



Sonoma Technology, Inc.
Air Quality Research and Innovative Solutions

**State of Arizona
Exceptional Event Documentation
for the Event of November 4, 2011,
for the Phoenix PM₁₀ Nonattainment Area**



Final Report Prepared for

Arizona Department of Environmental Quality
Phoenix, AZ

January 23, 2013

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State of Arizona
Exceptional Event Documentation
for the Event of November 4, 2011,
for the Phoenix PM₁₀ Nonattainment Area

Final Report
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1. Introduction

On November 4, 2011, 18 air quality monitors in the Phoenix PM₁₀ nonattainment area recorded 24-hr average PM₁₀ concentrations in excess of the National Ambient Air Quality Standard (NAAQS) for PM₁₀ of 150 µg/m³. The purpose of this report is to demonstrate that these exceedances were due to naturally occurring windblown dust, were not reasonably controllable or preventable, were historically unusual, and would not have occurred “but-for” the windblown dust and that they therefore constitute an Exceptional Event as defined by the U.S. Environmental Protection Agency’s (EPA) Exceptional Events Rule (EER).

1.1 Report Contents

Section 2 of this assessment contains a conceptual model of the wind-blown dust event that transpired on November 4, 2011, providing a background narrative of the exceptional event and an overall explanation that the event affected air quality. Section 2 also provides evidence that the event was a natural event.

Section 3 of this assessment establishes a clear causal connection between the natural event on November 4, 2011, and the exceedances of the 24-hr PM₁₀ standard at the monitoring stations. The evidence in this section also confirms that the event in question both affected air quality and was the result of natural events.

Section 4 of this assessment illustrates that the event of November 4, 2011, produced PM₁₀ concentrations in excess of normal historical fluctuations.

Section 5 of this assessment details the existing dust control measures and demonstrates that despite the presence and enforcement of these controls, the event of November 4, 2011, was not reasonably controllable or preventable.

Section 6 of this assessment builds upon the demonstrations made in the previous sections, showing a clear causal connection between the natural event and the exceedances, and concludes that the exceedances of the 24-hr PM₁₀ standard on November 4, 2011, would not have occurred “but for” the event.

Appendix A contains time-series graphs and data tables to supplement Section 3. **Appendix B** contains links to videos, images, and media reports to supplement Section 3. **Appendix C** contains time-series graphs to supplement Section 4. **Appendix D** contains air quality forecasts issued by the Arizona Department of Environmental Quality (ADEQ) and weather statements and warnings issued by the National Weather Service. **Appendix E** contains a copy of the affidavit of public notice concerning this assessment report.

1.2 Exceptional Event Rule Requirements

In addition to the technical requirements that are contained within the EER, procedural requirements must also be met in order for the EPA to concur with the flagged air quality

monitoring data. This section of the report lists the requirements of the EER and associated guidance and discusses how ADEQ addressed those requirements.

1.2.1 Public Notification that the Event Was Occurring (40 CFR 50.14(c)(1)(i))

ADEQ issued Dust Control Action Forecasts and Air Quality Forecasts for Maricopa County advising citizens of the potential for high wind dust events on November 4, 2011. More information on ADEQ's forecasts can be found in Section 5.2 of this report. The forecast products that were issued for November 4, 2011, are included in Appendix D.

1.2.2 Place Informal Flag on Data in AQS (40 CFR 50.14(c)(2)(ii))

ADEQ and other operating air quality agencies in Arizona submit data into the EPA's Air Quality System (AQS), the official repository of ambient air quality data. This data submittal to AQS includes particulate matter (PM) data from both filter-based and continuous monitors operated in Arizona.

When ADEQ and/or another agency operating monitors in Arizona suspect that data may be influenced by an exceptional event, ADEQ and/or the other operating agency expedites analysis of the filters collected from the potentially-affected filter-based air monitoring instruments, quality-assures the results, and submits the data into AQS. ADEQ and/or other operating agencies also submit data from continuous monitors into AQS after quality assurance is complete.

If ADEQ and/or other operating air quality agencies have determined that a potential exists that a monitor's reading(s) have been influenced by an exceptional event, a preliminary flag is submitted for the measurement in AQS. The data are not official until they undergo more thorough quality assurance and quality control, leading to certification by May 1 of the year following the calendar year in which the data were collected (40 CFR 58.15(a)(2)). The presence of the flag on the November 4, 2011, data can be confirmed in AQS.

1.2.3 Notify EPA of Intent to Flag Through Submission of Initial Event Description by July 1 of Calendar Year Following Event (40 CFR 50.14(c)(2)(iii))

ADEQ submitted notice to EPA on August 29, 2012, listing all days from calendar year 2011 that ADEQ intends to analyze under the Exceptional Events Rule. The PM₁₀ exceedances that occurred on November 4, 2011, in the Phoenix PM₁₀ nonattainment area were included on this list. This assessment report serves as demonstration supporting the flagging of these data.

1.2.4 Document that the Public Comment Process Was Followed for Event Documentation (40 CFR 50.14(c)(3)(iv))

ADEQ posted this assessment report on the ADEQ webpage and placed a hard copy of the report in the ADEQ Records Management Center for public review. ADEQ opened a 30-day public comment period on December 3, 2012. A copy of the public notice certification, along

with any comments received, will be submitted to EPA, consistent with the requirements of 40 CFR 50.14(c)(3)(iv). See Appendix E for a copy of the affidavit of public notice.

1.2.5 Submit Demonstration Supporting Exceptional Event Flag (40 CFR 50.14(a)(1-2))

At the close of the public comment period, and after ADEQ has had the opportunity to consider any comments submitted on this document, ADEQ will submit this document, the comments received, and ADEQ's responses to those comments to EPA Region 9 headquarters in San Francisco, California. The deadline for the submittal of this package is September 30, 2014.

1.2.6 Documentation Requirements (40 CFR 50.14(c)(3)(iii))

The EER states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

1. The event satisfies the criteria set forth in 40 CFR 501(j) that
 - a. the event affected air quality,
 - b. the event was not reasonably controllable or preventable, and
 - c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
2. There is a clear causal relationship between the measurement(s) under consideration and the event;
3. The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
4. There would have been no exceedance or violation but for the event.

2. Conceptual Model

This section provides a narrative background and summarizes the meteorological and air quality conditions in place on November 4, 2011 in the Phoenix area. Elements described in this section include

- A description and map of the geographic setting of the air quality and meteorological monitors.
- A description of Phoenix's climate.
- An overall description of meteorological and air quality conditions on the event day.

2.1 Geographic Setting and Monitor Locations

Phoenix is located in the Salt River Valley in south-central Arizona. It lies at an elevation of 1,090 feet above mean sea level (msl) in the northeastern part of the Sonoran Desert. Other than the mountains in and around the city, the topography of Phoenix is generally flat. The Phoenix area is surrounded by the McDowell Mountains (~4,200 ft msl) to the northeast, the foothills of the Bradshaw (~7,900 ft msl) and Mazataal (~7,900 ft msl) ranges to the north, the White Tank Mountains (~4,500 ft msl) to the west, the Sierra Estrella (~4,450 ft msl) to the southwest, and the Superstition Mountains (~5,000 ft msl) far to the east. Within the City are the Phoenix Mountains (~2,600 ft msl) and South Mountain (~2,600 ft msl). Current development is pushing north, west, and south into Pinal County.

A fairly dense network of air quality and meteorological monitors exists throughout the Phoenix area, with a much less dense network of monitors throughout the rest of Arizona. **Figure 2-1** shows the general geographic setting of Phoenix, as well as the locations of PM₁₀ monitors that recorded exceedances on November 4, 2011. These monitors include AQS monitors, which measure air quality and meteorological data, and National Weather Service (NWS) monitors, which measure meteorological data only. Some of the AQS monitors in the Phoenix area are run by the Maricopa County Air Quality Department (MCAQD), while others are run by ADEQ. The primary NWS site used in this demonstration package was the Phoenix Sky Harbor International Airport (KPHX) site, because of that site's high data quality, data completeness, and representativeness of meteorological conditions in the Phoenix area. **Figure 2-2** shows the locations of PM₁₀ monitors statewide on November 4, 2011.

Figure 2-3 depicts the drainage systems or watersheds for the State of Arizona. Many of the rivers that form Arizona's drainage system are dry for most of the year and, consequently, are sources of silt and fine soils that become suspended and add to regional PM₁₀ loadings during high wind events. Much of this alluvial matter and fine soil is deposited in the low-lying areas of central and southern Arizona, with larger depositional areas focused in and around the confluences of dry river channels.

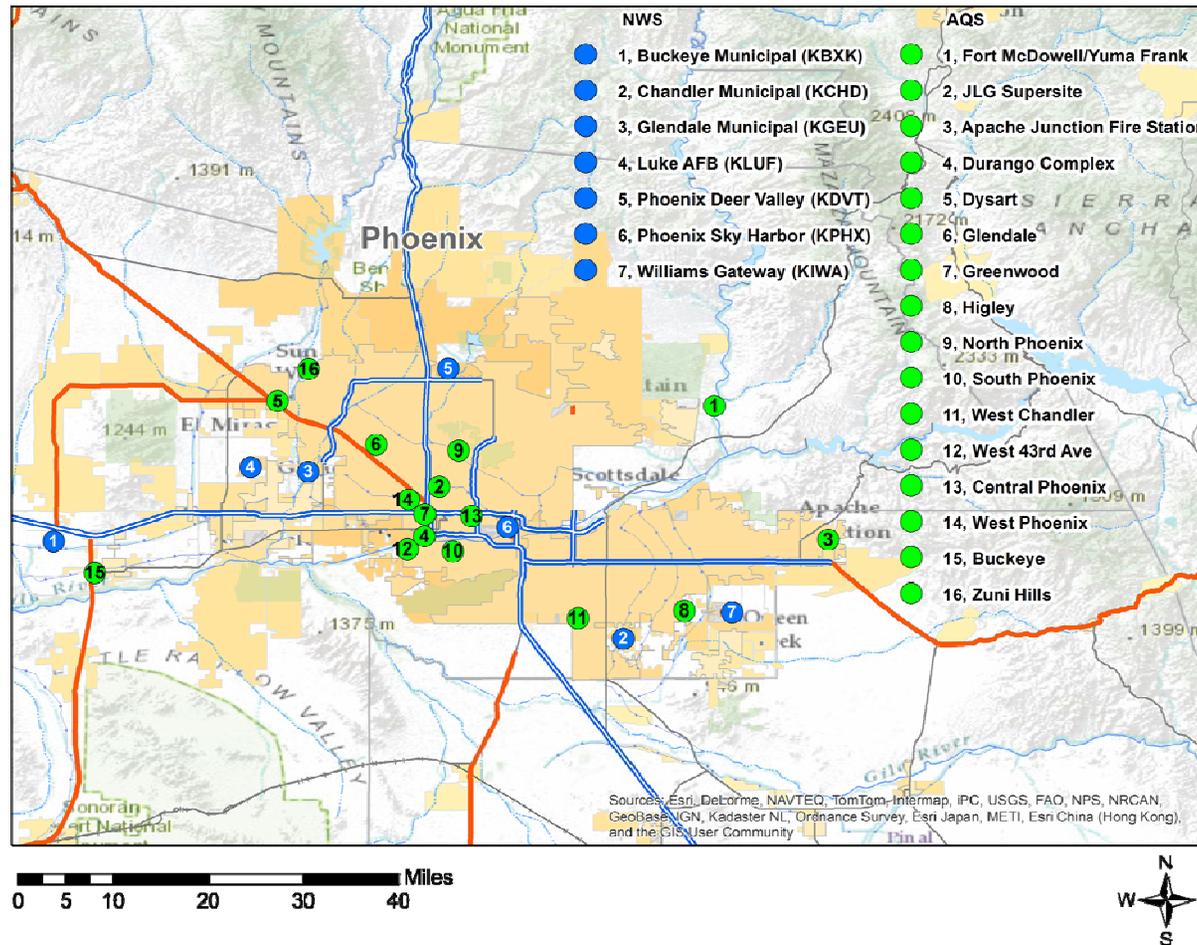


Figure 2-1. Locations of air quality monitors that recorded exceedances of the 24-hr PM₁₀ NAAQS and NWS monitors in the Phoenix area.

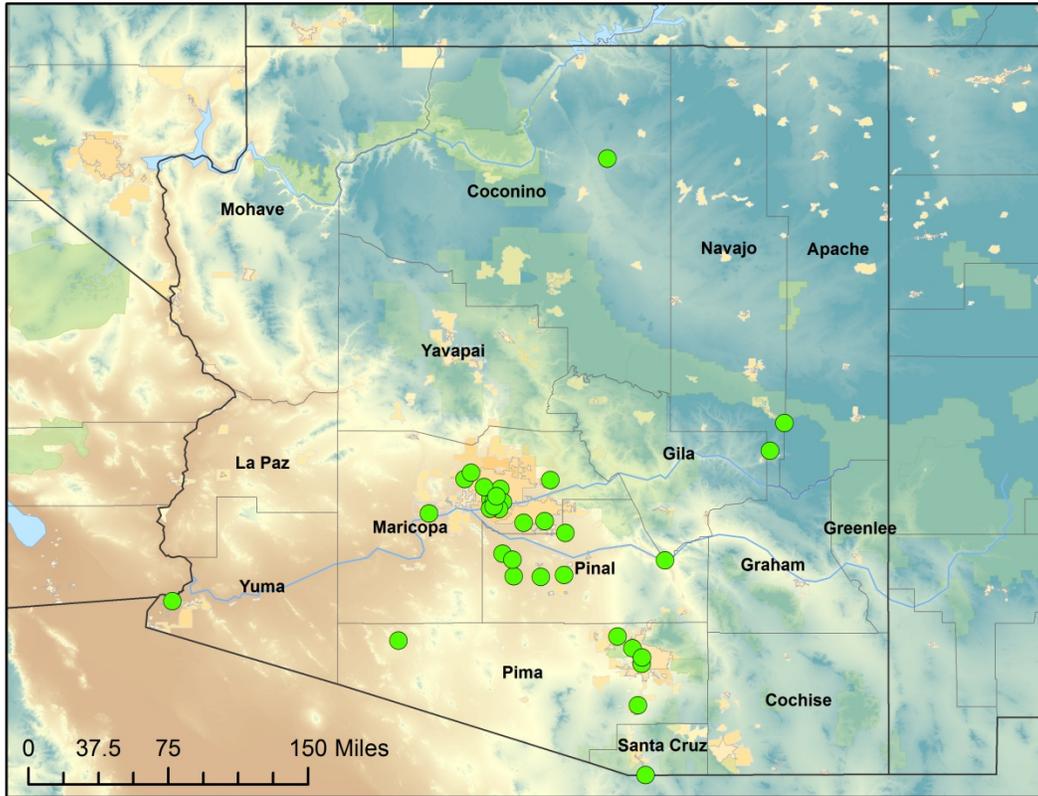
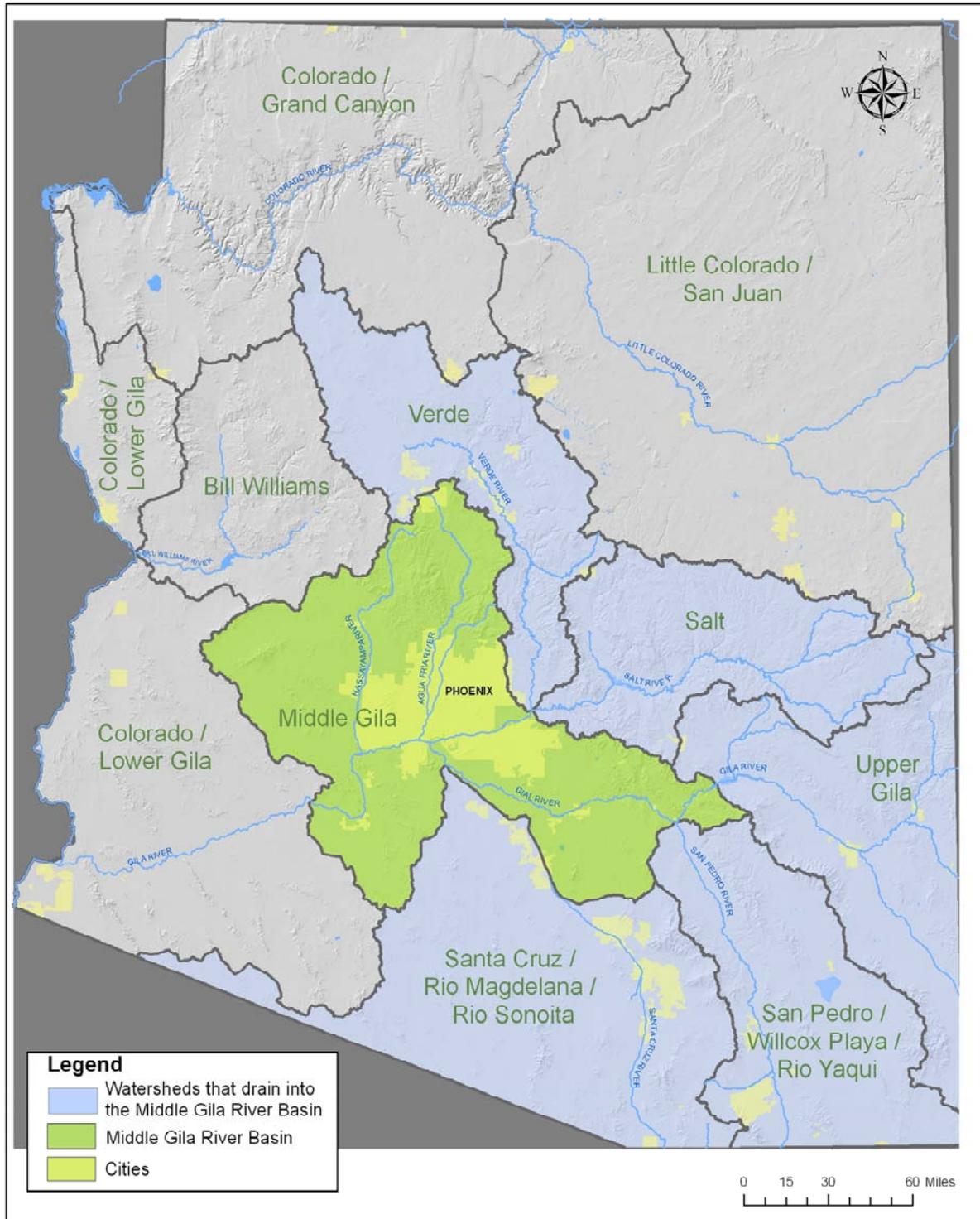


Figure 2-2. Location of sites monitoring PM₁₀ in Arizona on November 4, 2011.



Author: N. Caroli, March 15, 2010



Figure 2-3. Drainage system of Phoenix, Arizona.

2.2 Climate

Phoenix has an arid climate, with very hot summers and temperate winters. The average summer high temperatures are among the hottest of any populated area in the United States (**Figure 2-4**). Temperatures reach or exceed 100°F an average of 110 days annually, and reach or exceed 110°F an average of 18 days annually. Phoenix receives an average of 7.66 inches of rain per year. The bulk of this rain usually falls during the December through March and July through August time periods. During the December through March period, winter storms originating from the Pacific Ocean can produce significant rains in southwestern Arizona. During the mid- to late-summer time period, monsoonal moisture originating from the Gulf of California, Gulf of Mexico, and large thunderstorm complexes over the Sierra Madre Occidental Mountains in Mexico move northward into Arizona.

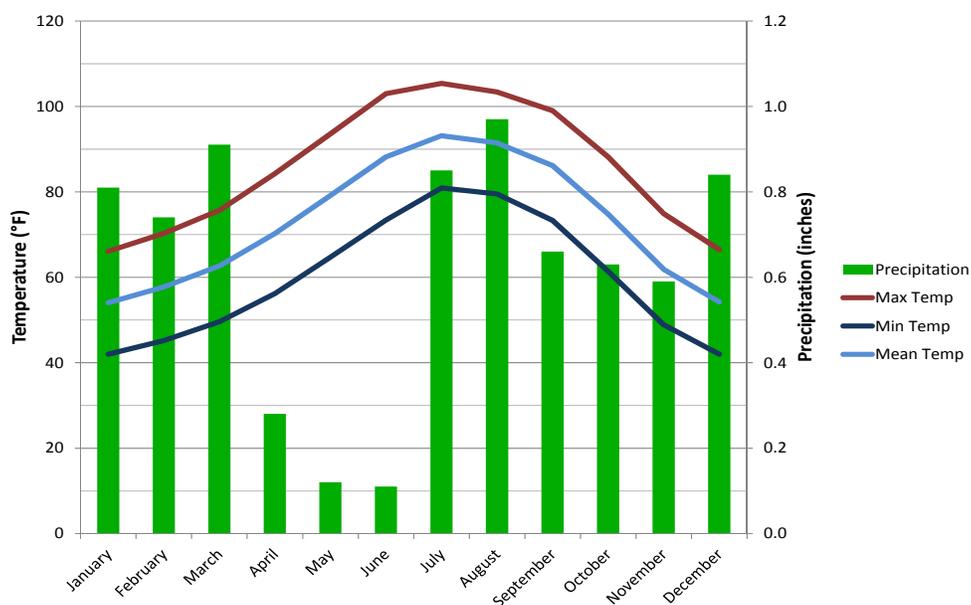


Figure 2-4. Average monthly temperatures and precipitation for Phoenix, 1981–2010.

While windblown dust events in Arizona during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall are usually due to strong winds associated with low-pressure systems and cold fronts moving southeast across California and Arizona. These winds are the result of strong surface pressure gradients between the approaching low-pressure system or cold front and higher pressure ahead of it. As the low-pressure system (or cold front) approaches and passes, gusty southwesterly winds typically shift to northwesterly. The strong winds can loft dust into the air and transport it over long distances, especially if soils in the source region are dry.

2.3 Event Day Summary

On the afternoon and evening of November 4, 2011, strong winds generated by an approaching cold front transported dust northeastward into the Phoenix area (**Figure 2-5**; cold

front depicted in blue). The windblown dust resulted in 24-hr average PM₁₀ concentrations in exceedance of the NAAQS at 18 air quality monitors (**Table 2-1**). The PM₁₀ concentrations measured at these monitors were in excess of normal historical fluctuations. The dust was naturally occurring and likely originated over undeveloped lands south of the Phoenix area, and wind speeds in excess of 20 mph throughout the Phoenix area and over 25 mph at some NWS stations, with gusts frequently over 35 mph, overwhelmed reasonable dust control measures. The PM₁₀ monitors with exceedances were located across the Phoenix PM₁₀ nonattainment area, as well as in Pinal, Pima, and Santa Cruz Counties, illustrating the widespread, regional nature of this event.

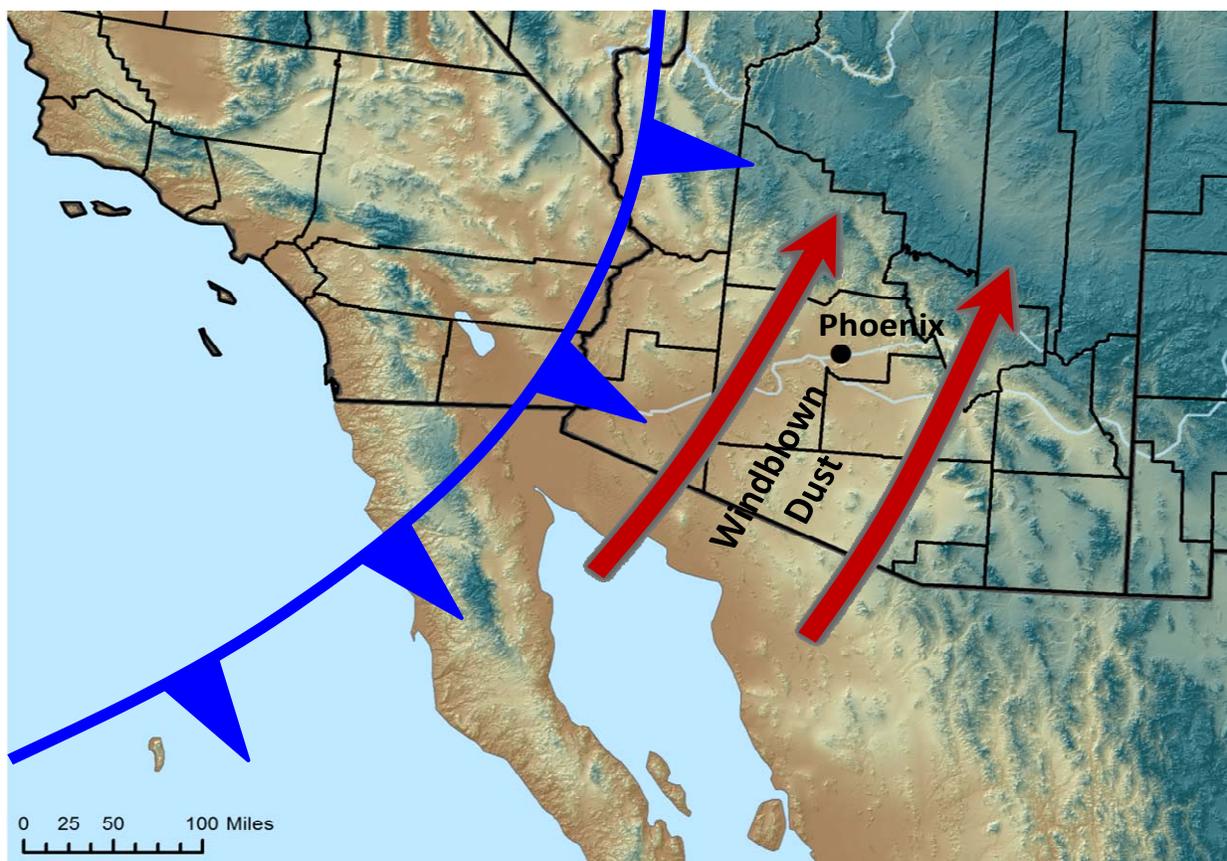


Figure 2-5. Gusty south-southwesterly winds associated with an approaching cold front transported dust north-northeastward to the Phoenix area on November 4, 2011.

Table 2-1. Maricopa County area monitor information and PM₁₀ measurements on November 4, 2011. The exceedance monitors discussed in this report are shown in bold.

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM ₁₀ (µg/m ³)	1-hr Max PM ₁₀ (µg/m ³)	Time of Max 1-hr PM ₁₀ (LST)	AQS Qualifier Flag
Maricopa County							

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg PM ₁₀ (µg/m ³)	1-hr Max PM ₁₀ (µg/m ³)	Time of Max 1-hr PM ₁₀ (LST)	AQS Qualifier Flag
Buckeye	TEOM	MC	04-013-4011-81102-1	284	1638	1700	RJ
Central Phoenix	TEOM	MC	04-013-3002-81102-4	223	1258	1800	RJ
Durango Complex	TEOM	MC	04-013-9812-81102-1	251	1145	1700	RJ
Dysart	TEOM	MC	04-013-4010-81102-1	224	1370	1800	RJ
Fort McDowell/Yuma Frank	TEOM	FMIR	04-013-5100-8112-1	237	N/A	N/A	
Glendale	TEOM	MC	04-013-2001-81102-1	229	1083	1700	RJ
Greenwood	TEOM	MC	04-013-3010-81102-1	231	1507	1800	RJ
Higley	TEOM	MC	04-013-4006-81102-1	258	1243	1500	RJ
JLG Supersite	BAM	ADEQ	04-013-9997-81102-3	200	985 985	1700 1800	RJ
JLG Supersite	TEOM	ADEQ	04-013-9997-81102-4	199	1346	1800	RJ
North Phoenix	TEOM	MC	04-013-1004-81102-1	186	N/A	N/A	RJ
North Phoenix	BAM	MC	04-013-1004-81102-2	186	1053	1800	RJ
South Phoenix	TEOM	MC	04-013-4003-81102-1	231	904	1800	
West Chandler	TEOM	MC	04-013-4004-81102-1	670	2745	1500	RJ
West 43 rd Avenue	TEOM	MC	04-013-4009-81102-1	242	1230	1700	RJ
West Phoenix	TEOM	MC	04-013-0019-81102-1	279	1506	1700	RJ
Zuni Hills	TEOM	MC	04-013-4016-81102-1	258	1574	1800	RJ
Apache County							
N/A	N/A	WMAT	04-001-1003-81102-1	29	56	2200	
Cocnino County							
N/A	N/A	ADEQ	04-005-1237-81102-1	N/A	N/A	N/A	
Gila County							
Hayden Old Jail	TEOM	ADEQ	04-007-1001-81102-3	119	508	2300	IJ
Navajo County							
N/A	N/A	WMAT	04-017-1002-81102-1	36	63	2100	
Pima County							
Ajo	TEOM	ADEQ	04-019-0001-81102-3	149	444	1400	IJ
Geronimo	BAM	PCDEQ	04-019-1113-81102-1	116	517	2200	
Green Valley	BAM	PCDEQ	04-019-1030-81102-1	62	230	2100	
Orange Grove	FRM	PCDEQ	04-019-0011-81102-2	N/A	N/A	N/A	
Rillito	TEOM	ADEQ	04-019-0020-81102-3	226	1241	2200	RJ
South Tucson	FRM	PCDEQ	04-019-1001-81102-1	N/A	N/A	N/A	
Pinal County							
Apache Junction Fire Station	TEOM	PCAQCD	04-021-3002-81102-3	225	825	1600	RJ
Casa Grande Downtown	TEOM	PCAQCD	04-021-0001-81102-3	428	2377	1500	RJ
Combs School	TEOM	PCAQCD	04-021-3009-81102-3	280	1132	1600	RJ
Cowtown	TEOM	PCAQCD	04-021-3013-81102-3	395	1326	1500	RJ

Monitor	Monitor Type	Operator	AQS Monitor ID	24-hr Avg	1-hr Max	Time of Max 1-hr PM ₁₀ (LST)	AQS Qualifier Flag
				PM ₁₀ (µg/m ³)	PM ₁₀ (µg/m ³)		
Maricopa	TEOM	PCAQCD	04-021-3010-81102-3	336	1123	1600	RJ
Pinal County Housing	TEOM	PCAQCD	04-021-3011-81102-3	1161	2404	1400	RJ
Stanfield	TEOM	PCAQCD	04-021-3008-81102-3	586	1987	1500	RJ
Santa Cruz County							
Nogales Post Office	BAM	ADEQ	04-023-0004-81102-3	151	316	1600	IJ
Yuma County							
Yuma Supersite	TEOM	ADEQ	04-027-8011-81102-3	52	170	1700	

TEOM: Tapered element oscillating microbalance monitor
 BAM: Beta attenuation monitor
 FRM: Federal reference method
 WMAT: White Mountain Apache Tribe of Fort Apache Reservation, AZ
 MC: Maricopa County Air Quality Department
 ADEQ: Arizona Department of Environmental Quality
 FMIR: Fort McDowell Indian Reservation
 PCAQCD: Pinal County Air Quality Control District
 PCDEQ: Pima County Department of Environmental Quality
 RJ: qualifier flag for high winds
 IJ: qualifier flag for high winds

3. Causal Relationship

3.1 Discussion

Meteorological and air quality observations indicate that dust carried by gusty winds accompanied by an approaching cold front was directly responsible for the high PM₁₀ concentrations observed in the Phoenix area on November 4, 2011. On the afternoon of November 4, a strong cold front was rapidly moving southeastward across California into western Arizona (**Figure 3-1**). A strong surface pressure gradient associated with this front led to the development of widespread, gusty southwesterly winds across much of Arizona, including in the Phoenix area. The likely source region for PM₁₀ during the November 4, 2011, event was the south-central Arizona desert region south of the Phoenix PM₁₀ nonattainment area. This region largely consists of natural, undisturbed desert. In addition, the two-month period prior to November 4, 2011, was very dry in Phoenix, with only 0.08 inches of rain recorded at Phoenix Sky Harbor International Airport; as a result, soils were very dry. This combination of geography and lack of rainfall preceding the event resulted in a large fetch of soils that were particularly vulnerable to particulate suspension.

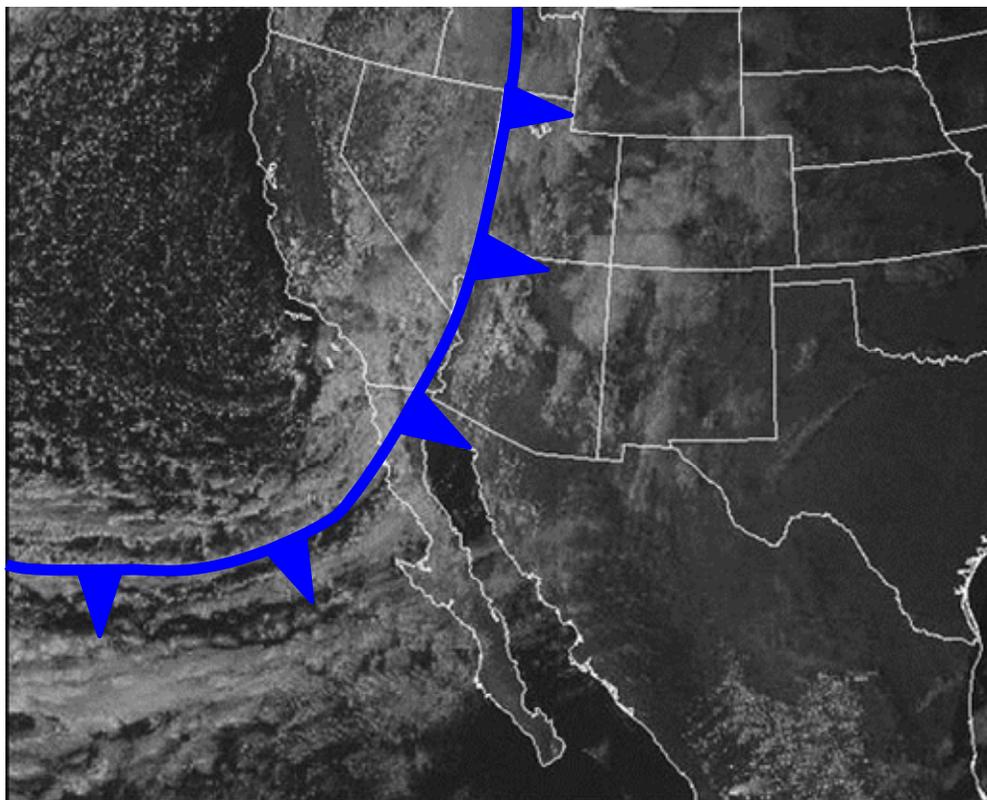
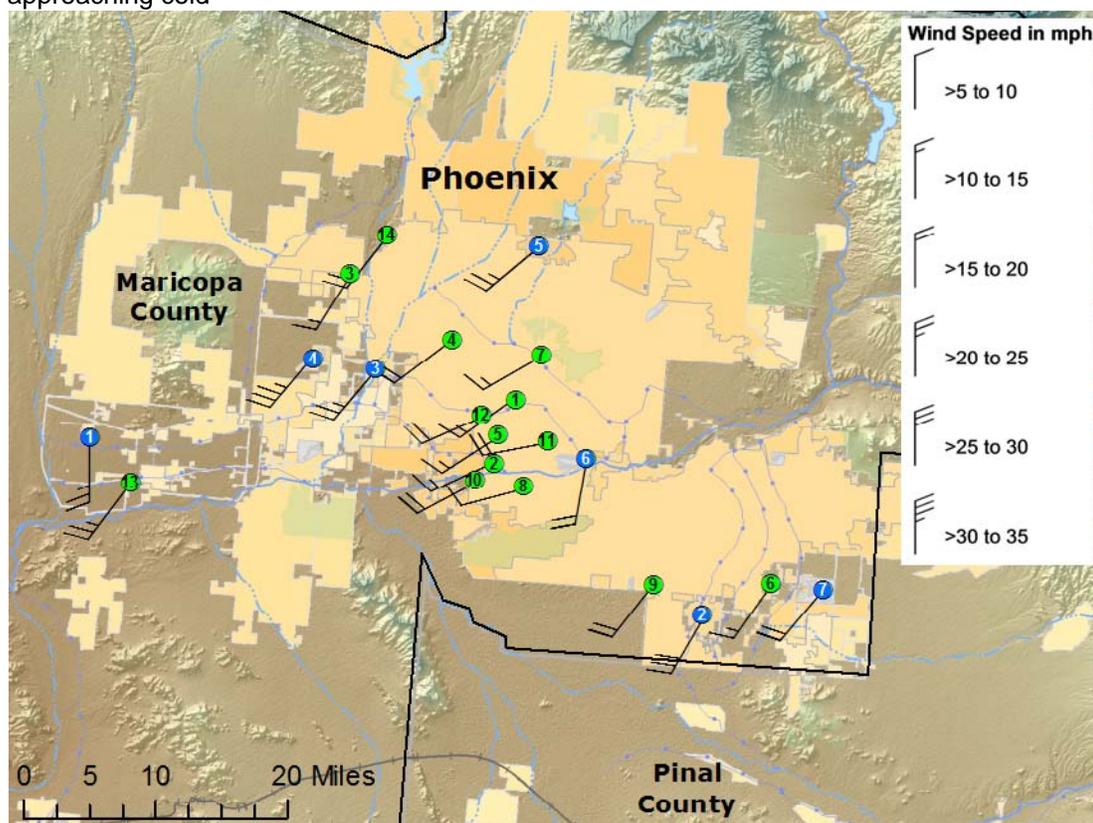


Figure 3-1. Visible satellite image from 1600 LST on November 4, 2011 (GOES-West), depicting a strong cold front approaching Arizona. Strong south to southwesterly winds ahead of this front transported dust into the Phoenix area.

As the cold front approached Phoenix, winds from the southwest increased and were gusty for most of the afternoon and evening. **Figure 3-2** and **Table 3-1** illustrate wind and PM_{10} data in the Phoenix area during the late afternoon hours of November 4, 2011, when PM_{10} concentrations were highest. Monitors in the Phoenix area measured sustained winds of over 20 mph and wind gusts in excess of 30 mph coincident with the high PM_{10} concentrations while some NWS stations in the Phoenix area measured sustained winds above 25 mph with strong gusts above 35 mph (**Figures 3-3** and **3-4**, Table 3-1, **Appendix A**). These conditions lasted for several hours, resulting in a prolonged period of dust transport into the Phoenix area. Visibility at KPHX (**Figure 3-5**) and other regional airports (Appendix A) also decreased significantly with the arrival of the dust, prompting the National Weather Service office in Phoenix, Arizona, to issue a Dust Storm Warning for Maricopa County (see Appendix D). It is also important to note that winds were lighter and PM_{10} concentrations were much lower before the dust storm, illustrating the correlation between the high winds and the dust. Visibility cameras in the Phoenix area also clearly depicted the rapid arrival of dust and the resulting significant reduction in visibility on the afternoon of November 4, 2011. Links to these videos and other media coverage and images pertaining to this windblown dust event are shown in Appendix B.

Figure 3-2. Phoenix area air quality and meteorological monitors. Wind and PM_{10} data and time of observation are shown in Table 3-1. Gusty southwesterly winds ahead of an approaching cold



front transported dust into the Phoenix area on November 4, 2011. Circular symbols and numbers are placed at the location of the monitor site; wind barbs are offset for visual clarity.

Table 3-1. PM₁₀, wind speeds and wind gusts at Phoenix area monitors on November 4, 2011. Symbols in the first column correspond to monitor locations in Figure 3-2.

	Monitor	1-hr Max PM ₁₀ (µg/m ³)	Time of Observation (LST)	Wind Speed (mph)	Wind Gust (mph)	Wind Direction (degrees)
8	Higley	1243	1500	14	32	215
11	West Chandler	2745	1500	19	36	218
7	KIWA	-	1547	17	35	220
3	KGEU	-	1547	21	29	220
6	KPHX	-	1551	20	27	190
2	KCHD	-	1654	28	32	210
15	Buckeye	1638	1700	21	39	217
5	KDVT	-	1700	21	28	230
4	Durango Complex	1145	17:00	13	29	245
6	Glendale	1083	1700	20	40	233
12	West 43 rd Avenue	1230	1700	16	31	242
14	West Phoenix	1506	1700	16	33	246
2	JLG Supersite(3)	985	1700	9	23	239
1	KBXK	-	1755	25	36	180
4	KLUF	-	1757	32	38	220
13	Central Phoenix	1258	1800	16	33	259
5	Dysart	1370	1800	14	33	212
7	Greenwood	1507	1800	14	32	237
2	JLG Supersite(4)	1346	1800	11	26	234
9	North Phoenix(2)	1053	1800	11	30	240
10	South Phoenix	904	1800	7	27	255
16	Zuni Hills	1574	1800	22	37	218

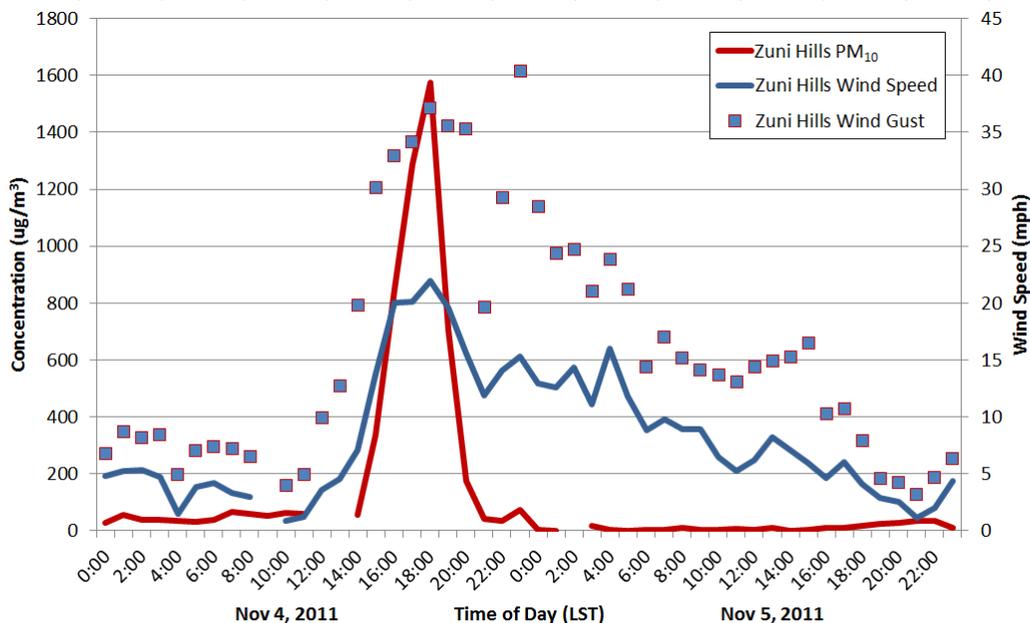


Figure 3-3. Hourly PM₁₀ concentrations and wind speeds at the Zuni Hills monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust. Note that PM₁₀ concentrations were not available at 1200 or 1300 LST on November 4, 2011 or at 0200 LST on November 5, 2011.

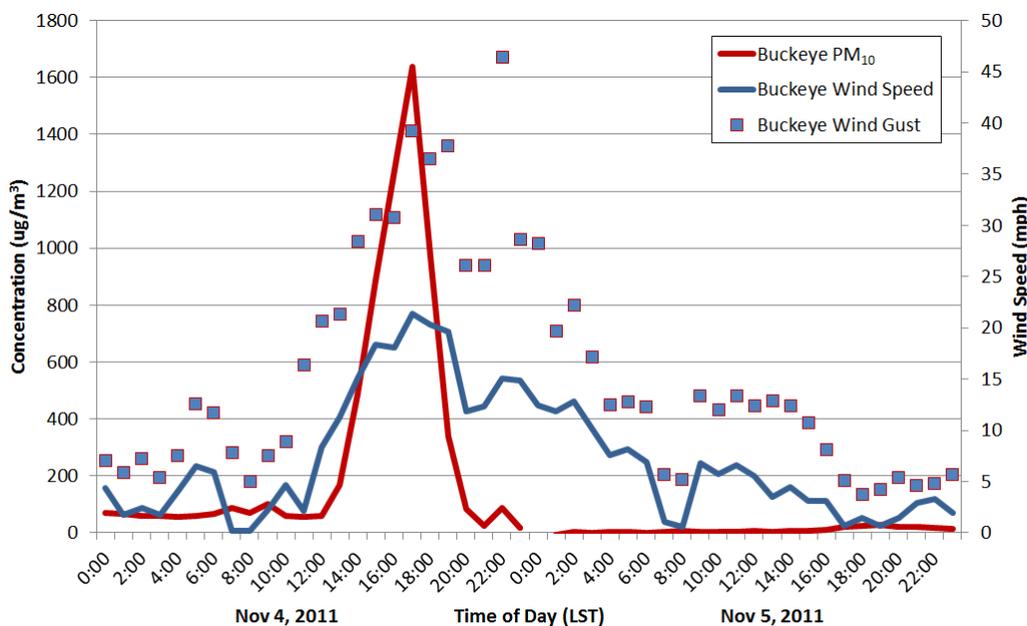


Figure 3-4. Hourly PM₁₀ concentrations and wind speeds at the Buckeye monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust. Sustained winds were measured over 20 mph with gusts over 35 mph. Note that PM₁₀ concentration data was not available at 0000 LST on November 5, 2011.

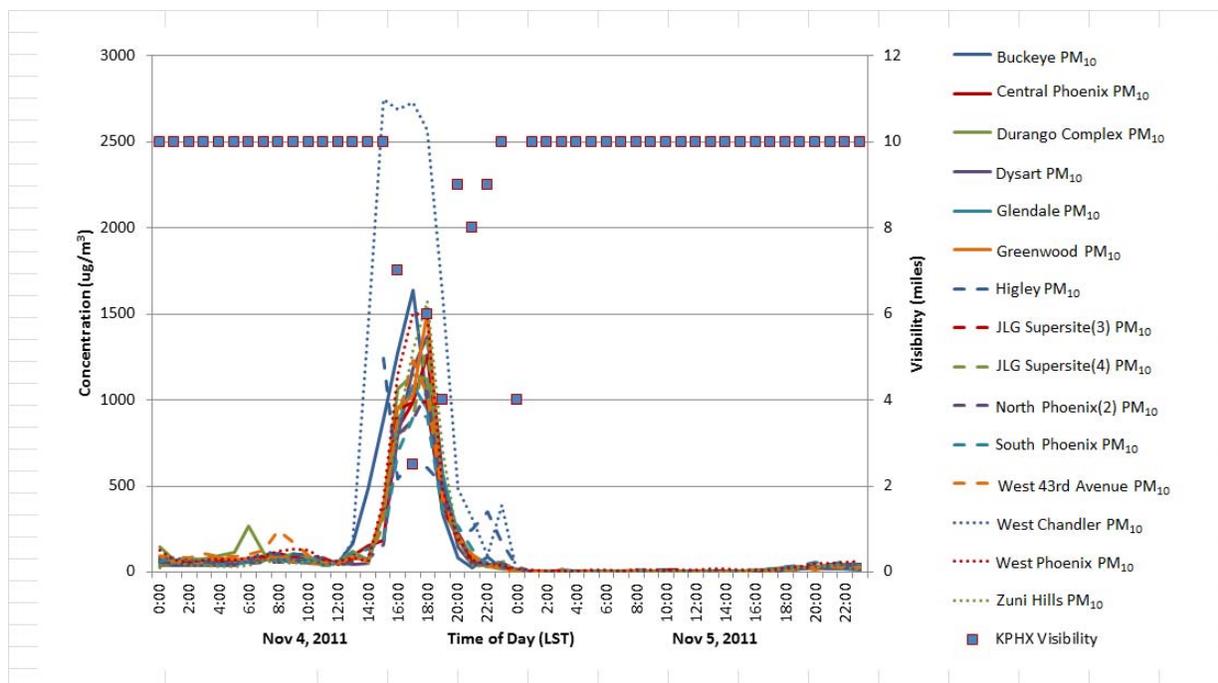


Figure 3-5. Hourly PM₁₀ concentrations at Maricopa County monitors and visibility at KPHX. Visibility was greatly reduced after 1500 LST on November 4, coinciding with the sharp increase in PM₁₀ concentrations at Phoenix area monitors, indicating the arrival of windblown dust.

Strong, gusty winds continued into the overnight hours as the cold front moved through the Phoenix area. However, PM₁₀ concentrations decreased after 2000 LST; this drop in PM₁₀ was likely due in part to rain showers. The rain acts to remove suspended PM₁₀ from the atmosphere and also moistens the surface, making the soils less vulnerable to suspension by the strong winds.

3.2 Summary

The information presented in this section demonstrates a clear causal relationship between the windblown dust and the PM₁₀ exceedances measured in the Phoenix PM₁₀ nonattainment area on November 4, 2011. The wind and PM₁₀ data shown in this section illustrate the spatial and temporal representation of the dust storm as it moved through Maricopa County. In addition, the time series plots of air quality and meteorological data found in this section and in Appendix A show that the sharp increase in PM₁₀ concentrations coincided with the strong wind speeds and wind gusts, and that the strong winds and high PM₁₀ concentrations were experienced over a large area.

4. Historical Norm

4.1 Analysis

PM₁₀ concentrations measured at Phoenix-area monitors on November 4, 2011, were unusual and in excess of normal historical fluctuations. To establish the severity of this event, PM₁₀ concentrations measured on November 4, 2011, were compared to a historical 2007–2011 5-year annual data set at each monitor (**Figure 4-1** and **Appendix C**). The PM₁₀ concentrations measured at the Higley monitor (Figure 4-1) on November 4, 2011, resulted in one of the highest 24-hr averages measured over the 5-year period. Similar time-series plots for the other monitors with exceedances of the 24-hour PM₁₀ standard are shown in Appendix C.

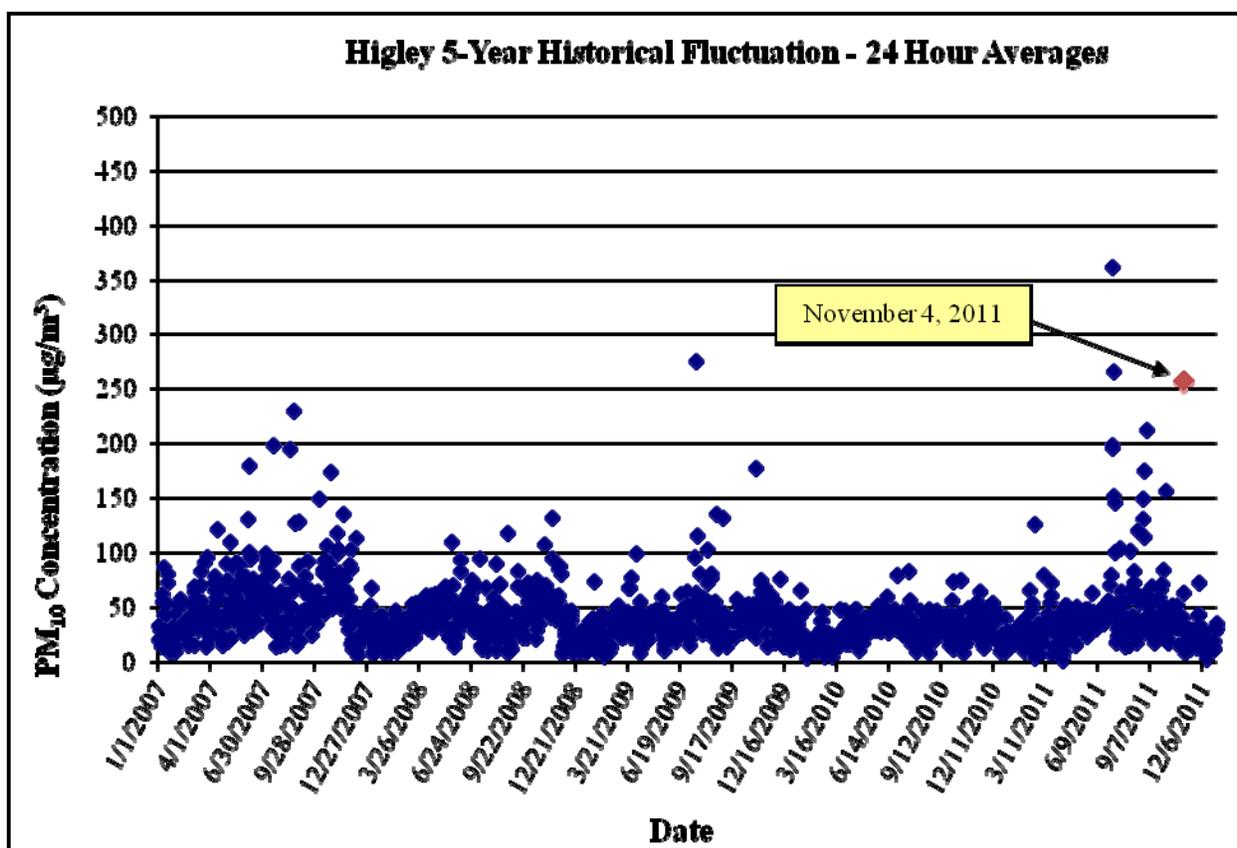


Figure 4-1. 24-hr average PM₁₀ concentrations at the Higley monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

4.2 Summary

Given the recorded values and using a methodology similar to the one accepted by EPA, it is clear that the PM₁₀ levels on November 4, 2011, were outside normal historical fluctuations. This analysis provides evidence that the event affected air quality on a historic scale.

5. Not Reasonably Controllable or Preventable

5.1 Background

ADEQ and MCAQD are responsible for implementing regulatory measures to control emissions from agricultural sources, stationary sources, fugitive dust sources, and open burning within Maricopa County. Three major programs provide or contribute to air pollution control measures for the Greater Phoenix area. These programs include

1. ADEQ's Agricultural Best Management Program (AgBMP)
2. Maricopa County's Inspection and Compliance Program
3. ADEQ's Air Quality Forecasting Program

Specifically, ADEQ is responsible for compliance assistance and enforcement of Agricultural Best Management Practices developed by the Governor's Agricultural Best Management Practices Committee, while MCAQD is responsible for compliance assurance for all other significant sources of PM₁₀ emissions. In addition to routine inspections and inspections driven by complaints, inspections are often increased when (1) ADEQ forecasters issue a Maricopa County Dust Control Forecast of "High Risk", (2) ADEQ forecasters issue a High Pollution Advisory, or (3) near-real-time monitoring data indicate unique activity via high PM concentrations. The forecasting program and inspection/compliance programs work together so that resources can be best utilized during days of greatest risk for elevated PM emissions.

On July 25, 2002, EPA took initial action to finalize approval of the Best Available Control Measure (BACM) and the Most Stringent Measure (MSM) demonstrations in the Serious Area PM₁₀ plan for the Maricopa County portion of the metropolitan Phoenix PM₁₀ nonattainment area (67 FR 48718). These BACM and MSM demonstrations were again approved by EPA on July 14, 2006 (71 FR 43979). The Agricultural Best Management Practices General Permit rule and related definitions have been adopted into the Arizona Administrative Code as R18-2-610 and R18-2-611, pursuant to Arizona Revised Statutes §49-457¹.

5.1.1 Control Measures

Maricopa County regulations of PM₁₀ emissions are listed in **Table 5-1**.

¹ Updates to the AgBMP program in December, 2011, clarified BMPs for crops and added BMPs for animal operations. Effective 12/29/2011, R18-2-611 was renumbered to R18-2-610.01 **Agricultural PM10 General Permit for Crop Operations** and R18-2-611.01 **Animal Operations PM10 General Permit** was added. Definitions for Crop Operations were revised at R18-2-610 and new definitions for Animal Operations were added at R18-2-611.

Table 5-1. Rules and ordinances regulating PM emissions in Maricopa County.

Rule/Ordinance Number & Title	Description
Rule 300: Visible emissions	Establishes standards for visible emissions and opacity.
Rule 310: Fugitive dust from dust-generating operations	Establishes limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source.
Rule 310.01: Fugitive dust from non-traditional sources of fugitive dust	Establishes limits for the emissions of particulate matter into the ambient air from open areas, vacant lots, unpaved parking lots, and unpaved roadways which are not regulated by Rule 310 and which are not required to have either a permit or a dust control plan.
Rule 311: Particulate matter from process industries	Establishes emission rates based on process weight applicable to any affected operations not subject to Rule 316.
Rule 312: Abrasive blasting	Establishes limits for particulate emissions from abrasive blasting operations.
Rule 314: Open outdoor fires and indoor fireplaces at commercial and institutional establishments	Establishes limits for the emissions of air contaminants produced from open burning.
Rule 316: Nonmetallic mineral processing	Establishes limits for the emissions of particulate matter into the ambient air from any nonmetallic mining operation or rock product processing plant.
Rule 317: Hospital/medical/infectious waste incinerators	Establishes limits for the emissions of air pollutants from medical waste incinerators.
Rule 322: Power plant operations	Establishes limits for the emissions of nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter from existing power plants and cogeneration plants.
Rule 323: Fuel burning equipment from industrial/commercial/institutional (ICI) sources	Establishes limits for the emissions of nitrogen oxides, sulfur oxides, carbon monoxide and particulate matter from ICI sources.
Rule 324: Stationary internal combustion (IC) engines	Establishes limits for the emissions of carbon monoxide, nitrogen oxides, sulfur oxides, volatile organic compounds, and particulate matter from stationary internal combustion engines, including stationary IC engines used in cogeneration.
Rule 325: Brick and structural clay products (BSCP) manufacturing	Establishes limits for particulate matter emissions from the use of tunnel kilns for curing in the BSCP manufacturing processes.
Ordinance P-25: Leaf blower restriction	Establishes restrictions for leaf blowers in incorporated and unincorporated sections of Area A in Maricopa County.
Ordinance P-26: Residential wood burning restriction	Establishes restrictions for residential wood burning.
Ordinance P-27: Vehicle parking and use on unstabilized vacant lots	Establishes restrictions for vehicle parking and use on unstabilized vacant lots in unincorporated sections of Area A in Maricopa County.
Ordinance P-28: Off-road vehicle use in unincorporated areas of Maricopa County	Establishes restrictions for operating vehicles on unpaved property in unincorporated areas of Maricopa County.

Rule/Ordinance Number & Title	Description
Arizona Administrative Code R18-2-611 & 610: Agricultural PM ₁₀ general permit	Establishes a requirement for commercial farmers to implement best management practices and maintain a record demonstrating compliance.

5.1.2 Additional Measures

In addition to the rules and regulations listed in **Table 5-1**, other PM₁₀-reducing control measures (e.g., paving unpaved roads, PM₁₀-certified street sweepers, controlling unpaved parking lots, etc.) have been committed to and implemented by local jurisdictions throughout the PM₁₀ nonattainment area and incorporated into the Arizona state implementation plan (SIP) through PM₁₀ plans such as the Revised Maricopa Association of Governments' (MAG) 1999 Serious Area Particulate Plan for PM₁₀ for the Maricopa County Nonattainment Area. The Pinal County Air Quality Control District (PACQCD) also implements regulatory control measures on emissions from existing and new non-point sources within Pinal County (see **Table 5-2**). Additionally, the PACQCD implements specific nonattainment rules for that part of the Phoenix PM₁₀ nonattainment area that resides in Pinal County (see **Table 5-3**).

Table 5-2. Pinal County rules regulating existing and new non-point sources in Pinal County.

Article Number & Title	Description
Article 2: Fugitive dust	Provides a mechanism to reasonably regulate operations which periodically may cause fugitive dust emissions into the atmosphere.
Article 3: Construction sites – fugitive dust	Improves the control of excessive fugitive dust emissions that have been traditionally associated with construction, earthwork, and land development, and thereby minimize nuisance impacts.

Table 5-3. Pinal County rules regulating fugitive dust in Pinal County portion of the Phoenix PM₁₀ Nonattainment Area.

Article Number & Title	Description
Article 4: Nonattainment area rules; dustproofing for commercial parking, drives, and yards	Establishes rules to avoid violations of the prevailing PM ₁₀ standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions from unpaved parking lots.
Article 5: Nonattainment area rules; stabilization for residential parking and drives	Establishes rules for stabilizing residential properties.
Article 6: Restrictions on vehicle parking and use on vacant lots	Establishes rules for unpaved or unstable vacant lots.
Article 7: Construction sites in nonattainment areas – fugitive dust	Establishes rules to avoid violations of the prevailing PM ₁₀ standard and additionally minimize nuisance impacts by improving control of excessive fugitive dust emissions from activities associated with construction, earthwork, or land development.

Article Number & Title	Description
Article 8: Nonattainment area rules, requirement for stabilization of disturbed areas at vacant lots	Establishes rules for stabilizing disturbed areas at vacant lots.

5.1.3 PM₁₀ Rule Effectiveness

MCAQD analyzed the effectiveness of its fugitive dust rules (Rules 310, 310.01 and 316) in terms of permit compliance rates. This rule effectiveness (RE) study was designed to assess how many sources regulated by MCAQD during the subject time period received no PM₁₀ emissions-related violations. As a basis for comparison, the percentage of permitted sources in compliance during calendar year 2007 was 76% for sources subject to Rule 310, 85% for Rule 310.01 sources, and 40% for Rule 316 sources. In early 2008, Rules 310, 310.01, and 316 were strengthened, and new ordinances (covering additional source categories such as leaf blowers, vacant lots, and off-road vehicles) were adopted. These enhancements resulted from MCAQD department’s obligations under such agreements as the 2005 Revised PM₁₀ State Implementation Plan for the Salt River Area and the Maricopa Association of Governments 2007 Five Percent Plan for PM₁₀ for the Maricopa County Nonattainment Area to reduce PM₁₀ emissions throughout the county. Three major areas that contributed to increased compliance were an increase in departmental staffing (especially inspectors), a robust training program, and regulatory changes that broadened and strengthened control measures under Rules 310, 310.01, and 316.

Source compliance rates were re-assessed for FY 2009 (July 2008–June 2009), a period that allowed time for the new and revised regulations to take effect. The results showed significant increases in compliance compared with the earlier period: to 90% (from 76%) for Rule 310 sources, 95% compliance (from 85%) for Rule 310.01 sources, and 65% (from 40%) for Rule 316 sources. These improvements continued into calendar year 2010 with compliance rates of 94% for Rule 310 sources, 96% for Rule 310.01 sources, and 73% for Rule 316 sources. The timeline below (**Figure 5-1**) illustrates the improvements in RE over the last several years; it also points out significant revisions to previous rules, as well as newly adopted rules and ordinances.

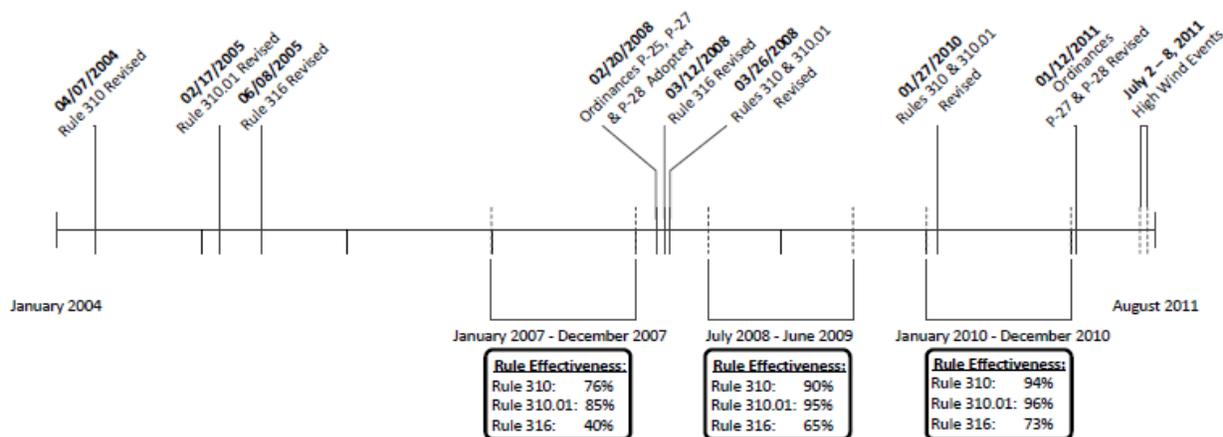


Figure 5-1. Timeline of Maricopa County fugitive dust rules and ordinances.

5.1.4 Compliance and Enforcement Activities

MCAQD is prepared to proactively respond to high wind events and protect human health and well-being. MCAQD’s approach consists of two primary components: proactive inspections conducted routinely, as well as surveillance inspections conducted during and after significant air quality events. MCAQD routinely inspects dust control-permitted sites and increases the frequency of inspections for permits covering areas of 10 acres or more. Rule 316 sources are also regularly inspected multiple times every year. Maricopa County responds to the majority of complaints within 24 hours.

Maricopa County monitors the ADEQ Five-Day Dust Control Forecast to identify the potential for elevated PM₁₀ pollution levels due to high winds or stagnant conditions. When a High Pollution Advisory (HPA) is issued for Maricopa County, MCAQD conducts increased surveillance before, during, and after the forecast event(s). MCAQD also conducts event surveillance and post-event activities during exceedance days that had not been forecast (i.e., those instances in which an HPA had not been issued).

Pre-event surveillance consists of surveying high-risk areas for any dust-generating activities, educating sources of the impending HPA event, and issuing violations for failure to comply with local, state, or federal regulations. During the event, MCAQD inspectors survey high-risk areas to confirm that control measures are in place, document any violations, and contact other regulatory agencies if necessary. Post-event activities include continued surveys of high-risk areas, re-inspecting sources that had incurred violations within two business days, and an internal MCAQD debriefing of event activities.

During 2011, a total of 14 MCAQD air monitoring sites were upgraded with new equipment that allows the monitoring sites to automatically report measured readings at 5-minute intervals. Previously, only hourly readings were available. The real-time data reporting system includes a mechanism to alert MCAQD field staff when PM concentrations are elevated. The system allows MCAQD responders to review concentrations at the monitors and

to consult the National Weather Service website to check for weather event activity. This capability allows the MCAQD responder to identify regional events and monitor specific issues. If necessary, the MCAQD responders can inform nearby stakeholders and local governments of the elevated PM₁₀ concentrations.

5.1.5 Review of Source-Permitted Inspections and Public Complaints

ADEQ's Arizona Unified Repository for Information Tracking of the Environment (AZURITE) database was queried to compile a list of inspections for the permitted sources in the Maricopa area around the time of the November 4, 2011, PM₁₀ exceedances. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation did not indicate any evidence of unusual anthropogenic-based PM₁₀ emissions. During the period of November 1 through November 7, 2011, MCAQD inspectors conducted a total of 146 inspections of permitted facilities, of which 91 were at fugitive dust sources. Additionally, MCAQD conducted 209 inspections on vacant lots and unpaved parking lots. During this 7-day period, a total of 18 violations were issued countywide for PM₁₀ and non-PM₁₀ related violations. Nine violations were issued for PM₁₀ emissions within a 4-mile radius of an exceeding monitor (Buckeye, Central Phoenix, Higley, and Zuni Hills).

On November 2, 2011, two violations were issued to a permitted facility within 4 miles of the Buckeye monitor. A violation was issued for failure to maintain records of daily self-inspection and implementation of control measures from the Dust Control Plan. A second violation was issued for failure to provide to the inspector, in a timely manner, operational records required in the permit pertaining to grain loading and unloading. The source corrected the violations on subsequent inspections. The permitted site is located approximately 1.8 miles northeast of the Buckeye monitor. During the exceptional event on November 4, 2011, winds were generally from the southwest at the Buckeye monitor.

On November 3, 2011, a violation was issued to a permitted construction site for failure to maintain records of daily self-inspection and implementation of control measures in the Dust Control Plan. At the time of the inspection, no disturbed surfaces were observed, and the source was complying with the required control measures detailed in their earthmoving permit. The source corrected the violation and maintained compliance with their permit on subsequent inspections. The site is approximately 1.4 miles southeast of the Central Phoenix monitor. During the exceptional event, the winds were generally from the west and southwest at the Central Phoenix monitor.

On November 4, 2011, three violations were issued to a permitted construction site within 4 miles of the Higley monitor. A violation was issued for approximately 0.22 acres of disturbed area on which no earthmoving activity was occurring. A second violation was issued for failure to keep dust control records. A third violation was issued for exceeding the permitted earthmoving area by approximately 0.11 acres. The inspector observed the stability issue at 1210 LST and remained onsite until the entire site was stabilized with water at 1330 LST. The Higley monitor began showing exceedances at about 1500 LST. The site was permitted for 0.96 acres and observed with 0.22 acres of unstable surface areas. The permitted site is approximately 1.0 mile north of the Higley monitor. During the exceptional event, the winds were generally from the south and southwest at the Higley monitor.

MCAQD was prepared for any complaints received due to the high wind event. During the 7-day period from November 1 through November 7, 2011, MCAQD received 41 complaints, of which 30 were related to windblown dust. Each complaint was assigned to, and investigated by, a MCAQD inspector. A review of all pertinent records from this period indicates that MCAQD inspectors observed three PM₁₀ emissions violations of local, state, or federal regulations within a 4-mile radius of exceeding monitors (Zuni Hills and Higley).

On November 2, 2011, a complaint investigation led to the issuance of a violation to the owner of a vacant lot for failure to stabilize surface areas that had been disturbed by vehicular activity during a temporary carnival. The vacant lot is approximately 1.5 miles northeast of the Zuni Hills monitor, and the total disturbed surface area was 0.79 acres. The violation was observed at 0700 LST, and a City of Peoria water truck began applying water to the unstable areas at approximately 0915 LST. Additionally, a response letter from the parcel owner indicated that 3/8-inch gravel had been applied to the property and "No Trespassing" signs were posted. The vacant lot was stabilized prior to the November 4 high wind event.

On November 4, 2011, a complaint investigation led to the issuance of a violation to the owner of a vacant lot for failure to stabilize surface areas that had been disturbed by vehicular activity. The total unstable area was approximately 0.14 acres. The vacant lot is approximately 1.5 miles northeast of the Zuni Hills monitor. During the exceptional event, the winds were generally from the southwest at the Zuni Hills monitor.

On November 4, 2011, a complaint investigation led to the issuance of a violation to the owner of a vacant lot for failure to prevent vehicle access. The inspector stated that there was a small area, approximately 0.01 acres, of unstable soil of caused by foot traffic, bicycles, and vehicle use. The vacant lot was stabilized with water, while fences, "no access" signs, and non-erodible materials were installed to further control and stabilize the vacant lot. The vacant lot is approximately 3.3 miles northeast of the Higley monitor. During the exceptional event, the winds were generally from the south and southwest at the Higley monitor.

In addition to MCAQD's efforts in pre-event surveillance and proactive inspections, ADEQ's Agricultural Best Management Practice Program (Ag BMP) inspector also monitors the ADEQ Five-Day Dust Control Forecast and the MCAQD air monitoring sites that include real-time data. The ADEQ Ag BMP inspector uses specific knowledge of seasonal activities and associations with the local growers and dairymen to communicate the importance of limiting dust-generating activities, especially during high wind events. Additional outreach is conducted with facility representatives prior to forecast high wind alert days. Should the PM₁₀ readings at a MCAQD air monitoring site show a notable increase, the ADEQ Ag BMP inspector is dispatched to contact the owners and operators of agricultural fields in the area to discern whether their activities are causing negative impacts. The Ag BMP inspector is prepared to respond to most agriculture complaints within 24 hours.

A review of the inspection reports and site visit documentation shows no evidence to suggest that agricultural activities produced unusual PM₁₀ emissions. From November 3 through November 4, 2011, the ADEQ Ag BMP inspector distributed notification of the November 4 PM₁₀ HPA to 12 agricultural operations and conducted surveillance near the Buckeye monitor on November 4.

5.2 Forecasts and Warnings

Dust forecasts and statements were released prior to the event by both ADEQ and the NWS office in Phoenix (Appendix D). For November 3, 2011, ADEQ issued a Maricopa County Dust Control Forecast indicating a high risk level for unhealthy PM₁₀. The Dust Control Forecast also indicated a potential for strong and gusty winds throughout the area, as well as dense blowing and transported dust generated by a very strong trough of low pressure. ADEQ also issued a PM₁₀ High Pollution Advisory for Maricopa County for November 4, 2011.

The NWS in Phoenix issued a Special Weather Statement on Wednesday, November 2, 2011, indicating that strong winds and blowing dust and sand would be possible on Friday, November 4. On Thursday, November 3, the NWS issued a Wind Advisory and Blowing Dust Advisory for the Phoenix area effective 1100 to 2000 LST on Friday, November 4, for the potential for sustained southerly winds of 25 to 35 mph with gusts to 50 mph and blowing dust with visibilities reduced to under 1 mile. This time period corresponds to the period of very high PM₁₀ concentrations reported at Phoenix-area monitors. At 1407 LST on Friday, November 3, the NWS upgraded the Blowing Dust Advisory to a Dust Storm Warning. NWS offices in Tucson and Flagstaff, Arizona, and in Las Vegas, Nevada, also issued statements and/or advisories related to strong winds and blowing dust, illustrating the widespread, regional nature of this event.

5.3 Wind Observations

Wind data during the event (Table 3-1, Figure 3-3 and Appendix A) showed several hours of sustained wind speeds of over 20 mph, a few NWS sites with peak sustained winds over 25 and as high as 32 mph, and wind gusts frequently over 35 mph coincident with the high PM₁₀ concentrations.

5.4 Summary

On November 4, 2011, strong winds associated with a cold front transported dust and PM₁₀ into the Phoenix PM₁₀ nonattainment area. The source region of the dust that caused the exceedances was largely outside the Phoenix PM₁₀ nonattainment area, primarily the deserts south of the Phoenix PM₁₀ nonattainment area. The Phoenix area is designated as a serious nonattainment area for PM₁₀ and is required to have BACM for all significant sources of PM₁₀. BACM-approved control measures on significant anthropogenic sources were in place and enforced during the events, and proactive tracking and response to the events by regulatory agencies and local governments confirmed the uncontrollable nature of the dust emissions; therefore, these previously approved required controls are adequate for meeting the requirements of an exceptional event and should be considered “reasonable” for these purposes.

Despite the deployment of comprehensive control measures and sophisticated response programs, high wind conditions associated with the approaching cold front transported high concentrations of PM₁₀ into, and also overwhelmed controls within, the Phoenix PM₁₀ nonattainment area. Widespread sustained winds in excess of 20 mph with some sustained

winds as high as 32 mph and gusts frequently over 35 mph were strong enough to overwhelm available efforts to limit PM₁₀ concentrations during the event. The fact that these were natural events involving strong winds that transported PM₁₀ emissions into and across Maricopa County, with a majority of the PM₁₀ emissions recorded by Maricopa County area monitors coming from sources outside of the Phoenix PM₁₀ nonattainment area, provides strong evidence that the exceedances of November 4, 2011, recorded within the Phoenix PM₁₀ nonattainment area were not reasonably controllable or preventable.

6. But-For Analysis

6.1 Discussion

Section 50.14(c)(3)(iv)(D) in 40 CFR Part 50 requires that an exceptional event demonstration satisfy the condition that “[t]here would have been no exceedance or violation but for the event.” The prior sections of this submittal have provided detailed information that, in regard to the PM₁₀ exceedances at Phoenix area monitors on November 4, 2011,

- the exceedance was not reasonably controllable or preventable, and
- there was a clear causal relationship between PM₁₀ transported strong winds originating in desert areas outside the Phoenix PM₁₀ nonattainment area and the measured PM₁₀ exceedances in the Phoenix PM₁₀ nonattainment area.

The weight of evidence in these sections demonstrates that, but for the existence of dust emissions generated by strong winds and the associated transport of PM₁₀, there would have been no exceedance of the NAAQS for 24-hr average PM₁₀.

As shown in Section 3, maps and time-series plots of PM₁₀ and wind speeds establish a clear causal relationship between the arrival of strong winds associated with an approaching cold front and elevated PM₁₀ concentrations at Phoenix-area monitors. Multiple independent measurements of wind speed, wind direction, and visibility point to the presence of widespread, strong winds as the mechanism for transport of PM₁₀ into the Phoenix nonattainment area. In addition, PM₁₀ concentrations were well below the NAAQS on days immediately before and after the windblown dust event. The source region for the PM₁₀ is clearly identified as desert areas south of the Phoenix PM₁₀ nonattainment area. The weight of evidence presented in this submittal provides no alternative that could tie the exceedance of November 4, 2011 to any causal source except PM₁₀ transported by strong winds, confirming that there would have been no exceedance but for the presence of this uncontrollable natural event.

As detailed in Section 5, all reasonable control measures were in place and/or implemented on a continual basis. Air quality-related inspection and compliance data revealed no violations or complaints within three days before and after the time of the event. Local regulatory agencies, industry, and the general public were alerted to the possibility of dust storms due to strong winds via daily forecasts and media reports.

6.2 Summary

The weight of evidence presented in this submittal provides no alternative that could tie the exceedance of November 4, 2011, to any causal source other than PM₁₀ transported by strong winds associated with an approaching cold front, confirming that there would have been no exceedance but for the presence of this uncontrollable natural event.

7. Conclusions

The PM₁₀ exceedances that occurred on November 4, 2011, satisfy the criteria of the EER, which states that in order to justify the exclusion of air quality monitoring data, evidence must be provided for the following elements:

- The event satisfies the criteria set forth in 40 CFR 501 (j) that
 - a. the event affected air quality,
 - b. the event was not reasonably controllable or preventable, and
 - c. the event was caused by human activity unlikely to recur in a particular location or was a natural event;
- There is a clear causal relationship between the measurement(s) under consideration and the event;
- The event is associated with a measured concentration(s) in excess of normal historical fluctuations; and
- There would have been no exceedance or violation but for the event.

7.1 Affects Air Quality

As stated in the preamble to the EER, the event in question is considered to have affected air quality if it can be shown that there is a clear causal relationship between the monitored exceedances and the event, and that the event is associated with a measured concentration in excess of normal historical fluctuations. Given the information presented in Sections 2, 3, 4, and 5, we can reasonably conclude that the event in question affected air quality.

7.2 Not Reasonably Controllable or Preventable

Section 50.1(j) of 40 CFR Part 50 requires that an event must be “not reasonably controllable or preventable” in order to be defined as an exceptional event. This requirement is met by demonstrating that despite reasonable control measures in place within Maricopa County, high winds overwhelmed all reasonably available controls (Section 5). The PM₁₀ exceedances discussed in this report were caused by naturally occurring strong winds associated with an approaching cold front that transported dust into the Phoenix area from areas largely outside the Phoenix PM₁₀ nonattainment area. These facts provide strong evidence that the PM₁₀ exceedances on November 4, 2011, were not reasonably controllable or preventable.

7.3 Natural Event

As discussed above, the PM₁₀ exceedances in the Phoenix area on November 4, 2011, were shown to be caused by transport of PM₁₀ into the Phoenix area from widespread strong winds associated with an approaching cold front. The event therefore qualifies as a natural event.

7.4 Clear Causal Relationship

The following points demonstrate that the high PM₁₀ concentrations were caused by windblown dust:

- Time-series of PM₁₀ concentrations show that the timing of high PM₁₀ at Phoenix area monitors was consistent with gusty winds and low visibilities at Phoenix-area meteorological stations (Section 3).
- High PM₁₀ concentrations and gusty winds were reported throughout the Phoenix metropolitan area, as well as across much of Arizona, southeastern California, and southern Nevada, illustrating the widespread, regional, and uncontrollable nature of this event (Sections 3 and 5).
- PM₁₀ concentrations were well below the NAAQS on days immediately before and after the windblown dust event (Section 3).
- Dry conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by high winds (Section 3).
- Visibility cameras clearly illustrate the arrival of dust and significant reductions in visibility in the Phoenix area coinciding with the sharp increases in PM₁₀ concentrations.

7.5 Historical Norm

The 24-hr average PM₁₀ values measured at Phoenix area monitors were historically unusual compared to a multi-year data set (Section 4).

7.6 But For

On the basis of the weight of evidence described above and in Section 6, the exceedances of the federal 24-hr PM₁₀ standard on November 4, 2011, in the Phoenix PM₁₀ nonattainment area would not have occurred but for the high winds and transport of dust from areas largely outside the Phoenix PM₁₀ nonattainment area.

Appendix A: Air Quality and Meteorological Data for Maricopa County

This section contains time-series of PM₁₀ concentrations and wind data for Phoenix-area air quality monitors on November 4 and 5, 2011. The data show a region-wide increase in wind speeds and wind gusts coincident with the arrival of dust and high PM₁₀ concentrations.

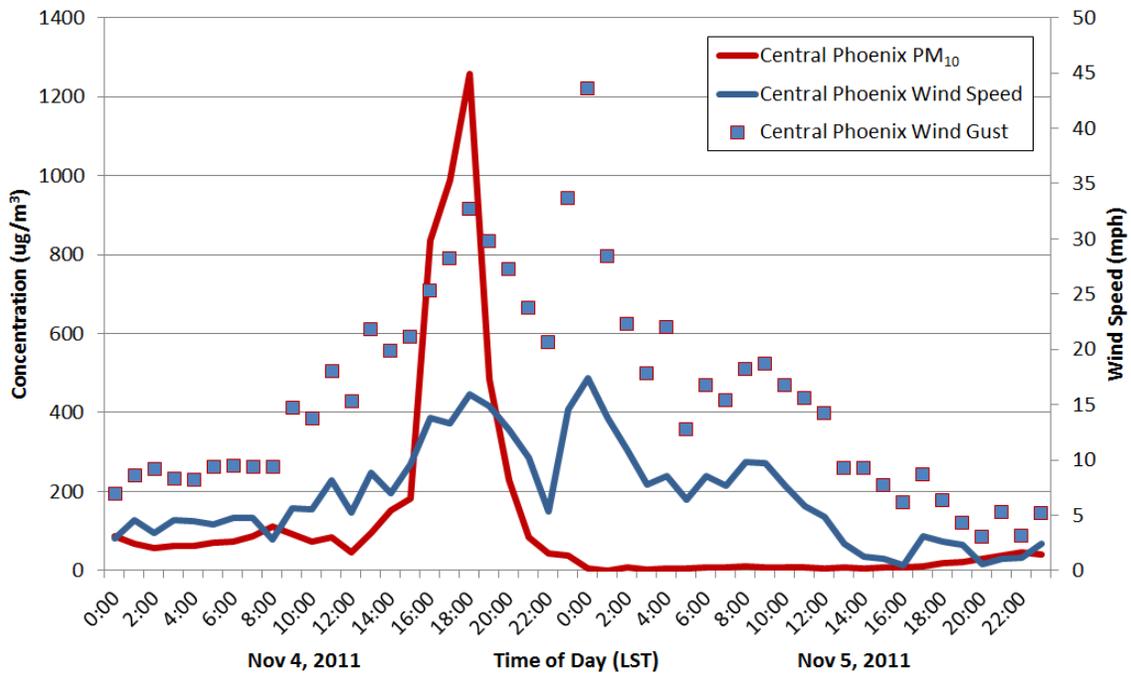


Figure A-1. Hourly PM₁₀ concentrations and wind speeds at the Central Phoenix monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

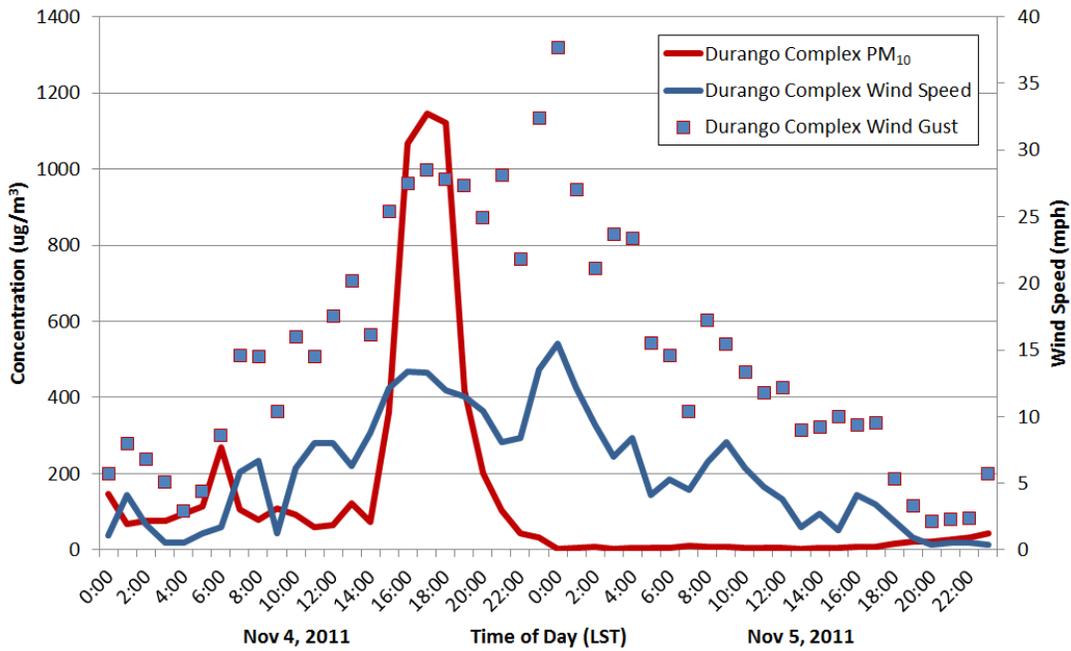


Figure A-2. Hourly PM₁₀ concentrations and wind speeds at the Durango Complex monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

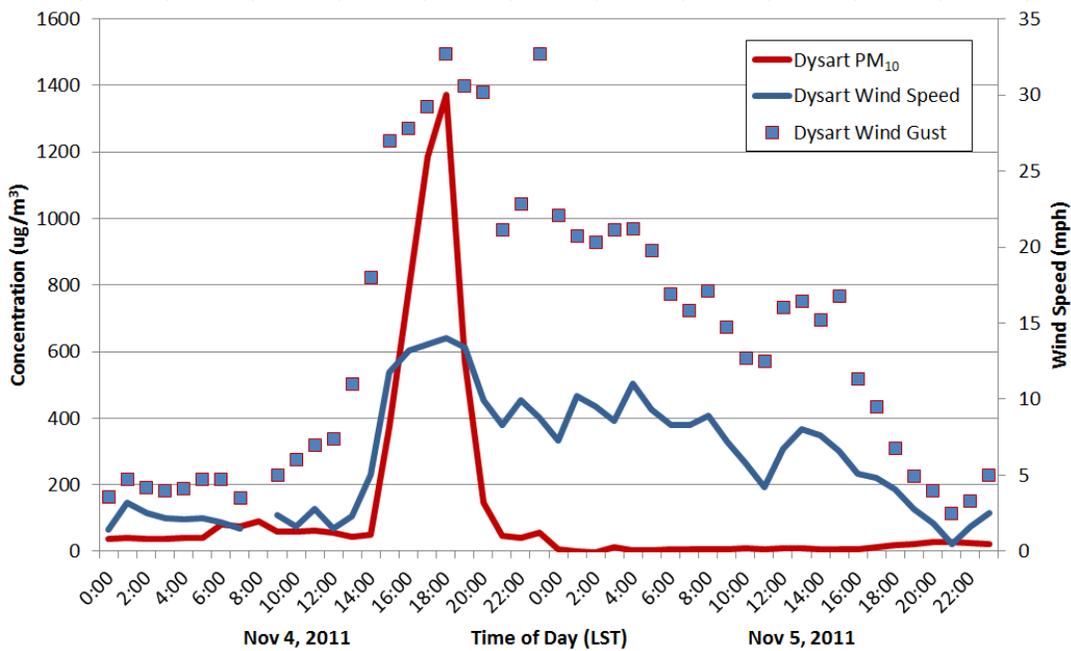


Figure A-3. Hourly PM₁₀ concentrations and wind speeds at the Dysart monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust. Note that wind speed and wind gust data were not available at 0800 LST on November 4, 2011 at the Dysart monitor.

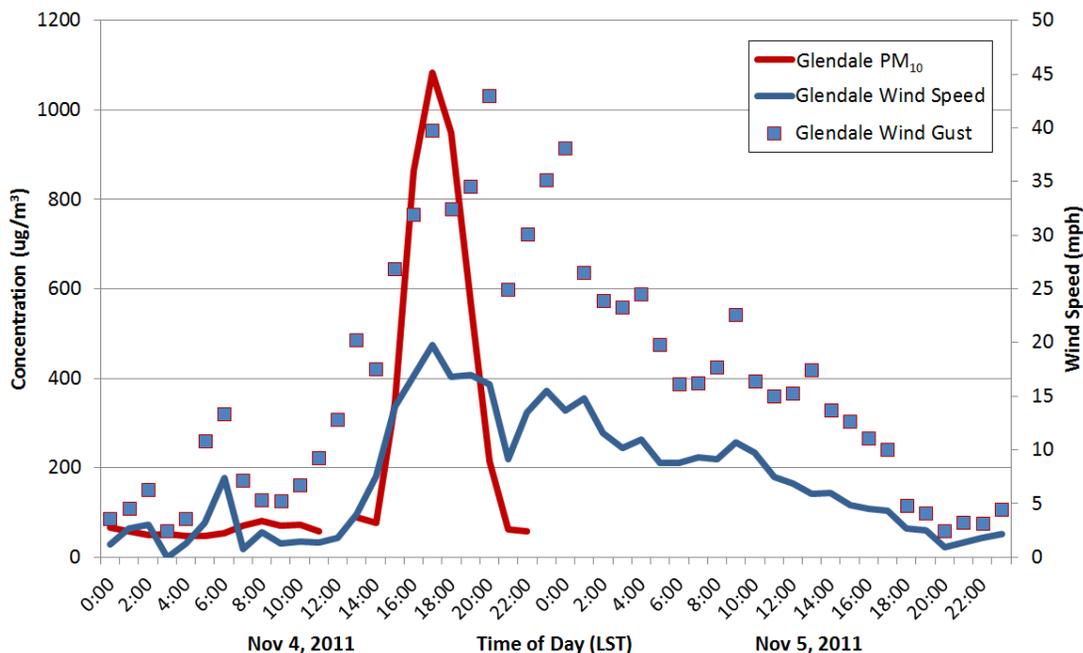


Figure A-4. Hourly PM₁₀ concentrations and wind speeds at the Glendale monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust. Note that PM₁₀ concentrations were not available at 1200 or 2300 LST on November 4, 2011 or for the entirety of November 5, 2011 at the Glendale monitor.

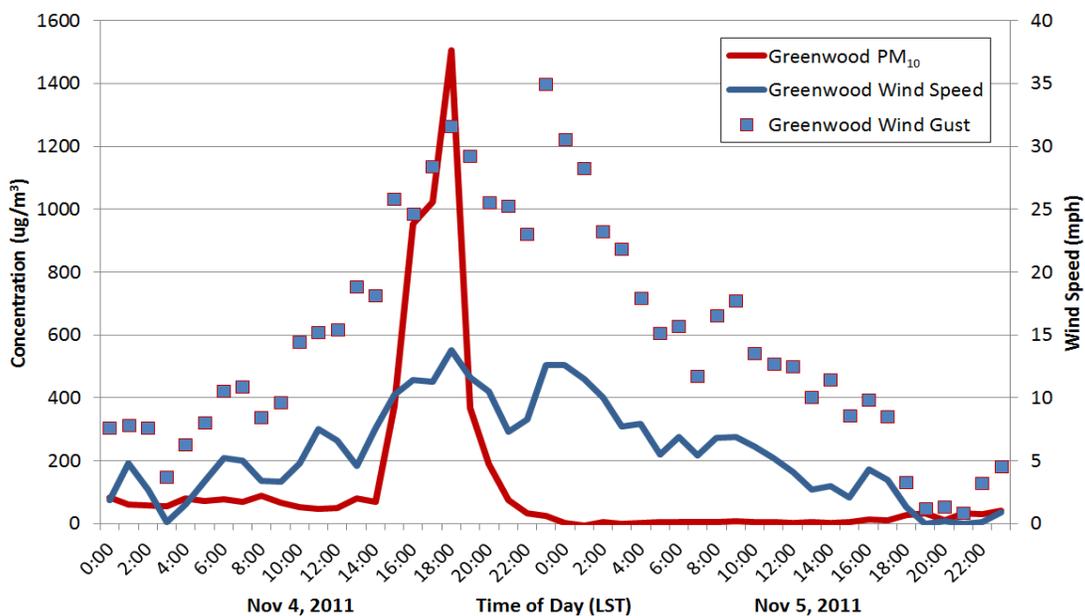


Figure A-5. Hourly PM₁₀ concentrations and wind speeds at the Greenwood monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

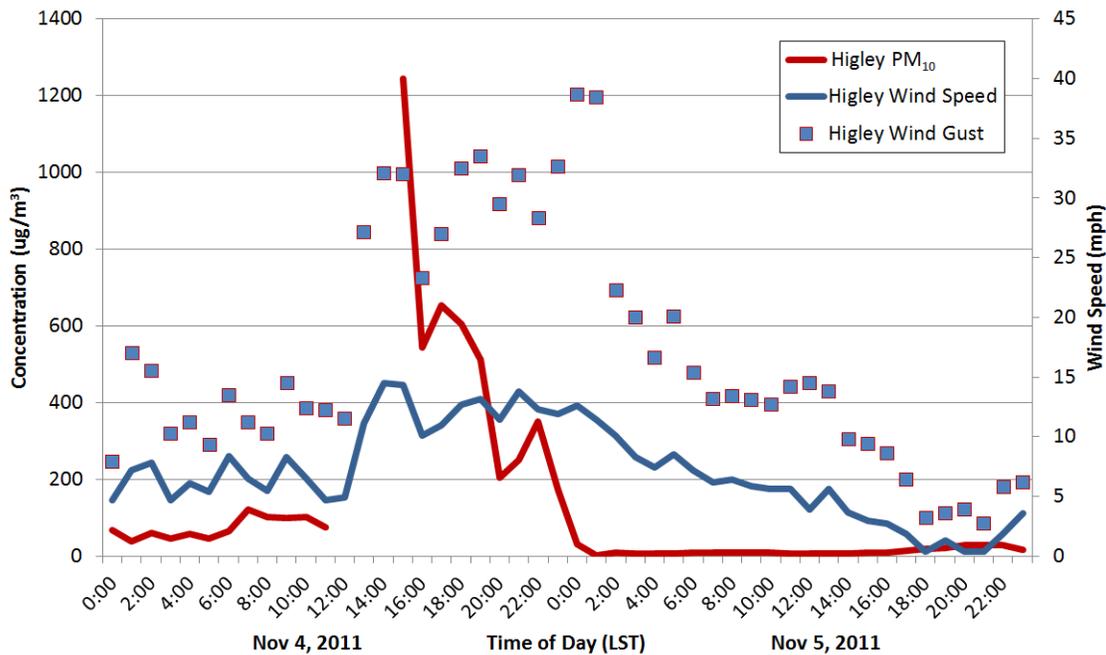


Figure A-6. Hourly PM₁₀ concentrations and wind speeds at the Higley monitor on November 4 and 5, 2011. Note that PM₁₀ concentrations were not available between 1200 and 1400 LST on November 4, 2011 at the Higley monitor.

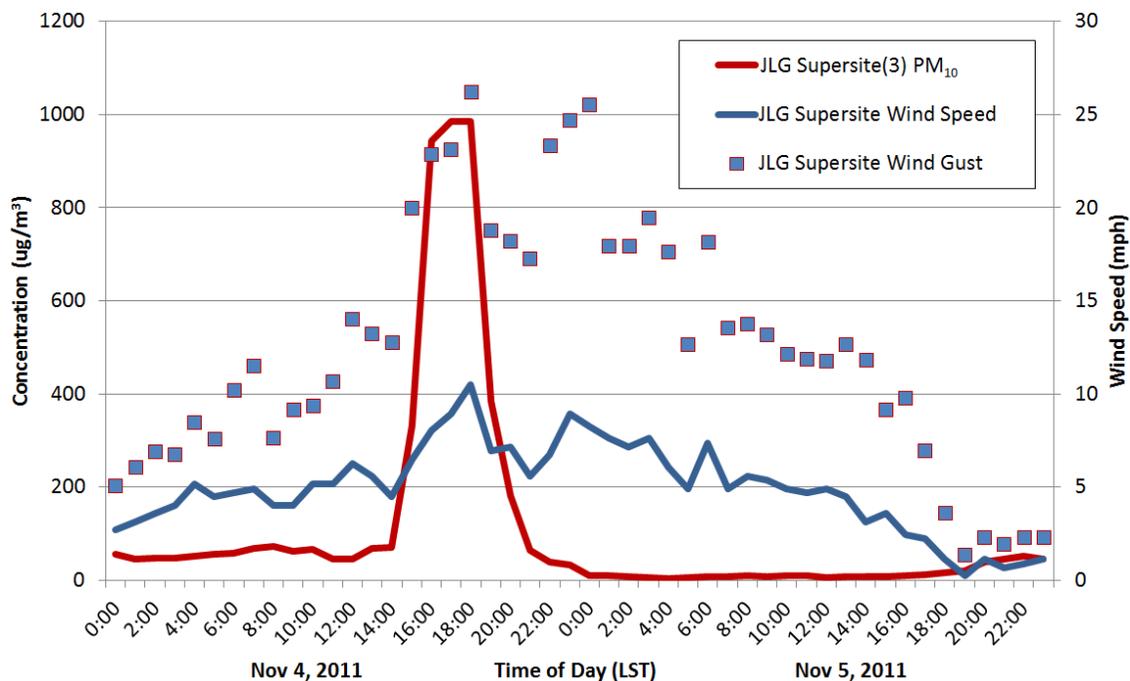


Figure A-7. Hourly PM₁₀ concentrations and wind speeds at the JLG Supersite(3) monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

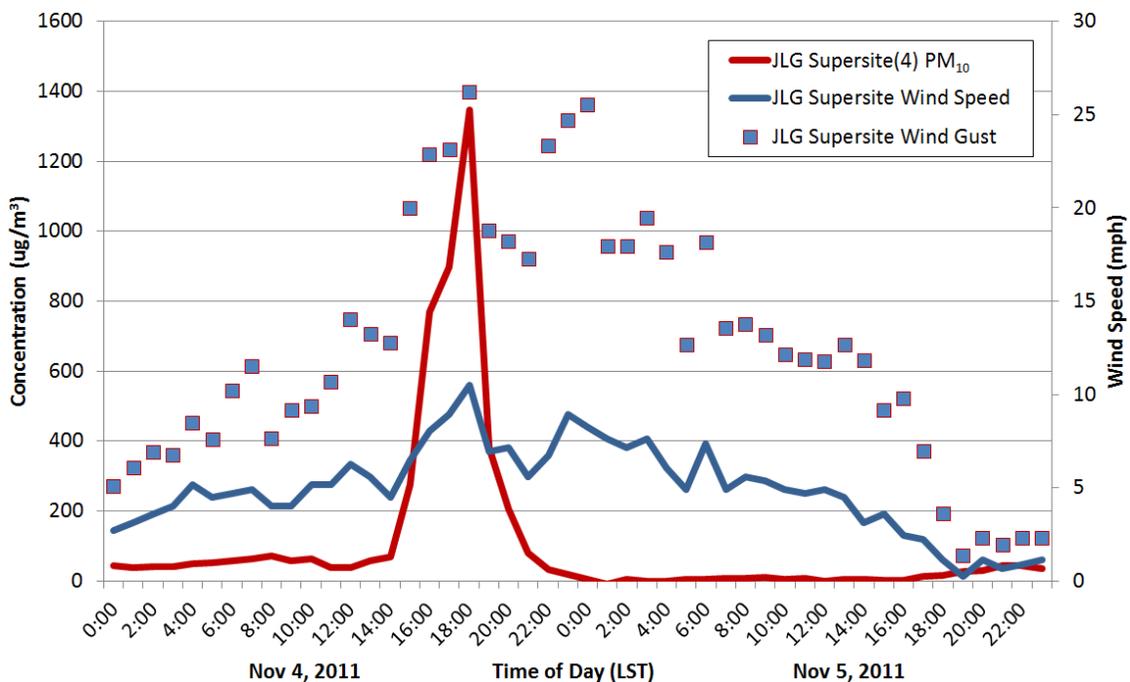


Figure A-8. Hourly PM₁₀ concentrations and wind speeds at the JLG Supersite(4) monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

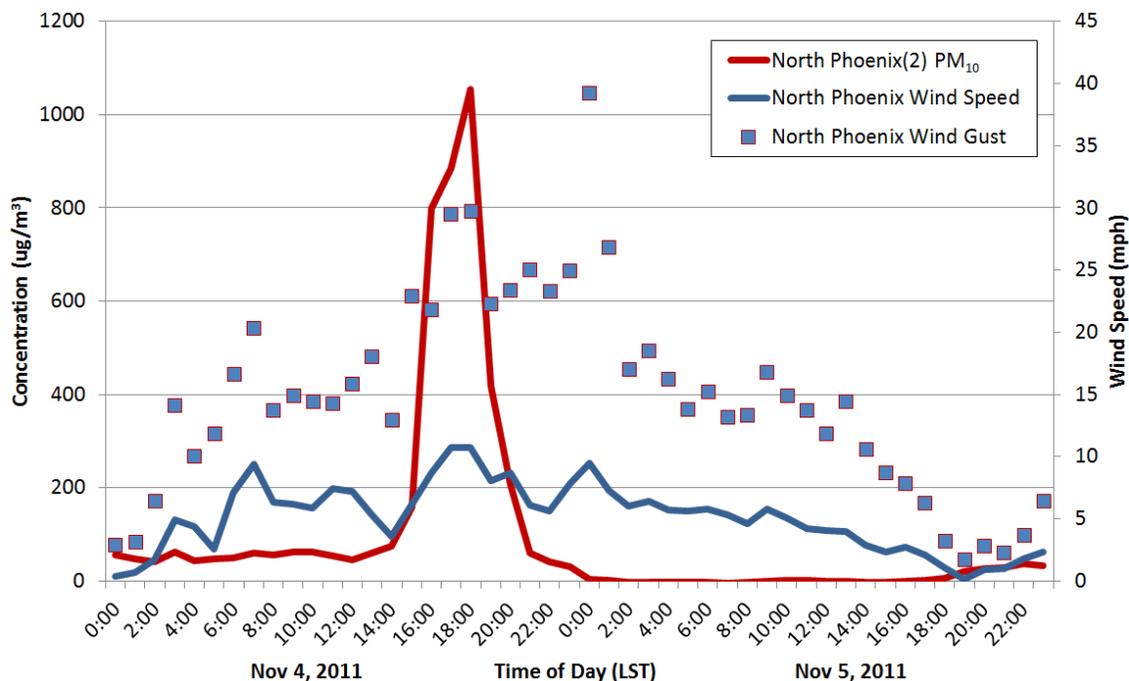


Figure A-9. Hourly PM₁₀ concentrations and wind speeds at the North Phoenix(2) monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

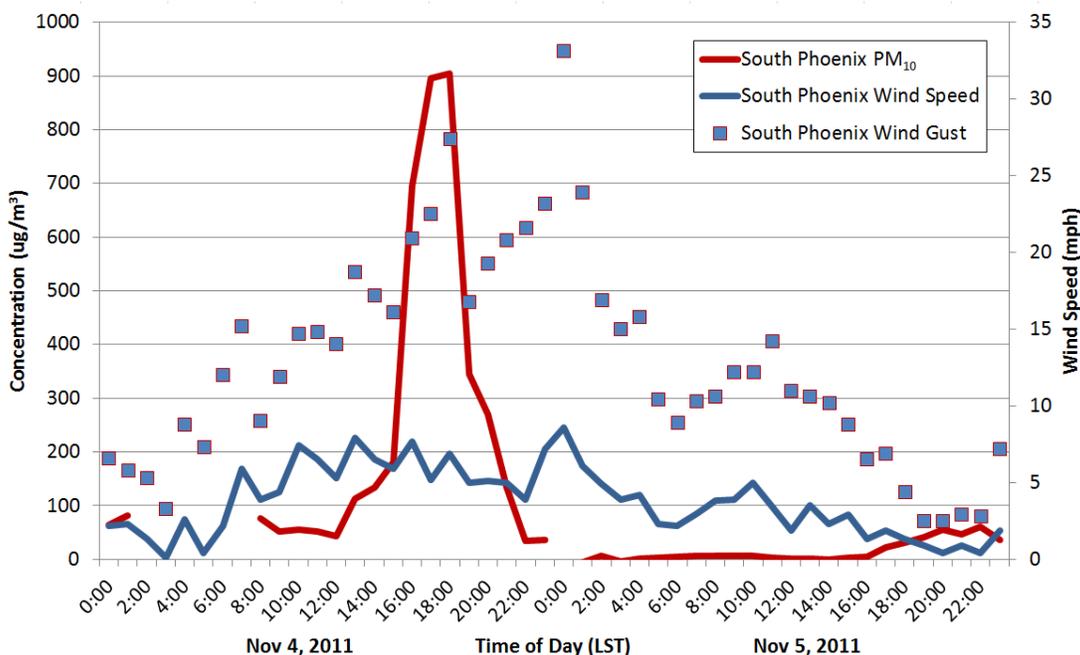


Figure A-10. Hourly PM₁₀ concentrations and wind speeds at the South Phoenix monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust. Note that PM₁₀ concentrations were not available between 0200 or 0700 LST on November 4, 2011 or at 0000 LST on November 5, 2011 at the South Phoenix monitor.

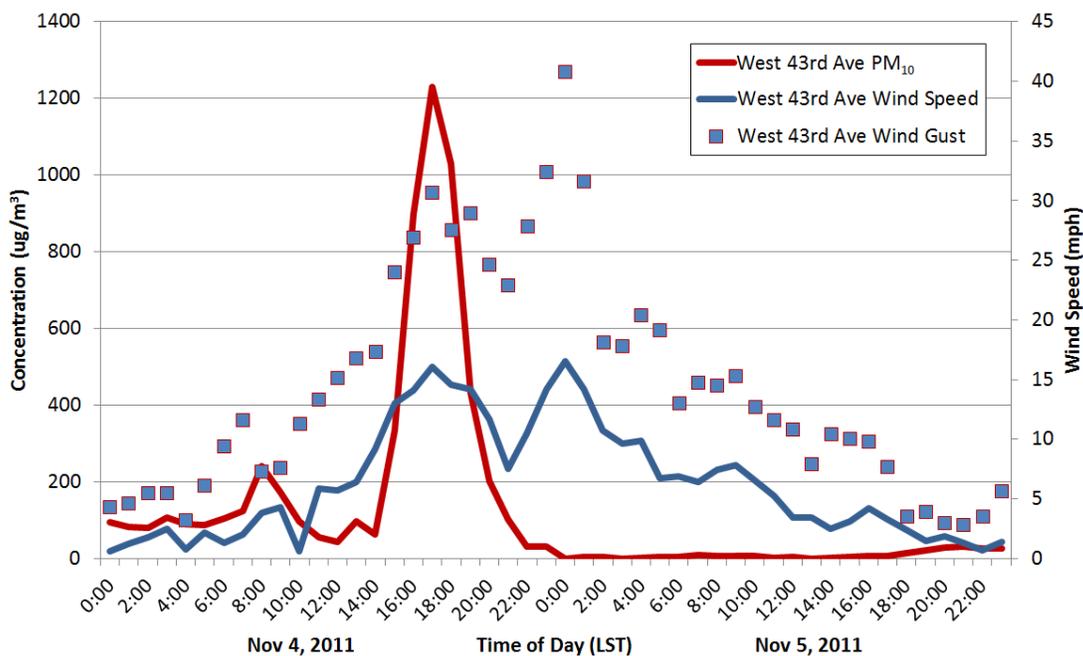


Figure A-11. Hourly PM₁₀ concentrations and wind speeds at the West 43rd Avenue monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1600 LST on November 4, 2011, indicating the arrival of windblown dust.

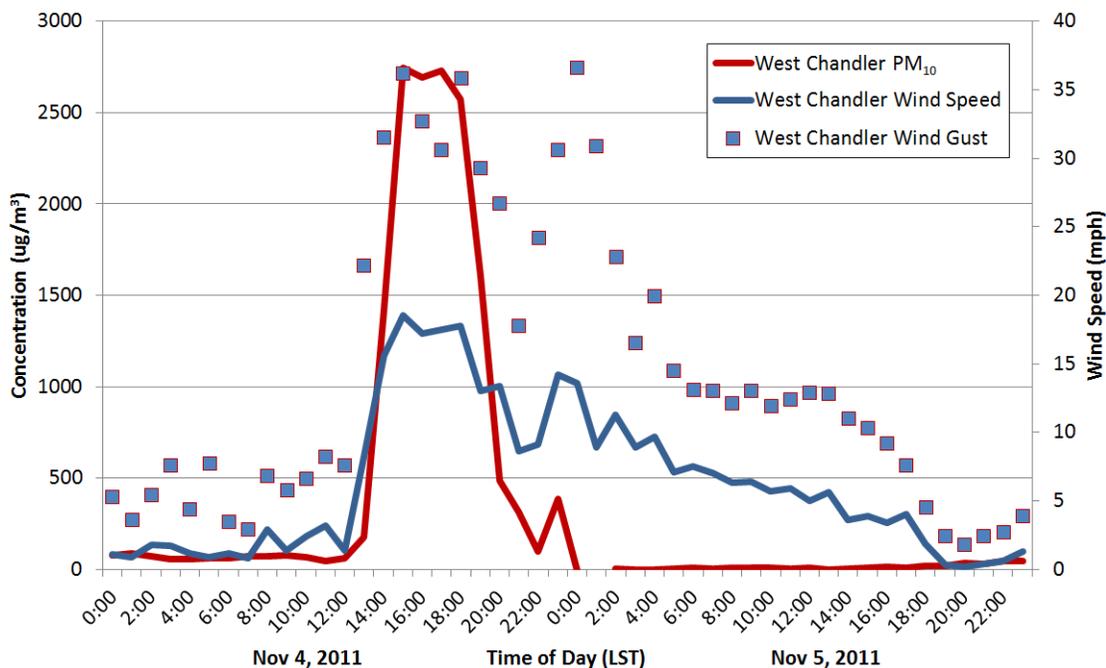


Figure A-12. Hourly PM₁₀ concentrations and wind speeds at the West Chandler monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1400 LST on November 4, 2011, indicating the arrival of windblown dust. Note that PM₁₀ concentration data was not available at 0100 LST on November 5, 2011 at the West Chandler monitor.

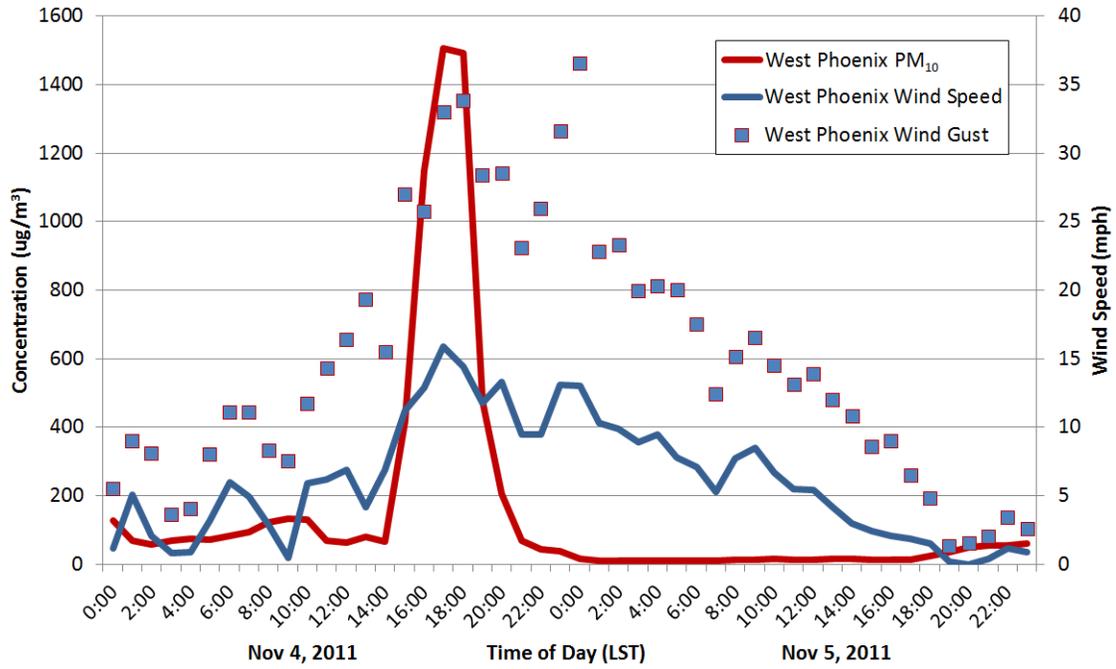


Figure A-13. Hourly PM₁₀ concentrations and wind speeds at the West Phoenix monitor on November 4 and 5, 2011. PM₁₀ concentrations and wind speeds sharply increased at 1500 LST on November 4, 2011, indicating the arrival of windblown dust.

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA
PHOENIX SKY HARBOR INTL AIRPORT (23183)
PHOENIX, AZ (11/2011)

Elevation: 1107 ft. above sea level

Latitude: 33.427

Longitude: -112.003

Data Version: VER3

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0051	11	SCT180 BKN230	10.00		66	18.9	49	9.2	29	-1.7	25	3	060		28.66						29.83
04	0151	11	SCT180 BKN230	10.00		64	17.8	48	8.7	29	-1.7	27	10	100		28.64	8	013	29.79	AA		29.81
04	0251	11	SCT180 BKN230	10.00		64	17.8	48	8.7	29	-1.7	27	7	130		28.64			29.77	AA		29.81
04	0351	11	SCT170 BKN230	10.00		64	17.8	47	8.4	27	-2.8	25	8	060		28.63			29.76	AA		29.80
04	0451	11	SCT170 BKN210	10.00		64	17.8	46	7.8	23	-5.0	21	7	110		28.62	8	007	29.75	AA		29.79
04	0551	11	SCT160 BKN210	10.00		62	16.7	46	7.9	27	-2.8	26	7	080		28.62			29.75	AA		29.79
04	0651	11	FEW180 BKN220 BKN240	10.00		61	16.1	46	7.9	29	-1.7	30	6	120		28.62			29.75	AA		29.79
04	0751	11	FEW170 BKN200 BKN240	10.00		66	18.9	47	8.4	24	-4.4	20	10	140		28.62	0	000	29.75	AA		29.79
04	0851	11	FEW170 BKN200 BKN240	10.00		67	19.4	49	9.2	27	-2.8	22	3	110		28.63			29.76	AA		29.80
04	0951	11	FEW170 BKN220 BKN250	10.00		70	21.1	50	9.7	26	-3.3	19	8	140		28.62			29.76	AA		29.79
04	1051	11	FEW170 BKN220 BKN250	10.00		73	22.8	51	10.5	26	-3.3	17	9	130		28.61	8	004	29.74	AA		29.78
04	1151	11	FEW190 BKN220 BKN250	10.00		77	25.0	53	11.6	27	-2.8	16	11	160		28.57			29.70	AA		29.74
04	1251	11	FEW110 BKN220 BKN250	10.00		79	26.1	54	12.3	29	-1.7	16	9	150		28.52			29.65	AA		29.69
04	1351	11	FEW110 SCT220	10.00		83	28.3	57	13.7	32	0.0	16	14	170	18	28.47	8	046	29.59	AA		29.64
04	1444	11	FEW033 SCT110 SCT220	10.00		81	27.0	56	13.2	32	0.0	17	13	240	23	28.44			M	SP		29.61
04	1451	11	FEW037 SCT110 SCT220	10.00		80	26.7	56	13.0	32	0.0	17	14	270		28.43			29.56	AA		29.60
04	1551	11	FEW039 SCT110 SCT220	7.00		81	27.2	57	13.6	34	1.1	18	20	190	26	28.43			29.56	AA		29.60
04	1649	11	FEW027 SCT110 SCT220	2.50	BLDU	75	24.0	61	16.3	52	11.0s	45	15	260		28.43			M	SP		29.60
04	1651	11	SCT027 SCT110 SCT220	2.50	BLDU	76	24.4	61	16.2	51	10.6	42	14	240		28.43	5	001	29.56	AA		29.60
04	1710	11	SCT027 SCT110 SCT220	4.00	BLDU	77	25.0	59	15.0	45	7.0	32	16	210	25	28.43			M	SP		29.60
04	1751	11	SCT032 SCT110 SCT220	6.00	BLDU	75	23.9	59	14.8	46	7.8	36	14	250	28	28.43			29.56	AA		29.60
04	1849	11	BKN027 BKN065	4.00	BLDU	72	22.0	58	14.6	48	9.0	43	15	250	28	28.45			M	SP		29.62
04	1851	11	BKN027 BKN065	4.00	BLDU	71	21.7	58	14.4	48	8.9	44	18	260	28	28.45			29.58	AA		29.62
04	1900	11	BKN030 BKN065	5.00	BLDU	70	21.0	58	14.2	48	9.0	46	17	240	26	28.45			M	SP		29.62
04	1951	11	BKN060 BKN095	9.00		70	21.1	57	14.0	47	8.3	44	15	240		28.45	0	006	29.58	AA		29.62
04	2051	11	BKN050 OVC065	8.00	-RA	66	18.9	58	14.4	52	11.1	61	11	250	20	28.46			29.59	AA	0.01	29.63
04	2151	11	SCT048 BKN060 BKN095	9.00	-RA	62	16.7	57	14.1	54	12.2	75	14	200	23	28.45			29.59	AA	T	29.62
04	2200	11	SCT048 SCT060 BKN090	10.00		63	17.0	58	14.3	54	12.0	73	11	210		28.45			M	SP		29.62
04	2251	11	SCT040 SCT055 BKN090	10.00	-RA	62	16.7	58	14.4	55	12.8	78	7	VR		28.43	8	005	29.57	AA	T	29.60
04	2314	11	SCT031 BKN060 OVC090	1.75	-RA	57	14.0	54	12.3	52	11.0	83	29	210	61	28.43			M	SP		29.60
04	2317	11	FEW031CB BKN075 OVC090	1.25	+TSRA	55	13.0	53	11.8	52	11.0	90	23	210	61	28.43			M	SP		29.60
04	2323	11	FEW031CB BKN075 OVC090	2.50	-TSRA	57	14.0	55	12.9	54	12.0	90	20	200	33	28.43			M	SP		29.60
04	2330	11	FEW031CB BKN075 OVC090	7.00	-TSRA	57	14.0	55	12.9	54	12.0	90	16	210		28.43			M	SP		29.60
04	2343	11	FEW031CB BKN043 OVC070	3.00	-RA BR	54	12.0	53	11.6	52	11.0	93	25	270	40	28.45			M	SP		29.62
04	2351	11	FEW031CB BKN043 OVC070	4.00	-RA BR	54	12.2	53	11.6	52	11.1	93	22	270	32	28.45			29.58	AA	0.24	29.62

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Figure A-14. Quality controlled local climatological data hourly observations table for Phoenix Sky Harbor International Airport, Phoenix, Arizona (11/04/2011). Note in the Weather Type column that BLDU (blowing dust) was reported for several hours. For a more detailed explanation of the weather codes shown in the table above, please see <http://www.nws.noaa.gov/oso/oso1/oso12/document/guide.shtml>. Data dynamically generated via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA (final)
HOURLY OBSERVATIONS TABLE
PHOENIX DEER VALLEY ARPT (03184)
PHOENIX, AZ (11/2011)**

Elevation: 1455 ft. above sea level
Latitude: 33.688
Longitude: -112.081
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0053	12	CLR	10.00		62	16.7	44	6.7	20	-6.7	20	3	100		28.28						29.84
04	0153	12	CLR	10.00		61	16.1	44	6.5	20	-6.7	20	3	090		28.27	6	013	29.78	AA		29.83
04	0253	12	CLR	10.00		58	14.4	42	5.7	20	-6.7	23	0	000		28.26			29.77	AA		29.82
04	0353	12	CLR	10.00		56	13.3	41	5.1	20	-6.7	25	5	090		28.25			29.76	AA		29.81
04	0453	12	CLR	10.00		60	15.6	44	6.5	22	-5.6	23	6	080		28.24	6	008	29.75	AA		29.80
04	0553	12	CLR	10.00		59	15.0	44	6.4	23	-5.0	25	8	110		28.23			29.75	AA		29.79
04	0653	12	CLR	10.00		63	17.2	45	7.3	22	-5.6	21	11	130		28.23			29.74	AA		29.79
04	0753	12	CLR	10.00		64	17.8	46	7.6	22	-5.6	20	14	140		28.23	5	003	29.75	AA		29.79
04	0853	12	CLR	10.00		66	18.9	47	8.2	23	-5.0	19	10	140		28.25			29.76	AA		29.81
04	0953	12	CLR	10.00		68	20.0	48	8.9	24	-4.4	19	8	130		28.25			29.76	AA		29.81
04	1053	12	CLR	10.00		72	22.2	50	10.0	25	-3.9	17	9	140		28.22	8	003	29.73	AA		29.78
04	1153	12	CLR	10.00		73	22.8	51	10.4	26	-3.3	17	9	180		28.20			29.70	AA		29.75
04	1253	12	CLR	10.00		75	23.9	53	11.5	30	-1.1	19	11	170	18	28.15			29.65	AA		29.70
04	1353	12	CLR	10.00		76	24.4	53	11.7	30	-1.1	18	5	160		28.10	8	042	29.60	AA		29.65
04	1453	12	CLR	10.00		77	25.0	54	12.0	30	-1.1	18	11	260		28.07			29.57	AA		29.62
04	1553	12	CLR	10.00		77	25.0	56	13.2	37	2.8	24	17	230	25	28.06			29.56	AA		29.61
04	1646	12	OVC029	3.00	HZ	73	23.0	60	15.3	50	10.0	44	22	240	30	28.06			M	SP		29.61
04	1653	12	OVC029	3.00	HZ	72	22.2	60	15.4	51	10.6	48	18	220	29	28.05	6	017	29.55	AA		29.60
04	1700	12	OVC029	2.50	HZ	72	22.0	59	15.1	50	10.0	46	21	230	28	28.05			M	SP		29.60
04	1743	12	OVC029	4.00	HZ	70	21.0	58	14.2	48	9.0	46	20	230	29	28.06			M	SP		29.61
04	1751	12	OVC031	4.00	HZ	70	21.0	57	13.7	46	8.0	42	22	240	32	28.06			M	SP		29.61
04	1753	12	OVC031	4.00	HZ	69	20.6	57	13.7	47	8.3	46	18	240	32	28.05			29.56	AA		29.60
04	1829	12	OVC029	3.00	HZ	66	19.0	56	13.3	48	9.0	52	17	240	29	28.07			M	SP		29.62
04	1853	12	OVC027	4.00	HZ	67	19.4	56	13.3	47	8.3	49	20	230	29	28.08			29.59	AA		29.63
04	1933	12	SCT025 BKN075 OVC095	6.00	HZ	66	19.0	55	12.8	46	8.0	49	18	220	31	28.09			M	SP		29.64
04	1953	12	FEW060 BKN095	6.00	HZ	66	18.9	56	13.0	47	8.3	51	16	220	23	28.09	3	012	29.59	AA		29.64
04	2053	12	BKN048 BKN055 OVC085	10.00	-RA	62	16.7	55	12.6	49	9.4	63	21	240	33	28.09			29.59	AA	T	29.64
04	2153	12	BKN050 OVC070	10.00	-RA	58	14.4	55	12.8	53	11.7	84	6	200		28.08			29.59	AA	0.03	29.63
04	2253	12	BKN041 BKN048 OVC055	5.00	-RA BR	56	13.3	54	12.1	52	11.1	87	14	200	23	28.05	8	012	29.55	AA	0.06	29.60
04	2325	12	FEW018 BKN048 OVC070	6.00	VCTS -RA	55	13.0	53	11.8	52	11.0	90	18	200	30	28.05			M	SP		29.60
04	2340	12	FEW019 BKN039 OVC070	8.00	-RA	55	13.0	51	10.7	48	9.0	77	21	210	29	28.06			M	SP		29.61
04	2353	12	SCT012 BKN024 OVC060	7.00	-RA	54	12.2	52	11.0	50	10.0	86	18	240	29	28.07			29.57	AA	0.08	29.62

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Figure A-15. Quality controlled local climatological data hourly observations table for Phoenix Deer Valley Airport, Phoenix, Arizona (11/04/2011). Note in the Weather Type column that HZ (haze) was reported for several hours. Dynamically generated via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA (final)
HOURLY OBSERVATIONS TABLE
WILLIAMS GATEWAY AIRPORT (23104)
PHOENIX, AZ (11/2011)**

Elevation: 1382 ft. above sea level
Latitude: 33.3
Longitude: -111.666
Data Version: VER2

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Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0015	0	CLR	10.00		63	17.0	47	8.1	27	-3.0	26	7	140		28.41			M	AA		29.87
04	0035	0	CLR	10.00		63	17.0	47	8.3	28	-2.0	27	8	150		28.41			M	AA		29.87
04	0055	0	CLR	10.00		63	17.0	48	8.6	30	-1.0	29	6	140		28.41			M	AA		29.87
04	0115	0	CLR	10.00		61	16.0	46	7.7	28	-2.0	29	7	120		28.40			M	AA		29.86
04	0135	0	CLR	10.00		61	16.0	47	8.1	30	-1.0	31	7	150		28.40			M	AA		29.86
04	0155	0	CLR	10.00		61	16.0	46	7.7	28	-2.0	29	10	140		28.39			M	AA		29.85
04	0215	0	CLR	10.00		61	16.0	46	7.7	28	-2.0	29	9	150		28.39			M	AA		29.85
04	0235	0	CLR	10.00		61	16.0	47	8.1	30	-1.0	31	7	150		28.39			M	AA		29.85
04	0255	0	CLR	10.00		61	16.0	47	8.1	30	-1.0	31	7	130		28.39			M	AA		29.85
04	0315	0	CLR	10.00		63	17.0	48	8.6	30	-1.0	29	9	140		28.38			M	AA		29.84
04	0335	0	CLR	10.00		63	17.0	48	8.6	30	-1.0	29	8	140		28.37			M	AA		29.83
04	0355	0	SCT100	10.00		61	16.0	46	7.7	28	-2.0	29	10	160		28.37			M	AA		29.83
04	0415	0	CLR	10.00		64	18.0	47	8.5	28	-2.0	26	7	180		28.38			M	AA		29.84
04	0435	0	CLR	10.00		63	17.0	47	8.3	28	-2.0	27	6	160		28.38			M	AA		29.84
04	0455	0	CLR	10.00		63	17.0	48	8.6	30	-1.0	29	0	000		28.38			M	AA		29.84
04	0515	0	CLR	10.00		63	17.0	48	8.6	30	-1.0	29	5	120		28.37			M	AA		29.83
04	0547	0	FEW150 BKN250	20.00		63	17.0	47	8.3	28	-2.0	27	6	110		28.37			M	AA		29.83
04	0650	0	SCT150 BKN250	35.00		61	16.0	46	7.7	28	-2.0	29	3	120		28.37			M	AA		29.83
04	0747	0	SCT150 BKN250	35.00		61	16.0	47	8.1	30	-1.0	31	0	000		28.38			M	AA		29.84
04	0847	0	SCT150 BKN250	35.00		72	22.0	52	11.2	32	0.0	23	8	140		28.38			M	AA		29.84
04	0949	0	SCT150 BKN250	35.00		77	25.0	53	11.5	27	-3.0	16	14	140		28.37			M	AA		29.83
04	1047	0	SCT150 BKN250	35.00		77	25.0	53	11.5	27	-3.0	16	13	130		28.36			M	AA		29.82
04	1147	0	FEW150 BKN200	35.00		81	27.0	55	12.6	28	-2.0	14	6	140		28.32			M	AA		29.78
04	1247	0	FEW150 BKN200	35.00		82	28.0	55	12.8	28	-2.0	14	6	180		28.27			M	AA		29.73
04	1347	0	FEW150 BKN200	4.00	BLDU	84	29.0	57	13.8	32	0.0	15	14	180	24	28.22			M	AA		29.67
04	1402	0	FEW150 BKN200	2.50	BLDU	84	29.0	57	13.8	32	0.0	15	11	180	26	28.22			M	AA		29.67
04	1456	0	FEW150 BKN200	2.00	BLDU	86	30.0	58	14.6	34	1.0	16	14	220	29	28.19			M	AA		29.64
04	1547	0	BKN075 BKN200	2.00	BLDU	84	29.0	58	14.2	34	1.0	17	17	220	34	28.19			M	AA		29.64
04	1647	0	FEW150 BKN200	3.00	BLDU	82	28.0	57	14.1	36	2.0	19	17	210	29	28.18			M	AA		29.63
04	1755	0	FEW150 BKN200	2.00	BLDU	77	25.0	61	16.2	50	10.0	39	17	220	29	28.18			M	AA		29.63
04	1850	0	FEW150 BKN200	2.00	BLDU	73	23.0	62	16.4	54	12.0	52	17	230	37	28.20			M	AA		29.65
04	1947	0	OVC	4.00		72	22.0	M	M	54	12.0	M	23	220	31	M			M	AA		29.66
04	1955	0	CLR	5.00	HZ	72	22.0	60	15.7	52	11.0	50	28	240	34	28.20			M	AA		29.65
04	2015	0	VV007	1.50	-RA	70	21.0	60	15.3	52	11.0	53	30	240	39	28.20			M	AA		29.65
04	2035	0	CLR	7.00		70	21.0	60	15.3	52	11.0	53	25	230	30	28.20			M	AA		29.65
04	2047	0	OVC	4.00		70	21.0	M	M	54	12.0	M	23	220	39	M			M	AA		29.66
04	2055	0	CLR	3.00	HZ	70	21.0	60	15.3	52	11.0	53	29	230	39	28.21			M	AA		29.66

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
04	2115	0	CLR	4.00	HZ	68	20.0	60	15.4	54	12.0	61	26	230	38	28.21			M	AA		29.66
04	2135	0	CLR	7.00	TS	68	20.0	59	14.8	52	11.0	57	21	230		28.21			M	AA		29.66
04	2155	0	CLR	10.00		68	20.0	59	14.8	52	11.0	57	22	230	28	28.21			M	AA		29.66
04	2215	0	SCT001	3.00	-RA	66	19.0	59	15.0	54	12.0	65	22	220	36	28.21			M	AA		29.66
04	2235	0	SCT001	5.00	HZ	66	19.0	58	14.4	52	11.0	61	18	210	25	28.20			M	AA		29.65
04	2255	0	SCT001	2.50	TSHZ	68	20.0	58	14.3	50	10.0	53	26	220	31	28.19			M	AA		29.64
04	2315	0	SCT001	1.75	HZ	64	18.0	56	13.4	50	10.0	61	26	220	33	28.18			M	AA		29.63
04	2335	0	SCT001	2.50	HZ	66	19.0	57	13.8	50	10.0	57	28	210	33	28.18			M	AA		29.63
04	2355	0	SCT001 SCT085	7.00	TS	63	17.0	58	14.6	55	13.0	75	20	230	31	28.19			M	AA		29.64

Figure A-16. Quality controlled local climatological data hourly observations table for Williams Gateway Airport, Phoenix, Arizona (11/04/2011). Note in the Weather Type column that BLDU (blowing dust) and HZ (haze) was reported for several hours. Dynamically generated via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
GLENDALE MUNICIPAL AIRPORT (53126)
GLENDALE, AZ
(11/2011)**

Elevation: 1066 ft. above sea level
Latitude: 33.527
Longitude: -112.295
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0547	0	SCT150 SCT250	20.00		54	12.0	43	6.2	30	-1.0	40	0	000		28.67			M	AA		29.80
04	0647	0	SCT150 BKN200	20.00		54	12.0	43	6.2	30	-1.0	40	0	000		28.67			M	AA		29.80
04	0748	0	SCT150 BKN200	20.00		57	14.0	44	6.7	28	-2.0	33	0	000		28.68			M	AA		29.81
04	0848	0	SCT150 BKN200	20.00		61	16.0	46	7.8	28	-2.0	29	0	000		28.69			M	AA		29.82
04	0950	0	SCT150 BKN200	20.00		64	18.0	48	8.9	30	-1.0	28	3	VR		28.69			M	AA		29.82
04	1047	0	SCT150 BKN200	20.00		66	19.0	48	9.1	28	-2.0	24	0	000		28.67			M	AA		29.80
04	1147	0	SCT150 BKN200	20.00		72	22.0	51	10.5	28	-2.0	19	0	000		28.63			M	AA		29.76
04	1247	0	FEW150 SCT200	20.00		77	25.0	54	12.4	32	0.0	19	0	000		28.58			M	AA		29.71
04	1347	0	FEW150 SCT200	20.00		79	26.0	55	12.8	32	0.0	18	3	VR		28.54			M	AA		29.67
04	1452	0	SCT150 BKN200	20.00		79	26.0	55	12.8	32	0.0	18	5	170		28.50			M	AA		29.63
04	1513	0	BKN150	4.00	BLDU	79	26.0	63	17.1	52	11.0s	39	17	220	23	28.50			M	AA		29.63
04	1547	0	BKN150	3.00	BLDU	79	26.0	63	17.1	52	11.0	39	21	220	29	28.49			M	AA		29.62
04	1650	0	BKN150	1.00	BLDU	73	23.0	61	15.9	52	11.0	48	20	210	29	28.48			M	AA		29.61
04	1753	0	SCT027 BKN110	1.00	BLDU	70	21.0	59	14.7	50	10.0	49	17	210	25	28.50			M	AA		29.63
04	1850	0	OVC060	3.00	BLDU	70	21.0	58	14.2	48	9.0	46	18	190	30	28.52			M	AA		29.65
04	1950	0	BKN095	5.00	BLDU	66	19.0	57	13.9	50	10.0	57	16	190	26	28.52			M	AA		29.65

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Figure A-17. Quality controlled local climatological data hourly observations table for Glendale Municipal Airport, Glendale, Arizona (11/04/2011). Note in the Weather Type column that BLDU (blowing dust) was reported for several hours. Dynamically generated via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)
HOURLY OBSERVATIONS TABLE
LUKE AFB AIRPORT (23111), GLENDALE, AZ (11/2011)

Elevation: 1085 ft. above sea level
Latitude: 33.55, Longitude: -112.366

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0055	0	CLR	10.00		55	12.5	42	5.3	23	-4.9	29	6	330		28.69			AA		29.84	
04	0155	0	CLR	10.00		54	12.0	43	6.1	29	-1.6	38	8	330		28.68	8	010	AA		29.83	
04	0255	0	CLR	10.00		53	11.8	43	6.0	30	-1.3	41	6	360		28.66			AA		29.81	
04	0355	0	CLR	10.00		53	11.8	42	5.6	28	-2.5	38	0	000		28.65			AA		29.80	
04	0455	0	CLR	10.00		52	11.3	42	5.7	30	-1.3	43	3	340		28.65	6	010	AA		29.80	
04	0555	0	CLR	10.00		53	11.5	42	5.4	27	-2.6	37	0	000		28.64			AA		29.79	
04	0655	0	FEW220	10.00		52	11.2	42	5.5	29	-1.9	41	0	000		28.64			AA		29.79	
04	0755	0	CLR	10.00		54	12.2	44	6.4	31	-0.4	42	5	310		28.65	3	002	AA		29.80	
04	0855	0	CLR	10.00		60	15.3	47	8.4	33	0.4	36	0	000		28.66			AA		29.81	
04	0955	0	CLR	10.00		64	17.7	49	9.3	32	0.0	30	0	000		28.65			AA		29.80	
04	1055	0	CLR	10.00		67	19.7	49	9.3	28	-2.1	23	3	050		28.63	8	006	AA		29.78	
04	1155	0	CLR	10.00		73	22.7	52	10.9	29	-1.8	20	5	020		28.59			AA		29.74	
04	1255	0	CLR	10.00		76	24.3	53	11.8	30	-1.2	18	0	000		28.55			AA		29.70	
04	1355	0	FEW140	10.00		78	25.3	55	12.8	33	0.6	19	0	000		28.50	8	044	AA		29.65	
04	1455	0	CLR	10.00		78	25.8	56	13.5	37	3.0	23	8	200		28.47			AA		29.62	
04	1555	0	CLR	5.00	HZ	76	24.2	62	16.8	53	11.7	45	23	230		28.46			AA		29.61	
04	1558	0	CLR	4.00	HZ	75	24.0	62	16.9	54	12.0	48	24	220	29	28.46			AA		29.61	
04	1602	0	FEW003	4.00	HZ	75	24.0	62	16.9	54	12.0	48	25	220	30	28.46			AA		29.60	
04	1615	0	BKN004	2.50	HZ	73	23.0	62	16.5	54	12.0	52	28	230	32	28.46			AA		29.60	
04	1622	0	BKN004	3.00	HZ	73	23.0	62	16.5	54	12.0	52	22	230	32	28.46			AA		29.60	
04	1636	0	OVC005	3.00	HZ	73	23.0	62	16.5	54	12.0	52	25	220		28.46			AA		29.60	
04	1642	0	OVC005	2.50	HZ	73	23.0	62	16.5	54	12.0	52	25	220	31	28.46			AA		29.60	
04	1647	0	OVC005	3.00	HZ	73	23.0	61	15.9	52	11.0	48	25	230	31	28.46			AA		29.60	
04	1655	0	OVC005	3.00	HZ	73	22.5	61	16.2	53	11.4	50	24	220		28.46	6	015	AA		29.60	
04	1657	0	OVC005	2.50	HZ	72	22.0	60	15.7	52	11.0	50	23	220		28.46			AA		29.60	
04	1658	0	OVC006	2.50	HZ	72	22.0	60	15.7	52	11.0	50	24	220		28.46			AA		29.60	
04	1659	0	OVC005	2.50	HZ	72	22.0	60	15.7	52	11.0	50	24	230		28.46			AA		29.60	
04	1712	0	OVC006	2.50	HZ	72	22.0	60	15.7	52	11.0	50	26	230		28.46			AA		29.60	
04	1728	0	OVC006	3.00	HZ	72	22.0	60	15.7	52	11.0	50	24	210		28.46			AA		29.60	
04	1732	0	OVC006	2.50	HZ	70	21.0	60	15.3	52	11.0	53	28	210	32	28.46			AA		29.60	
04	1735	0	OVC006	1.75	HZ	70	21.0	59	14.7	50	10.0	49	29	220	37	28.46			AA		29.60	
04	1737	0	OVC005	1.25	HZ	70	21.0	59	14.7	50	10.0	49	31	220	37	28.46			AA		29.60	
04	1738	0	VV005	1.00	HZ	70	21.0	59	14.7	50	10.0	49	29	220	37	28.46			AA		29.60	
04	1742	0	VV005	0.75	HZ	70	21.0	59	14.7	50	10.0	49	29	220	37	28.46			AA		29.60	
04	1748	0	VV005	1.00	HZ	70	21.0	59	14.7	50	10.0	49	29	220	34	28.46			AA		29.60	
04	1752	0	OVC005	1.25	HZ	70	21.0	59	14.7	50	10.0	49	25	220	34	28.46			AA		29.61	
04	1753	0	OVC005	1.75	HZ	70	21.0	59	14.7	50	10.0	49	25	220		28.46			AA		29.60	
04	1755	0	OVC005	2.00	HZ	70	21.0	59	14.7	50	10.0	49	31	220	38	28.46			AA		29.60	
04	1757	0	OVC005	1.75	HZ	70	21.0	59	14.7	50	10.0	49	32	220	38	28.46			AA		29.60	
04	1758	0	OVC004	1.75	HZ	70	21.0	59	14.7	50	10.0	49	31	220	38	28.46			AA		29.61	
04	1800	0	OVC004	1.25	HZ	70	21.0	59	14.7	50	10.0	49	30	220	38	28.46			AA		29.60	
04	1800	0	OVC	1.25		70	21.0	M	M	50	10.0	M	30	220	38	M			SP		29.60	
04	1801	0	VV004	1.00	HZ	70	21.0	59	14.7	50	10.0	49	29	220	38	28.46			AA		29.61	
04	1806	0	VV003	1.00	HZ	70	21.0	59	14.7	50	10.0	49	33	220	38	28.46			AA		29.60	
04	1807	0	VV003	0.75	HZ	70	21.0	59	14.7	50	10.0	49	29	220	38	28.46			AA		29.61	

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
04	1809	0	VV003	1.00	HZ	70	21.0	59	14.7	50	10.0	49	29	210	36	28.46			29.58	AA		29.61
04	1812	0	OVC003	1.25	HZ	70	21.0	59	14.7	50	10.0	49	29	220	36	28.46			29.58	AA		29.61
04	1815	0	VV003	1.00	HZ	70	21.0	59	14.7	50	10.0	49	34	220	41	28.46			29.58	AA		29.60
04	1824	0	OVC003	1.25	HZ	68	20.0	58	14.3	50	10.0	53	30	210	38	28.46			29.58	AA		29.61
04	1826	0	OVC003	1.50	HZ	68	20.0	58	14.3	50	10.0	53	29	220	38	28.46			29.59	AA		29.61
04	1829	0	OVC003	2.00	HZ	68	20.0	58	14.3	50	10.0	53	29	220	33	28.47			29.59	AA		29.62
04	1832	0	OVC003	1.75	HZ	68	20.0	58	14.3	50	10.0	53	29	220	34	28.47			29.59	AA		29.62
04	1835	0	OVC004	1.75	HZ	68	20.0	58	14.3	50	10.0	53	30	220	34	28.47			29.59	AA		29.62
04	1842	0	OVC004	2.00	HZ	68	20.0	58	14.3	50	10.0	53	28	220	34	28.47			29.59	AA		29.62
04	1847	0	OVC004	3.00	HZ	68	20.0	58	14.3	50	10.0	53	30	210	36	28.47			29.59	AA		29.62
04	1854	0	BKN004	5.00	HZ	68	20.0	57	13.8	48	9.0	49	32	210	37	28.47			29.59	AA		29.62
04	1855	0	BKN004	5.00	HZ	68	20.1	57	14.0	49	9.5	51	32	210	37	28.47			29.59	AA		29.62
04	1901	0	SCT004	5.00	HZ	68	20.0	58	14.3	50	10.0	53	31	210	37	28.47			29.60	AA	0.01	29.62
04	1907	0	SCT004	5.00	-RA	68	20.0	58	14.3	50	10.0	53	32	210	38	28.47			29.59	AA	0.01	29.62
04	1917	0	FEW015	6.00	HZ	66	19.0	59	15.0	54	12.0	65	26	200	44	28.47			29.60	AA	0.01	29.62
04	1926	0	SCT027 BKN080	7.00		64	18.0	58	14.5	54	12.0	70	23	200		28.47			29.60	AA	0.01	29.62
04	1928	0	SCT027 BKN080	7.00	-RA	64	18.0	58	14.5	54	12.0	70	25	200		28.47			29.59	AA	0.01	29.62
04	1952	0	BKN036 BKN055 BKN080	10.00	-RA	64	18.0	57	14.0	52	11.0	65	28	210	33	28.47			29.60	AA	0.01	29.62
04	1954	0	FEW034 BKN042 BKN055	10.00		64	18.0	57	14.0	52	11.0	65	29	210	34	28.47			29.60	AA	0.01	29.62
04	1955	0	FEW034 BKN046 BKN055	10.00		65	18.2	58	14.2	52	11.1	63	31	210	34	28.47	3	006	29.60	AA	0.01	29.62
04	2001	0	FEW033 BKN045 BKN055	10.00		64	18.0	57	14.0	52	11.0	65	21	210	36	28.48			29.60	AA	0.03	29.63
04	2005	0	BKN038 BKN048 BKN090	9.00	-RA	63	17.0	58	14.3	54	12.0	73	26	220	36	28.47			29.60	AA	0.03	29.62
04	2009	0	BKN029 BKN037 BKN090	8.00	-RA	63	17.0	57	13.7	52	11.0	68	29	220	39	28.48			29.60	AA	0.03	29.63
04	2013	0	BKN030 BKN037	8.00	-RA	63	17.0	58	14.3	54	12.0	73	25	220	39	28.48			29.61	AA	0.03	29.63
04	2016	0	BKN038	8.00		61	16.0	57	13.9	54	12.0	78	23	210	39	28.49			29.62	AA	0.03	29.64
04	2018	0	FEW034 OVC042	9.00		61	16.0	57	13.9	54	12.0	78	20	200	36	28.49			29.62	AA	0.03	29.64
04	2022	0	BKN045	9.00	-RA	61	16.0	57	13.9	54	12.0	78	15	200		28.49			29.62	AA	0.03	29.64
04	2030	0	BKN039 OVC049	10.00	-RA	63	17.0	58	14.3	54	12.0	73	13	200		28.49			29.62	AA	0.03	29.64
04	2031	0	BKN041 OVC049	10.00	-RA	63	17.0	58	14.6	55	13.0	75	11	190		28.49			29.62	AA	0.03	29.64
04	2040	0	BKN050 OVC060	10.00		63	17.0	58	14.6	55	13.0	75	9	190		28.49			29.62	AA	0.03	29.64
04	2052	0	BKN045 OVC055	10.00	-RA	63	17.0	58	14.3	54	12.0	73	24	230	28	28.49			29.62	AA	0.03	29.64
04	2055	0	BKN045 OVC060	10.00	-RA	62	16.9	56	13.5	52	11.2	70	24	230	28	28.49			29.62	AA	0.03	29.64
04	2102	0	FEW042 BKN050 BKN065	10.00		61	16.0	56	13.3	52	11.0	72	22	230		28.49			29.62	AA	T	29.64
04	2107	0	FEW042 SCT055	10.00		61	16.0	56	13.3	52	11.0	72	22	220		28.49			29.61	AA	T	29.64
04	2119	0	FEW041 SCT060	10.00	-RA	61	16.0	56	13.3	52	11.0	72	17	220		28.48			29.60	AA	T	29.63
04	2140	0	FEW065	10.00		59	15.0	56	13.4	54	12.0	84	14	200		28.47			29.59	AA	T	29.62
04	2155	0	FEW032 SCT075 SCT095	10.00	-RA	60	15.7	57	13.6	54	12.0	81	14	200		28.47			29.59	AA	T	29.62
04	2159	0	FEW032 SCT070 BKN090	10.00	-RA	61	16.0	57	13.9	54	12.0	78	14	200		28.47			29.59	AA	T	29.62
04	2213	0	SCT060 BKN080	10.00		61	16.0	56	13.3	52	11.0	72	17	190		28.47			29.58	AA	T	29.62
04	2234	0	FEW065 SCT080	10.00		61	16.0	56	13.3	52	11.0	72	20	190		28.46			29.57	AA	T	29.61
04	2245	0	BKN070	10.00		61	16.0	55	12.7	50	10.0	67	21	200		28.46			29.56	AA	T	29.60
04	2253	0	SCT065 SCT080	10.00		61	16.0	55	12.7	50	10.0	67	20	190		28.44			29.55	AA	T	29.59
04	2255	0	SCT065	10.00		61	16.2	55	12.7	50	9.9	67	20	190		28.44			29.55	AA	T	29.59
04	2302	0	FEW039 BKN065	10.00		61	16.0	55	12.7	50	10.0	67	20	200		28.46	8	011	29.56	AA	0.03	29.60
04	2306	0	FEW035 SCT042 BKN065	7.00	RA	61	16.0	56	13.3	52	11.0	72	25	230	36	28.46			29.57	AA	0.03	29.60
04	2312	0	FEW034 SCT045 BKN070	7.00	-RA	59	15.0	54	12.2	50	10.0	72	24	270	36	28.46			29.56	AA	0.03	29.60
04	2317	0	FEW034 SCT048 SCT065	10.00	-RA	57	14.0	53	11.7	50	10.0	78	18	250	29	28.46			29.58	AA	0.03	29.61
04	2320	0	FEW026 SCT045 BKN055	10.00	-DZ	57	14.0	53	11.7	50	10.0	78	21	240	29	28.47			29.59	AA	0.03	29.62
04	2355	0	FEW032 BKN049 OVC060	10.00	-RA	55	12.8	52	11.2	50	10.2	83	13	230		28.48			29.59	AA	0.03	29.63

Figure A-18. Quality controlled local climatological data hourly observations table for Luke Air Force Base, Glendale, Arizona (11/04/2011).

Note in the Weather Type column that HZ (haze) was reported for several hours. Dynamically generated via

<http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA (final)
HOURLY OBSERVATIONS TABLE
CHANDLER MUNICIPAL AIRPORT (53128)
CHANDLER, AZ (11/2011)**

Elevation: 1243 ft. above sea level
Latitude: 33.268
Longitude: -111.812
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
04	0550	0	SCT180	15.00		57	14.0	44	6.7	28	-2.0	33	13	090		28.48			M	AA		29.80
04	0647	0	SCT150 BKN210	40.00		55	13.0	43	6.1	28	-2.0	36	5	150		28.49			M	AA		29.81
04	0747	0	SCT120 BKN200	40.00		61	16.0	47	8.5	32	0.0	34	5	VR		28.49			M	AA		29.81
04	0847	0	SCT120 BKN200	40.00		66	19.0	50	10.1	34	1.0	31	8	090		28.49			M	AA		29.81
04	1047	0	SCT150 BKN200	40.00		75	24.0	52	11.1	27	-3.0	17	7	VR		28.48			M	AA		29.80
04	1147	0	SCT120 BKN200	40.00		M	M	M	M	M	M	M	9	150		28.44			M	AA		29.76
04	1247	0	BKN200 BKN250	25.00		81	27.0	55	12.9	30	-1.0	16	15	150		28.39			M	AA		29.70
04	1335	0	SCT110	2.00	BLDU	82	28.0	56	13.1	30	-1.0	15	29	170	37	28.34			M	AA		29.65
04	1352	0	SCT110	2.00	BLDU	82	28.0	56	13.1	30	-1.0	15	24	180	38	28.34			M	AA		29.65
04	1450	0	SCT100	1.00	BLDU	82	28.0	56	13.1	30	-1.0	15	34	180	40	28.31			M	AA		29.62
04	1547	0	SCT100	1.00	BLDU	81	27.0	56	13.2	32	0.0	17	23	210	39	28.31			M	AA		29.62
04	1654	0	SCT100 BKN250	1.00	BLDU	77	25.0	59	15.0	45	7.0	32	28	210	32	28.30			M	AA		29.61
04	1750	0	SCT100 BKN200	2.00	BLDU	73	23.0	59	14.8	48	9.0	41	17	210	32	28.30			M	AA		29.61
04	1852	0	SCT100 BKN150	2.00	BLDU	70	21.0	59	14.7	50	10.0	49	34	190	41	28.32			M	AA		29.63
04	1925	0	SCT050	5.00	BLDU	70	21.0	59	14.7	50	10.0	49	24	200		28.34			M	AA		29.65
04	1950	0	SCT150	5.00	BLDU	70	21.0	58	14.2	48	9.0	46	24	200	31	28.34			M	AA		29.65
04	2048	0	BKN100	M		68	20.0	57	13.8	48	9.0	49	31	190	40	28.33			M	AA		29.64

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Figure A-19. Quality controlled local climatological data hourly observations table for Chandler Municipal Airport, Chandler, Arizona (11/04/2011). Note in the Weather Type column that BLDU (blowing dust) was reported for several hours. Dynamically generated via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>.

Appendix B: Media Coverage, Videos, and Images

Video Links

ADEQ visibility cameras in the Phoenix area:

South Mountain: www.phoenixvis.net/videos/mpeg4/SOMT_11042011.mp4

Estrella Mountains: www.phoenixvis.net/videos/mpeg4/ESMO_11042011.mp4

Camelback Mountains: www.phoenixvis.net/videos/mpeg4/CAME_11042011.mp4

Superstition Mountains: www.phoenixvis.net/videos/mpeg4/SUPM_11042011.mp4

Local citizens often create videos during dust storms, documenting their observations. Here are a few links to these videos.

<http://www.youtube.com/watch?v=-ixD2Vx7DPQ>

<http://www.youtube.com/watch?v=D1ZqJcUxzU8>

<http://www.youtube.com/watch?v=k2Z1I8Wd77o>

Articles and Image Links

http://www.azcentral.com/news/articles/2011/11/04/20111104arizona-drivers-warned-blowing-dust-abrk04-ON.html?nclick_check=1

Drought has caused unusually dusty weather in Valley

by Kelsey Pfeffer and Morgan Sailor - Nov. 4, 2011 09:40 PM
The Arizona Republic-12 News Breaking News Team

A severe, ongoing drought has caused some unusually dusty weather in the Valley for this time of year.

On Friday strong winds and blowing dust forced the intermittent closure of Interstate 8 west and Interstate 10. The National Weather Service issued a dust-storm warning until late Friday spanning the Phoenix, Casa Grande to Gila Bend areas, meteorologist Craig Ellis said.

Typically there are localized areas of blowing dust, but large gusts have produced significant amounts especially along Interstate 8, meteorologist Mike Bruce said.

Evening showers can tame the blowing dust, but threats of dust storms will continue until Arizona gets some significant rain, Bruce said.

There was an unusually high chance of rain at 80 percent or more in Phoenix, Friday night. The National Weather Service predicted rainfall amounts to range from one-tenth inch in the lower deserts to one-half inch in the mountains and foothills of Maricopa and Gila counties.

On Saturday, there is a slight chance of lingering showers in the morning especially in the east valley with a forecasted high of 65 degrees, which would tie for the record high hit in both 1895 and 1925. The National Weather Service expects a partly cloudy day with cool temperatures. The clouds are expect to clear up into the evening.

A strong cold front moved across southwest and south-central Arizona including the greater Phoenix area Friday evening. The cold front is expected to move East on Saturday, according to the National Weather Service.

There is a 30 percent chance of showers Sunday night extending through Monday, as another storm system rolls through the Valley. There is a chance of blowing dust on Sunday but not to the magnitude of Friday's storms, meteorologist Mike Bruce said.

Temperatures are expected to reach the upper 70s late next week ,which is the average for this time of year, Ellis said.



Dust covers the Camelback Mountain in Phoenix on Friday afternoon. The chance of strong winds prompted the National Weather Service to issue a wind advisory until 11 pm Friday. Credit: Rob Schumacher/The Arizona Republic.

<http://www.copanews.com/Article.aspx?ID=3199>

Strong winds, blowing dust may affect I-10 and I-8 travel on Friday

Received article

Friday, November 4, 2011

Threat of low visibility, dust storms could slow traffic

PHOENIX, AZ — With the National Weather Service (NWS) issuing a wind advisory for Friday (November 4), motorists in southern Arizona could have their travel affected on two major interstates.

A cold front with strong sustained southwest winds from 25 to 35 mph, including wind gusts up to 50 mph, is expected to impact most of the state. Widespread blowing dust is expected along stretches of I-10 between Tucson and Phoenix, and from Phoenix to Quartzsite. In addition, dust is possible on I-8 between Casa Grande and Yuma.

In northern Arizona, an unseasonably strong low pressure system and cold front will bring winter weather conditions this weekend, and could result in the first significant snowfall of the season, according to the NWS.

The Arizona Department of Transportation (ADOT) urges drivers to take extra precautions as strong winds over desert areas can result in sudden periods of limited or zero visibility. Motorists play an important role in safety when operating their vehicles during a dust storm. ADOT and the Arizona Department of Public Safety recommend the following driving tips when encountering a dust storm:

- Check traffic immediately around your vehicle (front, back, and to the side) and begin slowing down.

- Do not stop in the travel lane unless the vehicle traffic in front of you has come to a stop.

- Look for a safe place to pull completely off the paved portion of the roadway.

- Stop the vehicle in a position ensuring it is a safe distance from the main roadway and not near where any vehicles may travel.

- Turn off all vehicle lights.

- Set your emergency brake and take the foot off the brake.

- Stay in the vehicle and keep your seat belts on.

- Wait for the storm to pass over and away from the area before re-entering the roadway.

ADOT, along with DPS, will continue to work as a public safety team to support Arizona's highways and drivers and will closely monitor conditions on the highways while maintaining driver safety.

Drivers planning trips today tomorrow are urged to monitor travel conditions by calling 5-1-1 within Arizona, 1-888-411-ROAD outside the state, or via the website www.az511.gov. Because weather conditions can quickly evolve, drivers are encouraged to regularly check in with ADOT's Traveler Information Service. Motorists should delay or detour travel plans if necessary.

Appendix C: Historical Fluctuation Time Series Graphs

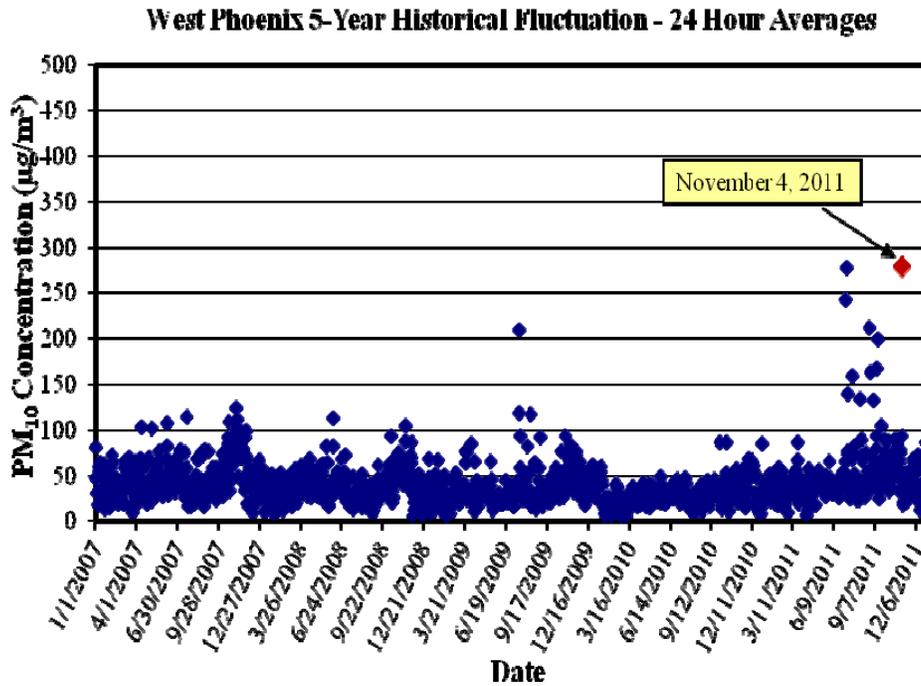


Figure C-1. 24-hr average PM₁₀ concentrations at the West Phoenix monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

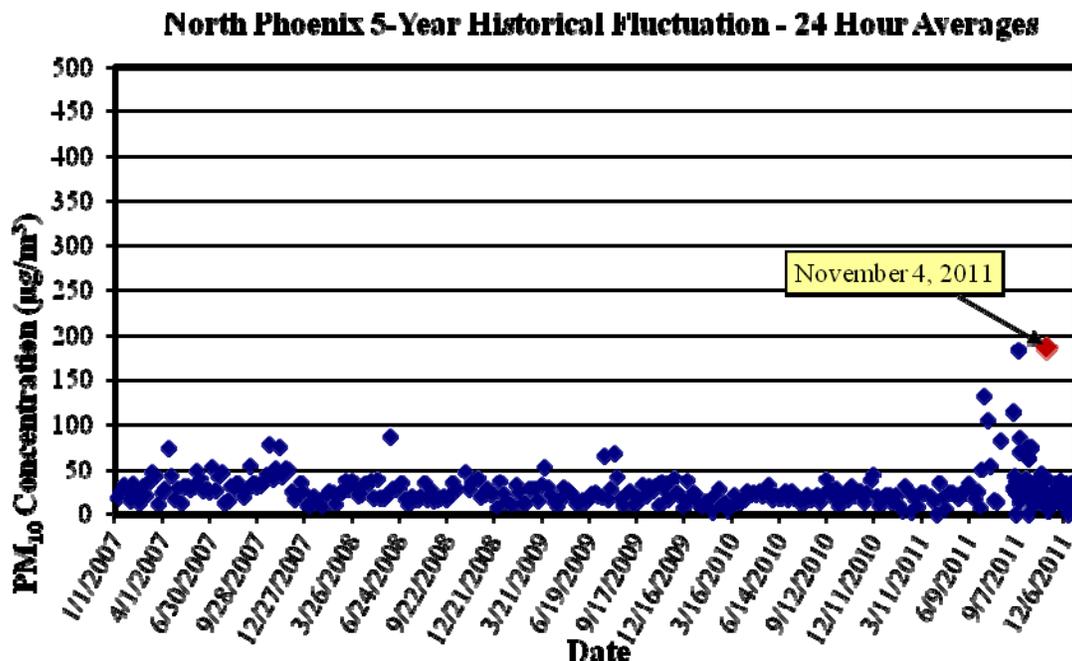


Figure C-2. 24-hr average PM₁₀ concentrations at the North Phoenix monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

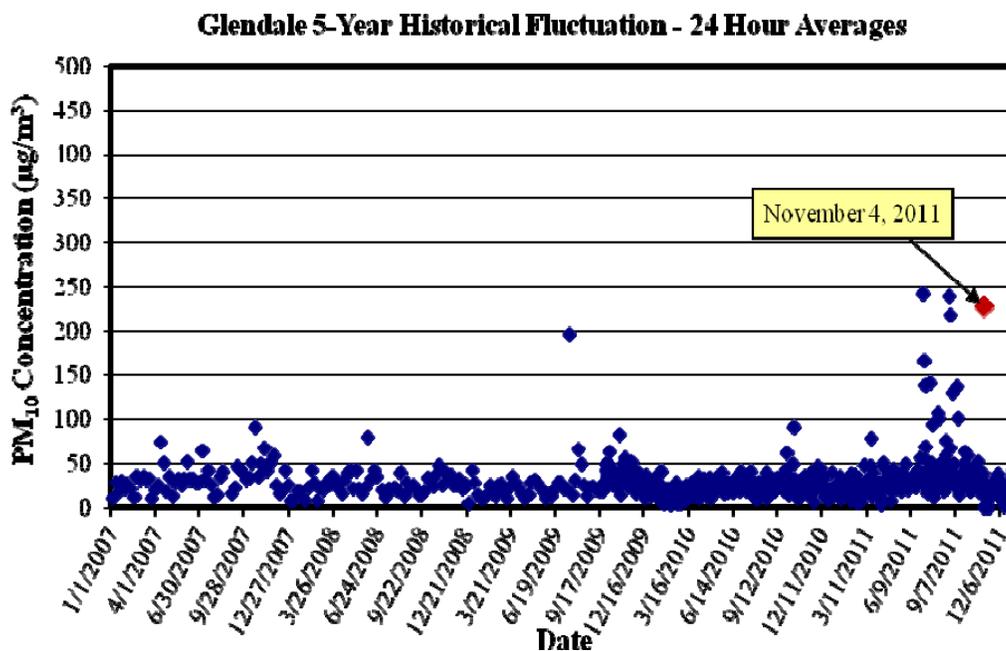


Figure C-3. 24-hr average PM₁₀ concentrations at the Glendale Phoenix monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

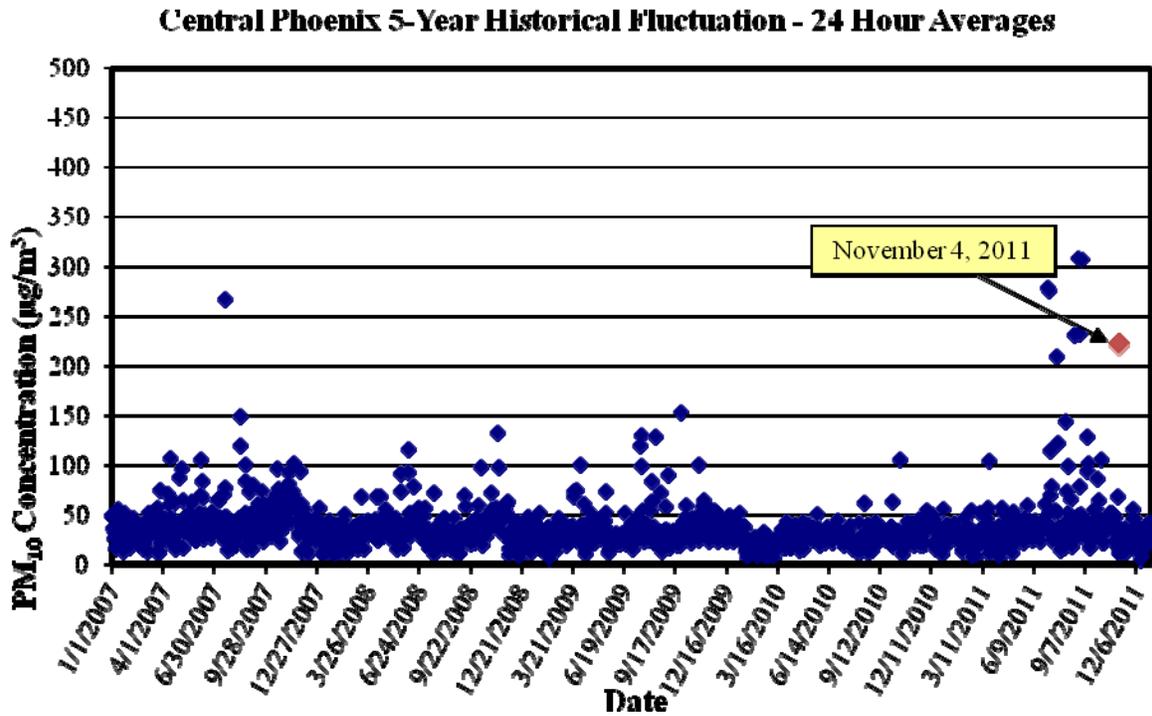


Figure C-4. 24-hr average PM₁₀ concentrations at the Central Phoenix monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

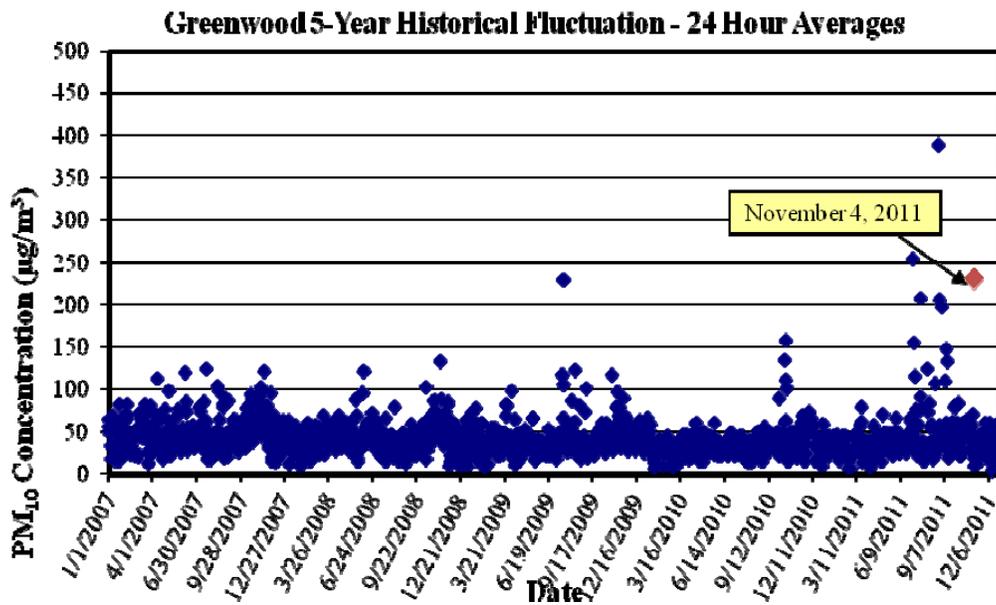


Figure C-5. 24-hr average PM₁₀ concentrations at the Greenwood monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

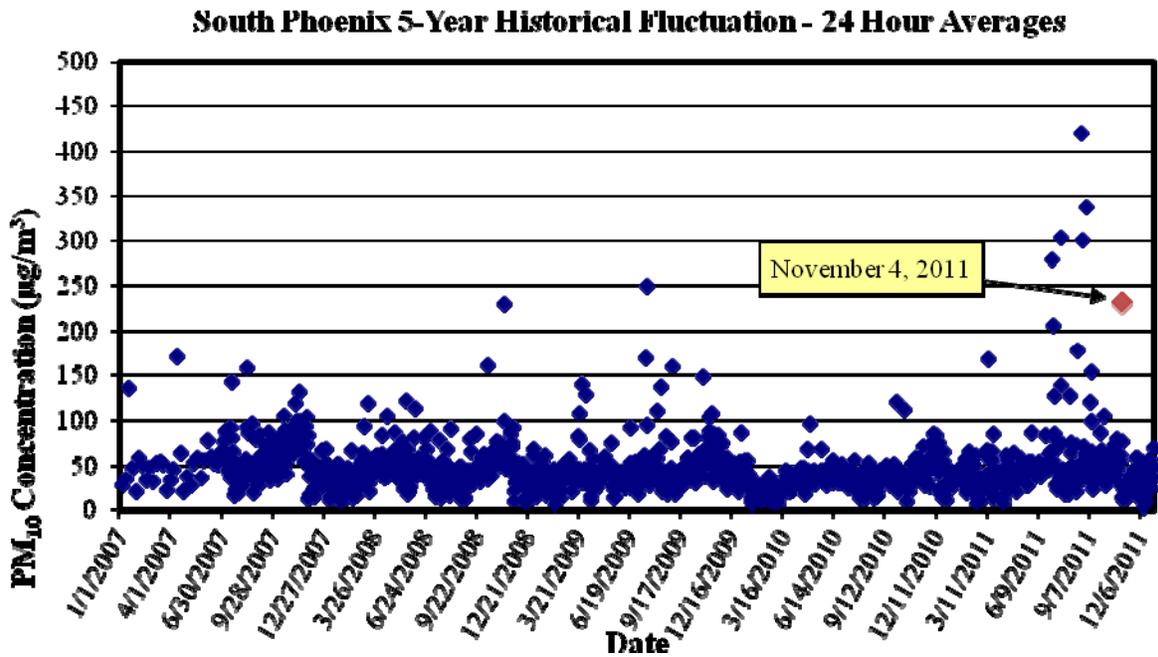


Figure C-6. 24-hr average PM₁₀ concentrations at the South Phoenix monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

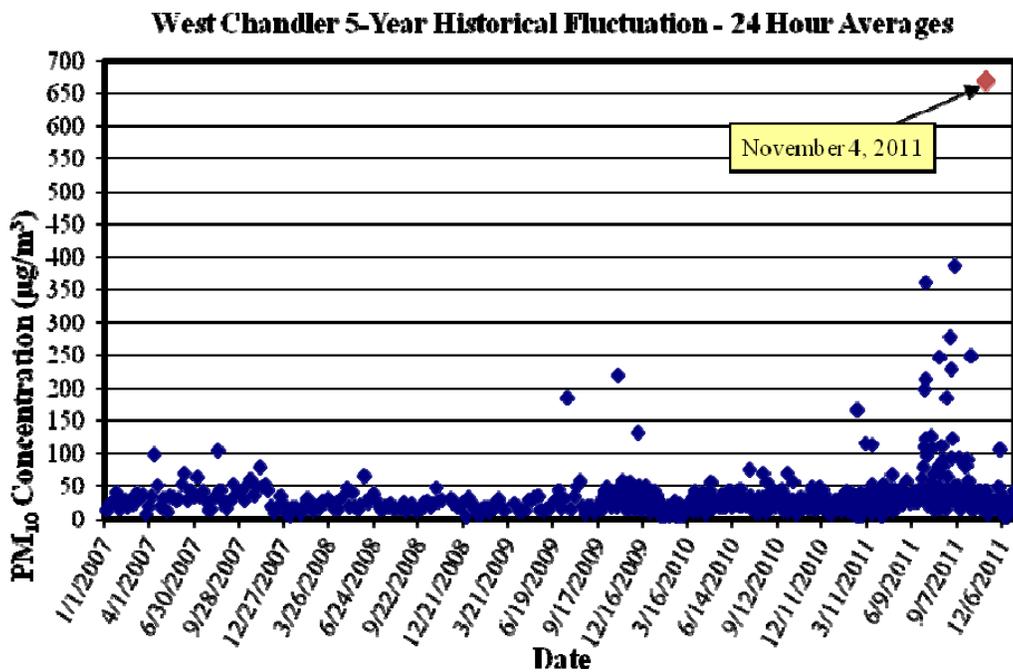


Figure C-7. 24-hr average PM₁₀ concentrations at the West Chandler monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

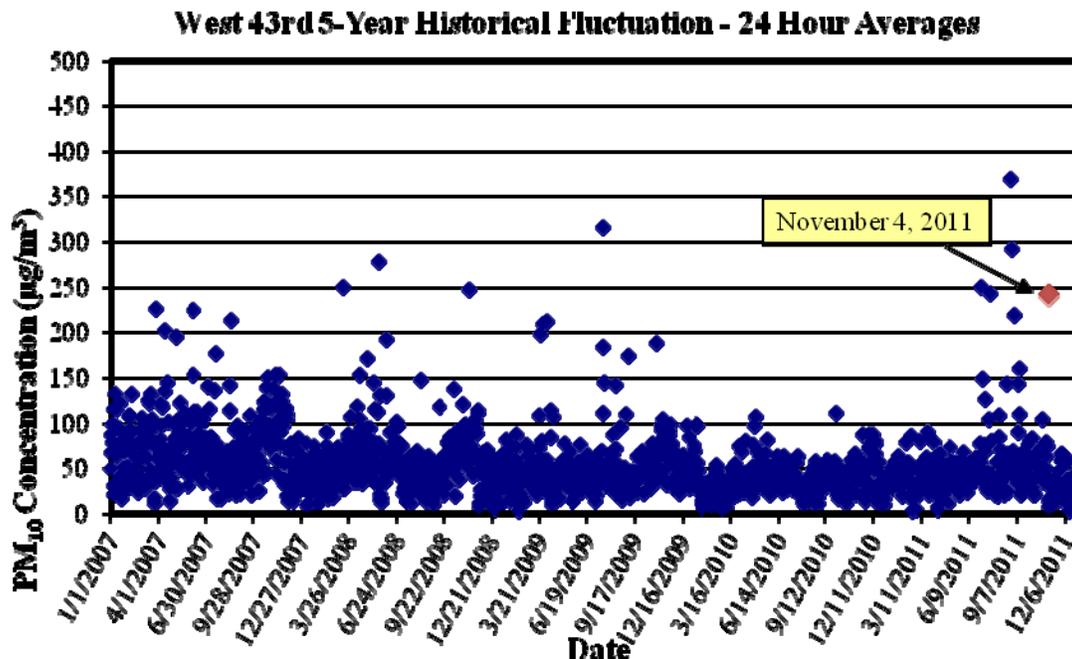


Figure C-8. 24-hr average PM₁₀ concentrations at the West 43rd monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

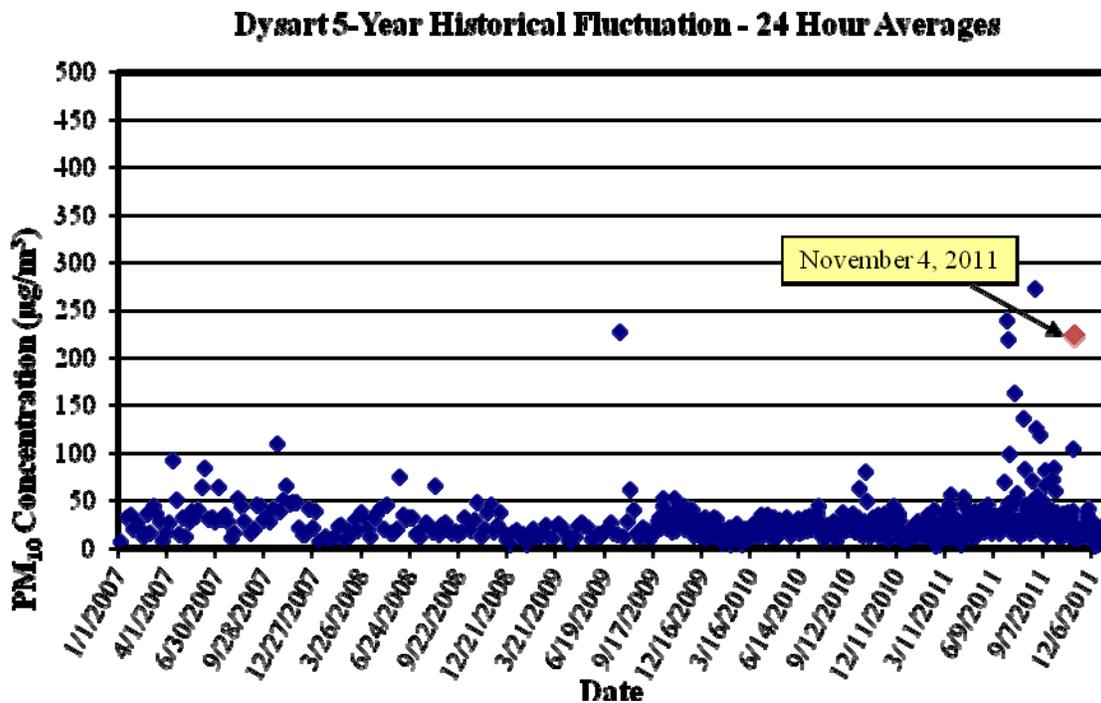


Figure C-9. 24-hr average PM₁₀ concentrations at the Dysart monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

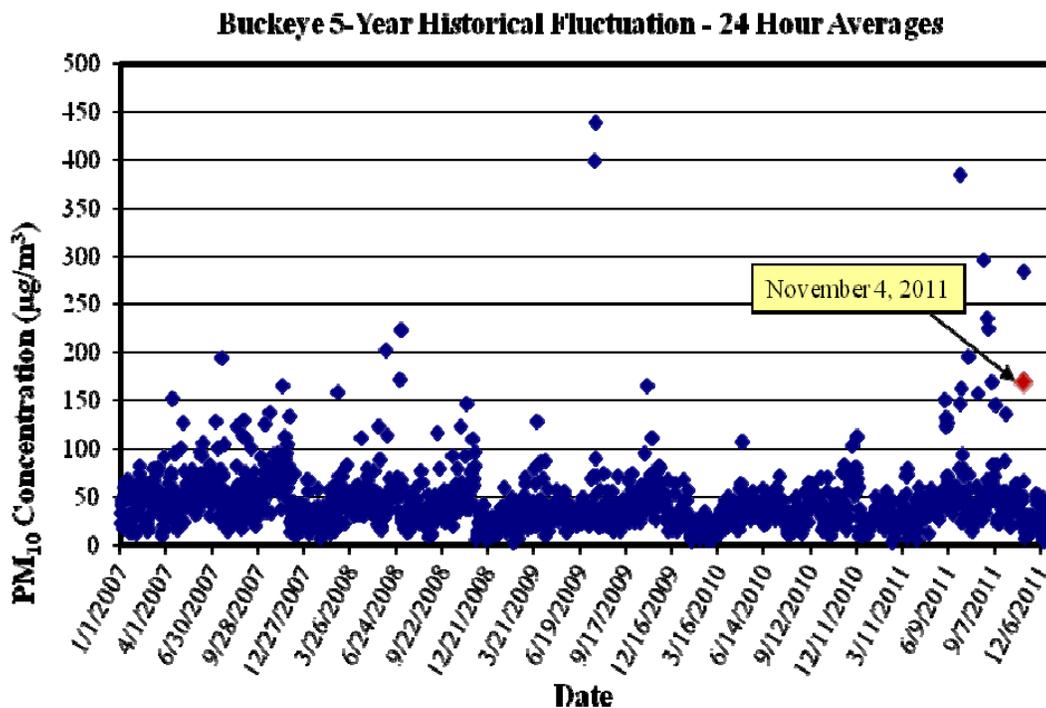


Figure C-10. 24-hr average PM₁₀ concentrations at the Buckeye monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

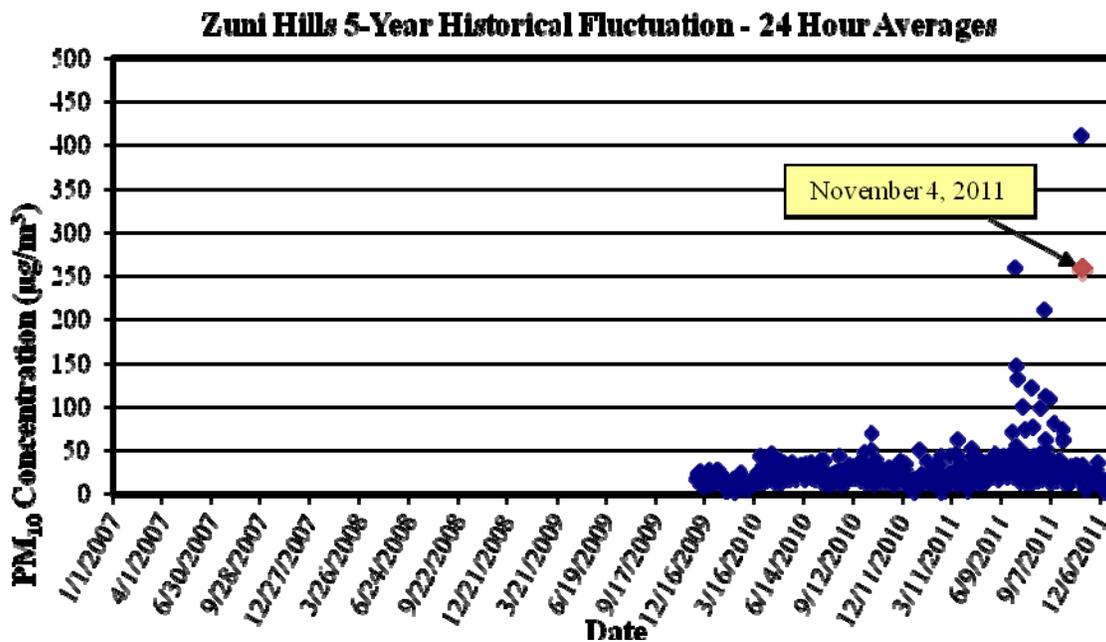


Figure C-11. 24-hr average PM₁₀ concentrations at the Zuni Hills monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

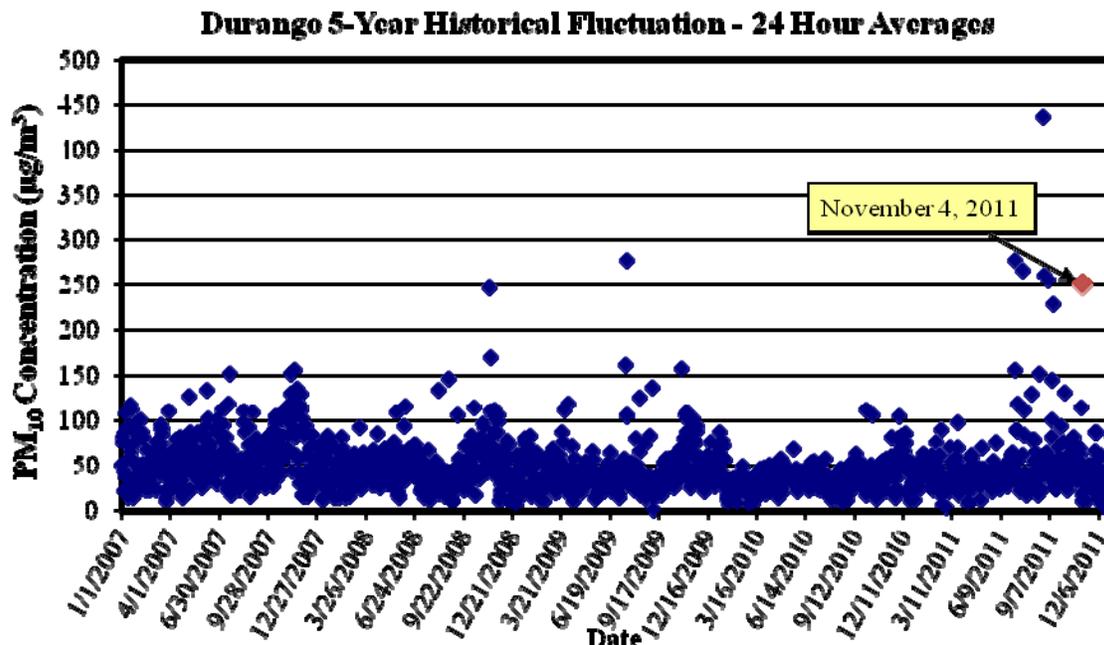


Figure C-12. 24-hr average PM₁₀ concentrations at the Durango monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

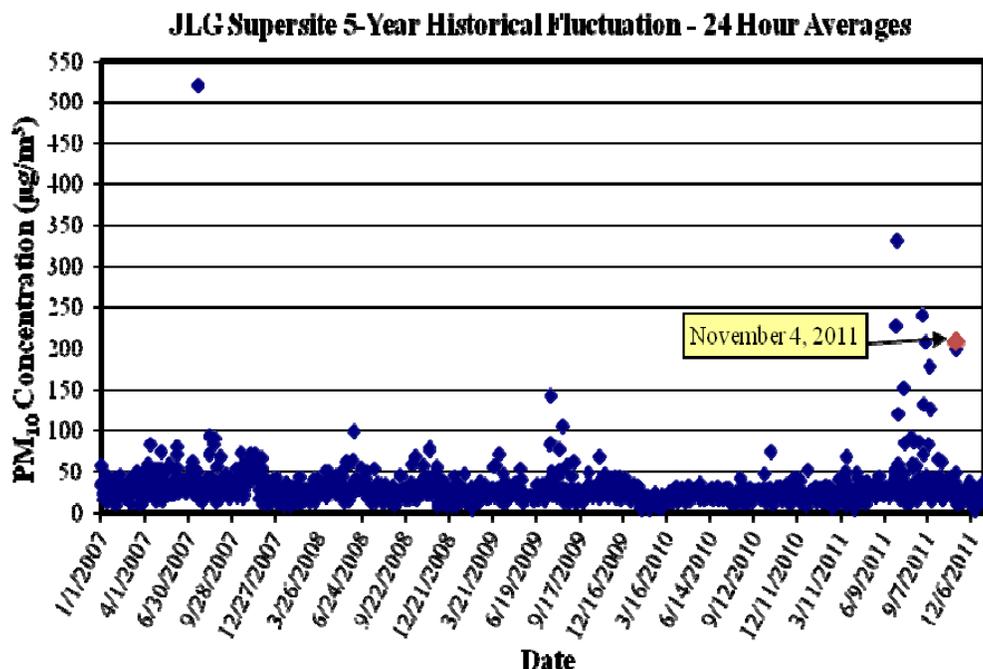


Figure C-13. 24-hr average PM₁₀ concentrations at the JLG Supersite monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

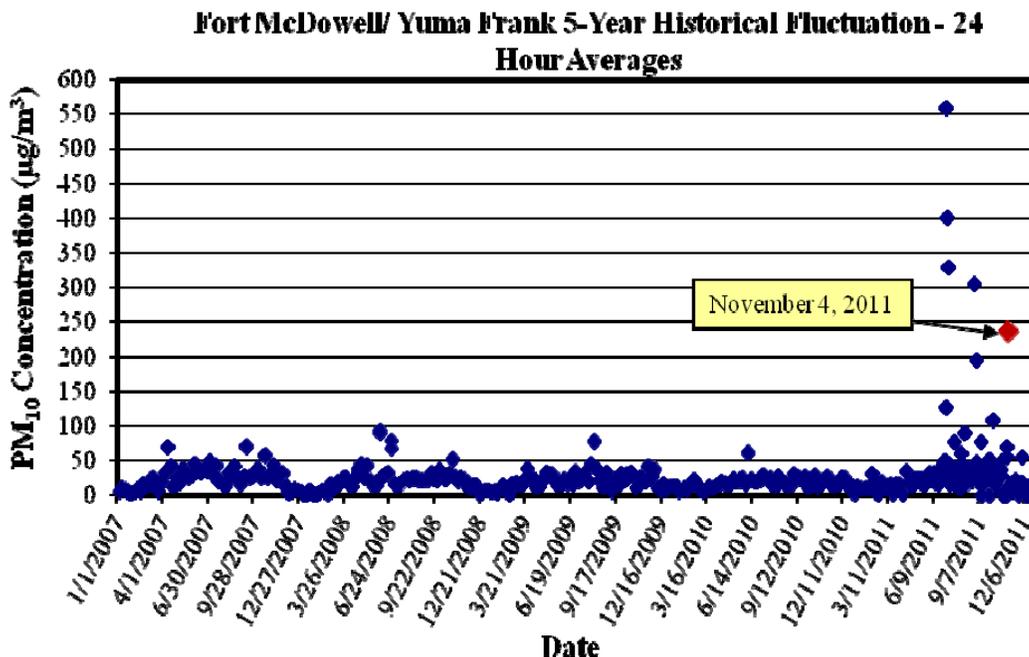


Figure C-14. 24-hr average PM₁₀ concentrations at the Fort McDowell/Yuma Frank monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

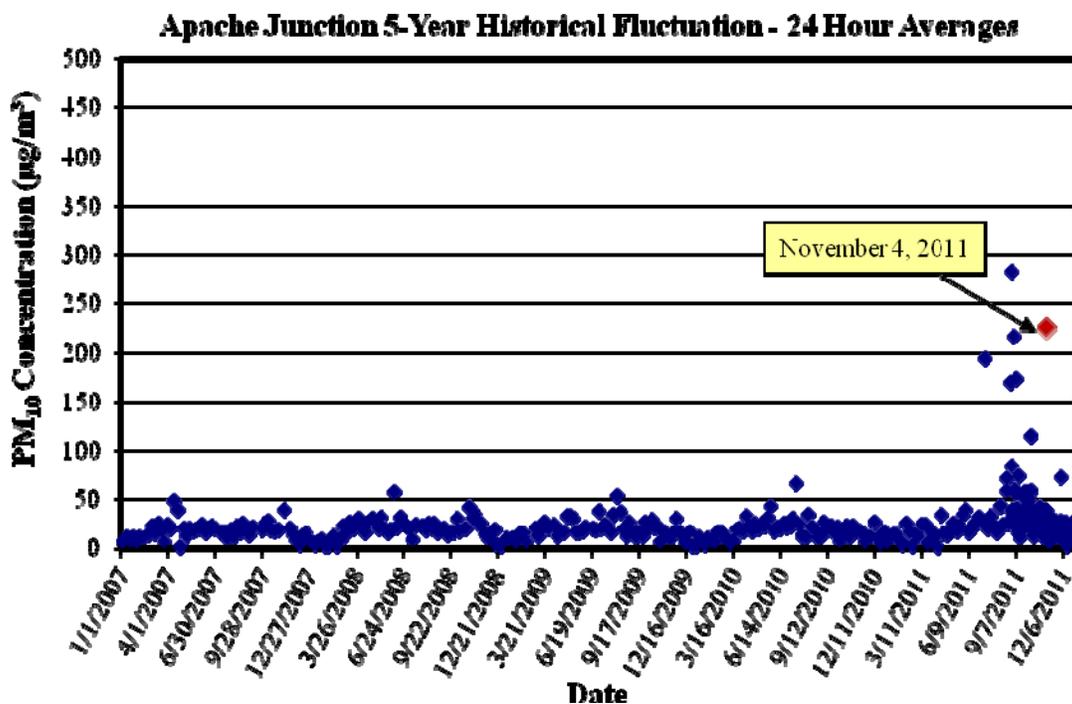


Figure C-15. 24-hr average PM₁₀ concentrations at the Apache Junction monitor (2007–2011). The 24-hr average PM₁₀ concentration on November 4, 2011, is shown in red and highlighted by the arrow.

Appendix D: ADEQ and NWS Forecast Products



MARICOPA COUNTY DUST CONTROL FORECAST ISSUED THURSDAY, NOVEMBER 3, 2011

Three-day weather outlook:

A very strong trough of low pressure will bring unseasonably cool air and significant winds. Blowing dust is expected across a much of the desert southwest as gust will likely top 50 mph. There's a 70% chance of evening showers in Phoenix continuing into early Saturday. Winds drop of considerably Saturday afternoon. Daytime temperatures will be in the upper 60s through the weekend with lows in the 40s. The risk of exceeding the 24-hr PM10 health standard in Phoenix will be **HIGH** on Friday, dropping to Low by Saturday.

R I S K F A C T O R S

	<u>WINDS</u>	+	<u>STAGNATION</u>	=	<u>UNHEALTHY PM-10 RISK LEVEL</u>
Day 1: Fri 11/04/2011	Northwest winds around 25 to 35 mph are expected with gusts near 50 mph at times (70% chance of showers late).	+	Little to not stagnation is expected.	=	HIGH
Day 2: Sat 11/05/2011	Southwest winds around 5 to 10 mph are expected (10% chance for morning showers).	+	Increasingly stagnant conditions will develop during the afternoon.	=	LOW
Day 3: Sun 11/06/2011	South-southwest winds around 5 to 10 mph are expected.	+	Rather stagnant conditions are likely much of the day.	=	LOW

EXTENDED OUTLOOK

Day 4: Mon 11/07/2011	West winds around 5 to 10 mph are expected.	+	Rather stagnant conditions are likely much of the day.	=	LOW
Day 5: Tue 11/08/2011	Mostly light winds are expected.	+	Rather stagnant conditions are likely much of the day.	=	LOW

The Maricopa County Dust Control Action Forecast is issued to assist in the planning of work activities to help reduce dust pollution. A recorded message of this forecast can be accessed at [602-771-2368](tel:602-771-2368). To review the complete air quality forecast for the Phoenix metropolitan area, as well as the health impacts and reduction methods for different air pollutants, call [602-771-2367](tel:602-771-2367) for recorded forecast information or click on ADEQ's Air Quality Forecast at <http://www.azdeq.gov/envirom/air/ozone/ensemble.pdf>.

JRP 04/28/2011



For more information visit:
<http://www.airnow.gov/index.cfm?action=aqibasics.aqi>

LINK TO 2011 AIR POLLUTION EXCEEDANCE GRAPH
AIR QUALITY FORECAST FOR FRIDAY, NOVEMBER 4, 2011

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 <u>WED 11/02/2011</u>	TODAY <u>THU 11/03/2011</u>	TOMORROW <u>FRI 11/04/2011</u>	EXTENDED <u>SAT 11/05/2011</u>
NOTICES (*SEE BELOW FOR DETAILS)	DUST		(PM10) DUST	
AIR POLLUTANT	Highest AQI Reading/Site (Preliminary data only)		COUNTY-ISSUED NO BURN DAY	
O3*	42 MULTIPLE LOCATIONS	38 GOOD	35 GOOD	38 GOOD
CO*	8 TEMPE	23 GOOD	9 GOOD	17 GOOD
PM-10*	282 ZUNI HILLS	40 GOOD	195 UNHEALTHY	35 GOOD
PM-2.5*	36 DURANGO & DYSART	60 MODERATE	45 GOOD	53 MODERATE

* O3 = Ozone CO = Carbon Monoxide PM-10 = Particles 10 microns & smaller PM-2.5 = Particles smaller than 2.5 microns
**"Ozone Health Watch" means that the highest concentration of OZONE may approach the federal health standard.

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

Health message for Thursday, November 3: Unusually sensitive people should consider limiting prolonged exertion outdoors.

Health message for Friday, November 4: People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.

...A PM10 HIGH POLLUTION ADVISORY HAS BEEN ISSUED FOR FRIDAY, NOV. 4, 2011...

Wednesday’s cold front brought strong winds to the region with gusts reaching 50 mph at times in the northwest part of the Valley. It was there that the highest levels of PM10 were recorded (282 AQI at Zuni Hills, 76 AQI at Dysart). As winds decreased to a steady 10-20 mph, the air cleared out well across the forecast area. Thursday’s winds are considerably lower and will remain that way through early Friday.

With Wednesday’s event in the books, we’re looking ahead at Friday’s system. This trough of low pressure will drop a bit further south, generating much stronger winds across the southwest. Widespread dust is likely from southern California east across Arizona deserts including the cities of Yuma, Phoenix, Casa Grande and Tucson. The timing of the strongest winds in Phoenix will be between 11am and 11pm. Fortunately because the system is dropping further south, it will tap into a good fetch of moisture. We will see showers develop across the region around 3-5pm with the heaviest expected around 11pm. Totals will generally be around a tenth to a half an inch with more near thunderstorms and in the upslope areas. The rain should help wash out any lingering/suspended dust.

Colder air will fill in behind the system, dropping daytime temperatures into upper 60s Saturday and Sunday with lows in the 40s.

NOTE: Multiple-vehicle accidents are not uncommon along Arizona freeways when similar wind/dust events occur. This is especially a concern for drivers along I-10 between California and Phoenix and between Phoenix and Tucson, as well as I-8 between Casa Grande and Yuma. Those expecting to travel along these routes may want to pay close attention to the [Nation Weather Service](#) and [Arizona Department of Transportation](#) for the latest weather information and road conditions.

Check back tomorrow for the more. Until then, have a good day! -J.Paul

MONITORING SITE MAPS	
STATIC MAP	http://www.azdeq.gov/environ/air/monitoring/images/map.jpg
INTERACTIVE MAPS	http://aqwww.maricopa.gov/AirMonitoring/SitePollutionMap.aspx http://156.42.96.39/alert/Google/air.html http://www.airnow.gov/

POLLUTION MONITOR READINGS FOR WEDNESDAY, NOVEMBER 2, 2011

O3 (OZONE)

Info on current 8-hour ozone standard: http://www.epa.gov/air/ozonepollution/pdfs/2008_03_aqi_changes.pdf

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

SITE NAME	MAX 8-HR VALUE (PPB)	MAX AQI	AQI COLOR CODE
Apache Junction (Pinal County)	43	36	
Blue Point	46	39	
Central Phoenix	44	37	
Fountain Hills	47	40	
North Phoenix	48	41	
Phoenix Supersite	50	42	
Pinnacle Peak	49	42	
South Phoenix	45	38	
South Scottsdale	44	37	
West Phoenix	49	42	

CO (CARBON MONOXIDE)

SITE NAME	MAX 8-HR VALUE (PPM)	MAX AQI	AQI COLOR CODE
Buckeye	0.2	2	
Central Phoenix	0.5	6	
Dysart	0.2	2	
Glendale	0.2	2	
Greenwood	0.6	7	
Mesa	0.6	7	
North Phoenix	0.5	6	
South Phoenix	0.5	6	
South Scottsdale	0.6	7	
Tempe	0.7	8	
West Chandler	0.5	6	
West Phoenix	0.5	6	

PM-10 (PARTICLES)

SITE NAME	MAX 24-HR VALUE (µg/m3)	MAX AQI	AQI COLOR CODE
Buckeye	51.0	46	
Central Phoenix	25.7	23	
Combs School (Pinal County)	141.3	93	
Durango	39.5	26	
Dysart	105.0	76	
Glendale	35.5	32	
Greenwood	37.8	34	
Higley	29.6	27	
Maricopa (Pinal County)	40.0	37	
North Phoenix	22.1	20	
Phoenix Supersite	30.0	27	
South Phoenix	54.0	49	
West Chandler	25.2	23	
West Forty Third	37.0	34	
West Phoenix	48.4	44	
Zuni Hills	441.9	282	

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 (µg/m3)	MAX AQI	AQI COLOR CODE
Durango	11.0	36	
Dysart	11.2	36	
Estrella Mountain Park	7.3	24	
Glendale	3.7	12	
Phoenix Supersite	5.4	18	
North Phoenix	3.8	12	
South Phoenix	6.7	22	
Vehicle Emissions Lab	3.1	10	
West Phoenix	1.6	5	

Statements, Advisories, and Warnings issued by the National Weather Service office in Phoenix, AZ pertaining to this dust storm event:

WWUS85 KPSR 030213
SPSPSR
SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE PHOENIX AZ
713 PM MST WED NOV 2 2011
AZZ020>028-CAZ030>033-031300-
LOWER COLORADO RIVER VALLEY AZ-WEST CENTRAL DESERTS-
NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
SOUTHERN GILA COUNTY/TONTO NATIONAL FOREST FOOTHILLS-
YUMA/MARTINEZ LAKE AND VICINITY-SOUTHWEST DESERTS-
SOUTHWEST MARICOPA COUNTY-NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
INCLUDING THE CITIES OF...EHRENBERG...PARKER...BOUSE...QUARTZSITE...
SALOME...BUCKEYE...LAKE PLEASANT...MORRISTOWN...NEW RIVER...
TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...CHANDLER...
FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...PHOENIX...
SCOTTSDALE...SUN CITY...TEMPE...GLOBE...MIAMI...SAN CARLOS...
SUPERIOR...TOP-OF-THE-WORLD...ALSO INCLUDING APACHE...BARTLETT...
CANYON...HORSESHOE...ROOSEVELT...AND SAGUARO LAKES...
FORTUNA FOOTHILLS...SAN LUIS...SOMERTON...YUMA...DATELAND...TACNA...
WELLTON...GILA BEND...APACHE JUNCTION...CASA GRANDE...COOLIDGE...
FLORENCE...COTTONWOOD VISITOR CENTER...KEYS VIEW...LOST HORSE...
BLYTHE...CHIRIACO SUMMIT...DESERT CENTER...EAGLE MOUNTAIN...
BRAWLEY...CALEXICO...EL CENTRO...GLAMIS...IMPERIAL...
AND THE SALTON SEA
713 PM MST WED NOV 2 2011 /713 PM PDT WED NOV 2 2011/
...PACIFIC LOW TO BRING UNSETTLED...WINDY AND MUCH COOLER WEATHER TO
THE AREA FRIDAY INTO SATURDAY...
THE SECOND IN A SERIES OF COLD PACIFIC LOW PRESSURE SYSTEMS IS SLATED
TO MOVE PROGRESSIVELY EAST ACROSS SOUTHEAST CALIFORNIA AND ARIZONA
FRIDAY INTO SATURDAY...BRINGING WITH IT STRONG GUSTY WINDS...MUCH
COOLER TEMPERATURES AND SHOWERY CONDITIONS. THE STRONG COLD FRONT
WILL LOWER TEMPERATURES ACROSS SOUTHEAST CALIFORNIA AND SOUTHWEST
ARIZONA INTO THE UPPER 60S AND LOW 70S ON FRIDAY. THE FRONT WILL EXIT
TO THE EAST ON FRIDAY NIGHT AND BY SATURDAY MOST OF THE LOWER
CALIFORNIA AND ARIZONA DESERTS WILL SEE HIGH TEMPERATURES IN THE 60S.
STRONG GUSTY SOUTH TO SOUTHWEST WINDS WILL DEVELOP DURING THE LATE
MORNING AND AFTERNOON HOURS FRIDAY AHEAD OF THE COLD FRONT. SUSTAINED
SPEEDS BETWEEN 20 AND 30 MPH ARE LIKELY AND PEAK GUSTS COULD REACH TO
NEAR 50 MPH. WINDS WILL CONTINUE TO BE STRONG AND GUSTY AS THE COLD
FRONT PASSES AND WILL SWING TOWARDS THE WEST OR NORTHWEST. IT IS
LIKELY THAT A WIND ADVISORY WILL BE NEEDED ACROSS MUCH OF THE AREA
DURING THE AFTERNOON AND EVENING HOURS ON FRIDAY.
GIVEN THE CURRENTLY DRY CONDITIONS...THE STRONG WINDS WILL LIKELY
GENERATE AREAS OF BLOWING SAND...DUST AND DIRT WHICH WILL
NECESSITATE THE ISSUANCE OF BOTH DUST STORM ADVISORIES AND DUST STORM
WARNINGS OVER PORTIONS OF THE LOWER CALIFORNIA AND ARIZONA DESERT
FRIDAY AFTERNOON AND EVENING.

FINALLY...THERE WILL BE A CHANCE FOR SHOWERS FRIDAY IN SOUTHEAST CALIFORNIA...AND AS THE FRONT MOVES ACROSS ARIZONA FRIDAY NIGHT THE CHANCES WILL SHIFT INTO SOUTHERN AND SOUTH CENTRAL ARIZONA. SHOWERS WILL BE NUMEROUS OVER THE HIGHER TERRAIN OF SOUTHERN GILA COUNTY FRIDAY NIGHT. RAINFALL TOTALS OF ONE HALF INCH OR MORE ARE POSSIBLE ACROSS SOUTH CENTRAL ARIZONA FRIDAY NIGHT...ESPECIALLY OVER FAVORED UPSLOPE AREAS NORTH AND EAST OF PHOENIX. BY SATURDAY MORNING THE COLD AIR ASSOCIATED WITH THE FRONT WILL LOWER SNOW LEVELS TO NEAR 5000 FEET...HOWEVER NO SIGNIFICANT SNOWFALL ACCUMULATIONS ARE EXPECTED AT THAT LEVEL.

STAY UP-TO-DATE ON THE LATEST FORECASTS BY LISTENING TO WEATHER RADIO ON THE PUBLIC SERVICE BAND. MORE DETAILED INFORMATION IS AVAILABLE FROM THE NATIONAL WEATHER SERVICE IN PHOENIX ON THE INTERNET AT WEATHER.GOV/PHOENIX

WWUS75 KPSR 030958

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

258 AM MST THU NOV 3 2011

AZZ021>024-026>028-032200-

/O.NEW.KPSR.WI.Y.0033.111104T1800Z-111105T0300Z/

WEST CENTRAL DESERTS-NORTHWEST MARICOPA COUNTY-

GREATER PHOENIX AREA-

SOUTHERN GILA COUNTY/TONTO NATIONAL FOREST FOOTHILLS-

SOUTHWEST DESERTS-SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...QUARTZSITE...SALOME...BUCKEYE...

NEW RIVER...WICKENBURG...MESA...PHOENIX...GLOBE...MIAMI...

SAN CARLOS...SUPERIOR...TOP-OF-THE-WORLD...TACNA...WELLTON...

GILA BEND...APACHE JUNCTION...CASA GRANDE...FLORENCE

258 AM MST THU NOV 3 2011

...WIND ADVISORY IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A WIND

ADVISORY...WHICH IS IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY.

* AFFECTED AREA: LA PAZ...YUMA...MARICOPA...NORTHWEST PINAL...AND SOUTHERN GILA COUNTIES.

* LOCATIONS INCLUDE: THE ENTIRE PHOENIX METROPOLITAN AREA...GILA BEND...TACNA...WELLTON...GLOBE...MIAMI...SAN CARLOS...WICKENBURG ...QUARTZSITE... SALOME...CASA GRANDE...FLORENCE...INTERSTATE TEN FROM NEAR CASA GRANDE WEST THROUGH PHOENIX AND TOWARD QUARTZSITE... AND INTERSTATE EIGHT FROM NEAR CASA GRANDE WEST TOWARD YUMA.

* TIMING: BEGINNING LATE FRIDAY MORNING AND CONTINUING INTO FRIDAY EVENING.

* WINDS: SUSTAINED SOUTHERLY WINDS 25 TO 35 MPH GUSTING TO 50 MPH.

* IMPACTS: TRAVEL MAY BE DIFFICULT...ESPECIALLY ALONG EAST TO WEST ORIENTED ROADS WHICH INCLUDES INTERSTATES EIGHT AND TEN. WIDESPREAD AREAS OF BLOWING DUST ARE LIKELY WITH LOCALIZED AREAS OF VERY DENSE BLOWING DUST POSSIBLE. MOTORISTS SHOULD BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY. SMALL UNSECURED OBJECTS MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN 30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND 58 MPH. 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.

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NATIONAL WEATHER SERVICE PHOENIX IS ON THE INTERNET AT WEATHER.GOV/PHOENIX

WWUS85 KPSR 031638

SPSPSR

SPECIAL WEATHER STATEMENT

NATIONAL WEATHER SERVICE PHOENIX AZ

938 AM MST THU NOV 3 2011

AZZ020>028-CAZ030>033-041330-

LOWER COLORADO RIVER VALLEY AZ-WEST CENTRAL DESERTS-
NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-
SOUTHERN GILA COUNTY/TONTO NATIONAL FOREST FOOTHILLS-
YUMA/MARTINEZ LAKE AND VICINITY-SOUTHWEST DESERTS-
SOUTHWEST MARICOPA COUNTY-NORTHWEST AND NORTH CENTRAL PINAL COUNTY-
JOSHUA TREE NATIONAL PARK-LOWER COLORADO RIVER VALLEY CA-
RIVERSIDE COUNTY/EASTERN DESERTS-IMPERIAL COUNTY-
INCLUDING THE CITIES OF...EHRENBERG...PARKER...BOUSE...QUARTZSITE...
SALOME...BUCKEYE...LAKE PLEASANT...MORRISTOWN...NEW RIVER...
TONOPAH...WICKENBURG...CAREFREE...CAVE CREEK...CHANDLER...
FOUNTAIN HILLS...GILBERT...GLENDALE...MESA...PEORIA...PHOENIX...
SCOTTSDALE...SUN CITY...TEMPE...GLOBE...MIAMI...SAN CARLOS...
SUPERIOR...TOP-OF-THE-WORLD...ALSO INCLUDING APACHE...BARTLETT...
CANYON...HORSESHOE...ROOSEVELT...AND SAGUARO LAKES...
FORTUNA FOOTHILLS...SAN LUIS...SOMERTON...YUMA...DATELAND...TACNA...
WELLTON...GILA BEND...APACHE JUNCTION...CASA GRANDE...COOLIDGE...
FLORENCE...COTTONWOOD VISITOR CENTER...KEYS VIEW...LOST HORSE...
BLYTHE...CHIRIACO SUMMIT...DESERT CENTER...EAGLE MOUNTAIN...
BRAWLEY...CALEXICO...EL CENTRO...GLAMIS...IMPERIAL...
AND THE SALTON SEA

938 AM MST THU NOV 3 2011 /938 AM PDT THU NOV 3 2011/

...PACIFIC STORM SYSTEM WITH STRONG WINDS...BLOWING DUST...SHOWERS...
POSSIBLE THUNDERSTORMS...AND MUCH COOLER WEATHER ON THE WAY...
WINDS FROM THE SOUTH AND WEST ARE EXPECTED TO INCREASE ACROSS
SOUTHEAST CALIFORNIA...AND SOUTHWEST AND SOUTH-CENTRAL ARIZONA LATE
FRIDAY MORNING THROUGH FRIDAY EVENING AHEAD OF A PACIFIC COLD FRONT.
STRONG CROSS WINDS ARE EXPECTED ACROSS SOME ROADS AND HIGHWAYS. THE
STRONGEST WINDS ARE EXPECTED IN SOUTHWEST AND SOUTH-CENTRAL ARIZONA
WITH GUSTS TO 50 MPH FRIDAY AFTERNOON AND FRIDAY EVENING.
THE STRONG GUSTY WINDS ARE EXPECTED TO CAUSE AREAS OF DENSE BLOWING
SAND AND DUST THE DESERT AREAS. THIS INCLUDES INTERSTATES 10 AND 8
BETWEEN TUCSON...CASA GRANDE...PHOENIX...GILA BEND...YUMA...AND EL
CENTRO. THE AREA BETWEEN TUCSON...CASA GRANDE...PHOENIX...AND GILA
BEND IS ESPECIALLY PRONE TO VERY DENSE BLOWING DUST WITH NEAR ZERO
VISIBILITY POSSIBLE FRIDAY AFTERNOON AND FRIDAY EVENING.
THE DENSE BLOWING DUST COULD OCCUR IN THE GREATER PHOENIX AREA DURING
THE COMMUTER RUSH HOUR LATE FRIDAY AFTERNOON AND EARLY EVENING.
IF YOU SEE A DUST STORM APPROACHING OR GET CAUGHT IN ONE...PULL OFF
THE ROAD AS FAR AS SAFELY POSSIBLE...PUT YOUR VEHICLE IN PARK...KEEP
YOUR FOOT OFF THE BRAKE PEDAL...AND TURN YOUR LIGHTS ALL THE WAY OFF.
THE PACIFIC COLD FRONT WITH A CHANCE OF SHOWERS AND THUNDERSTORMS WILL

MOVE FROM WEST TO EAST ACROSS SOUTHEAST CALIFORNIA AND SOUTHWEST ARIZONA LATE FRIDAY AFTERNOON AND FRIDAY EVENING WITH SHOWERS LIKELY IN SOUTH-CENTRAL ARIZONA FRIDAY NIGHT ALONG WITH A CHANCE OF THUNDERSTORMS.

MOST OF THE RAIN IS EXPECTED TO BE IN SOUTH-CENTRAL ARIZONA INCLUDING THE GREATER PHOENIX AREA FRIDAY NIGHT. THE SHOWERS AND CHANCE OF THUNDERSTORMS WILL PROBABLY NOT REACH THE PHOENIX AREA UNTIL LATE FRIDAY EVENING.

RAINFALL AMOUNTS ARE EXPECTED TO RANGE FROM LESS THAN A TENTH OF AN INCH IN SOUTHEAST CALIFORNIA AND SOUTHWEST ARIZONA INCLUDING EL CENTRO AND YUMA. RAINFALL AMOUNTS ARE EXPECTED TO RANGE FROM 1 TENTH OF AN INCH TO MORE THAN A QUARTER OF AN INCH IN THE SOUTH-CENTRAL ARIZONA DESERT INCLUDING THE PHOENIX AREA TO MORE THAN A HALF INCH IN THE HIGHER TERRAIN NORTH AND EAST OF THE GREATER PHOENIX AREA. COLDER AIR WILL MOVE IN BEHIND THE FRONT WITH EARLY MORNING TEMPERATURES DROPPING INTO THE UPPER 30S AND 40S IN MOST DESERT LOCATIONS SATURDAY MORNING. AND...COMPARED WITH TODAY...HIGH TEMPERATURES ARE EXPECTED TO BE 10 TO 20 DEGREES COLDER SATURDAY WITH HIGHS BETWEEN 60 AND 70 IN THE DESERT AREAS INCLUDING PHOENIX...YUMA AND EL CENTRO.

THE SNOW LEVEL WILL LOWER TO NEAR 5000 FEET BY SATURDAY MORNING. HOWEVER...MOST OF THE PRECIPITATION WILL HAVE ENDED BY THEN. THUS...NO SIGNIFICANT SNOWFALL ACCUMULATION IS EXPECTED AT THAT LEVEL.

STAY UP-TO-DATE ON THE LATEST FORECASTS BY LISTENING TO WEATHER RADIO ON THE PUBLIC SERVICE BAND. MORE DETAILED INFORMATION IS AVAILABLE FROM THE NATIONAL WEATHER SERVICE IN PHOENIX ON THE INTERNET AT WEATHER.GOV/PHOENIX

WWUS75 KPSR 040347

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

847 PM MST THU NOV 3 2011

AZZ021>023-026>028-041315-

/O.NEW.KPSR.DU.Y.0003.111104T1800Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.111104T1800Z-111105T0300Z/

WEST CENTRAL DESERTS-NORTHWEST MARICOPA COUNTY-

GREATER PHOENIX AREA-SOUTHWEST DESERTS-SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...QUARTZSITE...SALOME...BUCKEYE...

NEW RIVER...WICKENBURG...MESA...PHOENIX...TACNA...WELLTON...

GILA BEND...APACHE JUNCTION...CASA GRANDE...FLORENCE

847 PM MST THU NOV 3 2011

...BLOWING DUST ADVISORY IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY...

...WIND ADVISORY REMAINS IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A BLOWING DUST ADVISORY...WHICH IS IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY. A WIND ADVISORY REMAINS IN EFFECT FROM 11 AM TO 8 PM MST FRIDAY.

* AFFECTED AREA: LA PAZ...YUMA...MARICOPA...NORTHWEST PINAL... AND SOUTHERN GILA COUNTIES.

* LOCATIONS INCLUDE: GILA BEND...TACNA...WELLTON...BUCKEYE...

MESA...PHOENIX...NEW RIVER...WICKENBURG...QUARTZSITE...
SALOME...APACHE JUNCTION...CASA GRANDE...FLORENCE. AREAS ESPECIALLY
IMPACTED BY THE BLOWING DUST ADVISORY INCLUDE THE GREATER PHOENIX
AREA SOUTHEASTWARD DOWN THE INTERSTATE 10 CORRIDOR TOWARDS CASA
GRANDE AND COOLIDGE.

* TIMING: BEGINNING LATE FRIDAY MORNING AND CONTINUING INTO
FRIDAY EVENING.

* WINDS: SUSTAINED SOUTHERLY WINDS 25 TO 35 MPH GUSTING TO 50
MPH.

* VISIBILITIES: AREAS OF LOWERED VISIBILITY BETWEEN 3 AND 5 MILES
LOCALLY BELOW ONE MILE.

* IMPACTS: TRAVEL MAY BE DIFFICULT...ESPECIALLY ALONG EAST TO WEST
ORIENTED ROADS WHICH INCLUDES INTERSTATES EIGHT AND TEN. STRONG
CROSSWINDS WILL PRODUCE DANGEROUS DRIVING CONDITIONS FOR DRIVERS OF
HIGH PROFILE VEHICLES. WIDESPREAD AREAS OF BLOWING DUST ARE LIKELY
WITH LOCALIZED AREAS OF VERY DENSE BLOWING DUST POSSIBLE. MOTORISTS
SHOULD BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN
VISIBILITY. SMALL UNSECURED OBJECTS MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN
30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND
58 MPH. 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.

A BLOWING DUST ADVISORY MEANS THAT BLOWING DUST WILL RESTRICT
VISIBILITIES. SOME LOCATIONS WILL SEE VISIBILITIES FALL BELOW ONE
MILE. TRAVELERS ARE URGED TO USE EXTRA CAUTION.

WWUS75 KPSR 041117

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

417 AM MST FRI NOV 4 2011

AZZ022-023-027-028-042330-

/O.EXT.KPSR.WI.Y.0033.111104T1800Z-111105T0600Z/

/O.CON.KPSR.DU.Y.0003.111104T1800Z-111105T0300Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-

SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG...

MESA...PHOENIX...GILA BEND...APACHE JUNCTION...CASA GRANDE...

FLORENCE

417 AM MST FRI NOV 4 2011

...WIND ADVISORY NOW IN EFFECT FROM 11 AM THIS MORNING TO 11 PM
MST THIS EVENING...

...BLOWING DUST ADVISORY REMAINS IN EFFECT FROM 11 AM THIS
MORNING TO 8 PM MST THIS EVENING...

THE WIND ADVISORY IS NOW IN EFFECT FROM 11 AM THIS MORNING TO
11 PM MST THIS EVENING. A BLOWING DUST ADVISORY REMAINS IN EFFECT
FROM 11 AM THIS MORNING TO 8 PM MST THIS EVENING.

* AFFECTED AREA: MARICOPA...AND NORTHWEST PINAL COUNTIES FOR BOTH
DUST AND WINDS.

* LOCATIONS INCLUDE: DUST PRONE AREAS NEAR FARM FIELDS AND

CONSTRUCTION SITES WILL BE MOST SUSCEPTIBLE...ESPECIALLY THE INTERSTATE 10 CORRIDOR THROUGH PINAL COUNTY. OTHERWISE...STRONG WINDS WILL AFFECT LOCATIONS INCLUDING...BUT NOT LIMITED TO...GILA BEND...TACNA...WELLTON...BUCKEYE... MESA...PHOENIX...NEW RIVER...WICKENBURG...QUARTZSITE... SALOME...APACHE JUNCTION...CASA GRANDE...FLORENCE.

- * TIMING: BEGINNING LATE THIS MORNING AND CONTINUING THROUGH THIS EVENING.
- * WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING 40 TO 50 MPH.
- * VISIBILITIES: BROAD AREAS REDUCED TO 3 TO 5 MILES...LOCALLY BELOW ONE MILE.
- * IMPACTS: BLOWING DUST WILL CREATE HAZARDOUS DRIVING CONDITIONS DUE TO REDUCED VISIBILITIES. STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS-WINDS...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

WWUS75 KPSR 042107

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

207 PM MST FRI NOV 4 2011

AZZ023-027-028-050600-

/O.UPG.KPSR.DU.Y.0003.000000T0000Z-111105T0300Z/

/O.NEW.KPSR.DS.W.0024.111104T2107Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

GREATER PHOENIX AREA-SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...MESA...PHOENIX...GILA BEND...

APACHE JUNCTION...CASA GRANDE...FLORENCE

207 PM MST FRI NOV 4 2011

...DUST STORM WARNING IN EFFECT UNTIL 8 PM MST THIS EVENING...

...WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM WARNING...WHICH IS IN EFFECT UNTIL 8 PM MST THIS EVENING. THE BLOWING DUST ADVISORY IS NO LONGER IN EFFECT. A WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING.

- * AFFECTED AREA: MARICOPA...AND NORTHWEST PINAL COUNTIES FOR BOTH DUST AND WINDS.
- * LOCATIONS INCLUDE: INTERSTATE 10 BETWEEN PHOENIX AND CASA GRANDE...HIGHWAY 347 BETWEEN PHOENIX AND MARICOPA...AND INTERSTATE 8 BETWEEN GILA BEND AND CASA GRANDE. OTHER LOCATIONS INCLUDE BUT ARE NOT LIMITED TO FLORENCE JUNCTION...COOLIDGE AND FLORENCE.
- * TIMING: CONTINUING THROUGH 8 PM THIS EVENING.
- * WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING TO 45 MPH.
- * VISIBILITIES: AREAS REDUCED DOWN TO 3 TO 5 MILES IN BLOWING

DUST...LOCALLY BELOW ONE QUARTER MILE IN DUST PRONE LOCATIONS.
* IMPACTS: BLOWING DUST WILL CREATE HAZARDOUS DRIVING CONDITIONS DUE TO REDUCED VISIBILITIES. STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS-WINDS...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.
A DUST STORM WARNING IS ISSUED WHEN WINDS HAVE GENERATED LARGE AREAS OF BLOWING DUST OR BLOWING SAND THAT HAVE SUBSTANTIALLY REDUCED VISIBILITIES...TO 1/4 MILE OR LESS...RESULTING IN HAZARDOUS DRIVING CONDITIONS IN SOME AREAS. BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. USE EXTRA CAUTION AND SLOW DOWN WHILE DRIVING...AS OBJECTS ON AND NEAR ROADWAYS WILL BE SEEN ONLY AT CLOSE RANGE. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.
A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN 30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND 58 MPH. 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.

AZZ022-050600-

/O.CON.KPSR.DU.Y.0003.000000T0000Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

NORTHWEST MARICOPA COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG

207 PM MST FRI NOV 4 2011

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING...

...WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING...

A BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING. A WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING.

* AFFECTED AREA: MARICOPA...AND NORTHWEST PINAL COUNTIES FOR BOTH DUST AND WINDS.

* LOCATIONS INCLUDE: DUST PRONE AREAS NEAR FARM FIELDS AND CONSTRUCTION SITES WILL BE MOST SUSCEPTIBLE...ESPECIALLY THE INTERSTATE 10 CORRIDOR THROUGH PINAL COUNTY. OTHERWISE... STRONG WINDS WILL AFFECT LOCATIONS INCLUDING...BUT NOT LIMITED TO...GILABEND...TACNA...WELLTON...BUCKEYE... MESA... PHOENIX...NEW RIVER...WICKENBURG...QUARTZSITE... SALOME... APACHE JUNCTION...CASA GRANDE...FLORENCE.

* TIMING: CONTINUING THROUGH THIS EVENING.

* WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING 40 TO 50 MPH.

* VISIBILITIES: BROAD AREAS REDUCED TO 3 TO 5 MILES...LOCALLY BELOW ONE MILE.
* IMPACTS: BLOWING DUST WILL CREATE HAZARDOUS DRIVING CONDITIONS DUE TO REDUCED VISIBILITIES. STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS-WINDS...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

WWUS75 KPSR 042107

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

207 PM MST FRI NOV 4 2011

AZZ023-027-028-050600-

/O.UPG.KPSR.DU.Y.0003.000000T0000Z-111105T0300Z/

/O.NEW.KPSR.DS.W.0024.111104T2107Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

GREATER PHOENIX AREA-SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...MESA...PHOENIX...GILA BEND...

APACHE JUNCTION...CASA GRANDE...FLORENCE

207 PM MST FRI NOV 4 2011

...DUST STORM WARNING IN EFFECT UNTIL 8 PM MST THIS EVENING...

...WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM WARNING...WHICH IS IN EFFECT UNTIL 8 PM MST THIS EVENING. THE BLOWING DUST ADVISORY IS NO LONGER IN EFFECT. A WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING.

* AFFECTED AREA: MARICOPA...AND NORTHWEST PINAL COUNTIES FOR BOTH DUST AND WINDS.

* LOCATIONS INCLUDE: INTERSTATE 10 BETWEEN PHOENIX AND CASA GRANDE...HIGHWAY 347 BETWEEN PHOENIX AND MARICOPA...AND INTERSTATE 8 BETWEEN GILA BEND AND CASA GRANDE. OTHER LOCATIONS INCLUDE BUT ARE NOT LIMITED TO FLORENCE JUNCTION...COOLIDGE AND FLORENCE.

* TIMING: CONTINUING THROUGH 8 PM THIS EVENING.

* WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING TO 45 MPH.

* VISIBILITIES: AREAS REDUCED DOWN TO 3 TO 5 MILES IN BLOWING DUST...LOCALLY BELOW ONE QUARTER MILE IN DUST PRONE LOCATIONS.

* IMPACTS: BLOWING DUST WILL CREATE HAZARDOUS DRIVING CONDITIONS DUE TO REDUCED VISIBILITIES. STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS-WINDS...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE

ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

A DUST STORM WARNING IS ISSUED WHEN WINDS HAVE GENERATED LARGE AREAS OF BLOWING DUST OR BLOWING SAND THAT HAVE SUBSTANTIALLY REDUCED VISIBILITIES...TO 1/4 MILE OR LESS...RESULTING IN HAZARDOUS DRIVING CONDITIONS IN SOME AREAS. BE READY FOR A SUDDEN DROP IN VISIBILITY TO NEAR ZERO. USE EXTRA CAUTION AND SLOW DOWN WHILE DRIVING...AS OBJECTS ON AND NEAR ROADWAYS WILL BE SEEN ONLY AT CLOSE RANGE. IF YOU ENCOUNTER BLOWING DUST OR BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN 30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS OF BETWEEN 40 AND 58 MPH. 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.

AZZ022-050600-

/O.CON.KPSR.DU.Y.0003.000000T0000Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

NORTHWEST MARICOPA COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG

207 PM MST FRI NOV 4 2011

...BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING...

...WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING...

A BLOWING DUST ADVISORY REMAINS IN EFFECT UNTIL 8 PM MST THIS EVENING. A WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING.

* AFFECTED AREA: MARICOPA...AND NORTHWEST PINAL COUNTIES FOR BOTH DUST AND WINDS.

* LOCATIONS INCLUDE: DUST PRONE AREAS NEAR FARM FIELDS AND CONSTRUCTION SITES WILL BE MOST SUSCEPTIBLE...ESPECIALLY THE INTERSTATE 10 CORRIDOR THROUGH PINAL COUNTY. OTHERWISE... STRONG WINDS WILL AFFECT LOCATIONS INCLUDING...BUT NOT LIMITED TO...GILABEND...TACNA...WELLTON...BUCKEYE... MESA... PHOENIX...NEW RIVER...WICKENBURG...QUARTZSITE... SALOME... APACHE JUNCTION...CASA GRANDE...FLORENCE.

* TIMING: CONTINUING THROUGH THIS EVENING.

* WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING 40 TO 50 MPH.

* VISIBILITIES: BROAD AREAS REDUCED TO 3 TO 5 MILES...LOCALLY BELOW ONE MILE.

* IMPACTS: BLOWING DUST WILL CREATE HAZARDOUS DRIVING CONDITIONS DUE TO REDUCED VISIBILITIES. STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS-WINDS...ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG

INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

WWUS75 KPSR 050309

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

809 PM MST FRI NOV 4 2011

AZZ023-027-028-050600-

/O.EXP.KPSR.DS.W.0024.000000T0000Z-111105T0300Z/

/O.CON.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

GREATER PHOENIX AREA-SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...MESA...PHOENIX...GILA BEND...

APACHE JUNCTION...CASA GRANDE...FLORENCE

809 PM MST FRI NOV 4 2011

...WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING...

...DUST STORM WARNING EXPIRED AT 8 PM MST THIS EVENING...

THE DUST STORM WARNING EXPIRED AT 8 PM MST THIS EVENING. A WIND ADVISORY REMAINS IN EFFECT UNTIL 11 PM MST THIS EVENING.

* AFFECTED AREA: SOUTHWEST MARICOPA...NORTHWEST PINAL COUNTIES AND THE GREATER PHOENIX AREA.

* LOCATIONS INCLUDE: GILA BEND...BUCKEYE...MESA...PHOENIX...

APACHE JUNCTION...CASA GRANDE...FLORENCE

* TIMING: CONTINUING THROUGH 11 PM THIS EVENING.

* WINDS: SUSTAINED SOUTH AND SOUTHWESTERLY WINDS 25 TO 35 MPH GUSTING TO NEAR 45 MPH.

* IMPACTS: STRONG WINDS WILL MAKE VEHICLE HANDLING MORE DIFFICULT DUE TO CROSS- WINDS... ESPECIALLY FOR HIGH PROFILE VEHICLES. IN ADDITION...SMALL UNSECURED OBJECTS AROUND HOMES AND BUSINESSES MAY BECOME AIRBORNE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

MOTORISTS SHOULD USE EXTRA CAUTION AND BE PREPARED FOR VERY QUICK AND DRASTIC REDUCTIONS IN VISIBILITY...ESPECIALLY ALONG INTERSTATES 10 AND 8. IF YOU ENCOUNTER VERY LOW VISIBILITY ON THE ROADWAY...PULL OFF THE ROAD AS FAR AS POSSIBLE AND PARK...TURN OFF THE LIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

AZZ022-023-027-028-050700-

/O.CAN.KPSR.WI.Y.0033.000000T0000Z-111105T0600Z/

NORTHWEST MARICOPA COUNTY-GREATER PHOENIX AREA-

SOUTHWEST MARICOPA COUNTY-

NORTHWEST AND NORTH CENTRAL PINAL COUNTY-

INCLUDING THE CITIES OF...BUCKEYE...NEW RIVER...WICKENBURG...

MESA...PHOENIX...GILA BEND...APACHE JUNCTION...CASA GRANDE...

FLORENCE...

1053 PM MST FRI NOV 4 2011

...WIND ADVISORY IS CANCELLED...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS CANCELLED THE WIND ADVISORY FOR MARICOPA COUNTY AND NORTHWEST PINAL COUNTY. WINDS ACROSS MARICOPA COUNTY...NORTHWEST PINAL COUNTY AND THE GREATER PHOENIX AREA HAVE STAYED BELOW WIND ADVISORY CRITERIA FOR THE MOST PART SINCE 9 PM

AND ARE NOT EXPECTED TO STRENGTHEN SIGNIFICANTLY FOR THE REST OF TONIGHT. THUS THE WIND ADVISORY HAS BEEN CANCELLED. HOWEVER...IT IS POSSIBLE THAT WHEN THE COLD FRONT PASSES THROUGH THE AREA LATER TONIGHT...GUSTY WINDS TO NEAR 40 MPH MAY BRIEFLY OCCUR. OVERALL WINDS SHOULD REMAIN BELOW 30 MPH FOR THE REST OF TONIGHT.

Appendix E: Affidavit of Public Notice

ADEQ
AIR QUALITY DIVISION

12 DEC -6 AM 10:47

THE ARIZONA REPUBLIC

PUBLIC NOTICE
Arizona Department of Environmental Quality
Request for Public Comments

On Exceptional Events in the Greater Phoenix Area
 In 2005, Congress identified a need to account for events that result in exceedances of the National Ambient Air Quality Standards (NAAQS) that are exceptional in nature (e.g., not expected to reoccur or caused by acts of nature beyond man-made controls). In response, EPA promulgated the Exceptional Events Rule (EER) to address exceptional events in 40 CFR Parts 50 and 51 on March 22, 2007 (72 FR 33560). On May 2, 2011, EPA released draft guidance documents on the implementation of the EER to State, tribal, and local air agencies for review. The EER allows for states and tribes to flag air quality monitoring data as exceptional event. If flagged, these data can be excluded from consideration in air quality planning if EPA concurs with the demonstration submitted by the flagging agency, documenting that all procedural and technical requirements have been met. Pursuant to 40 CFR 50.14(c)(3)(i), the Arizona Department of Environmental Quality (ADEQ) is soliciting comments on its final demonstrations of events that have caused elevated concentrations of PM10 in the Greater Phoenix area on February 18; July 18; August 3; August 18; August 25 through 28; September 2; October 4; November 4, 2011; January 21, 22, and February 27, 2012. ADEQ has decided to flag these episodes based on these analyses. Copies of the demonstrations are available for review beginning Monday, December 3, 2012, on the ADEQ website at www.azdeq.gov/environ/air/plan/. Interested parties can submit written comments throughout the comment period which will end at 5:00 p.m. on Tuesday, January 1, 2013. Any comments received will be responded to and forwarded to EPA with the final demonstrations. Written comments should be addressed, faxed, or e-mailed to: Andra Juniel, Air Assessment Section, Arizona Department of Environmental Quality, 1110 W. Washington Street, 3415-A, Phoenix, AZ 85007; PHONE: (602) 771-4417; FAX: (602) 771-2366; E-mail: juniel.andra@azdeq.gov. In addition to being available on-line, copies of the analyses are available for review at the following location: Arizona Department of Environmental Quality, Records Retention Center, First Floor, 1110 W. Washington Street, Phoenix, Arizona 85007; Attn: David J. Olivo, (602) 771-4380; E-mail: david.olivo@azdeq.gov. Persons with a disability may request reasonable accommodations by contacting Linda Morrison at (602) 771-4793 or 1-800-234-5677 ext. 771-4793. This document is available in alternative formats by contacting ADEQ TDD phone number at (602) 771-4829.
 Pub: December 3, 2012

STATE OF ARIZONA
 COUNTY OF MARICOPA } SS.

Tabitha Weaver, being first duly sworn, upon oath deposes and says: That she is a legal advertising representative of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published at Phoenix, Arizona, by Phoenix Newspapers Inc., which also publishes The Arizona Republic, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates as indicated.

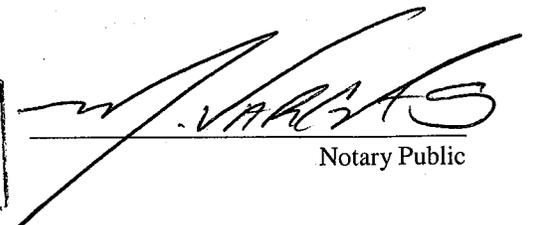
The Arizona Republic

December 3, 2012



Sworn to before me this
 3rd day of
 December A.D. 2012

MANUEL VARGAS
 Notary Public - State of Arizona
 MARICOPA COUNTY
 My Commission Expires
 November 30, 2015

Notary Public