 (111.87Wx33.39N) 03/14/08

29-MESA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
29-MESA	12	63	34	0	4	8	SE
	1	61	35	0	3	8	SE
	2	60	34	0	4	8	E
	3	60	33	0	3	6	E
	4	58	34	0	4	8	E
	5	58	34	0	4	7	E
	6	58	33	0	6	9	E
	7	60	33	0	5	8	SE
	8	64	29	0	5	9	SE
	9	69	27	0	4	8	SE
	10	73	22	0	2	7	N
	11	78	12	0	10	22	W
	12	79	10	0	14	25	W
	1	81	7	0	16	28	W
	2	81	7	0	15	28	W
	3	82	9	0	11	22	W
	4	81	10	0	10	19	W
	5	80	11	0	9	17	W
	6	78	12	0	5	13	SW
	7	75	12	0	5	12	SW
	8	73	11	0	6	12	SW
	9	72	11	0	5	11	SW
	10	70	12	0	3	11	SW
	11	65	16	0	2	5	SW

22 (111.64Wx33.26N) 03/14/08

22-QUEEN CREEK

	Hr	T(F)	RH	Rn	Spd	Max	Dir
22-QUEEN CREEK	12	53	49	0	6	8	SE
	1	54	44	0	6	8	E
	2	56	36	0	6	9	E
	3	55	38	0	7	10	E
	4	52	45	0	8	10	SE
	5	51	48	0	6	9	E
	6	53	41	0	6	9	E
	7	55	42	0	6	10	E
	8	60	43	0	9	12	SE
	9	67	30	0	9	12	S
	10	72	23	0	9	14	S
	11	76	15	0	12	24	W
	12	78	10	0	16	24	W
	1	80	9	0	16	31	W
	2	80	9	0	16	25	W
	3	80	9	0	15	25	W
	4	79	10	0	17	28	W
	5	77	11	0	15	24	W
	6	73	13	0	9	18	W
	7	69	14	0	6	11	SW
	8	65	15	0	6	10	SW
	9	64	16	0	8	13	SW
	10	63	16	0	6	12	SW
	11	60	20	0	9	13	SW

16317 (111.33Wx34.23N) 03/14/08

ADEQ - PAYSON WELL S

	Hr	T(F)	RH		Spd		Dir
ADEQ - PAYSON WELL S	12	40	63		1		E
	1	39	65		1		E
	2	39	67		1		E
	3	38	68		2		E
	4	37	70		1		E
	5	36	75		2		E
	6	36	75		2		E
	7	41	65		1		E
	8	54	34		4		S
	9	58	22		9		W
	10	59	19		12		SW
	11	60	18		14		W
	12	61	18		13		W
	1	63	16		16		SW
	2	64	13		13		SW
	3	64	9		16		W
	4	63	9		16		W
	5	61	12		12		W
	6	57	11		11		SW
	7	54	11		9		SW
	8	51	15		5		W
	9	45	24		3		W
	10	42	29		1		E
	11	40	34		2		E

06 (111.97Wx33.07N) 03/14/08

06-MARICOPA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
06-MARICOPA	12	61	31	0	5	8	SE
	1	60	30	0	5	9	SE
	2	60	32	0	9	13	S
	3	59	33	0	9	14	S
	4	57	37	0	3	9	E
	5	57	36	0	5	17	E
	6	60	31	0	5	11	S
	7	62	32	0	8	15	SW
	8	66	30	0	9	13	S
	9	72	25	0	15	25	SW
	10	75	18	0	12	20	W
	11	78	11	0	13	22	W
	12	80	10	0	15	23	W
	1	81	10	0	14	26	W
	2	82	8	0	16	28	W
	3	82	9	0	14	24	W
	4	82	9	0	15	26	W
	5	80	9	0	14	23	W
	6	76	11	0	9	15	SW
	7	70	13	0	7	13	SW
	8	68	14	0	6	10	SW
	9	67	14	0	8	12	W
	10	63	18	0	7	11	SW
	11	64	18	0	10	14	SW

05 (111.60Wx32.98N) 03/14/08

05-COOLIDGE

	Hr	T(F)	RH	Rn	Spd	Max	Dir
05-COOLIDGE	12	54	49	0	4	7	E
	1	52	53	0	6	9	E
	2	55	43	0	5	9	E
	3	54	46	0	5	8	SE
	4	52	49	0	5	7	E
	5	49	58	0	4	7	SE
	6	47	65	0	4	9	S
	7	50	64	0	2	6	SE
	8	61	50	0	4	12	S
	9	68	36	0	5	15	S
	10	72	29	0	12	18	SW
	11	74	21	0	16	25	W
	12	75	19	0	17	28	W
	1	76	16	0	16	27	W
	2	77	16	0	14	24	W
	3	77	14	0	14	27	W
	4	76	16	0	13	25	W
	5	76	12	0	14	24	W
	6	71	12	0	10	21	W
	7	68	13	0	9	15	W
	8	65	16	0	5	10	SW
	9	62	20	0	2	7	S
	10	64	16	0	9	18	SW
	11	60	21	0	4	8	SE

04 (109.68Wx32.81N) 03/14/08

04-SAFFORD

	Hr	T(F)	RH	Rn	Spd	Max	Dir
04-SAFFORD	12	58	27	0	7	13	NW
	1	55	30	0	5	9	S
	2	48	36	0	5	9	SE
	3	45	40	0	3	7	SE
	4	42	42	0	3	6	E
	5	41	45	0	3	6	SE
	6	41	44	0	4	7	SE
	7	47	38	0	6	10	E
	8	58	29	0	5	10	E
	9	68	21	0	5	14	W
	10	73	14	0	20	34	NW
	11	75	11	0	32	46	NW
	12	76	9	0	28	40	W
	1	76	8	0	28	43	NW
	2	76	7	0	29	43	NW
	3	76	6	0	28	40	W
	4	74	7	0	26	38	NW
	5	72	9	0	20	32	NW
	6	68	12	0	12	23	NW
	7	64	13	0	10	15	NW
	8	61	14	0	9	13	NW
	9	60	12	0	9	14	NW
	10	59	15	0	5	12	NW
	11	55	16	0	5	11	E

Appendix M: EVENT METEOROLOGICAL / AIR QUALITY TABLES

13 (111.23Wx32.46N) 03/14/08

13-MARANA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
13-MARANA	12	60	28	0	2	5	E
	1	55	36	0	4	7	E
	2	52	41	0	5	8	E
	3	50	45	0	6	9	E
	4	51	45	0	6	10	E
	5	49	49	0	6	9	E
	6	49	49	0	8	11	E
	7	53	43	0	8	11	E
	8	62	31	0	9	13	E
	9	69	24	0	5	12	SE
	10	**75**	**18**	**0**	**10**	**18**	**W**
	11	**76**	**13**	**0**	**11**	**21**	**NW**
	12	**77**	**12**	**0**	**11**	**19**	**NW**
	1	**79**	**10**	**0**	**12**	**26**	**W**
	2	**80**	**10**	**0**	**12**	**24**	**W**
	3	**81**	**10**	**0**	**16**	**26**	**W**
	4	**80**	**9**	**0**	**17**	**26**	**W**
	5	**78**	**8**	**0**	**17**	**24**	**W**
	6	**72**	**9**	**0**	**8**	**19**	**W**
	7	64	14	0	3	7	W
	8	62	12	0	5	10	SW
	9	62	12	0	2	6	NE
	10	57	16	0	2	8	SE
	11	54	22	0	2	6	SE

01 (110.95Wx32.28N) 03/14/08

01-TUCSON

	Hr	T(F)	RH	Rn	Spd	Max	Dir
01-TUCSON	12	52	39	0	2	4	E
	1	52	40	0	2	5	E
	2	50	44	0	3	6	E
	3	50	46	0	4	6	E
	4	49	48	0	4	6	E
	5	49	48	0	4	6	E
	6	48	50	0	3	6	E
	7	53	43	0	4	7	E
	8	62	29	0	5	9	E
	9	69	21	0	3	7	E
	10	72	20	0	5	14	W
	11	**74**	**14**	**0**	**13**	**22**	**NW**
	12	**75**	**11**	**0**	**14**	**24**	**NW**
	1	**76**	**11**	**0**	**12**	**23**	**NW**
	2	**77**	**9**	**0**	**13**	**24**	**W**
	3	**78**	**11**	**0**	**14**	**26**	**W**
	4	**78**	**11**	**0**	**16**	**26**	**W**
	5	**76**	**8**	**0**	**19**	**28**	**W**
	6	**73**	**8**	**0**	**13**	**26**	**W**
	7	67	12	0	3	10	W
	8	59	20	0	1	5	E
	9	55	32	0	1	5	N
	10	52	33	0	2	5	E
	11	50	40	0	3	5	E

09 (109.93Wx32.46N) 03/14/08

09-BONITA

	Hr	T(F)	RH	Rn	Spd	Max	Dir
09-BONITA	12	43	42	0	5	9	NE
	1	53	26	0	5	12	NW
	2	47	35	0	4	8	N
	3	42	42	0	3	6	NE
	4	38	52	0	4	6	NE
	5	37	57	0	3	6	NE
	6	43	44	0	4	8	NW
	7	47	42	0	3	10	NE
	8	**60**	**22**	**0**	**15**	**24**	**W**
	9	**64**	**20**	**0**	**16**	**24**	**W**
	10	**67**	**16**	**0**	**17**	**26**	**W**
	11	**68**	**9**	**0**	**21**	**34**	**W**
	12	**69**	**9**	**0**	**21**	**32**	**W**
	1	**69**	**11**	**0**	**19**	**29**	**W**
	2	**70**	**10**	**0**	**17**	**31**	**W**
	3	**70**	**9**	**0**	**18**	**30**	**W**
	4	**69**	**9**	**0**	**18**	**26**	**W**
	5	**67**	**11**	**0**	**14**	**24**	**W**
	6	**62**	**14**	**0**	**8**	**16**	**W**
	7	**60**	**12**	**0**	**12**	**21**	**W**
	8	55	16	0	8	14	W
	9	51	19	0	3	9	N
	10	53	16	0	4	11	N
	11	50	16	0	2	9	N

23160 (110.96Wx32.13N) 03/14/08

NWS-TUCSON INTL

	Hr	T(F)	VR	Dust	Spd	Max	Dir
NWS-TUCSON INTL	12	59	10		6		SE
	1	54	10		5		SE
	2	57	10		3		E
	3	60	10		7		S
	4	55	10		0		-
	5	57	10		6		SE
	6	55	10		5		E
	7	60	10		6		SE
	8	66	10		5		E
	9	71	10		5		*VR
	10	74	10		9		W
	11	**75**	**10**		**11**	**22**	**NW**
	12	76	10		11		NW
	1	78	10		10		NW
	2	**80**	**10**		**15**	**24**	**W**
	3	**79**	**10**		**20**	**26**	**W**
	4	**77**	**10**		**14**	**26**	**W**
	5	**75**	**10**		**18**	**24**	**W**
	6	71	10		8		W
	7	69	10		8		SW
	8	67	10		5		*VR
	9	63	10		0		-
	10	62	10		3		*VR
	11	55	10		3		SE

34 (109.73Wx32.05N) 03/14/08

34-KANSAS SETTLEMENT

	Hr	T(F)	RH	Rn	Spd	Max	Dir
34-KANSAS SETTLEMENT	12	50	33	0	4	7	SE
	1	41	58	0	4	8	SE
	2	43	49	0	4	8	SE
	3	40	50	0	5	7	SE
	4	38	58	0	5	9	SE
	5	40	57	0	6	8	SE
	6	39	56	0	6	8	SE
	7	47	47	0	5	7	SE
	8	59	34	0	3	8	S
	9	**64**	**25**	**0**	**11**	**26**	**SW**
	10	**67**	**22**	**0**	**22**	**33**	**W**
	11	**69**	**16**	**0**	**23**	**33**	**W**
	12	**71**	**13**	**0**	**25**	**38**	**W**
	1	**72**	**13**	**0**	**26**	**39**	**W**
	2	**72**	**14**	**0**	**27**	**38**	**W**
	3	**72**	**12**	**0**	**29**	**39**	**W**
	4	**71**	**11**	**0**	**28**	**35**	**W**
	5	**69**	**11**	**0**	**26**	**37**	**W**
	6	**65**	**13**	**0**	**17**	**27**	**W**
	7	**62**	**13**	**0**	**12**	**23**	**W**
	8	58	14	0	4	12	N
	9	55	21	0	6	11	W
	10	48	36	0	9	12	SW
	11	50	28	0	8	12	SW

33 (109.48Wx32.33N) 03/14/08

33-BOWIE

	Hr	T(F)	RH	Rn	Spd	Max	Dir
33-BOWIE	12	52	26	0	3	6	N
	1	51	27	0	3	10	NW
	2	56	22	0	5	9	W
	3	56	22	0	7	12	W
	4	57	22	0	7	13	W
	5	53	27	0	4	8	W
	6	54	27	0	7	14	W
	7	61	22	0	8	13	NW
	8	**67**	**18**	**0**	**12**	**24**	**W**
	9	**69**	**18**	**0**	**15**	**26**	**W**
	10	**70**	**16**	**0**	**21**	**35**	**W**
	11	**72**	**13**	**0**	**21**	**35**	**W**
	12	**73**	**10**	**0**	**22**	**40**	**W**
	1	**74**	**9**	**0**	**22**	**37**	**W**
	2	**74**	**10**	**0**	**21**	**34**	**W**
	3	**74**	**9**	**0**	**21**	**33**	**W**
	4	**73**	**8**	**0**	**21**	**32**	**W**
	5	**71**	**9**	**0**	**20**	**33**	**W**
	6	**68**	**12**	**0**	**15**	**24**	**W**
	7	**66**	**12**	**0**	**14**	**23**	**W**
	8	**65**	**10**	**0**	**11**	**22**	**W**
	9	59	12	0	4	11	NW
	10	57	13	0	4	9	N
	11	53	16	0	3	8	W

128562 (111.01Wx31.83N) 03/14/08

ADEQ - GREEN VALLEY

	Hr			PM	Spd		Dir
ADEQ - GREEN VALLEY	12			11	11		SW
	1			12	9		W
	2			10	9		SW
	3			10	9		SW
	4			9	9		W
	5			17	11		SW
	6			13	11		SW
	7			20	11		SW
	8			17	13		SW
	9			11	13		SW
	10			11	11		SW
	11			10	9		SW
	12			12	9		W
	1			12	11		W
	2			9	13		SW
	3			10	13		SW
	4			16	13		SW
	5			16	13		SW
	6			14	9		SW
	7			13	7		SW
	8			14	7		SW
	9			13	7		SW
	10			16	7		SW
	11			5	9		SW

16511 (110.94Wx31.34N) 03/14/08

ADEQ - NOGALES POST

	Hr			PM	Spd		Dir
ADEQ - NOGALES POST	12			81	3		SW
	1			61	1		E
	2			55	1		S
	3			57	1		SE
	4			32	1		SE
	5			47	1		S
	6			83	1		S
	7			100	2		S
	8			152	3		S
	9			58	6		SW
	10			40	8		SW
	11			43	8		SW
	12			42	8		W
	1			95	11		W
	2			87	12		W
	3			66	11		W
	4			40	12		W
	5			17	11		W
	6			28	6		W
	7			19	4		W
	8			122	3		SW
	9			75	2		SW
	10			216	3		S
	11			245	2		SW

16361 (109.55Wx31.33N) 03/14/08

ADEQ - AGUA PRIETA F

	Hr	T(F)	RH		Spd		Dir
ADEQ - AGUA PRIETA F	12	60	18		3		S
	1	58	20		3		S
	2	57	21		4		S
	3	56	22		5		SW
	4	55	24		2		SW
	5	55	24		5		S
	6	54	25		4		S
	7	57	22		2		SE
	8	61	19		6		S
	9	66	16		8		S
	10	69	14		10		SW
	11	73	12		12		W
	12	74	11		18		W
	1	75	10		17		W
	2	76	10		16		W
	3	76	9		15		W
	4	76	10		15		W
	5	74	10		14		W
	6	71	10		12		W
	7	69	10		11		W
	8	66	11		6		W
	9	63	11		2		W
	10	62	11		5		W
	11	62	11		6		SW

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Appendix N
Event Visibility Camera Images

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Phoenix Visibility Network Cameras

The visibility cameras aimed at South Mountain and the Estrella Mountains capture images every 15 minutes. Both cameras are looking south. The Estrella Mountains camera shows the southwestern portions of the Valley, looking toward the Salt River channel upwind of the West 43rd Ave. monitor. The South Mountain Camera shows downtown Phoenix with South Mountain in the background as well as a portion of the Estrella Mountains in the extreme upper right hand corner of the camera view. On March 14, 2008, both cameras' images showed reductions in visibility beginning in the morning and continuing into the early afternoon. Because winds were out of a westerly/southwesterly direction and the cameras both face toward the south, the dust causing the reduction in visibility captured by each camera comes in from the right hand side of the images.

The upper right hand portion of the South Mountain images depicts the area near West 43rd Ave. and provides an opportunity to see any windblown dust propagating down the Salt River channel in front of the Estrella Mountains and South Mountain. Due to the importance of that portion of the images, and in order to help better see the area, images were zoomed in to allow for a closer, more detailed look. In examining these images, it becomes increasingly apparent that there was a large amount of dust moving down the Salt River channel (from right to left in the images) during the morning and afternoon hours of March 14, 2008. During the 9:00 a.m. hour dust can be seen moving in from the right (west) and impacting visibility in front of the Estrella Mountains in the far ground on the right hand side of the images. Significant visibility reduction continues through the 1:00 p.m. hour when visibility was at its worse during the event. Diminished visibility continues into the 2:00 p.m. hour before some clearing becomes apparent. The timing of the visibility impacts is concurrent with the period of measured high winds and elevated PM_{10} concentrations at the West 43rd Ave. monitor and throughout portions of the Phoenix area.

The full South Mountain images (pp. 6-7) first clearly show increases in windblown dust and visibility reduction during the 9:00 am and 10:00 am hours. Throughout the images taken during this time span, windblown dust can be seen moving into the frames from right to left (west to east). Dust enters the right portion of the image and begins to obscure the Estrella Mountains before also obscuring much of South Mountain as well. The period of strongest wind gusts and highest PM_{10} concentrations occurred around the 1:00 p.m. hour, and the images associated with that time show that the terrain in the background behind downtown Phoenix is almost fully obscured as dust moves down the river channel to the east.

The Estrella Mountains images also begin to show a reduction in visibility in the morning hours, with significant reductions occurring after 11:00 a.m. when a noticeable haze moves into the images from right to left. In particular, the 11:30 a.m. image shows a significant increase in haze due to windblown dust. This timing is concurrent with increased winds throughout much of the Valley and coincides with wind gusts at West 43rd Ave. of greater than 25 mph. During the period from 12:00 p.m. through about 2:00 p.m., winds reached peak gusts of 36 mph at the West 43rd Ave. monitor site. It was also during this 12:00 p.m. to 2:00 p.m. period that both the Estrella Mountains and South Mountain cameras recorded the greatest reduction in visibility. This timing is consistent with the highest hourly values of PM_{10} emissions measured at the West 43rd Ave. monitor on March 14, 2008.

Appendix N - South Mountain Camera – (Zoomed View)
March 14, 2008 - 8:00 a.m. to 12:00 p.m.

View of pristine conditions in the frame of South Mountain and Estrella Mountain from the South Mountain Camera located on North Mountain looking south. Peak in the far ground, visible in the photograph, is in the Estrella range. The south end of the Estrella range is 26.1 miles from the camera and is not visible on the map. South Mountain is at a range of 17 to 20 miles.		

8:00 a.m.	8:15 a.m.	8:30 a.m.	8:45 a.m.
			
9:00 a.m.	9:15 a.m.	9:30 a.m.	9:45 a.m.
			
10:00 a.m.	10:15 a.m.	10:30 a.m.	10:45 a.m.
			
11:00 a.m.	11:15 a.m.	11:30 a.m.	11:45 a.m.
			

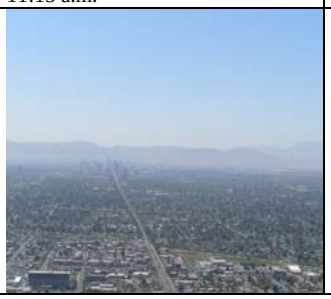
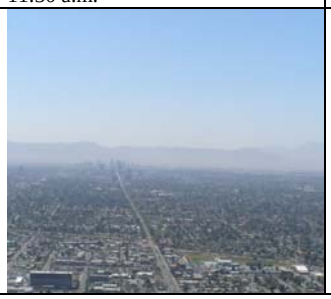
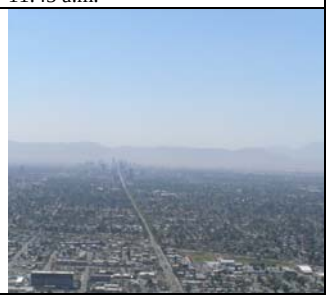
Appendix N - South Mountain Camera – (Zoomed View)
March 14, 2008 - 12:00 p.m. to 4:00 p.m.

View of pristine conditions in the frame of South Mountain and Estrella Mountain from the South Mountain Camera located on North Mountain looking south. Peak in the far ground, visible in the photograph, is in the Estrella range. The south end of the Estrella range is 26.1 miles from the camera and is not visible on the map. South Mountain is at a range of 17 to 20 miles.		

12:00 p.m.	12:15 p.m.	12:30 p.m.	12:45 p.m.
			
1:00 p.m.	1:15 p.m.	1:30 p.m.	1:45 p.m.
			
2:00 p.m.	2:15 p.m.	2:30 p.m.	2:45 p.m.
			
3:00 p.m.	3:15 p.m.	3:30 p.m.	3:45 p.m.
			

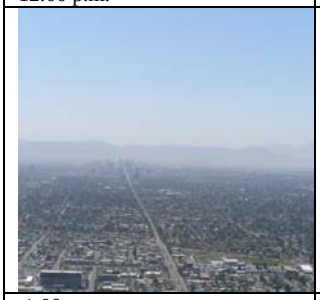
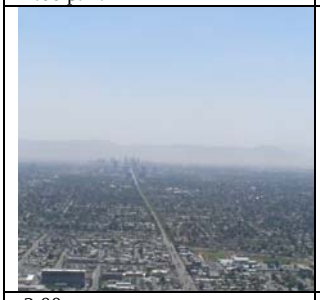
Appendix N - South Mountain Camera – March 14, 2008 - 8:00 a.m. to 12:00 p.m.

View of Pristine Conditions from the South Mountain Camera located on North Mountain looking toward the downtown Phoenix area with South Mountain visible in the background. Peak in the far ground, visible in the photograph, is in the Estrella range. The south end of the Estrella range is 26.1 miles from the camera and is not visible on the map. South Mountain is at a range of 17 to 20 miles.		

8:00 a.m.	8:15 a.m.	8:30 a.m.	8:45 a.m.
			
9:00 a.m.	9:15 a.m.	9:30 a.m.	9:45 a.m.
			
10:00 a.m.	10:15 a.m.	10:30 a.m.	10:45 a.m.
			
11:00 a.m.	11:15 a.m.	11:30 a.m.	11:45 a.m.
			

Appendix N - South Mountain Camera – March 14, 2008 - 12:00 p.m. to 4:00 p.m.

View of Pristine Conditions from the South Mountain Camera located on North Mountain looking toward the downtown Phoenix area with South Mountain visible in the background. Peak in the far ground, visible in the photograph, is in the Estrella range. The south end of the Estrella range is 26.1 miles from the camera and is not visible on the map. South Mountain is at a range of 17 to 20 miles.		

12:00 p.m.	12:15 p.m.	12:30 p.m.	12:45 p.m.
			
1:00 p.m.	1:15 p.m.	1:30 p.m.	1:45 p.m.
			
2:00 p.m.	2:15 p.m.	2:30 p.m.	2:45 p.m.
			
3:00 p.m.	3:15 p.m.	3:30 p.m.	3:45 p.m.
			

Appendix N – Estrella Camera – March 14, 2008 - 8:00 a.m. to 12:00 p.m.

View of Pristine Conditions from the Estrella Camera in the West Valley looking south at the Sierra Estrella.		

8:00 a.m.	8:15 a.m.	8:30 a.m.	8:45 a.m.
			
9:00 a.m.	9:15 a.m.	9:30 a.m.	9:45 a.m.
			
10:00 a.m.	10:15 a.m.	10:30 a.m.	10:45 a.m.
			
11:00 a.m.	11:15 a.m.	11:30 a.m.	11:45 a.m.
			

Appendix N – Estrella Camera – March 14, 2008 – 12:00 p.m. to 4:00 p.m.

View of Pristine Conditions from the Estrella Camera in the West Valley looking south at the Sierra Estrella.		

12:00 p.m.	12:15 p.m.	12:30 p.m.	12:45 p.m.
			
1:00 p.m.	1:15 p.m.	1:30 p.m.	1:45 p.m.
			
2:00 p.m.	2:15 p.m.	2:30 p.m.	2:45 p.m.
			
3:00 p.m.	3:15 p.m.	3:30 p.m.	3:45 p.m.
			

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Appendix O
Event Source Contribution Assessment

APPENDIX O

EVENT SOURCE CONTRIBUTION ASSESSMENT

Windblown Emission Analyses
West 43rd Avenue Monitor

Introduction

The recording of several exceedances of the federal 24-hour PM_{10} ambient air quality standard at the West 43rd Avenue monitoring station in Phoenix in 2008 has focused new attention on the question of contributing sources in the Salt River area. All of the exceedances in question occurred during high wind events, with peak hourly PM_{10} concentrations correlating with highest wind velocity hours. This correlation strongly implicates windblown dust as a primary contributor to measured PM_{10} concentrations. Previous analyses of the wind trajectories leading to the monitoring site immediately prior to peak hourly PM_{10} levels on each of four exceedance days reveal that lands likely to generate the monitored dust lie to the west-southwest of the monitoring site. To evaluate the categories and emission significance of lands contributing to windblown dust loads, a sequence of analyses were conducted by the Maricopa Association of Governments (MAG) and Sierra Research.

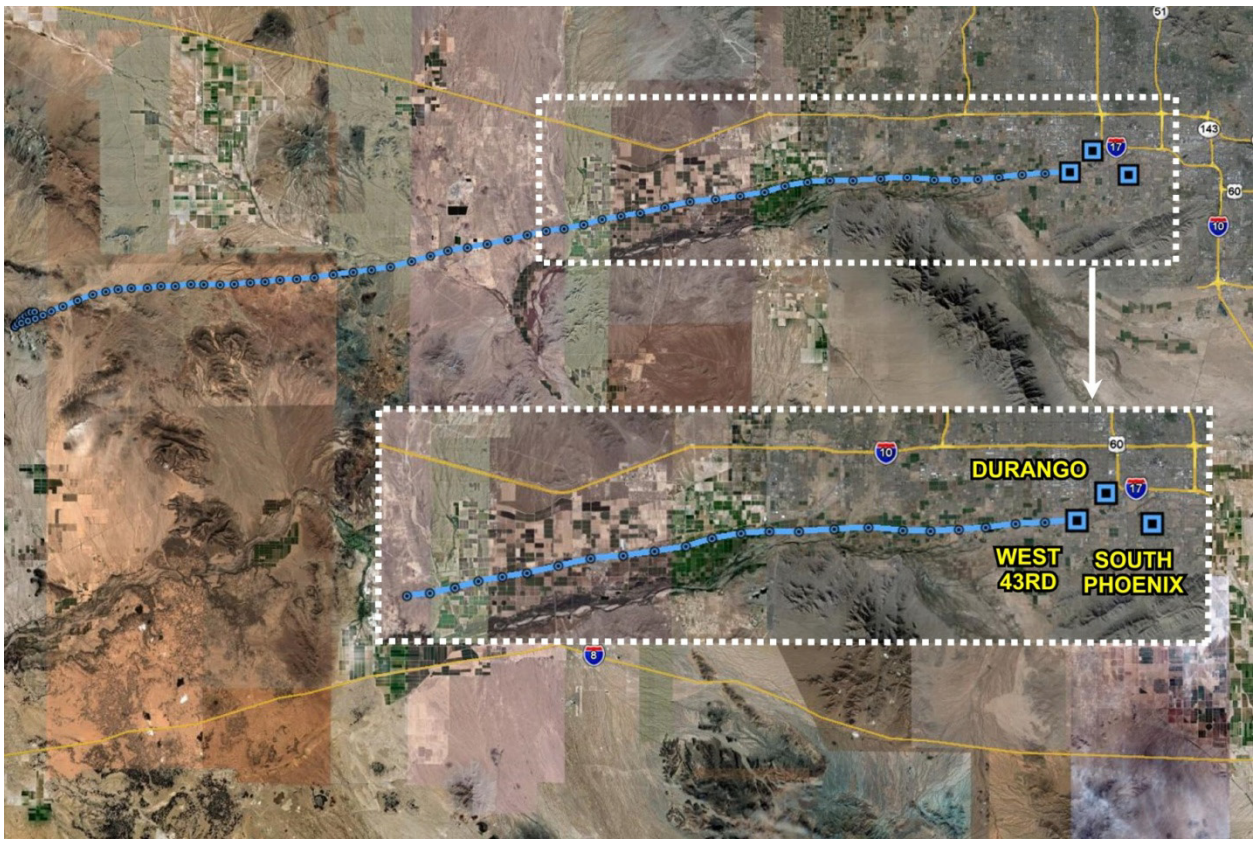
Contributing Land Uses

A MAG analysis of land uses began with work done by Sierra Research to study circumstances causing PM_{10} exceedances at a critical Salt River area air quality monitoring site operated by the Maricopa County Air Quality Department (MCAQD). Sierra Research plotted wind parcel back-trajectories from the West 43rd Avenue monitoring station starting from the peak PM_{10} hour on each of four exceedances days in 2008. These days are March 14, April 30, May 21, and June 4, 2008. The back-trajectories were plotted in 5-minute links based on 5-minute average wind speed and wind direction data recorded at the West 43rd Avenue station by MCAQD. The back-trajectory plot for March 14, as an example, is shown in Figure 1. These back-trajectories revealed that winds accompanying peak PM_{10} concentrations typically blew from the west-southwest to the West 43rd Avenue station, crossing a mosaic of agricultural, residential, industrial, and riverbed lands.

MAG staff used land use GIS files to determine the zoned uses of all lands within ½ mile of each back-trajectory track over which wind parcels travelled during the two hours prior to delivering the peak PM_{10} concentration to the West 43rd Avenue monitor. Lands under active construction on each exceedance day were identified from MCAQD earthmoving permit records. Parcel areas were aggregated within seven general categories for which limited emission factor data were available: vacant, agriculture, construction, open/restricted access, riverbed, sand and gravel/landfill, and other lands. The uses of these land categories are generally defined as follows:

- Vacant – represents undeveloped land to which public access is not restricted;
- Agriculture – represents lands under agricultural cultivation;
- Construction – represents lands being developed for long term use that will include ground coverage elements such as pavement, structures, or landscaping that will prevent the generation of windblown dust;
- Passive/restricted open space – represents undeveloped or partially developed lands to which public vehicular access is restricted (these lands include public parks, national forests, military posts, and Indian reservations);
- Riverbed – represents riverbed channels of the Salt and Gila River branches;
- Landfill/sand and gravel – represents lands being used for mineral extraction or waste deposit;
- Other – represents developed lands that are protected from windblown dust generation by elements such as paving, structures, and landscaping.

Figure 1
March 14, 2008 Back-Trajectory



These categories correspond to those used in the windblown dust emission inventory published in the MCAQD's 2008 Periodic PM_{10} Emission Inventory[1] with the exception of the riverbed category, which was split out from the passive/restricted open space category and reported

[1] 2008 PM_{10} Periodic Emissions Inventory for the Maricopa County, Arizona, Nonattainment Area, Appendix 4, Windblown Dust Emission Estimates Methodology, Final Draft, Maricopa County Air Quality Department, June 2010.

separately. The separate reporting and analysis of windblown emissions from riverbed lands was deemed necessary because of the finer soil texture and higher emission rate in comparison to other restricted open space lands, and because of the high prevalence of riverbed lands in the zones along the mapped back-trajectories.

The total acreages reported within each of these seven categories within ½ mile of the wind back-trajectory for the two hours preceding the peak PM_{10} concentrations recorded at the West 43rd Avenue monitoring station on each of the exceedance days are shown in Table 1.

Table 1
Total Acreage Within ½ Mile of March 14, 2008 Back-Trajectory by Land Use Category

Category	1st Hour	2nd Hour
Vacant	763	2,427
Agriculture	6,054	6,796
Construction	343	159
Passive/Restricted	0	84
Riverbed	2,322	19
Sand & Gravel	1,552	0
Other	1,402	1,706
Total	12,436	11,191

Windblown dust emissions on these lands are controlled by MCAQD Rules 310, 310.01, and 316. Under these rules, disturbed soil surfaces are to be stabilized to reduce windblown emissions. When wind speeds are high, however, even stabilized soil surfaces will produce windblown emissions, but at lower rates than non-stabilized soils. Periodically, MCAQD conducts compliance surveys of lands regulated by these rules. The most recent compliance analysis is published in the Department's 2008 PM_{10} Periodic Emission Inventory.[2] The compliance analysis reports rule effectiveness rates for each of the three rules and compliance rates with agricultural best management practices on agricultural lands. These rule effectiveness rates were used in this analysis, as was done in the windblown dust portion of the 2008 PM_{10} Periodic Emission Inventory (2008 PEI), to represent the fractions of stabilized and non-stabilized lands in each land use category. A listing of the 2008 rule effectiveness rates by rule and affected land use category are shown in Table 2.

[2] 2008 PM10 Periodic Emissions Inventory for the Maricopa County, Arizona, Nonattainment Area, Appendix 3, Final Draft, Maricopa County Air Quality Department, June 2010

Table 2 Rule Effectiveness Rates from 2008 PM_{10} Periodic Emission Inventory			
Rule Number	Affected Land Use Categories	Stabilized Fraction	Non-Stabilized Fraction
310	Construction	82.99%	17.01%
310.01	Vacant, Open/Restricted,	80.76%	19.24%
316	Sand and Gravel/ Landfill	49.62%	50.38%
Best Management Practices	Agricultural	55.33%	44.67%

The stabilized and non-stabilized fractions reported in the 2008 PEI were used to split appropriate land use acreages along each back-trajectory into stabilized and non-stabilized subtotals. However, further evaluation of the agricultural data revealed that compliance fractions related to controls applied to lands that were exposed with wind erosion and not covered with protective crops or crop residues. As a result, MAG staff conducted an independent analysis of the months during which protective crops were being grown on lands within ½ mile of each back-trajectory. This analysis shows much of the land in each back-trajectory zone was being used to cultivate alfalfa during the exceedance days, which fully protected these lands from wind erosion and greatly reduced emissions from agricultural lands in the aggregate. For other crops, the analysis quantified the acreage within each back-trajectory zone devoted to each of 8 other crop types, and determined the monthly activity calendar for each crop showing the months during which tilling, planting, irrigating, crop growth, and harvesting activities occurred. These data were used to refine the estimates of stabilized and non-stabilized land fractions for agricultural lands on each exceedance day. For purposes of calculating the stabilized and non-stabilized fractions of agricultural lands as a whole, we assumed that:

- lands being tilled, planted, or harvested were disturbed;
- lands with emergent growth of alfalfa, corn, grain, hay, or sorghum were undisturbed (by virtue of the continuous soil coverage provided by these crop);
- lands being cultivated for cotton, orchards, or vegetables were disturbed through the cultivation cycle (by virtue of the lack of soil coverage afforded by these crops);
- fallow lands were disturbed; and
- all disturbed agricultural lands were subject to partial control through application of the compliance fractions reported in the 2008 PEI.

Table 3 shows these data for the March 14, 2008, back-trajectory zone. Because the database used for this analysis (Arizona Cotton Research and Protection Council GIS Data) was different from that used in the original quantification of back-trajectory land use acreages, the totals of agricultural lands within the back-trajectory zones are somewhat different. Because of the high threshold friction velocities needed to generate emissions from both undisturbed and disturbed agricultural lands, these differences do not affect the resulting land category contributions to windblown PM_{10}. The full results of the MAG analysis are presented in Attachment 1.

Table 3 Crop Type Status and Acreage in March 14, 2008 Back-Trajectory Zone					
Crop	Cultivation Status	Total Acres		Disturbed Acres	
		1st Hour	2nd Hour	1st Hour	2nd Hour
Cotton	Tilling	577	1,090	577	1,090
Alfalfa	Crop in Field	4,377	5,856		
Corn	Planting	26	108	26	108
Fallow	No Activity	251	78	251	78
Grain	Crop in Field	668	1,314		
Hay	Crop in Field	268	0		
Orchard	Crop in Field	38	0	38	0
Sorghum	No Activity	0	0		
Vegetable	Planting	0	0	0	0
Total		6,205	8,446	892	1,276
Non-Compliance Fraction				44.67%	44.67%
Net Disturbed Acres				398	570
Net Disturbed Faction				6.42%	6.75%

When the refined agricultural disturbed land fractions are combined with the rule effectiveness rates from the 2008 PEI, the resulting acreages of undisturbed and disturbed lands with each land use category were calculated and are shown in Table 4 for the March 14, 2008, back-trajectory.

Windblown PM_{10} Emission Equations by Land Use

The windblown PM_{10} emissions of each land use category during each high wind transport hour were computed as a product of two factors: (1) a PM_{10} emission factor, in units of pounds of emission per hour per acre, specific to the land use category and 5-minute average wind velocities within each back-trajectory hour; (2) the acreage by land use category within ½ mile on either side of the back-trajectory wind path for each hour studied. The windblown PM_{10} emission factor by land use category was derived from data published in a paper by W.A. Nickling and J.A. Gillies that described the 1985 wind tunnel emission testing conducted on exposed soils in desert portions of Arizona.[3] Nickling and Gillies fitted their research data to the classical Prandtl equation for near-surface wind velocity profiles.[4] This equation relates wind speed at any height above ground to the friction velocity and roughness height specific to the soil surface. The friction velocity is the coefficient of a logarithmic equation relating wind velocity to height above the ground. The friction velocity, or slope of the wind velocity curve, is itself a function of the wind velocity. The soil roughness height is the maximum height above the soil

[3] Evaluation of Aerosol Production Potential of Type Surfaces in Arizona, prepared for Engineering-Science by W.G. Nickling and J.A. Gillies, for EPA Contract No. 68-02-380, September 1986

[4] Meteorologische Anwendung der Stromungslehre, Beitr. Phys. D. Freien Atm., vol. XIX, pp. 188-202, L. Prandtl, 1932

Table 4 Acreage by Land Use Category and Stability Status Within ½ Mile of March 14, 2008 Back-Trajectory			
Land Use Category/ Stability Status	Fraction of Land Use Category Total Acreage	March 14, 2008	
		1st Hour, Acres	2nd Hour, Acres
Vacant/Undisturbed	80.76%	617	1,963
Vacant/Disturbed	19.24%	146	464
Agriculture/Undisturbed	93.58%/93.25% (1st/2nd hr)	5,665	6,338
Agriculture/Disturbed	6.42%/6.75% (1st/2nd hr)	389	459
Construction/Undisturbed	82,99%	285	132
Construction/Disturbed	17.01%	58	27
Passive-Restricted/ Undisturbed	80.76%	0	68
Passive-Restricted/Disturbed	19.24%	0	16
Riverbed/Undisturbed	80.76%	1,878	15
Riverbed/Disturbed	19.24%	444	4
Sand & Gravel/Undisturbed	49.62%	1,255	0
Sand & Gravel/Disturbed	50.38%	297	0
Other	100.00%	1,402	1,706
	Subtotal/Undisturbed	11,102	10,222
	Subtotal/Disturbed	1,334	970
	Total	12,436	11,191

surface at which the wind velocity remains zero due to the sheltering effects of surface roughness. Research by Bagnold and others has found that wind erosion of surface soil particles commences at a minimum threshold wind velocity, and below this velocity wind erosion emissions are effectively zero.[5] Nickling and Gillies measured threshold velocities at each of 13 test sites and converted these values to equivalent threshold wind speeds measured at a 10-meter height (the typical height above ground for wind velocity sensors) using the Prandtl equation. Based on these data, Nickling and Gillies formulated emission factor equations for each of five land use categories: desert lands, riverbed (fluvial) lands, construction sites, mine tailing lands, and agricultural lands. The emission factors were developed by regression analysis as power equations using the computed friction velocity as an independent variable. These equations are presented in Table 5.

[5] The Physics of Blown Sand and Desert Dunes, R.A. Bagnold, Morrow Press, New York, 1941

Table 5 Nickling and Gillies Windblown PM_{10} Emission Factor Equations by Land Use Category	
Land Use Category	PM_{10} Emission Factor Equation, gm/cm^2-sec
Natural and disturbed desert	$F = 7.99 \times 10^{-13} u_*^{2.99}$
Fluvial sites	$F = 1.59 \times 10^{-13} u_*^{3.32}$
Construction sites	$F = 5.82 \times 10^{-15} u_*^{4.24}$
Mine tailings	$F = 1.59 \times 10^{-12} u_*^{2.93}$
Agricultural lands	$F = 1.445 \times 10^{-18} u_*^{6.026}$

The friction velocity is calculated through the Prandtl equation as a function of the roughness height and the wind velocity measured at a 10-meter height. The modified Prandtl equation used in this analysis is:

$$u_* = (u_z * k)/\ln(z/z_0)$$

where:

u_* = friction velocity, cm/sec
u_z = measured wind velocity at z height = 10-meter height, cm/sec
k = von Karman coefficient, ~= 0.4
z = height of wind measurement = 10 meters
z_0 = roughness height, cm

The roughness heights, and threshold friction velocities reported by Nickling and Gillies for each of the 13 sites tested, are shown in Table 6. This table also reports the threshold friction velocities in units of miles per hour measured at a 10-meter height for comparison with wind velocities reported at the West 43rd Avenue monitoring station.

The Nickling and Gillies study contains substantial information about each site tested. A discussion of how this information was used to select roughness heights and threshold friction velocities for undisturbed and disturbed lands within each land use category found in the exceedance day back-trajectory zones is presented in Attachment 2. The emission factor equations, together with the roughness heights and threshold friction velocities, used to compute emissions for each land use category, are shown in Table 7.

Table 6
Nickling and Gillies Windblown PM_{10} Emission Factor Constants

Location	Land Use Category	Roughness Height Z_0, cm	Threshold Friction Velocity		
			@Z_0, m/s	@10 m., m/s	@10 m., mph
Yuma, AZ	Scrub Desert	0.0163	0.386	11.33	25.3
Yuma, AZ	Disturbed Scrub Desert	0.0731	0.320	8.11	18.1
Algodones, CA	Dune Flats	0.0166	0.625	18.31	41.0
Mesa, AZ	Agricultural	0.0331	0.569	15.63	35.0
Yuma, AZ	Agricultural	0.0224	0.582	16.59	37.1
Maricopa, AZ	Agricultural	0.1255	0.578	13.82	30.9
Casa Grande, AZ	Abandoned Agricultural	0.0067	0.246	7.80	17.4
Tucson, AZ	Santa Cruz River Terrace	0.0204	0.180	5.18	11.6
Mesa, AZ	Salt River Channel	0.0100	0.218	6.68	14.9
Ajo, AZ	Mine Tailings	0.0176	0.228	6.65	14.9
Hayden, AZ	Mine Tailings	0.0141	0.172	5.11	11.4
Glendale, AZ	Construction Site	0.0301	0.530	14.69	32.9
Tucson, AZ	Construction Site	0.0181	0.251	7.26	16.2

Table 7
PM_{10} Emission Equations and Coefficients Selected to Represent Land Use Categories

Land Use Category	Roughness Height Z_o, (cm)	Threshold Friction Velocity (mph)	PM_{10} Emission Factor Equation
Vacant – Undisturbed	0.0163	25.3	$F = 7.99 \times 10^{-13} u_*^{2.99}$
Vacant – Disturbed	0.0731	18.1	$F = 7.99 \times 10^{-13} u_*^{2.99}$
Agriculture – Undisturbed	0.0067	17.4	$F = 1.445 \times 10^{-18} u_*^{6.026}$
Agriculture – Disturbed	0.0278	41.2	$F = 1.445 \times 10^{-18} u_*^{6.026}$
Construction – Undisturbed	0.0163	25.3	$F = 5.82 \times 10^{-15} u_*^{4.24}$
Construction – Disturbed	0.0241	28.2	$F = 5.82 \times 10^{-15} u_*^{4.24}$
Passive/Restricted - Undisturbed	0.0163	25.3	$F = 7.99 \times 10^{-13} u_*^{2.99}$
Passive/Restricted - Disturbed	0.0731	18.1	$F = 7.99 \times 10^{-13} u_*^{2.99}$
River Terrain - Undisturbed	0.0100	14.9	$F = 1.59 \times 10^{-13} u_*^{3.32}$
River Terrain – Disturbed	0.0204	11.6	$F = 1.59 \times 10^{-13} u_*^{3.32}$
Sand & Gravel – Undisturbed	0.0163	25.3	$F = 1.59 \times 10^{-12} u_*^{2.93}$
Sand & Gravel - Disturbed	0.0731	18.1	$F = 1.59 \times 10^{-12} u_*^{2.93}$

PM_{10} Emissions by Anthropogenic and Nonanthropogenic Sources

PM_{10} emissions were calculated for each back-trajectory hour using emission factors derived from the Nickling and Gillies data, 5-minute wind speed averages recorded at the West 43rd Avenue monitoring station, and the land use acreage along each back-trajectory computed by MAG staff.

The emission factor equations were used to compute PM_{10} emissions for each 5-minute portion of each back-trajectory hour. For each 5-minute period, the measured average wind speed was compared to the threshold friction velocity calculated at a 10-meter height to determine whether the threshold wind speed necessary to the generation of windblown PM_{10} on each land use, undisturbed and disturbed, had been exceeded. If the threshold velocity was exceeded, the appropriate Nickling and Gillies emission factor equation was used to compute PM_{10} emissions in units of gm/cm^2-sec. Emissions for each 5-minute period within each hour and within each land use category were converted to units of lb/acre-hr and then summed to produce hourly average PM_{10} emission rates per land use category. A sample calculation of the hourly average emission rate from vacant-disturbed lands using the 5-minute average wind speeds measured during the first back-trajectory hour on March 14, 2008, is presented in Table 8. The emission rates for the other land use categories and the 2nd hour were calculated using a similar methodology.

Table 8
Average Hourly PM_{10} Rate for Vacant-Disturbed Land
on 1st Hour of March 14, 2008 Back-Trajectory

5-Minute Segment	Average Wind Speed (mph)	PM_{10} Emission Rate (lb/acre-hr)
17:00-17:05	18.2	9.88
17:05-17:10	18.7	10.72
17:10-17:15	22.5	18.64
17:15-17:20	21.7	16.73
17:20-17:25	22	17.43
17:25-17:30	17.5	0.00
17:30-17:35	18.1	0.00
17:35-17:40	17.1	0.00
17:40-17:45	19.1	11.42
17:45-17:50	18.7	10.72
17:50-17:55	21	15.16
17:55-18:00	19.8	12.72
Average		10.28

The land use category emission rates were then multiplied by the acreages within each appropriate land use category to derive PM_{10} emissions for each back-trajectory hour by land use category. A sample land use category emission calculation for the first back-trajectory of March 14, 2008, is presented in Table 9. The appearance of zeros as PM_{10} emission rates resulted when

none of the 5-minute wind speed averages exceeded the threshold friction velocity for that land use category.

Table 9
Land Use Category PM_{10} Emissions for 1st Back-Trajectory Hour of March 14, 2008

Land Use Category	PM_{10} Emission Factor (lb/ac-hr)	Area Within Back-Trajectory Zone (ac)	PM_{10} Emissions (lb/hr)
Vacant/Undisturbed	0.00	616.8	0
Vacant/Disturbed	3.78	145.9	1,501
Agriculture/Undisturbed	0.00	5,665.4	0
Agriculture/Disturbed	0.00	388.8	0
Construction/Undisturbed	0.00	284.7	0
Construction/Disturbed	0.00	58.4	277
Passive-Restricted/Undisturbed	0.00	0.0	0
Passive-Restricted/Disturbed	3.78	0.0	0
Riverbed/Undisturbed	2.18	1,877.8	8,234
Riverbed/Disturbed	3.17	444.2	2,408
Sand & Gravel/Undisturbed	0.00	1,255.1	0
Sand & Gravel/Disturbed	3.78	296.9	3,053
Other	0.00	1,402.2	0
Total		12,436.2	15,474

EPA guidance on exceptional event determinations requires the analysis of emissions from anthropogenic sources.[6] The land use categories shown in Table 9 were grouped within anthropogenic and nonanthropogenic categories, and the hourly PM_{10} emissions within each of these groupings were summed to assess the fractional contribution of anthropogenic and nonanthropogenic sources to peak hourly PM_{10} concentrations measured on exceedance days at the West 43rd Avenue site. The groupings of anthropogenic and nonanthropogenic land use categories are shown in Table 10.

The PM_{10} emissions for each of the two back-trajectory hours on each exceedance day were summed together to calculate total emissions over each exceedance day back-trajectory by land use category. These land use category emissions were then grouped by anthropogenic and nonanthropogenic categories to assess the relative contribution of nonanthropogenic sources to exceedances recorded at the West 43rd Avenue monitoring station during 2008. A summary of the results of these calculations for the March 14, 2008, exceedance day is presented in Table 11.

[6] Federal Register/ Vol. l72, No. 55, Thursday, March 22,2007/ Rules and Regulations, Environmental Protection Agency, 40 CFR Parts 50 and 51, Treatment of Data Influenced by Exceptional Events, Final Rule.

Table 10 Anthropogenic and Nonanthropogenic Land Use Categories		
Land Use Category	Anthropogenic	Nonanthropogenic
Vacant/Undisturbed		X
Vacant/Disturbed	X	
Agriculture/Undisturbed	X	
Agriculture/Disturbed	X	
Construction/Undisturbed	X	
Construction/Disturbed	X	
Passive-Restricted/Undisturbed		X
Passive-Restricted/Disturbed	X	
Riverbed/Undisturbed		X
Riverbed/Disturbed	X	
Sand & Gravel/Undisturbed	X	
Sand & Gravel/Disturbed	X	
Other	X	

Table 11 Anthropogenic and Nonanthropogenic Windblown PM_{10} Emissions From West 43rd Avenue Monitor Back-Trajectory Lands on March 14, 2008			
	PM_{10} Emissions (lb)		% of
Land Use Category	Anthropogenic	Nonanthropogenic	Anthropogenic
Vacant/Undisturbed	-	0	
Vacant/Disturbed	4,649	-	43.9%
Agriculture/Undisturbed	0	-	0.0%
Agriculture/Disturbed	0	-	0.0%
Construction/Undisturbed	0	-	0.0%
Construction/Disturbed	359	-	3.4%
Passive-Restricted/Undisturbed	-	0	
Passive-Restricted/Disturbed	110	-	1.0%
Riverbed/Undisturbed	-	8,284	
Riverbed/Disturbed	2,424	-	22.9%
Sand & Gravel/Undisturbed	0	-	0.0%
Sand & Gravel/Disturbed	3,053	-	28.8%
Other	0	-	
Total	10,595	8,284	
% of Grand Total	56.1%	43.9%	

Attachment 1

Analysis of Agricultural Crop Coverage and Cultivation Calendars in the Salt River Area

Table 1 Disturbed and Undisturbed Agricultural Crop Acreage for One-Mile Swath of Trajectory (1/2 mile each side)

	3/14/2008		4/30/2008		5/21/2008		6/4/2008	
	1st HR	2nd HR	1st HR	2nd HR	1st HR	2nd HR	1st HR	2nd HR
Disturbed Agriculture (Acre)								
COTTON	577	1,090	0	0	0	0	0	0
GRAIN	0	0	0	0	0	0	317	0
Disturbed Total	**577**	**1,090**	**0**	**0**	**0**	**0**	**317**	**0**
Undisturbed Agriculture (Acre)								
ALFALFA	4,377	5,856	499	0	623	0	692	0
CORN	26	108	0	0	0	0	0	0
COTTON	0	0	0	0	0	0		
FALLOW	251	78	0	0	34	0	52	0
GRAIN	668	1,314	0	0	132	0	0	0
HAY	268	0	0	0	0	0	93	0
ORCHARD	38	0	0	0	0	0	0	0
SORGHUM	0	0	0	0	0	0	0	0
VEGETABLE	0	0	0	0	0	0	0	0
Undisturbed Total	**5,628**	**7,356**	**499**	**0**	**789**	**0**	**836**	**0**

Agricultural Area Data Source: Arizona Cotton Research and Protection Council (ACRPC) GIS Data.

Crop Calendar for Maricopa County												
(Usual Field Activity by Month and Crop)												
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Alfalfa[1]												
Corn - Silage[1]												
Cotton[1]												
Grain[2]												
Orchard[3]												
Hay[2]												
Sorghum - Grain[3]												
Vegetables[1]												
Days of Interest			**3/14/08**	**4/30/08**	**5/21/08**	**6/4/08**						

Field Activities Legend

- Tilling =
- Planting =
- Irrigated =
- Crop in Field =
- Harvest =
- No Activity =

Notes

1. Salt River PM_{10} TSD (2003 meetings with Maricopa County Farm Bureau and U of A Cooperative Extension).

2. "Usual Planting and Harvesting Dates for U.S. Crops," Agricultural Handbook Number 628, USDA, ARS, NASS, December 1997.

3. Communication with Maricopa County Farm Bureau, May 11, 2010. In 2008, sorghum was grown for grain instead of silage. Common practice is to plant sorghum in July in the same field that corn had been harvested from in July, with little tillage.

4. Cotton fields must be plowed down by February 15th and cannot be irrigated until March 15th as required by Pink Bollworm Program.

5. Planting - fields are either irrigated prior to planting or shortly after planting.

Attachment 2

Use of Nickling and Gillies Test Data in Characterizing Emission Potential of Salt River Area Lands

The Nickling and Gillies study of windblown PM_{10} emissions from Arizona lands under different use patterns constitutes the best available information on the emission potential of undeveloped lands upwind of the W. 43rd Avenue monitoring station.[7] The challenge in using the data was to best match the surface soil conditions found at the 13 sampling sites in 1985 with conditions existing at lands upwind of the monitoring station in 2008. This appendix discusses how these matches were developed.

Critical Parameters

As discussed in the report, Nickling and Gillies fit their field data to the classical Prandtl wind velocity equation and a series of power equations relating PM_{10} emissions to wind velocity. The Prandtl equation assumes a logarithmic relationship between wind velocity and the height above ground surface at which the wind velocity is measured. The coefficient linking these two parameters is referred to as the friction velocity (u_*). Nickling and Gillies developed PM_{10} emission factor equations for five different land use categories that use the friction velocity as the sole independent variable. A second Prandtl equation coefficient, which dictates the magnitude of the friction velocity, is the soil roughness height (Zo) at the point of wind velocity measurement. The soil roughness height is calculated from wind velocity profile measurements and represents the height below which the wind velocity is effectively zero due to the sheltering effects of soil surface elements.

The final parameter of significance in computing windblown PM_{10} emission rates is the threshold friction velocity. This is the velocity above which shear forces on the soil surface commence the saltating, or bouncing, movement of sand particles that is the primary mechanism for the dislodgement and entrainment into the air of fine soil particles. At wind speeds below the threshold friction velocity, no windblown PM_{10} emissions are generated.

Land Use Categories Tested

Nickling and Gillies conducted wind tunnel emission studies on five categories of land use:

- Desert lands,
- Fluvial, or riverbed, lands,
- Construction sites,
- Mine tailing piles, and
- Agricultural lands.

[7] Evaluation of Aerosol Production Potential of Type Surfaces in Arizona, prepared for Engineering-Science by W.G. Nickling and J.A. Gillies, for EPA Contract No. 68-02-380, September 1986.

Of the 13 sites tested among these land use categories, most were fairly disturbed. Only two of the test sites were relatively undisturbed: a scrub desert site near Yuma, AZ, and an abandoned farm near Casa Grande, AZ. The lack of test data from undisturbed sites offered one of the more significant challenges in using Nickling and Gillies test data to represent disturbed and undisturbed portions of lands upwind of the W. 43rd Avenue station.

Desert Lands

One of the more expansive land use categories, in terms of acres of undeveloped land along wind back-trajectories impacting the monitoring station, is vacant lands. This category includes lands that are not in productive use, but which are partially disturbed by human trespass. Much of the land within this category constitutes open desert. As a result, the surface soil characteristics of lands within this category were assumed to be very similar to those in the "desert" category tested by Nickling and Gillies. Nickling and Gillies tested two desert soil sites near Yuma, AZ, one of which had been disturbed by off-road vehicle traffic and one of which was relatively undisturbed by anthropogenic activities.

The undisturbed site was located on federal land under the control of the U.S. Bureau of Land Management. The soil surface was crusted, but the crust was extremely delicate and broke with the slightest pressure. Saltating particles easily broke the crust once the wind tunnel tests were initiated. The soil surface contained widely scattered pebble deposits, and was sparsely vegetated with low grasses. This structure is very representative of undisturbed desert soils in the Salt River area.

The disturbed site was located within the University of Arizona's Agricultural Research Station at Yuma. The surface soil was very loose from vehicle disturbance and also sparsely vegetated with low grasses. Data from these two sites were used to represent undisturbed and disturbed vacant lands in the Salt River area, respectively.

A second related land use category identified in the back-trajectory zones upwind of the W. 43rd Avenue monitoring station was restricted-access open areas. Access to these lands is limited by fencing, barriers, active enforcement, or other means. Lands that fall within this category include parks, military lands, national forest land, and privately owned fenced lands. Because the surface soils on these lands are essentially desert soils, the soil characteristics of these lands were also represented by the desert soils test data collected by Nickling and Gillies.

Finally, Nickling and Gillies also conducted testing of windblown emissions from sand dunes in the Algodones Dunes area near Brawley, CA. Because there are no sand dunes of significance within the Salt River area, these test data were not used to represent surface soil conditions for any land use category in this analysis.

Fluvial Sites

Fluvial, or riverbed, lands typically contain higher concentrations of fine silts than alluvial desert lands, and are capable of higher PM_{10} emission rates at lower threshold friction velocities as a result. Nickling and Gillies tested two riverbed sites—one on the Salt River channel near Mesa, AZ, and a second on the Santa Cruz River channel near Tucson, AZ.

Both riverbed sites were somewhat disturbed. The Salt River test site was located in the river channel among large silt lenses in an area heavily disturbed by vehicle traffic. The Santa Cruz River site, however, was located on a terrace above the main channel and was moderately disturbed. The soil in this latter site also contained small gravel particles that provided limited wind sheltering to exposed silt.

On the basis of the descriptions in the Nickling and Gillies report, the Salt River test site data were selected to represent disturbed riverbed soils, and the Santa Cruz River data were used to represent undisturbed soils. Because of the higher silt content of the fluvial soils, the characteristics of undisturbed desert soils were not considered to be similar to those of undisturbed riverbed sites.

Construction Sites

Two construction sites were tested by Nickling and Gillies, one in Glendale, AZ, and a second in Tucson, AZ. The Glendale site was being developed by the west campus of the Arizona State University, and had been severely disturbed by earthmoving equipment, but had also been heavily watered as part of a dust control operation. During testing, the soil surface was found to have formed a crust from water application that increased the threshold friction velocity and reduced the windblown PM_{10} emission rate. Data from this site were used to represent undisturbed construction sites in the Salt River area.

The Tucson site was located on the south side of I-10, where a major motel complex was being constructed. The site had been leveled by earthmoving equipment and the surface soil was heavily pulverized. The soil surface at this site contained more loose particles than the Glendale site, apparently as a result of less dust control watering and more recent vehicle disturbance. Data collected at this site, as a result, were used to represent disturbed construction lands along the back-trajectories upwind of the W. 43rd Avenue monitor.

Mine Tailings

Two mine tailings piles were tested by Nickling and Gillies. Emissions from these structures were of interest because of the high silt content of the finely ground mill waste, and the lack of any sheltering vegetation or larger particles on the surfaces of these piles. One of the piles tested was on the property of the Phelps-Dodge Company in Ajo, AZ, and the second was located near Hayden, AZ.

The Ajo tailings had very little cohesive structure on the surface, resulting in high PM_{10} emissions rates at low threshold velocities. The Hayden tailings possessed greater cementation and greater variability in particle size, but also contained a higher silt content than the Ajo tailings. The higher silt content appeared to provide a slight crust when the tailings surfaces were watered and then allowed to dry.

The very fine and uniform particle sizes of soils in these tailing piles are unlike any soils found in the Salt River area. The tailing piles were formed through the pulverization of quarried rock to release precious minerals, especially copper, through chemical extraction. No soils or rock in the Salt River area are processed to this degree, or in any other fashion to produce such fine, noncohesive material. As a result, the test data from these sites were not used to represent any of the undeveloped lands in the Salt River area.

The mining of riverbed material for use as sand and gravel in the construction industry is a significant land use in the Salt River area. In this process, however, silt is an undesirable by-product, and material processing operations are designed to produce a minimum of this fine material. Much of the exposed surface at sand and gravel mines capable of generating windblown PM_{10} is actually desert soil upon which processing operations are located. As a result, the surface soil characteristics of these sites were represented by the disturbed and undisturbed desert land data collected by Nickling and Gillies.

Agricultural Lands

Nickling and Gillies conducted emissions tests on three active and one abandoned farm site in 1985. The active sites were located near Mesa, Yuma, and Maricopa, AZ, and the abandoned farm site was located near Casa Grande, AZ. Soil conditions related to windblown emissions at the farms in the Mesa and Yuma areas were found to be relatively similar. These sites were characterized as having been recently tilled and awaiting planting. No dust control measures had been applied at either site, and the soil surface was somewhat cloddy from the recent plowing. The active farming site at Maricopa was found to have been recently tilled while the soil had been relatively damp, resulting in large, dried clods on the soil surface that were heavily crusted and responsible for a relatively high surface roughness. As a result, the test data from the Maricopa site were substantially different from data collected at the other two active sites. Because of this difference, and the unique conditions found at the Maricopa site, the data from this site were not used to represent soil conditions on agricultural lands in the Salt River area. Instead, the data collected at Mesa and Yuma were averaged together to represent these lands.

The abandoned farm land near Casa Grande, AZ, was also unusual compared to lands found in the Salt River area. The Casa Grande site had not been cultivated for a number of years, and the soil surface showed significance evidence of wind erosion and a return to desert conditions. Additionally, however, lands in this portion of Pinal County are known to have high alkaline contents—hence their abandonment from cultivation—and high windblown dust potential. Because of these unique properties, data collected at this site by Nickling and Gillies were not used to represent any land use category in the Salt River area.

Separate analyses of crop coverages and cultivation calendars in the Salt River area have found that significant fractions of agricultural lands are covered by maturing crops during the high wind season in the spring of each year. As a result, soil surface characteristics for lands with cover crops—such as alfalfa, corn, and grains—were estimated using classical protocols. The roughness height for these lands was calculated to be $1/30^{th}$ of the height of the lowest continuous crop, which is 3 inches for freshly mowed alfalfa, resulting in a roughness height of 0.254 cm. The friction velocity for vegetated fields was assumed to be the same as that measured on disturbed fields by Nickling and Gillies. The resulting calculated threshold friction velocity of 34.1 mph at a 10-meter height for undisturbed fields was found to be less than the value of 41.2 mph measured on disturbed fields, meaning that this approach resulted in a conservatively low calculated value that would not underestimate the emissions from undisturbed fields.

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Appendix P
Event Control Measures Report

APPENDIX P

EVENT CONTROL MEASURES REPORT

PM_{10} Control Measures Reporting Form
High Wind Exceptional Event Demonstration

Date of Flagged Event: March 14, 2008

PM_{10} Planning Area: Maricopa County PM_{10} Nonattainment Area

Exceeding Monitor(s): West 43rd Ave.

AQI/High Wind/Dust Forecast (rolling three-day forecast) issued?

Yes	No
X	

Type: PM_{10} Health Watch (issued the day prior)

In the spaces below, please provide information about the 72-hour period preceding the event, the day of the event, and the 72-hour period following the event. For a list of control measures for the planning area, see back of this form. Account for minimum 2-mile area around exceeding monitor(s). Please attach additional information if necessary.

Complaints:
- March 12, 2008: One (1) complaint received re: "construction" on vacant lot; complaint inspection determined that the activity in question was agricultural in nature (i.e., manure was being spread over a earlier-planted field crop).
- March 13, 2008: One (1) complaint re: construction dust. Inspection did not observe any violation of rules;
- March 13, 2008: One (1) complaint re: smoke. Inspection did not observe any emissions or violation of rules.

Inspections:
- March 12, 2008: Three (3) inspections of dust control permits; no evidence of any violations at two (2) of these sites; NOV # 712842 issued at third site.
- March 14, 2008: One (1) inspection of dust control permit; no violations of Rule 310 observed.
- March 17, 2008: Two (2) inspections of dust control permits; no violations of Rule 310 observed at either site.

Notices or Enforcement Actions:
- March 12, 2008: Issued a 60-day letter for an unstable vacant lot under Rule 310.01.
- March 12, 2008: Issued a Notice of Violation (NOV) # 712842 for unsuitable track-out control device (returned to compliance 4/24/08).

Regulating Agency: Maricopa County Air Quality Department

Information Supplied By: Jo Crumbaker, Planning & Analysis Division Manager

Date Completed: August 6, 2010

Measures included in the Maricopa County PM_{10} Five Percent Plan:
(committed measure numbers in parentheses)

1. Extensive dust control training program (2).
2. Dust managers/Coordinators at earthmoving sites < than or equal to 5 acres (3,16).
3. Increase proactive Rule 310 and 316 inspections (9, 10, 44).
4. Strengthen Rule 310 to promote continuous compliance (36 thru 38, 28).
5. Conduct nighttime and weekend inspections (8).
6. Ban leaf blowers from blowing debris into streets (21).
7. Prohibit use of leaf blowers on unstabilized surfaces (45).
8. Implement a leaf blower outreach program (22).
9. Ban ATV use on high pollution advisory days (23).
10. Pave or stabilize existing unpaved parking lots (25).
11. Pave or stabilize unpaved road shoulders (28).
12. Strengthen and increase enforcement of Rule 310.01 for vacant lots (31, 32)
13. Recover costs for stabilizing vacant lots (33).
14. Restrict and enforce vehicle use/parking on vacant lots (31, 32).
15. Increase fines for open burning (34).
16. Restrict use of outdoor fireplaces/pits/ambience fireplaces (35).
17. Other wood burning restrictions in SB 1552 (47, 48).
18. Repave or overlay paved roads with rubberized asphalt (53).

Emission Source Categories:
1. Agriculture – Agricultural Best Management Practices (AgBMP) Program.
2. Point sources – Permit Conditions (stack, fugitive, and area source emissions).
3. Construction – Rules 310 and 310.01; sand and gravel – Rule 316.
4. Windblown, area sources – mobile, roadway, vacant lots, fires, et al.

Appendix Q
Event Preliminary Assessment & Notification

Preliminary Notification of Exceptional Event
Submitted June 30, 2009

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Janice K. Brewer
Governor

Benjamin H. Grumbles
Director

June 30, 2009

Electronic Submittal (to be followed by U.S. Mail)

Deborah Jordan, Air Division Director
U.S. Environmental Protection Agency, Region IX
Air-1
75 Hawthorne Street
San Francisco, CA 94105

SUBJECT: Submittal of Preliminary Documenation of Exceptional/Natural Events in Arizona, 2008 and Request for Concurrence

Dear Ms. Jordan:

The purpose of this letter is to notify the Environmental Protection Agency (EPA) of information regarding exceptional events that resulted in exceedances of the 24-hour PM_{10} National Ambient Air Quality Standards (NAAQS), or the Limited Maintenance Plan threshold concentration, throughout the State of Arizona during 2008. After preliminary investigations of the unusual nature of the exceedances, the Arizona Department of Environmental Quality (ADEQ) is has determined that the aforementioned sample data are exceptional events in the Air Quality Subsystem (AQS) database. The events that have been flagged in AQS, and for which preliminary documentation is being submitted with this letter, are listed in Table 1 (enclosed).

Attached to this letter are the preliminary assessment reports or documentation for the exceptional events (Enclosure 1 binder). These events qualify for flagging under ADEQ's Air Quality Natural and Exceptional Events Policy - Policy Number 2009.001, Rev 002 (NEEP). This policy was revised on June 22, 2007, after a multiple month stakeholder process and transmitted to you on June 23, 2007. These analyses rely upon the "Technical Criteria Document for Determination of Natural and Exception Event" finalized on December 12, 2005. ADEQ concludes it is important to exclude these readings because of their exceptional causes. ADEQ will be requesting EPA to provide written concurrence with the flagging determinations after the final demonstrations are submitted in the near future. ADEQ is working with your staff to add certain components to our assessment reports to improve clarity of the reports. These should be finalized in the next few months.

Enclosure 2 (CD) is a compact disc containing an electronic copy of the exceptional/natural event analyses in Enclosure 1. Those who are being copied on this letter will only receive Enclosures 2.

All of these events have been made available for informal public review and comment at stakeholder meetings, consistent with the requirement in our NEEP to hold such meetings prior to finalizing the attached assessments. Please note that prior to submittal of the final documentation for these events, the final demonstration reports will be made available for a formal 30-day public review and comment period as required by the Federal Exceptional Events Rule (EER).

If you have any questions related to this request, please do not hesitate to contact me at (602) 771-2308 or Steven Peplau, Air Quality Assessment Manager, at (602) 771-2274.

Sincerely,

Nancy C. Wrona, Director
Air Quality Division

Enclosures (2)

NCW:AJ:mbl

Cc: Colleen McKaughan, USEPA, Region IX (w/Enclosure 2)
John Kelley, USEPA, Region IX (w/Enclosure 2)
Coleman Owen, USEPA, Region IX (w/Enclosure 2)
Lawrence Odle, Director, MCAQD (w/Enclosure 2)
Don Gabrielson, PCAQCD (w/Enclsoure 2)
Mack Luckie, YMPO (w/Enclosure 2)

INDEX OF 2008 EXCEPTIONAL EVENTS
PRELIMINARY DOCUMENTATION

TAB	Agency *	Date	Monitor (Operator/Type)	AQS ID **	24-hr Avg PM_{10} (or $PM_{2.5}$)	Maximum Winds	Nature of Event
1	ADEQ	1/1/2008	Nogales Post Office PM2.5 (ADEQ/BAM)	04-023-0004	52	Calm	Smoke from Mexico
	ADEQ	1/1/2008	Nogales Post Office (PM2.5 FRM primary)	04-023-0004	47	Calm	Smoke from Mexico
	ADEQ	1/1/2008	Nogales Post Office (PM2.5 FRM collocated)	04-023-0004	47	Calm	Smoke from Mexico
2	ADEQ	1/26/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	204	Calm	Dust from Mexico
3	ADEQ	2/27/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	166	Calm	Dust from Mexico
4	MCAQD	3/2/2008	Buckeye (Maricopa Co. [MC]/TEOM)	04-013-4011	160	36 mph	Frontal system passage
	ADEQ	3/2/2008	Yuma Courthouse (ADEQ/TEOM)	04-027-0004	161	46 mph	Frontal system passage
5	MCAQD	3/14/2008	West 43rd Ave (MC/TEOM)	04-013-4009	251	43 mph	Low pressure trough
6	MCAQD	4/16/2008	West 43rd Ave (MC/TEOM)	04-013-4009	155	28 mph	Frontal system passage
7	MCAQD	4/30/2008	West 43rd Ave (MC/TEOM)	04-013-4009	173	41 mph	Frontal system passage
8	ADEQ	5/12/2008	Paul Spur (ADEQ/FRM - Primary)	04-003-0011 (1)	160	34 mph	Frontal system passage
	ADEQ	5/12/2008	Paul Spur (ADEQ/FRM - Collocated)	04-003-0011 (2)	156	34 mph	Frontal system passage
9	ADEQ	5/18/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	169	Calm	Dust from Mexico
10	MCAQD	5/21/2008	West 43rd Ave (MC/TEOM)	04-013-4009	279	37 mph	Frontal system passage
	ADEQ	5/21/2008	Yuma Courthouse (ADEQ/TEOM)	04-027-0004	164	37 mph	Frontal system passage
11	ADEQ	5/22/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	217	49 mph	Frontal system passage
12	MCAQD	6/4/2008	Yuma Courthouse (ADEQ/TEOM)	04-027-0004	386	40 mph	Frontal system passage
	MCAQD	6/4/2008	Buckeye (Maricopa Co. [MC]/TEOM)	04-013-4011	204	40 mph	Frontal system passage
	MCAQD	6/4/2008	West 43rd Ave (MC/TEOM)	04-013-4009	194	40 mph	Frontal system passage
	ADEQ	6/4/2008	Coyote Lakes (MC/TEOM)	04-013-4014	187	40 mph	Frontal system passage
13	MCAQD	7/1/2008	Buckeye (Maricopa Co. [MC]/TEOM)	04-013-4011	172	49 mph	Monsoon Storm
14	MCAQD	7/4/2008	Buckeye (Maricopa Co. [MC]/TEOM)	04-013-4011	223	39 mph	Monsoon Storm
15	MCAQD	10/11/2008	South Phoenix (Maricopa Co. [MC]/TEOM)	04-013-4003	162	34 mph	Frontal system passage
16	MCAQD	10/22/2008	Coyote Lakes (MC/TEOM)	04-013-4014	168	35 mph	Strong pressure gradient
17	ADEQ	10/26/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	157	Calm	International transport
18	PDEQ	10/27/2008	Santa Clara (R&P 2000)	04-019-1026	173	46 mph	Strong pressure gradient
19	ADEQ	10/31/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	159	Calm	International transport
	ADEQ	11/1/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	234	Calm	International transport
20	MCAQD	11/7/2008	Durango (Maricopa Co. [MC]/TEOM)	04-013-9812	249	Calm	Ag-related exceedance (cannot flag)
21	ADEQ	11/8/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	168	Calm	International transport

Public Comment Period
TBA

INDEX OF 2008 EXCEPTIONAL EVENTS
PRELIMINARY DOCUMENTATION

TAB	Agency *	Date	Monitor (Operator/Type)	AQS ID **	24-hr Avg PM_{10} (or $PM_{2.5}$)	Maximum Winds	Nature of Event
21	ADEQ	11/8/2008	Nogales Post Office (PM10 FRM)	04-023-0004	??	Calm	International transport
22	MCAQD	11/9/2008	Durango (Maricopa Co. [MC]/TEOM)	04-013-9812	170	40 mph	High winds
	MCAQD	11/9/2008	South Phoenix (Maricopa Co. [MC]/TEOM)	04-013-4003	230	40 mph	High winds
	MCAQD	11/9/2008	West 43rd Ave (MC/TEOM)	04-013-4009	248	40 mph	High winds
	ADEQ	11/9/2008	Yuma Courthouse (ADEQ/TEOM)	04-027-0004	252	47 mph	High winds
23	ADEQ	11/16/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	171	Calm	International transport
	ADEQ	11/17/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	206	Calm	International transport
24	ADEQ	11/20/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	161	Calm	International transport
25	ADEQ	11/22/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	179	Calm	International transport
26	ADEQ	12/20/2008	Nogales Post Office PM2.5 FRM Primary	04-023-0004	36	Calm	International transport
	ADEQ	12/20/2008	Nogales Post Office PM2.5 FRM Collocated	04-023-0004	37	Calm	International transport
27	ADEQ	12/31/2008	Nogales Post Office (ADEQ/BAM)	04-023-0004	156	Calm	International transport

* Agency: ADEQ – Arizona Department of Environmental Quality
MCAQD – Maricopa County Air Quality Department
PCAQCD – Pinal County Air Quality Control District

** EPA Air Quality System Identification Number

{LMP Flag} – Value below NAAQS flagged for LMP eligibility

Type Abbreviations: FRM – Federal Reference Method Filter Based Monitor
BAM – Beta-Attenuation Mass Monitor (Continuous monitor)
TEOM – Tapered Element Oscillating Microbalance Monitor (Continuous monitor).

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov
Janice K. Brewer
Governor
Benjamin H. Grumbles
Director

Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM_{10}) Concentration Events in the Phoenix Area on March 14, 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 Thursday, March 13, 2008, in response to a tightening pressure gradient ahead of a low pressure system and associated cold front approaching Arizona from the west, ADEQ air quality forecasters issued the Maricopa County Dust Control Action Forecast which called for a moderate risk of wind-blown dust for Friday, March 14th. In addition, ADEQ air quality forecasters issued a PM_{10} Health Watch for March 14, 2008, due to the possibility of strong winds and blowing dust throughout the Maricopa County area. The forecasts and advisories satisfy the requirement in 40 CFR 51.930(a)(1).

The forecast for March 14th called for strong winds capable of producing wind-blown dust. This potential wind-blown dust event equated to a moderate risk of exceeding the PM_{10} National Ambient Air Quality Standards (NAAQS) in Maricopa County. During the late morning / early afternoon hours of March 14th, strong, gusty winds moved into the Phoenix Metro area from the west. 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 PM_{10} Areas" (see "References").

Strong winds were observed throughout portions of Maricopa County and the Phoenix Metro area on March 14, 2008. The initialization of the 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). Gusty winds greater than 20 and 30 mph were reported between the 10:00 a.m. and 5:00 p.m. hours at several Phoenix area monitoring locations. In addition, Phoenix Goodyear Airport reported reduced visibility and a wind gust of 43 mph during the event.

This significant event brought elevated ambient concentrations of PM_{10} to the Phoenix area. Due to the spatial variability of PM sources both within and outside of the Phoenix urban core, the PM_{10} 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 PM_{10} 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 43rd Ave (MC/TEOM)	**04-013-4009***	**251**	**1286**	**1300**	**RJ**
South Phoenix (MC/TEOM)	**04-013-4003***	**119**	**461**	**1300**	None
Durango Complex (MC/TEOM)	**04-013-9812***	**92**	**310**	**1300**	None
Greenwood (MC/TEOM)	**04-013-3010***	**71**	**151**	**1300**	None
Higley (MC/TEOM)	**04-013-4006***	**51**	**140**	**0700**	None
West Phoenix (MC/TEOM)	**04-013-0019***	**57**	**126**	**1300**	None
Central Phoenix (MC/TEOM)	**04-013-3002***	**69**	**231**	**1300**	None
JLG Supersite (ADEQ/TEOM)	**04-013-9997***	**40**	**62**	**1300**	None
Coyote Lakes (MC/TEOM)	**04-013-4014***	**47**	**107**	**0700**	None

* EPA Air Quality System Identification Number
** 24-hr PM_{10} 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).

NWS-Goodyear Airport

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	0	0		0	0	N/A
2	0	0		0	0	N/A
3	0	0		0	0	N/A
4	0	0		0	0	N/A
5	0	0		0	0	N/A
6	0	0		0	0	N/A
7	0	0		0	0	N/A
8	61	60		9	9	W
9	66	40		9	9	SW
10	70	30		7	7	W
11	73	20		6	6	SW
12	82	15		14	29	W
1	86	10		18	34	W
2	86	15		25	43	W
3	84	20		14	23	W
4	84	20		17	17	SW
5	82	40		17	17	SW
6	81	40		11	11	W
7	75	40		6	6	*VR
8	0	0		0	0	N/A
9	70	20		11	11	SW
10	0	0		0	0	N/A
11	0	0		0	0	N/A
12	0	0		0	0	N/A

NWS-Glendale Airport

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	0	0		0	0	N/A
2	0	0		0	0	N/A
3	0	0		0	0	N/A
4	0	0		0	0	N/A
5	0	0		0	0	N/A
6	0	0		0	0	N/A
7	0	0		0	0	N/A
8	0	0		0	0	N/A
9	0	0		0	0	N/A
10	70	20		15	23	SW
11	73	20		16	23	SW
12	79	20		18	23	W
1	81	20		20	26	W
2	82	20		21	26	W
3	82	20		20	25	W
4	81	20		14	23	SW
5	82	20		11	21	W
6	81	20		11	21	SW
7	75	20		5	5	W
8	0	0		0	0	N/A
9	0	0		0	0	N/A
10	0	0		0	0	N/A
11	0	0		0	0	N/A
12	0	0		0	0	N/A

NWS-Phx Sky Harbor

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	63	10		6	6	E
2	62	10		6	6	E
3	60	10		6	6	E
4	59	10		7	7	E
5	59	10		5	5	E
6	57	10		8	8	E
7	57	10		0	0	N
8	61	10		0	0	N
9	65	10		6	6	E
10	70	10		5	5	SW
11	77	10		11	20	W
12	79	10		21	29	W
1	81	10		21	30	W
2	82	10		25	30	W
3	82	10		23	23	W
4	82	10		17	24	W
5	81	10		13	23	W
6	80	10		14	14	W
7	77	10		7	7	W
8	76	10		9	9	SW
9	72	10		11	11	SW
10	73	10		10	10	W
11	69	10		10	10	W
12	67	10		7	7	W

Event Contrib. Analysis

Hourly PM_{10} Conc. (µg/m^3)

MONITORS:

1-W43RD

Hr	1
1	26.1
2	28.9
3	22.2
4	28.4
5	64.6
6	155
7	146
8	134
9	188
10	329
11	355
12	1052
1	1270
2	1286
3	374
4	87
5	57.1
6	23.6
7	37.1
8	40.8
9	86.4
10	93.1
11	73.4
12	72.9

24-Hr. Avg PM_{10}

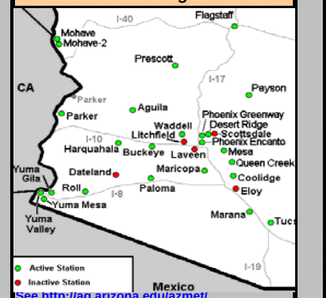
Monitor:	with Event	w/o Event
1-W43RD	251	69

> NAAQS | < NAAQS

Pink=Event Contrib.

Conclusion: As shown above, the PM_{10} concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).

AZMET Monitoring Locations



See http://ag.arizona.edu/azmet/

wnd @3m agl / Dir corrected to true north

HIGHLIGHTING	Col.	Parameter
Max Wind	T(F)	Temp. (Deg. F.)
> 15 mph	RH	Rel Humidity %
>25 mph	Rn	Rain (Inches/hr)
HR - Time (End)	Spd	Avg Speed mph
A.M.	Max	Max Speed mph
P.M.	Dir	Wind Dir. (from)

Figure 1. Key Data for Event of March 14, 2008

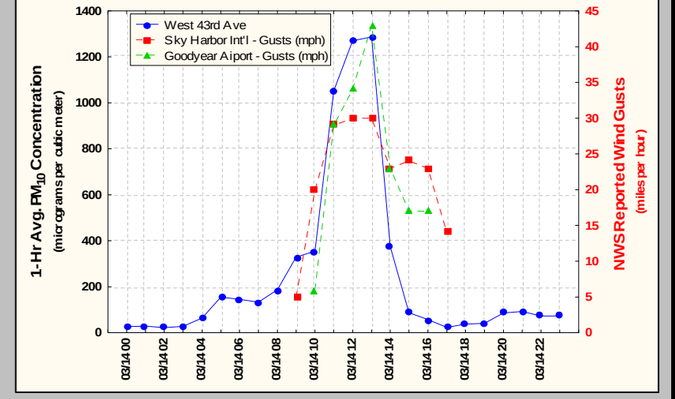
PHX WINDS	KEY	PM10 PLOT
CEN. AZ WINDS		SAT IMAGES
SO AZ WINDS		PHX VIS. CAMERAS

SUMMARY OF EVENT

A low pressure system caused strong west-southwesterly winds on 3/14 throughout portions of the valley. Sky Harbor Int'l Airport reported gusts to 30 m.p.h. while Goodyear Airport had gusts as high as 43 m.p.h. These gusty winds coincided with elevated PM10 levels at West 43rd Ave.

Selected PM_{10} Concentrations - March 14, 2008

(showing arrival of high winds/blowing dust)



PARKER

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	68	24	-	4	11	S
2	71	20	-	11	18	W
3	69	22	-	8	17	SW
4	65	29	-	4	8	SE
5	67	31	-	8	22	W
6	68	34	-	16	26	NW
7	66	36	-	9	17	NW
8	67	36	-	13	21	NW
9	68	37	-	10	20	NW
10	70	33	-	12	18	NW
11	73	27	-	10	18	NW
12	76	24	-	5	11	N
1	78	20	-	4	9	W
2	80	16	-	9	18	NW
3	80	14	-	13	18	NW
4	80	14	-	13	20	NW
5	79	14	-	13	19	NW
6	76	13	-	11	17	NW
7	72	13	-	9	13	NW
8	69	13	-	11	15	NW
9	68	13	-	11	16	NW
10	67	13	-	17	27	NW
11	66	14	-	19	26	NW
12	64	15	-	20	27	NW

BUCKEYE

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	62	36	-	2	5	W
2	61	36	-	4	7	NW
3	59	38	-	4	6	NW
4	56	39	-	4	5	N
5	54	44	-	4	6	N
6	54	45	-	4	7	N
7	51	53	-	3	6	NW
8	55	51	-	4	6	N
9	60	57	-	5	9	W
10	67	39	-	9	13	W
11	72	30	-	11	22	W
12	74	21	-	16	24	NW
1	76	16	-	17	25	NW
2	77	20	-	13	22	W
3	77	24	-	10	18	W
4	77	24	-	9	17	W
5	77	24	-	6	15	W
6	76	19	-	7	12	NW
7	71	22	-	4	7	NW
8	66	25	-	4	7	W
9	60	32	-	4	7	W
10	63	27	-	4	7	NW
11	58	30	-	3	5	N
12	54	39	-	2	3	NW

CENTRAL PHOENIX

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	58	55	-	1	3	E
2	56	57	-	1	2	E
3	55	61	-	1	2	E
4	53	65	-	1	3	E
5	53	60	-	0	2	NE
6	51	64	-	0	2	NE
7	51	59	-	1	2	E
8	57	46	-	1	3	E
9	65	35	-	1	3	SE
10	69	27	-	6	17	W
11	72	21	-	9	16	W
12	75	17	-	9	17	W
1	78	13	-	10	21	W
2	79	11	-	11	18	W
3	80	10	-	11	20	W
4	79	13	-	9	18	W
5	79	13	-	9	16	W
6	78	13	-	7	13	W
7	76	14	-	3	9	W
8	73	15	-	3	8	SW
9	73	12	-	4	11	SW
10	69	15	-	2	6	W
11	67	15	-	3	7	W
12	43	65	-	3	7	E

Historical Distribution

5-Yr. Dist. of Values (µg/m^3)

MONITORS:

1-W43RD

Column Index

Yr - All Data (5-Yrs)

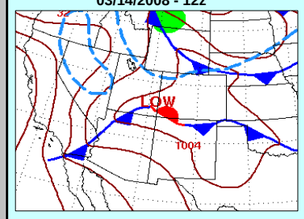
Sea - Data for Spring season only (5-Yrs)

Cum. Freq.	Mon 1 Yr	Mon 1 Sea
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	251	

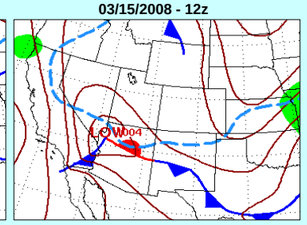
Conclusion: Flagged Value is exceptional in nature (ie greater than 95% of all data)

NOAA - Surface Analysis Maps

03/14/2008 - 12z

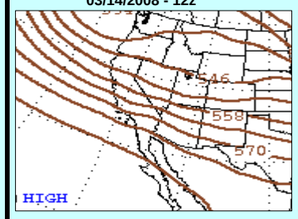


03/15/2008 - 12z

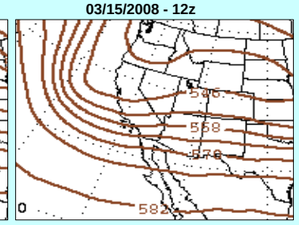


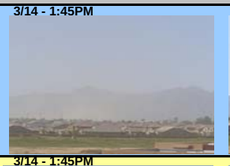
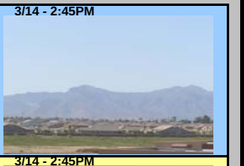
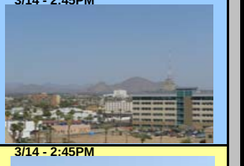
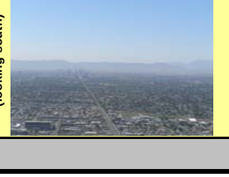
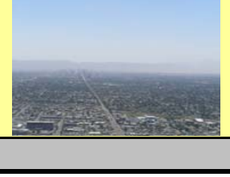
500 mb Analysis Charts

03/14/2008 - 12z



03/15/2008 - 12z



	3/14 - 10:45AM	3/14 - 11:45AM	3/14 - 12:45PM	3/14 - 1:45PM	3/14 - 2:45PM
WHITE TANK MTN (looking west)					
ESTRELLA MTN (looking south)					
CAMELBACK MTN (looking northeast)					
SOUTH MOUNTAIN (looking south)					

YUMA

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	58	61	-	4	6	S
2	57	64	-	3	8	SW
3	55	63	-	2	5	S
4	54	68	-	3	5	SW
5	53	74	-	2	4	SW
6	52	73	-	3	5	SW
7	50	76	-	2	6	E
8	53	72	-	1	3	NE
9	62	55	-	2	6	E
10	69	42	-	2	5	E
11	76	28	-	2	6	S
12	78	25	-	6	12	SW
1	80	20	-	10	16	SW
2	82	16	-	10	19	SW
3	84	13	-	11	17	SW
4	84	12	-	13	21	NW
5	82	12	-	18	27	W
6	79	13	-	17	23	W
7	76	12	-	15	22	W
8	72	14	-	11	18	W
9	67	23	-	11	17	NW
10	64	26	-	10	19	NW
11	64	27	-	17	26	NW
12	61	32	-	16	25	NW

SW AZ - YUMA N GILA

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	61	53	-	5	8	S
2	59	62	-	4	6	S
3	59	60	-	6	8	S
4	57	62	-	4	9	S
5	56	64	-	3	6	W
6	53	72	-	3	9	NW
7	52	74	-	2	4	SE
8	54	71	-	1	3	E
9	65	53	-	2	4	S
10	72	36	-	2	4	S
11	76	26	-	2	5	SW
12	79	22	-	6	13	SW
1	81	21	-	10	16	SW
2	83	14	-	11	20	W
3	85	13	-	10	19	W
4	85	11	-	12	19	W
5	84	10	-	14	22	W
6	81	13	-	11	18	W
7	77	14	-	11	20	W
8	73	14	-	11	18	W
9	69	21	-	10	16	W
10	67	26	-	14	21	NW
11	66	27	-	11	20	NW
12	43	65	-	3	7	E

MARANA

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	60	28	-	2	4	E
2	55	36	-	3	6	E
3	52	41	-	4	6	E
4	50	45	-	5	8	E
5	51	45	-	5	8	E
6	49	49	-	5	7	E
7	49	49	-	6	9	E
8	53	43	-	6	9	E
9	62	31	-	7	11	SE
10	69	24	-	4	10	SE
11	75	19	-	9	15	W
12	76	13	-	9	17	NW
1	77	12	-	9	15	NW
2	79	10	-	10	21	NW
3	80	10	-	9	20	W
4	81	10	-	13	22	W
5	80	9	-	14	22	W
6	78	8	-	14	20	W
7	72	9	-	6	16	W
8	64	14	-	2	6	W
9	62	12	-	4	8	W
10	62	12	-	1	5	NE
11	57	16	-	2	6	SE
12	54	22	-	2	5	SE

TUCSON

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	52	39	-	2	3	E
2	52	40	-	2	4	E
3	50	44	-	2	5	E
4	50	46	-	3	5	E
5	49	48	-	3	5	E
6	49	48	-	3	5	E
7	48	50	-	2	5	E
8	53	43	-	3	6	E
9	62	29	-	4	7	E
10	69	21	-	2	6	E
11	72	21	-	4	11	NW
12	74	14	-	11	18	NW
1	75	11	-	11	20	NW
2	76	11	-	10	18	NW
3	77	9	-	11	20	NW
4	78	11	-	12	21	W
5	78	11	-	13	22	W
6	76	8	-	16	23	W
7	73	8	-	11	21	W
8	67	12	-	2	8	NW
9	59	21	-	1	4	E
10	55	32	-	1	4	N
11	53	33	-	2	4	E
12	50	40	-	2	4	E

Prepared by S. Kendall, A. Juniel, B. Busby and B. Paris/ ADEQ 3/19/09

Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM_{10} readings from the West 43rd Ave. monitoring site were valid for March 14th. 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 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 of the meteorological conditions that were in place on March 14th. Strong westerly winds were occurring in the Phoenix area due to a low pressure system approaching from the west with a cold front situated west of Arizona. The plot of hourly PM_{10} concentration data and max winds in the upper right corner of Figure 1 confirms the nearly identical timing of elevated PM_{10} and strong wind gusts at 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 PM_{10} 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 PM_{10} 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 PM_{10} 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 March 14, 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 PM_{10} concentrations may be characterized as unusual as described in "Impact of Exceptional Events' 'Unusual Winds' on PM_{10} Concentrations" (see "References").

4. Examine the meteorological conditions before and during the event. The 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 10:00 or 11:00 a.m., when several stations reported gusty winds that approached 30 and even 40 mph at times. This timing corresponds to the onset of elevated PM_{10} concentrations recorded at the West 43rd Ave. monitoring site, which remained elevated through the afternoon hours until the winds decreased to below 20 mph.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM_{10} 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 March 14, 2008. Observational reports of reduced visibility throughout portions of Phoenix are further proof that the elevated PM_{10} concentrations were attributed to soil emissions transported by high winds. These reports, in addition to the visual evidence of reduced visibility seen in the lower right portion of Figure 1, provide proof that the elevated PM_{10} concentrations in Phoenix 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 at West 43rd Ave. was attributed to a natural event.

Conclusion

Transport of dust from soils by high winds. The elevated PM_{10} event on March 14, 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.

Appendix R
Event Public Process & Comments

Transmittal of Assessment Report of March 14, 2008
Submitted November 17, 2009

ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007
(602) 771-2300 • www.azdeq.gov

Janice K. Brewer
Governor

Benjamin H. Grumbles
Director

NOV 17 2009

Electronic Submittal (to be followed by U.S. Mail)

Deborah Jordan, Air Division Director
U.S. Environmental Protection Agency, Region IX
Air-1
75 Hawthorne Street
San Francisco, CA 94105

SUBJECT: Submittal of Final Demonstrations of the 2008 Greater Phoenix Area Exceptional/Natural Events and Request for Concurrence

Dear Ms. Jordan:

The purpose of this letter is to request the Environmental Protection Agency's (EPA) review of information regarding exceptional events that resulted in exceedances of the 24-hour PM_{10} National Ambient Air Quality Standards (NAAQS) in the Greater Phoenix Area in 2008. After investigating the unusual nature of the exceedances, the Arizona Department of Environmental Quality (ADEQ) is recommending that EPA concur with ADEQ's findings that the aforementioned sample data are exceptional events in the Air Quality Subsystem (AQS) database. ADEQ staff worked with EPA staff to add certain components to the assessment reports to improve clarity and better document the conditions that caused the exceedances. The events that have been flagged, and for which final demonstrations have been prepared to provide EPA a basis for applying concurrence flags, are listed in Table 1 (enclosed).

Enclosed in this letter are detailed analyses of exceptional events titled "Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM_{10}) Concentration Events in the..." (Enclosure 1 binder). This policy was revised on June 22, 2007, after a multiple month stakeholder process and transmitted to you on June 23, 2007. These analyses rely upon the "Technical Criteria Document for Determination of Natural and Exceptional Event" finalized on December 12, 2005. ADEQ concludes it is important to exclude these readings because of their exceptional causes. ADEQ requests EPA provide written concurrence with the flagging determinations contained in the attached assessment reports.

To help understand the nature of exceptional/natural events in Arizona, ADEQ researched threshold wind speeds that suspend dust into the air and special circumstances that lead to elevated dust levels. This research is described in the white paper titled "Impact of Exceptional Events 'Unusual Winds' in PM_{10} Concentrations in Arizona." ADEQ also examined the effectiveness of PM_{10} control measure for high wind events in Arizona. This research is described in the white paper titled "High Wind Exceptional Events and Control Measures for PM_{10} Areas." Future submittals will refer to these white papers as reference material. Copies of the white papers have been included in Enclosure 1 and were available during the public comment period.

As required by EPA's Exceptional Event Rule (40 CFR 50.14 (c)(3)(i)) and ADEQ Policy 2009.001, ADEQ requested comments on its flagging of these exceptional/natural events, on its final demonstrations, and on the two white papers. ADEQ made copies of the demonstrations and the white papers available for public review for a 30-day public comment period beginning October 15, 2009, on the ADEQ Web-site and at the ADEQ library in Phoenix. No comments were received from the public during the comment period. Enclosure 2 contains a copy of the affidavit of publication of the public notice of the 30-day comment period.

Enclosure 3 (Excel spreadsheet) is a checklist created by EPA that ADEQ staff used in the preparation of the assessment reports to ensure that the analyses meet the requirements of the Federal Exceptional Events Rule (EER, May 21, 2007).

Enclosure 4 (CD) is a compact disc containing an electronic copy of the exceptional/natural event analyses in Enclosure 1, along with this letter and Enclosures 2 and 3.

Those who are being copied on this letter will only receive Enclosures 2 through 4.

If you have any questions related to this request, please do not hesitate to contact me at (602) 771-2308 or Steven Peplau, Air Quality Assessment Manager, at (602) 771-2274.

Sincerely,

Nancy C. Wrona, Director
Air Quality Division

Enclosures (4)

cc: Colleen McKaughan, USEPA, Region IX (w/enclosures 2-4)
John Kelley, USEPA, Region IX (w/enclosures 2-4)
Coleman Owen, USEPA, Region IX (w/enclosures 2-4)
Lawrence Odle, Director, MCAQD (w/enclosures 2-4)
Don Gabrielson, PCAQCD (w/enclosures 2-4)

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 West Washington Street • Phoenix, Arizona 85007
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Janice K. Brewer
Governor
Benjamin H. Grumbles
Director

Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM_{10}) Concentration Events in the Phoenix Area on March 14, 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 Thursday, March 13, 2008, in response to a tightening pressure gradient ahead of a low pressure system and associated cold front approaching Arizona from the west, ADEQ air quality forecasters issued the Maricopa County Dust Control Action Forecast which called for a moderate risk of wind-blown dust for Friday, March 14th. In addition, ADEQ air quality forecasters issued a PM_{10} Health Watch for March 14, 2008, due to the possibility of strong winds and blowing dust throughout the Maricopa County area. The forecasts and advisories satisfy the requirement in 40 CFR 51.930(a)(1).

The forecast for March 14th called for strong winds capable of producing wind-blown dust. This potential wind-blown dust event equated to a moderate risk of exceeding the PM_{10} National Ambient Air Quality Standards (NAAQS) in Maricopa County. During the late morning / early afternoon hours of March 14th, strong, gusty winds moved into the Phoenix Metro area from the west. 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 PM_{10} Areas" (see "References").

Strong winds were observed throughout portions of Maricopa County and the Phoenix Metro area on March 14, 2008. The initialization of the 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). Gusty winds greater than 20 and 30 mph were reported between the 10:00 a.m. and 5:00 p.m. hours at several Phoenix area monitoring locations. In addition, Phoenix Goodyear Airport reported reduced visibility and a wind gust of 43 mph during the event.

This significant event brought elevated ambient concentrations of PM_{10} to the Phoenix area. Due to the spatial variability of PM sources both within and outside of the Phoenix urban core, the PM_{10} 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 PM_{10} 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 43rd Ave (MC/TEOM)	**04-013-4009***	**251**	**1286**	**1300**	**RJ**
South Phoenix (MC/TEOM)	**04-013-4003***	**119**	**461**	**1300**	None
Durango Complex (MC/TEOM)	**04-013-9812***	**92**	**310**	**1300**	None
Greenwood (MC/TEOM)	**04-013-3010***	**71**	**151**	**1300**	None
Higley (MC/TEOM)	**04-013-4006***	**51**	**140**	**0700**	None
West Phoenix (MC/TEOM)	**04-013-0019***	**57**	**126**	**1300**	None
Central Phoenix (MC/TEOM)	**04-013-3002***	**69**	**231**	**1300**	None
JLG Supersite (ADEQ/TEOM)	**04-013-9997***	**40**	**62**	**1300**	None
Coyote Lakes (MC/TEOM)	**04-013-4014***	**47**	**107**	**0700**	None

* EPA Air Quality System Identification Number
** 24-hr PM_{10} 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).

NWS-Goodyear Airport

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	0	0		0	0	N/A
2	0	0		0	0	N/A
3	0	0		0	0	N/A
4	0	0		0	0	N/A
5	0	0		0	0	N/A
6	0	0		0	0	N/A
7	0	0		0	0	N/A
8	61	60		9	9	W
9	66	40		9	9	SW
10	70	30		7	7	W
11	73	20		5	5	SW
12	82	15		14	29	W
1	86	10		18	34	W
2	86	15		25	43	W
3	84	20		14	23	W
4	84	20		17	17	SW
5	82	40		17	17	SW
6	81	40		11	11	W
7	75	40		6	6	*VR
8	0	0		0	0	N/A
9	70	20		11	11	SW
10	0	0		0	0	N/A
11	0	0		0	0	N/A
12	0	0		0	0	N/A

NWS-Glendale Airport

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	0	0		0	0	N/A
2	0	0		0	0	N/A
3	0	0		0	0	N/A
4	0	0		0	0	N/A
5	0	0		0	0	N/A
6	0	0		0	0	N/A
7	0	0		0	0	N/A
8	0	0		0	0	N/A
9	0	0		0	0	N/A
10	70	20		15	23	SW
11	73	20		16	23	SW
12	79	20		18	23	W
1	81	20		20	26	W
2	82	20		21	26	W
3	82	20		20	25	W
4	81	20		14	23	SW
5	82	20		11	21	W
6	81	20		11	11	SW
7	75	20		5	5	W
8	0	0		0	0	N/A
9	0	0		0	0	N/A
10	0	0		0	0	N/A
11	0	0		0	0	N/A
12	0	0		0	0	N/A

NWS-Phx Sky Harbor

Hr	T(F)	VR	Dust	Spd	Gust	Dir
1	63	10		6	6	E
2	62	10		6	6	E
3	60	10		6	6	E
4	59	10		7	7	E
5	59	10		5	5	E
6	57	10		8	8	E
7	57	10		0	0	N
8	61	10		0	0	N
9	65	10		6	6	E
10	70	10		5	5	SW
11	77	10		11	20	W
12	79	10		21	29	W
1	81	10		21	30	W
2	82	10		25	30	W
3	82	10		23	23	W
4	82	10		17	24	W
5	81	10		13	23	W
6	80	10		14	14	W
7	77	10		7	7	W
8	76	10		9	9	SW
9	72	10		11	11	SW
10	73	10		10	10	W
11	69	10		10	10	W
12	67	10		7	7	W

Event Contrib. Analysis

Hourly PM_{10} Conc. ($\mu g/m^3$)

MONITORS:

1-W43RD

Hr	1
1	26.1
2	28.9
3	22.2
4	28.4
5	64.6
6	155
7	146
8	134
9	188
10	329
11	355
12	1052
1	1270
2	1286
3	374
4	87
5	57.1
6	23.6
7	37.1
8	40.8
9	86.4
10	93.1
11	73.4
12	72.9

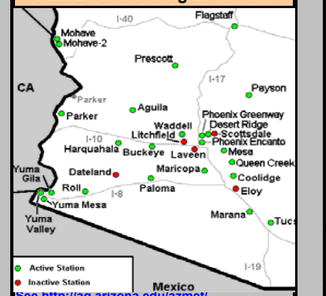
24-Hr. Avg PM_{10}

Monitor:	with Event	w/o Event
1-W43RD	251	69

> NAAQS | < NAAQS | Pink=Event Contrib.

Conclusion: As shown above, the PM_{10} concentration would have been below the NAAQS "BUT FOR" the event contribution (hours highlighted in pink).

AZMET Monitoring Locations



See http://ag.arizona.edu/azmet/

wnd @3m agl / Dir corrected to true north

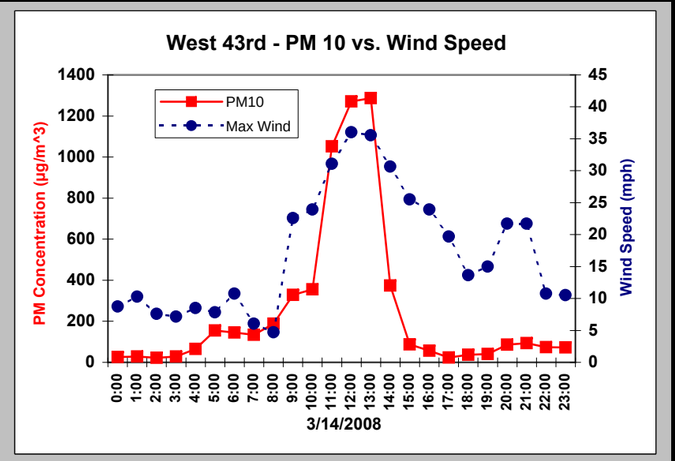
HIGHLIGHTING	Col.	Parameter
Max Wind	T(F)	Temp. (Deg. F.)
> 15 mph	RH	Rel Humidity %
>25 mph	Rn	Rain (Inches/hr)
HR - Time (End)	Spd	Avg Speed mph
A.M.	Max	Max Speed mph
P.M.	Dir	Wind Dir. (from)

Figure 1. Key Data for Event of March 14, 2008

WIND & PM10 DATA	ECA	KEY	PM10 & WIND PLOT
	HIST		Wx IMAGERY
	DIST		PHX VIS. CAMERAS

SUMMARY OF EVENT

A low pressure system caused strong west-southwesterly winds on 3/14 throughout portions of the valley. Sky Harbor Int'l Airport reported gusts to 30 m.p.h. while Goodyear Airport had gusts as high as 43 m.p.h. These gusty winds coincided with elevated PM10 levels at West 43rd Ave.



16659 (112.14Wx33.41N)

MC - WEST FORTY THIR

Hr	T(F)		PM	Spd	Max	Dir
1	69		26	5	9	SW
2	68		28	6	10	SW
3	66		22	5	8	W
4	64		28	5	7	SW
5	58		64	3	9	NE
6	57		154	5	8	E
7	57		145	4	11	E
8	59		133	2	6	E
9	64		187	2	5	NE
10	73		328	7	23	W
11	77		355	12	24	W
12	79		1051	16	31	W
1	82		1270	18	36	W
2	83		1286	19	36	W
3	84		374	14	31	W
4	84		87	12	26	W
5	83		57	12	24	W
6	81		23	10	20	W
7	77		37	6	14	W
8	75		40	8	15	SW
9	74		86	11	22	SW
10	72		93	10	22	SW
11	67		73	6	11	W
12	66		72	5	11	SW

16375 (112.12Wx33.43N)

MC - DURANGO COMPLEX

Hr	T(F)		PM	Spd	Max	Dir
1	63		63	1	4	W
2	64		66	3	10	SW
3	66		43	6	11	W
4	62		30	1	7	SW
5	58		63	2	6	E
6	56		67	2	6	E
7	56		68	2	8	E
8	62		132	2	4	E
9	71		80	0	3	NE
10	74		117	8	20	W
11	76		90	13	24	W
12	78		216	15	29	W
1	80		205	15	34	W
2	81		310	19	36	W
3	82		127	15	41	W
4	84		32	13	27	W
5	83		28	12	30	W
6	81		27	9	19	W
7	77		35	6	14	W
8	73		67	7	14	W
9	72		92	9	18	SW
10	70		89	7	16	W
11	66		81	6	11	W
12	62		80	4	7	W

16477 (112.14Wx33.48N)

MC - WEST PHOENIX

Hr	T(F)		PM	Spd	Max	Dir
1	70		19	5	12	SW
2	68		28	4	11	SW
3	67		22	4	11	SW
4	64		24	3	8	SW
5	60		35	1	6	E
6	58		46	2	5	E
7	56		61	2	6	E
8	59		82	1	4	SE
9	65		49	2	11	SW
10	70		75	9	22	SW
11	73		66	12	23	W
12	76		72	11	28	W
1	79		106	13	28	W
2	81		125	14	31	W
3	81		121	14	36	W
4	81		36	11	25	W
5	80		25	11	24	SW
6	80		27	9	21	W
7	78		35	4	10	W
8	75		50	4	15	SW
9	73		66	5	18	SW
10	70		65	4	14	W
11	68		67	5	13	W
12	67		66	5	10	W

Historical Distribution

5-Yr. Dist. of Values ($\mu g/m^3$)

MONITORS:

1-W43RD

Column Index

Yr - All Data (5-Yrs)

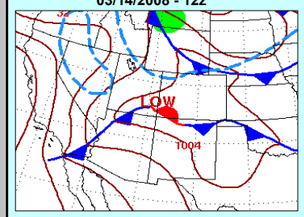
Sea - Data for Spring season only (5-Yrs)

Cum. Freq.	Mon 1 Yr	Mon 1 Sea
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	251	

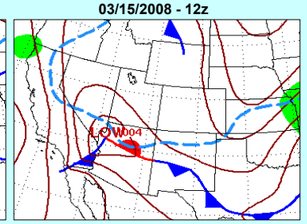
Conclusion: Flagged Value is exceptional in nature (ie greater than 95% of all data)

NOAA - Surface Analysis Maps

03/14/2008 - 12z

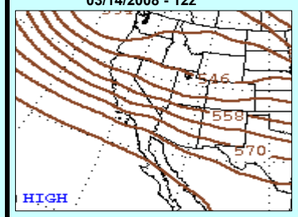


03/15/2008 - 12z

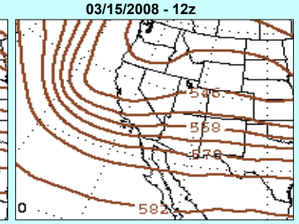


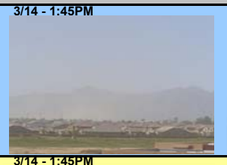
500 mb Analysis Charts

03/14/2008 - 12z



03/15/2008 - 12z



	3/14 - 10:45AM	3/14 - 11:45AM	3/14 - 12:45PM	3/14 - 1:45PM	3/14 - 2:45PM
WHITE TANK MTN (looking west)					
ESTRELLA MTN (looking south)					
CAMELBACK MTN (looking northeast)					
SOUTH MOUNTAIN (looking south)					

127530 (112.31Wx33.67N)

MC - COYOTE LAKES

Hr	T(F)		PM	Spd	Max	Dir
1	58		82	2	6	N
2	57		68	2	6	N
3	55		58	2	5	N
4	53		24	3	8	N
5	52		32	2	6	N
6	51		45	3	7	NE
7	50		50	2	7	N
8	54		106	1	5	N
9	66		77	1	4	NE
10	71		55	1	6	N
11	76		35	1	10	SW
12	79		22	6	21	SW
1	81		52	11	25	W
2	82		61	11	30	W
3	82		98	14	32	W
4	82		31	12	28	W
5	82		17	10	26	W
6	81		13	10	21	W
7	74		13	4	14	W
8	66		41	0	2	NW
9	62		44	0	4	S
10	61		32	0	4	NE
11	57		33	0	3	N
12	55		42	2	4	N

16329 (112.05Wx33.46N)

MC - CENTRAL PHOENIX

Hr	T(F)		PM	Spd	Max	Dir
1	63		43	3	7	E
2	61		39	3	6	E
3	59		41	2	6	E
4	58		42	4	7	E
5	57		36	2	5	E
6	56		36	4	6	E
7	56		33	3	6	E
8	64		38	2	6	SE
9	71		54	3	6	E
10	76		55	2	17	SW
11	78		105	12	25	W
12	80		127	15	30	W
1	81		149	16	30	W
2	82		230	20	37	W
3	82		159	19	37	W
4	83		33	14	28	W
5	83		28	13	29	W
6	81		31	12	24	W
7	77		30	7	16	W
8	74		47	6	16	W
9	73		64	7	16	SW
10	71		77	6	15	W
11	69		75	8	19	W
12	68		74	8	16	W

AZMET - PHX METRO - MESA

29-Mesa

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	63	34	-	3	6	SE
2	61	35	-	3	6	SE
3	60	34	-	3	6	E
4	60	33	-	3	5	E
5	58	34	-	3	6	E
6	58	34	-	3	6	E
7	58	33	-	5	7	SE
8	60	33	-	4	7	SE
9	64	29	-	4	7	SE
10	69	27	-	3	6	SE
11	73	22	-	2	6	N
12	78	12	-	9	18	W
1	79	10	-	11	21	W
2	81	7	-	13	23	W
3	81	7	-	12	23	W
4	82	9	-	9	18	W
5	81	11	-	9	16	W
6	80	11	-	8	14	W
7	78	12	-	4	10	W
8	75	12	-	4	10	SW
9	73	11	-	5	9	SW
10	73	11	-	4	9	SW
11	70	13	-	3	9	SW
12	43	65	-	3	7	E

AZMET - SOUTHEAST PHOENIX

22-Queen Creek

Hr	T(F)	RH	Rn	Spd	Max	Dir
1	53	49	-	5	6	SE
2	54	44	-	5	7	SE
3	56	36	-	5	7	E
4	55	38	-	6	8	E
5	52	45	-	6	8	SE
6	51	48	-	5	8	E
7	53	41	-	5	7	E
8	55	42	-	5	8	SE
9	60	43	-	7	10	SE
10	67	30	-	7	10	S
11	72	23	-	7	12	SW
12	76	15	-	10	20	W
1	78	10	-	13	20	W
2	80	9	-	13	25	W
3	80	9	-	13	21	W
4	80	9	-	12	20	W
5	79	10	-	14	23	W
6	77	11	-	12	19	W
7	73	13	-	8	15	W
8	69	14	-	5	9	W
9	65	15	-	5	9	W
10	64	16	-	6	11	W
11	63	16	-	5	10	SW
12	60	20	-	7	11	SW

Prepared by S. Kendall, A. Juniel, B. Busby and B. Paris/ ADEQ 3/19/09

Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM_{10} readings from the West 43rd Ave. monitoring site were valid for March 14th. 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 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 of the meteorological conditions that were in place on March 14th. Strong westerly winds were occurring in the Phoenix area due to a low pressure system approaching from the west with a cold front situated west of Arizona. The plot of hourly PM_{10} concentration data and max winds in the upper right corner of Figure 1 confirms the nearly identical timing of elevated PM_{10} and strong wind gusts at 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 PM_{10} 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 PM_{10} 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 PM_{10} 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 March 14, 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 PM_{10} concentrations may be characterized as unusual as described in "Impact of Exceptional Events' 'Unusual Winds' on PM_{10} Concentrations" (see "References").

4. Examine the meteorological conditions before and during the event. The 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 10:00 or 11:00 a.m., when several stations reported gusty winds that approached 30 and even 40 mph at times. This timing corresponds to the onset of elevated PM_{10} concentrations recorded at the West 43rd Ave. monitoring site, which remained elevated through the afternoon hours until the winds decreased to below 20 mph.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM_{10} 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 March 14, 2008. Observational reports of reduced visibility throughout portions of Phoenix are further proof that the elevated PM_{10} concentrations were attributed to soil emissions transported by high winds. These reports, in addition to the visual evidence of reduced visibility seen in the lower right portion of Figure 1, provide proof that the elevated PM_{10} concentrations in Phoenix 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 at West 43rd Ave. was attributed to a natural event.

Conclusion

Transport of dust from soils by high winds. The elevated PM_{10} event on March 14, 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 (PM_{10})* (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 PM_{10} Concentrations* (October 14, 2009).

Arizona Department of Environmental Quality (ADEQ), *High Wind Exceptional Events and Control Measures for PM_{10} 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).

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

VERY UNHEALTHY (201-300)

UNHEALTHY (151-200)

UNHEALTHY FOR SENSITIVE GROUPS (101-150)

MODERATE (51-100)

GOOD (0-50)

For more information visit:
http://www.epa.gov/airnow/aqibroch

LINK TO EXCEEDANCE & HEALTH STATEMENT INFO FOR THE 2006-07 & 2007-08 FORECAST SEASONS

AIR QUALITY FORECAST FOR FRIDAY, MARCH 14, 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 WED 03/12/2008	TODAY THU 03/13/2008	TOMORROW FRI 03/14/2008	EXTENDED SAT 03/15/2008
NOTICES (*SEE BELOW FOR DETAILS)	**NONE**	**NONE**	**PM-10 HEALTH WATCH**	**NONE**
AIR POLLUTANT	Highest AQI Reading/Site (Preliminary data only)			
O3*	**42 APACHE JUNCTION**	**51 MODERATE**	**47 GOOD**	**35 GOOD**
CO*	**16 GREENWOOD**	**15 GOOD**	**11 GOOD**	**09 GOOD**
PM-10*	**58 WEST FORTY THIRD**	**68 MODERATE**	**94 MODERATE**	**74 MODERATE**
PM-2.5*	**38 PHOENIX SUPERSITE**	**31 GOOD**	**27 GOOD**	**24 GOOD**

* 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 Thursday, Mar 13: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Health message for Friday, Mar 14: Unusually sensitive people should consider reducing prolonged or heavy exertion.

Synopsis and Discussion

A PM-10 HEALTH WATCH HAS BEEN ISSUED FOR FRIDAY MARCH 14

Major changes in local weather conditions are on tap the next few days as the mid-latitude storm track migrates south over the area. Westerly winds aloft over the Valley are advertised to reach 50+ mph at the 10K' level and near 100 mph at the 18K' level on Friday; since the predicted mixing depth is near 9K', some of this momentum will have an avenue for reaching the surface. Areas of blowing and suspended dust are therefore likely as is the potential for transported dust from desert areas upwind of the metro area. Since PM-10 (coarse particle) levels may approach unhealthy levels, a PM-10 Health Watch has been issued for Friday. After a very breezy day on Saturday, an upper level trough and surface cold frontal passage are forecast to occur on Sunday and will be accompanied by showers and a few thunderstorms – along with gusty winds and much colder temperatures. -Reith

MONITORING SITE MAPS: STATIC MAP – **http://www.azdeq.gov/environ/air/monitoring/images/winter.jpg**
INTERACTIVE MAPS – **http://aqwww.maricopa.gov/AirMonitoring/SitePollutionMap.aspx**
http://www.airnow.gov/

POLLUTION MONITOR READINGS FOR WEDNESDAY, MARCH 12, 2008

O3 (OZONE)

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Apache Junction	54	42	
Blue Point	42	33	
Central Phoenix	43	34	
Fountain Hills	49	38	
North Phoenix	32	25	
Phoenix Supersite	47	37	
Pinnacle Peak	45	35	
South Phoenix	50	39	
South Scottsdale	43	34	
West Phoenix	45	35	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Buckeye	0.3	04	
Central Phoenix	0.8	09	
Dysart	0.4	05	
Glendale	0.6	07	
Greenwood	1.4	16	
Mesa	0.5	06	
North Phoenix	0.6	07	
Phoenix Supersite	1.2	14	
South Phoenix	0.8	09	
South Scottsdale	0.4	05	
Tempe	0.7	08	
West Chandler	0.5	06	
West Indian School	1.3	15	
West Phoenix	1.0	11	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (ug/m3)	MAX AQI	AQI COLOR CODE
Buckeye	48	44	
Central Phoenix	35	32	
Coyote Lakes	22	20	
Durango	56	51	
Greenwood	48	44	
Higley	42	39	
Maricopa (Pinal County)	70	58	
Phoenix Supersite	31	29	
Queen Creek (Pinal County)	54	50	
South Phoenix	46	43	
West Forty Third	70	58	
West Phoenix	40	37	

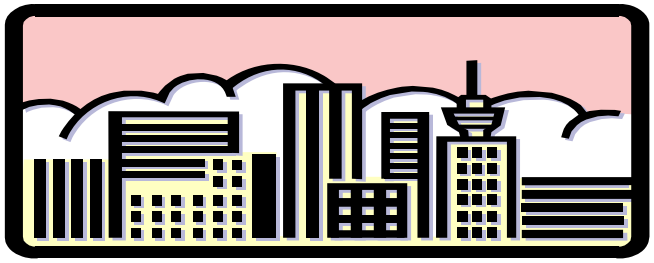
PM-2.5 (PARTICLES)

(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	11.2	36	
Dysart	3.4	11	
Estrella Mountain Park	6.1	20	
Phoenix Supersite	11.8	38	
Vehicle Emissions Lab	NOT AVBL	NOT AVBL	NOT AVBL
West Phoenix	11.4	37	

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 NOx (Nitrogen Oxides) in the presence of heat and sunlight.

Sources – VOCs are emitted from motor vehicles, chemical plants, refineries, factories, and other industrial sources. NOx 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 09/24/2007**}

ADEQ
Arizona Department of Environmental Quality
Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

ADEQ AIR POLLUTION HEALTH WATCH ISSUANCE NOTICE

Issuance Date and Time:	Thursday, March 13, 2008 10:00 a.m.
Valid for Date(s):	Friday, March 14, 2008
Pollutant:	COARSE PARTICLES (PM-10)
Message:	Blowing and suspended dust due to strong and gusty winds may cause concentrations of coarse particles to approach unhealthy levels on Friday.

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	520-770-3172
	Joe Paul	602-771-2363
	Bryan Paris	602/771-7665

CKR 12/06/2007

ADEQ Arizona Department of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

MARICOPA COUNTY
DUST CONTROL ACTION FORECAST
ISSUED THURSDAY, MARCH 13, 2008

Three-day weather outlook:

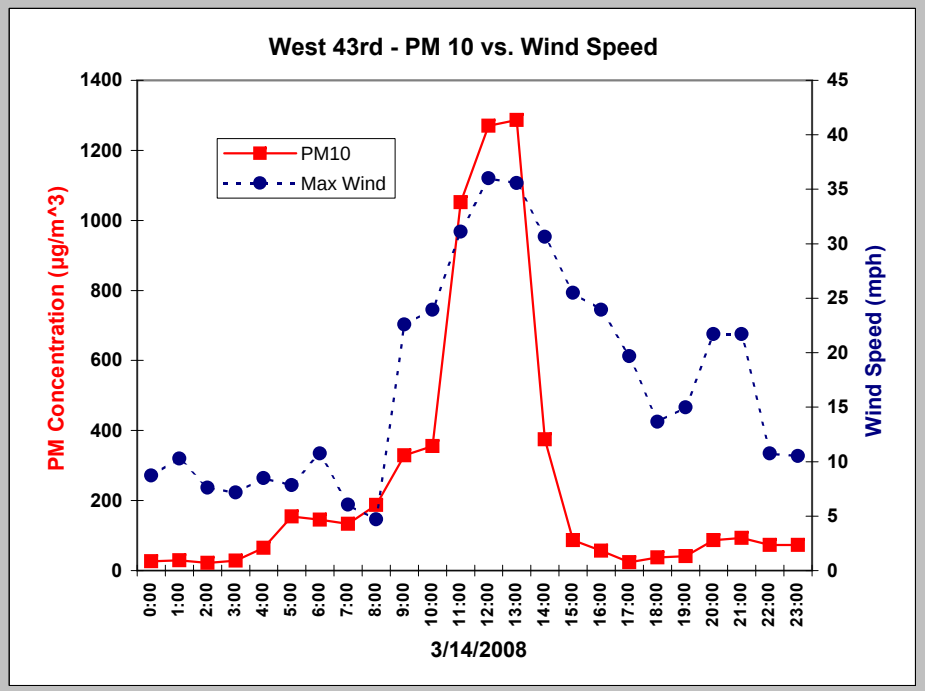
The broad low-amplitude ridge aloft currently over the local forecast area will give way to a strengthening and then amplifying mid-latitude storm track on Friday and thru the weekend. A strong westerly wind event looks likely on Friday and areas of blowing dust are possible by early afternoon; a MODERATE risk has been posted. A breezy to marginally windy day is expected on Saturday ahead of a strong trough and cold front; showers and thunderstorms are possible on Sunday with the frontal and trough passage.

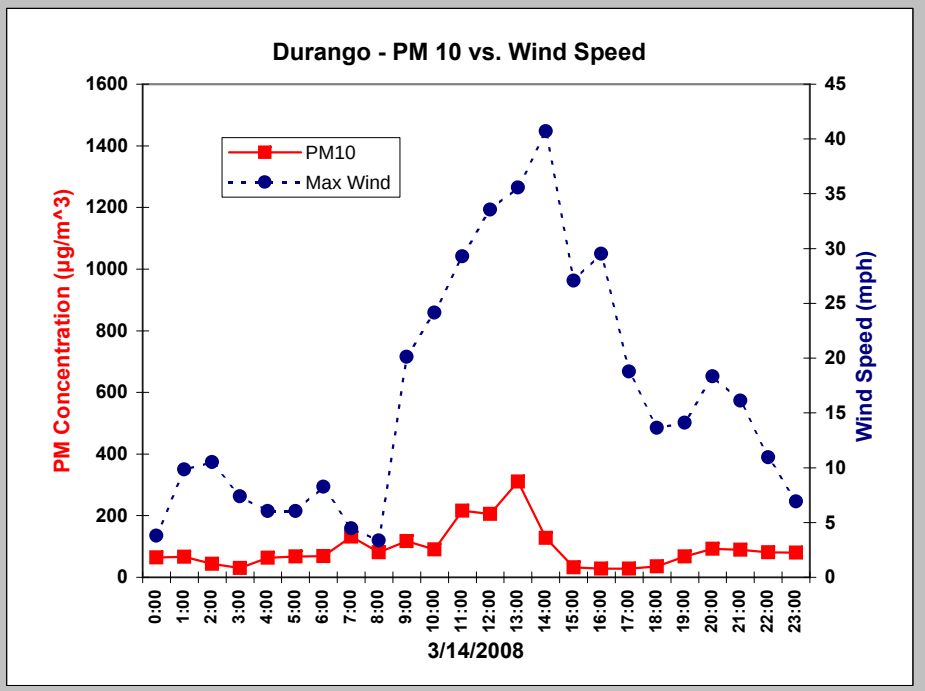
R I S K F A C T O R S

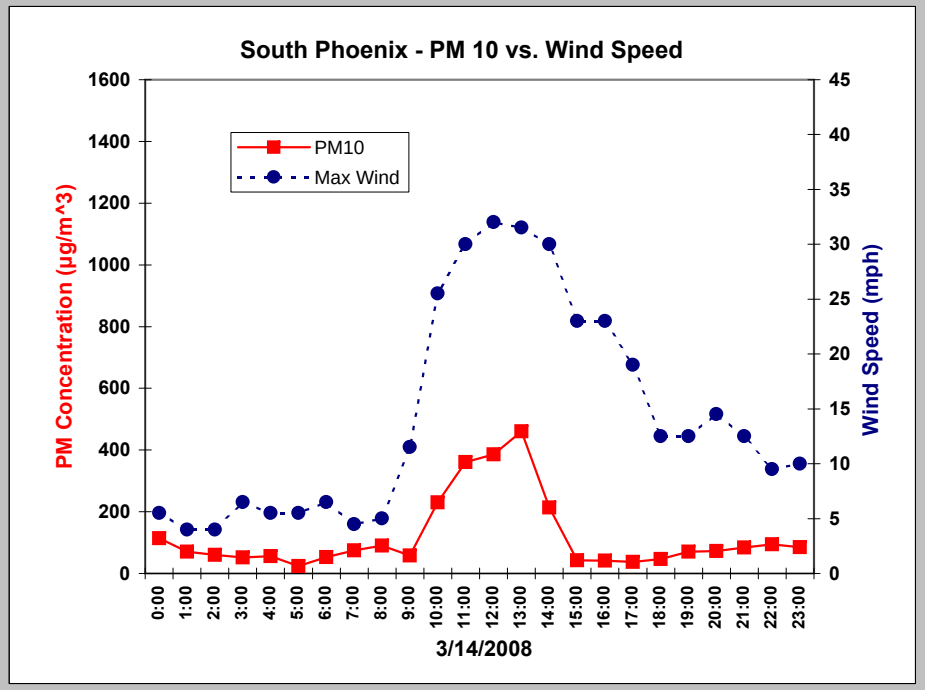
	WINDS		STAGNATION		RISK LEVEL
Day #1: Fri 03/14/2008	Westerly 20-30 mph with gusts near 40 mph.	+	Little if any stagnation expected.	=	**MODERATE**
Day #2: Sat 03/15/2008	South to southwesterly 15-25 mph.	+	Little if any stagnation expected.	=	**LOW**
Day #3: Sun 03/16/2008	Southwest to westerly 10-20 mph except strong and gusty near thunderstorms.	+	Little if any stagnation expected.	=	**MODERATE**

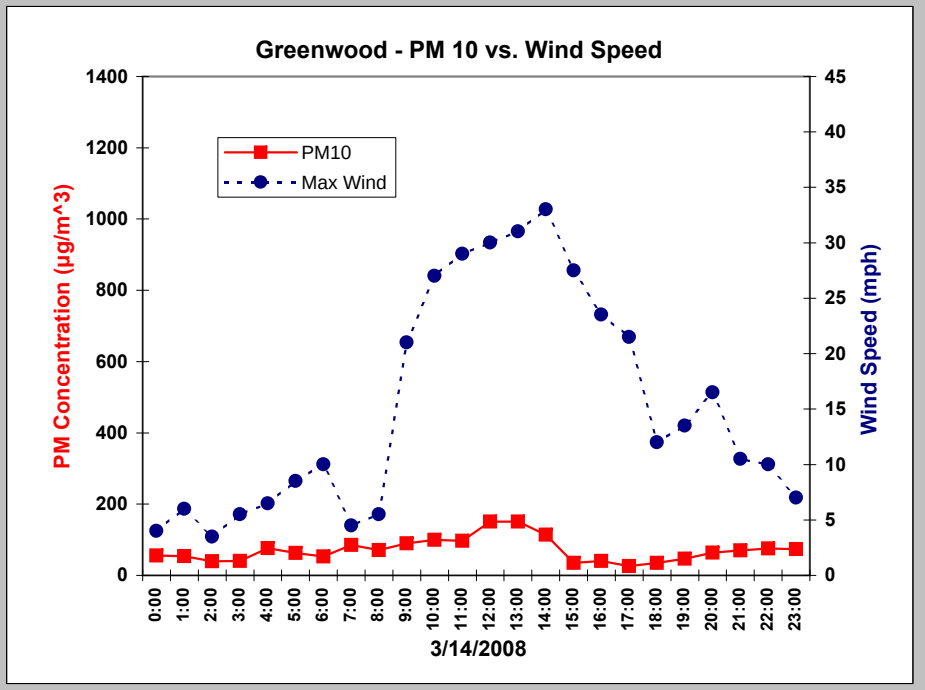
The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. To review the complete air quality forecast for the Phoenix metropolitan area and the health effects of air pollution, please see ADEQ's Air Quality Forecast at http://www.azdeq.gov/environ/air/ozone/ensemble.pdf, or call 602-771-2367 for recorded forecast information.

03/14/2008 - ADDITIONAL GRAPHS

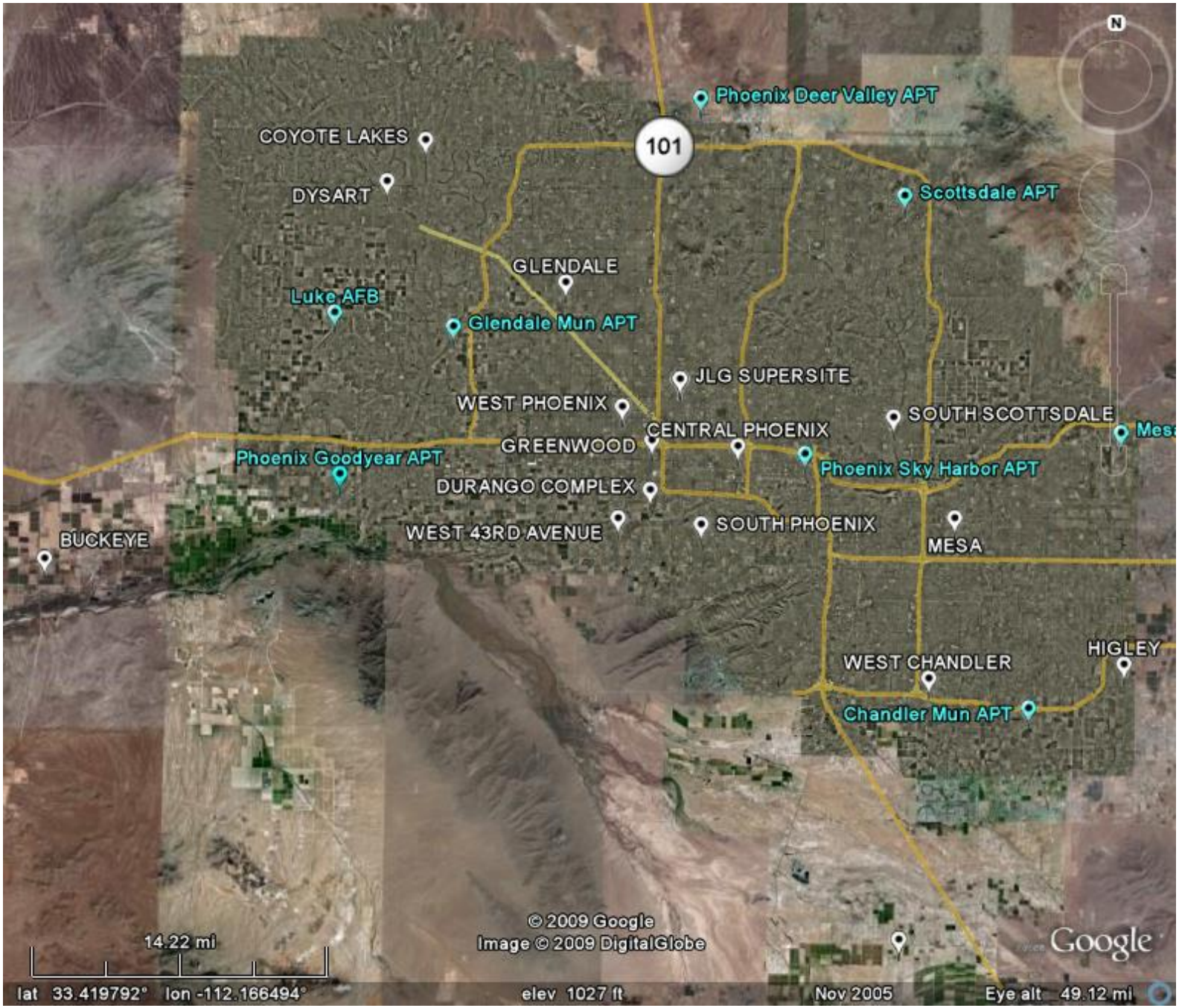






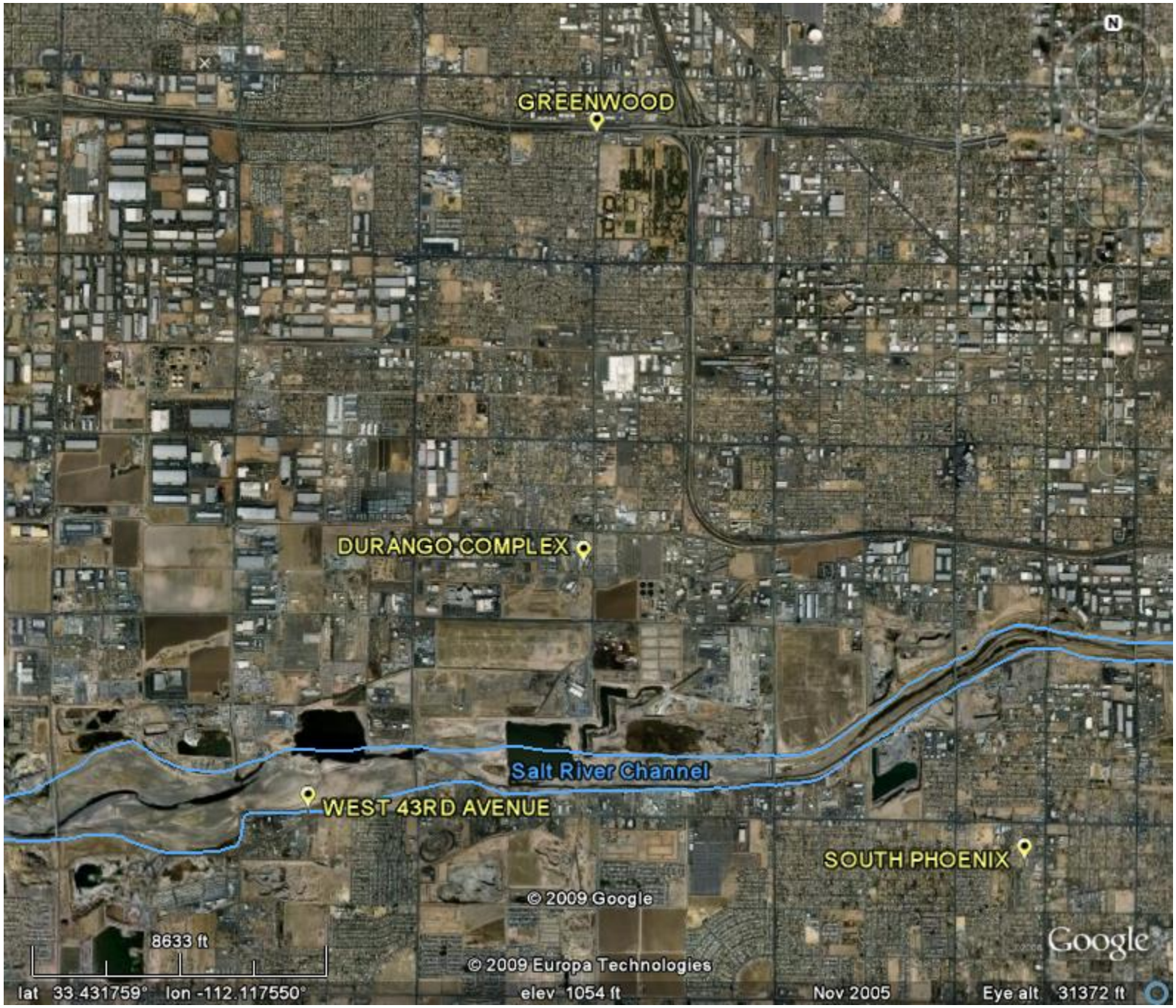


Phoenix Area PM_{10} and Meteorological Monitors



Source: US EPA, ADEQ, & Google Earth

Salt River Area PM_{10} and Meteorological Monitors



Source: US EPA, ADEQ, & Google Earth

CHAPTER 4: OVERVIEW OF PM_{10} CONTROL MEASURES

4.1 INTRODUCTION

Chapter 1.2.2 of this SIP ("Regulatory History of the Metropolitan Maricopa PM_{10} Nonattainment Area") notes that on July 25, 2002, EPA approved the Maricopa Serious PM_{10} 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 PM_{10} 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 PM_{10} 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.

Table 4.2.1 2002 Salt River Study Area Source Category Contributions to Ambient PM_{10} Concentrations

Source Category	Average Low Wind Day Contribution	Average High Wind Day Contribution	Highest Contribution($\mu g/m^3$)	
	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

Table 4.2.1 2002 Salt River Study Area Source Category Contributions to Ambient PM_{10} Concentrations				
Source Category	**Average Low Wind Day Contribution**	**Average High Wind Day Contribution**	**Highest Contribution($\mu g/m^3$)**	
	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 $\mu g/m^3$ 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.

Table 4.2.2 Salt River Study Area Source Category Contributions to Ambient PM_{10} Concentrations for the 2006 Attainment Case		
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%