2021 Exceptional Events Demonstration

High Wind Blowing Dust Events in Doña Ana and Luna Counties

Air Quality Bureau **11/9/22** **Public Review Draft**

The New Mexico Environment Department's Air Quality Bureau prepared this document. It is available for review at the website located at https://www.env.nm.gov/public-notices/ or in person at the address listed below. The Air Quality Bureau accepted public comment on this document from November 9, 2022, to December 8, 2022. For further information or to request a copy of this document, please contact the bureau by phone or in writing at:

NMED AQB
Planning Section
525 Camino de los Marquez, Suite 1 Santa Fe, NM 87505
Phone: (505) 476-4300

Table of Contents

1. Introduction

Purpose

The U.S. Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards (NAAQS) for Particulate Matter (PM) with an aerodynamic diameter of 10 microns or less (PM_{10}). The level of the PM_{10} NAAQS is set at 150 µg/m^3 for a 24-hour average concentration.

From January 1 - December 31, 2021, the New Mexico Environment Department (NMED) Air Quality Bureau (AQB) recorded 32 exceedances of the PM_{10} NAAQS. The exceedances occurred on 15 days and were the result of exceptional events, specifically high wind dust events.

The AQB submits this exceptional event demonstration for the exceedances of the PM_{10} NAAQS that occurred in 2021 in Doña Ana and Luna Counties of southern New Mexico (NM). The evidence provided in this demonstration substantiates AQB's request to exclude exceedance data from a compliance determination for these counties for the PM_{10} NAAQS. Table 1-1 lists the dates, 24-hour average concentrations, monitoring sites and other identifying information for NM's exclusion request.

Date	Anthony (35-013-0016)	Chaparral (35-013-0020)	Desert View (35-013-0021)	Holman (35-013-0019)	West Mesa (35-013-0024)	Deming (35-029-0003)
January 19	284	94	187	361	101	133
March 13	88	151	196	92	42	25
March 14	66	308	134	93	117	66
March 16	541	542	769	408	234	157
April 17	99	71	183	90	57	64
May 3	37	291	42	34	21	26
May 8	65	166	85	37	24	27
June 13	---	42	439	182	308	570
June 20	149	172	112	92	82	63
June 21	109	170	218	78	56	61
June 22	212	320	165	103	103	97
October 12	295	123	208	219	189	193
December 6	113	127	213	84	105	87
December 9	74	205	23	18	9	31
December 24	109	72	277	38	11	106

Table 1-1 Dates, Monitoring Sites (including AQS ID), and 24-Hour Average PM_{10} Concentrations (µg/m^3) for 2021 high wind blowing dust events requested for exclusion under the EER.

2. Background

Climatology of High Wind Blowing Dust in Southern New Mexico

Large- and small-scale weather systems provide the ideal meteorological conditions for high wind blowing dust events in Doña Ana and Luna Counties. These events can occur at any time of year, but the highest incidence of exceedances occurs during the Spring, New Mexico's traditional windy season. The

most common weather system responsible for these events occurs when Pacific storms and associated cold fronts traverse the state from west to east. On the windiest days, the storm's center of low-pressure is located along the Colorado-New Mexico border and upper-level winds align in the same direction as surface winds. This alignment increases surface wind speeds in southeastern Arizona, southwestern NM and northwestern Chihuahua, MX. Diurnal heating allows higher level winds to mix down to the lower levels of the atmosphere, intensifying wind speeds and creating the turbulence required for dust entrainment and transport.

The second large-scale weather systems responsible for blowing dust in NM are back door cold fronts whose low-pressure centers and cold air approach the state from the north or the east. The last system responsible for high wind blowing dust events in NM occurs during the monsoon season when small-scale conditions create thunderstorms. These storms are the result of convective heating during the summer months that create updrafts of moist air and allow cloud formation. Rain from these clouds causes wet and dry microbursts releasing massive amounts of energy in the form of outflow winds. These events are often hard to forecast with accuracy for a given area and can cause massive damage and threats to health and safety. These events are referred to as Haboobs and often receive major news coverage due to their sudden formation and dramatic nature. The cover page provides an example of the dramatic nature of such an event that was observed from west Las Cruces positioned in a southeast direction towards the Organ Mountains, May 13, 2021.

High wind conditions alone do not automatically create blowing dust. Winds must also impart enough energy on dust sources to begin the erosion process with the movement of larger sand particles (PM_{90-200}). The movement of these particles (creep) creates impacts with medium sized particles (PM_{50-90}) that begin to bounce along the surface (saltation). These particles in turn collide with PM_{50} and smaller particles creating entrained dust. Particles in the PM_{20-50} size range may quickly drop out of the atmosphere whereas smaller particles (PM_{10}) may stay suspended in the atmosphere for days. Other factors affecting the erodibility of soils include surface roughness, soil moisture content, vegetative cover, nonerodable elements (e.g., clods), frequency of disturbance and crust formation.

This year's soil was particularly vulnerable to the effects of increased erodibility due to a lack of precipitation from increased drought which has resulted in decreased ground cover to help stabilize and minimize the impacts of airborne particulate matter from windblown dust sources.

Exceptional Events Rule

The EPA has recognized the need for policies and rules regarding data affected by exceptional events for which the normal planning and regulatory processes are not appropriate, since the implementation of the Clean Air Act (CAA) in 1970. In 1996 EPA formalized their response to naturally occurring events by implementing the Natural Events Policy (NEP). Under this policy, Natural Events Action Plans (NEAPs) were developed to protect public health and document data handling and exclusion requests. In response to changes in the federal CAA, EPA developed the Exceptional Events Rule (EER) in 2007 to govern exclusion requests of air quality data when determining compliance with a given NAAQS (40 CFR 50.14), superseding the requirements of NEAPs. Under the EER, the EPA may exclude data from compliance determinations if a state meets the technical and administrative requirements of the rule and demonstrates that an exceptional event caused the exceedance. EPA last revised this rule in 2016.

Technical and Administrative Criteria

The EER provides technical and administrative criteria that air quality management agencies (i.e., AQB) must follow in order for EPA to concur with a claimed event and exclude the requested data. The first requirement is to engage EPA in the Initial Notification of Potential Exceptional Event process (40 CFR 50.14(c)(2)) by flagging data and creating an initial event description in EPA's AQS database. This begins the process of regular communication and consultation between the AQB and EPA regarding the development of a demonstration to exclude data affected by high wind exceptional events. The AQB submitted a formal letter indicating our intention of submitting a demonstration to EPA on December 31, 2022. A copy of this letter may be found in Appendix A of this document.

The AQB developed this demonstration to include the following elements of the 2016 EER (40 CFR 50.14(c)(3)(iv)) to exclude high wind exceptional events:

1. A narrative conceptual model that describes the event that caused the exceedance or violation and a discussion of how emissions from the event led to the exceedance or violation at the affected monitor(s);
2. A demonstration that the event affected air quality in such a way that there exists a clear causal relationship (CCR) between the specific event and the monitored exceedance or violation;
3. Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times;
4. A demonstration that the event was both not reasonably controllable and not reasonably preventable (nRCP); and
5. A demonstration that the event was caused by human activity that is unlikely to recur at a particular location or was a natural event. High wind dust events are considered natural events when windblown dust originates from entirely natural sources or all anthropogenic sources are reasonably controlled (40 CFR 50.14(b)(5)(ii)).

In addition, under 40 CFR 50.14(c)(3)(v), the air agency must follow the public comment process and provide documentation that this requirement was fulfilled. Appendix C contains copies of public notices and listserv emails announcing the public comment period, public comments received and AQB responses to those comments. Public notification requirements under 40 CFR 50.14(c)(1) and 40 CFR 50.930(a) were also met through press releases, informational flyers and brochures, and the AQB's Dust and Monitoring websites.

High Wind Threshold and Tiered Demonstrations

The EPA uses the nRCP criteria of the EER to determine if an exceedance, due to a high wind dust event, was caused in whole or in part by anthropogenic dust sources without reasonable controls in place. Exceedances caused by uncontrolled anthropogenic dust sources may not be eligible to be treated as exceptional events under the EER (see technical requirement 5 above). Evidence provided in this demonstration for nRCP include:

1. Sustained wind speed;
2. Contributing sources of windblown dust;
3. Approved reasonable controls in the State Implementation Plan (SIP), if required; and
4. Implementation and enforcement of reasonable controls;

To address the various requirements and the degree of event-specific evidence needed to demonstrate nRCP, the AQB uses a three-tiered approach in this demonstration. Tier 1 demonstrations will be used for large-scale and high-energy high wind dust events (40 CFR 50.14(b)(5)(vi)) provided that:

1. A Dust Storm Warning was issued by the National Weather Service (NWS) due to the event;
2. Sustained wind speeds were greater than or equal to 17.8 m/s (40 mph); and
3. Visibility was reduced to 0.5 miles or less.

Tier 2 demonstrations were developed for events with sustained wind speeds at or above the high wind threshold of 11.2 m/s (25 mph) for western states found at 40 CFR 50.14(b)(5)(iii). This threshold represents the minimum wind speed capable of overwhelming reasonable controls. For exceedances that do not meet the high wind threshold, Tier 3 demonstrations were developed where the largest amount of evidence is provided in the controls analysis for the nRCP criteria. Table 2-1 below provides examples of data and information provided for each Tier described above.

Tier Level	Control Analysis Elements
Large Scale and High Energy (Tier 1)	▪ NWS Dust Storm Warning; ▪ Sustained wind speeds of 17.8 m/s; and ▪ Reduced visibility
Basic Controls Analysis (Tier 2)	▪ Anthropogenic Sources and existing controls; ▪ Natural sources and existing controls, if any ▪ Effective implementation and enforcement of reasonable control measures; ▪ Reasonableness of controls; and ▪ How emissions occurred despite controls;
Comprehensive Controls Analysis (Tier 3)	▪ All elements of a Basic Control Analysis; plus ▪ Trajectories of source area; ▪ Source-specific emissions inventories; and ▪ Transport modeling

Table 2-1. Three-tiered approach to supply evidence for nRCP analysis in Exceptional Events Demonstrations.

Designation Status and SIP requirements

The Anthony Area in Doña Ana County was designated nonattainment for the 1987 PM_{10} NAAQS in 1991 (Figure 2-1). Monitoring for PM_{10} in Doña Ana County began at the Anthony site in 1989 with exceedances of the standard recorded every year since. The CAA Amendments of 1990 (CAAA) directed EPA to designate those areas that do not meet a NAAQS as nonattainment by operation of law, regardless of the cause of nonattainment. Prior to the CAAA and nonattainment designation, EPA treated Doña Ana County as a Rural Fugitive Dust Area. Under EPA policy these areas were not required to implement control measures due to the lack of anthropogenic sources in the area. The AQB developed a SIP for the Anthony nonattainment area (NAA) in 1993 (Appendix D), requesting and receiving a waiver for implementing control measures. The status of the Anthony NAA has not changed since the development of this SIP.

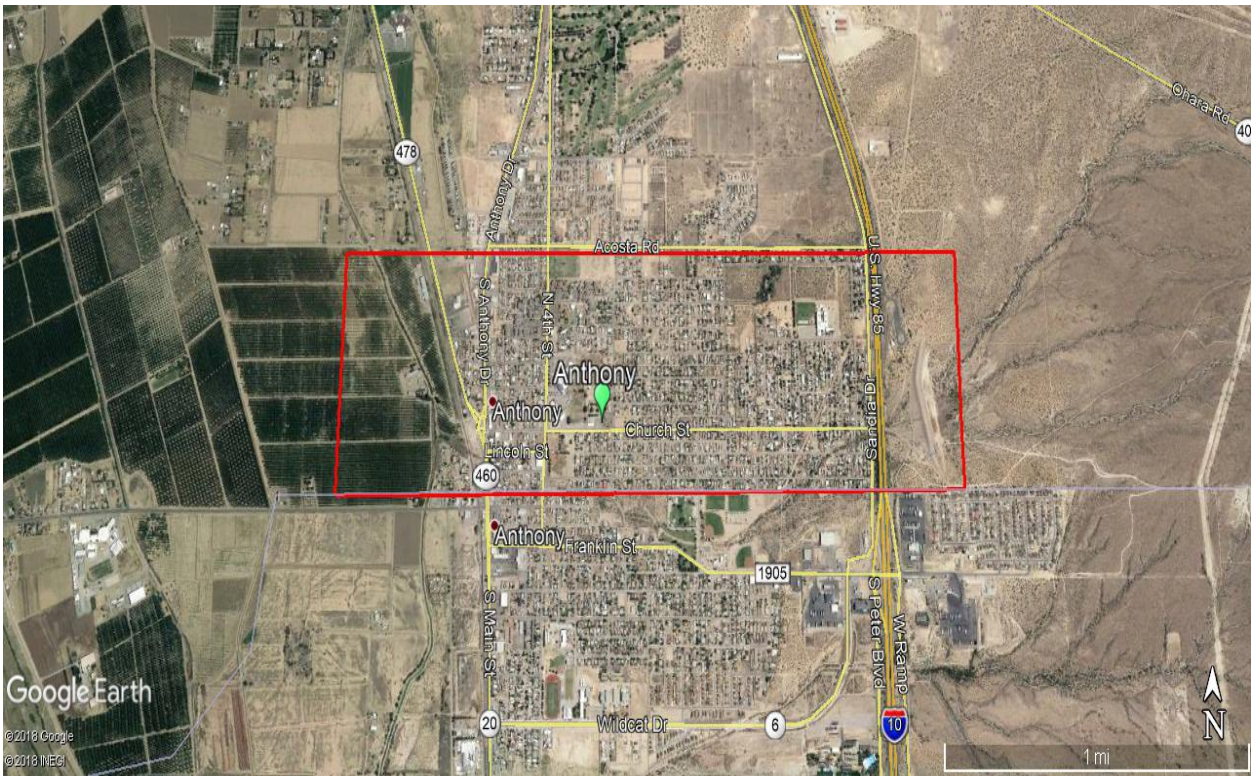


Figure 2-1. Anthony PM_{10} nonattainment area.

Natural Events Action Plans and Reasonable Control Measures

As monitoring expanded in southern New Mexico, exceedances and violations of the PM_{10} NAAQS continued to be recorded throughout Doña Ana and Luna Counties. Under the 1996 NEP, EPA required the AQB to develop and implement NEAPs in lieu of nonattainment designations for the remainder of Doña Ana County (i.e., outside of the Anthony NAA) and all of Luna County. NEAPs were developed to include five guiding principles with the protection of public health as the highest priority. Another guiding principle or element of NEAPs required reasonably available control measures (RACM) for dust sources. The AQB worked closely with local governments to adopt and implement ordinances containing RACM or better. NMED also entered into memorandums of understanding (MOUs) with large land managers, state and federal departments and agencies, the military and public institutions to ensure that dust control measures and best management practices would be used for soil disturbance and dust generating activities. Copies of the ordinances for Doña Ana County, the City of Las Cruces, Luna County and the City of Deming may be found in Appendix E. The local municipalities code enforcement officers uphold dust or erosion control ordinances in these jurisdictions. For example, the City of Las Cruces has a full-time Environmental Compliance Officer focusing efforts on controlling sources of fugitive dust during periods of high winds exceeding 11.2 m/s. The City of Anthony provided NMED a letter dated September 18, 2019, indicating the sidewalks and streets that have been paved since the incorporation of the City in 2010 (Appendix D). NMED's Fugitive Dust Control Rule, 20.2.23 New Mexico Administrative Code (Part 23), addresses fugitive dust emissions produced by sources of disturbed land in Doña Ana and Luna Counties that are greater than 1 acre and are not agricultural, military, roadways, or activities that have been issued a permit by the AQB. Part 23 is enforced on a complaint basis by the inspector based out of the Las Cruces field office. Minor sources in southern Doña Ana and Luna Counties are periodically inspected and assessed fines based on deficiencies observed. Fines are settled to include civil fines and a larger portion to Supplemental Environmental Projects that have a direct air quality

improvement to either the source facility or other project(s) that improves air quality within the impacted community. In 2018, the Jobe asphalt plant in Vado was inspected and was fined a civil penalty of $19,760 with a stipulated settlement agreement and compliance order in January 2021. The Vado Speedway is a fugitive dust source that was brought to the attention of the department in May 2021 that falls under Part 23 and is currently in the process of resolution. Many cases in prior years have been through the legal process to improve and protect air quality impacts by fugitive dust sources that fail to meet minimum air quality requirements. The department is actively responding to complaints, inspecting facilities and pursuing settlements based on utilizing the best available resources and most effective means to obtain compliance preferably through voluntary compliance or compliance assistance.

Monitoring Network and Data Collection

The AQB operates a State and Local Air Monitoring Stations network to measure the concentration of criteria pollutants and meteorological parameters. The AQB maintains five PM_{10} monitoring sites in Doña Ana County and one monitoring site in Luna County to track windblown dust in southern New Mexico. All monitoring sites in Doña Ana and Luna Counties are equipped with continuous Federal Equivalent Method instruments, while the Anthony site (Doña Ana County) is also equipped with a Federal Reference Method instrument. In 2018, the Anthony site had installed a standard 10-meter tower for measuring meteorological parameters and data from the La Union site is used as a proxy in this demonstration. Meteorological parameters from the Santa Teresa monitoring site are also used as it informs wind speeds at nearby, upwind source areas of PM_{10}, especially those monitors located in the southern half of Doña Ana County. Figure 2-2 shows the location of monitoring sites in the border area used in this demonstration.

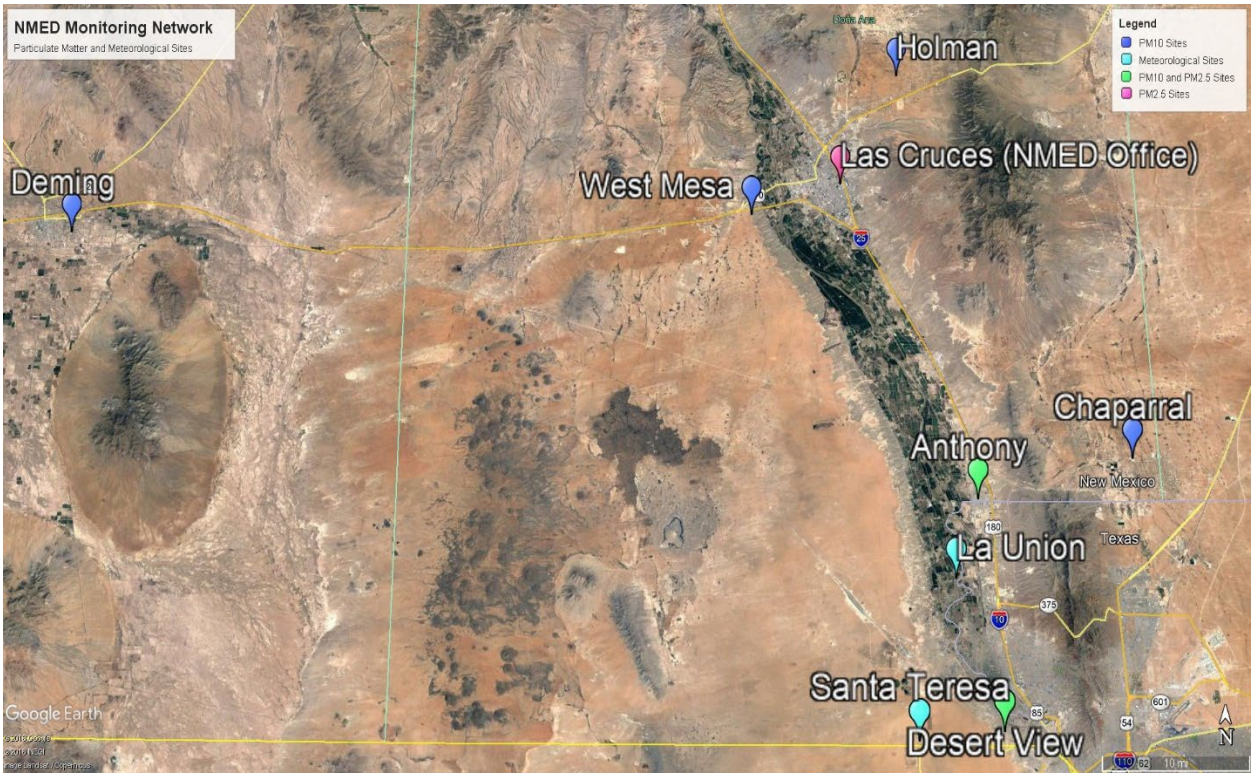


Figure 2-2. NMED monitoring network sites in Doña Ana and Luna Counties.

3. HIGH WIND EXCEPTIONAL EVENT: January 19, 2021

Conceptual Model

A backdoor cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Anthony, Desert View, and Holman monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 3-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0016	6CM Anthony	284 µg/m^3	10 m/s	18.7 m/s
RJ	35-013-0021	6ZM Desert View	187 µg/m^3	9.9 m/s	17.5 m/s
RJ	35-013-0019	6ZL Holman	361 µg/m^3	11.9 m/s	19.3 m/s

Table 3-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

This morning a slow drifting low-pressure cold front coming from the east will affect the border region which will result in increasing pressure surface gradients along southwestern Texas and southeastern New Mexico extending into southeastern Arizona. At the 1800 hour, a large area of low-pressure moved over the southern Pacific coast (Figure 3-1). Aloft, the low-pressure center of the storm system hovered over the Great basin with a trailing trough extending along the Baja coast (Figure 3-2). As the day progressed this low-pressure front traveled west and lost momentum along the Continental Divide and stalled along the border of Arizona and New Mexico from an opposing backdoor cold front thereby increasing easterly wind speeds especially along the westerly sides of mountain ranges throughout the afternoon.

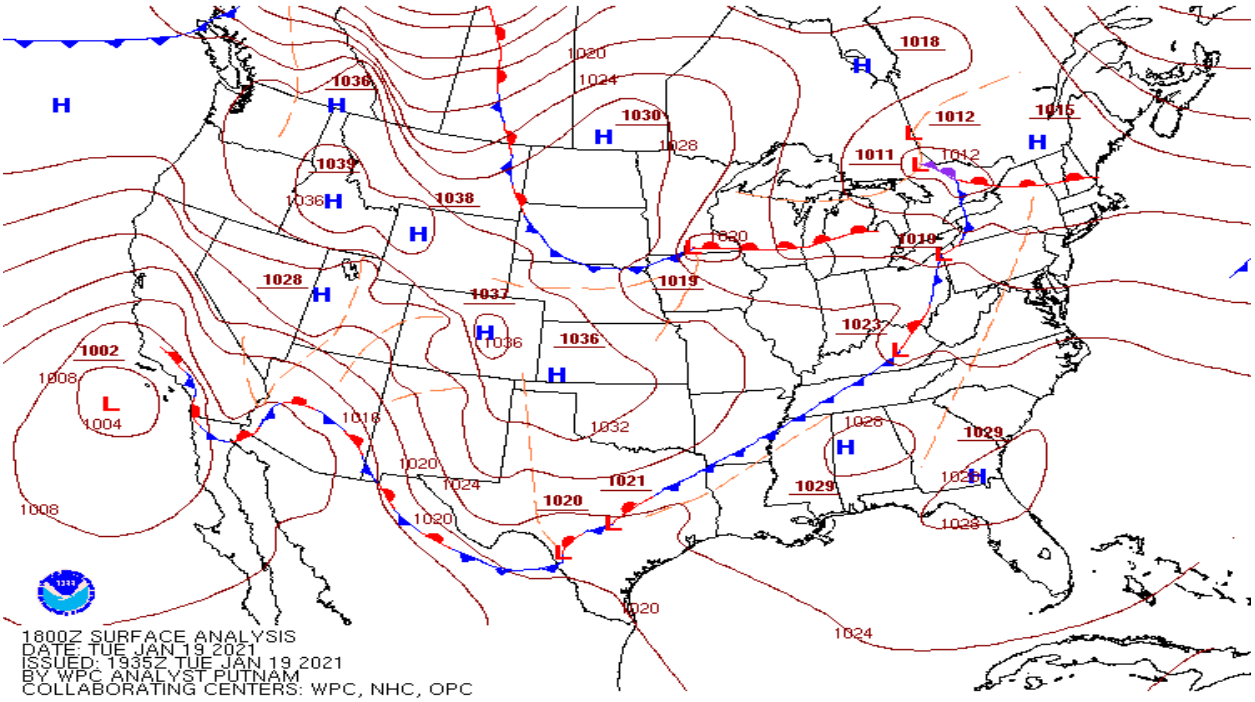


Figure 3-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

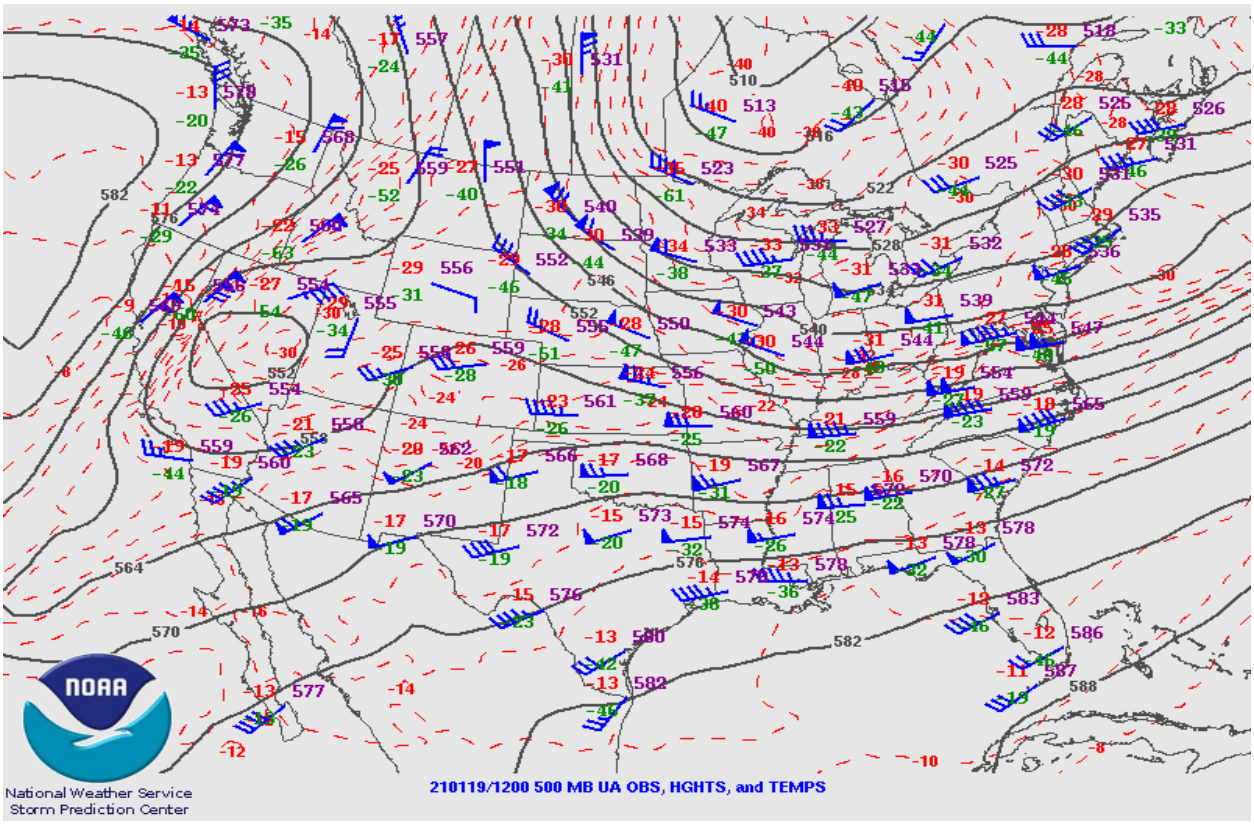


Figure 3-2. Upper air weather map for January 19, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the east throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at Anthony, Desert View, Holman, West Mesa, Santa Teresa, and Deming monitoring sites beginning at the 0000 hour and lasted through the 1800 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0000 hour. Hourly concentrations remained elevated through the 1800 hour. Table 3-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event for the monitors in exceedance of the 24-hour PM_{10} NAAQS.

Hour	Anthony			Desert View			Holman		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0000	215	4.3	10.3	312	8.4	14.2	1140	5.5	12.4
0100	754	8.3	14.8	244	7.5	12.4	390	9.3	14.3
0200	554	8.2	15.1	293	7.6	12.2	1394	8.9	14.2
0300	512	8.6	15.3	527	8.3	14.1	2346	10.5	17.5
0400	664	9.5	17.5	627	9.9	17	1316	11.9	18.3
0500	578	9.8	17.7	342	9.1	15	493	11.6	19.3
0600	320	8.8	16.7	337	9	17.5	295	10.1	18
0700	339	8.9	18.1	356	9.5	17	78	8.5	17
0800	334	9.5	16.7	161	8.5	14.7	151	7.6	15.7
0900	490	9.8	17.6	200	8.4	15.3	332	9.4	16.7
1000	346	10	18.7	114	7.9	13.8	124	9	18.6
1100	193	9.4	17.3	168	9.1	16.5	100	8.7	16

Table 3-2. Hourly PM_{10}, wind speed, and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day, although the spring windy season begins in March for most of the southwestern United States, high wind blowing dust events do occur in the winter months such as this backdoor cold front. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from east to west at the border of the Texas Panhandles and New Mexico in the morning and moving across New Mexico extending into Arizona in the afternoon. The systems movement across the area timed well with daytime heating and mixing generating a deep trough to the west as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico (Figure 3-3).

Figure 3-3. KFOX14 Forecast Graphic for the event.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Holman monitoring site recorded wind speeds above this threshold for 2 hours from the 0400 to the 0500 hour (Figure 3-4). In addition, the Santa Teresa monitoring site five-minute wind speed data recorded a total of 50 minutes from the 0340 hour through the 1335 hour (Table 3-3).

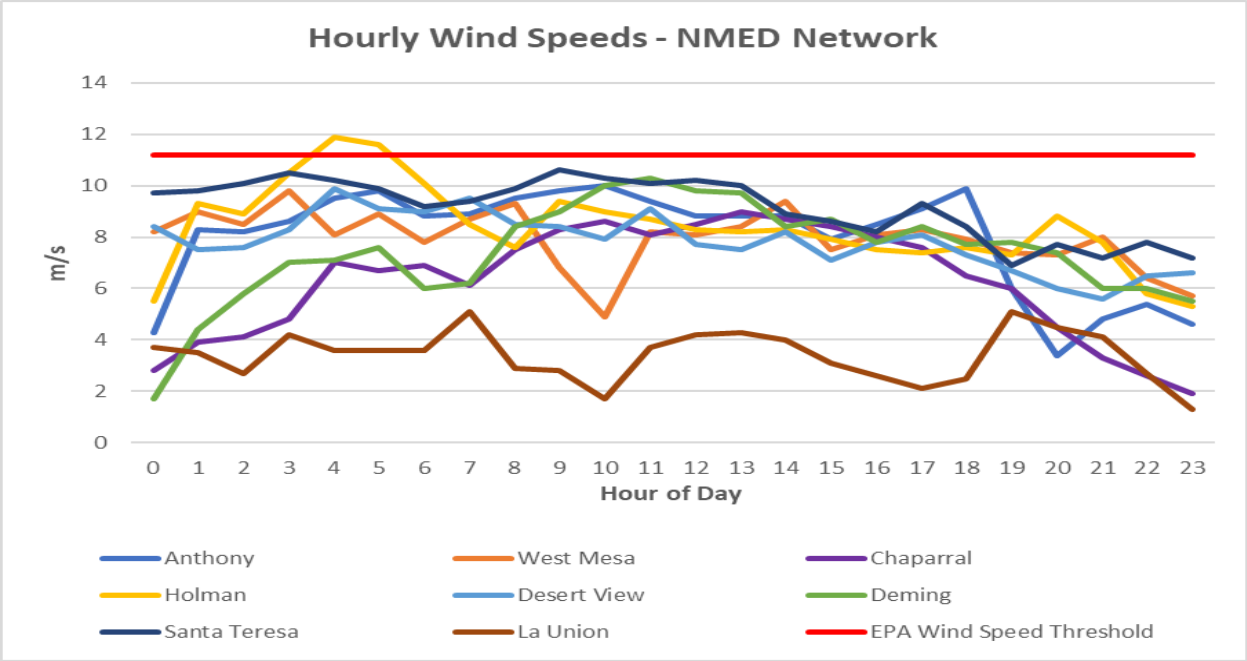


Figure 3-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Hour	Santa Teresa	
	Wind Speed (m/s)	Wind Gust (m/s)
0340	11.3	15.5
0405	11.3	15.8
0910	12.2	17.5
1010	11.8	16.3
1015	11.4	14.7
1100	11.4	14.8
1135	11.5	15.8
1215	11.3	15.3
1240	11.2	15
1335	11.3	14.8

Table 3-3 Santa Teresa monitoring site five-minute wind speed summary of hours exceeding EPA high wind speed threshold.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to

help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Otero, Eddy, Lea, and Chavez Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Texas and Chihuahua, MX likely contributed to the exceedances on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedances were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Radar Imagery

At the 0306 (MST) hour, historical radar imagery documented the active weather conditions during the time of peak PM_{10} concentrations that were observed at the NMED monitoring sites (Figure 3-5).

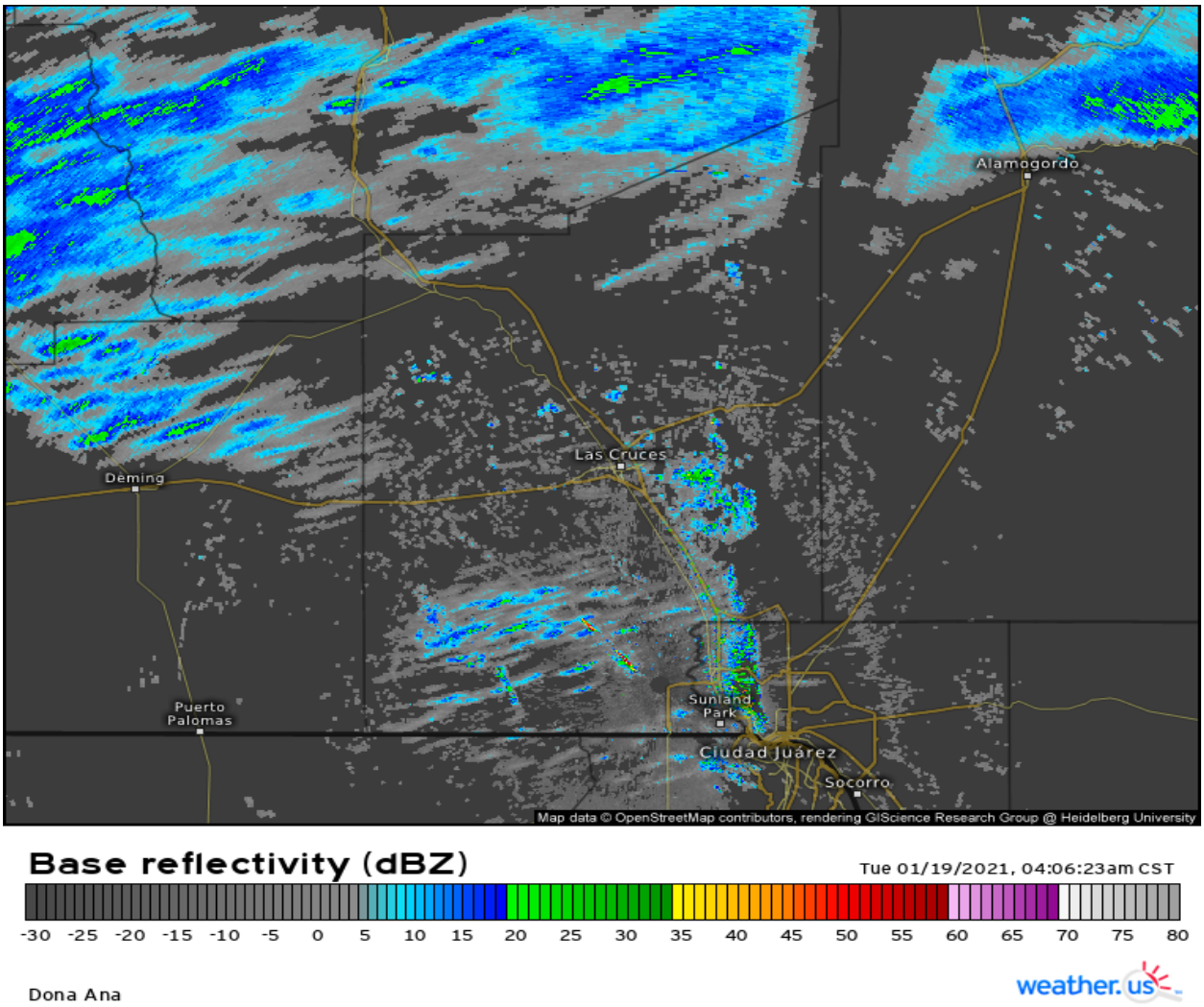


Figure 3-5. Radar imagery demonstrating active weather conditions at the NMED monitoring sites. Courtesy of weather.us.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Wind Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. This was in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"Wind Advisory until 6 PM MST… Winds will be between 20 to 35 mph with gusts up to 50 mph, especially in the west slopes of area mountains including the Franklin, Hueco, and Organ Mountains."

Reported wind damage was reported by KVIA ABC-7 (Figure 3-6).

Weather News

By KVIA ABC-7

January 19, 2021 4:58 PM Published January 19, 2021 4:43 PM

High wind causes damage across west El Paso, with rain to follow

EL PASO, Texas -- Strong winds whipped through El Paso on Tuesday, creating damage in the different parts of the city.

According to the National Weather Service, winds were the strongest on El Paso's west side, reaching gusts of up to 40 to 50 miles per hour in some spots.

At Francisco Delgado park in west El Paso, the canopy of a playground was ripped off its supports, dangling by a thread.

Trash and debris littered streets as strong gusts of wind knocked over several trash cans in some neighborhoods. Traffic lights dangled along portions of Mesa Street.

One woman in west El Paso, Lanica Yu-Richardson, woke up to sound of strong winds and then watched her plants trying to survive the gusts through her backyard. *(See video at the bottom of this article.)*

"It was very loud. I couldn't sleep. You could hear everything crashing because of the winds, Yu-Richardson said.

El Paso was under a Wind Advisory until 8 p.m. Wednesday, although ABC-7 chief meteorologist 'Doppler' Dave Speelman forecast it would remain windy on the west side with easterly gusts around 40 mph until about 11 p.m.

"Wind chills make it feel like temps in the 30's," he said.

While the wind will not a problem on Wednesday, he explained rain could become an issue.

With rain chances beginning late Tuesday night, and showers continuing off and on for Wednesday and Thursday, 'Doppler Dave' said the El Paso area "could see upwards of a half-inch or more the next couple of days in total rainfall."

Figure 3-6. KVIA ABC-7 News reporting structural damage caused by the high wind event.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from southeast New Mexico and southwest Texas into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours

preceding the start of elevated PM_{10} concentrations during the event (Figure 3-7). This analysis supports the hypothesis that dust plumes originated in Texas and New Mexico before being transported to downwind monitoring sites.

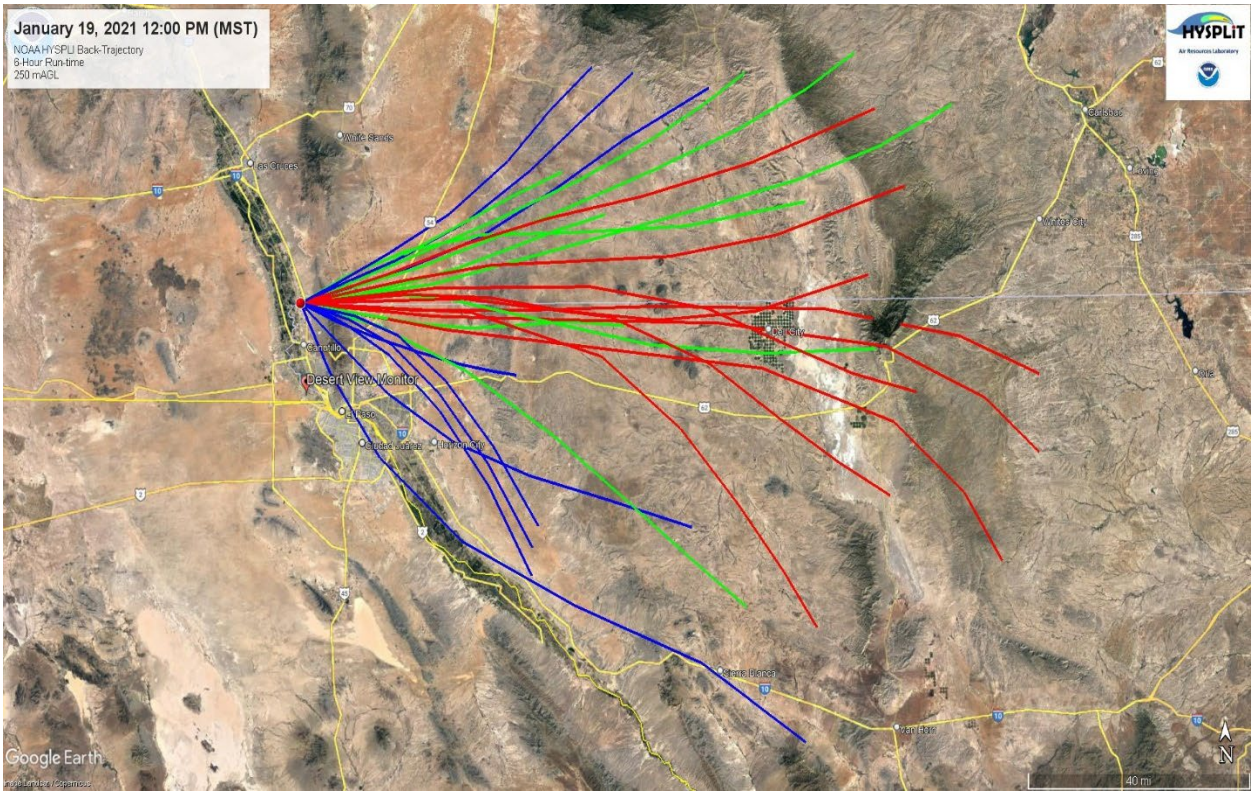


Figure 3-7. HYSPLiT back-trajectory analyses using the Ensemble mode for the Anthony monitoring site

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 3-8 through 3-10) for the Anthony, Desert View, and Holman monitoring sites were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0000 - 1800 hour). During the event, winds blew from the east-northeast through the east-southeast direction 100% of the time coinciding with peak PM_{10} concentrations.

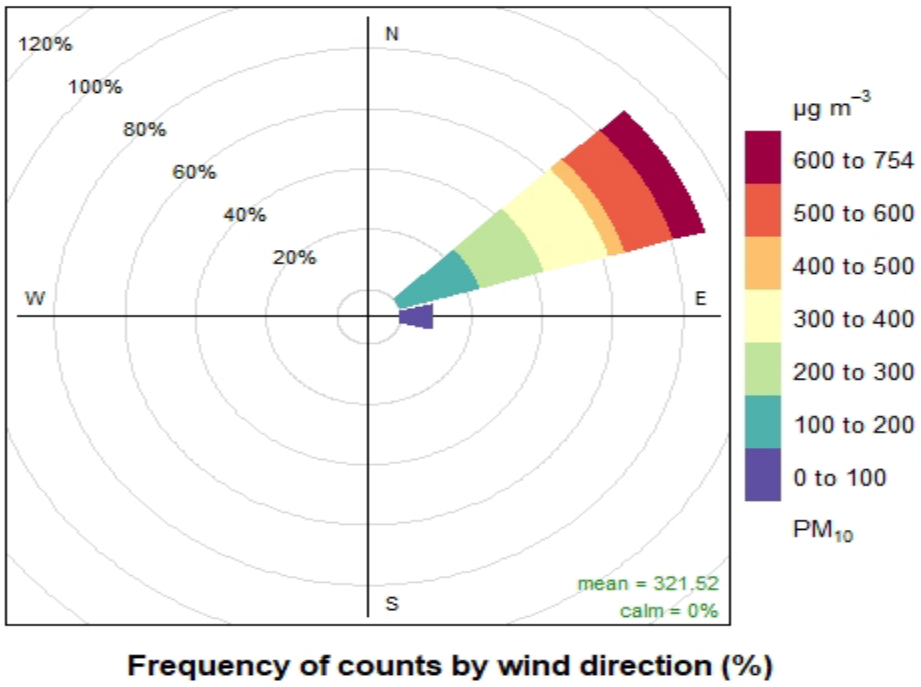


Figure 3-8. Pollution rose for the Anthony monitoring site.

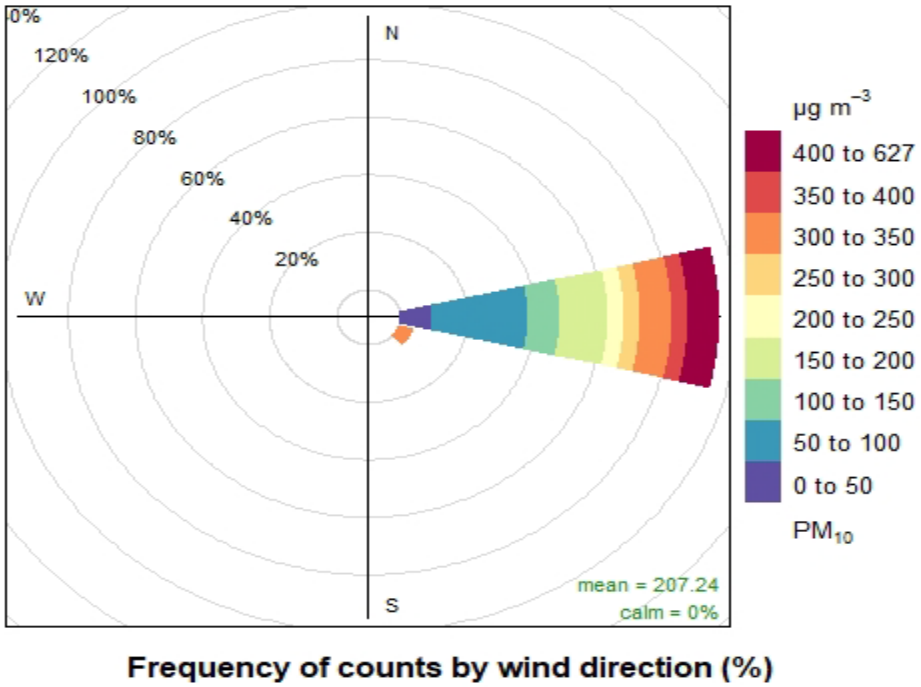


Figure 3-9. Pollution rose for the Desert View monitoring site

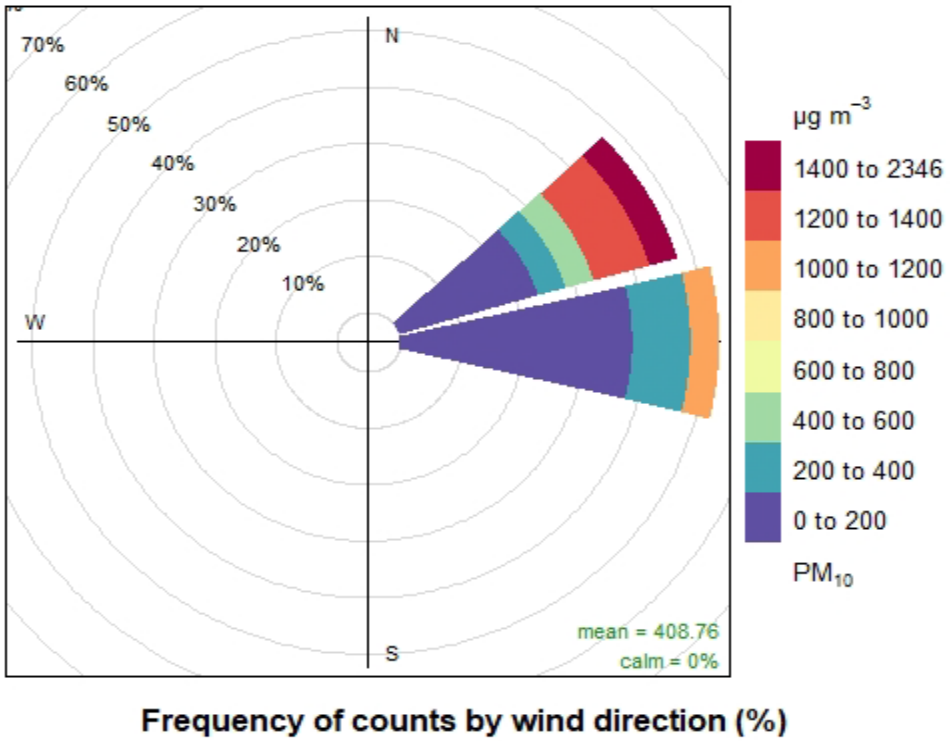


Figure 3-10. Pollution rose for the Holman monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong easterly winds beginning at the 0000 hour and lasting through the 1800 hour. During this time, peak hourly PM_{10} concentrations ranged from 246 to 2346 µg/m^3 were recorded at the Chaparral and Holman monitoring sites, respectively (Figure 3-11). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds ranged from 5.1 to 11.9 m/s were recorded at the La Union and Holman monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plots in Figures 3-12 through 3-14 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

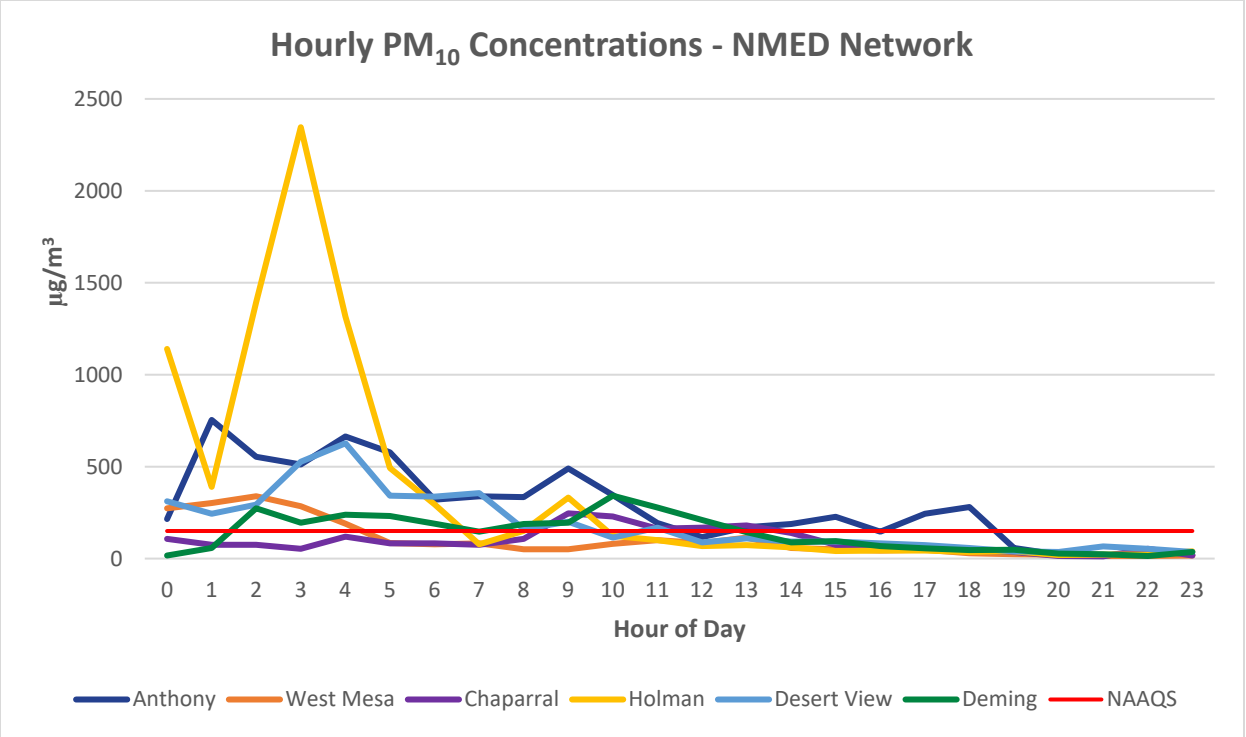


Figure 3-11. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

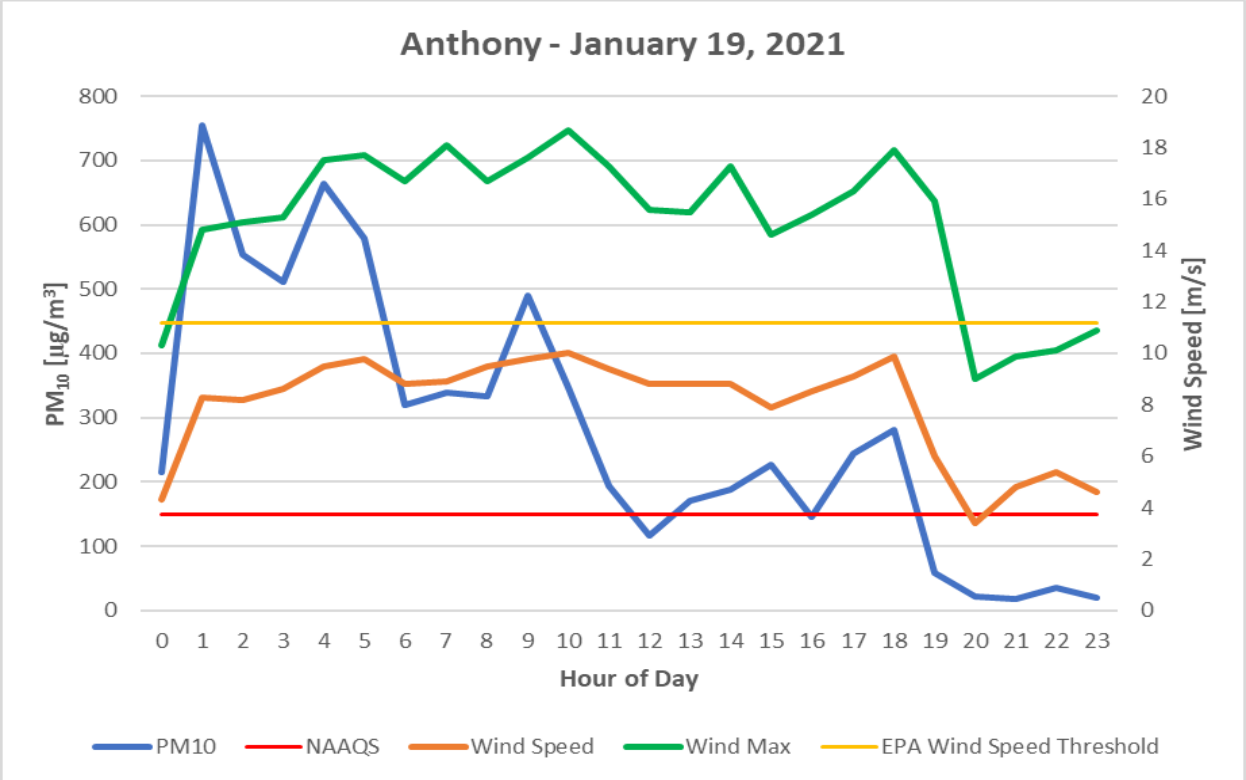


Figure 3-12. Anthony monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

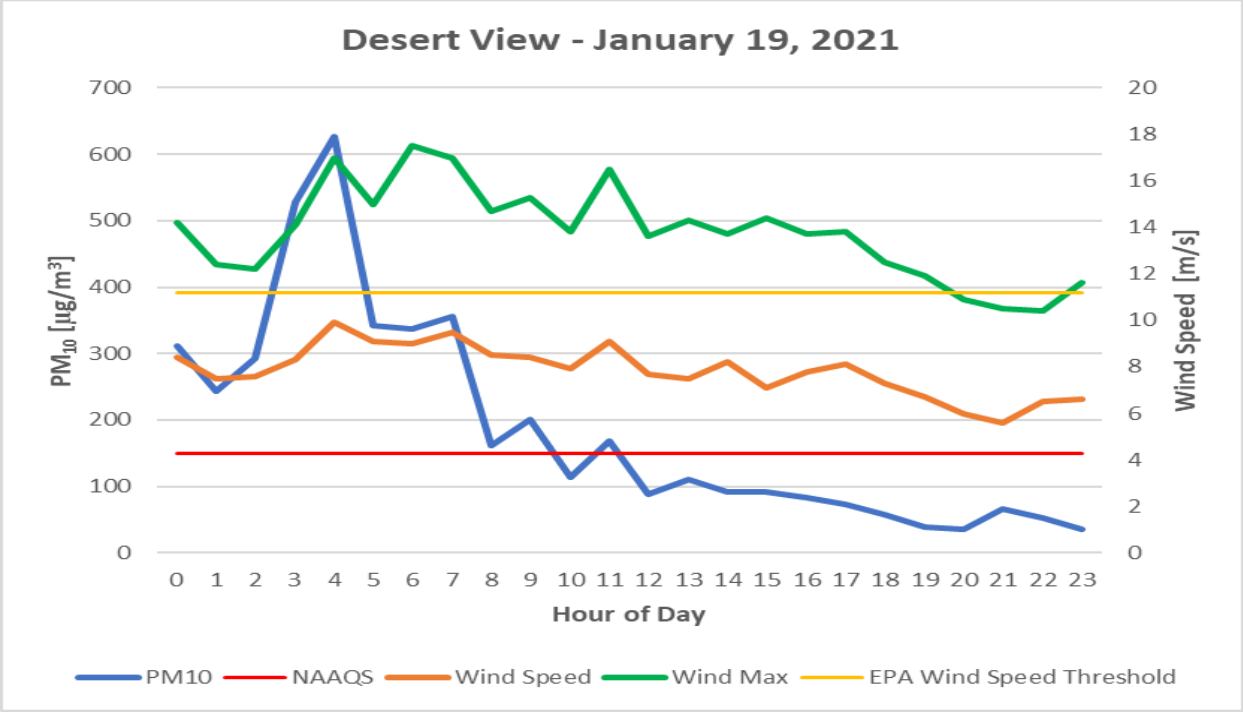


Figure 3-13. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

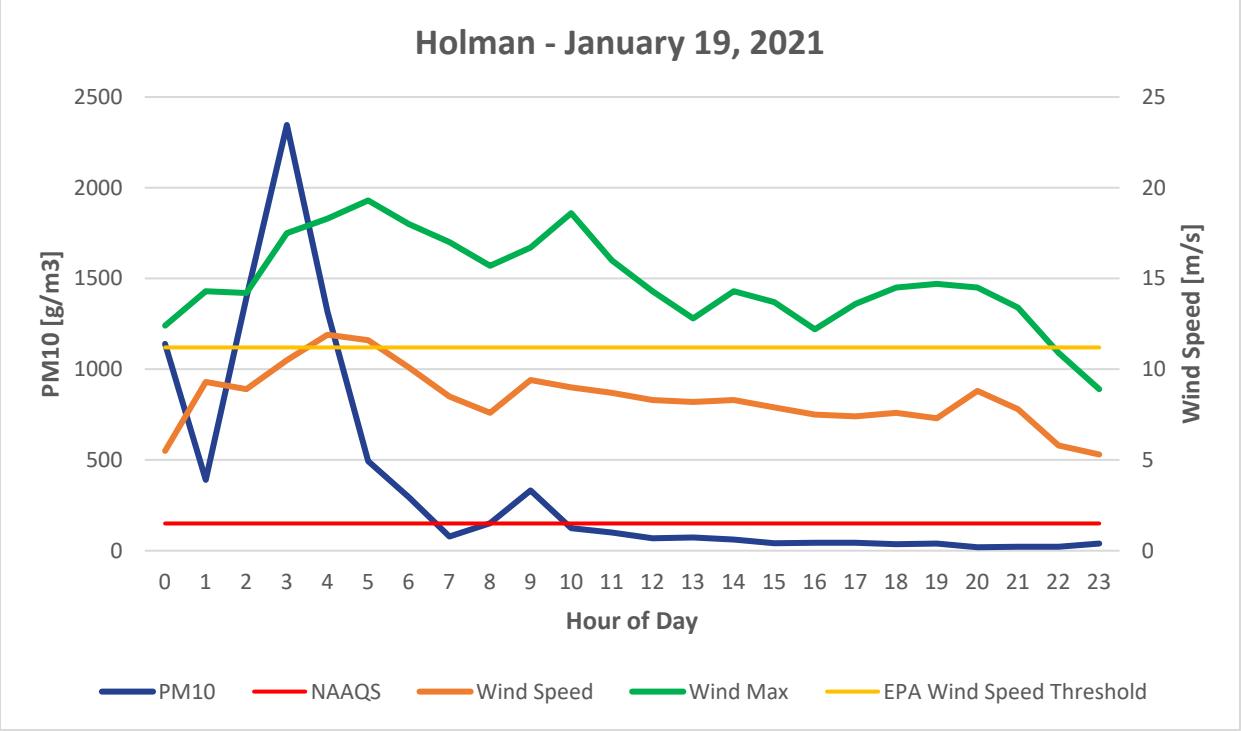


Figure 3-14. Holman monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED monitoring sites recorded 24 (Anthony), 32 (Desert View), and 9 (Holman) exceedances of the PM_{10} NAAQS (Figures 18-1, 18-2, and 18-5 in Appendix A). The maximum 24-hour

average PM_{10} concentrations were 506 (Anthony), 734 (Desert View), and 691 (Holman) µg/m^3 all recorded in 2019. High wind blowing dust events in southern New Mexico can occur at any time of the year such as the backdoor cold front that occurred on this day, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 3-15, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 107 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

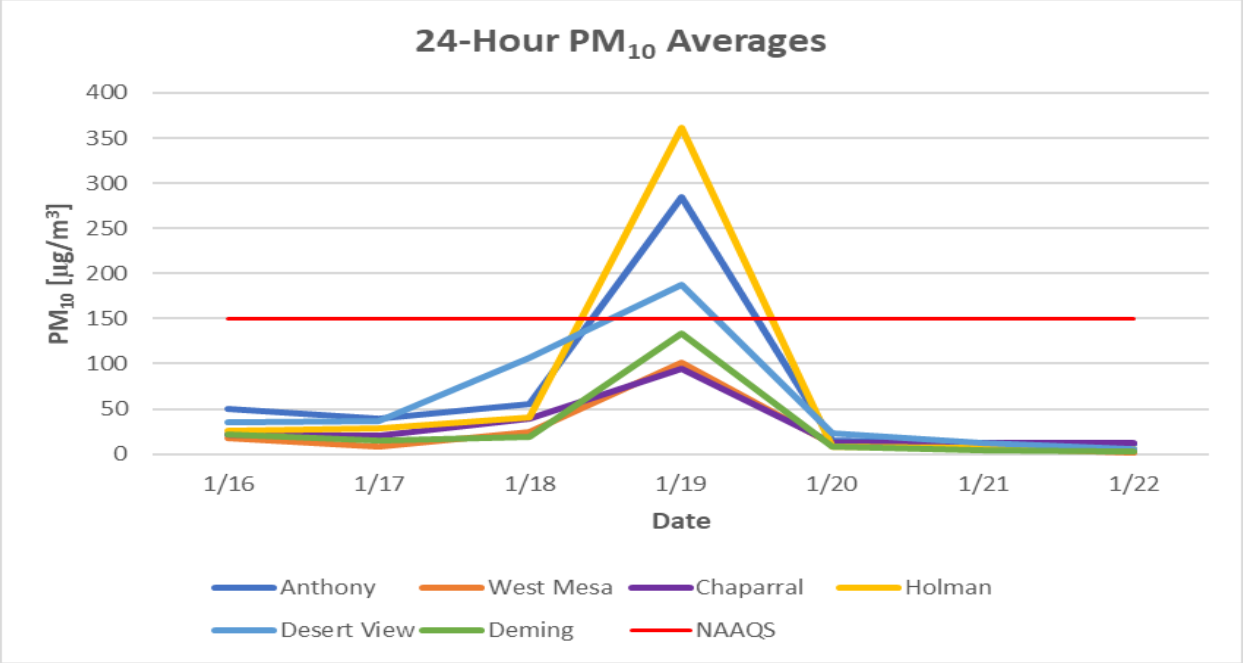


Figure 3-15. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for this day 284 (Anthony), 187 (Desert View), and 361 (Holman) µg/m^3 are near and above the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour averages of 284 (Anthony), 187 (Desert View), and 361 (Holman) µg/m^3 are near and above the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear

causal relationship exists between the high wind blowing dust event and the monitored exceedances on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedances associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

4. HIGH WIND EXCEPTIONAL EVENT: March 13, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Desert View monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 4-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0021	6ZM Desert View	196 µg/m3	10.2 m/s	18.2 m/s

Table 4-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER

A strong deep upper low-pressure system will position itself over the Four Corners creating strong winds for the borderland. As the storm system is forecast to move through the state, a tight pressure gradient will form over southeastern Arizona, southern New Mexico and up into the Texas Panhandles (Figure 4-1). At the 1200 hour, a large area of low-pressure moved east along the Four Corners extending into southern New Mexico and west Texas. As the day progressed increased humidity with low-pressure aloft slowly traveled east and aligned itself with New Mexico and the surface wind direction (Figure 4-2). Diurnal heating increased surface wind energy aloft to vigorously mix down, dramatically increasing the surface wind velocities especially on the western faces of mountains and providing the turbulence required for vertical mixing and entrainment of dust into plumes.

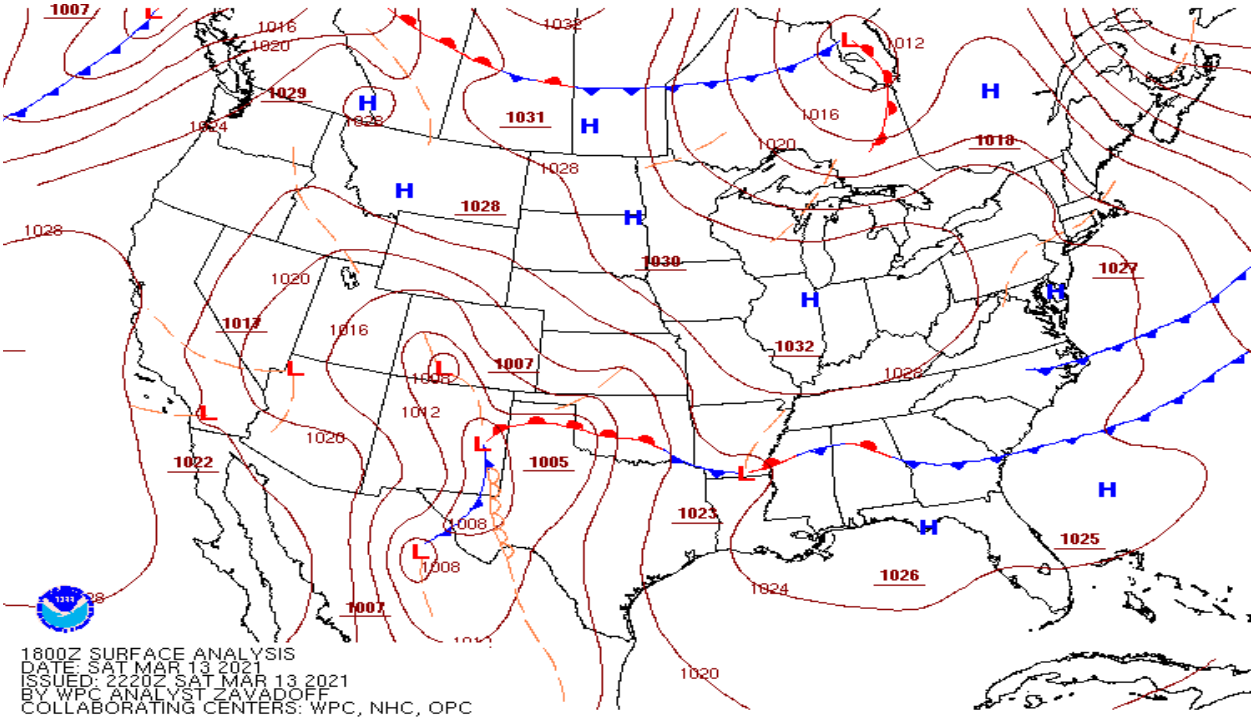


Figure 4-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

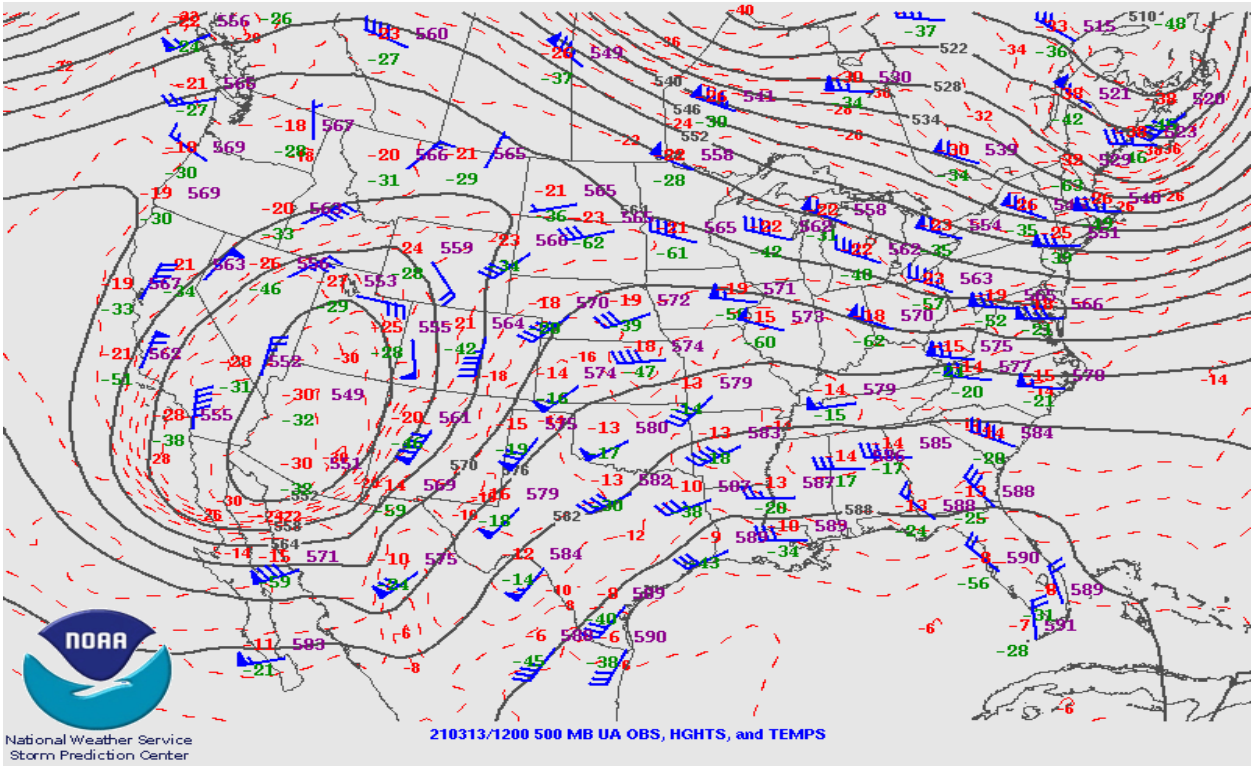


Figure 4-2. Upper air weather map for March 13, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at Anthony, Desert View, Chaparral, Holman, West Mesa, La Union, Santa Teresa and Deming monitoring sites beginning at the 0800 hour and lasted through the 1800 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Chaparral, Desert View, Holman, and West Mesa monitoring sites beginning at the 0900 hour. Hourly concentrations remained elevated through the 1600 hour. Table 4-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Desert View			Holman			Chaparral		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0800	31	5	11.8	31	4.1	8.9	144	9.5	16.9
0900	175	7.5	14.7	136	7.5	12.3	100	9.5	16.2
1000	305	8.1	13.9	34	9.7	15.4	222	8.9	16.7
1100	193	8.3	13.5	51	8.7	13.4	61	8.8	16.1
1200	578	9.9	17.4	146	9	14.3	188	10.5	17.1
1300	490	9.4	16.7	288	10.1	16.2	500	12.5	20.6
1400	1006	10.2	18.2	307	11.1	17.8	574	13.6	20
1500	1020	10.1	17.1	786	11.7	18.2	779	13.3	21.1
1600	459	9.4	17.5	200	12.8	18.6	732	11.3	20.4
1700	58	7.1	14.7	44	10.2	16.8	66	8.5	18.6

Table 4-2 Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day, as the Pacific cold fronts that typically occur this time of year bring. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east approaching the Four Corners aloft this morning and very slowly progressing east this afternoon. The systems movement across the area timed well with daytime heating and mixing generating a deep trough to the east as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, “the State shall not be required to provide a case-specific justification for a high wind dust event.”

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED’s monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Chaparral, Holman, and West Mesa monitoring sites recorded wind speeds above this threshold for 6 hours, beginning at the 1300 hour through the 1800 hour (Figure 4-3). The wind speeds at the upwind Deming, La Union, and Santa Teresa monitoring sites also reached the high wind threshold.

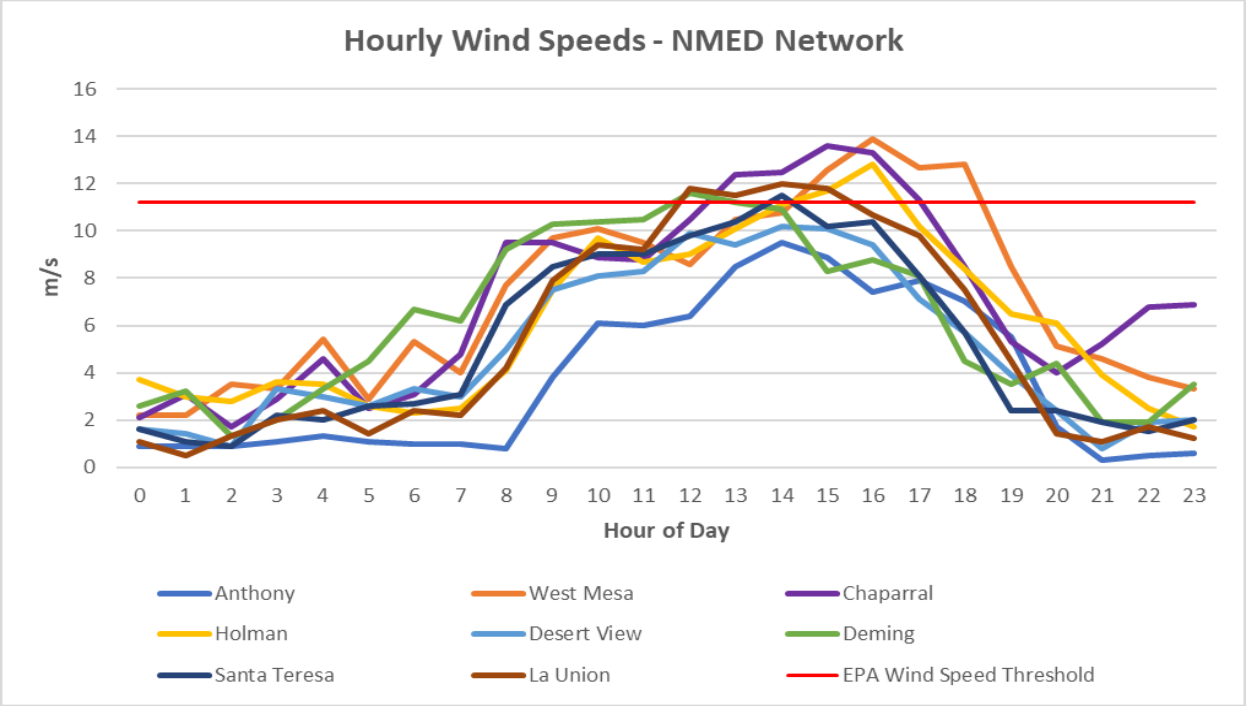


Figure 4-3. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before,

during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedances were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on GOES-16 geostationary satellite imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. which can be clearly seen from the imagery. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 4-4). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1741 MDT) that captured the imagery.

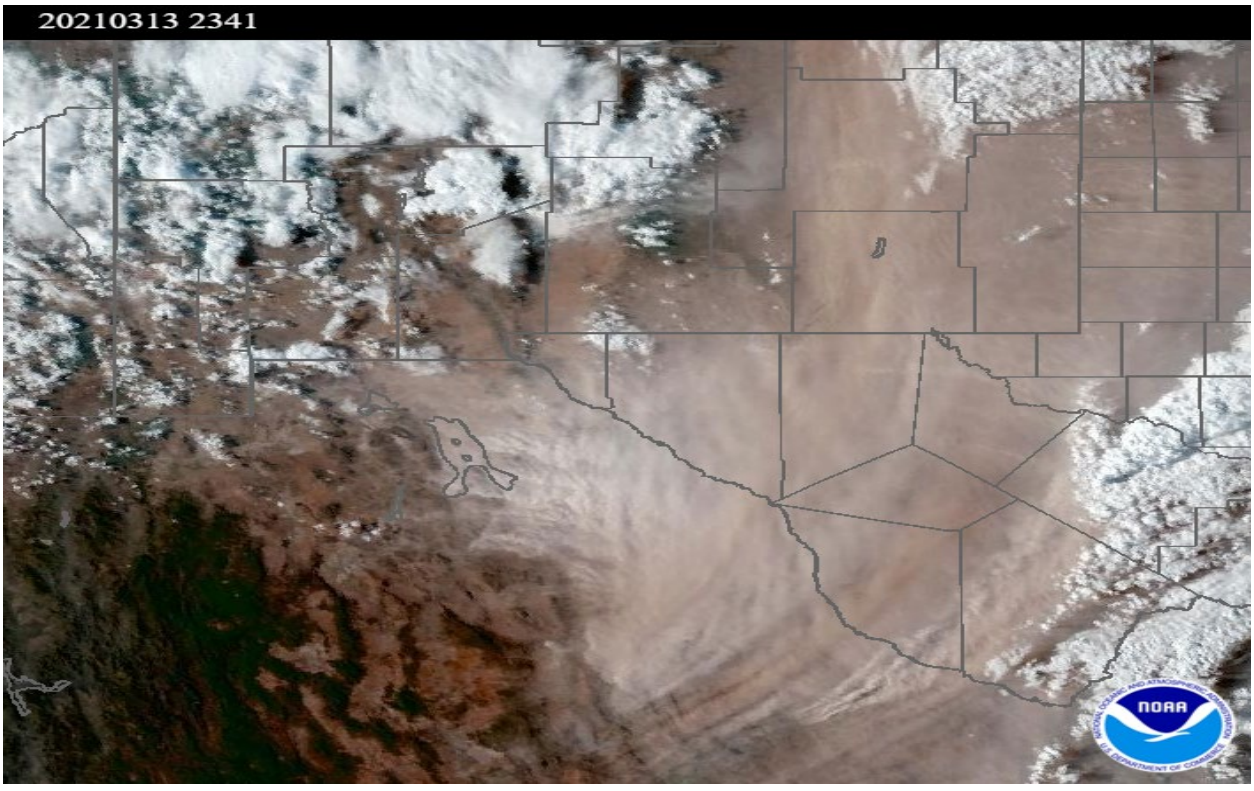


Figure 4-4. GOES-16 geostationary satellite imagery showing northern Chihuahua, west Texas, and southern New Mexico dust event. Courtesy of NOAA Aerosol Watch.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this date. A Hazardous Weather Outlook is a statement issued by NWS to provide information to the public about potential adverse weather events. A Hazardous Weather Outlook statement was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook and Area Forecast Discussion can be found below:

"…Winds increasing this afternoon to 20 to 30 mph. Patchy blowing dust possible..."

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 4-5). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

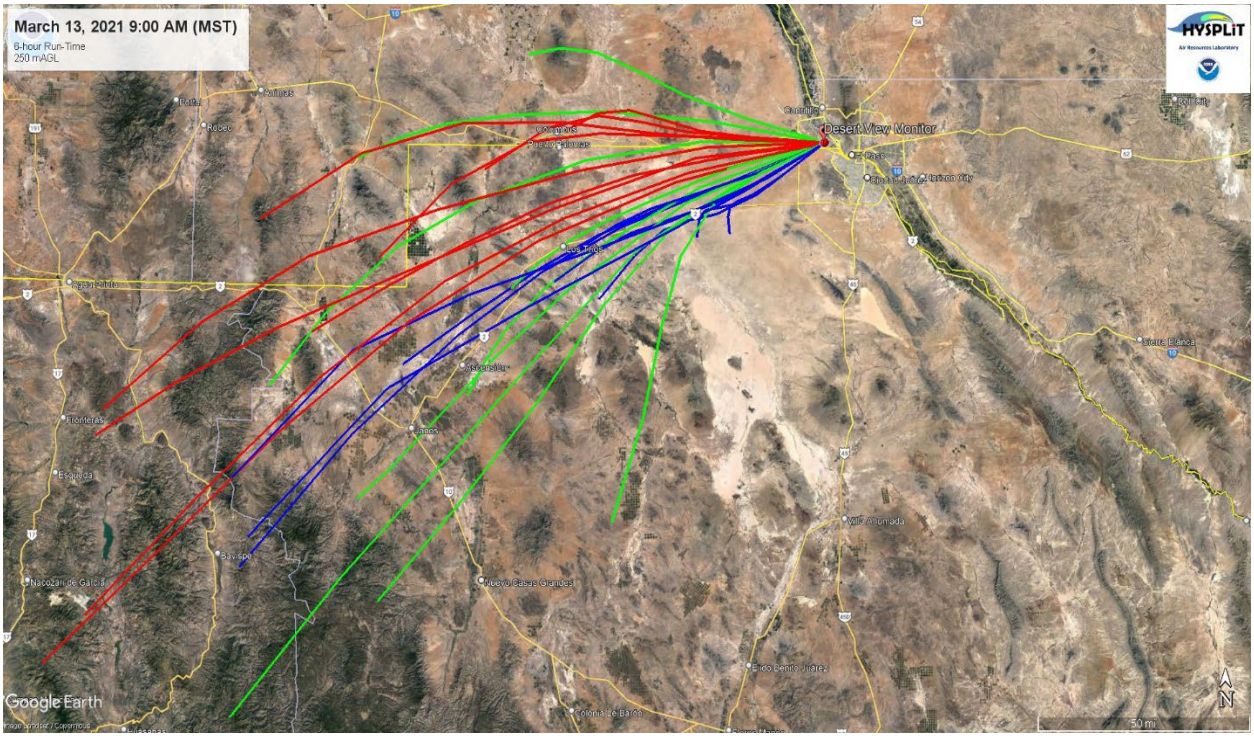


Figure 4-5. HYSPLiT back-trajectory analyses using the Ensemble mode for Desert View monitoring site

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 4-6) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m³ (0900 - 1600 hour). During the event, winds blew from the west-northwest to west-southwest directions 100% of the time coinciding with peak PM_{10} concentrations.

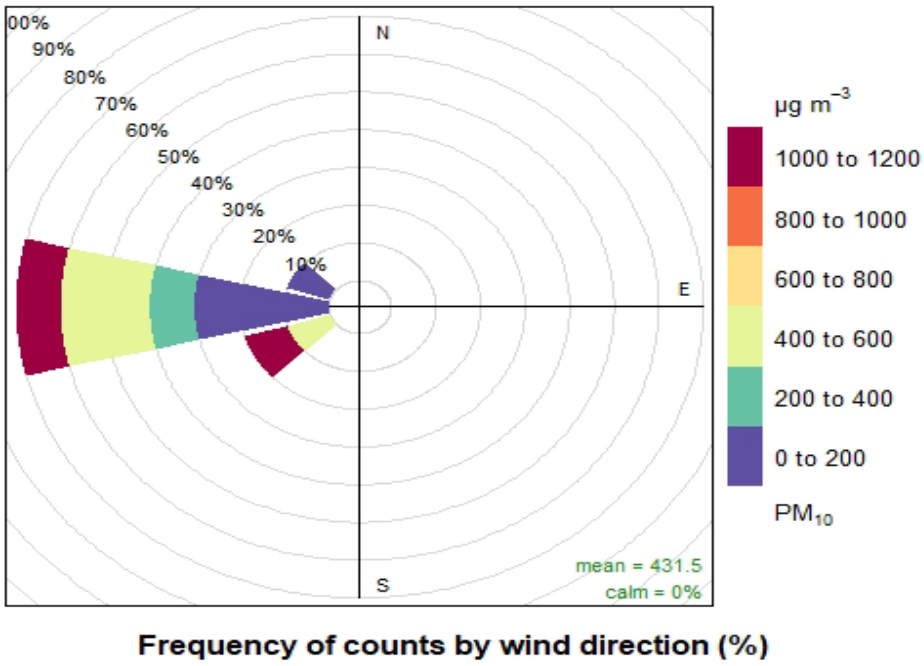


Figure 4-6. Pollution rose for the Desert View monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong westerly winds beginning at the 0800 hour. During this time, peak hourly PM_{10} concentrations ranged from 100 to 1020 µg/m^3 were recorded at the Deming and Desert View monitoring sites, respectively (Figure 4-7). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds ranged from 9.5 to 13.9 m/s were recorded at the Anthony and West Mesa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 4-8 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

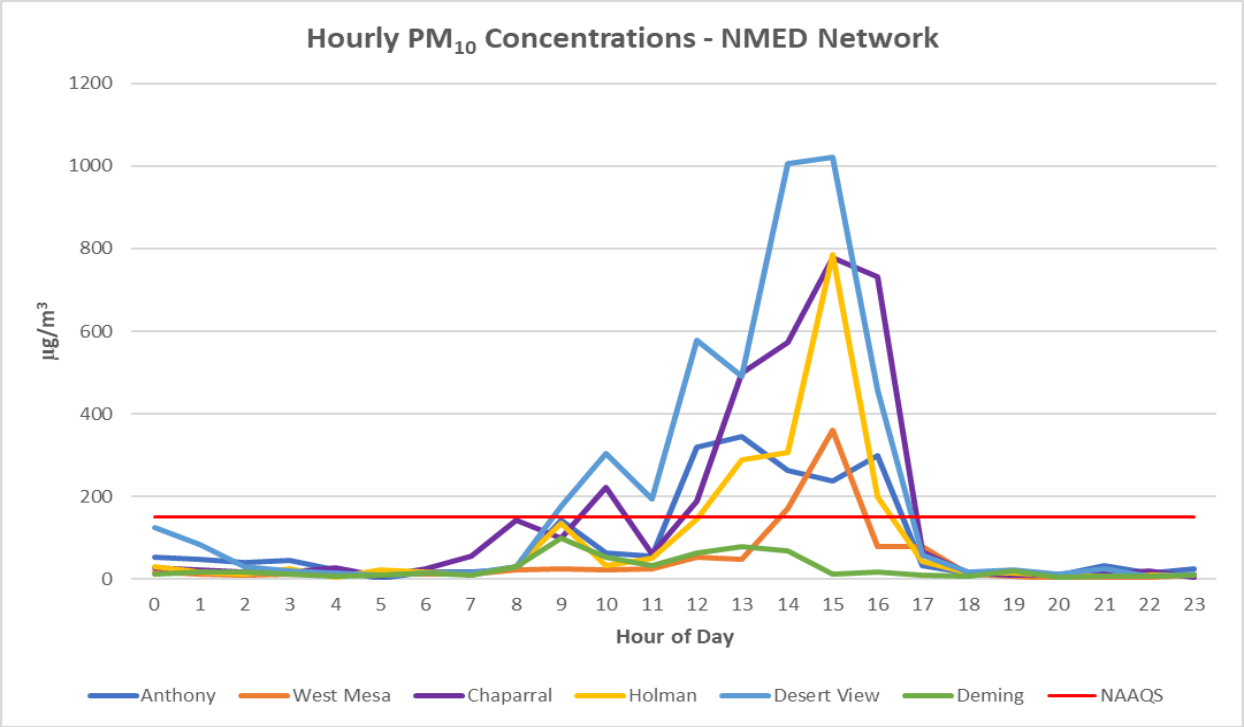


Figure 4-7. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

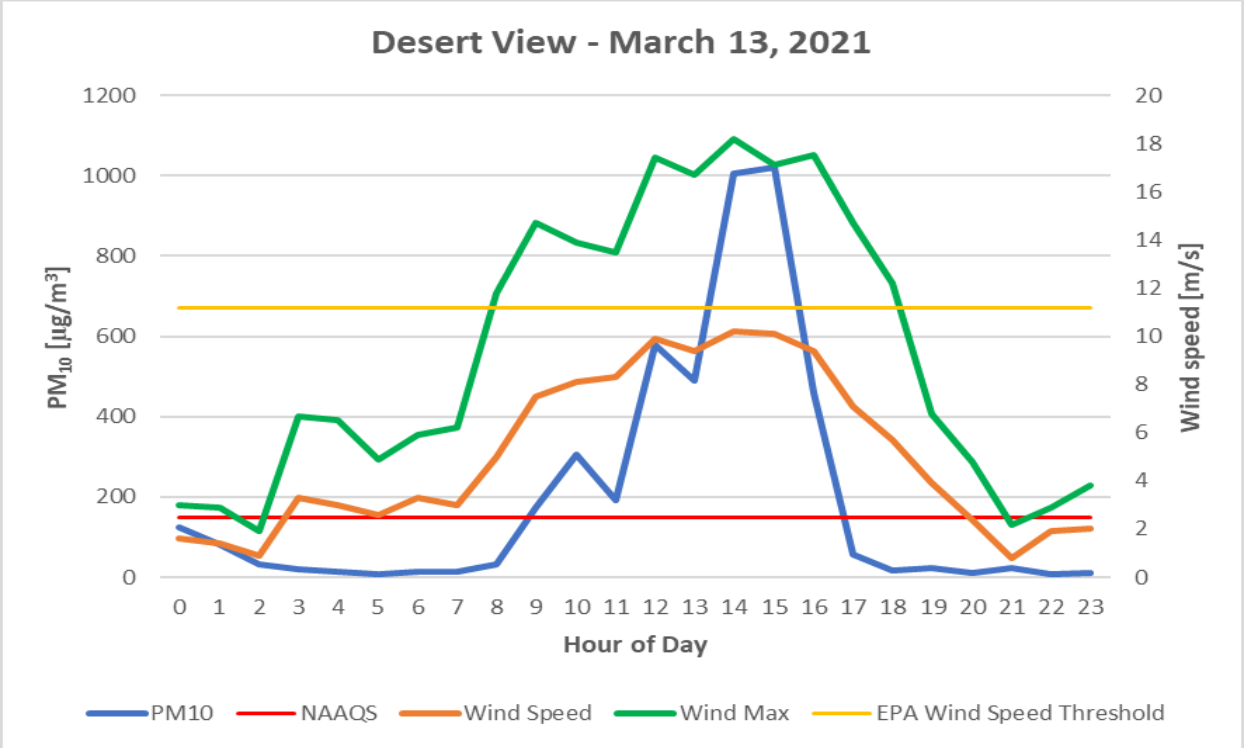


Figure 4-8. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Desert View monitoring site recorded 32 exceedances of the PM_{10} NAAQS (Figure 18-2 in Appendix A). The maximum 24-hour average PM_{10} concentration at this site was 734 µg/m^3 for the Desert View monitoring site recorded in 2019. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 4-9, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event, except for the following event dates March 14, 2021, and March 16, 2021, did not surpass 99 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

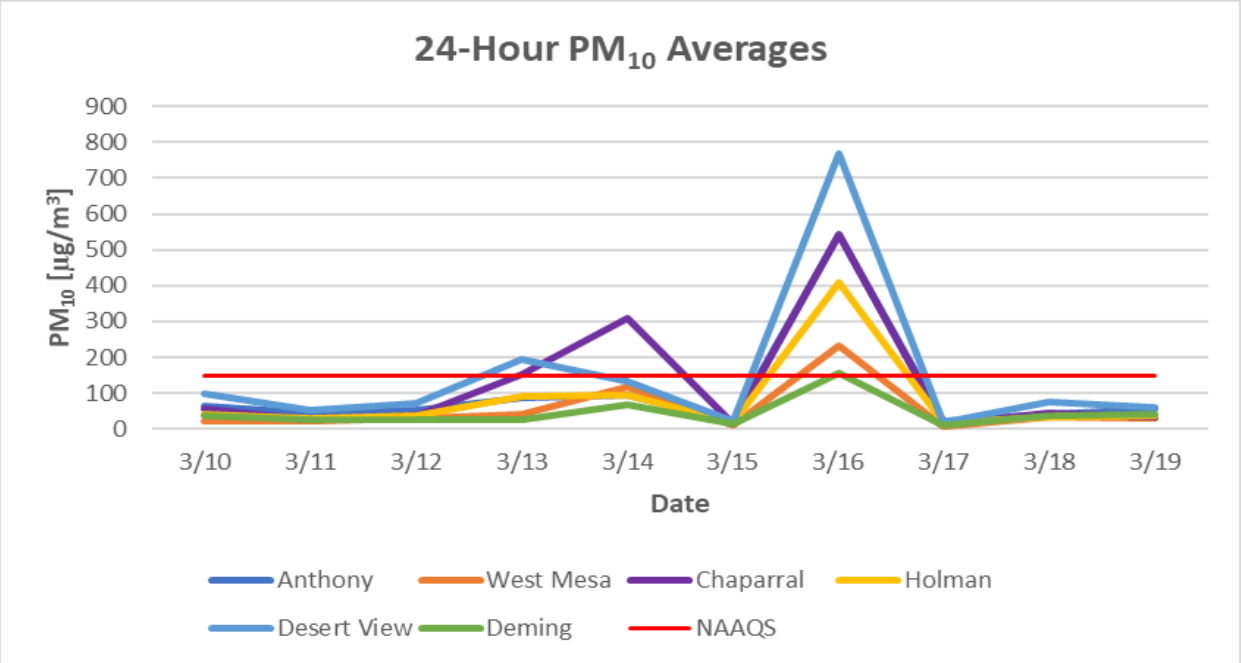


Figure 4-9. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (196 µg/m^3) is above the 95th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at the Desert View monitoring site. The monitored PM_{10} 24-hour average (196 µg/m^3) is above the 95th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event

affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

5. HIGH WIND EXCEPTIONAL EVENT: March 14, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Chaparral monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 5-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	308 µg/m^3	14.9 m/s	25 m/s

Table 5-1 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

This Pacific storm system is a continuance from yesterday's remaining slow-moving cold front that slowly progressed east of the Four Corners this morning into southeast Colorado. At the 1800 hour, an area of low-pressure moved over south-eastern Colorado (Figure 5-1). Aloft, an upper-low is over southeastern Colorado. As the day progressed this low-pressure aloft traveled towards the Central Plains and aligned itself with New Mexico and the surface wind direction (Figure 5-2). Northeast New Mexico's low-pressure system plus downslope warming will sustain lee-cyclogenesis, increasing surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust, particularly along east slopes and mountain gaps.

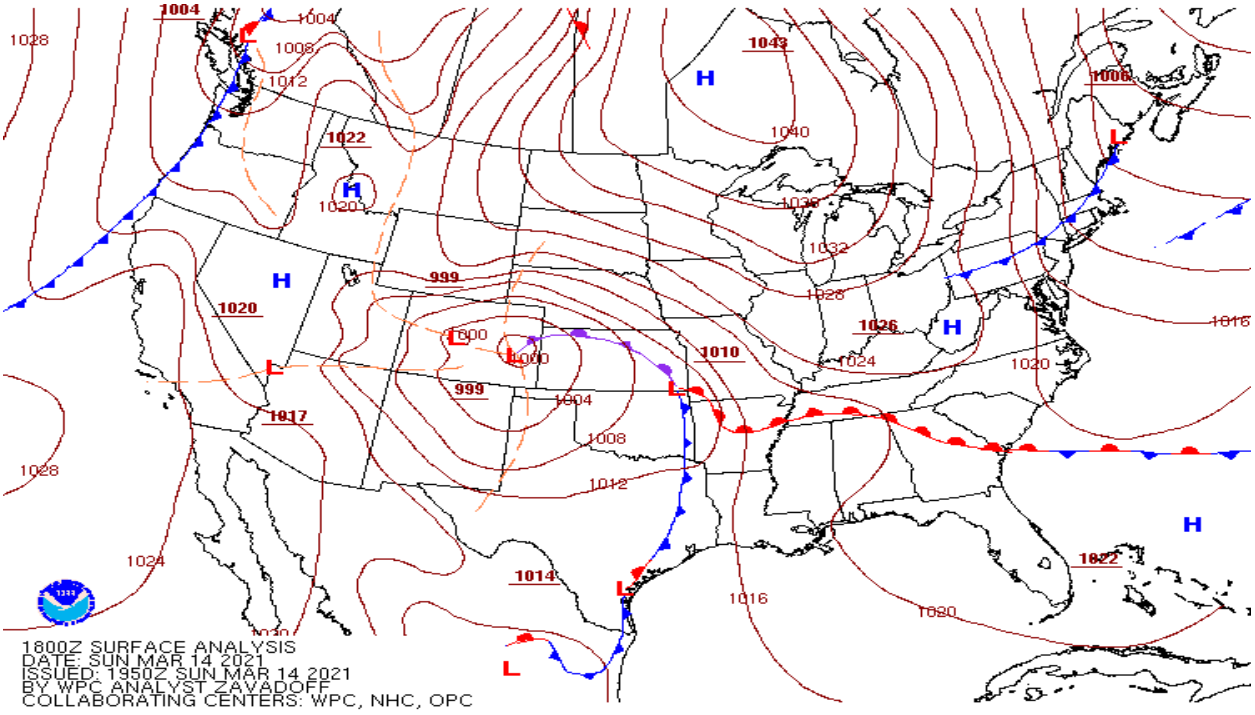


Figure 5-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

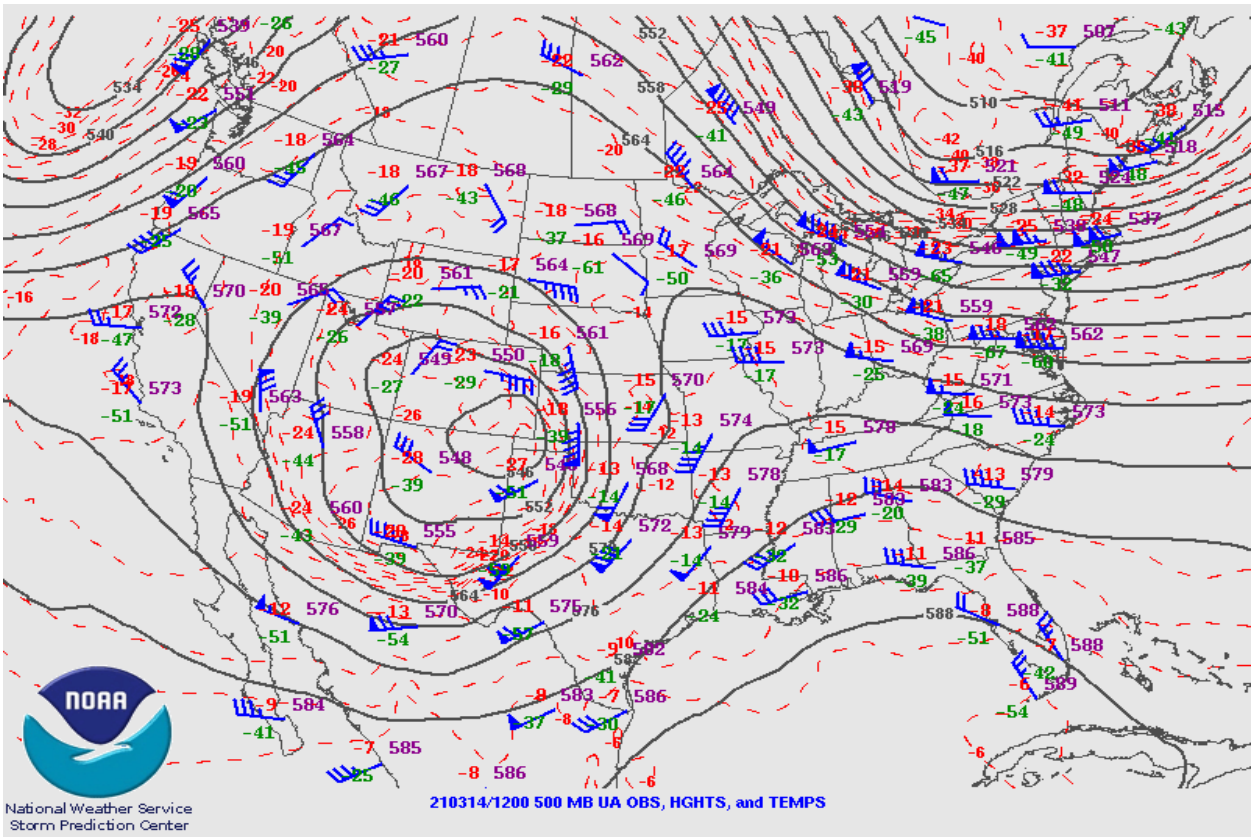


Figure 5-2. Upper air weather map for March 14, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the west-southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Chaparral, Desert View, Holman, West Mesa, La Union, Santa Teresa and Deming monitoring sites beginning at the 0400 hour and lasted through the 2300 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0900 hour. Hourly concentrations remained elevated through the 1700 hour. Table 5-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Desert View			Chaparral			Deming		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0800	5	3.8	9.9	12	10.8	16.2	63	12.3	19.5
0900	17	7	13.2	1133	14.4	23.3	119	13.3	19.2
1000	66	8.1	14	1008	13.6	21.8	75	12.6	18.8
1100	100	7.9	13.8	574	14.2	21.2	90	11.4	17.9
1200	139	8.4	16.1	1213	14.9	23	156	12.5	18.9
1300	312	9.3	15.9	1030	14.3	25	171	12	18
1400	464	9.5	18.1	544	13.2	21.5	329	13.6	21.2
1500	803	10.4	19	527	12.6	20.3	327	13.5	21
1600	832	9.9	16.1	578	12.9	21	102	11.9	17.9
1700	195	7.4	14.6	427	13.6	21.4	39	11.6	16.1
1800	88	5.4	10.2	153	9	20.2	19	9.1	17.6

Table 5-2 Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day, aloft an upper-low moved across northeastern New Mexico and southeastern Colorado. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east just east of the Four Corners in the morning and moving across New Mexico in the afternoon. The systems movement across the area timed well with daytime heating and mixing sustained lee-cyclogenesis to the east as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained localized dust throughout the area, especially in the desert areas of southern New Mexico (Figure 5-3).

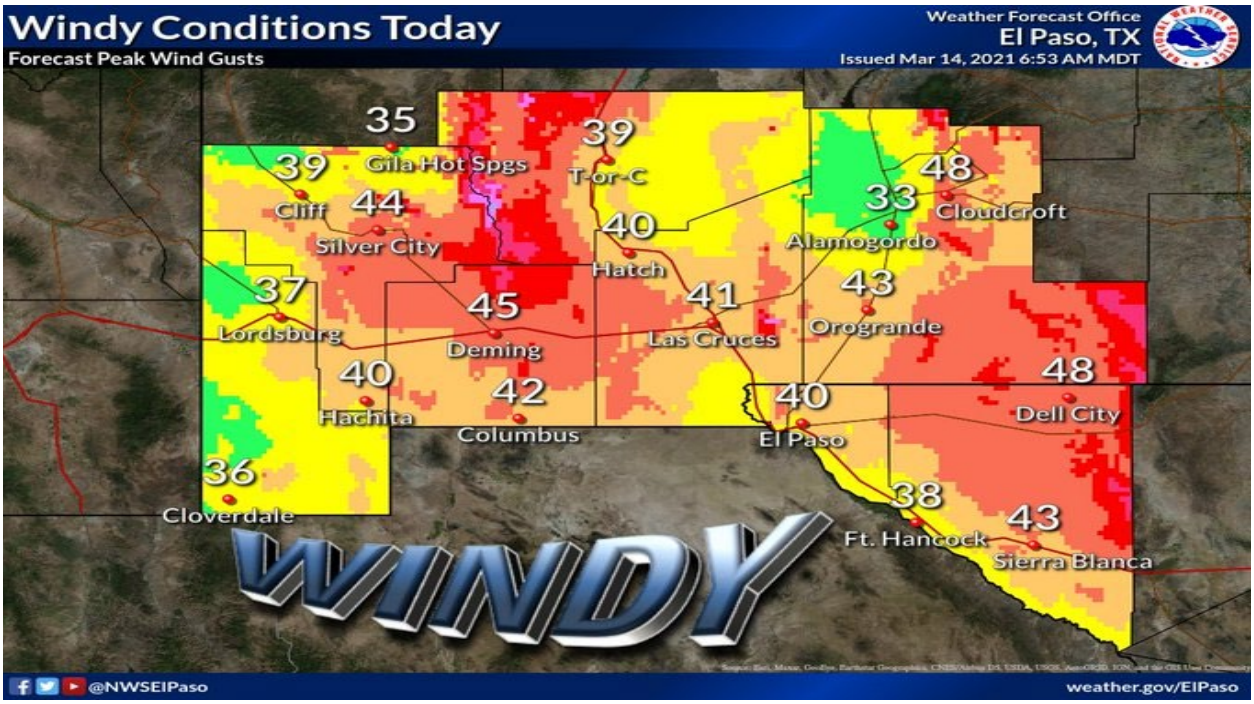


Figure 5-3. NWS Graphicast of high wind and blowing dust advisory

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Chaparral, West Mesa, and Holman monitoring sites recorded wind speeds above this threshold for 18 hours from the 0500 through the 2200 hours (Figure 5-4). The wind speeds at the upwind Deming, Santa Teresa, and La Union monitoring sites also reached the high wind threshold.

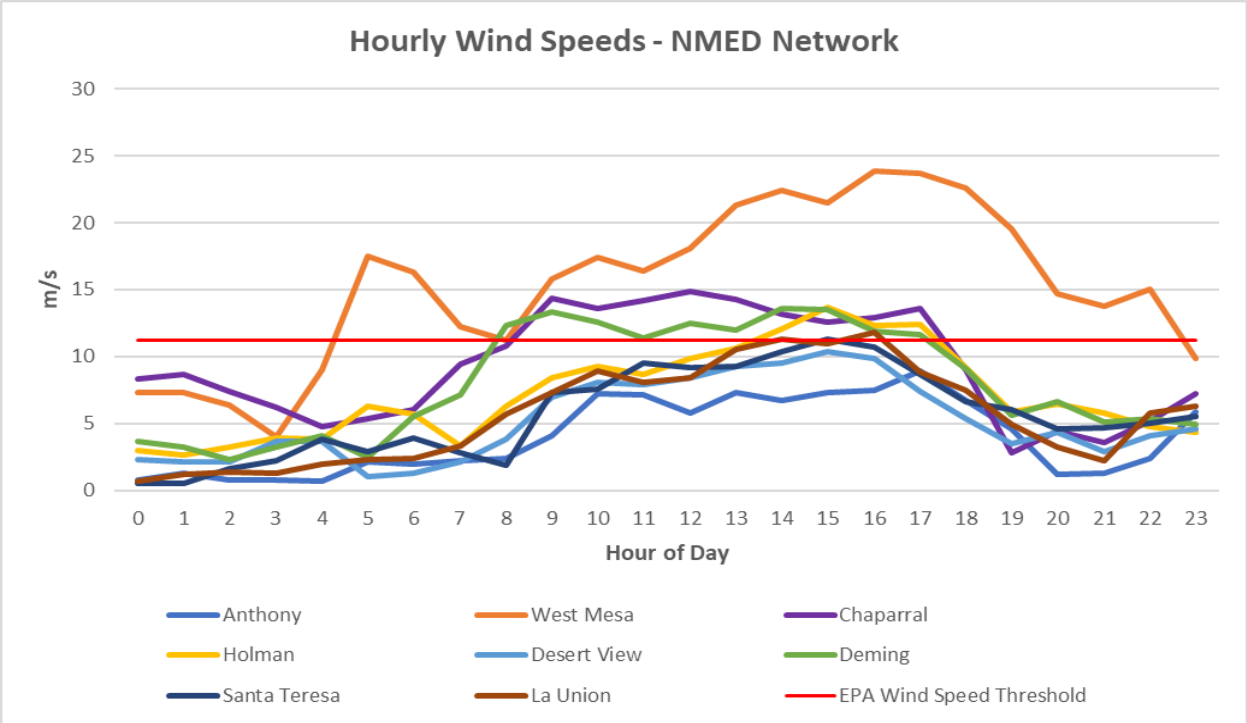


Figure 5-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the GOES-16 geostationary satellite RGB dust product imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. Which are represented as pink bands. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 5-5). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1741 MDT) that captured the imagery.

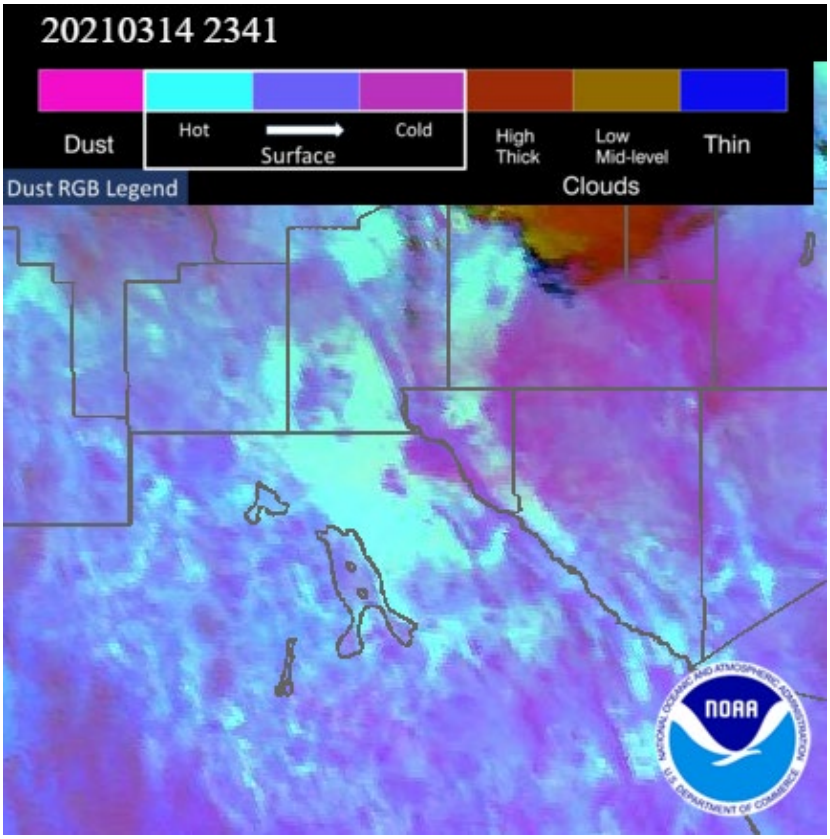


Figure 5-5. GOES-16 geostationary satellite RGB Dust Product imagery. Courtesy of Aerosol Watch.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Wind Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. This was in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"...Wind Advisory from 6 AM this morning to 8 PM MDT this evening…West winds of 30 to 40 mph and wind gusts up to 55 mph are likely, with the strongest winds along east slopes of mountain chains and gaps … Patchy blowing dust may also reduce visibility this afternoon and pose a risk to travel, especially near dust-prone locations…"

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from southwestern Arizona and northern Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 5-6). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

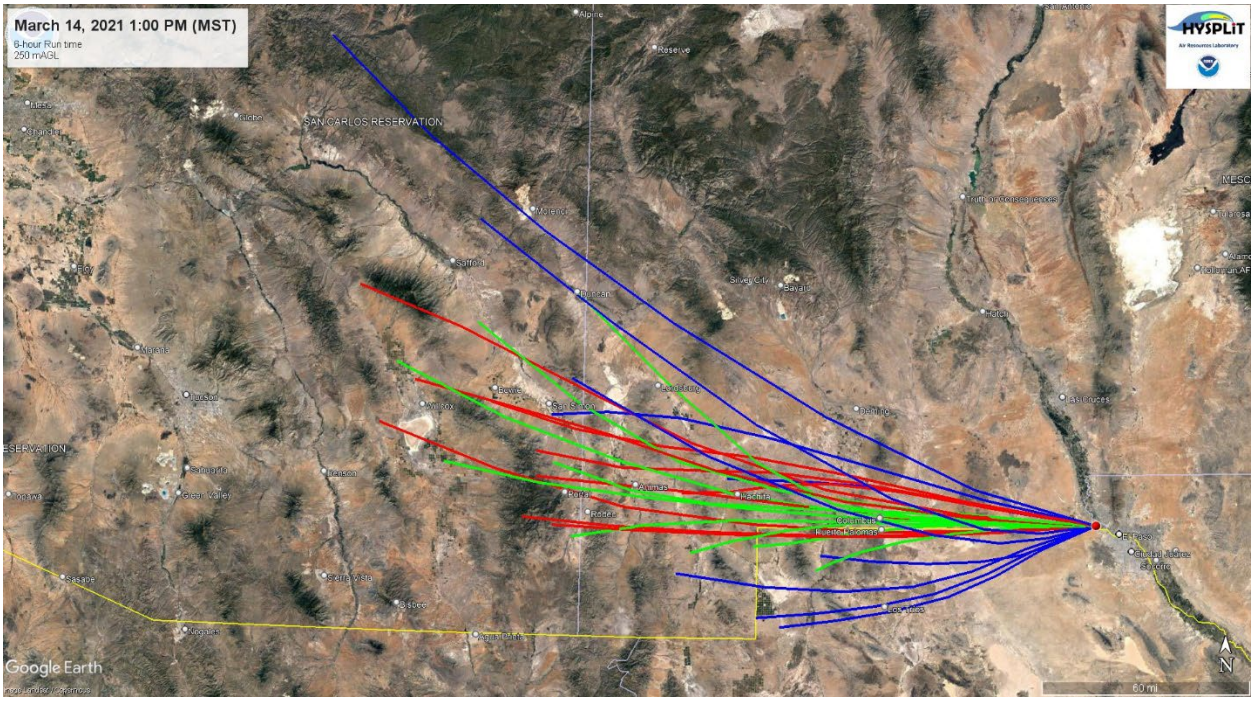


Figure 5-6. HYSPLiT back-trajectory analyses using the Ensemble mode for Desert View Monitoring site

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 5-7) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0900 -1700 hour). During the event, winds blew from the west-southwest direction 100% of the time coinciding with peak PM_{10} concentrations.

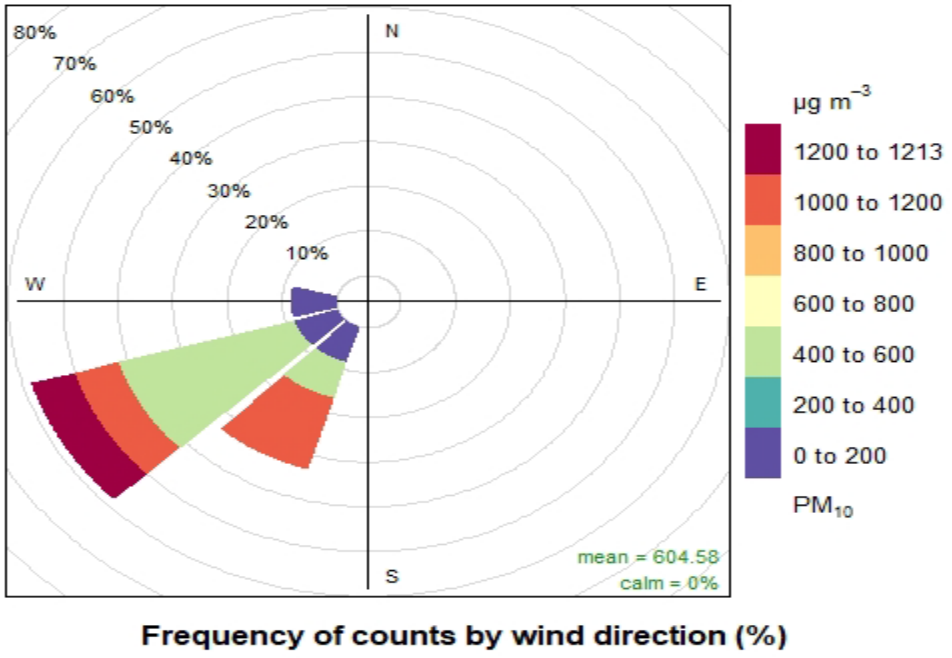


Figure 5-7. Pollution rose for the Chaparral monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southwesterly winds beginning at the 0400 hour and lasting through the 2300 hour. During this time, peak hourly PM_{10} concentrations ranged from 329 to 1213 µg/m^3 were recorded at the Deming and Chaparral monitoring sites, respectively (Figure 5-8). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 8.9 to 23.9 m/s were recorded at the Anthony and West Mesa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 5-9 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

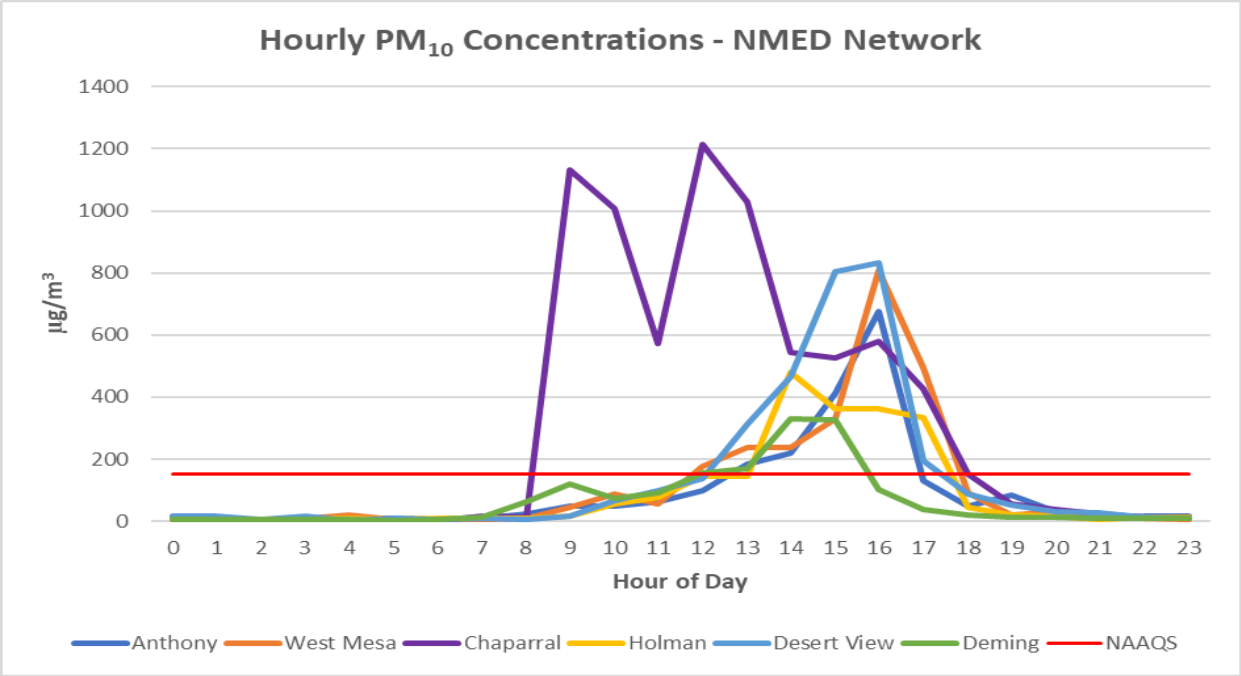


Figure 5-8. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

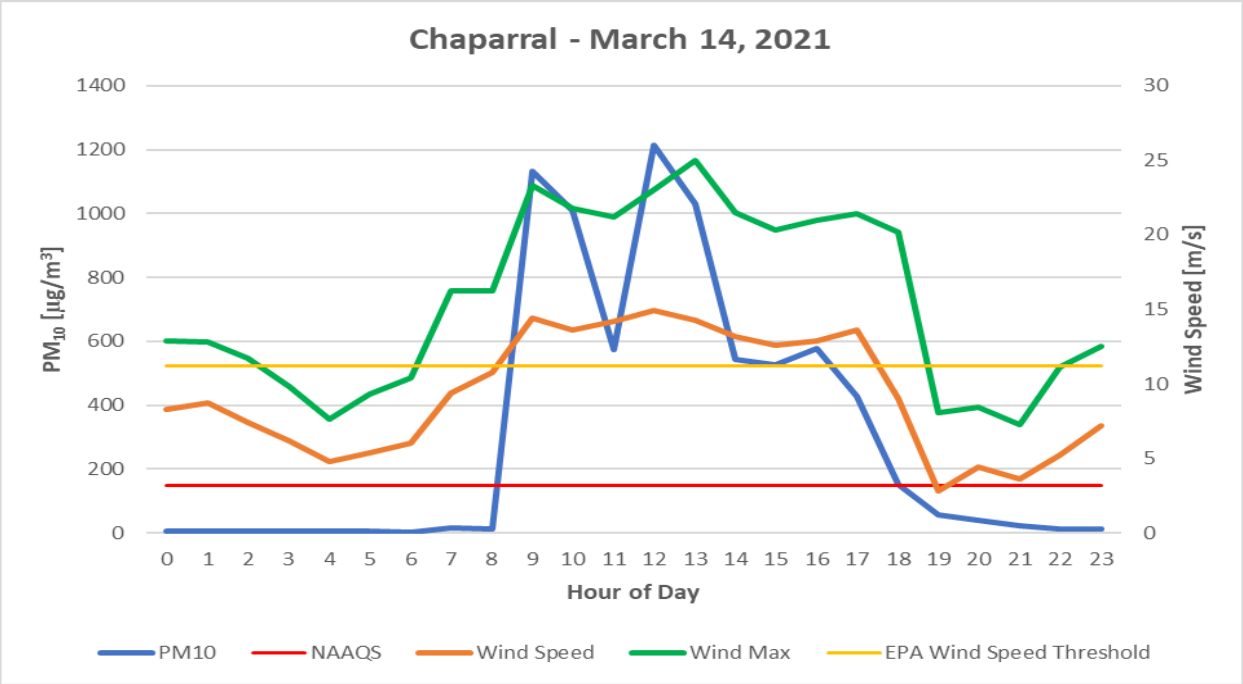


Figure 5-9. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Chaparral monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentrations at this site was 721 µg/m^3, recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 5-10, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event, except for the previous event date of March 13, 2021, and the following event date of March 16, 2021. Daily averages for the days surrounding the event did not surpass 99 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

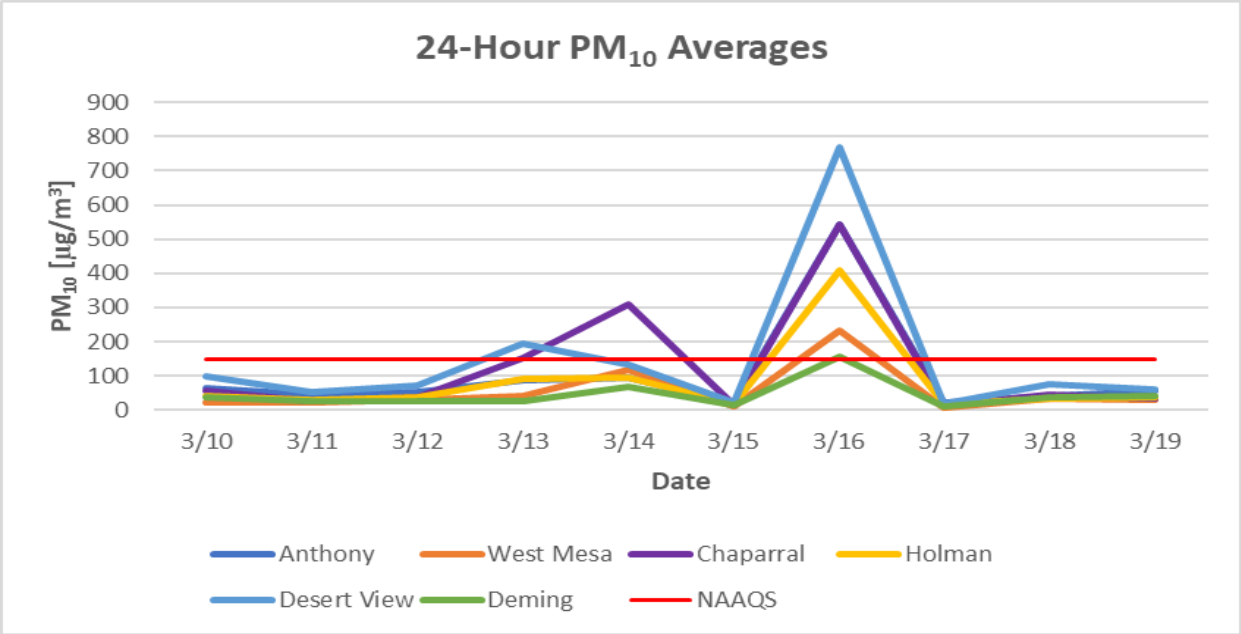


Figure 5-10. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (308 µg/m^3) is above the 99th percentiles of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (308 µg/m^3) is above the 99th percentiles of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

6. HIGH WIND EXCEPTIONAL EVENT: March 16, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana and Luna Counties resulting in exceedances of the PM_{10} NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 6-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0016	6CM Anthony	541 µg/m^3	11.2 m/s	21.3 m/s
RJ	35-013-0020	6ZK Chaparral	542 µg/m^3	13.2 m/s	23.4 m/s
RJ	35-013-0021	6ZM Desert View	769 µg/m^3	13.2 m/s	20.5 m/s
RJ	35-013-0019	6ZL Holman	408 µg/m^3	14.2 m/s	24.8 m/s
RJ	35-013-0024	6WM West Mesa	234 µg/m^3	16.3 m/s	26.3 m/s
RJ	35-029-0003	7E Deming	157 µg/m^3	14.5 m/s	22.9 m/s

Table 6-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

A very strong upper low-pressure system will track eastward across central New Mexico today in which lee-cyclogenesis will be ahead of the Pacific frontal boundary tightening surface gradients. At the 1800 hour, an area of low-pressure centered over northern New Mexico extending along the Texas and Oklahoma Panhandles (Figure 6-1). Aloft, the backside of a low-pressure center of the storm system hovered over the Great Basin. As the day progressed this low-pressure system aloft traveled east and aligned itself with New Mexico and the surface wind direction (Figure 6-2). Diurnal heating of the surface allowed high velocity winds aloft to mix down, increasing surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust.

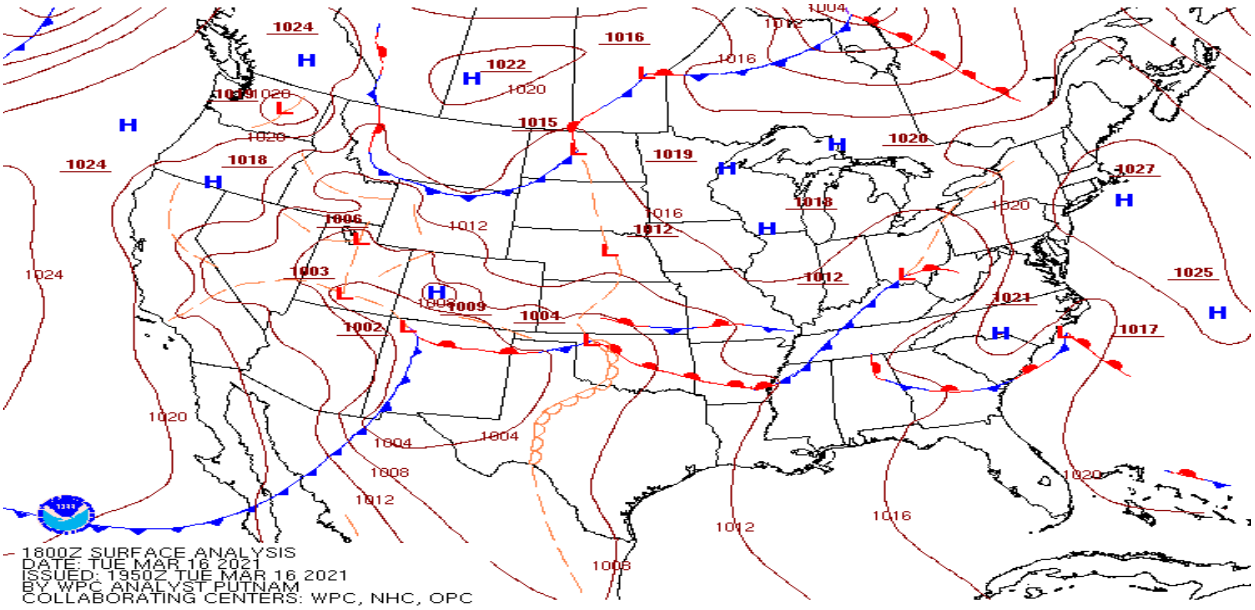


Figure 6-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

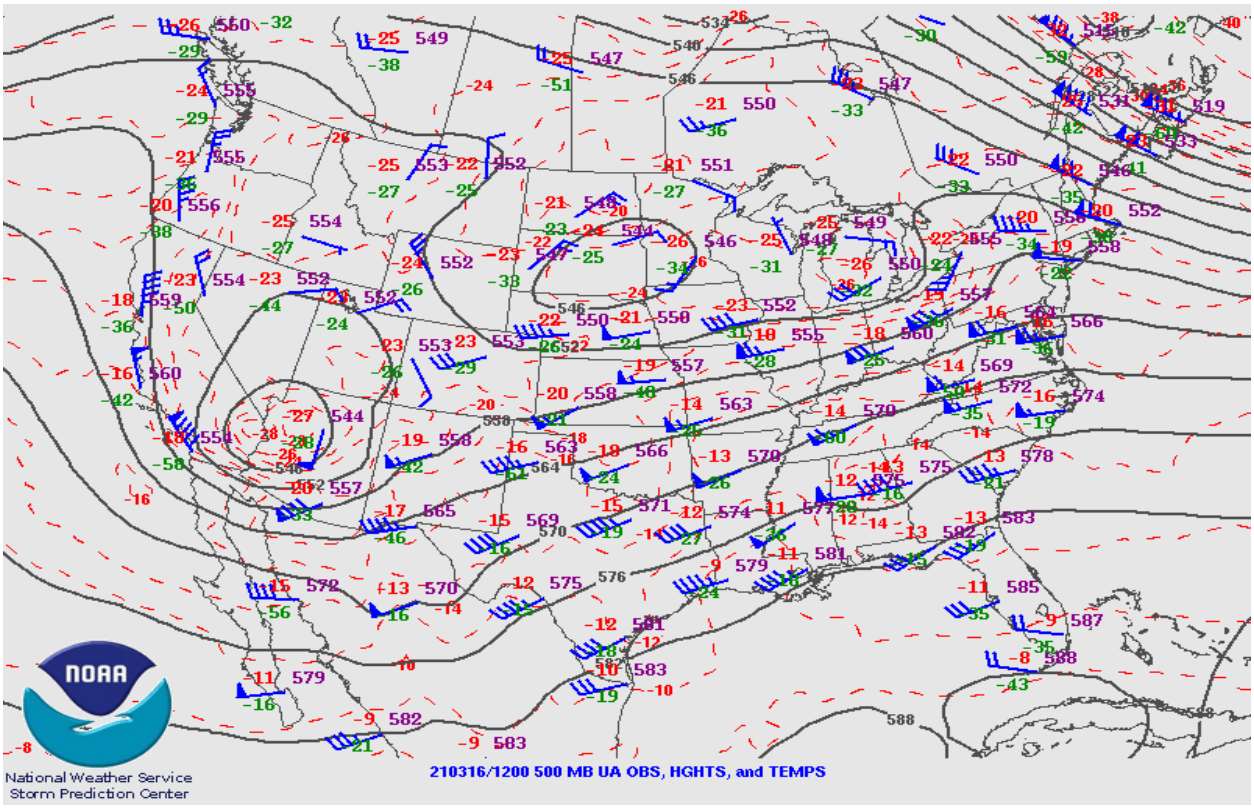


Figure 6-2. Upper air weather map for March 16, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Anthony, Desert View, Chaparral, Holman, West Mesa, La Union, Santa Teresa and Deming monitoring sites beginning at the 1000 hour and lasted through the 2300 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Chaparral, Desert View, Holman, West Mesa and Deming monitoring sites beginning at the 1000 hour. Hourly concentrations remained elevated through the 2000 hour. Table 6-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Desert View			West Mesa			Chaparral		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
1000	307	7.4	13.3	183	9.1	17.6	129	7.2	16.8
1100	713	8.3	13.6	1763	11.7	20	451	8.2	17.5
1200	4337	12	19.7	903	15.6	24.3	2962	11.2	20.7
1300	7208	13.2	20.5	449	14.1	22.8	4009	13.2	23.4
1400	1636	8.9	18	449	15.3	23	1008	11.8	18.2
1500	591	8	15.2	346	15.2	23.7	798	11.7	18.3
1600	559	77	13.1	654	16.2	24.5	1099	11.9	19.7
1700	1186	8.3	15.4	364	16.3	226.3	842	10.5	17.7
1800	635	7.8	13.4	217	15.6	23.8	732	11	20.1
1900	481	7.7	14.9	80	13.8	21.5	390	9.6	19.4
2000	288	7.2	14.8	9	13.1	21	288	11	19.4

Table 6-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day, as the spring windy season begins in March for most of the southwestern United States. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east from the Great Basin in the morning and moving across New Mexico in the afternoon towards the Central Plains. The systems movement across the area timed well with daytime heating and mixing generating lee-cyclogenesis to the east as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico (Figure 6-3).

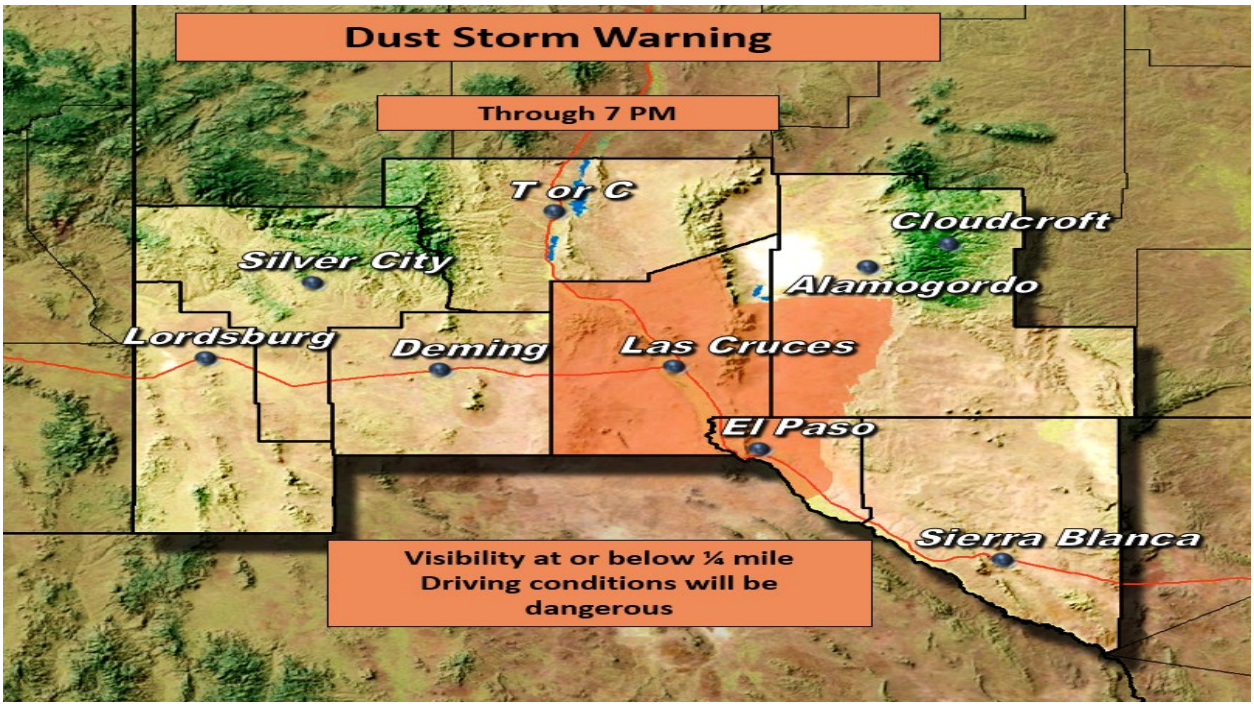


Figure 6-3. NWS GraphiCast product showing Dust Storm Warning for southern Dona Ana County, March 16, 2021.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Anthony, Chaparral, Desert View, Holman, and West Mesa monitoring sites recorded wind speeds above this threshold for 13 hours from the 1000 to the 2300 hour (Figure 6-4). The West Mesa monitoring site briefly recorded wind speeds below the wind threshold at the 2100 hour but continued through the 2300 hour thereafter. The wind speeds at the upwind Santa Teresa, La Union, and Deming monitoring sites also reached the high wind threshold.

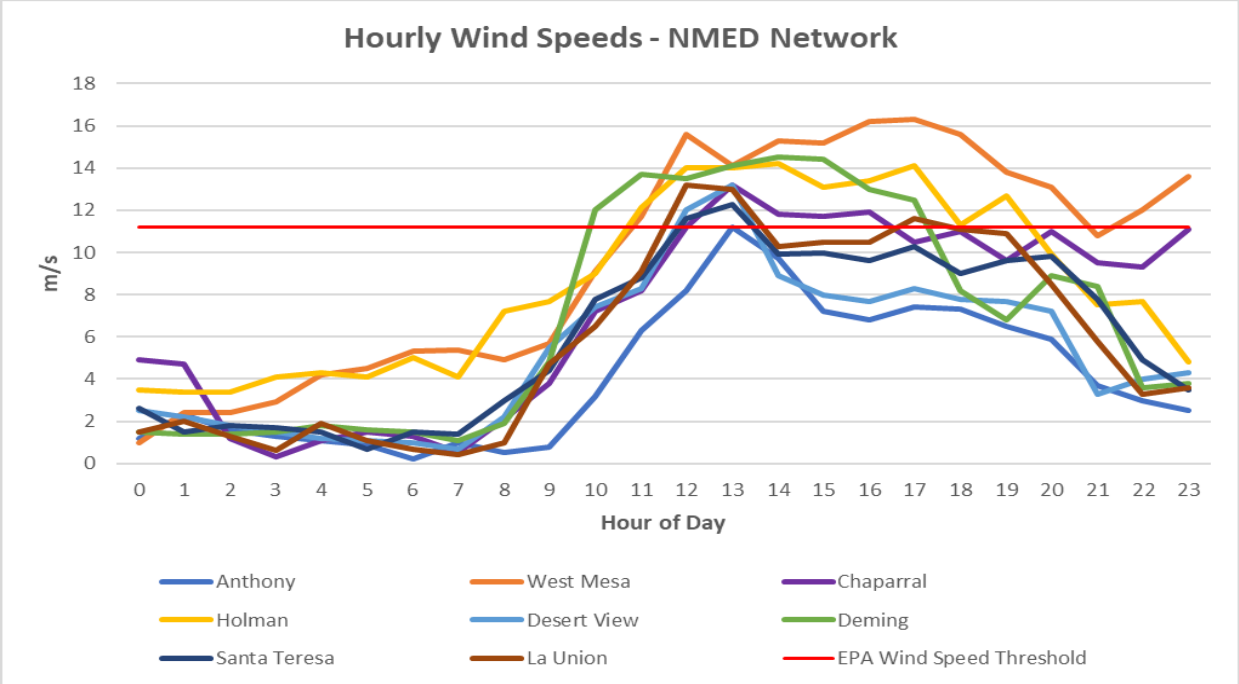


Figure 6-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Grant, Hidalgo, and Luna Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedances on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedances were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the Suomi NPP satellite VIIRS RGB dust product imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. which are represented as pink bands. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 6-5). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1351 MDT) that captured the imagery.

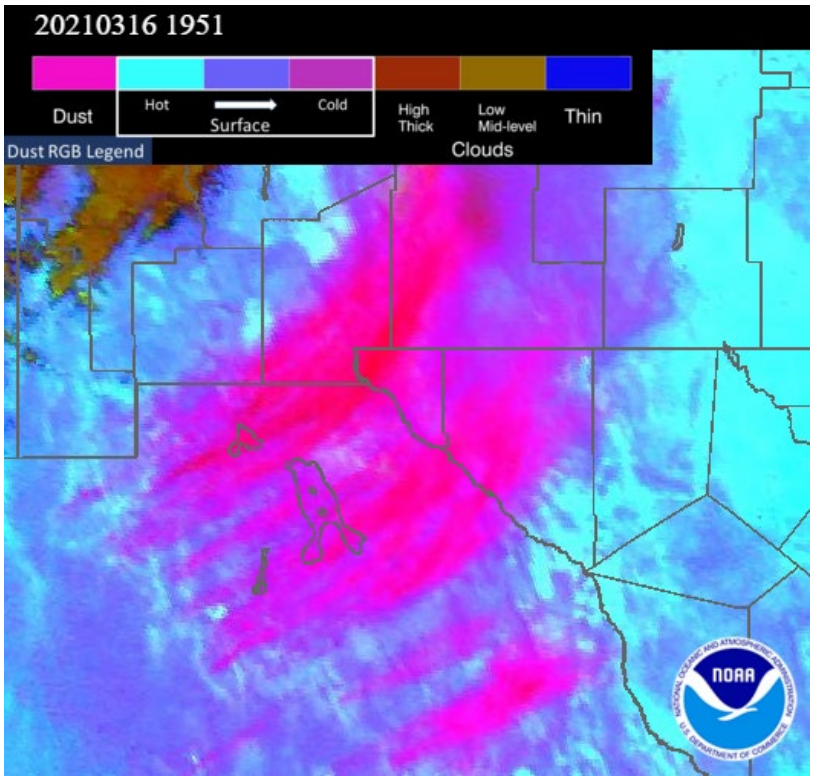


Figure 6-5. VIIRS RGB dust product imagery from the Suomi NPP Satellite showing southwestern New Mexico, northern Chihuahua and western Texas. Imagery obtained from NOAA AerosolWatch website. Pink bands show dust plumes.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a High Wind Warning and a Blowing Dust Advisory, Dust Storm Advisory, for this date (Figure 6-3). A High Wind Warning is issued by NWS when sustained winds of 40 mph are occurring or imminent for 1 hour or longer. A Blowing Dust Advisory is issued when blowing dust is expected to reduce visibility to between ¼ to 1 mile, generally with winds of 25 mph or greater. These were in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"...Blowing Dust Advisory until 7 PM MDT this evening…High Wind Warning until 8 PM MDT this evening...West winds of 35 to 45 mph will be common, with gusts as high as 60 mph for areas east of the Rio Grande…Blowing dust will also be a concern...and hazy conditions across much of the International border lowlands…"

The El Paso Times reported on the high wind blowing dust event published March 17, 2021, documenting the extent of the impact to area residents from the previous day's dust storm (Figure 6-6).

EL PASO

Tuesday's 200-mile-wide dust storm brought 64 mph winds to El Paso

Anthony Jackson
El Paso Times

Published 3:36 p.m. MT March 17, 2021

View Comments

Photos: Dust storm blows through El Paso
Dust storm roars into El Paso, high-wind warning issued

The sky turned beige and the wind roared Tuesday as a dust storm roughly 200 miles wide engulfed El Paso and neighboring regions as it lumbered toward northeastern New Mexico and other parts of Texas.

The storm's winds reached upwards of 60 mph in East-Central El Paso, where the weather station at the El Paso International Airport recorded a high of 64 mph gusts, according to Joe Delizio, a meteorologist with National Weather Service El Paso.

"Inside the city, but a little bit to the east, we had stronger winds," Delizio said, explaining there were wind gusts "in the 60s and 70s east of the mountain range."

A tree at Murchison Park on Scenic Drive is secured by wires against the strong wind that brought a dust storm to El Paso on Tuesday, March 16, 2021. *Samuel Gaytan/El Paso Times*

Although the wind was strong enough to uproot a tree in Central El Paso, it didn't break the 84 mph record recorded March 10, 1977, and March 26, 2010.

"Goes to show March is truly the start of the windy season here in El Paso," Delizio said.

The National Weather Service reported visibility dropped to less than a quarter mile in areas surrounding the Sun City from dust originating in northern Mexico. The dust storm stretched as far north as Truth of Consequences in Southern New Mexico.

El Paso Fire Department spokesman Enrique Dueñas-Aguilar said the storm brought a 10% increase in emergency calls citywide.

More: 'You can't even see out here.' Here's what the dust storm looks like in El Paso and New Mexico.

More: Dust storm roars into El Paso-Juárez region, bringing high-wind warning

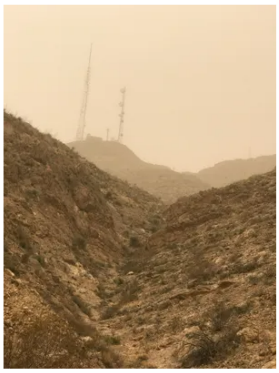
"We saw calls that we usually don't get that were caused by the dust storm," Dueñas-Aguilar said. "We had three children injured, one of them with severe injuries, by a jumping castle that flew up."

Dueñas-Aguilar also noted that, alongside downed power lines, a store in Socorro, Texas, had a roof collapse that affected nearby structures. However, no one was injured.

"We want to praise the work of first responders," he said, adding, "Anytime conditions become hazardous, we ask the community to stay inside."

View Comments

The overlook of El Paso and Juárez from Scenic Drive was obscured as a dust storm hit the Borderland on Tuesday, March 16, 2021. *Samuel Gaytan/El Paso Times*



The dust storm that hit El Paso on Tuesday, March 16, 2021, created a surreal scene in the Franklin Mountains. *Samuel Gaytan/El Paso Times*

Figure 6-6. El Paso Times news report depicting the extent of the March 16, 2021, high wind blowing dust event.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 6-7). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

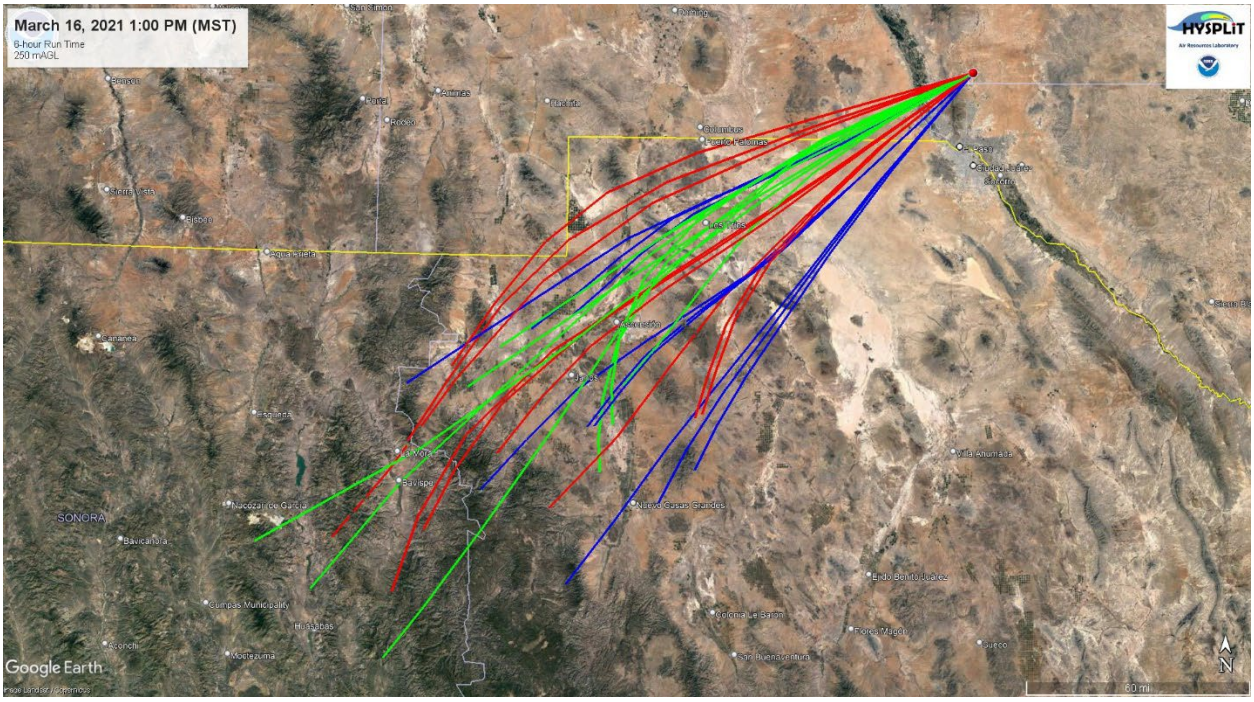


Figure 6-7. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 6-8 through 6-13) were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (1000 -2000 hour). During the event, winds primarily blew from the west through the south directions 69% and north direction 31% of the time for the Anthony monitoring site, the west-southwest through the south directions 100% of the time for the Chaparral monitoring site, the west-northwest through the south-southwest directions 100% of the time for the Desert View monitoring site, the west through the south directions 100% of the time for the Holman monitoring site, the west-northwest through the south-southwest directions 100% of the time for the West Mesa monitoring site, the west-northwest through the west directions 100% of the time for the Deming monitoring site, coinciding with peak PM_{10} concentrations.

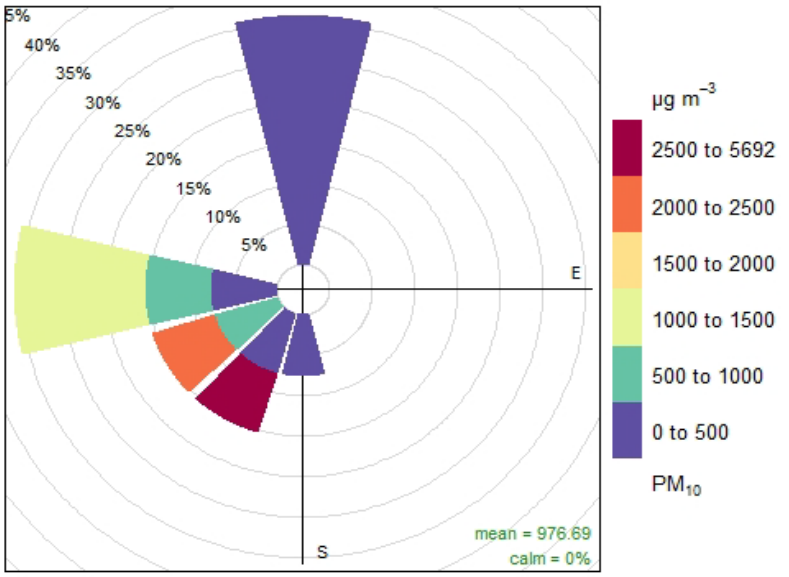


Figure 6-8. Pollution rose for the Anthony monitoring site.

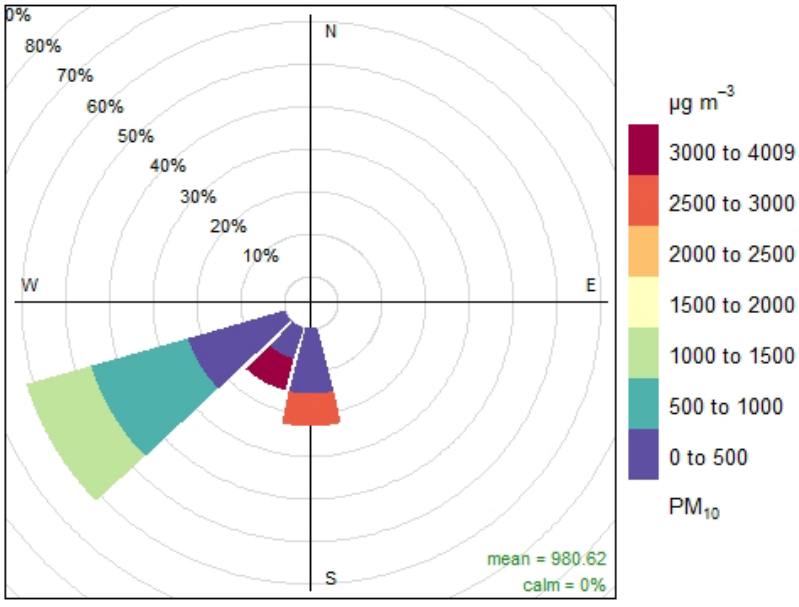


Figure 6-9. Pollution rose for the Chaparral monitoring site.

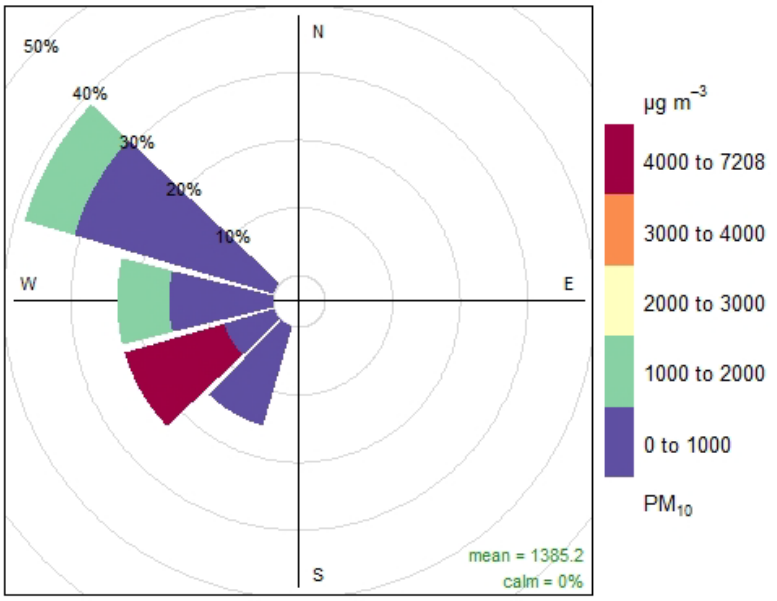


Figure 6-10. Pollution rose for the Desert View monitoring site.

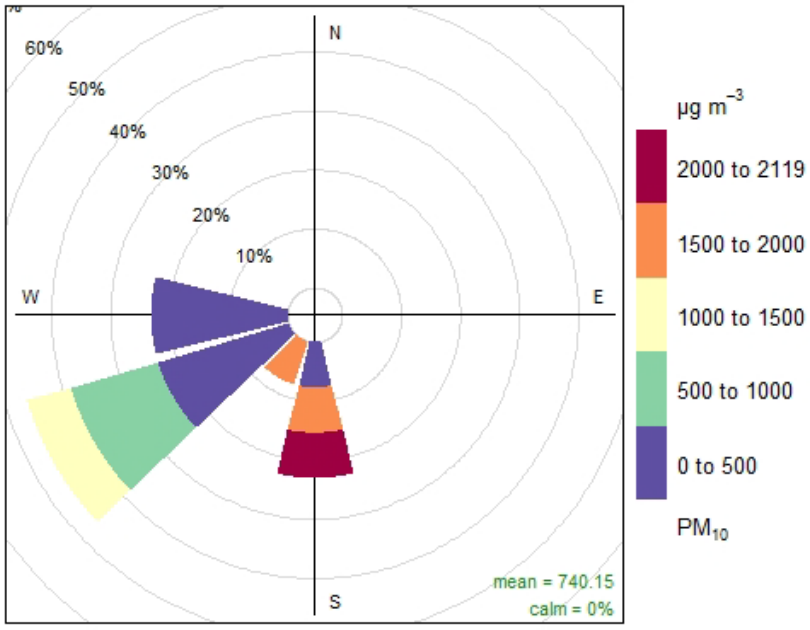


Figure 6-11. Pollution rose for the Holman monitoring site.

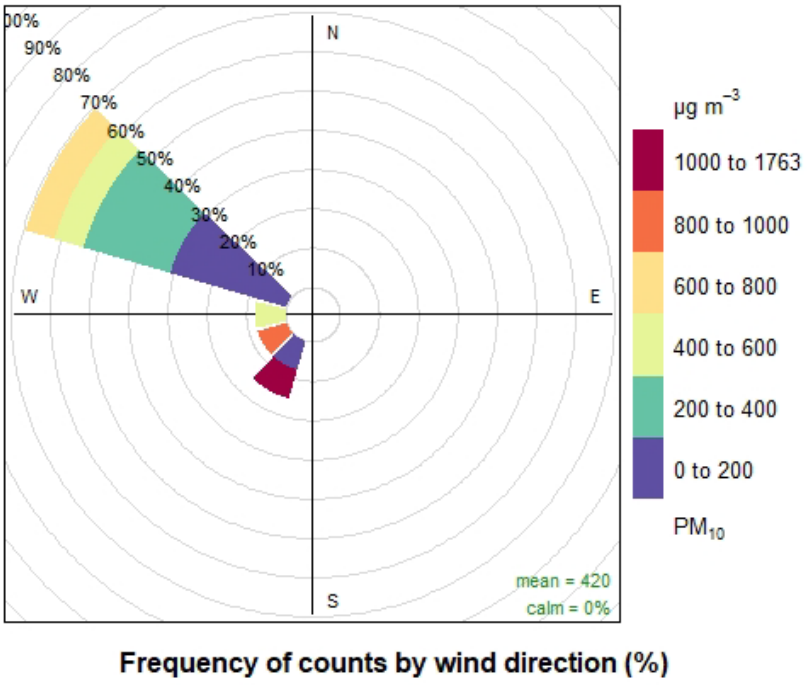


Figure 6-12. Pollution rose for the West Mesa monitoring site.

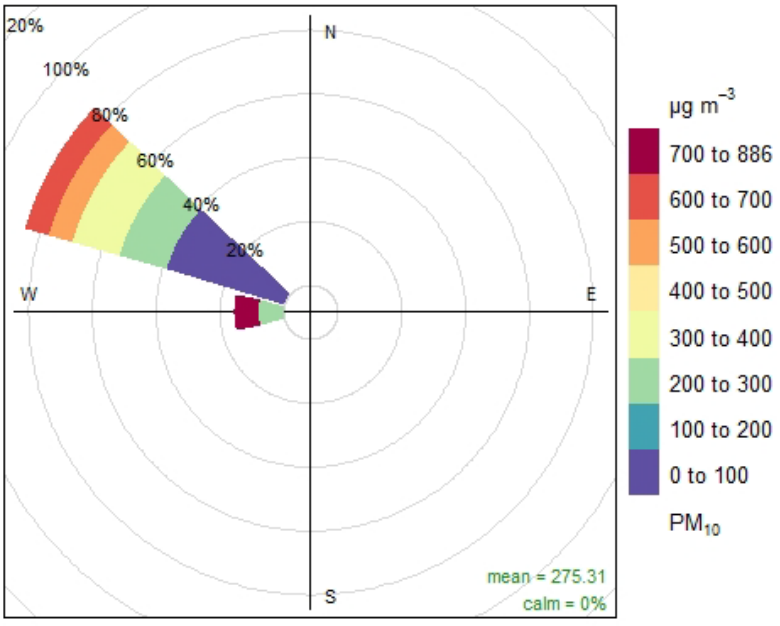


Figure 6-13. Pollution rose for the Deming monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong west-southwesterly winds beginning at the 1000 hour and lasting through the 2300 hour. During this time, peak hourly PM_{10} concentrations ranged from 886 to 7208 µg/m^3 were recorded at the Deming and Desert View monitoring sites, respectively (Figure

6-14). Since all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds ranged from 11.2 to 16.3 m/s were recorded at the Anthony and West Mesa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plots in Figures 6-15 through 6-20 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

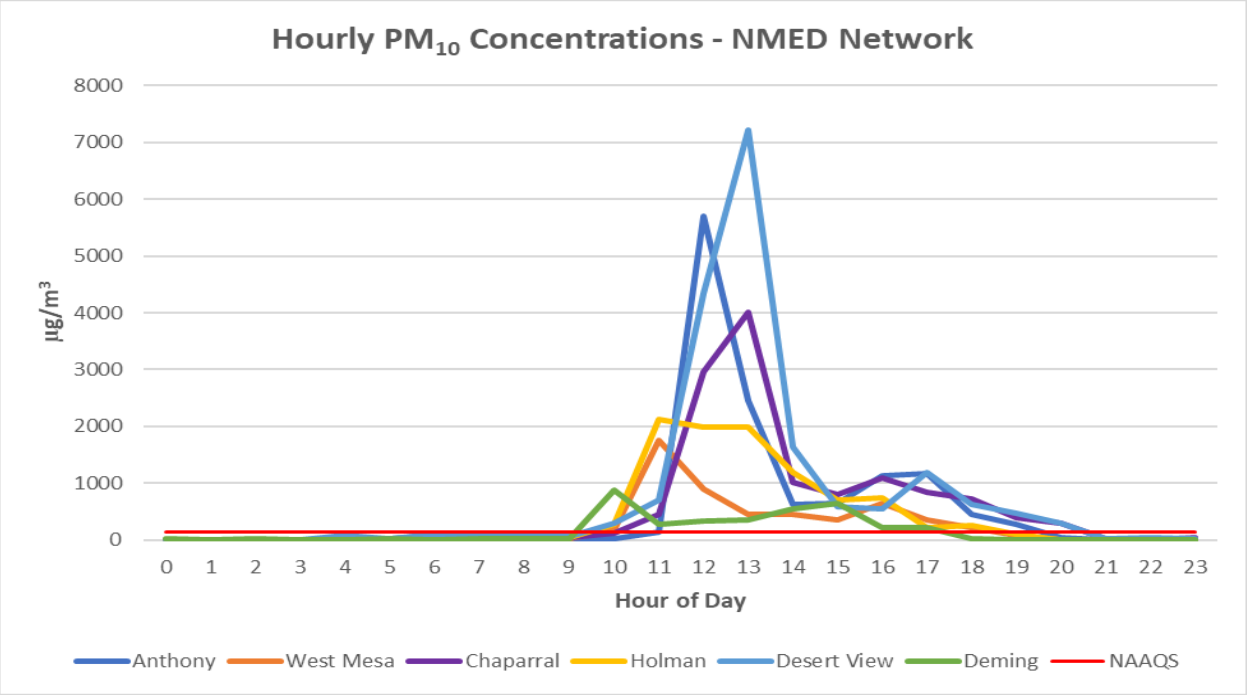


Figure 6-14. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

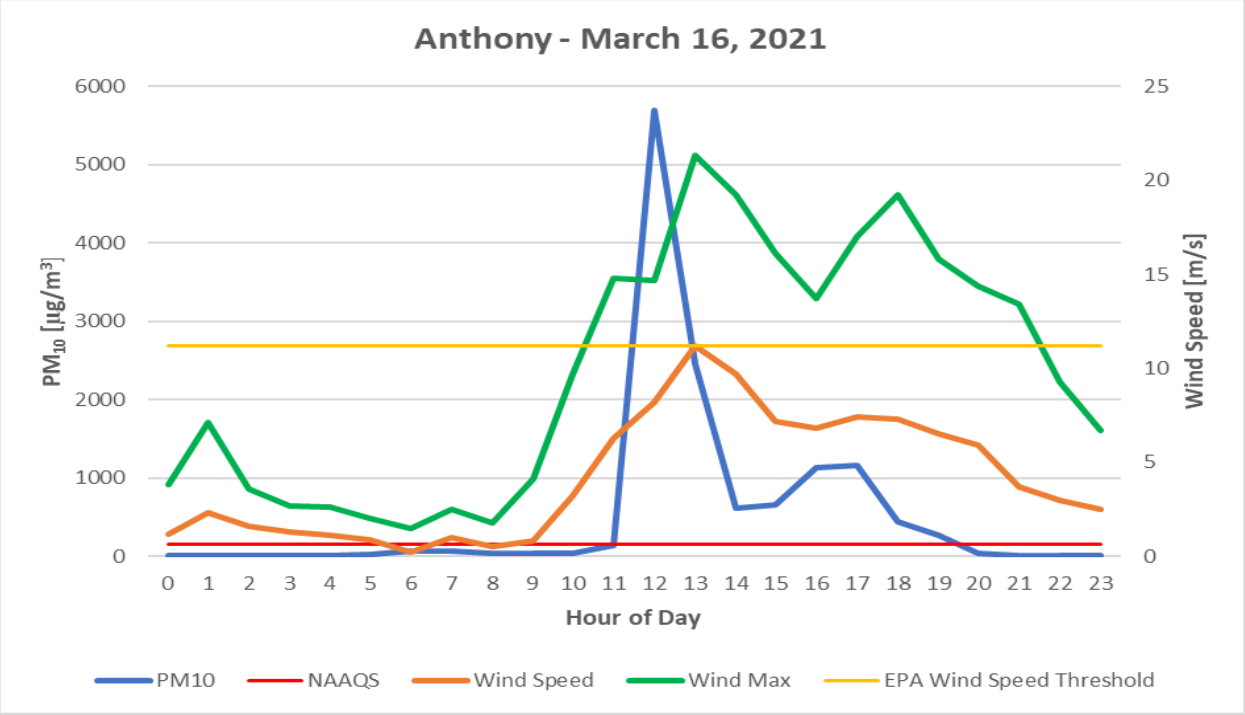


Figure 6-15. Anthony monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

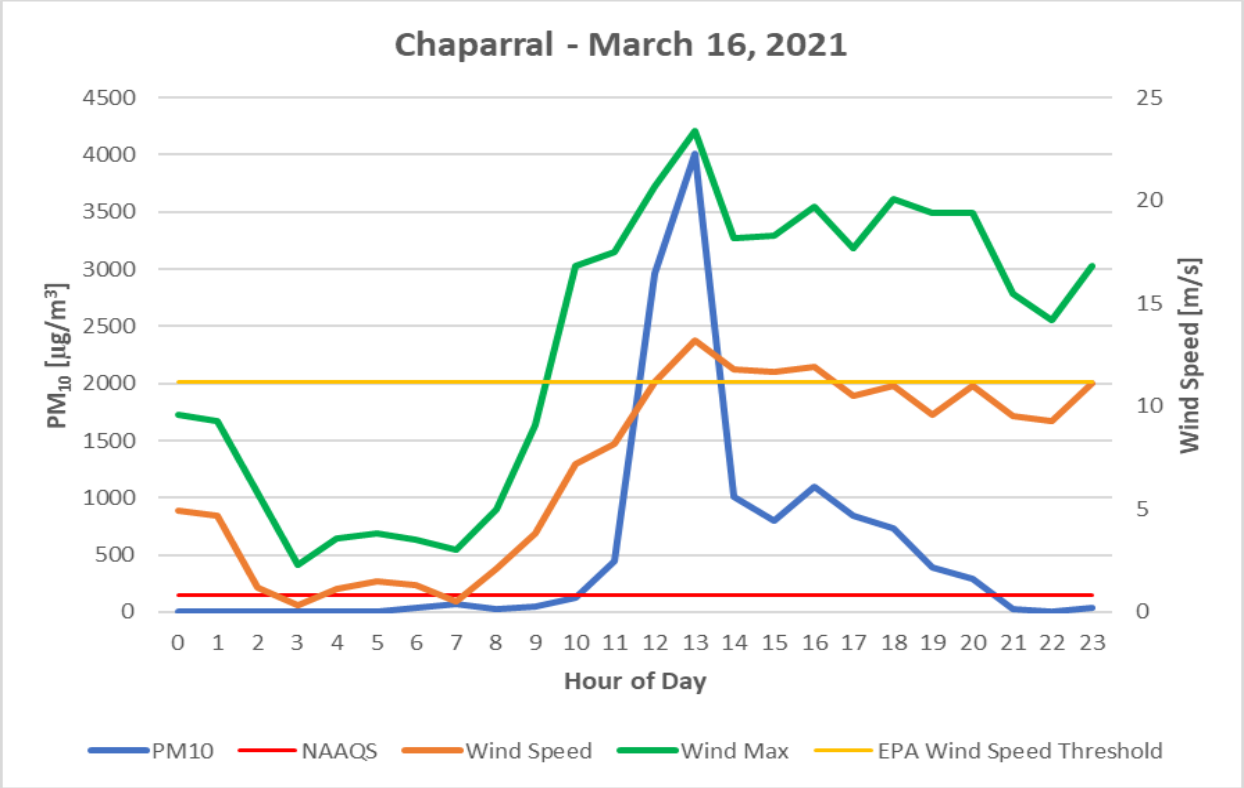


Figure 6-16. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

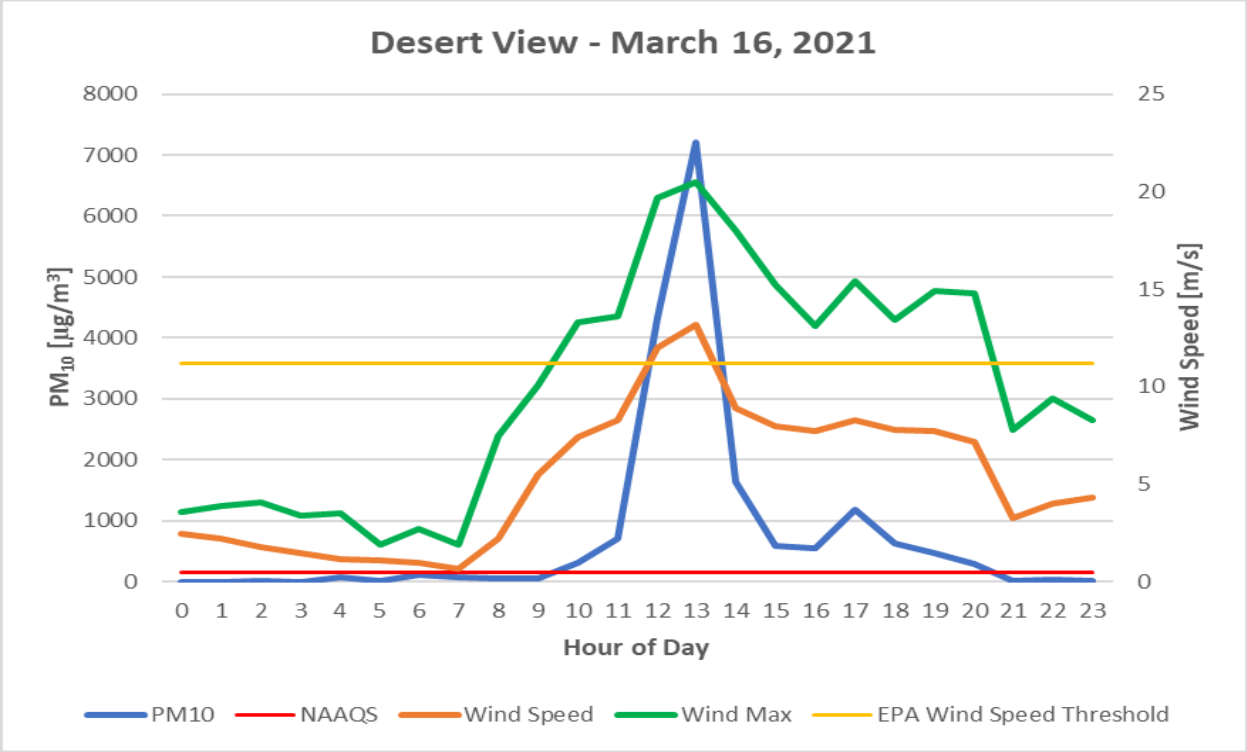


Figure 6-17. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

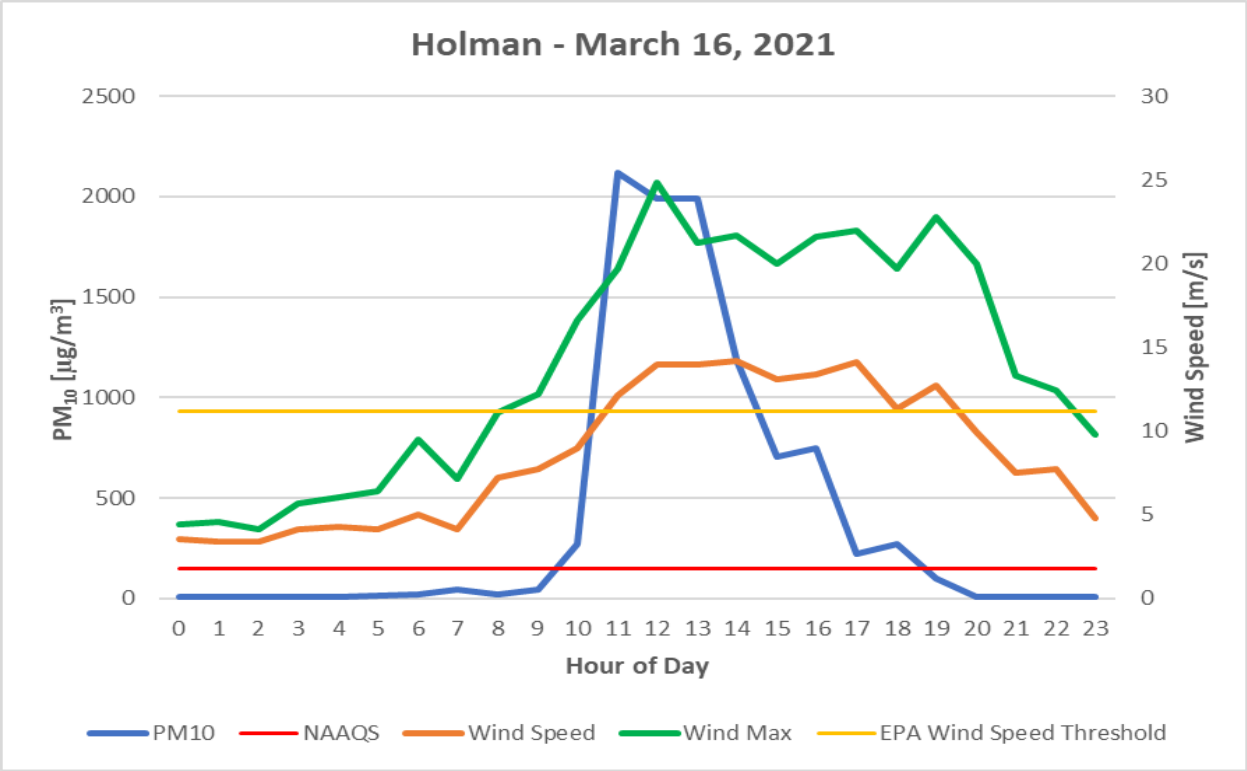


Figure 6-18. Holman monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

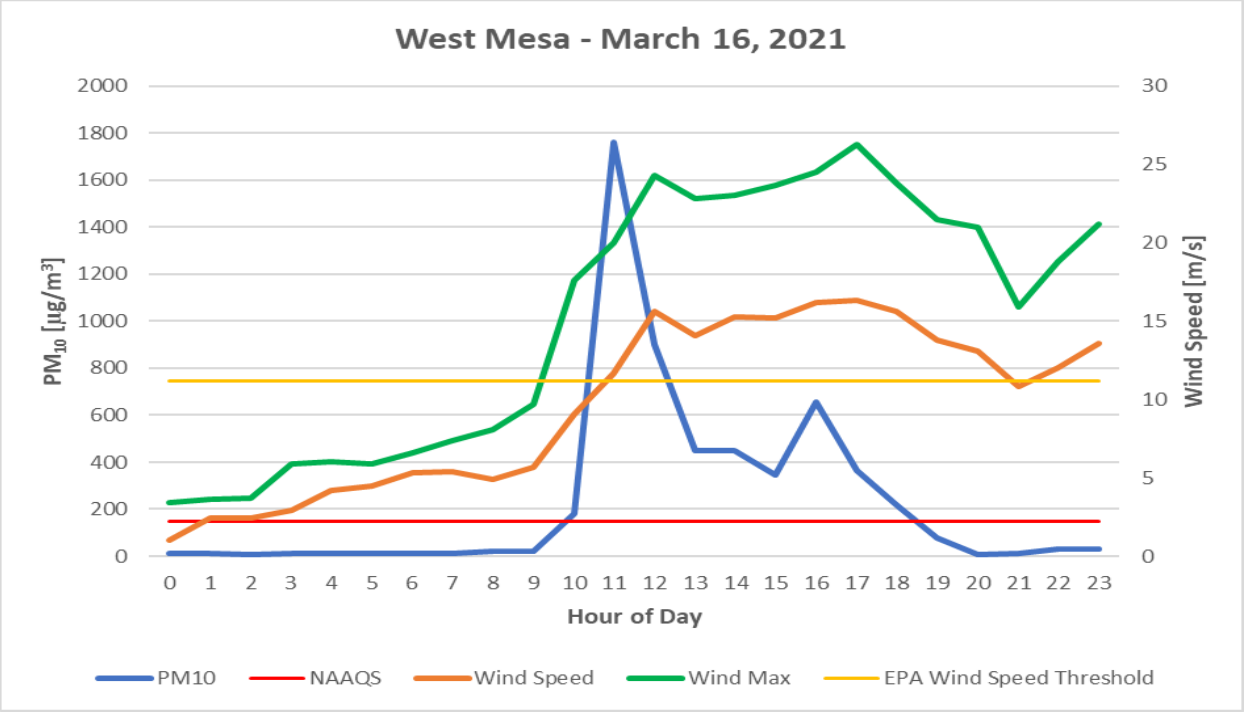


Figure 6-19. West Mesa monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

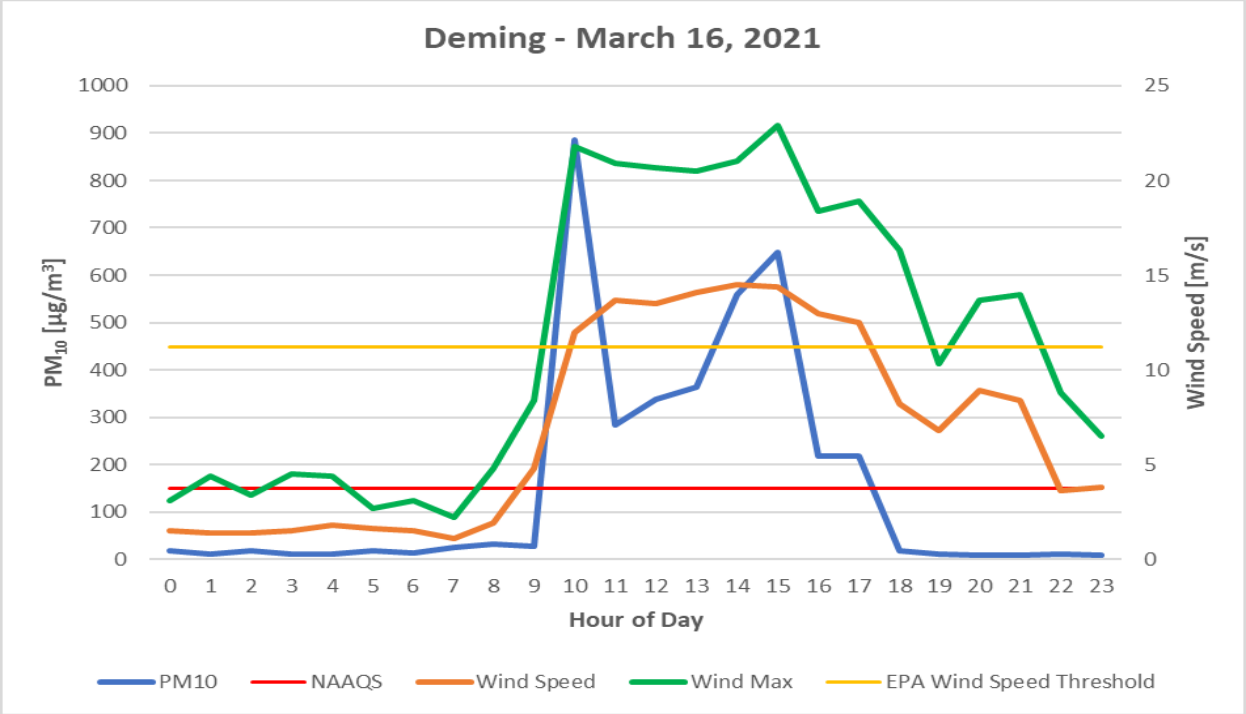


Figure 6-20. Deming monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED monitoring sites recorded 24 (Anthony), 25 (Chaparral), 32 (Desert View), 10 (Holman), 4 (West Mesa), and 14 (Deming) exceedances of the PM_{10} NAAQS (Figures 18-1 through 18-6 in Appendix A). The maximum 24-hour average PM_{10} concentrations at these sites were 506 (Anthony), 721 (Chaparral), 734 (Desert View), 691 (Holman), 351 (West Mesa), and 721 (Deming) µg/m^3 recorded in 2019, except for the Chaparral monitoring site which was in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 6-21, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 99 µg/m^3, except for the previous March 13, 2021, and March 14, 2021, event days, demonstrating the influence high winds have on PM_{10} concentrations in the area.

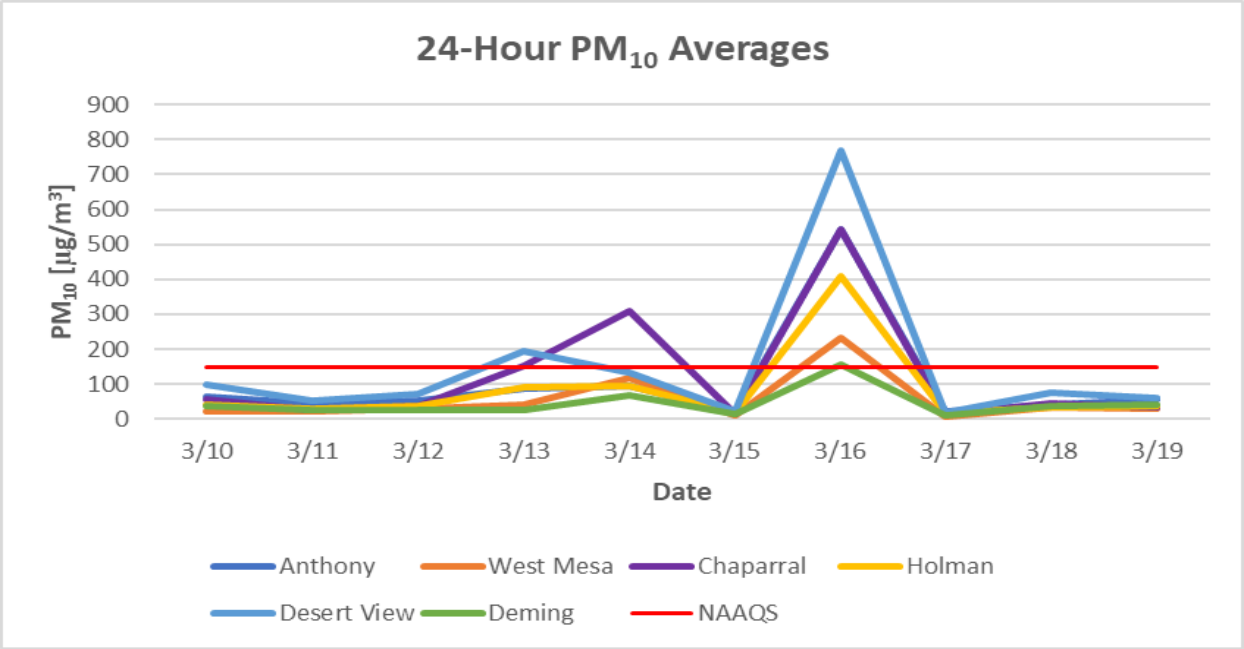


Figure 6-21. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for this day 541 (Anthony), 542 (Chaparral), 769 (Desert View), 408 (Holman), 234 (West Mesa), and 157 (Deming) µg/m^3 are above the 99th percentile of data monitored over the previous five years.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour averages of 541 (Anthony), 542 (Chaparral) 769 (Desert View), 408 (Holman), 234 (West Mesa), and 157 (Deming) µg/m^3 are above the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedances on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedances associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

7. HIGH WIND EXCEPTIONAL EVENT: April 17, 2021

Conceptual Model

A backdoor cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Desert View monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 7-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0021	6ZM Desert View	183 µg/m^3	10.5 m/s	16.3 m/s

Table 7-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

A strong late season backdoor cold front moving through southern New Mexico will begin early morning with strong cold winds. As the storm system moves through the state, a westerly pressure gradient will start forming over southwestern Texas, southern New Mexico and eastern Arizona. At the 1800 hour, the area of low-pressure extends into the Four Corners (Figure 7-1). Aloft, the deep trough axis of the storm system hovered over the Great Basin. As the day progressed this low-pressure aloft traveled west and aligned itself with New Mexico and tapped into the surface wind direction while sustaining wind speeds (Figure 7-2). Diurnal heating of the surface at sunrise allowed winds aloft to mix down creating enough convective energy to increase surface wind velocities providing the turbulence required for vertical mixing and entrainment of dust.

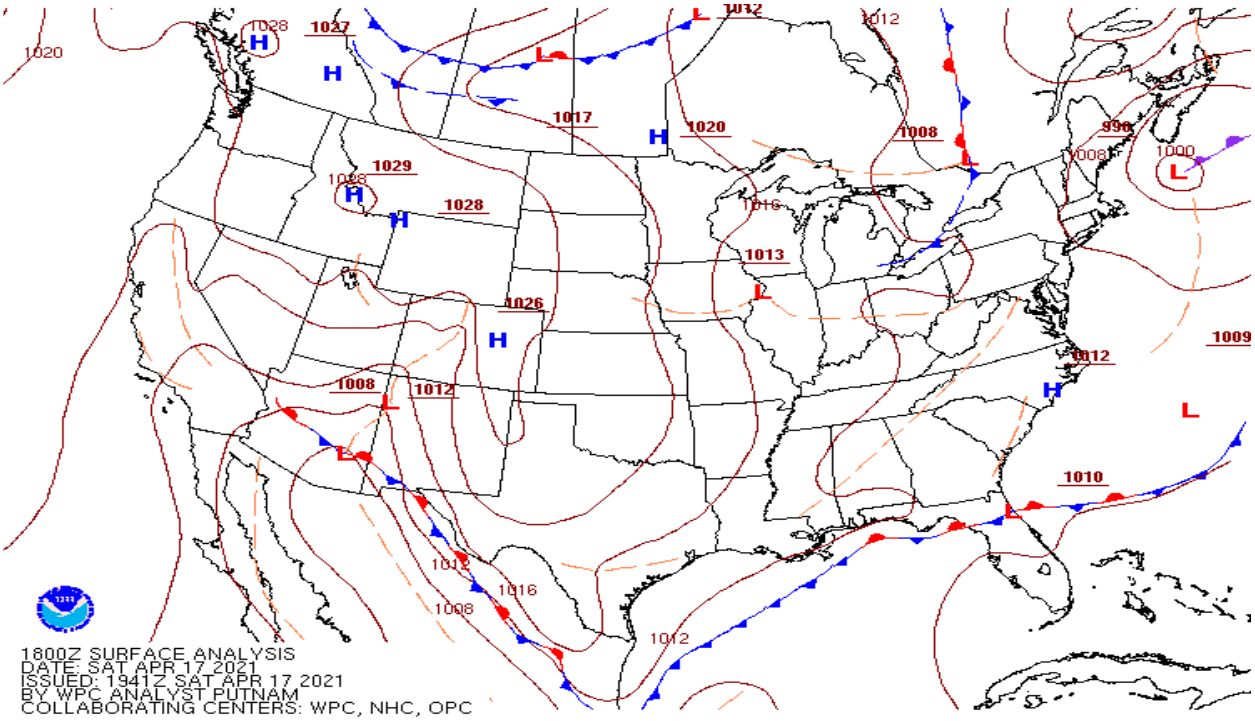


Figure 7-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

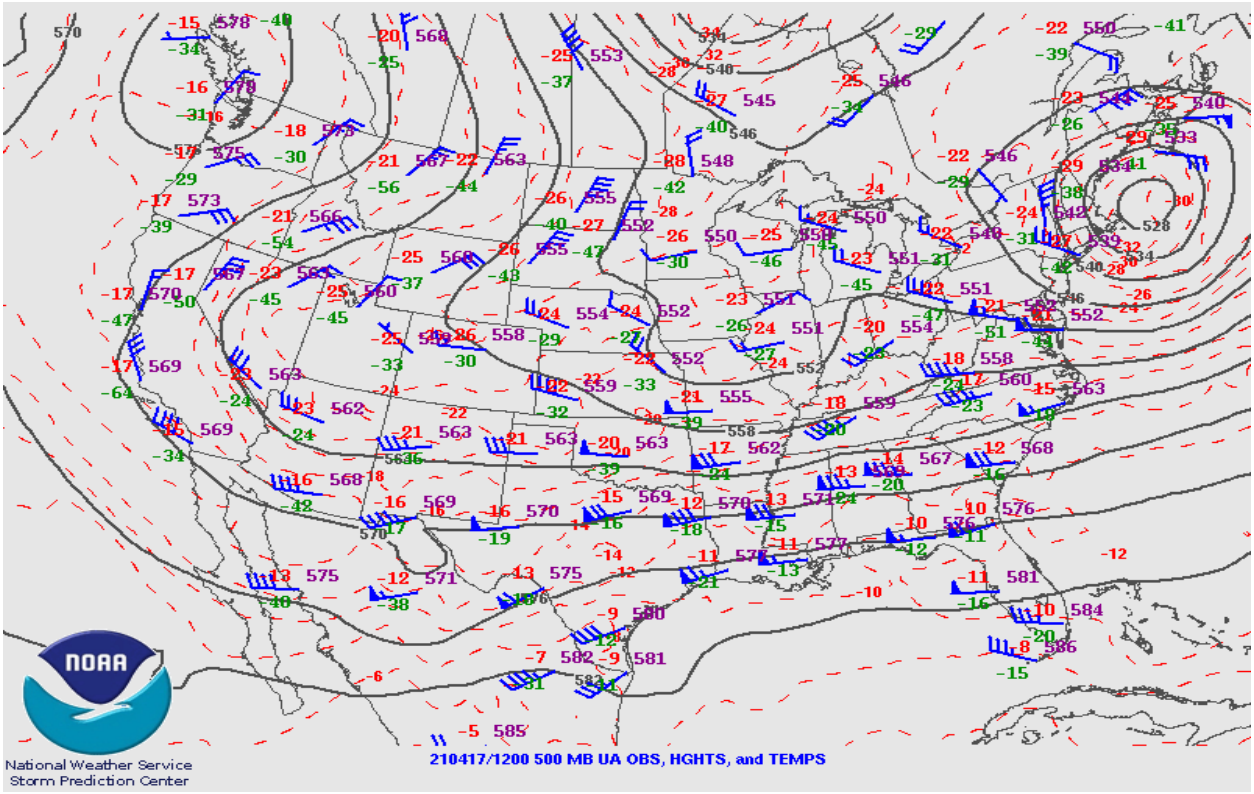


Figure 7-2. Upper air weather map for April 17, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the east-southeast throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at Desert View, Holman, and West Mesa monitoring sites beginning at the 0300 hour and lasted through the 2200 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0000 hour. Hourly concentrations remained elevated through the 2200 hour. Table 7-2 below summarizes peak hourly PM_{10} concentrations, wind speeds, and wind gusts during the event. Additionally, Santa Teresa and La Union five-minute wind speed data is provided in Table 7-3.

Hour	Desert View			Chaparral			Anthony		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0000	124	3.3	10.3	295	7.5	13	459	7.7	14.2
0100	112	4.7	12.7	144	5.6	14	144	3.4	8.6
0200	317	7.6	12.8	83	4	10.9	41	1.9	6.3
0300	544	9	14.4	136	2.9	8.1	85	1.8	4.9
0400	234	7.6	12.4	83	4	9.6	80	2.6	7.5
0500	373	8.2	13	158	5.8	9.1	100	1.7	5.4
0600	312	8.9	14.6	227	7.9	11.8	132	1.6	4.1
0700	439	10.5	15.4	1222	5.7	9.1	105	2.2	5.5
0800	329	10.3	16.3	36	2.4	5.3	146	6.4	12.1
0900	210	9.5	15	34	3.4	7	88	6	11.6
1000	259	9.6	14.7	46	5.7	10.1	58	5.3	11.3
1100	381	10.1	15.1	41	5	9.5	39	5.2	9.8
1200	149	8.6	15.5	24	5.3	9.4	58	5.9	10.2
1300	136	8.4	15.2	27	5.6	10.1	41	5.1	9.3
1400	63	8.2	13.5	24	5.6	10.2	36	4	8.5
1500	70	8.5	14.2	34	6.2	10.4	36	4.9	9.7
1600	58	8.1	14.2	29	5.8	10.4	31	5.2	10.3
1700	44	7.5	12.3	24	5.7	10.4	34	5.2	9.4
1800	34	6.6	12.2	24	5.4	8.6	34	5.6	9.5
1900	39	7.1	11.2	22	5.3	9.8	58	7	11.8
2000	39	7.1	11.8	17	4	7.6	163	8.2	13.6
2100	58	7	13.3	17	3.2	7.1	188	8.7	14.3
2200	56	6.3	11.5	27	5.4	12.2	136	8.1	14.7

Table 7-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Hour	Santa Teresa		La Union	
	Wind Speed (m/s)	Wind Gust (m/s)	Wind Speed (m/s)	Wind Gust (m/s)
0300	9.6	18.5	9.6	16
0400	9.4	14.8	6.4	12.9
0500	10.5	16.2	7.6	12
0600	10	16.2	8.5	13.8
0700	11.6	18.5	7.2	12.3
0800	10.4	15.9	5.2	8.3
0900	10.5	16.2	4.5	8.2
1000	11.4	17.1	6.8	10.7
1100	11.2	16.4	7.3	11
1200	10.4	15.6	6.3	10.4
1300	9.5	15.6	6.2	10.9
1400	9.4	14.1	5.9	9.6
1500	9.2	15.2	5.8	10.7
1600	9	14.5	5.6	10.5
1700	8.6	14.2	5.2	9.1
1800	7.8	12.2	4.3	7.6
1900	8.4	13.5	3.3	7.3
2000	8	13.4	3.1	6.8
2100	8.8	14.1	2.2	7.1
2200	9.5	15.1	2.3	6.4

Table 7-3 Hourly wind speeds for the Santa Teresa and La Union monitoring sites.

Meteorologists forecasted the high wind blowing dust event to occur this day, as the spring windy season begins in March for most of the southwestern United States. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from east to west moving across New Mexico in the early morning hours. The systems movement across the area timed well with daytime heating and mixing generating a deep trough to the west as strong winds continued throughout the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area, especially in the desert areas of southern New Mexico (Figure 7-3).

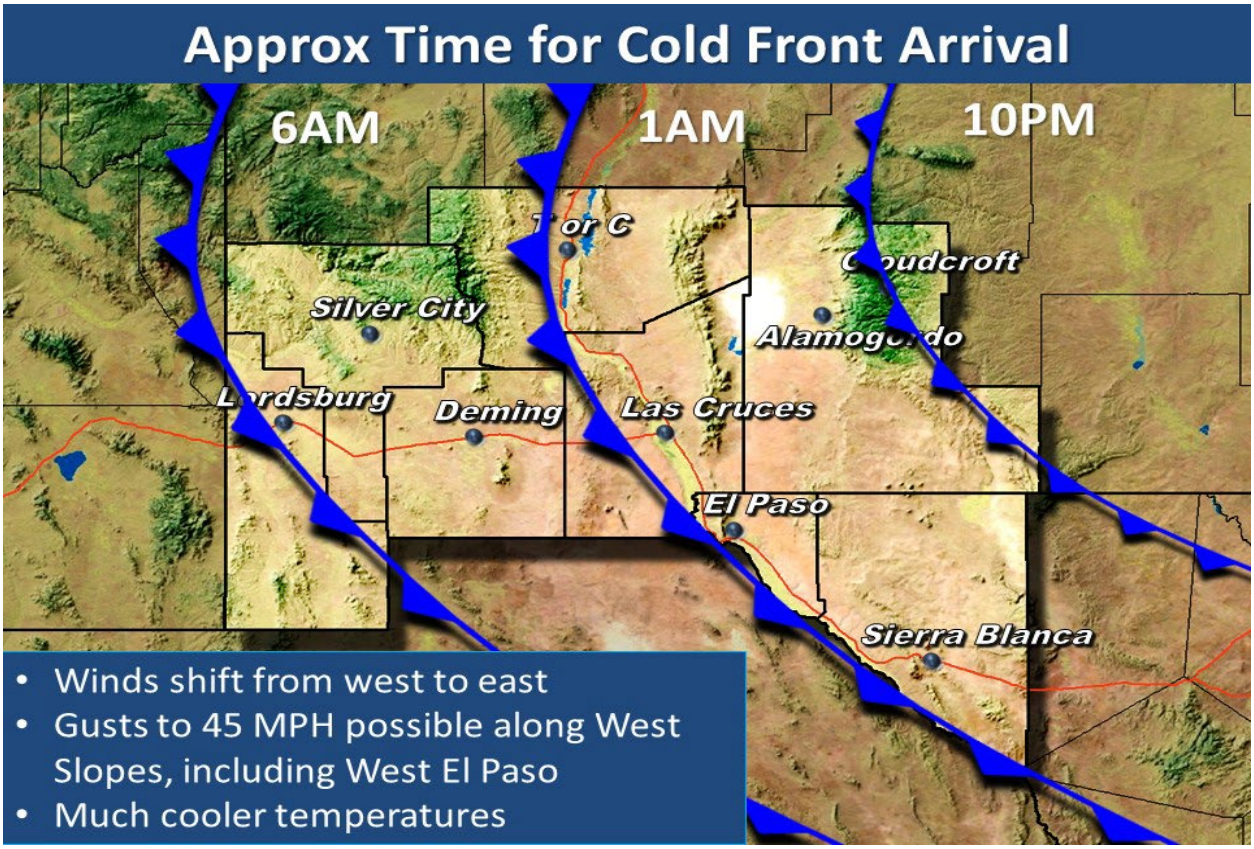


Figure 7-3. NWS Forecast Graphic for the event.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Santa Teresa monitoring site recorded wind speeds above this threshold for 3 hours for the 0700, 1000, and 1100 hours (Figure 7-4).

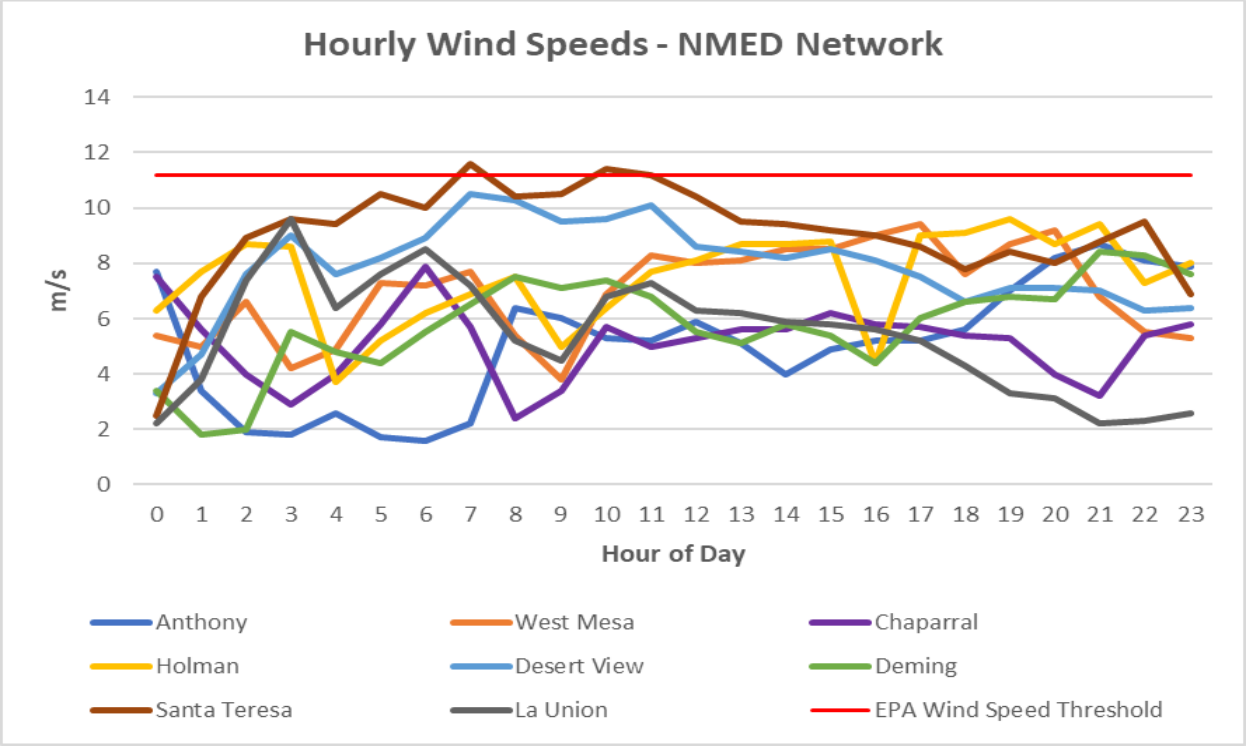


Figure 7-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual

PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Otero, Eddy, Lea, and Chavez Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Texas and Chihuahua, MX likely contributed to the exceedances on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on satellite imagery with dust plumes that are characterized as warm colors in the GOES-16 geostationary satellite Aerosol Optical Depth (AOD) dust product originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 7-5). The dust plumes of interest appear to be limited to Mexico, orientated in a northwest to southeast direction and traveling toward El Paso and NMED's monitoring sites at the time of the satellite observation (1441 hour MST) that captured the imagery.

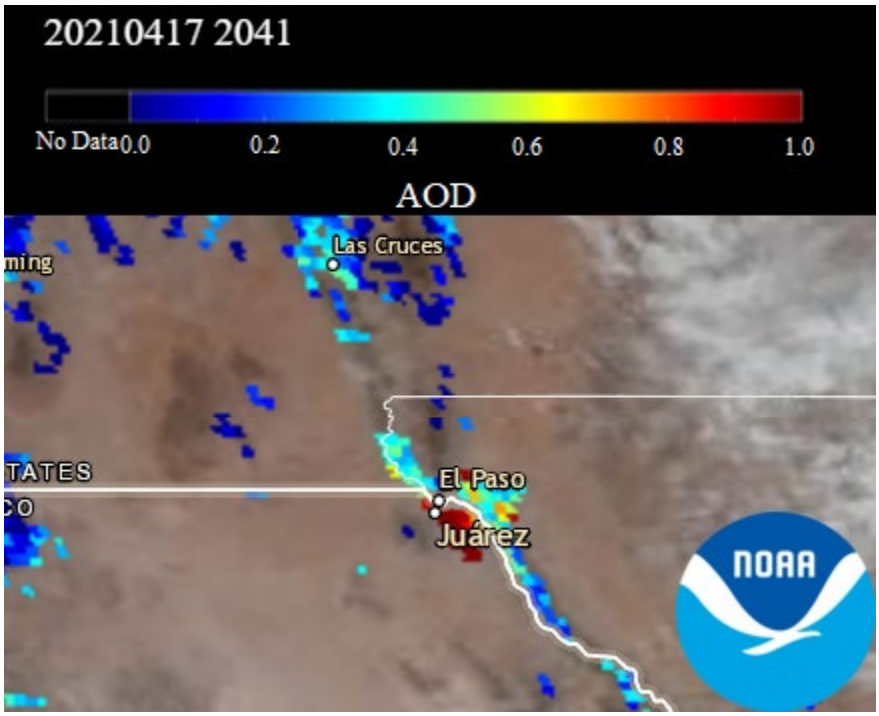


Figure 7-5. Aerosol Optical Depth (AOD) product imagery from the GOES-16 geostationary satellite showing southwestern New Mexico, northern Chihuahua and western Texas. Imagery obtained from NASA's AerosolWatch website.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this date. A Hazardous Weather Outlook is a statement issued by NWS to provide information to the public about potential adverse weather events. A Hazardous Weather Outlook statement was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook and Area Forecast Discussion can be found below:

“Gusty southeasterly winds will persist through mid-day before subsiding slightly…A slight chance for rain will develop across the lowlands later this evening into the overnight hours. Western slopes of area mountains will see wind gusts increase again tonight.”

The El Paso NWS tweets posted late night (2318 MST) April 16, 2021, and early morning (0250 MST) April 17, 2021, radar demonstrates the progression of the backdoor cold front that swept through the region by the blue line that travels from northeast to southeast (Figure 7-6).

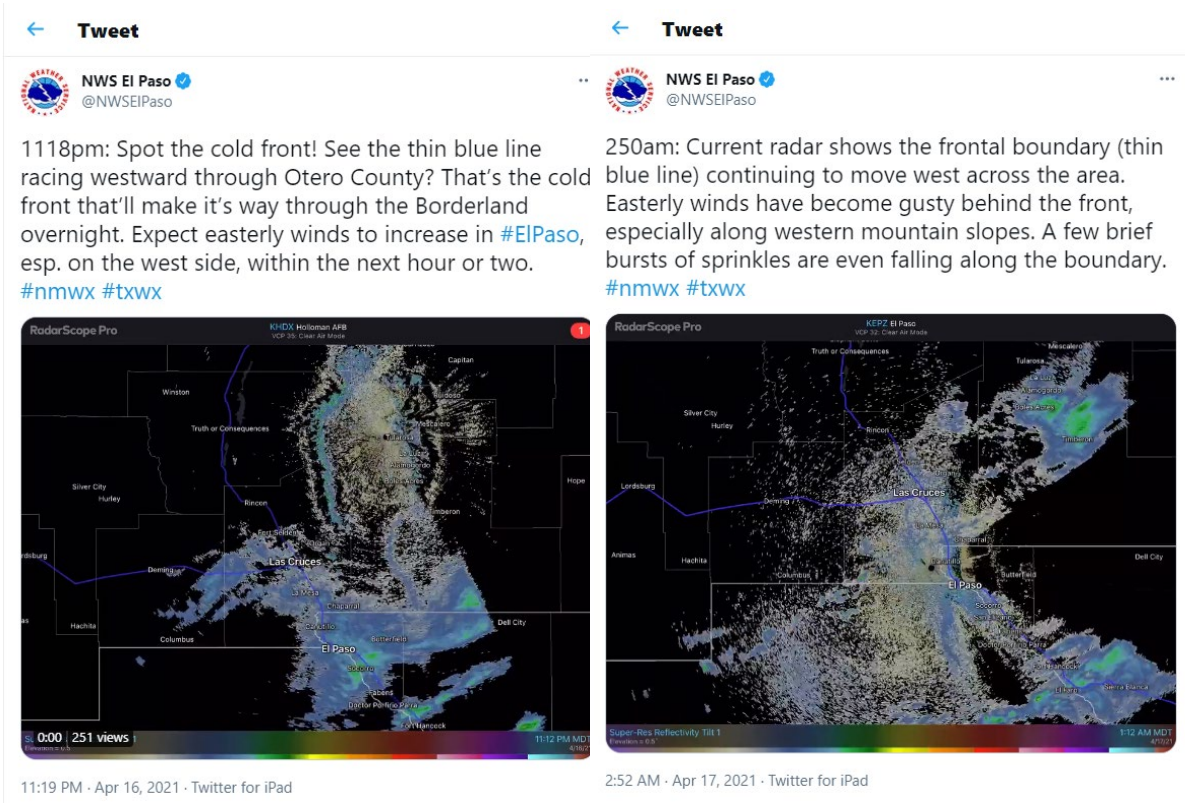


Figure 7-6. El Paso NWS tweets posted radar images demonstrating progression of fast-moving cold front the night of April 16, 2021, and early morning of April 17, 2021.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX and west Texas into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 7-7). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

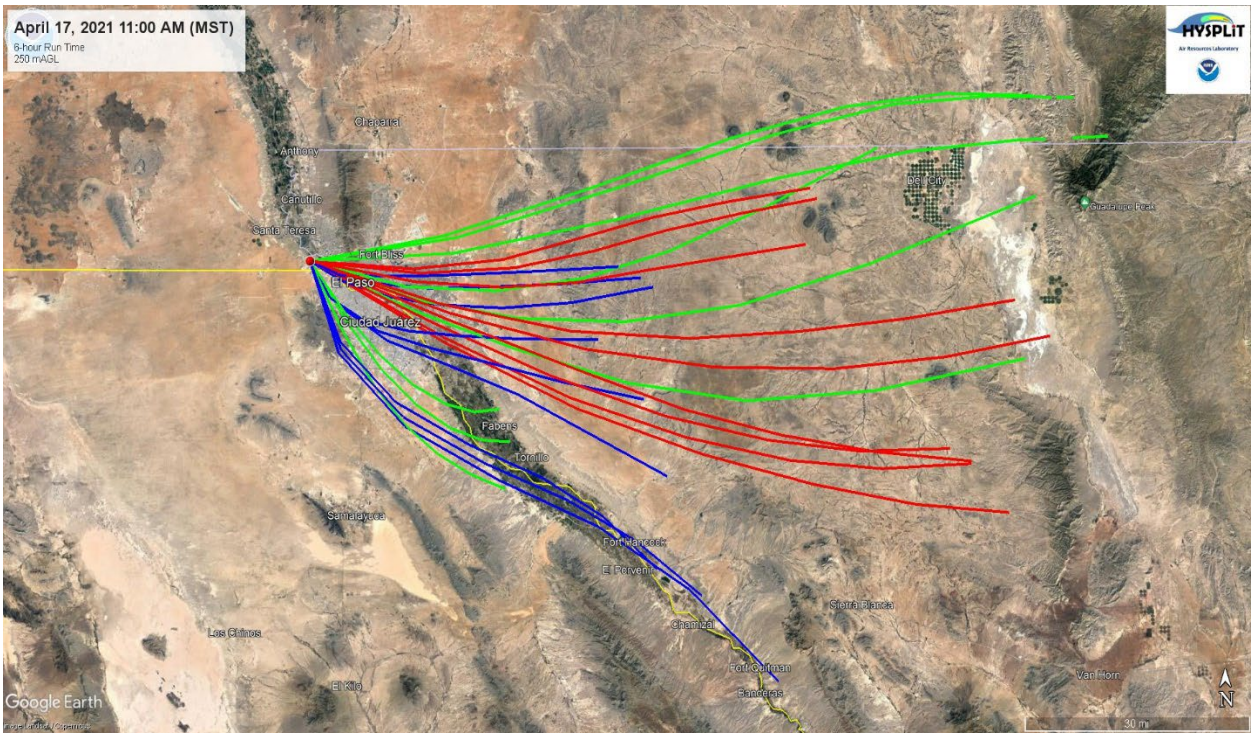


Figure 7-7. HYSPLiT back-trajectory analyses using the Ensemble mode for the Desert View monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 7-8) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m³ (0000-1100 hour). During the event, winds primarily blew from the east southeast approximately 100% of time coinciding with peak PM_{10} concentrations.

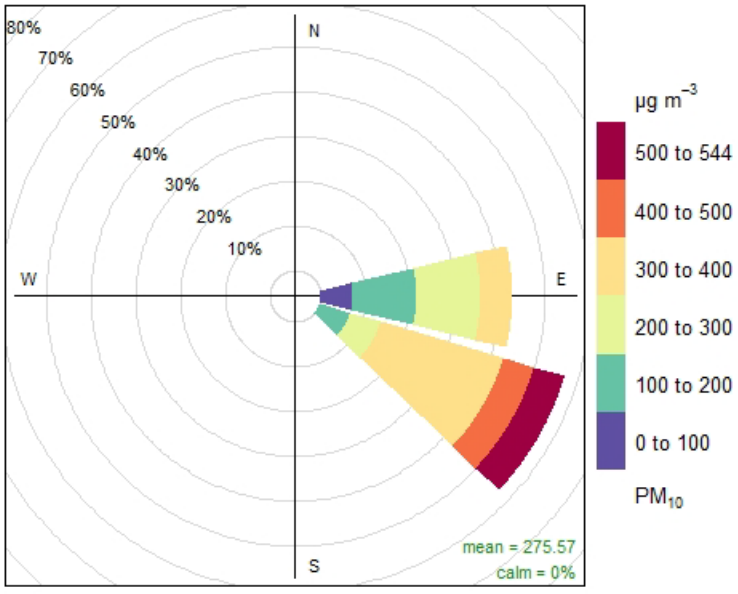


Figure 7-8. Pollution rose for the Desert View monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong east-southeasterly winds beginning at the 0300 hour and lasting through the 2200 hour. During this time, peak hourly PM_{10} concentrations ranged from 163 to 544 µg/m^3 were recorded at the West Mesa and Desert View monitoring sites, respectively (Figure 7-9). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds ranged from 7.9 to 11.6 m/s were recorded at the Chaparral and Santa Teresa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plots in Figure 7-10 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

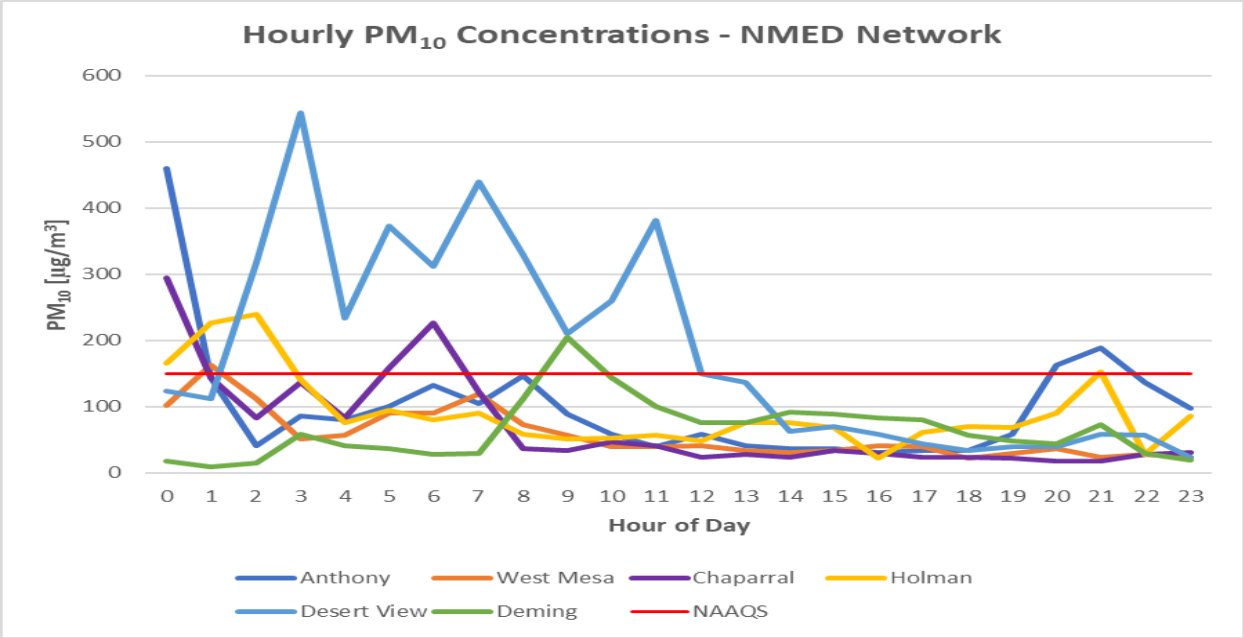


Figure 7-9. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

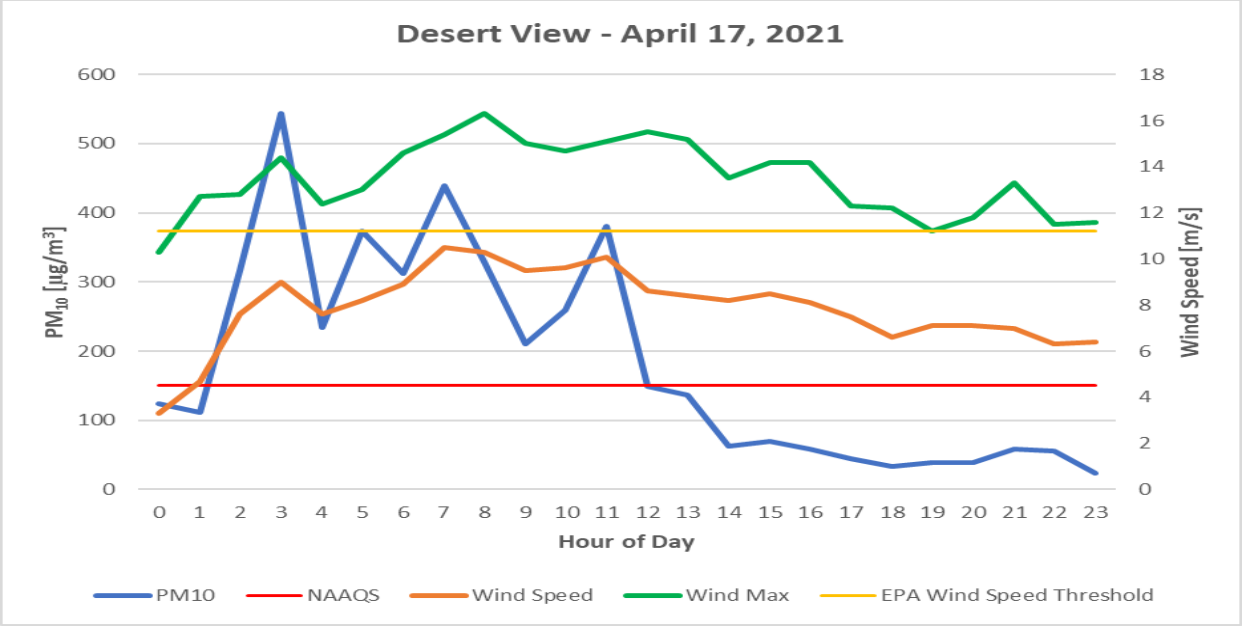


Figure 7-10. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Desert View monitoring site recorded 32 exceedances of the PM_{10} NAAQS (Figure 18-2 in Appendix A). The maximum 24-hour average PM_{10} concentration at this site was 734 µg/m^3, recorded in 2019. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 7-11, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 96 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

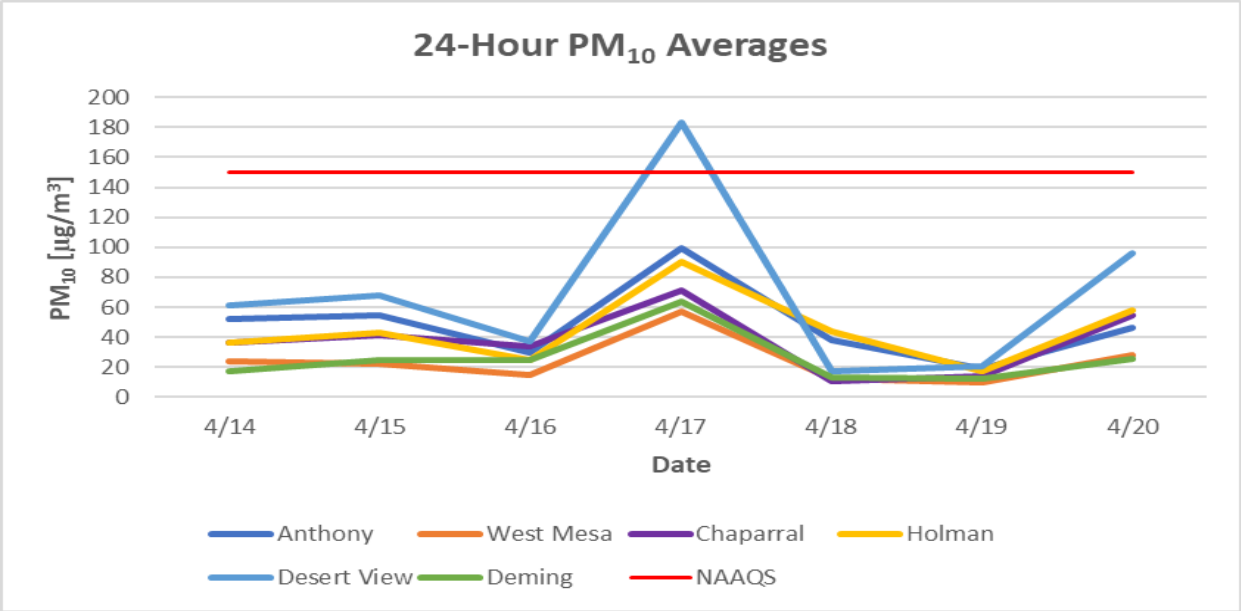


Figure 7-11. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (183 µg/m^3) is above the 95th percentile.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (187 µg/m^3) is above the 95th percentile monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedances on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedances associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

8. HIGH WIND EXCEPTIONAL EVENT: May 3, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Chaparral monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 8-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	291 µg/m^3	9.2 m/s	16.2 m/s

Table 8-1 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

An upper-level trough moving through southern New Mexico today shortly after yesterday's lee surface low is creating early morning windy conditions in the region. At the 1800 hour, an area of low-pressure moved east of the Four Corners (Figure 8-1). Aloft, the low-pressure center of the storm system hovered over eastern Arizona and aligned itself with New Mexico and the surface wind direction (Figure 8-2). Early morning heating of the surface allowed winds aloft to mix down, increasing surface wind velocities providing the turbulence required for the suspension of localized dust into the air from the surface to subside by noon.

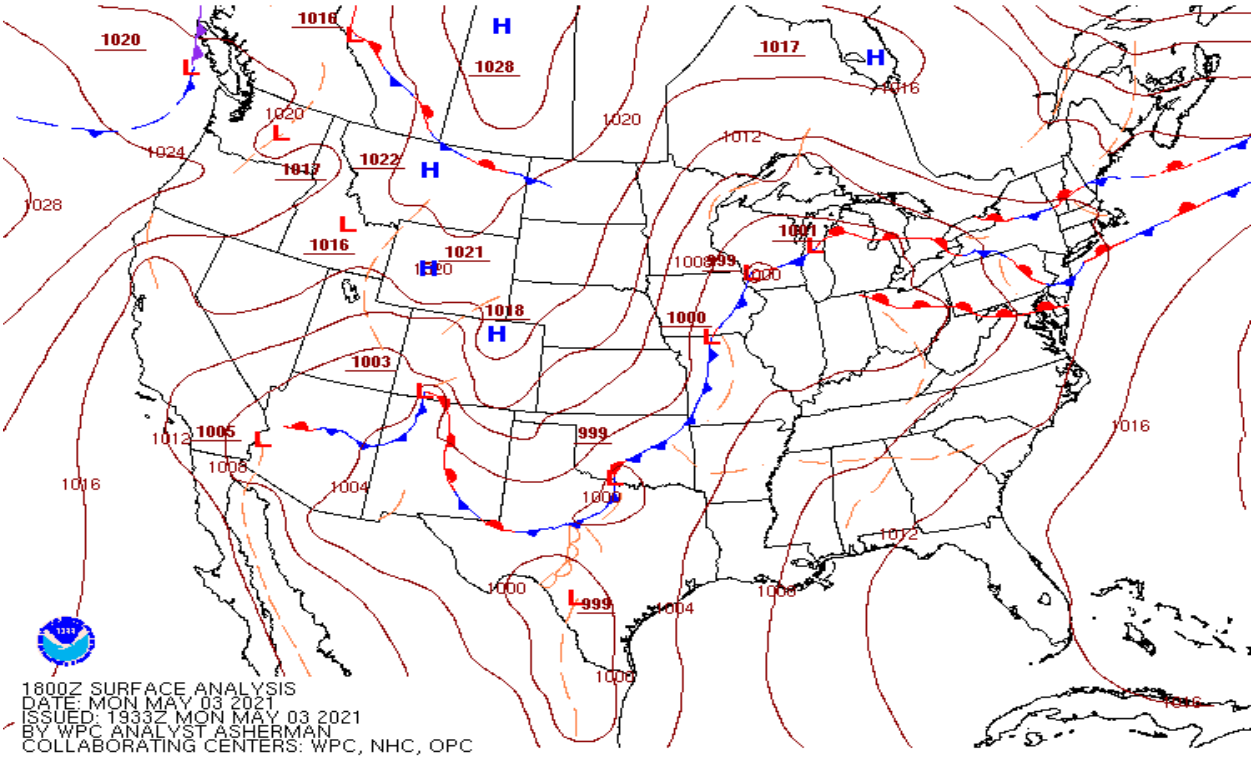


Figure 8-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

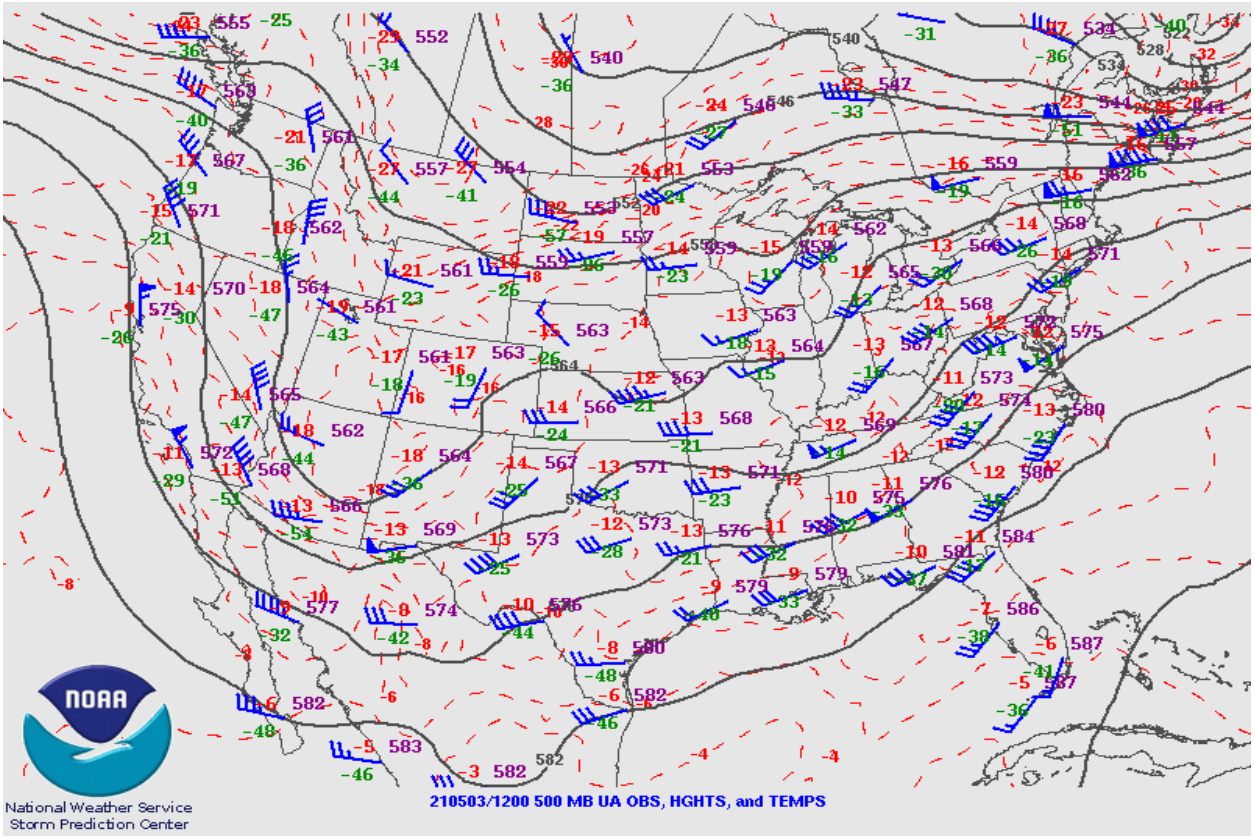


Figure 8-2. Upper air weather map for May 3, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at Chaparral and West Mesa monitoring sites intermittently beginning at the 0100 hour and resumed at the 0800 through 0900 hours then again at the 1600 hour; in addition, recorded wind speed data at the El Paso International Airport shows sustained hourly wind speeds beginning at the 0051 hour proceeding until the 0251 hour intermittently at the 1051 hour to resume again until the 1651 hour (Figure 8-5). PM_{10} concentrations began to exceed the NAAQS at the Chaparral monitoring site beginning at the 0800 hour. Hourly concentrations remained elevated through the 1100 hour. Table 8-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event. Additionally, five-minute wind speed data is provided during when peak wind speeds for the Chaparral monitoring site contributed to peak PM_{10} concentrations (Table 8-3).

Hour	Holman			West Mesa			Chaparral		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0700	19	6.4	10.1	12	8.9	13.8	14	6	11.1
0800	31	4.6	7.5	12	9.2	13.4	923	7.9	14.8
0900	27	4.3	8.4	29	7.1	11.6	2671	9.2	16.2
1000	22	4.9	10.7	17	6.4	10.9	1585	8.5	14.7
1100	19	5.1	10.4	17	6.5	11.2	1081	8.7	16

Table 8-2 Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Hour	Chaparral				
	Wind Speed (m/s)	Wind Gust (m/s)	Hour	Wind Speed (m/s)	Wind Gust (m/s)
0800	7.9	11.4	0940	9.4	13.1
0805	8.2	11.2	0945	9	13.7
0810	6.3	9.8	0950	8.3	13
0815	8.7	11.9	0955	8.8	12.8
0820	7.7	11	1000	8.4	14.4
0825	7.7	11.6	1005	10.1	14.7
0830	8.1	11.3	1010	9.1	12.6
0835	7.4	10.7	1015	8.9	14.4
0840	7.3	10	1020	7.2	11.6
0845	8.5	14.8	1025	8.8	13
0850	8.2	12.6	1030	6.6	13.5
0855	8.4	12.5	1035	9.5	14.1
0900	9.9	15.1	1040	8	14.5
0905	9	13.5	1045	9.8	13.8
0910	9.1	13.8	1050	7.1	10.8
0915	7.7	10.4	1055	8.4	14.1
0920	9.1	14.4	1100	9.2	16
0925	10	16.2	1105	8.7	13.7
0930	10.3	14.8	1110	9.4	13.2
0935	9.5	13.6	1115	7.3	11.8

Table 8-3. Five-minute wind speed data for the Chaparral monitoring site.

Meteorologists forecasted the high wind blowing dust event to occur this day, as the spring windy season begins in March for most of the southwestern United States. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east just east of the Four Corners in the morning and moving across New Mexico in the afternoon. The system's movement across the area timed well with daytime heating and mixing generating a deep trough to the west as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and

entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico (Figure 8-3).

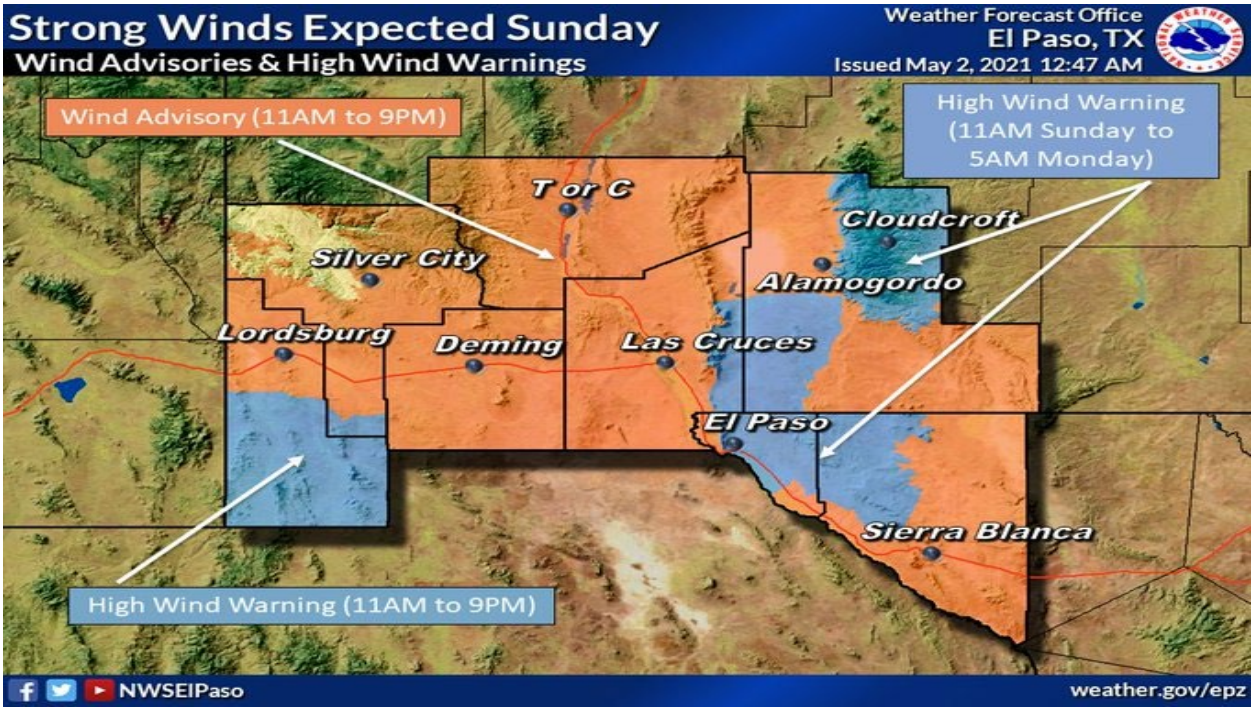


Figure 8-3. NWS GraphiCast product showing Wind Advisory forecast for southern Doña Ana and Luna Counties.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. Unfortunately, NMED monitoring sites did not record wind speeds above this threshold for this day (Figure 8-4). However, the El Paso International Airport one-hour wind speed data reached the high wind threshold for a total of two hours at the 0251 and 1551 hours (Figure 8-5).

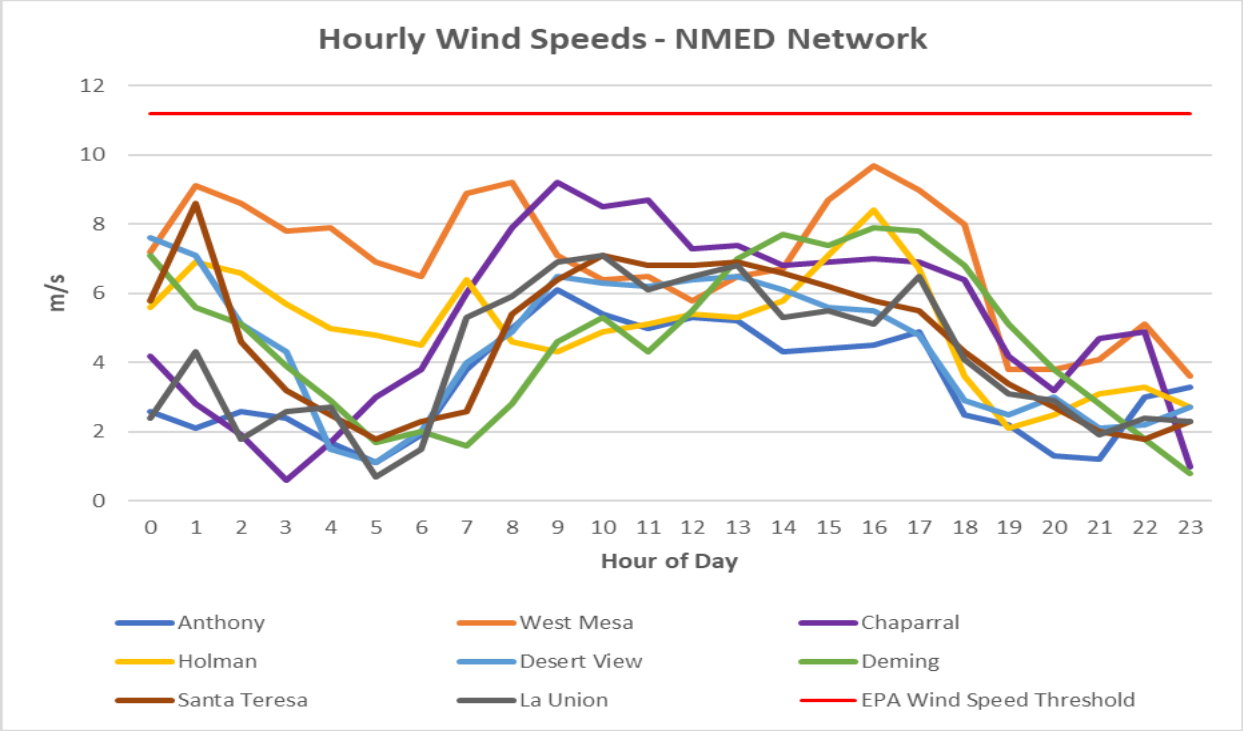


Figure 8-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

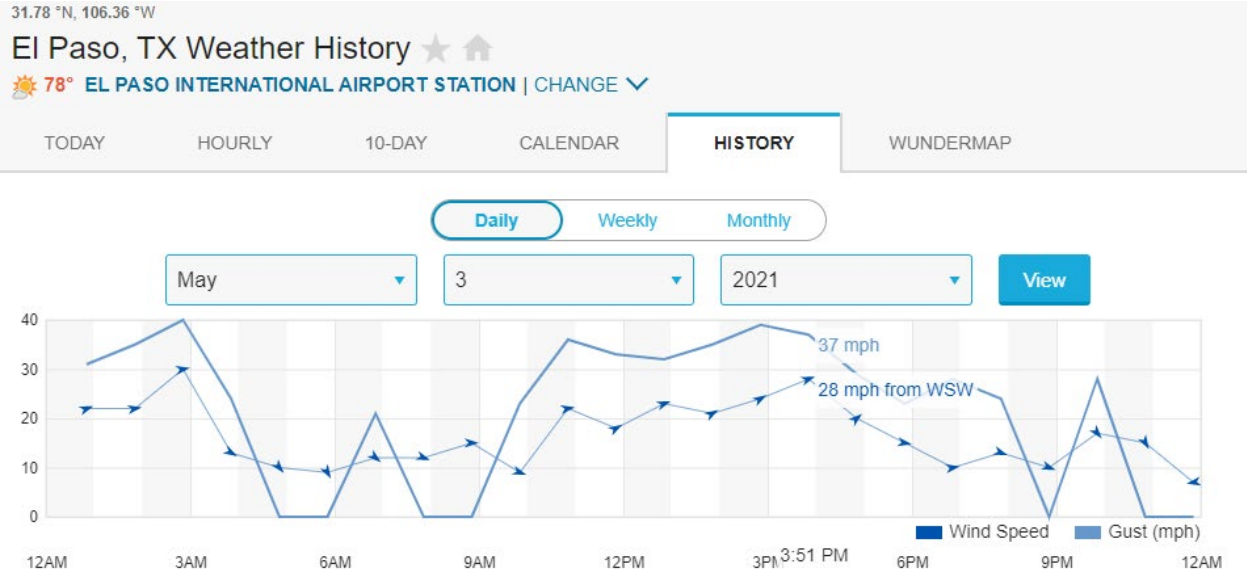


Figure 8-5. El Paso International Airport 1-hour wind speed data for May 3, 2021. Courtesy of Weather Underground.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedances on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedances were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on satellite imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 8-6). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward NMED's monitoring sites at the time of the satellite pass (1441 hour MDT) that captured the imagery.

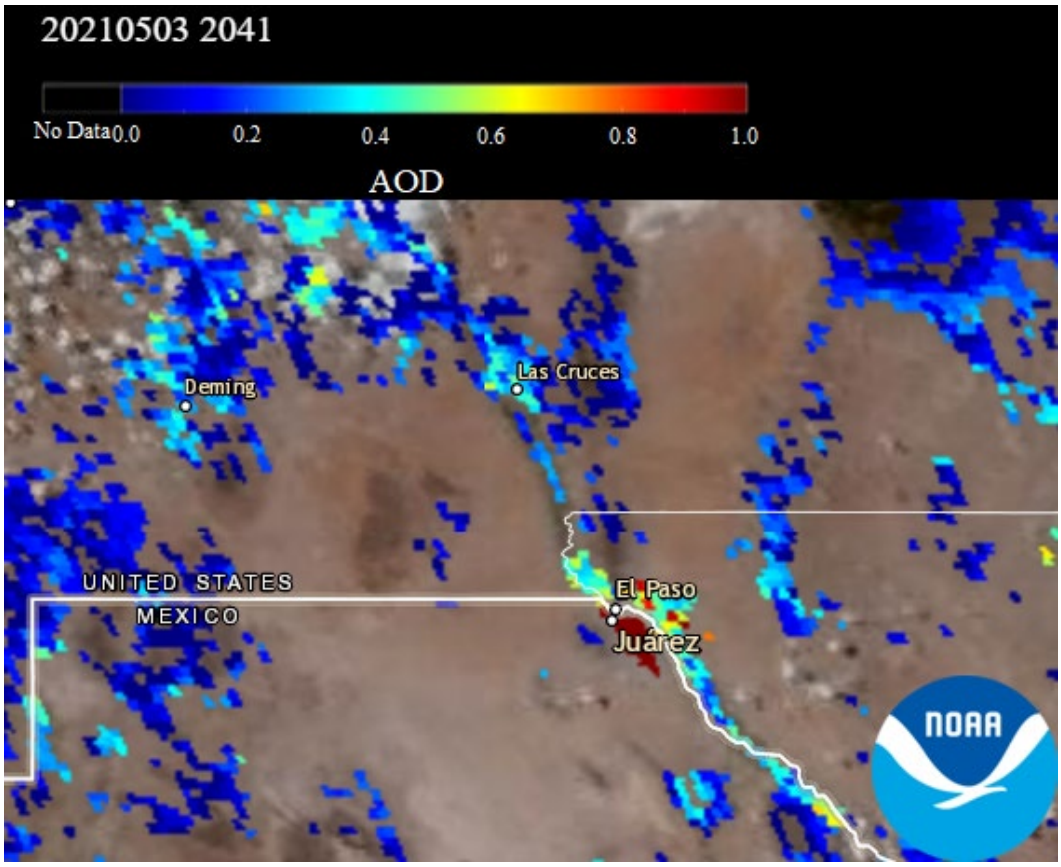


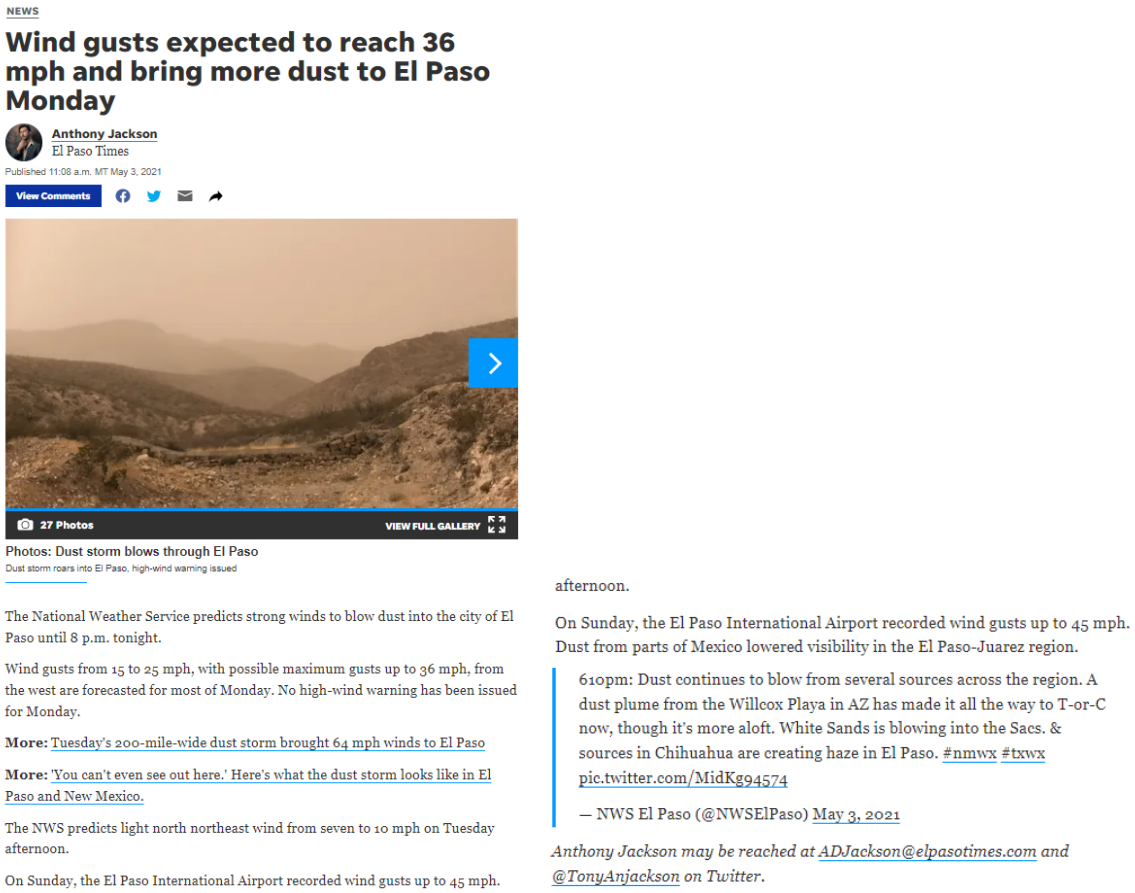
Figure 8-6. GOES satellite Composite AOD (1200-1500 MST) product imagery showing southwestern New Mexico, northern Chihuahua and far west Texas. Imagery obtained from NOAA AerosolWatch website.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a High Wind Warning for the early hours on this date and a Blowing Dust Advisory that ended at the 2000 hour the night before, May 2, 2021. A High Wind Warning is issued by NWS when sustained winds of 40 mph are expected for 1 hour or longer or gusts at 58 mph or greater. A Blowing Dust Advisory is issued when blowing dust is expected to reduce visibility to between ¼ to 1 mile, generally with winds of 25 mph or greater. These were in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS High Wind Warning and Blowing Dust Advisory can be found below:

"High Wind Warning until 5 AM MDT Monday…Blowing Dust Advisory until 8 PM MDT this evening…"

A news article in the El Paso Times is provided documenting the air quality impacts caused by the high wind blowing dust event in the Borderland for this date.



NEWS

Wind gusts expected to reach 36 mph and bring more dust to El Paso Monday

Anthony Jackson
El Paso Times

Published 11:08 a.m. MT May 3, 2021

View Comments

27 Photos VIEW FULL GALLERY

Photos: Dust storm blows through El Paso

Dust storm roars into El Paso, high-wind warning issued

The National Weather Service predicts strong winds to blow dust into the city of El Paso until 8 p.m. tonight.

Wind gusts from 15 to 25 mph, with possible maximum gusts up to 36 mph, from the west are forecasted for most of Monday. No high-wind warning has been issued for Monday.

More: Tuesday's 200-mile-wide dust storm brought 64 mph winds to El Paso

More: 'You can't even see out here.' Here's what the dust storm looks like in El Paso and New Mexico.

The NWS predicts light north northeast wind from seven to 10 mph on Tuesday afternoon.

On Sunday, the El Paso International Airport recorded wind gusts up to 45 mph.

afternoon.

On Sunday, the El Paso International Airport recorded wind gusts up to 45 mph. Dust from parts of Mexico lowered visibility in the El Paso-Juarez region.

> 610pm: Dust continues to blow from several sources across the region. A dust plume from the Willcox Playa in AZ has made it all the way to T-or-C now, though it's more aloft. White Sands is blowing into the Sacs. & sources in Chihuahua are creating haze in El Paso. #nmwx #txwx pic.twitter.com/MidKg94574
>
> — NWS El Paso (@NWSElPaso) May 3, 2021

Anthony Jackson may be reached at ADJackson@elpasotimes.com and @TonyAnjackson on Twitter.

Figure 8-7. El Paso Times article for May 3, 2021, showing air quality impacts from high wind blowing dust.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 8-7). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

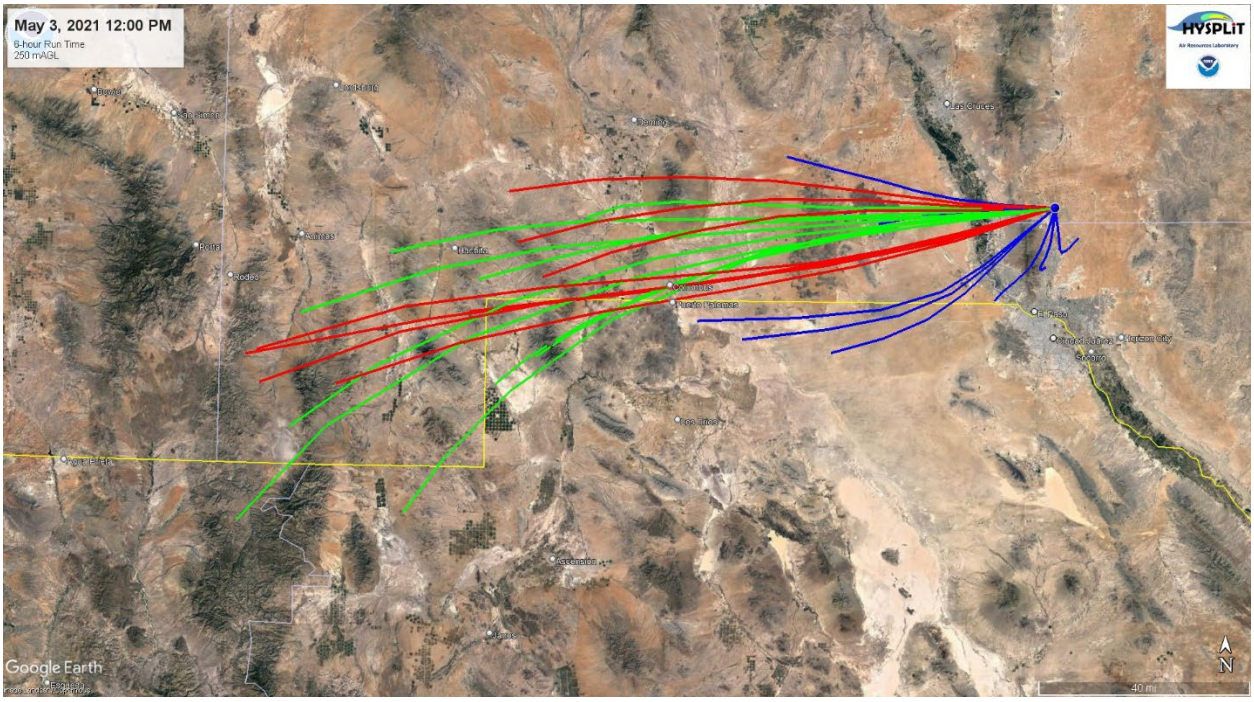


Figure 8-8. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 8-8) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0800 -1100 hour). During the event, winds blew from the southwest 100% of the time coinciding with peak PM_{10} concentrations.

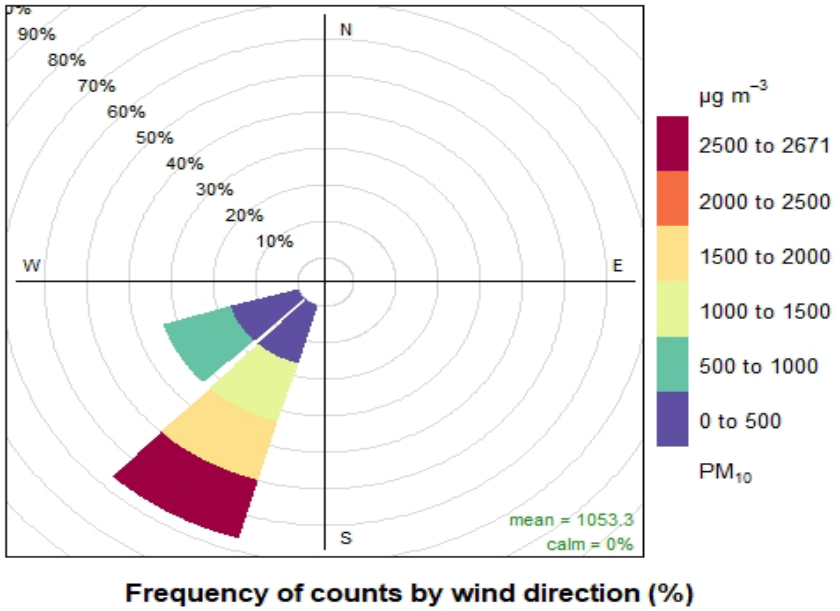


Figure 8-9. Pollution rose for the Chaparral monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southwesterly winds beginning at the 0100 hour and lasting through the 1600 hour. During this time, peak hourly PM_{10} concentrations ranged from 34 to 2671 µg/m^3 were recorded at the West Mesa and Chaparral monitoring sites, respectively (Figure 8-9). Since not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data only spiked for the Chaparral monitoring site. Sustained hourly average wind speeds ranged from 6.1 to 13.4 m/s were recorded at the Anthony monitoring site and El Paso International Airport, respectively, during the peak PM_{10} concentrations of the event. The time series plots in Figure 8-10 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

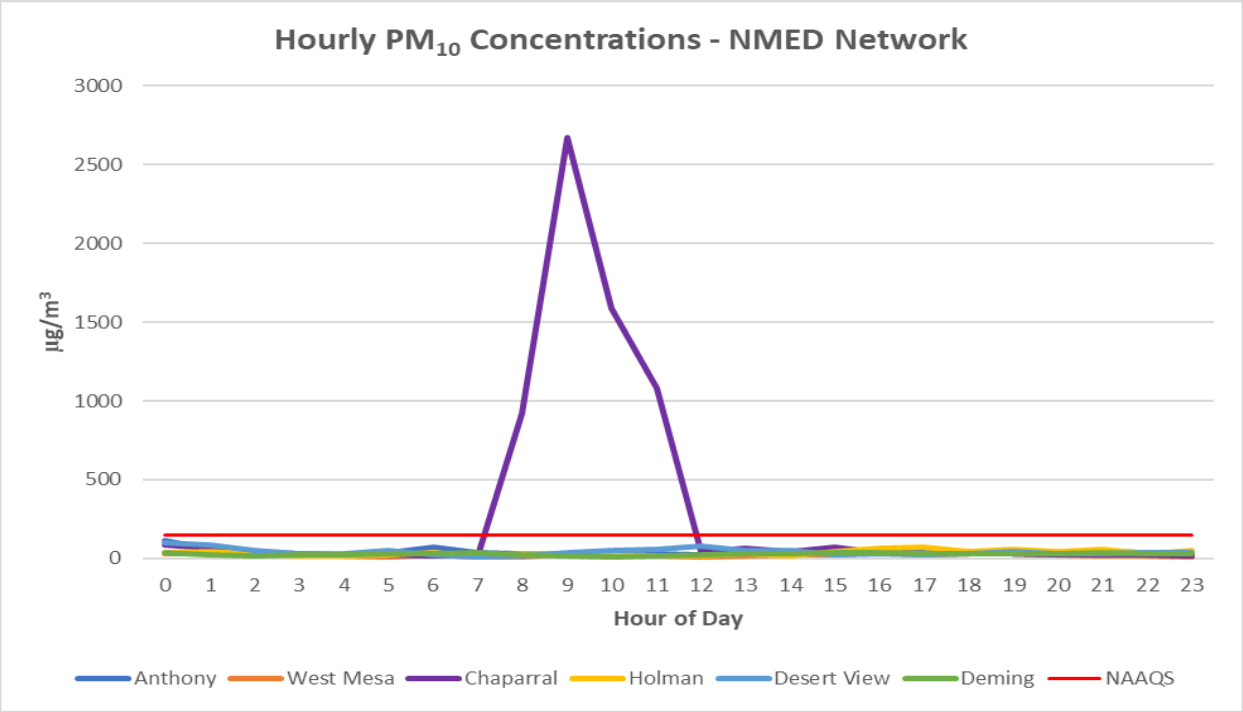


Figure 8-10. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

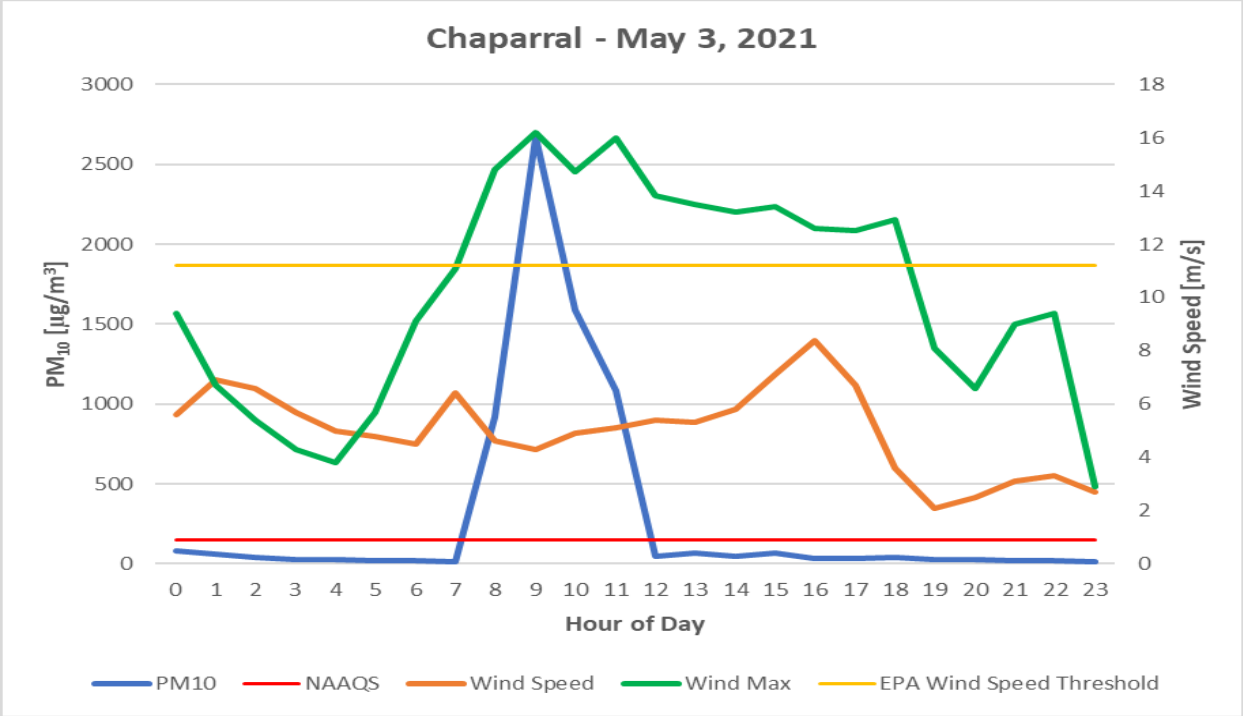


Figure 8-11. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Chaparral monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentrations was 721 µg/m^3 recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 8-12, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Other than the day before at the Desert View monitoring site with a 24-hour average concentration of 144 µg/m^3, the daily average for three days preceding and following the event did not surpass 88 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

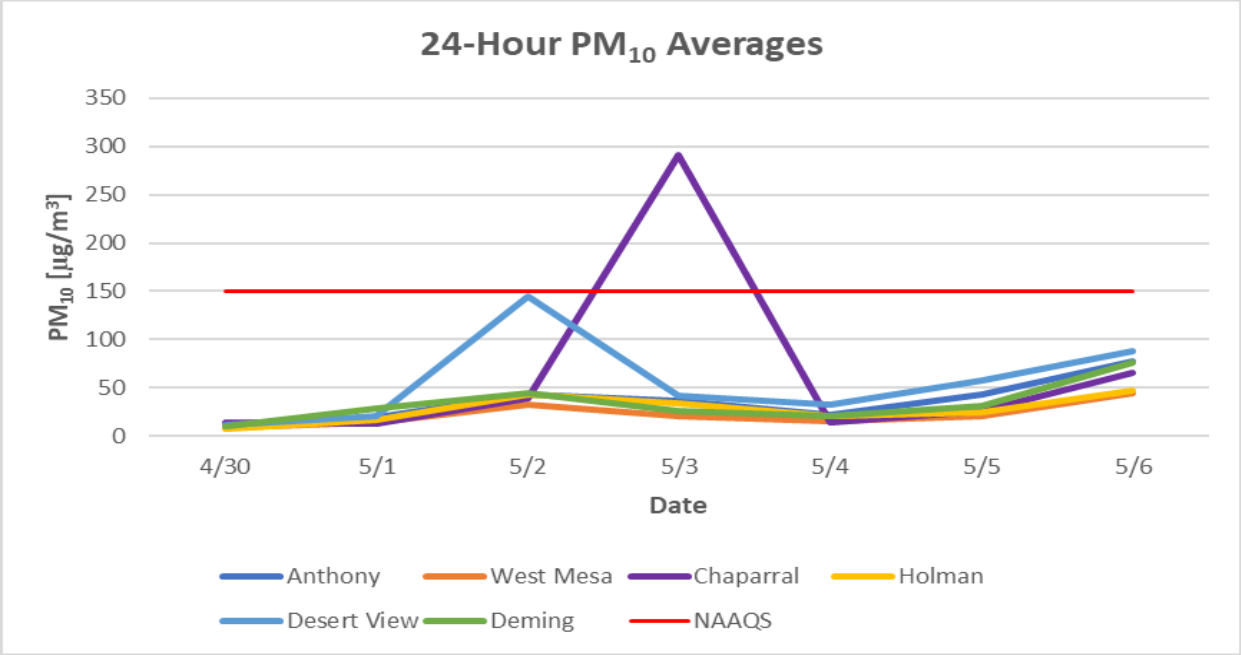


Figure 8-12. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (291 µg/m^3) is above the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (291 µg/m^3) is above the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedances on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedances associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

9. HIGH WIND EXCEPTIONAL EVENT: May 8, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Chaparral monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 9-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	166 µg/m^3	10 m/s	20.3 m/s

Table 9-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

An upper-level trough moving through the Borderland will combine with lee-cyclogenesis over southeastern Colorado and create very windy conditions today from tightening of gradients. At the 1800 hour, an area of low-pressure moved over the Great Basin and Central Plains (Figure 9-1). Aloft, the low-pressure center of the storm system hovered over the Great Basin. As the day progressed this low-pressure aloft traveled east creating a trailing trough and aligned itself with New Mexico and the surface wind direction (Figure 9-2). Diurnal heating of the surface allowed winds aloft to mix down, increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust from the gusty conditions.

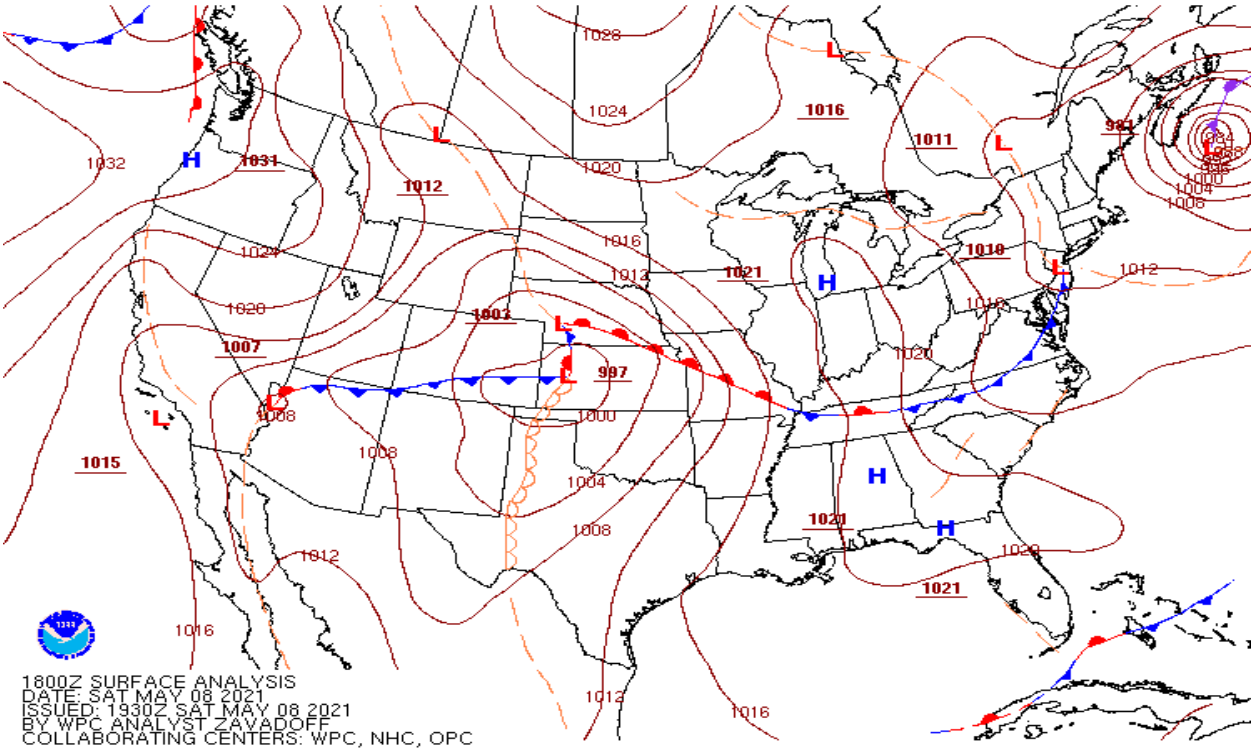


Figure 9-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

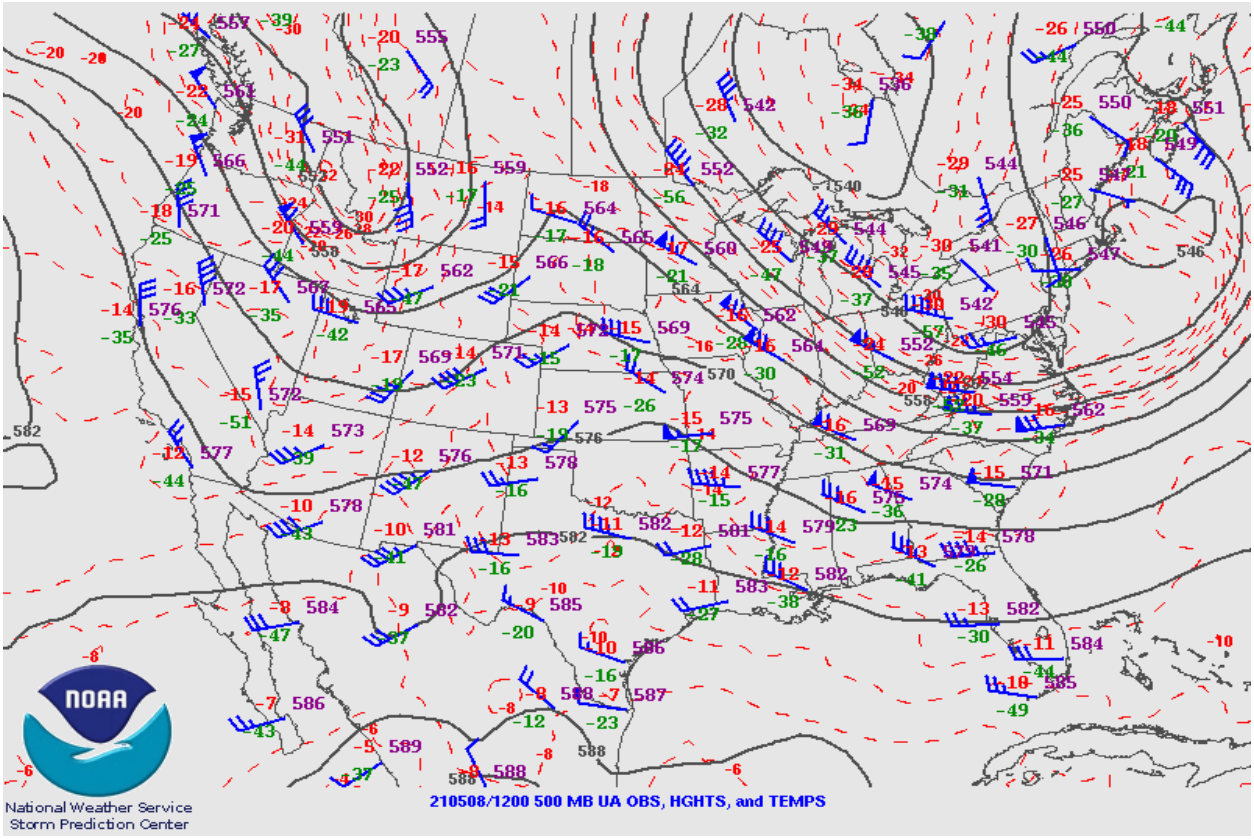


Figure 9-2. Upper air weather map for May 8, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at Holman, Chaparral, West Mesa, Santa Teresa, and Deming monitoring sites beginning at the 1200 hour lasting through the 1700 hour. PM_{10} concentrations began to exceed the NAAQS at the Chaparral and Desert View monitoring sites beginning at the 1100 hour. Hourly concentrations remained elevated through the 1600 hour. Table 9-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event. Additionally, five-minute wind speed data is provided during when peak wind speeds for the Chaparral monitoring site contributed to peak PM_{10} concentrations (Table 9-3).

Hour	Anthony			Desert View			Chaparral		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
1100	78	5.7	12.5	161	7.3	13.4	27	7.5	14.1
1200	107	6.7	12	63	6.4	13.5	249	8.5	16
1300	361	7.1	12.7	132	7.3	14.4	1506	9.8	17.1
1400	92	6.6	15.9	85	7.5	17.5	554	10	16.5
1500	51	6.7	11.4	293	8.8	15	891	9.6	20.3
1600	63	6.4	12.5	195	8.3	14.3	227	9.5	15.7

Table 9-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Hour	Chaparral				
	Wind Speed (m/s)	Wind Gust (m/s)	Hour	Wind Speed (m/s)	Wind Gust (m/s)
1300	10.8	16.6	1440	9.4	15.6
1305	12.4	17.1	1445	10.1	14.8
1310	8.3	14	1450	8.9	13.5
1315	8.1	13.9	1455	9.1	12.3
1320	9.7	13.7	1500	8.5	13.3
1325	10.3	14.3	1505	9.4	14.1
1330	8.2	15	1510	11	17.2
1335	10.2	15.3	1515	9.7	14.2
1340	10.8	15.1	1520	8.7	20.3
1345	9.9	14.9	1525	10.3	15
1350	10.2	14.7	1530	8.3	11.7
1355	8.9	13.9	1535	11	15.1
1400	8.7	14.8	1540	8.7	12.2
1405	11.1	15.4	1545	11.7	17.6
1410	10.6	16.5	1550	10	14.8
1415	10.7	15.5	1555	7.7	11.1
1420	9	13.9	1600	10.3	13.6
1425	10.9	15.9	1605	10.3	15.1
1430	11.1	15.7	1610	9	13.2
1435	10.3	14	1615	10.1	15.1

Table 9-3. Five-minute wind speeds for the Chaparral monitoring site.

Meteorologists forecasted the high wind blowing dust event to occur this day, as the spring windy season begins in March for most of the southwestern United States. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east just southeast of the Great Basin in the morning and moving across New Mexico in the afternoon. The system's movement across the area timed well with daytime heating and mixing generating a deep trough to the west as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of

blowing and entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. Unfortunately, NMED monitoring sites did not record wind speeds above this threshold (Figure 9-3). However, the El Paso International Airport one-hour wind speed data reached the high wind threshold for a total of four hours beginning at the 1451 hour and lasting through the 1751 hour (Figure 9-4).

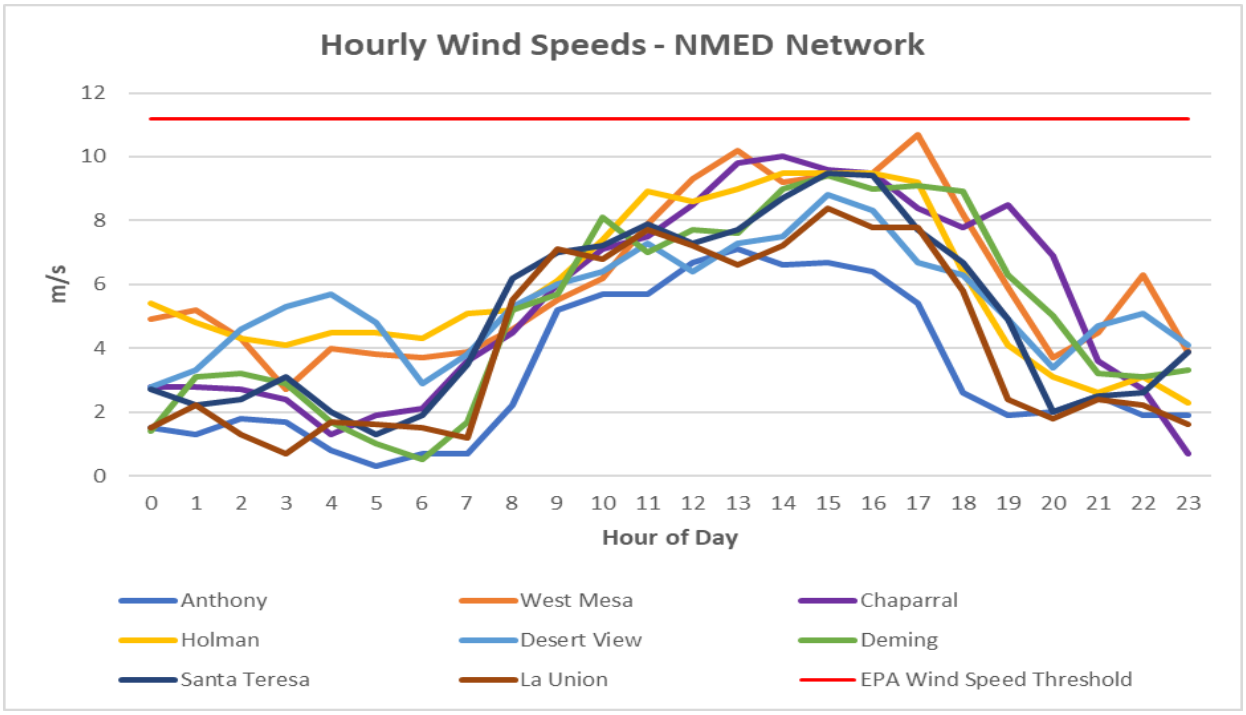


Figure 9-3. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

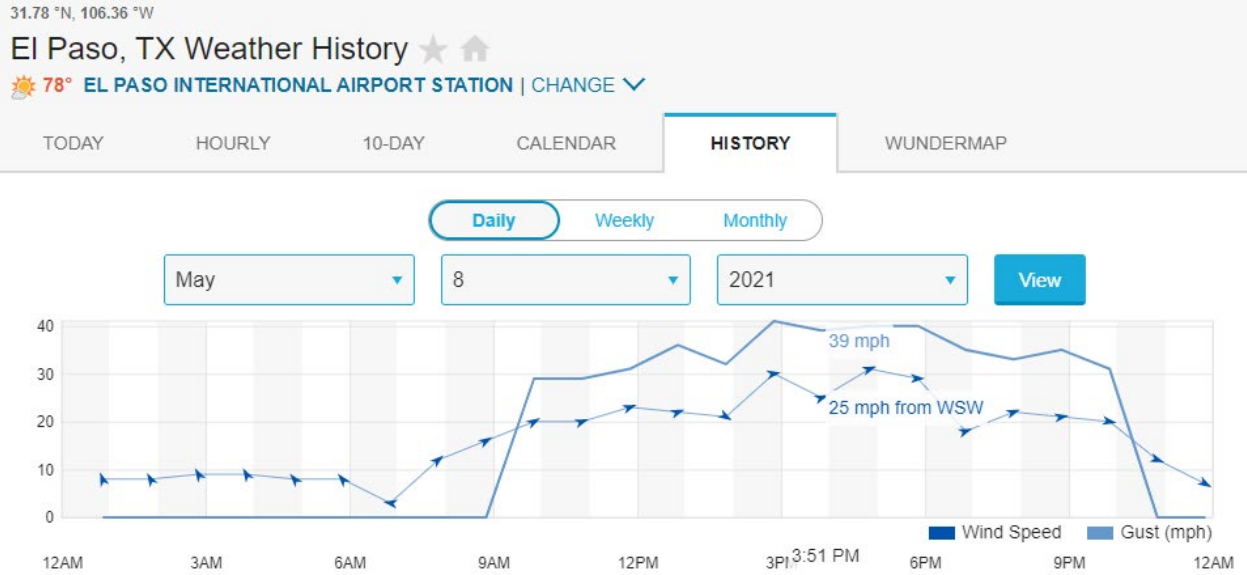


Figure 9-4. El Paso International Airport one-hour wind speed data for May 8, 2021. Courtesy of Weather Underground.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the

exceedances on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedances were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on GOES-16 geostationary satellite imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 9-5). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1741 hour MST) that captured the imagery.

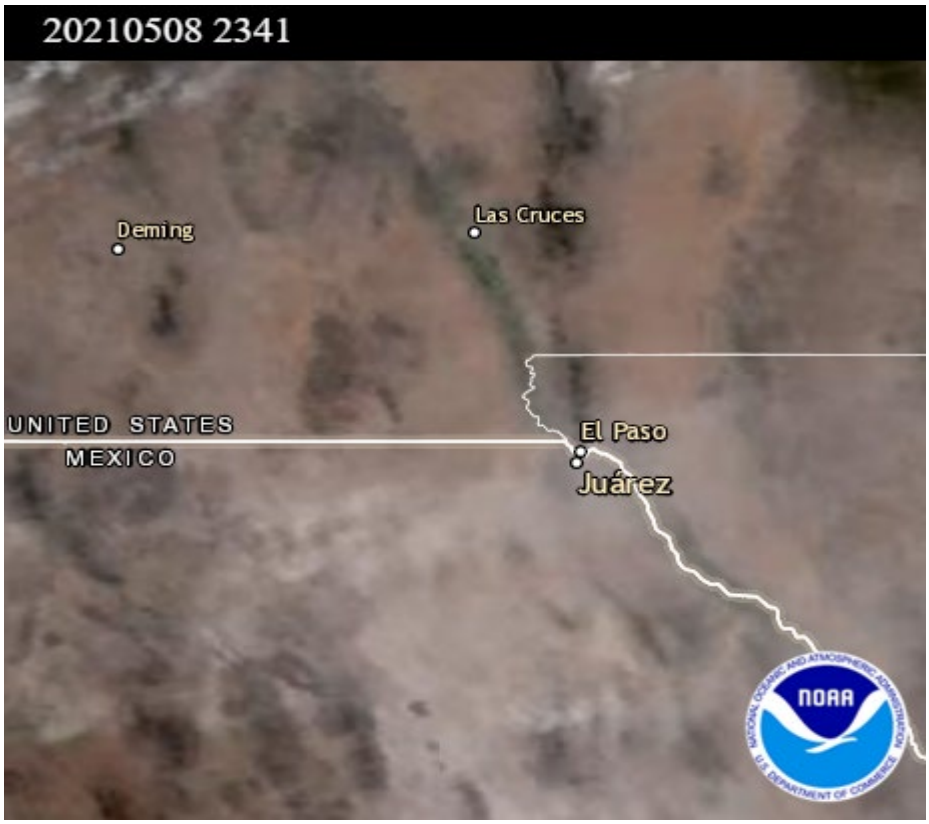


Figure 9-5. GOES-16 geostationary satellite (1741 MST) imagery showing southwestern New Mexico, northern Chihuahua and far west Texas. Imagery obtained from NOAA Aerosol Watch website.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this date. A Hazardous

Weather Outlook is a statement issued by NWS to provide information to the public about potential adverse weather events. A Hazardous Weather Outlook statement was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook and Area Forecast Discussion can be found below:

"Breezy to windy conditions are possible on Saturday which could lead to areas with blowing dust…Surface wind speeds of 15-25 mph, with gusts to 35 mph…higher gusts possible along east-facing mountain slopes"

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 9-6). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

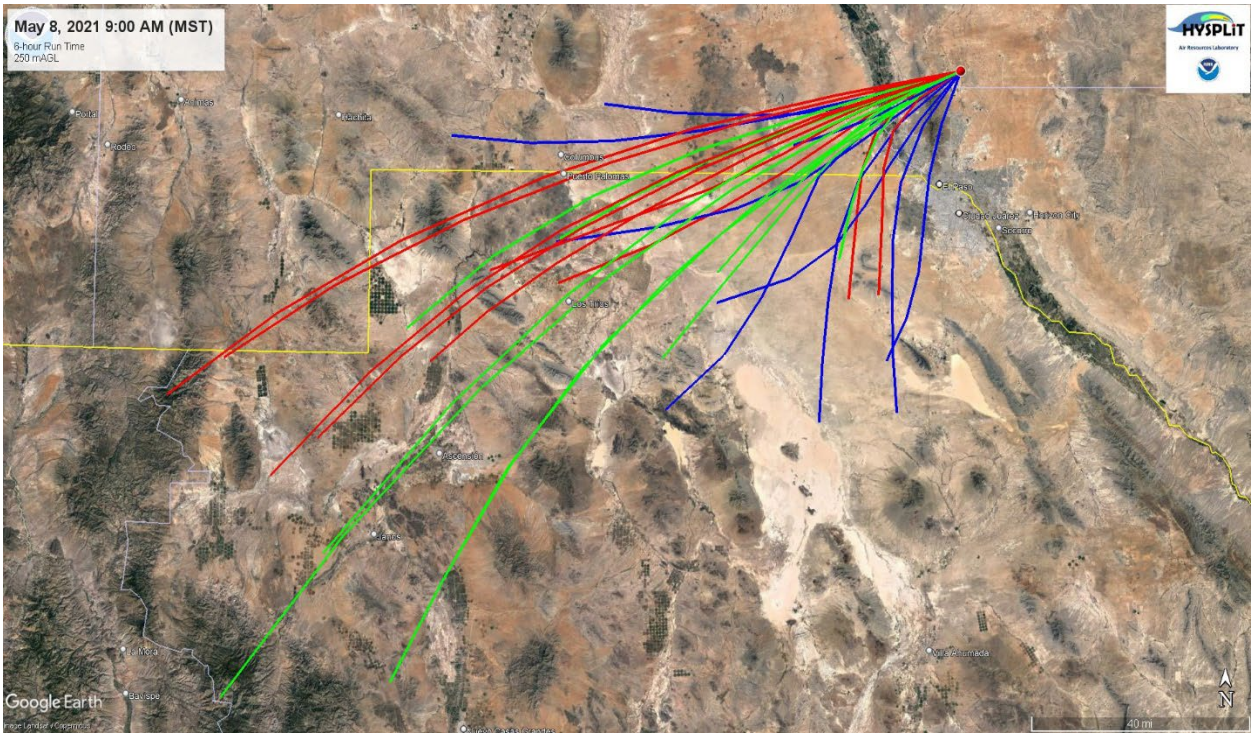


Figure 9-6. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 9-7) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (1100 -1600 hour). During the event, winds blew from the southwest 100% of the time coinciding with peak PM_{10} concentrations.

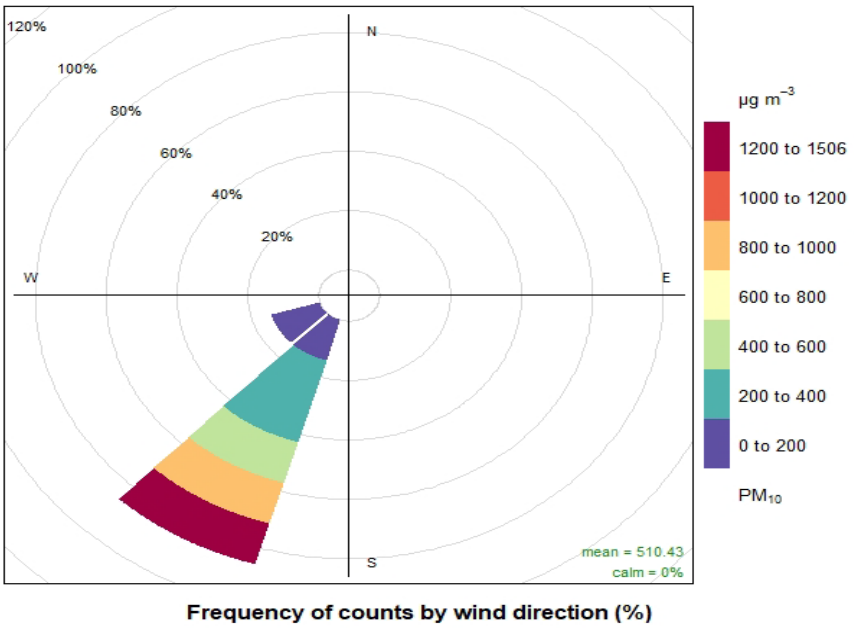


Figure 9-7. Pollution rose for the Chaparral monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southwesterly winds beginning at the 1200 hour and lasting through the 1700 hour. During this time, peak hourly PM_{10} concentrations ranged from 107 to 1506 µg/m^3 were recorded at the West Mesa and Chaparral monitoring sites, respectively (Figure 9-8). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds ranged from 7.1 to 13.9 m/s were recorded at the Anthony monitoring site and El Paso International Airport, respectively, during the peak PM_{10} concentrations of the event. The time series plots in Figure 9-9 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

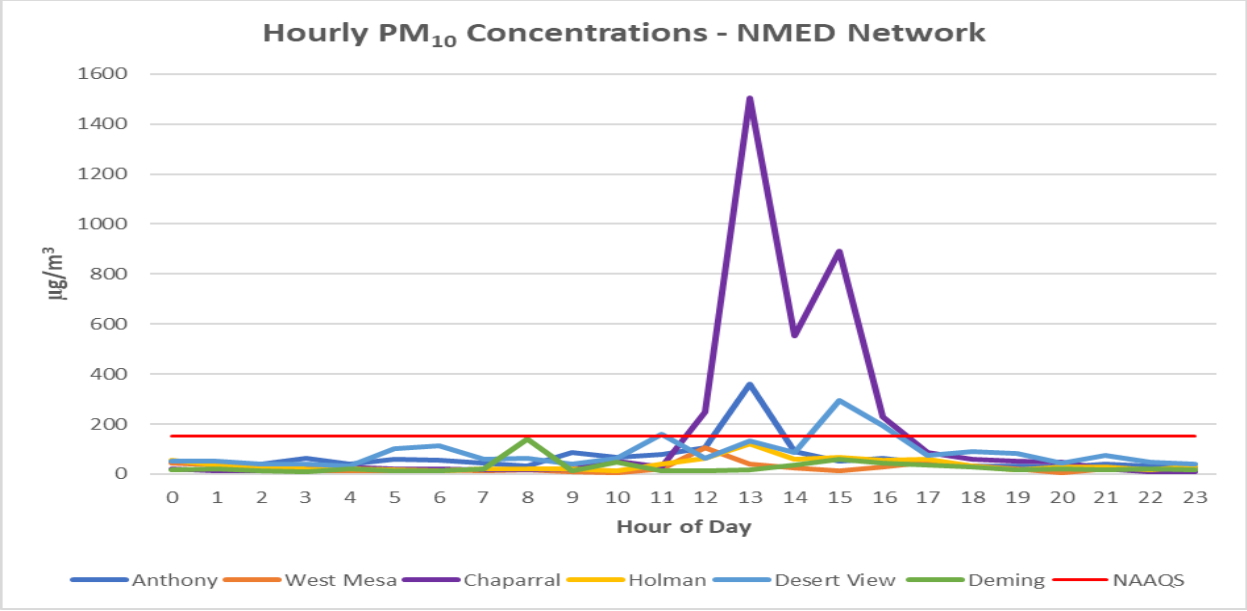


Figure 9-8. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

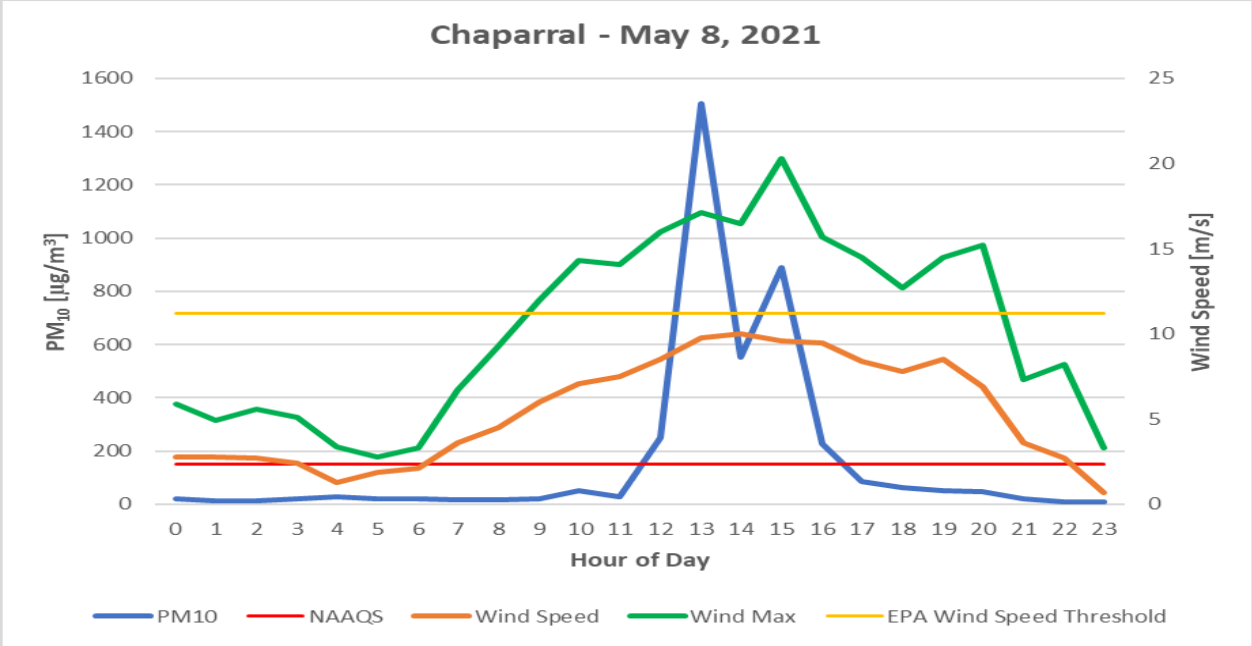


Figure 9-9. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Chaparral monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentrations was 721 µg/m^3 recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 9-10, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. The daily average for three days preceding and following the event did not surpass 95 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

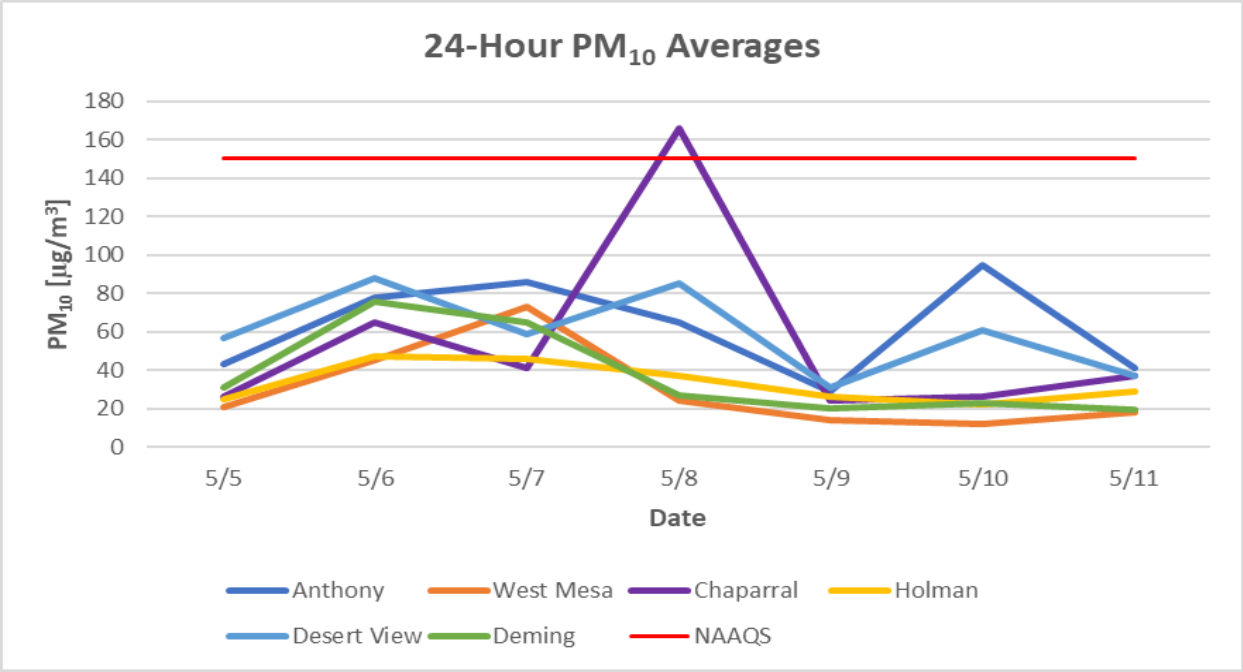


Figure 9-10. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (166 µg/m^3) is near the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (166 µg/m^3) is near the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedances on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedances associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

10. HIGH WIND EXCEPTIONAL EVENT: June 13, 2021

Conceptual Model

Thunderstorm outflow caused high winds and blowing dust in Doña Ana and Luna Counties resulting in an exceedance of the PM_{10} NAAQS at the Desert View, Holman, West Mesa and Deming monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 10-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0021	6ZM Desert View	439 µg/m^3	8.8 m/s	17.5 m/s
RJ	35-013-0019	6ZL Holman	182 µg/m^3	9.5 m/s	17.5 m/s
RJ	35-013-0024	6WM West Mesa	308 µg/m^3	10.7 m/s	17.2 m/s
RJ	35-029-0003	7E Deming	570 µg/m^3	9.4 m/s	17.1 m/s

Table 10-1 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

An upper-level ridge to the northwest of the region will ensure continued triple digit temperatures for the day with only a slight decrease from the previous day. Available moisture in the middle air columns will become more unstable and increase convection as the day progresses, especially for the Sacramento mountains, providing conditions for outflow storm activity favoring a northeast to southwest flow from higher to lower elevations. At the 1800 hour, an area of low-pressure with an outflow boundary moved over eastern New Mexico (Figure 10-1). Aloft, the low-pressure center of the storm system hovered over New Mexico (Figure 10-2). As the day progressed this low-pressure aloft traveled very slowly east and aligned itself with New Mexico. Diurnal heating of the surface allowed moisture aloft to become unstable creating outflow conditions. These outflow conditions provide large amounts of energy in a short amount of time to mix down, increasing the surface wind velocities in a small area and providing the turbulence required for vertical mixing and entrainment of dust.

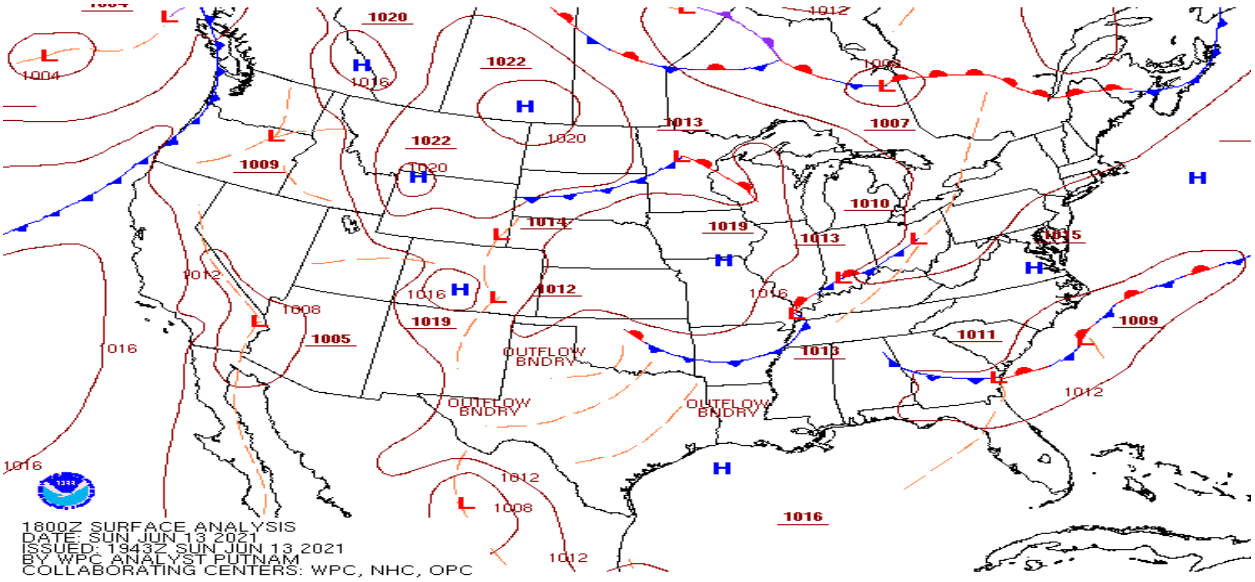


Figure 10-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

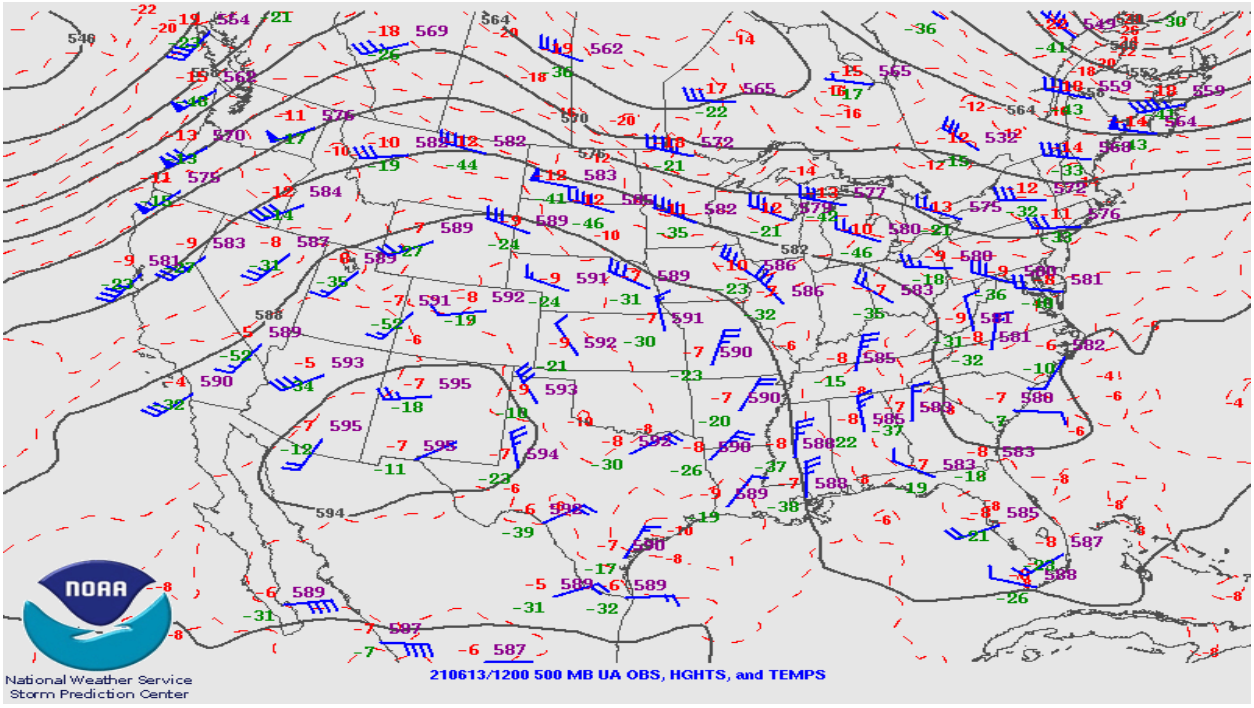


Figure 10-2. Upper air weather map for June 13, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the east-southeast throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Las Cruces and El Paso International Airports beginning at the 1855 hour and lasted through the 2110 hour, the evening before, June 12, 2021 (Figures 10-6 and 10-7). PM_{10} concentrations began to exceed the NAAQS at the Desert View, Holman, Deming, and West Mesa monitoring sites beginning at the 0000 hour, June 13, 2021. Hourly concentrations remained elevated through the 0900 hour, then spiked again at the 2100 and 2200 hours for the Deming monitoring site. Table 10-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	West Mesa			Desert View			Deming		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0000	190	2.4	3.4	2315	2.5	6.5	1501	3.4	8.2
0100	469	1.6	3.3	4097	1.4	5.9	2205	2	3.4
0200	498	1.6	2.7	884	0.8	1.8	1611	1.7	3.3
0300	1360	1.5	2.3	1924	2.1	3.8	1443	1.7	2.7
0400	2083	1.1	2.2	139	3.4	5.6	1245	2.7	4.9
0500	1843	1	2.8	112	4.1	6.5	979	3.6	5.5
0600	276	2.2	4.5	132	5.4	9.1	1526	3.9	6.4
0700	102	5.8	10.4	85	6.3	9.6	1279	5.3	7.8
0800	73	8	11.7	73	7.1	10.7	427	5.9	8.9
0900	48	7.2	11	41	6.3	10	190	5.9	9.9

Table 10-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur early this morning, as the spring windy season begins in March for most of the southwestern United States. This year's monsoon season started earlier than previous years as the variably high-speed winds for this event were dependent on the location of the outflow thunderstorm activity beginning the evening before, June 12, 2021, (Figure 10-3) and proceeded into the early morning of June 13, 2021. Forecasts predicted strong winds as the storm approached the area beginning with a high-pressure system centered over New Mexico with near record-breaking triple digit temperatures and increased moisture aloft provided the atmospheric instability for thunderstorm activity as the evening progressed (Figure 10-4). Convective outflows progressed from the highlands to the lowlands in a northeast to southwest direction from the Sacramento Mountains through the Tularosa Basin and towards the Organ and Franklin Mountain Ranges into the early morning hours. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze beginning in the evening and leading into the early morning, especially in the desert areas of southern New Mexico and southwest Texas. Nearby wildfire smoke impacts from the Gila National Forest's Johnson Fire and Arizona's Telegraph Fire exacerbated the PM_{10} concentrations this morning (Figure 10-6). The direction of the upper-air columns predominating from the northwest allowed for the transport of smoke through the upper-air columns into the Borderland. The energy created by the negative buoyancy moisture laden middle-air columns manifested as outflow thunderstorm activity allowing for the smoke to continue its transport to the lower-air columns. An early morning temperature inversion combined with breezy to gusty conditions allowed for PM_{10} concentrations to remain elevated and remain suspended near ground surface (850 mb) until thermal warming allowed for the settling and mixing of dust and smoke to continue its transport from the Borderland once the temperature inversion released after daybreak (Figure 10-4).

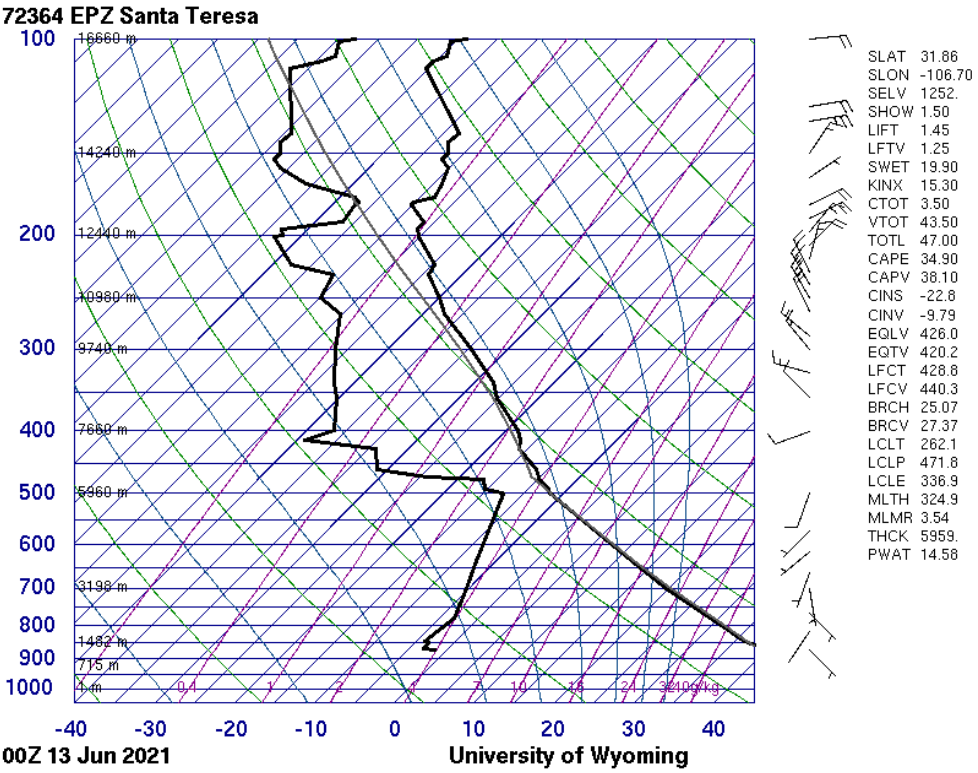


Figure 10-3. El Paso NWS Upper-air column sounding for June 12, 2021, at 1800 (MST). Notice increased moisture at 500 mb level with elevated Convective Available Potential Energy (CAPE).

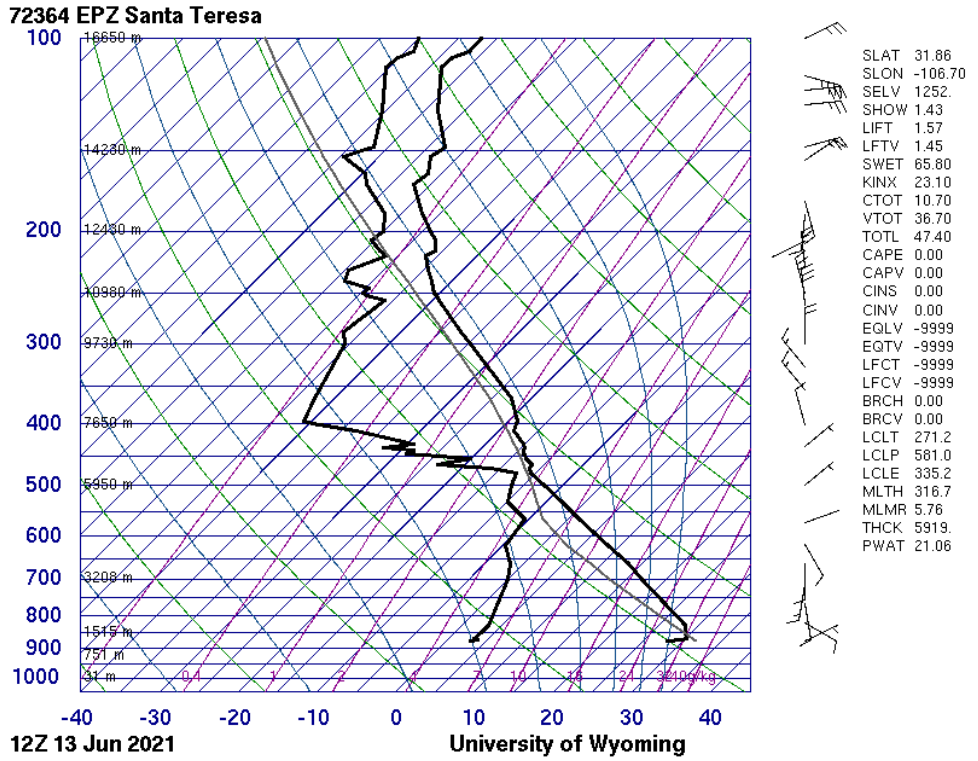


Figure 10-4. El Paso NWS Upper-air column sounding for June 13, 2021, at 0600 (MST). Notice the temperature inversion at the 850 mb level.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. Unfortunately, NMED monitoring sites did not record wind speeds meeting the wind speed threshold this day. (Figure 10-5). However, the Las Cruces International Airport recorded wind speeds for a total of twenty minutes at the 1935 hour that met the wind speed threshold the evening before, June 12, 2021 (Figure 10-6). In addition, the El Paso International Airport recorded a one-hour 10 .7 m/s wind speed at the 2051 hour and reportable conditions of blowing dust at the 1851 hour, June 12, 2021 (Figure 10-7).

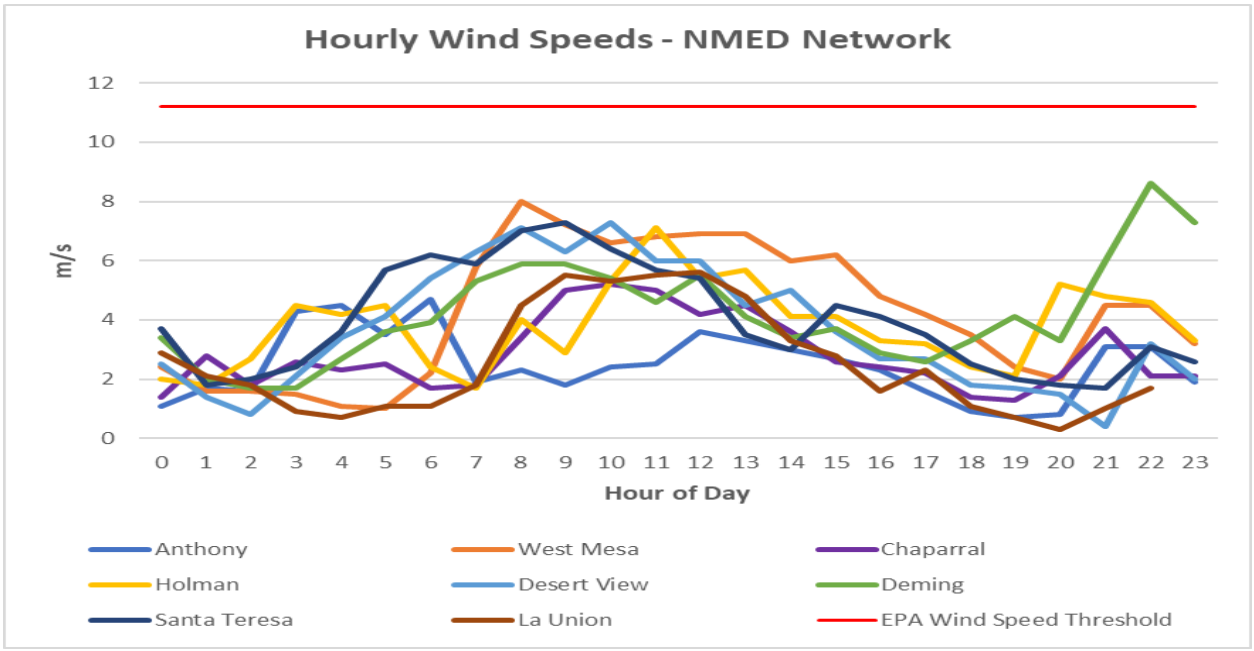


Figure 10-5. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

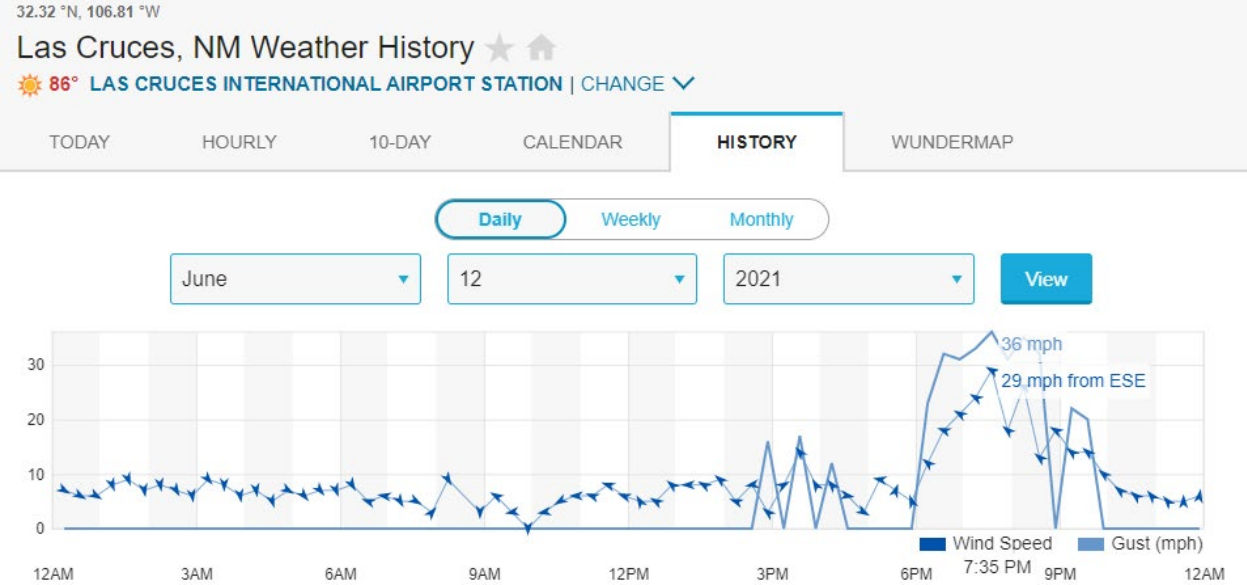
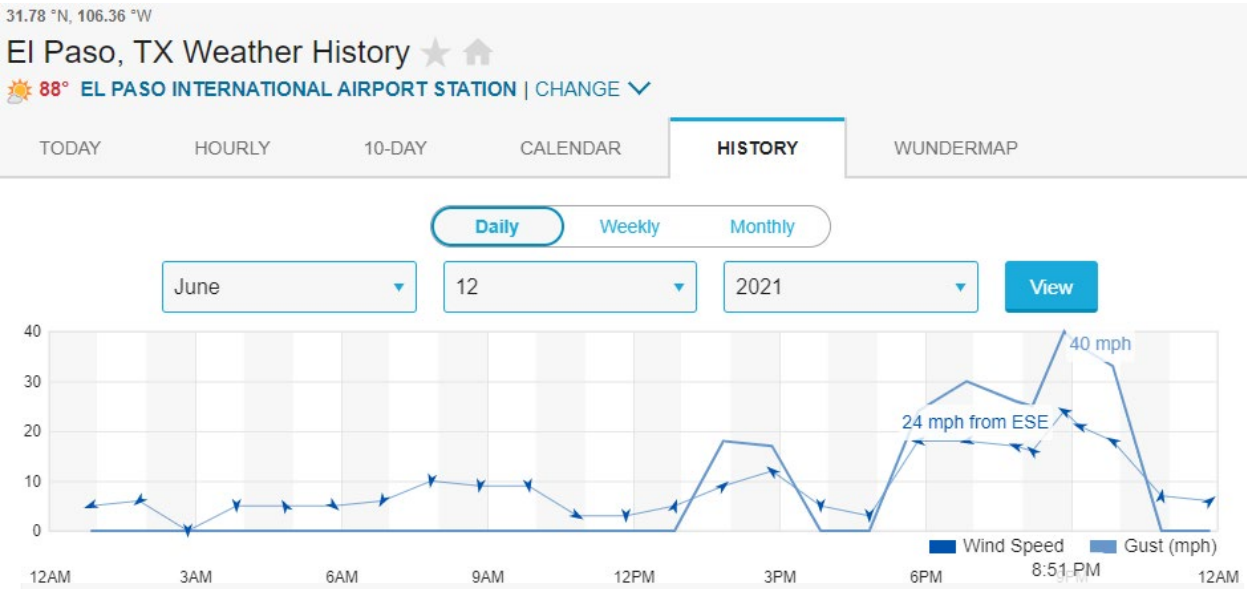


Figure 10-6. Las Cruces International Airport 20-minute wind speed data. Courtesy of Weather Underground



Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
6:51 PM	94 °F	49 °F	21 %	E	18 mph	30 mph	25.87 in	0.0 in	Blowing Dust
7:51 PM	92 °F	44 °F	19 %	ESE	17 mph	26 mph	25.92 in	0.0 in	Mostly Cloudy
8:12 PM	92 °F	43 °F	18 %	SE	16 mph	25 mph	25.93 in	0.0 in	Thunder
8:51 PM	92 °F	41 °F	17 %	ESE	24 mph	40 mph	25.92 in	0.0 in	Thunder / Windy
9:10 PM	90 °F	42 °F	19 %	ESE	21 mph	37 mph	25.91 in	0.0 in	Mostly Cloudy / Windy
9:51 PM	90 °F	40 °F	17 %	ESE	18 mph	33 mph	25.92 in	0.0 in	Mostly Cloudy
10:51 PM	89 °F	39 °F	17 %	S	7 mph	0 mph	25.93 in	0.0 in	Mostly Cloudy
11:51 PM	88 °F	39 °F	18 %	SW	6 mph	0 mph	25.91 in	0.0 in	Mostly Cloudy

Figure 10-7. El Paso International Airport one-hour wind speed data for the evening of June 12, 2021. Courtesy of Weather Underground

Level of Controls Analysis
Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures
Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event
Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Otero, Eddy, Lea and Chavez Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Texas and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery
The event was captured on GOES-16 geostationary satellite Aerosol Optical Depth (AOD) Composite (1200-1500 MST) product imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 10-8). The dust plumes of interest, characterized by warm colors, appear to be limited to Mexico, traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass that captured the imagery.

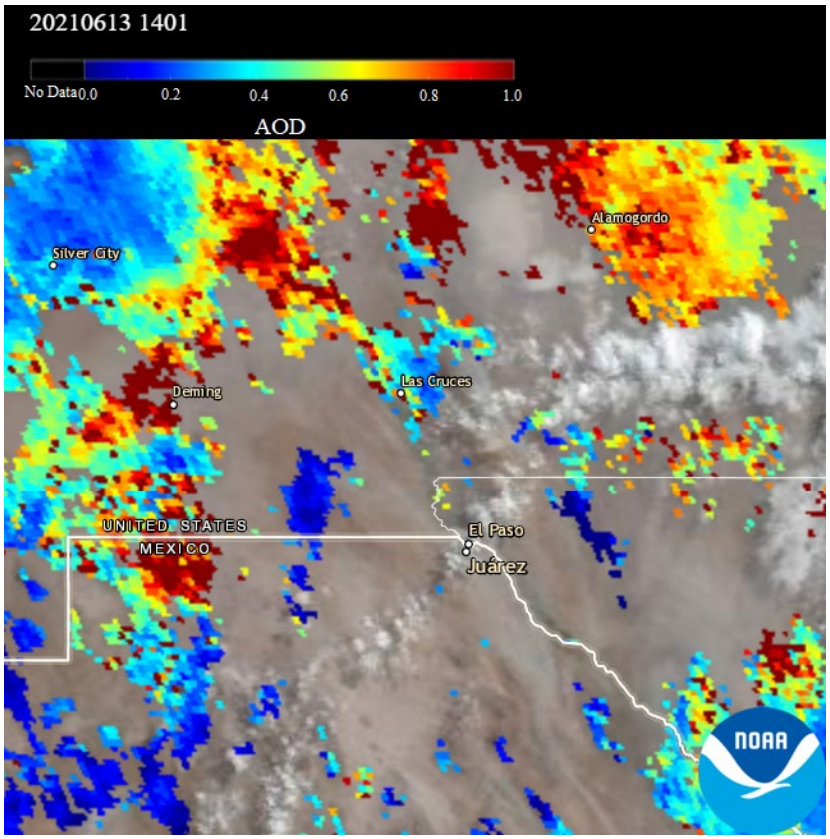


Figure 10-8. GOES-16 geostationary satellite AOD Composite product imagery showing early morning dust and wildfire smoke impacts. Courtesy of NOAA Aerosol Watch.

The VIIRS Deep Blue Aerosol Ångström Exponent product from the joint NASA/NOAA Suomi National Polar orbiting Partnership (Suomi NPP) satellite, in this case, is employed for over-land use to determine aerosol particle size and atmospheric aerosol loading. Pixels pass high-quality assurance tests and the Ångström exponent is defined between 412-470 nm for 'bright' surfaces, and 470-670 nm for 'dark' surfaces. Sensor/algorithm resolution is 6 km at nadir, imagery resolution is 2 km at nadir, and daily temporal resolution. Green colors suggest optical dominance of areas with dust or coarse particles and values less than 1. Areas with shades of blue suggest optical dominance of smoke or fine particulates associated with combustion and values greater than 1. Notice the areas around NMED monitoring sites contain a heavier presence of dust in comparison to smoke at the 1431 hour (Figure 10-9).

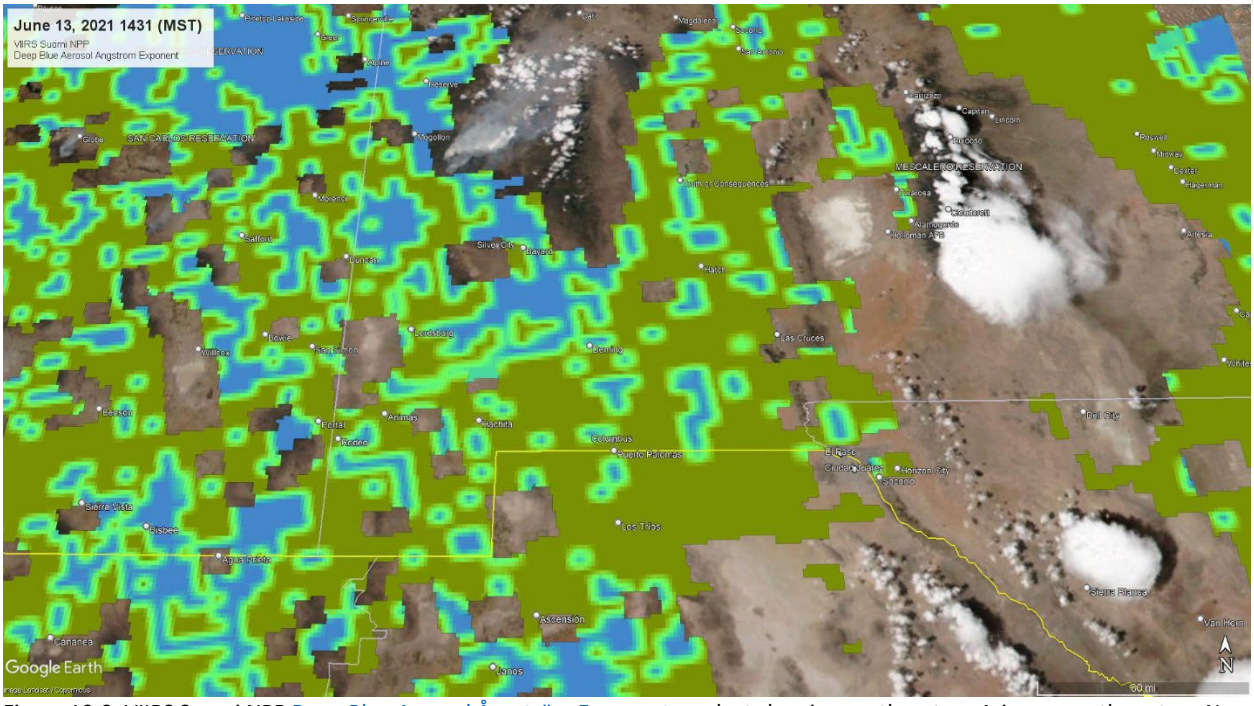


Figure 10-9. VIIRS Suomi NPP Deep Blue Aerosol Ångström Exponent product showing southeastern Arizona, southwestern New Mexico, and west Texas for June 13, 2021, at the 1431 hour (MST). Courtesy of NASA Worldview and the Deep Blue Science Team.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Wind Advisory and a Blowing Dust Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. A Blowing Dust Advisory is issued when blowing dust is expected to reduce visibility to between ¼ to 1 mile, generally with winds of 25 mph or greater. These were in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"Windy this afternoon and early this evening with winds gusting around 40 mph to 50 mph. Blowing dust will reduce the visibility to less than a half mile over a few areas…."

El Paso NWS Twitter tweet showing the outflow boundary radar image traveling southeast towards Las Cruces and El Paso at the 1632 hour (Figure 10-10).

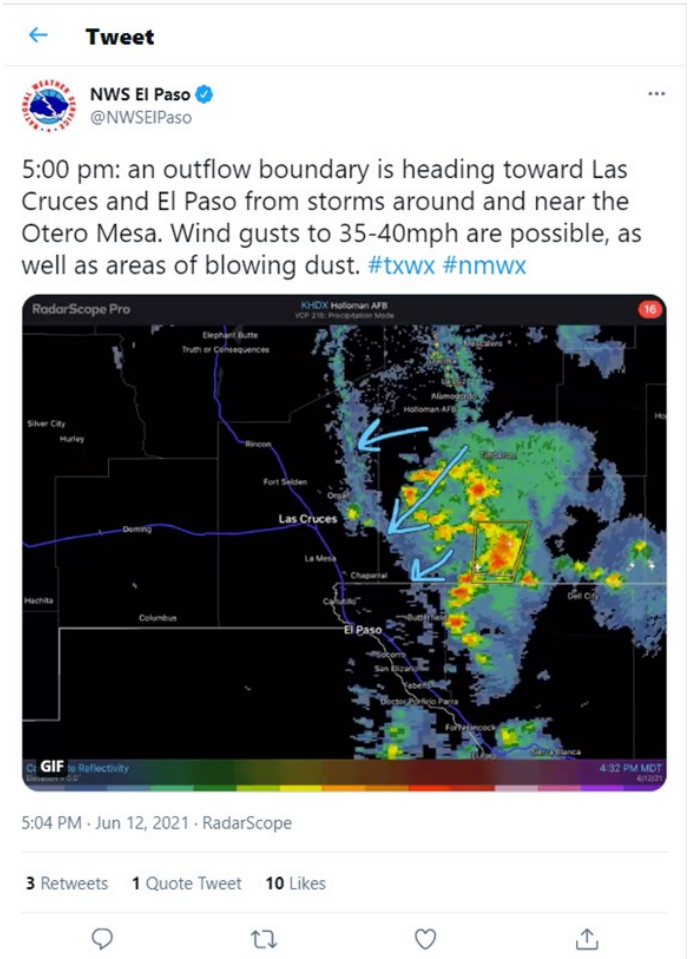


Figure 10-10. El Paso NWS tweet showing radar image of approaching outflow conditions the evening of June 12, 2021.

The wildfire smoke from the Johnson Fire located in the Gila National Forest northeast of the NMED monitoring sites estimates approximately 63,551 burned acres affected at the time of the update (Figure 10-11). In addition, wildfire smoke from the Arizona Telegraph Fire located in the Tonto National Forest southeast of Phoenix contributed to regional smoke impacts from the 88,155 burned acres affected at the time of the update (Figure 10-12).

Gila NF: Johnson Fire Update for June 13, 2021

JUNE 13, 2021 BY GILA NATIONAL FOREST PUBLIC AFFAIRS 0 COMMENTS

Sunday, June 13, 2021

Visit the New Mexico Fire Information website at www.nmfireinfo.com

Inciweb: https://inciweb.nwcg.gov/incident/7493/

Fire Phone 575-519-0103

JOHNSON FIRE

Location: Johnson Canyon, west of McKenna Park. 11 miles west of Gila Cliff Dwellings, Wilderness Ranger District, Catron County, NM

Start Date: May 20, 2021 **Size: ~ 63,551** **Cause: Lightning**

Vegetation: Ponderosa Pine and Grass **Total Personnel: 158** **Containment: 11%**

RESOURCES: Two Interagency Hotshot Crews, one twelve-person hand crew, one ten-person Wildfire Module, one twenty-person Initial Attack crew, four Type 3 Engines, three Type 6 Engines, four Water Tenders, two Type 3 Helicopters which includes short haul medical equipment and one Type 2 Helicopters.

SUMMARY: The Johnson Fire is approximately 63,551 acres and is burning in the Gila Wilderness on the Gila National Forest. The acreage is the most accurate information taken from an infrared (IR) flight on Saturday evening. The suppression strategy for this fire is confine and contain. In the evening hours the fire will appear both larger and closer than it is due to the inability to reference its size to any physical landmarks. Yesterday's continued hot and dry conditions brought active burning activities to the northwest corner of the fire as it moved into the upper reaches of Gobbler Canyon and up toward Mogollon Baldy Lookout. Firefighters began suppression activities on the Cross Fire, a new start detected north of the main fire. Crews continued to hold and secure control lines in White Rocks Canyon as the fire moved toward the West Fork of the Gila River. Fire growth occurred on the northern edge in Raw Meat Canyon and in the Miller Springs Cabin area. Helicopter bucket drops from Snow Lake were used to assist structure protection around Mogollon Baldy Lookout tower and cabin. Last night's burn out operations around Mogollon Baldy Lookout were successful. Today mop up operations will continue on the Cross Fire. Crews will be inserted into the Raw Meat Canyon area to hold the fire from moving north of the West Fork of the Gila River. Firefighters will monitor White Rocks Canyon to secure control lines. The southern and western portions of the fire will again be monitored by air operations.

INCIDENT OBJECTIVES: Provide for public and firefighter safety and allow fire to play its natural role on the landscape. Utilize Minimum Impact Suppression Techniques. Ensure information is accurate and timely regarding closures and planned fire operations. Values at risk are Gila Cliff Dwellings National Monument, White Creek Cabin, and sensitive aquatic species in the Gila Wilderness.

FIRE BEHAVIOR: Active flanking with creeping and backing.

CLOSURES: Due to hazardous fire conditions in the Johnson Fire area, an Emergency Area Closure order has been issued by the Gila National Forest for public health and safety. A large portion of the Gila Wilderness is CLOSED. For a copy of the order and maps see: Inciweb: https://inciweb.nwcg.gov/incident/7493/ **The Gila Cliff Dwellings National Monument remains CLOSED, and the closure shall remain in effect until rescinded. The Cliff Dwellings is closed while fire managers prepare for a burn-out operation for the Johnson Fire. Light Feather and Jordan Hot Springs, along with the Middle Fork Trailhead, are also included in this closure. For further information call 575-536-2250 (M-F 8:00 – 4:00 p.m.) or 575-519-0103 (any time before 7:00 p.m.) As a reminder "The Celebration Site-Skates area," Johnson Fire Camp is closed to camping.**

WEATHER: Little change over the coming days with temperatures remaining hot and relative humidity falling to the single digit range. Today, mostly sunny with isolated thunderstorms after 12:00. Chance of precipitation 10%. Threat from the thunderstorms will be gusty winds and dry lightning. Winds 7 to 14 mph, gusts to 22 mph, minimum relative humidity 9 to 11%.

AIR QUALITY: Silver City and Cliff, NM are expected to experience "Good" air quality today. However, in Cliff, NM area smoke may drift in throughout the day. The Gila Cliff Dwellings area and Glenwood, NM will see poor smoke dispersal in the morning and is expected to stay in the "Moderate" level throughout the day. The smoke monitor from the Wilderness Ranger District has been moved to Quemado, NM to monitor smoke levels in the northern portions of the Gila National Forest. Smoke from the Johnson Fire will be visible from NM Highway 15, NM Hwy 35, and US Highway 180. Smoke monitors have been placed at Gila Center (Unit #1076), Silver City, NM (Unit #1074), Cliff, NM (Unit #1054) and Glenwood, NM (Unit #1075), to assess smoke impacts, and can be viewed at https://app.airsis.com/USFS/UnitMap.

Please see the New Mexico Department of Health site also known as 5-3-1, https://nmtracking.org/fire for guidance on mitigating your smoke exposure. Smoke-sensitive individuals and people with respiratory problems are encouraged to take precautionary measures by staying inside during heavy smoke periods and avoiding outdoor activities.

Figure 10-11. Johnson Fire Update for the Gila National Forest on June 13, 2021.

SOUTHWEST AREA TYPE 1 INCIDENT MANAGEMENT TEAM 2
DAVE BALES - INCIDENT COMMANDER

Fire Information Public Phone Line: 480-608-2054
Fire Information Media Phone Line: 949-573-5408
Email: 2021.Telegraph@firenet.gov
InciWeb: https://inciweb.nwcg.gov/incident/7512/
Facebook: https://www.facebook.com/Telegraphfireinformation/
NEW **Twitter:** https://twitter.com/TelegraphFire

Telegraph Fire Morning Update – June 13, 2021

FOR CURRENT EVACUATION INFORMATION, residents are advised to monitor Facebook pages for Pinal County Sheriff's Office: https://www.facebook.com/PinalCountySO and Gila County Health and Emergency Management: https://www.facebook.com/gilacohealthem Notifications can change rapidly. Residents in areas affected by the fire should remain vigilant and be prepared to evacuate. Evacuation notifications are issued when danger is imminent and life threatening.

Acres: 88,155
Percent Containment: 76%
Date/Time Detected: Friday, June 4, 2021, 1:30 pm
Structures burned: 20

Number of Personnel: 990
Cause: Human, under investigation
Origin/Location: South of Superior, Arizona

Overnight firefighters continued to monitor and mop up the fire perimeter along U.S. Route 60 and near the Top-of-the-World community. Smoke will be visible to the public for days or weeks as interior islands of unburned fuel are consumed by fire. Fire in the Pinal/Signal Peak area advanced both north and south last night. Small firing operations by hand crews or aircraft may be employed today along Pioneer Pass Road, both north and south of the campground to keep fire edges even, and facilitate control of fire spread. The contingency group will continue constructing a fire line near El Capitan, using roads, hose lays, and chainsaw crews. Patrol and mop up will continue around the fire wherever necessary to protect values at risk. **We are reminding the motoring public to be alert for the increased presence of firefighters and large firefighting vehicles in the U. S. Route 60 corridor.** The Telegraph Fire is asking the public to refrain from delivering food and other donations to fire camp. We cannot legally accept donations. If you wish to help, we recommend contacting local agencies who can utilize your donations.

Evacuation status for Superior, Globe, Pinto/Carlotta and the Battle Axe area is now "Ready."
Evacuation status for Top-Of-The-World, Bellevue, Oak Flat, Miami, Central Heights, Six Ice and Claypool is now "Set."

The Tonto National Forest has initiated Stage 2 Fire Restrictions for the entire forest, effective 8 a.m. on June 11.
All State Land is under Stage 2 restrictions effective 8:00 AM on June 11.
All Bureau of Land Management lands in Arizona are under Stage 2 fire restrictions effective June 11, 2021. See: https://blm.gov/arizona/fire-restrictions
Gila County Emergency Management has activated a call center for information on sheltering if you evacuate due to the wildfire: 928-910-4009 8 a.m.-5 p.m.
CLOSURE AREAS: Tonto National Forest has revised its Closure Order and Map: https://www.fs.usda.gov/alerts/tonto/alerts-notices
Bureau of Land Management Emergency Fire Closure Order and Map: https://www.facebook.com/BLMArizona/

###

Figure 10-12. Arizona Incident Command Telegraph Fire Update for June 13, 2021.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from northern Mexico into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 10-13). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

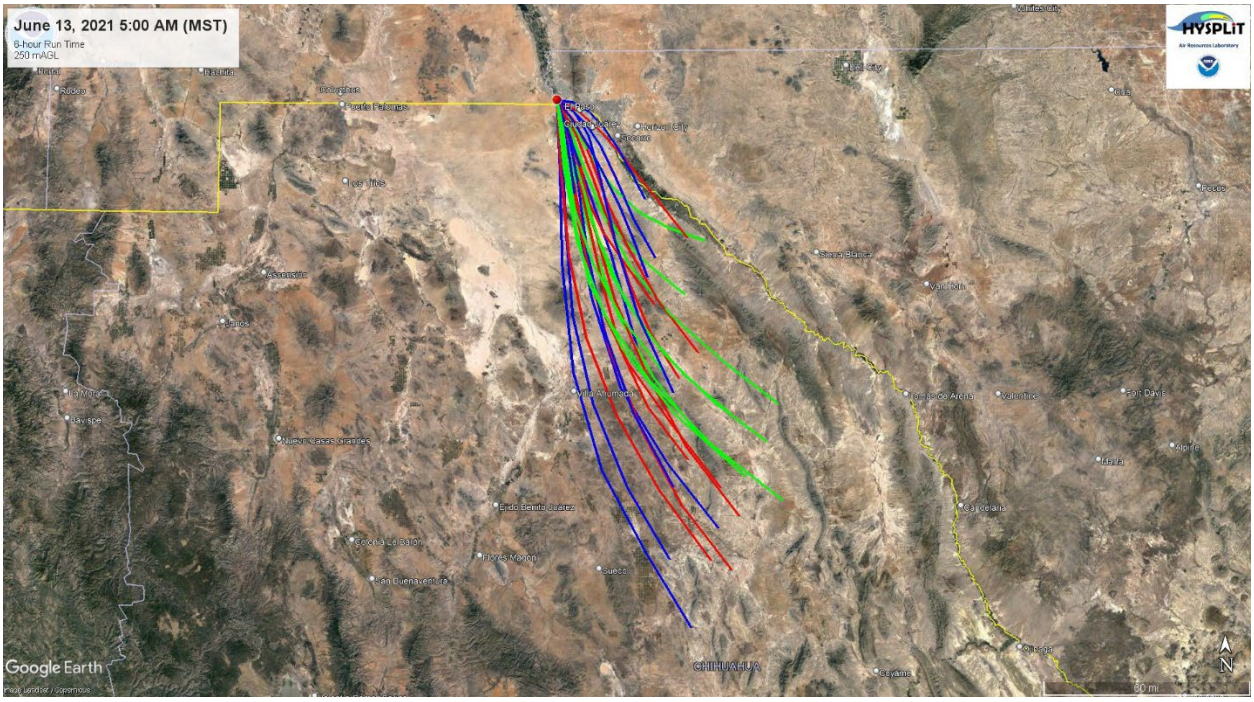


Figure 10-13. HYSPLiT back-trajectory analyses using the Ensemble mode for Desert View monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 10-14 through 10-17) were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0000 - 0900 hour). During the event, winds blew from the south through the east-southeast directions 100% of the time for the Desert View monitoring site, the east-northeast through the south-southeast directions 91% and the other remaining 9% of the time from the west-southwest direction for the Holman monitoring site, the east-southeast through the south-southwest directions 100% of the time for the West Mesa monitoring site, the east-southeast through the east-southeast through the north-northeast directions 84% and the remaining 16% of the time equally from west-northwest and south-southwest directions for the Deming monitoring site, coinciding with peak PM_{10} concentrations.

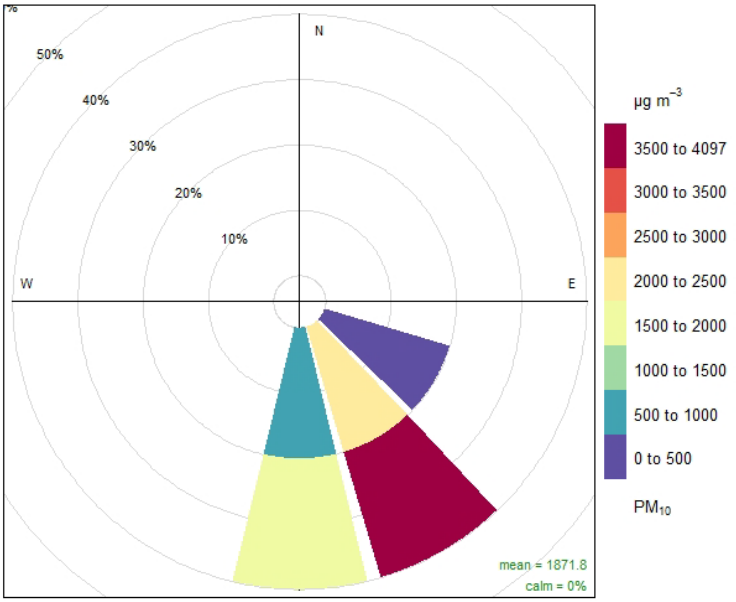


Figure 10-14. Pollution rose for the Desert View monitoring site.

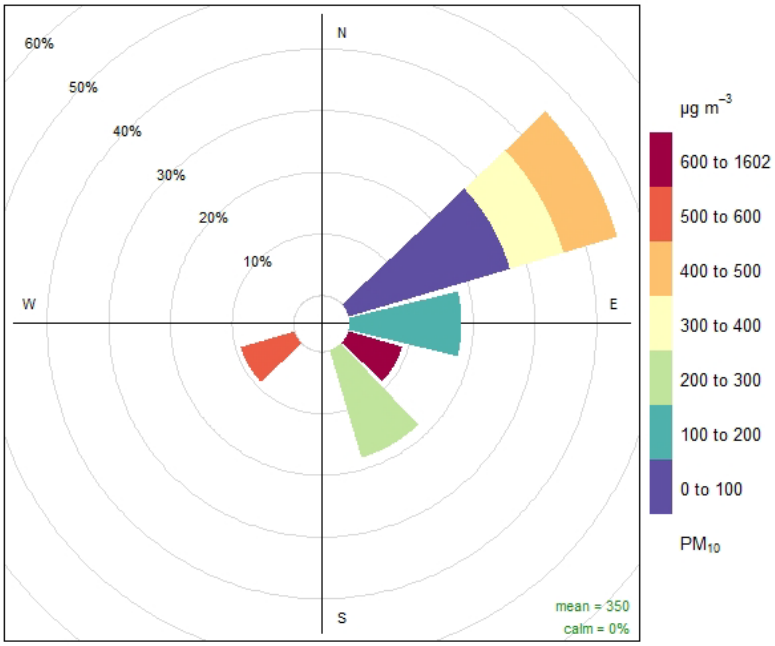


Figure 10-15. Pollution rose for the Holman monitoring site

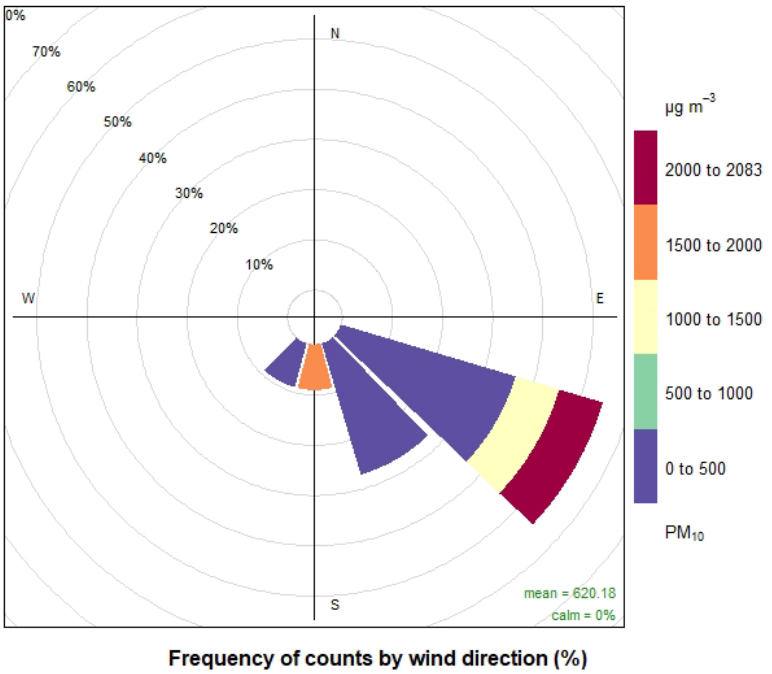


Figure 10-16. Pollution rose for the West Mesa monitoring site

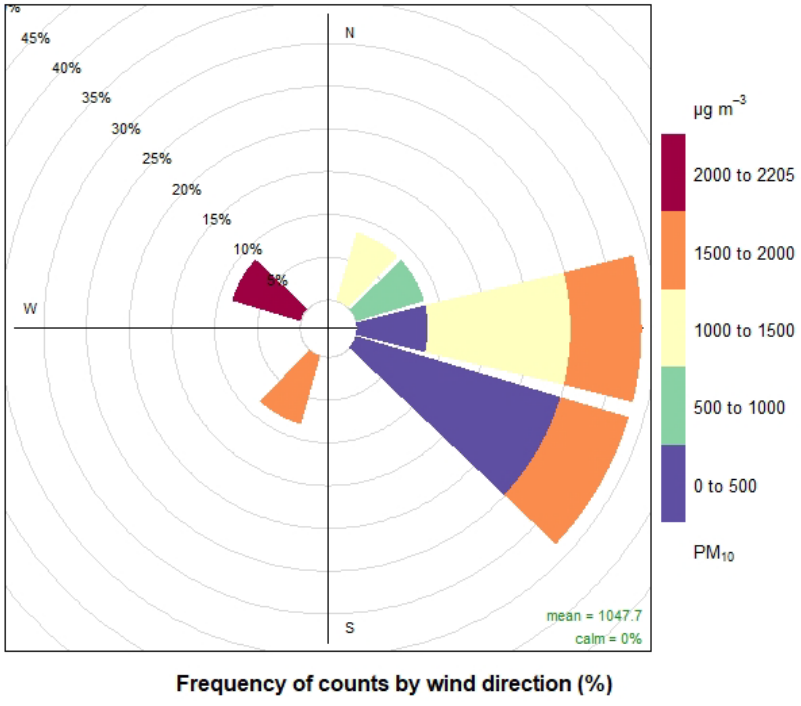


Figure 10-17. Pollution rose for the Deming monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southeasterly winds beginning at the 1855 hour and lasting through the 2110 hour, June 12, 2021. Shortly after the morning of June 13, 2021, peak hourly PM_{10} concentrations ranged from 107 to 4097 µg/m^3 were recorded at the Chaparral and Desert View

monitoring sites, respectively (Figure 10-18). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 4.7 to 8.6 m/s were recorded at the Anthony and Deming monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figures 10-19 through 10-22 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

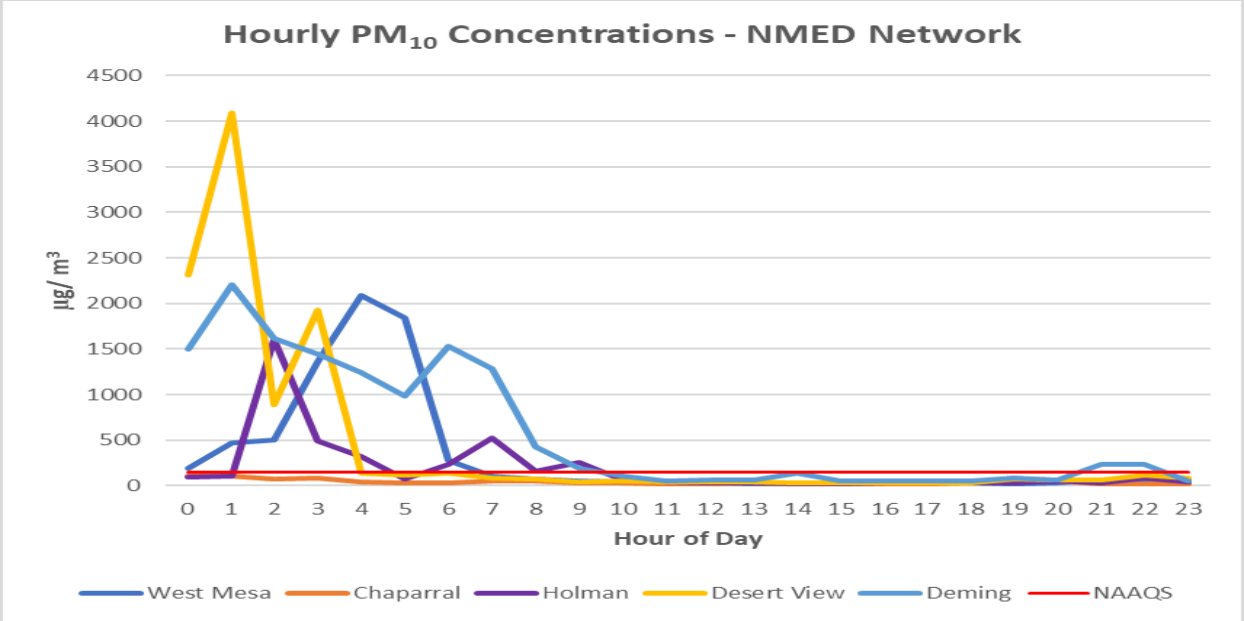


Figure 10-18. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

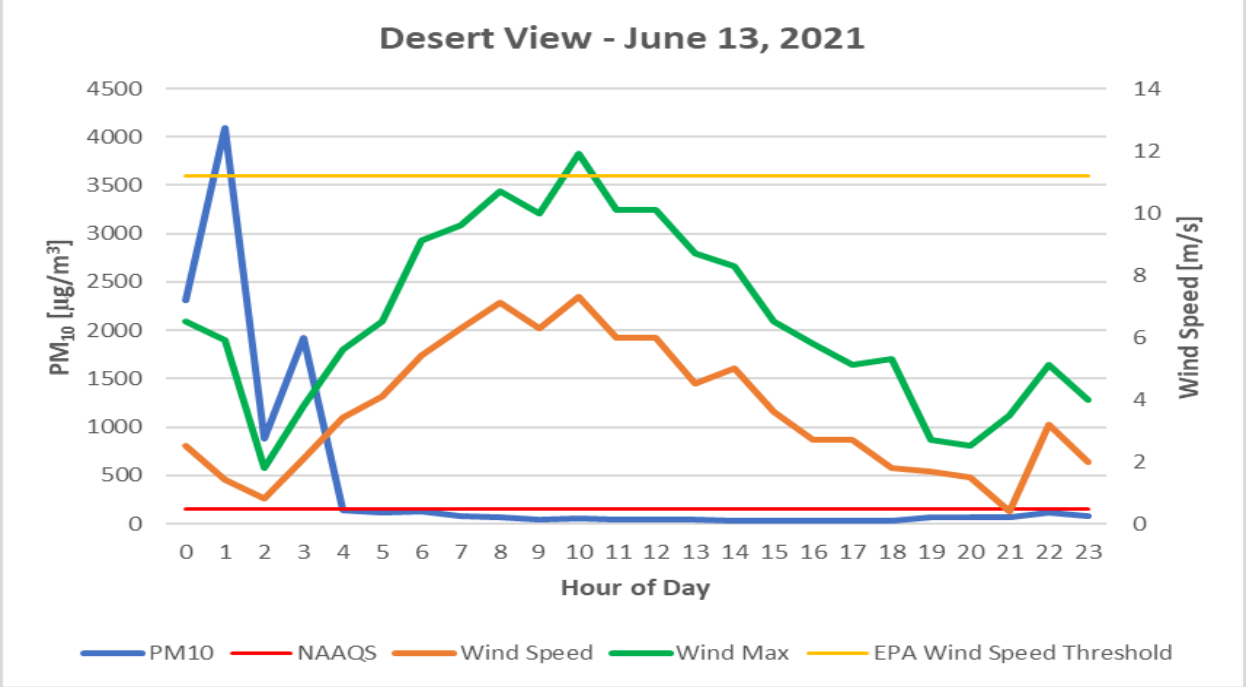


Figure 10-19. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

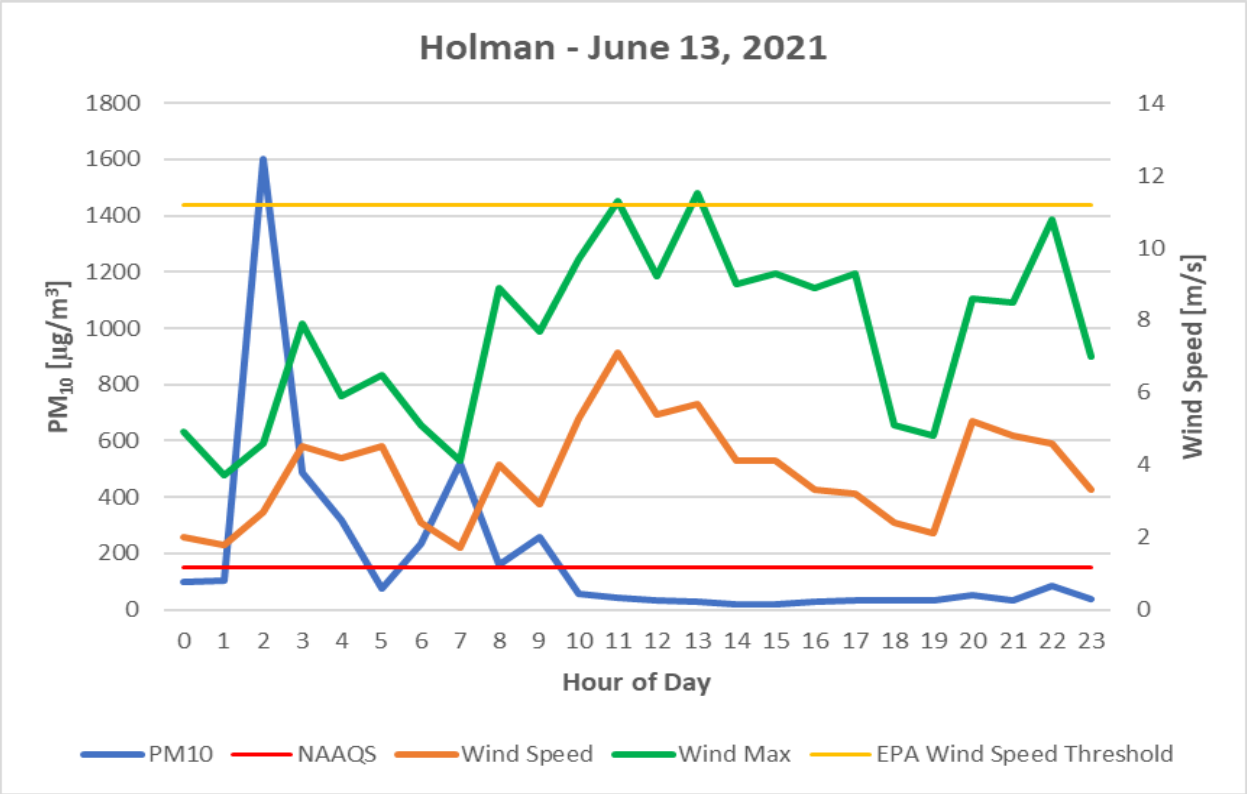


Figure 10-20. Holman monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

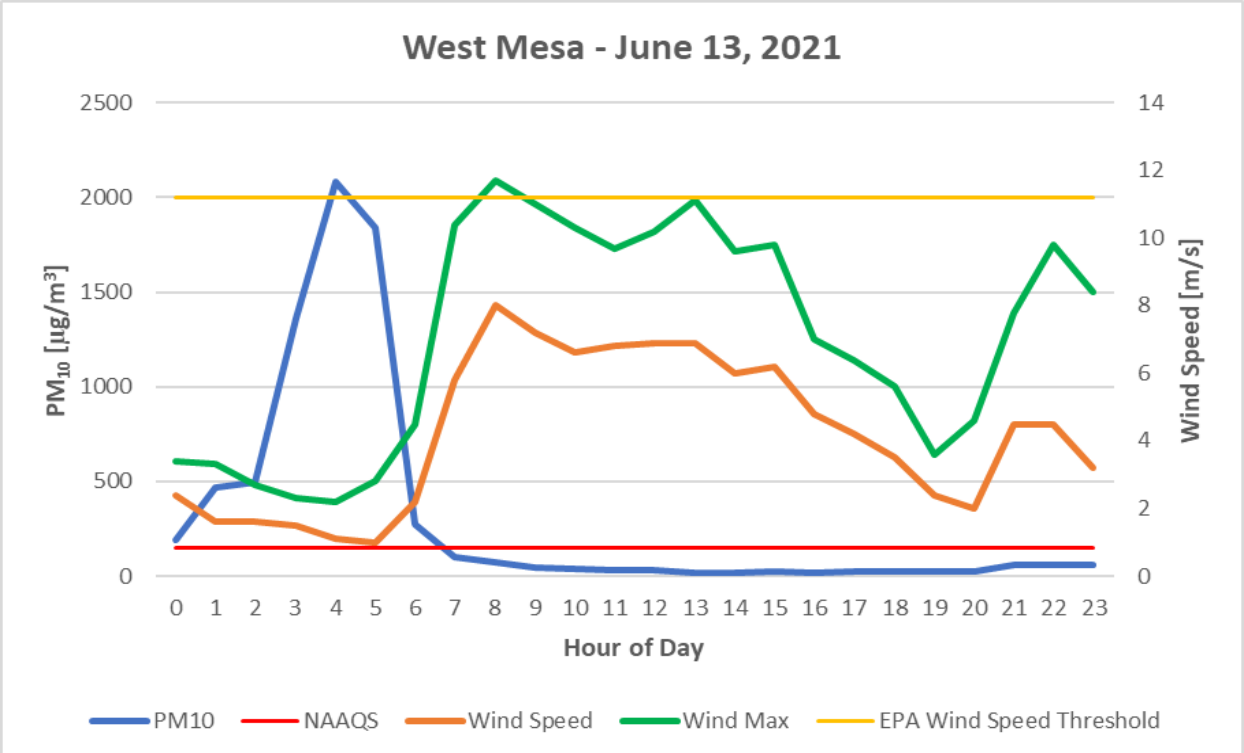


Figure 10-21. West Mesa monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

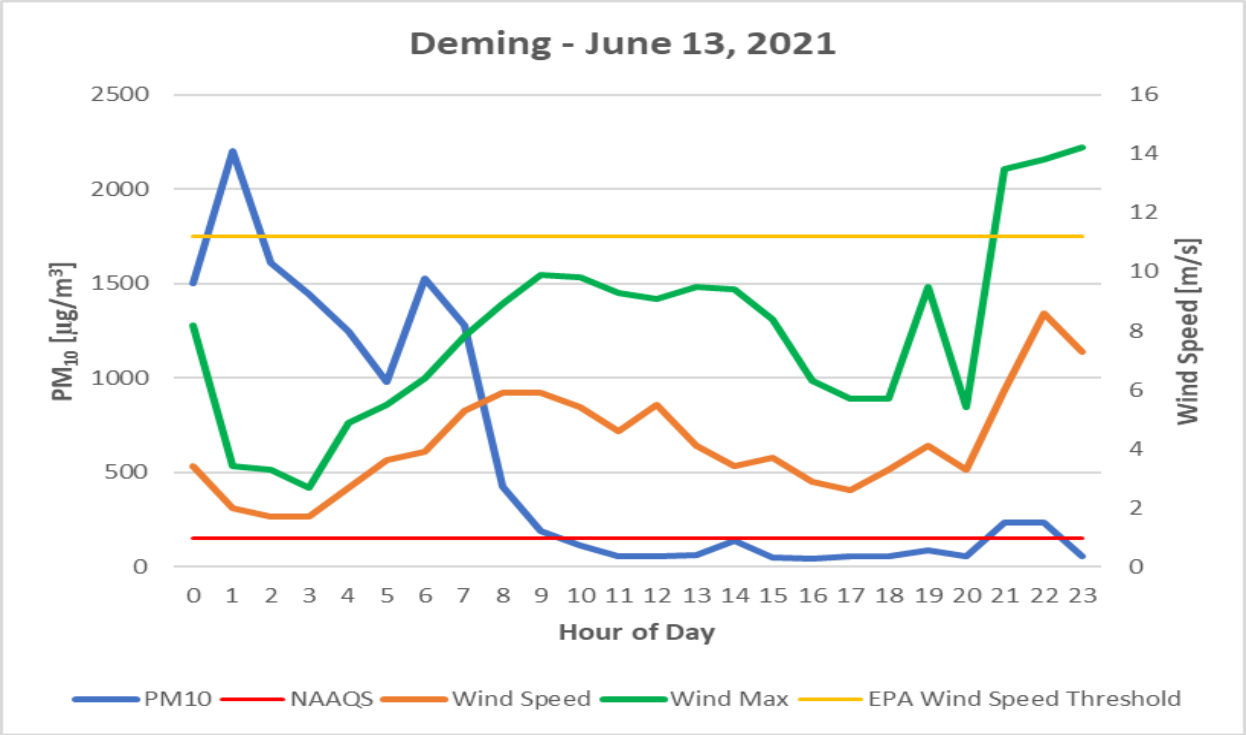


Figure 10-22. Deming monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED monitoring sites recorded 32 (Desert View), 4 (West Mesa), 9 (Holman), and 14 (Deming) exceedances of the PM_{10} NAAQS (Figures 18-2 through 18-6 in Appendix A). The maximum 24-hour average PM_{10} concentration at these sites were 734 (Desert View), 351 (West Mesa), 488 (Holman), and 721 (Deming) µg/m^3 all recorded in 2019. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events which include sporadic monsoonal events such as the case in this event.

Spatial and Temporal Variability

As demonstrated in Figure 10-23, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the three days surrounding the event did not surpass 132 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

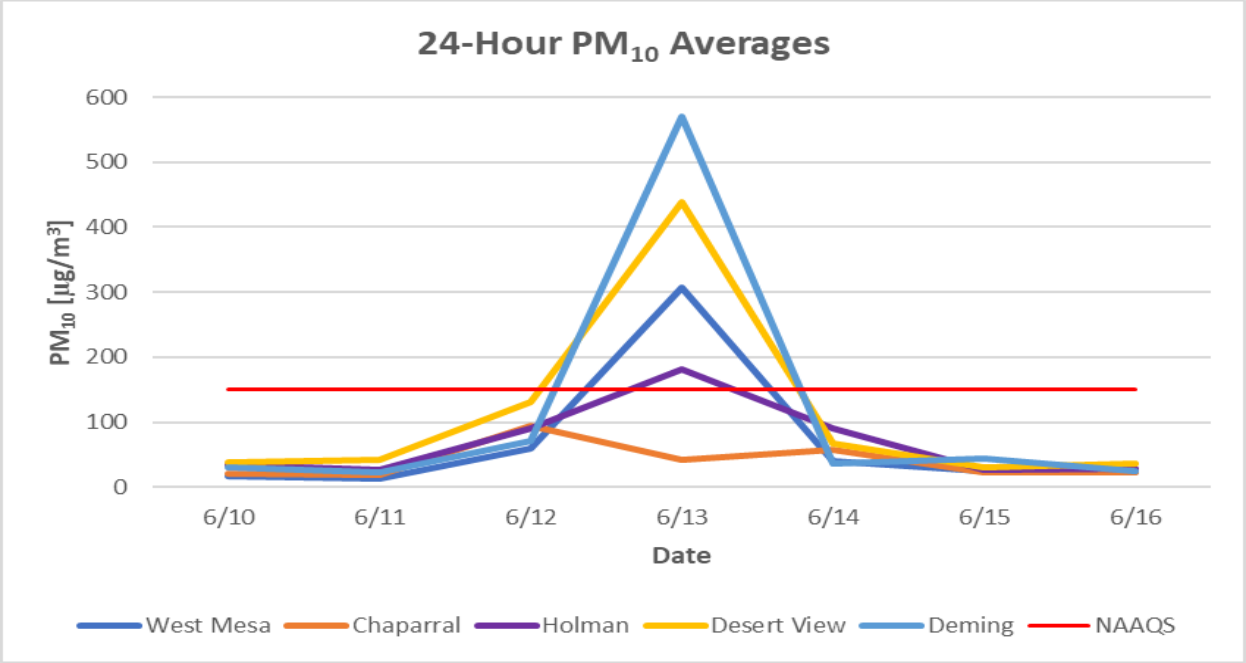


Figure 10-23. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for this day 439 (Desert View), 308 (West Mesa), 182 (Holman), and 570 (Deming) µg/m^3 are above the 99th percentile of historical data monitored over the past five years.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average of 439 (Desert View), 156 (West Mesa), and 293 (Holman) µg/m^3 are above the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

11. HIGH WIND EXCEPTIONAL EVENT: June 20, 2021

Conceptual Model

Thunderstorm outflow caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Chaparral monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 11-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	172 µg/m^3	9 m/s	17.2 m/s

Table 11-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

Today begins with a high-pressure system over southwestern New Mexico raising temperatures to near record highs with a mid-level storm system disturbance coming from the northwest in the evening with a high potential for outflow storm conditions. At the 1800 hour, an area of low pressure moved over southern New Mexico along with an outflow boundary (Figure 11-1). In addition, the high-pressure center of the storm system hovered off the Baja Coast. As the event progressed this low-pressure gradient traveled east and aligned itself with New Mexico and the surface wind direction (Figure 11-2). Convective forced outflows from the northwest allowed winds aloft to suddenly mix down, dramatically increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust in a relatively short period of time, particularly for eastern facing mountain slopes.

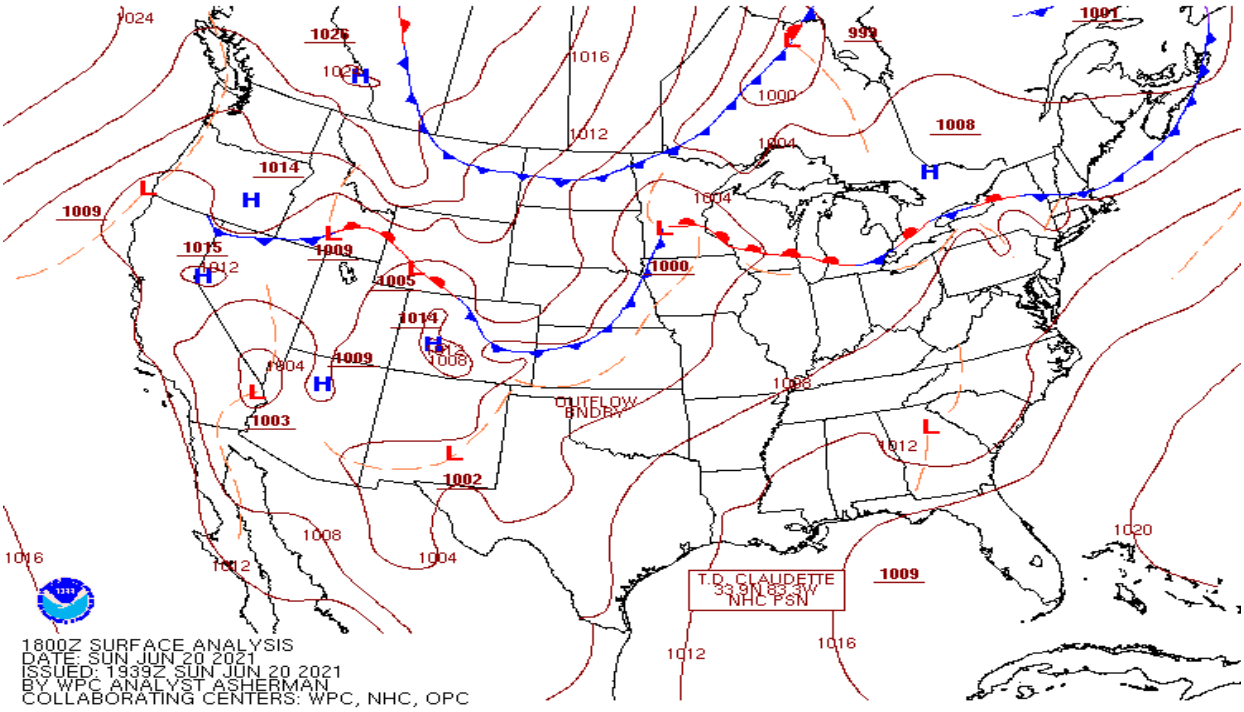


Figure 11-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

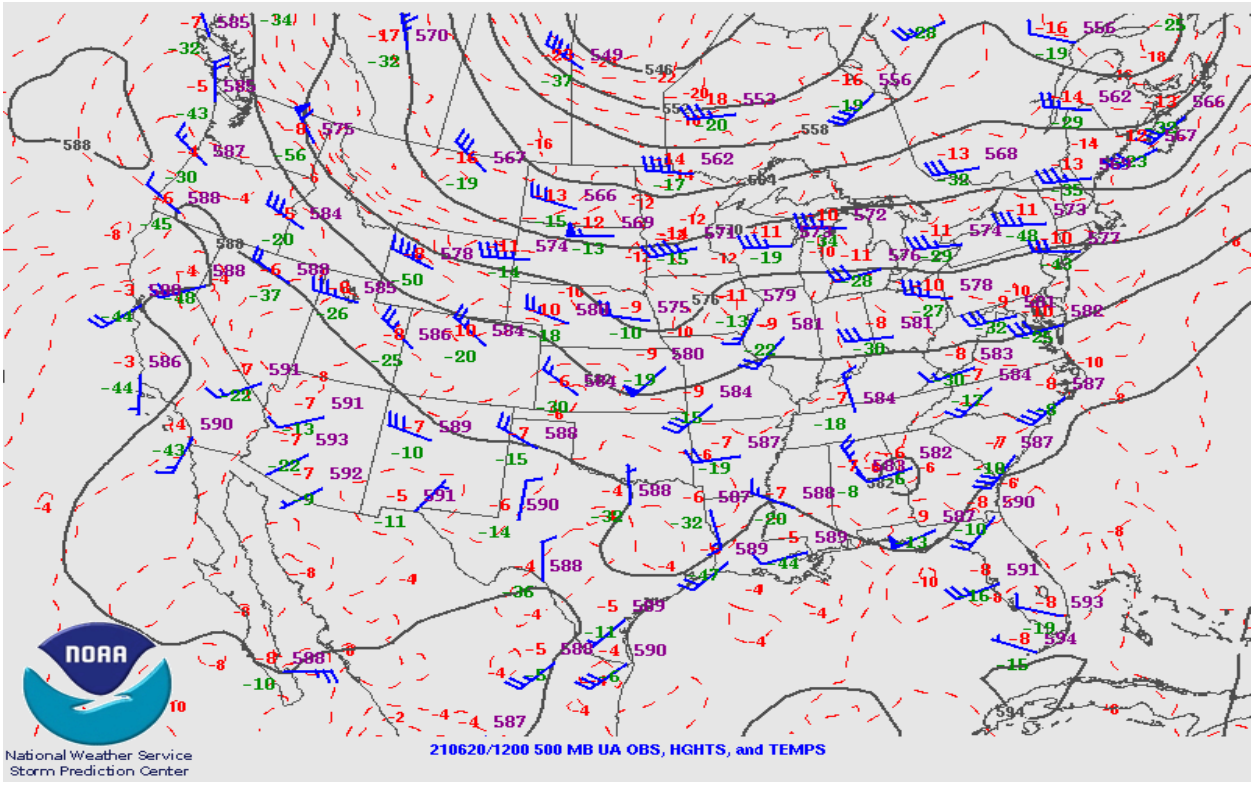


Figure 11-2. Upper air weather map for June 20, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the northwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the West Mesa monitoring site and the El Paso International Airport beginning at the 1525 hour and lasting through the 1855 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 1400 hour. Hourly concentrations remained elevated through the 2200 hour. Table 11-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event. Additionally, five-minute wind speeds for the West Mesa monitoring site support peak wind speeds for the NMED monitoring network during the event. (Table 11-3).

Hour	West Mesa			Chaparral			Desert View		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
1400	29	2.2	6	29	2.6	7.6	27	2.2	5.6
1500	237	6.7	20.7	53	5.3	11.3	29	2.5	5.6
1600	288	7.2	21.4	593	8.7	16.7	732	6.8	13
1700	835	10.9	18	920	9	17.2	----	8.3	17.6
1800	90	4.3	8.4	1011	4.6	11.2	----	6.2	19.4
1900	51	3.1	7.8	471	2.4	4.3	107	2.5	12.4
2000	31	2.8	5.1	190	1.5	3.5	156	2	6.8
2100	29	3.2	5.1	205	1.6	3.9	224	1.5	4.5
2200	22	2.9	5.2	70	3.2	5.6	180	3.7	7.8

Table 11-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Hour	West Mesa	
	Wind Speed (m/s)	Wind Gust (m/s)
1525	10.9	20.7
1530	13.2	19.4
1535	11.5	18.6
1640	12.8	17.4
1645	14.3	19
1650	15.8	21.4
1655	13.6	17.9
1700	12.3	15.6
1705	11.2	13.3
1710	12.3	16
1715	11.8	15.4
1720	13.6	18
1725	12.1	15.2
1730	12.8	16.8
1735	11.7	15.4
1740	9.4	12.3

Table 11-3. Five-minute wind speed summary for the hours with wind speeds > 9 m/s for the West Mesa Monitoring site.

Meteorologists forecasted the high wind blowing dust event to occur this day which normally accompany localized storm cells during a typical monsoon season. Forecasts predicted strong winds as the storm approached the area beginning with the area of high-pressure over southern New Mexico and Arizona. The systems movement across the area timed well with convective forced outflow winds that suddenly moved into the area from the northwest going in a southwest direction. Many outlets also

forecasted a high probability of blowing and entrained dust throughout the area and haze in the evening, especially in the desert areas of southern New Mexico (Figure 11-3).

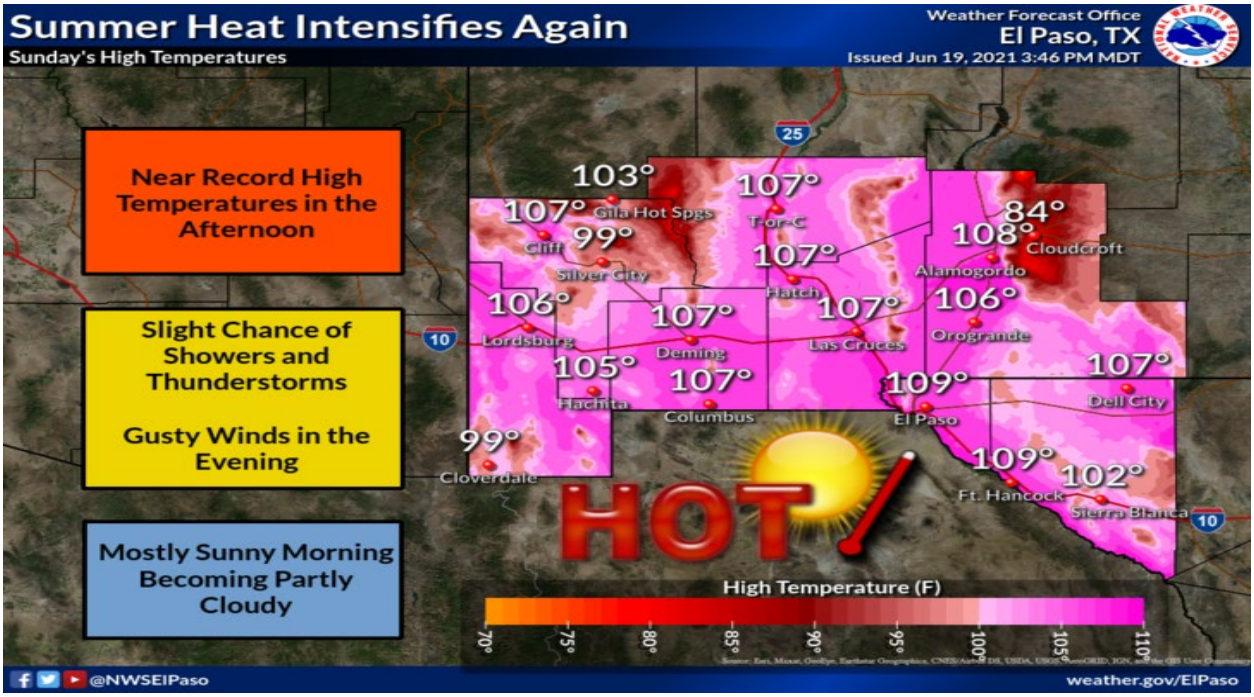


Figure 11-3. NWS GraphiCast product for June 20, 2021.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The West Mesa monitoring site recorded wind speeds for a cumulative total of one hour and fifteen minutes sustained above the threshold beginning at the 1530 hour and intermittently lasting through the 1735 hour (Table 11-3 and Figure 11-4). In addition, the wind speeds at the El Paso International Airport reached the wind speed threshold beginning at the 1751 hour and lasting through the 1855 hour for a total of 64 sustained minutes. Reportable conditions of "Blowing Dust/Windy" along with rapidly shifting cyclonic wind directional movement is consistent with a mesoscale synoptic convective event that suddenly develops and materializes during a typical monsoon season (Figure 11-5).

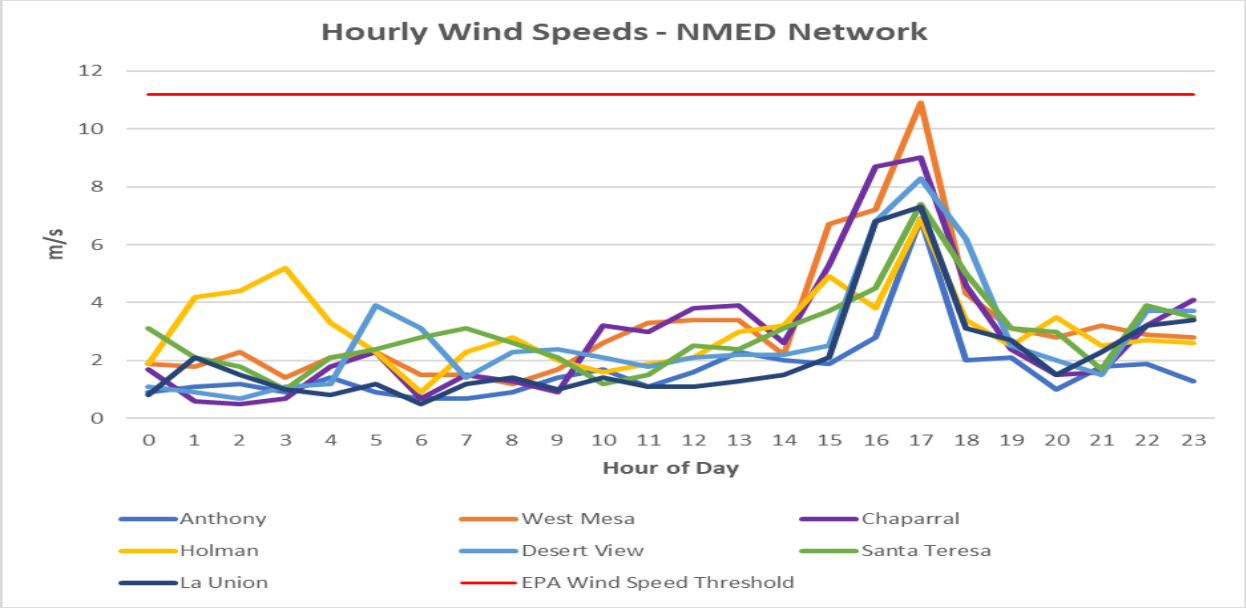


Figure 11-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

31.78 °N, 106.36 °W

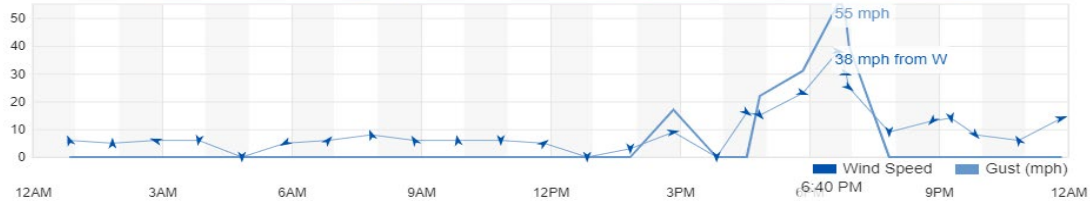
El Paso, TX Weather History

80° EL PASO INTERNATIONAL AIRPORT STATION | CHANGE

TODAY | HOURLY | 10-DAY | CALENDAR | HISTORY | WUNDERMAP

Daily | Weekly | Monthly

June | 20 | 2021 | View



Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
3:51 PM	107 °F	35 °F	8 %	CALM	0 mph	0 mph	25.74 in	0.0 in	Partly Cloudy
4:33 PM	107 °F	36 °F	9 %	NW	16 mph	0 mph	25.73 in	0.0 in	Partly Cloudy
4:51 PM	107 °F	36 °F	9 %	NW	15 mph	22 mph	25.73 in	0.0 in	Partly Cloudy
5:51 PM	103 °F	38 °F	11 %	WNW	23 mph	31 mph	25.73 in	0.0 in	Mostly Cloudy / Windy
6:40 PM	98 °F	40 °F	13 %	W	38 mph	55 mph	25.73 in	0.0 in	Blowing Dust / Windy
6:45 PM	97 °F	41 °F	15 %	WNW	36 mph	55 mph	25.74 in	0.0 in	Blowing Dust / Windy
6:51 PM	96 °F	42 °F	15 %	WNW	30 mph	49 mph	25.74 in	0.0 in	Blowing Dust / Windy
6:55 PM	96 °F	41 °F	15 %	NW	25 mph	40 mph	25.75 in	0.0 in	Blowing Dust / Windy
7:51 PM	97 °F	40 °F	14 %	N	9 mph	0 mph	25.80 in	0.0 in	Mostly Cloudy
8:51 PM	95 °F	39 °F	14 %	NE	13 mph	0 mph	25.80 in	0.0 in	Mostly Cloudy
9:17 PM	94 °F	41 °F	16 %	N	14 mph	0 mph	25.81 in	0.0 in	Mostly Cloudy
9:51 PM	94 °F	41 °F	16 %	NW	8 mph	0 mph	25.81 in	0.0 in	Mostly Cloudy
10:51 PM	93 °F	40 °F	16 %	SSE	6 mph	0 mph	25.82 in	0.0 in	Mostly Cloudy
11:51 PM	93 °F	40 °F	16 %	WSW	14 mph	0 mph	25.83 in	0.0 in	Mostly Cloudy

Figure 11-5. El Paso International Airport historic recorded meteorological data for June 20, 2021. Obtained from weatherunderground.com

Level of Controls Analysis
Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures
Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event
Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery
The event was captured on the GOES-16 geostationary satellite utilizing the Aerosol Optical Depth daily global composite imagery product with dust plumes observed as warm colors originating upwind of NMED's monitoring site in southwestern New Mexico and east Arizona. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 11-6). The dust plumes of interest appear to be limited to Mexico,

orientated in a northwest fashion and traveling toward El Paso and NMED's monitoring site at the time of the satellite pass (00Z) that captured the imagery.

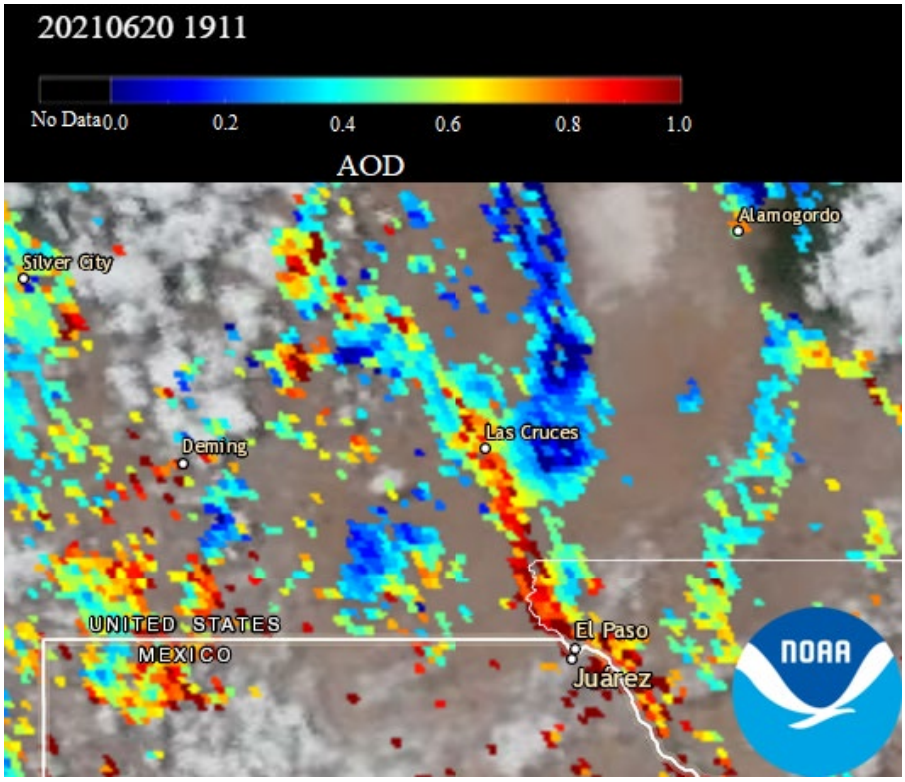


Figure 11-6. GOES-16 geostationary satellite Aerosol Optical Depth Composite (1800-2100 UTC) product showing southwestern New Mexico, northern Chihuahua and western Texas. Imagery obtained from AerosolWatch website.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this event. A Hazardous Weather Outlook is issued by NWS when a potentially hazardous meteorological event is expected to occur that could potentially disrupt normal activity such as a thunderstorm. A description of the potentially hazardous weather is described to warn residents and give them plenty of time to plan ahead. This was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook can be found below:

"Isolated to scattered thunderstorms are expected to develop this afternoon…will produce brief periods of rain and strong wind gusts…over 50mph will be possible near storms… strong winds will also transport smoke into the area as well as stir up and produce blowing dust for the desert lowlands this afternoon and early evening"

Image from Franklin Peak in El Paso, TX taken in a southeastern direction June 20, 2021, showing the haze in the air during the afternoon (Figure 11-7).

Figure 11-7. Image taken from Franklin Peak in southeast direction depicting haze.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from areas of east Arizona and southwestern New Mexico and into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 11-8). This analysis supports the hypothesis that dust plumes originated in east Arizona and southwestern New Mexico before being transported to downwind monitoring sites.

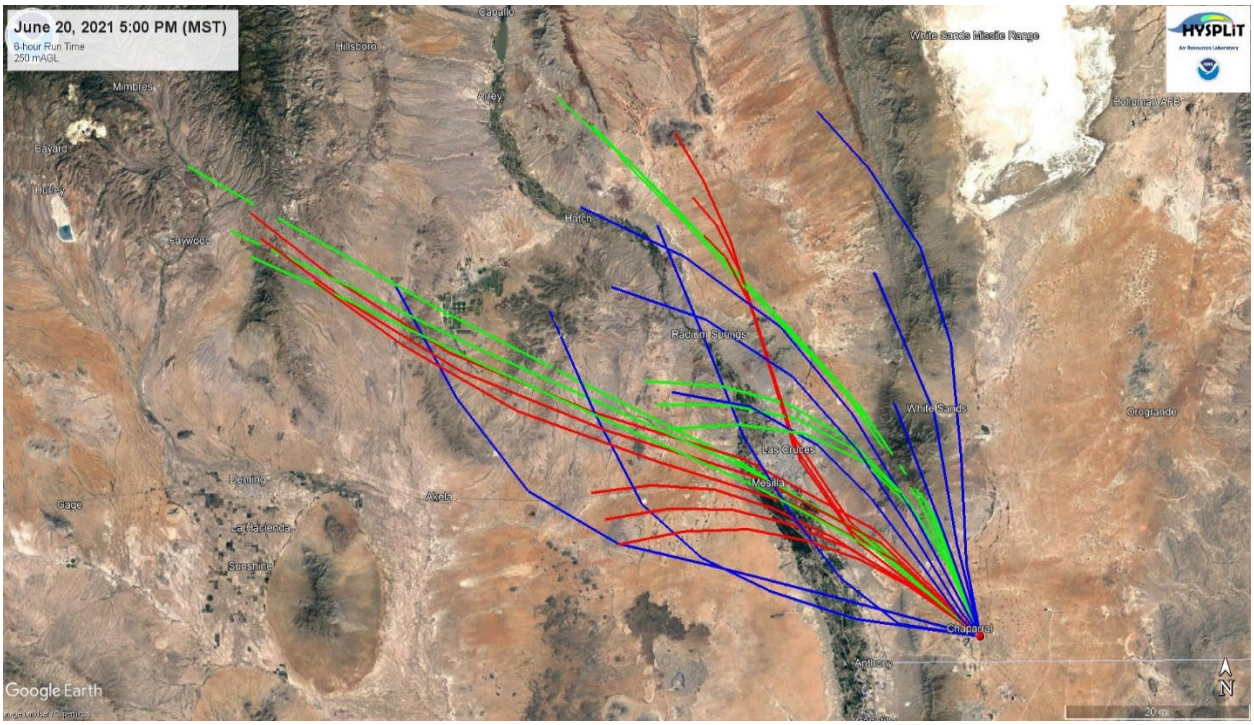


Figure 11-8. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 11-9) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (1400 -2200 hour). During the event, winds blew from the southwest direction 67%, northwest direction 22%, and southeast direction 11% of the time coinciding with peak PM_{10} concentrations.

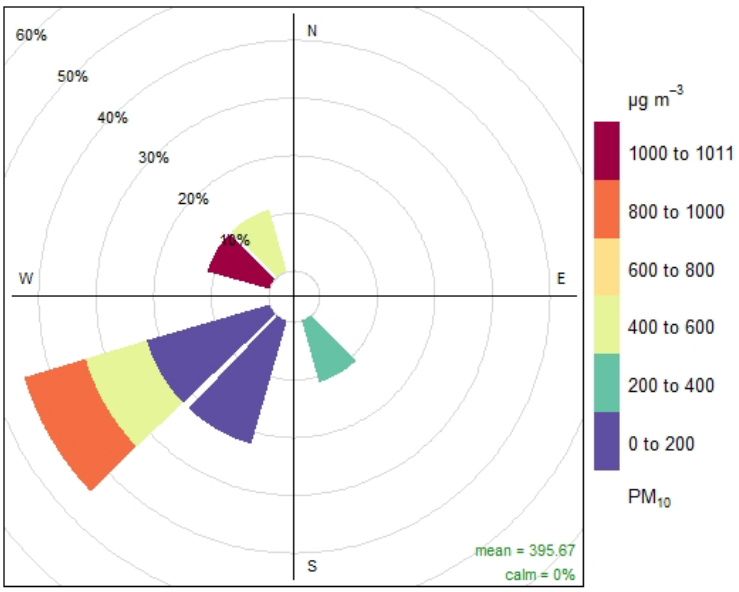


Figure 11-9. Pollution rose for the Chaparral monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated northwesterly winds beginning at the 1525 hour and lasting through the 1855 hour. During this time, peak hourly PM_{10} concentrations ranged from 488 to 1594 µg/m^3 were recorded at the Deming and Desert View monitoring sites, respectively (Figure 11-10). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 6.9 to 16.9 m/s were recorded at the Anthony monitoring site and El Paso International Airport, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 11-11 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

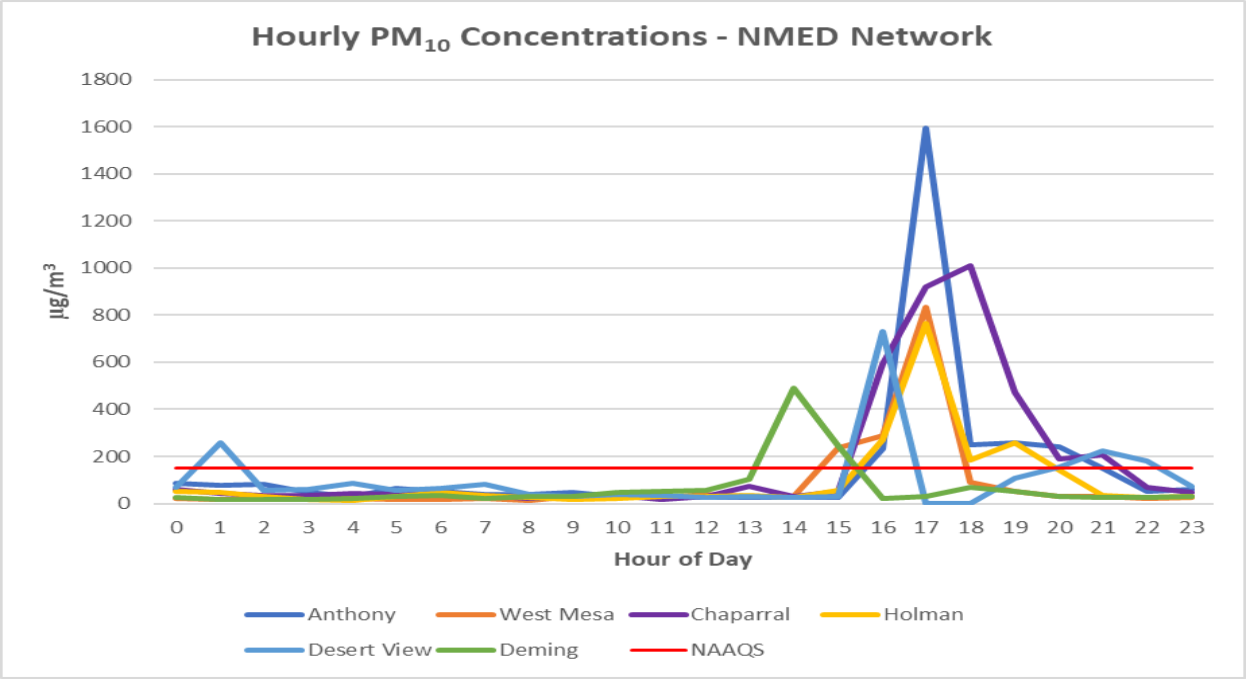


Figure 11-10. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

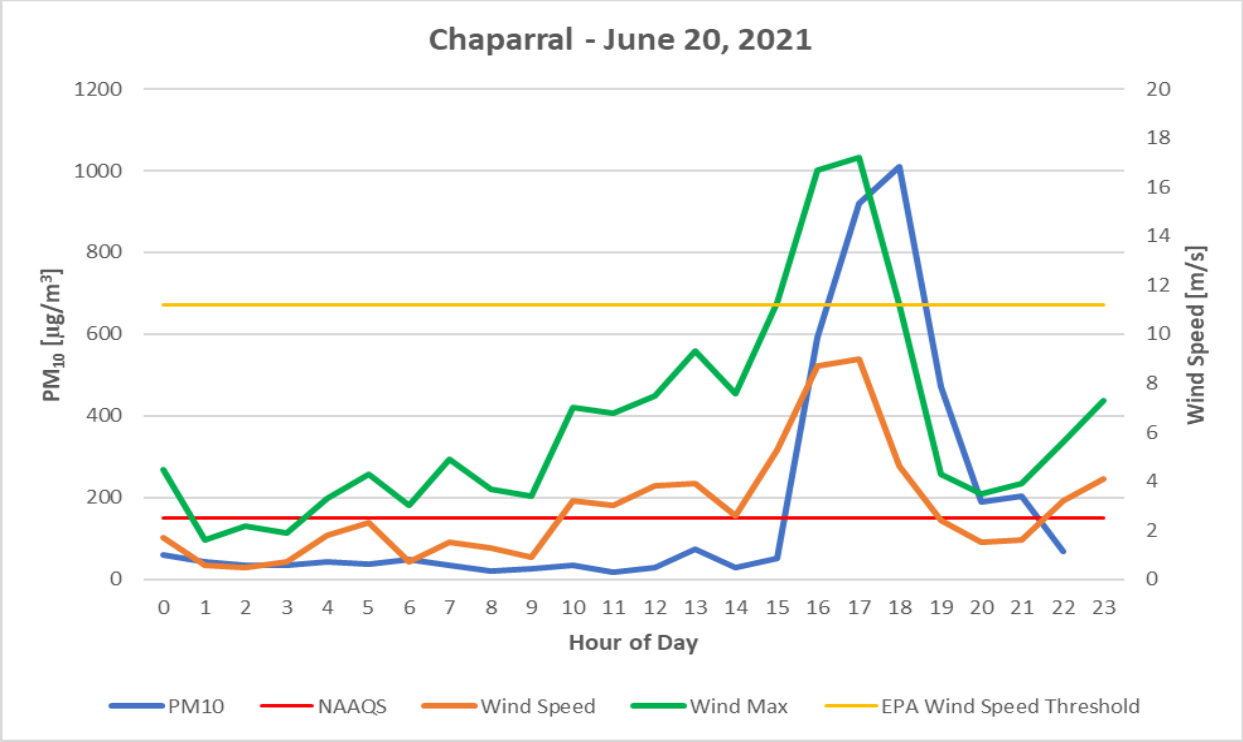


Figure 11-11. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Chaparral monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentration at this site was 721 µg/m^3 recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 11-12, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for three days surrounding the event did not surpass 91 µg/m^3, except for the following June 21, 2021, and June 22, 2021, exceedance event days, demonstrating the influence high winds have on PM_{10} concentrations in the area.

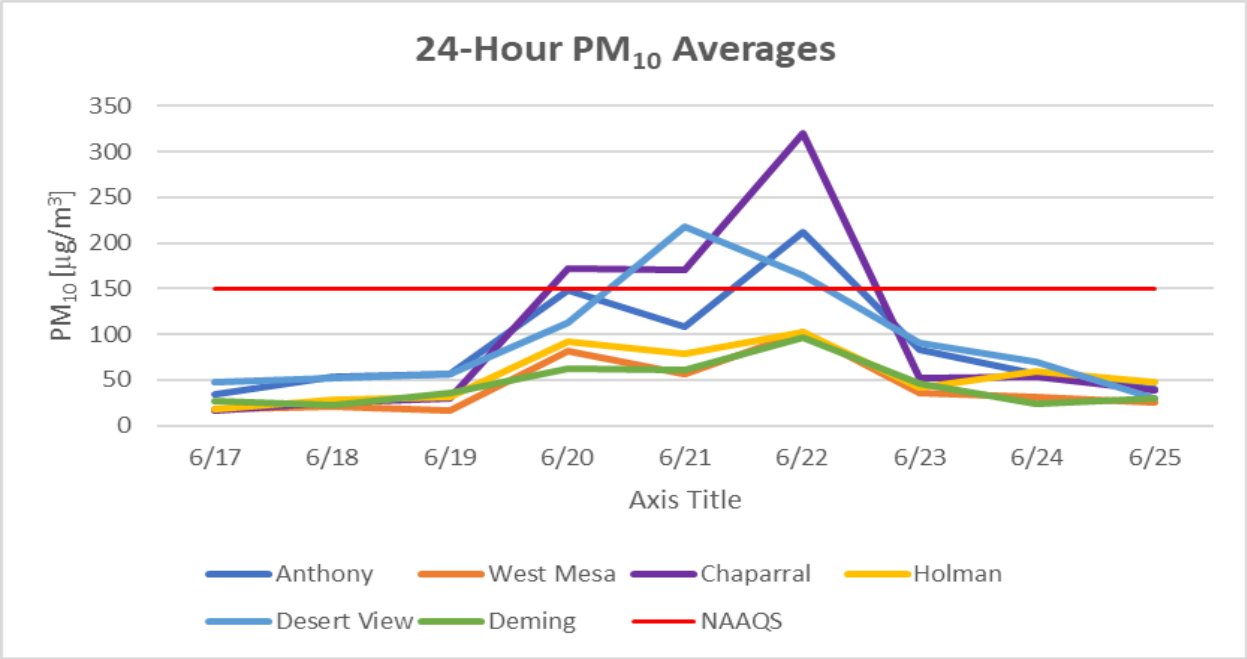


Figure 11-12. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (172 µg/m^3) is above the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at the Chaparral monitoring site. The monitored PM_{10} 24-hour average (172 µg/m^3) is above the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

12. HIGH WIND EXCEPTIONAL EVENT: June 21, 2021

Conceptual Model

Thunderstorm outflow and a backdoor cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Desert View and Chaparral monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 12-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	170 µg/m^3	8.1 m/s	13.2 m/s
RJ	35-013-0021	6ZM Desert View	218 µg/m^3	8.7 m/s	15.9 m/s

Table 12-1 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

As the tail end of yesterday's Pacific storm system exits the region this morning a backdoor cold front will quickly come from the northeast and continue active monsoon activity in the evening resulting in lowered temperatures and shifting wind directions. Various predicted outflows will create high wind blowing dust across the desert lowlands. At the 1800 hour, an area of low-pressure moved over New Mexico pulling moisture from west Texas (Figure 12-1). Aloft, the low-pressure center of the storm system hovered over the High Plains. As the event progressed this low-pressure gradient traveled west and aligned itself with New Mexico and the surface wind direction (Figure 12-2). Yesterday's convective forced outflow winds in the evening allowed winds aloft to suddenly mix down, dramatically increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust in a relatively short period of time.

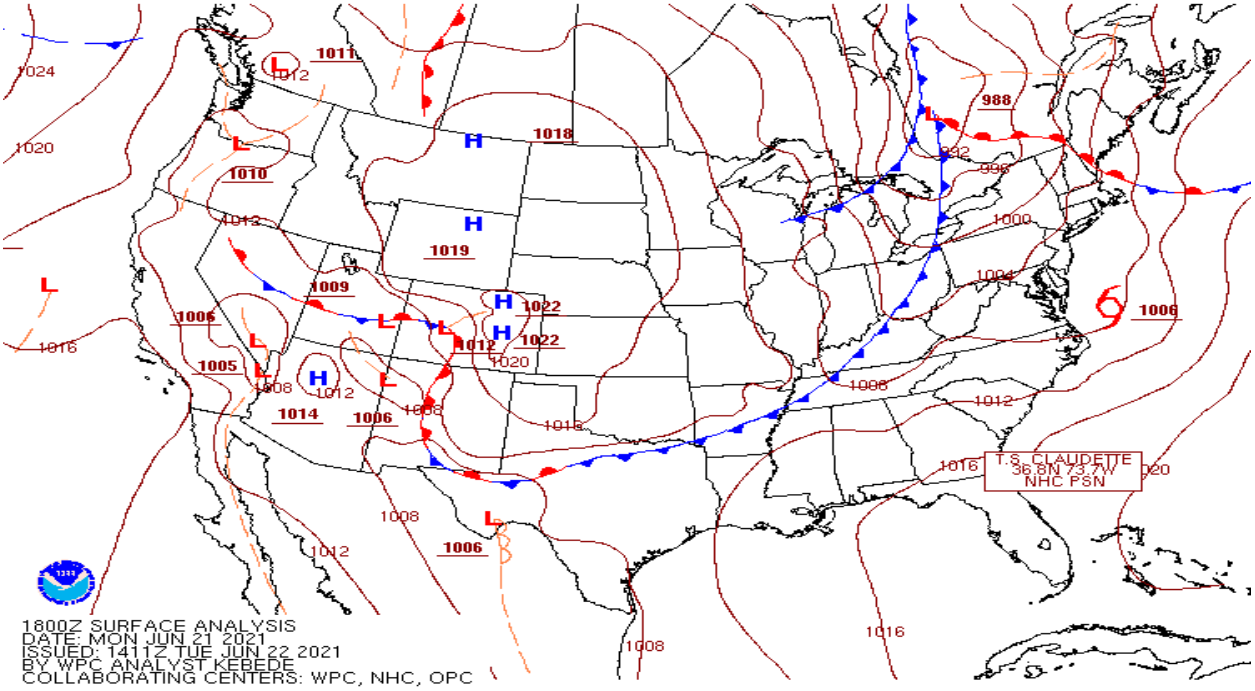


Figure 12-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

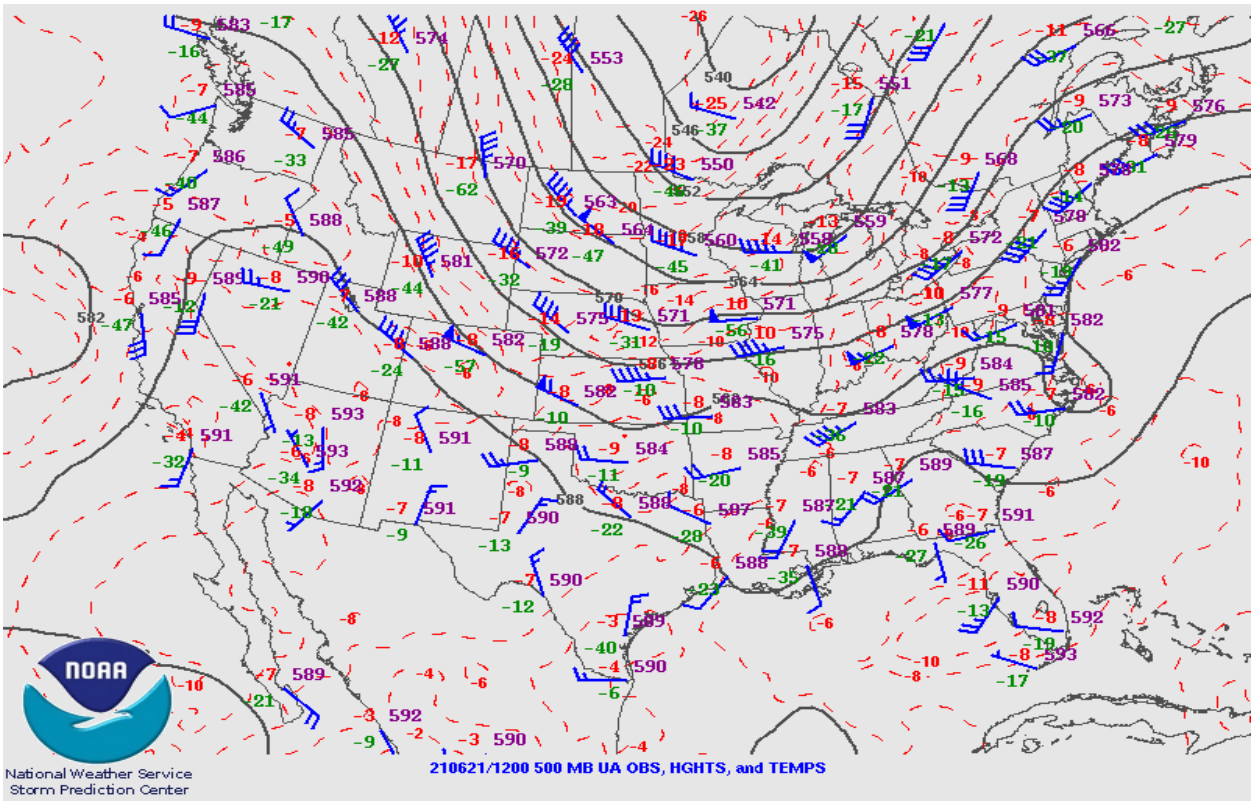


Figure 12-2. Upper air weather map for June 21, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event exacerbated by wildfire smoke and is a continuance of the previous day's event, June 20, 2021. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Holman and Santa Teresa monitoring sites beginning at the 1400 hour and lasted through the 2300 hour; at the Texas Commission of Environmental Quality's (TCEQ) El Paso Chamizal monitoring site beginning at the 0400 hour and lasted through the 0700 hour (Figure 12-8); at the El Paso International Airport for the 1551 hour (Figure 12-9); and at the Las Cruces International Airport for the 1615 and 2035 hours (Figure 12-10). PM_{10} concentrations began to exceed the NAAQS at the Desert View monitoring site beginning at the 0000 hour. Hourly concentrations remained elevated intermittently throughout the day until the 2300 hour. Table 12-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Anthony			Chaparral			Desert View		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0000	53	1.1	2.3	44	3.3	8.8	180	4.5	10.1
0100	53	1.4	4.7	31	5.1	9.2	1357	5.7	9.9
0200	239	1.7	4	78	6.9	10.9	327	5.4	9.5
0300	219	1.1	2.9	122	6.7	11	520	1.2	4.7
0400	151	1.4	2.8	97	5	7.8	241	1.6	5.3
0500	122	0.8	2.5	66	5.5	9	180	1.4	2.6
0600	102	0.7	2.1	85	7.6	13.2	97	1.9	4.3
0700	75	1.3	3.2	112	8.1	13	88	2.6	4.7
0800	66	0.9	3.6	63	6.5	10.7	70	2.5	5
0900	92	1.8	5.4	366	5.9	9.2	68	2.5	4.9
1000	61	2.1	5.1	622	4.3	9.9	63	2.6	5.5
1100	61	2.7	5.4	114	5.7	10.4	51	2.8	7.2
1200	53	2.5	6.9	842	6.2	10.3	44	1.7	5.5

Table 12-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day which normally accompanies localized storm cells during a typical monsoon season. Forecasts predicted strong winds just under advisory criteria as the storm approached the area with the area of high-pressure tracking from west to east at southern New Mexico early in the morning and moving across New Mexico into west Texas to be directly met up with a strong backdoor cold front beginning around noon which changed the westerly wind direction to the east into the evening and dropped the temperature only slightly. The systems movement across the area timed well with convective forced outflow winds that suddenly moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the evening and early mornings, especially in the desert areas of southern New Mexico (Figure 12-3). Variably high-speed winds for this event were influenced by thunderstorm activity beginning the night before, June 20, 2021, and leading into the early morning of June 21, 2021, and continuing throughout the day with the backdoor cold front. Forecasts predicted strong winds along outflow boundaries of storm activity. The area of high-pressure centered over New Mexico creating triple digit temperatures and increased moisture aloft setup the atmospheric instability for thunderstorm activity as the evening progressed. Convective outflows progressed from the highlands to the lowlands in a northwest to southeast direction from the Tonoto National Forest in Arizona and the Gila National Forest and towards the Organ and Franklin Mountain Ranges into the early morning hours. Nearby wildfire smoke impacts from the Gila National Forest's Bullard, Johnson, and Lampbright Fires and Arizona's Tonto National Forest's Telegraph Fire exacerbated the PM_{10} concentrations this morning and throughout the day. The direction of the upper-air columns predominating from the northwest allowed for the transport of smoke into the Borderland through the middle- and upper-air columns the evening of June 20, 2021 (Figure 12-4). The energy created by the negative buoyancy from the moisture laden middle-air columns manifested as outflow thunderstorm activity and allowed for the smoke to continue its transport to the lower-air columns. An early morning temperature inversion allowed for PM_{10} concentrations to remain elevated and remain suspended near ground surface (850 mb) until thermal warming and mixing of the temperature inversion occurred (Figures 12-5 and 12-6).

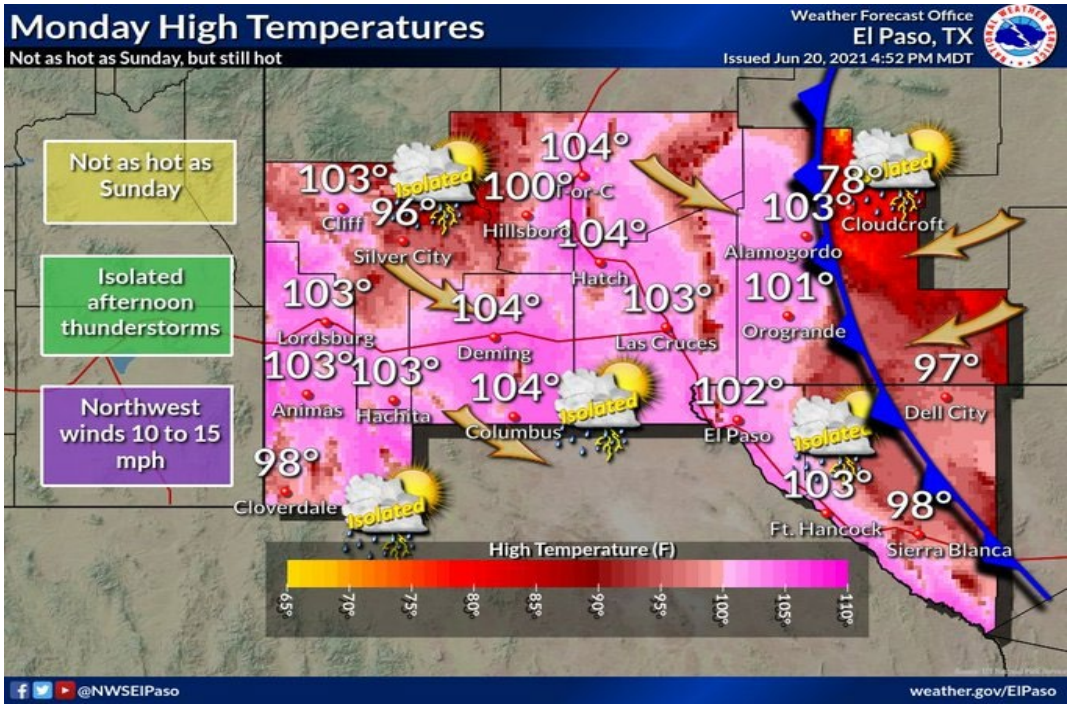


Figure 12-3. NWS GraphiCast weather forecast product for June 21, 2021.

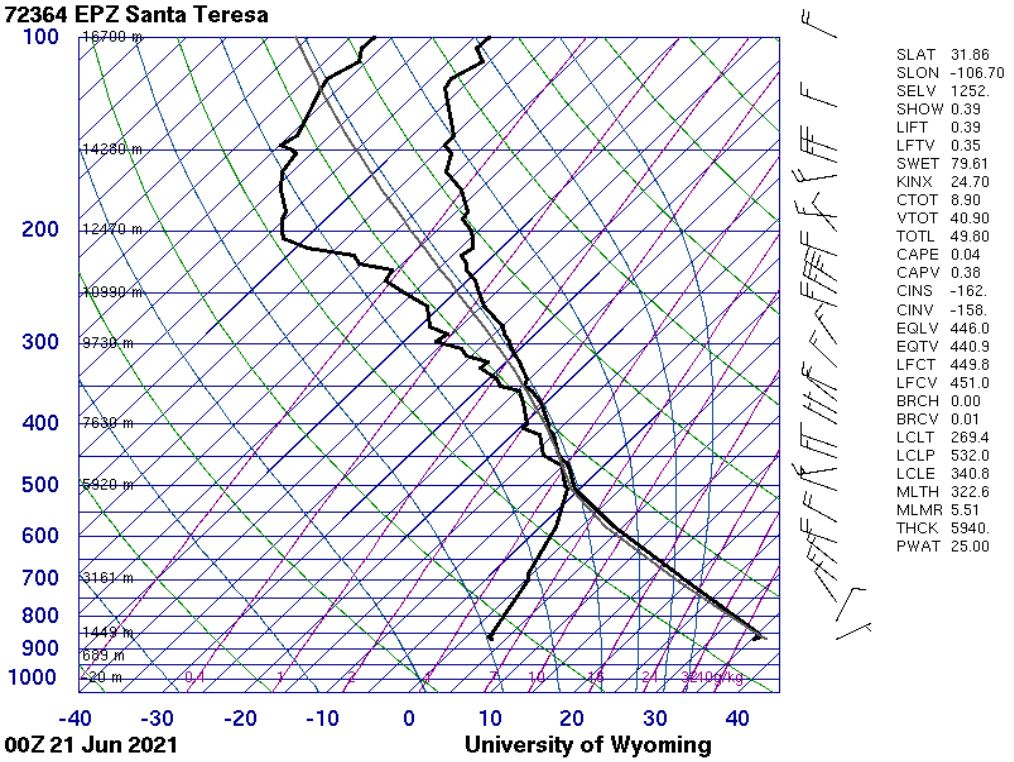


Figure 12-4. El Paso NWS Upper-air column skew-t sounding for June 20, 2021, at 1800 (MST). Notice increased moisture at 500 mb level with slightly elevated Convective Available Potential Energy (CAPE)

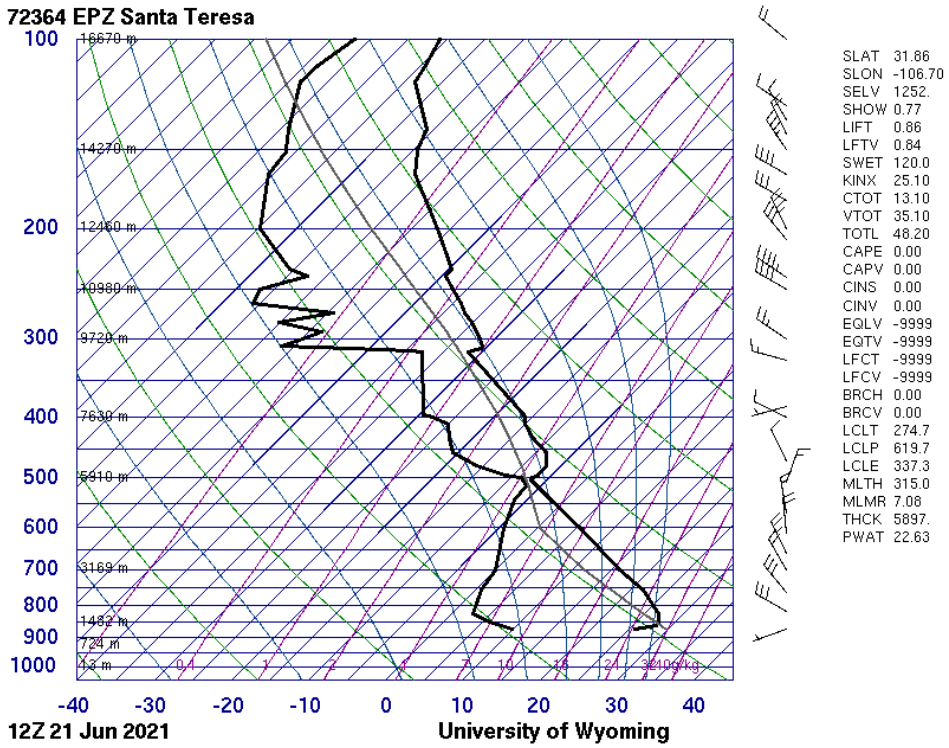


Figure 12-5. El Paso NWS Upper-air column skew-t sounding for morning of June 21, 2021, at 0600 (MST). Notice the temperature inversion at the 850 mb level.

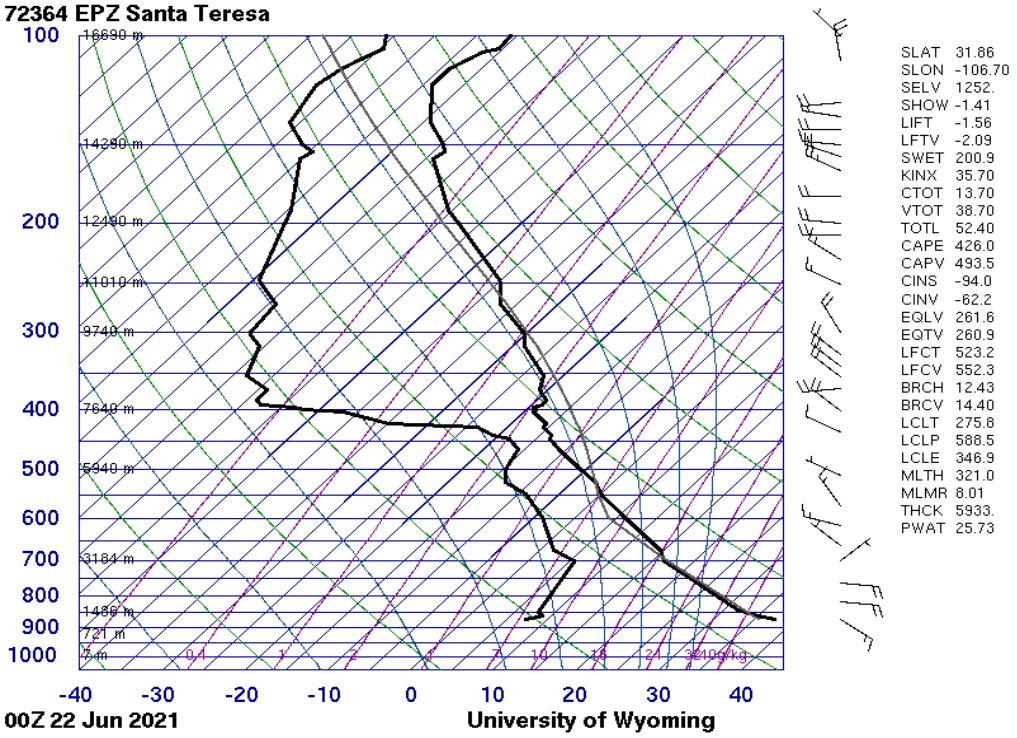


Figure 12-6. El Paso NWS Upper-air column skew-t sounding for June 21, 2021, at 1800 (MST). Notice increased moisture at 450 mb level with elevated Convective Available Potential Energy (CAPE)

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. Unfortunately, NMED monitoring sites recorded wind speeds below this threshold for this date (Figure 12-7). However, the wind speeds the night before on July 20, 2021, at the El Paso International Airport reached peak wind speeds close to the threshold starting at the 1751 hour and ending at the 1855 hour for a total of 64 sustained minutes. In addition, TCEQ's El Paso Chamizal monitoring site recorded sustained hourly wind speeds of 15.6 m/s (23.6 mph) as provided in Figure 12-8.

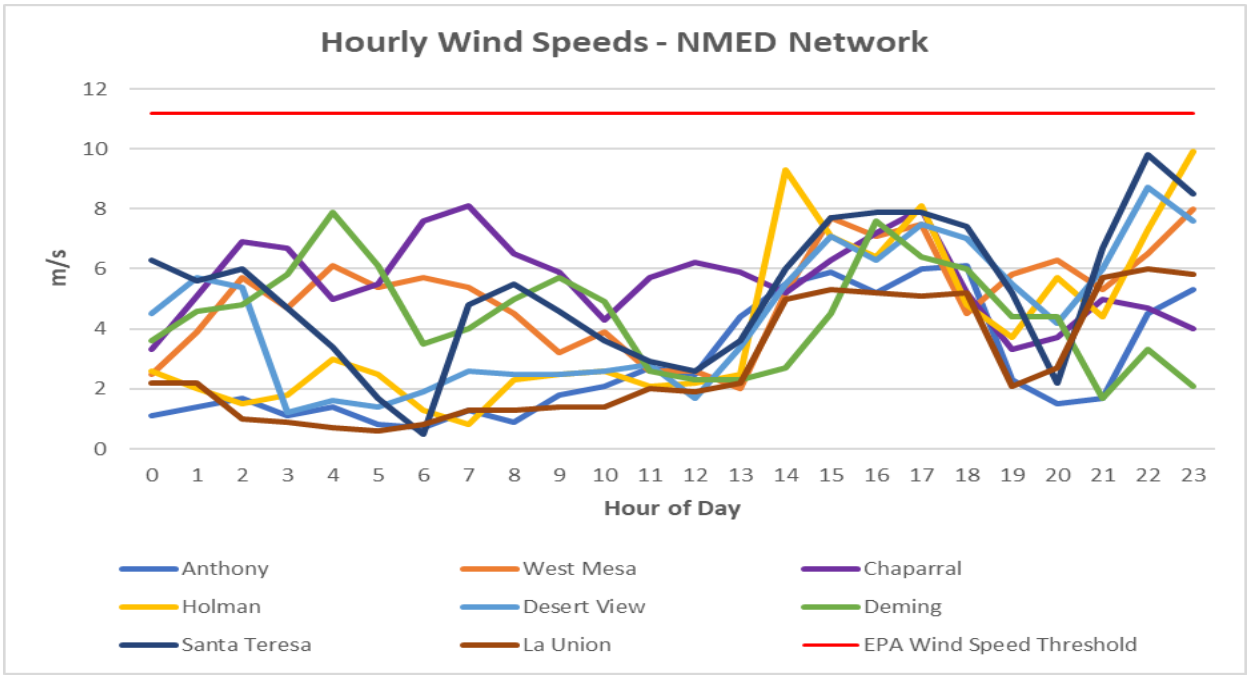


Figure 12-7. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

The table below contains hourly averages for all the pollutants and meteorological conditions measured at Chamizal C41/AH126 for **Monday, June 21, 2021**. All times shown are in MST.

Parameter Measured	Morning												Afternoon												Parameter Measured
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	
Wind Speed	10.4	20.0	16.9	19.5	20.4	17.1	**23.6**	23.2	18.1	14.9	13.3	***6.7***	9.9	10.3	9.5	10.9	10.8	13.0	12.8	9.4	7.7	9.2	10.3	11.3	Wind Speed
Resultant Wind Speed	9.9	19.7	16.6	19.2	20.2	16.9	**23.3**	22.8	17.8	14.7	13.0	***2.8***	8.3	9.3	8.6	10.3	10.3	12.6	12.4	9.0	7.5	8.9	9.9	10.9	Resultant Wind Speed
Resultant Wind Direction	265	279	277	278	281	275	287	281	284	285	285	**342**	***61***	87	99	94	100	100	99	93	97	93	88	85	Resultant Wind Direction
Maximum Wind Gust	29.4	31.7	29.7	33.0	35.5	29.8	**42.2**	39.0	33.2	24.5	21.8	18.7	21.6	28.6	24.6	20.6	22.6	24.9	22.9	20.0	***15.9***	20.2	18.8	23.6	Maximum Wind Gust
Std. Dev. Wind Direction	18	10	12	11	**9**	9	10	10	11	10	12	**62**	32	25	24	18	18	15	13	16	15	15	15	15	Std. Dev. Wind Direction
Outdoor Temperature	91.4	86.9	85.1	83.8	83.5	84.3	86.9	87.7	89.9	92.0	96.3	98.9	**99.9**	99.2	99.4	97.9	97.4	95.5	92.2	89.2	87.6	85.9	83.6	***82.0***	Outdoor Temperature
Dew Point Temperature	41.3	49.1	51.5	52.1	50.7	46.7	42.2	43.7	42.5	41.3	39.1	***37.2***	45.1	48.1	47.9	48.4	49.1	49.9	50.8	51.8	53.2	54.3	55.4	**56.2**	Dew Point Temperature
Relative Humidity	17.5	27.1	31.5	33.5	32.3	27.3	20.9	21.6	19.4	17.2	14.0	***11.9***	15.7	17.9	17.6	18.8	19.6	21.4	24.6	28.0	30.9	34.0	38.1	**41.2**	Relative Humidity
PM-10 (Local Conditions)	64.90	AQI	**589.90**	274.90	158.90	85.90	227.90	101.90	82.90	63.90	38.90	***30.90***	75.90	91.90	81.90	75.90	89.90	85.90	94.90	79.90	91.90	76.90	64.90	72.90	PM-10 (Local Conditions)
PM10-2.5 Local Conditions	48.70	AQI	**489.70**	236.70	132.70	61.70	201.70	79.70	61.70	38.70	13.70	***11.70***	58.70	71.70	60.70	60.70	74.70	69.70	82.70	66.70	75.70	62.70	50.70	56.70	PM10-2.5 Local Conditions
PM-2.5 (Local Conditions)	16.3	**129.3**	100.3	38.3	26.3	24.3	26.3	22.3	21.3	25.3	25.3	19.3	18.3	19.3	21.3	15.3	15.3	16.3	***12.3***	12.3	16.3	14.3	13.3	15.3	PM-2.5 (Local Conditions)
Parameter Measured	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Parameter Measured
	Morning												Afternoon												

Figure 12-8. Texas Commission for Environmental Quality's El Paso Chamizal air monitoring site historical data for June 21, 2021.

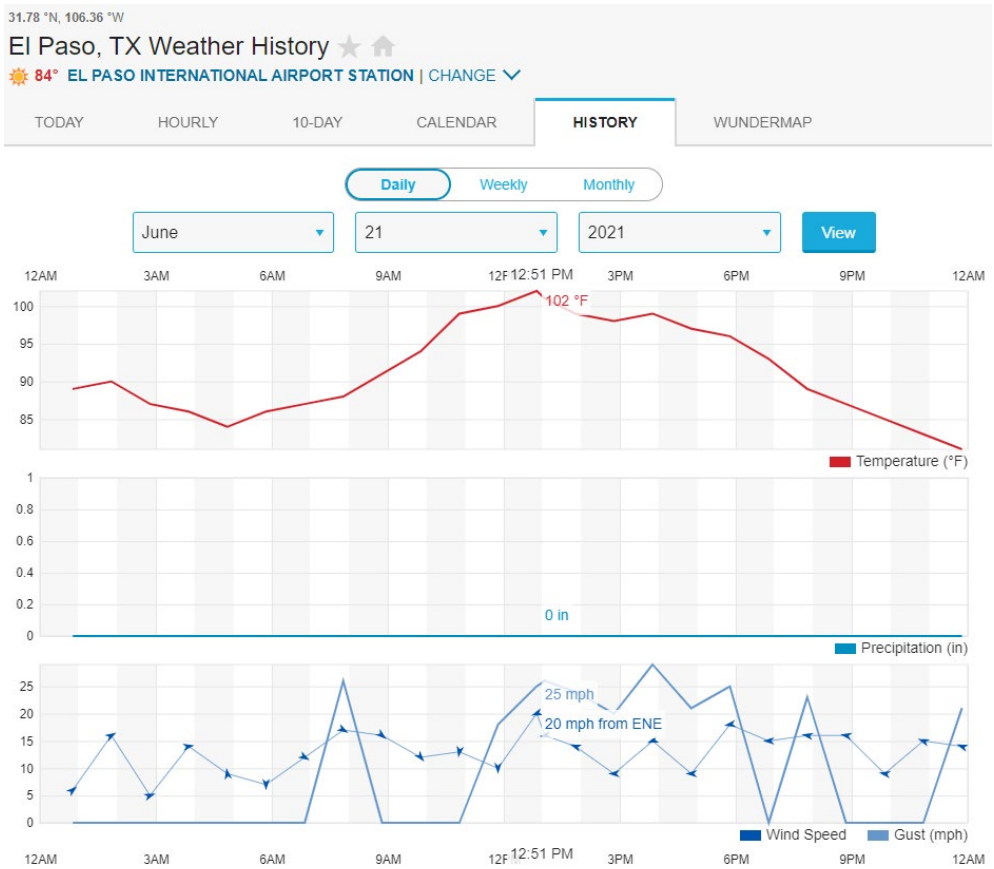


Figure 12-9. El Paso International Airport historic recorded one-hour wind speed data for June 21, 2021. Obtained from weatherunderground.com

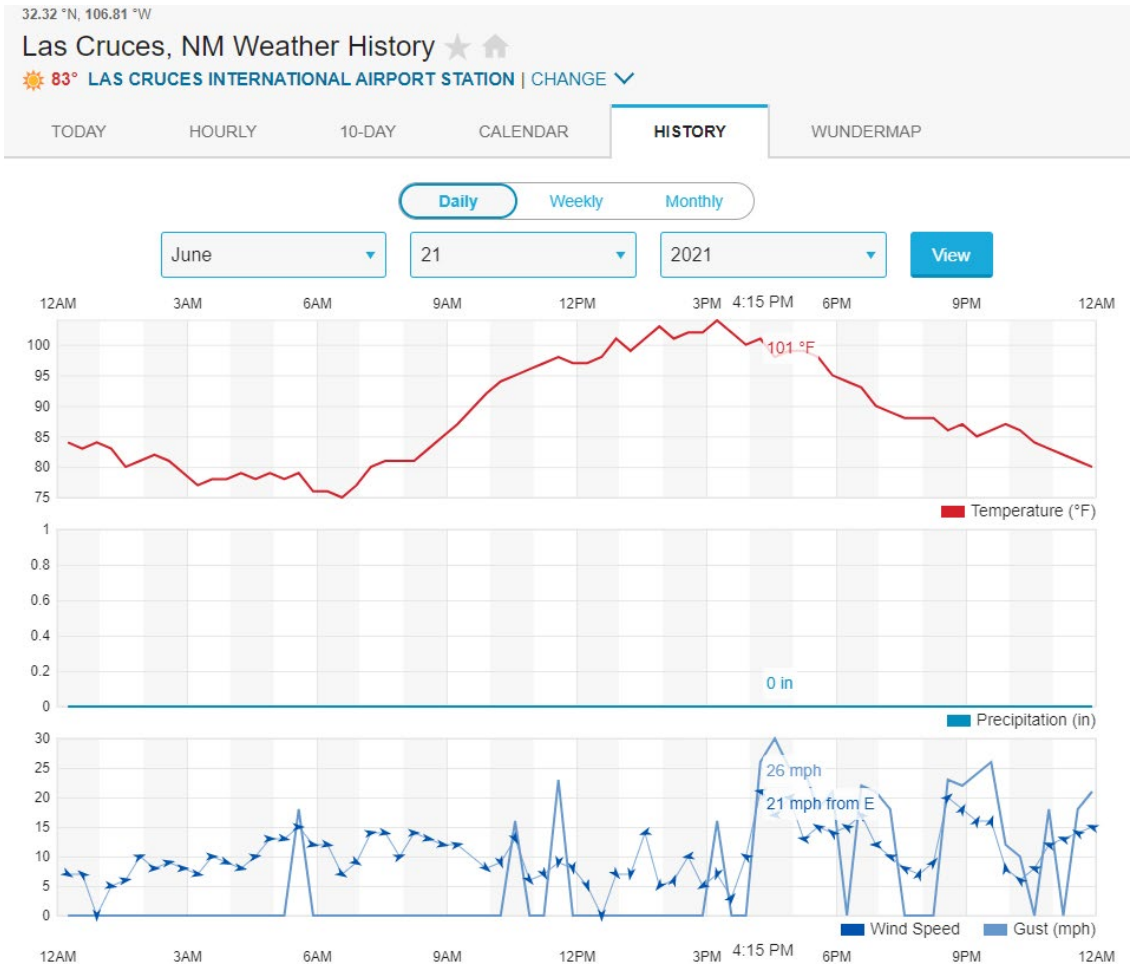


Figure 12-10. Las Cruces International Airport historic recorded 20-minute wind speed data for June 21, 2021. Obtained from weatherunderground.com

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview

does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Otero, Grant, and Sierra Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona, Texas, and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the GOES-16 satellite Aerosol Optical Depth composite (0900 – 1200 MST) imagery product with dust plumes observed as warm colors originating upwind of NMED's monitoring site near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 12-11). The dust plumes of interest appear to be limited to northern Mexico, southern New Mexico and west Texas, orientated from the northwest direction and traveling toward El Paso, TX and NMED's monitoring site at the time of the satellite pass (0951 MST) that captured the imagery. In addition, wildfire smoke from New Mexico's Gila National Forest Fires: Bullard, Johnson, and Lampbright; Arizona's Telegraph wildfire smoke exacerbated the PM_{10} concentrations and contributed to the visible haze this day.

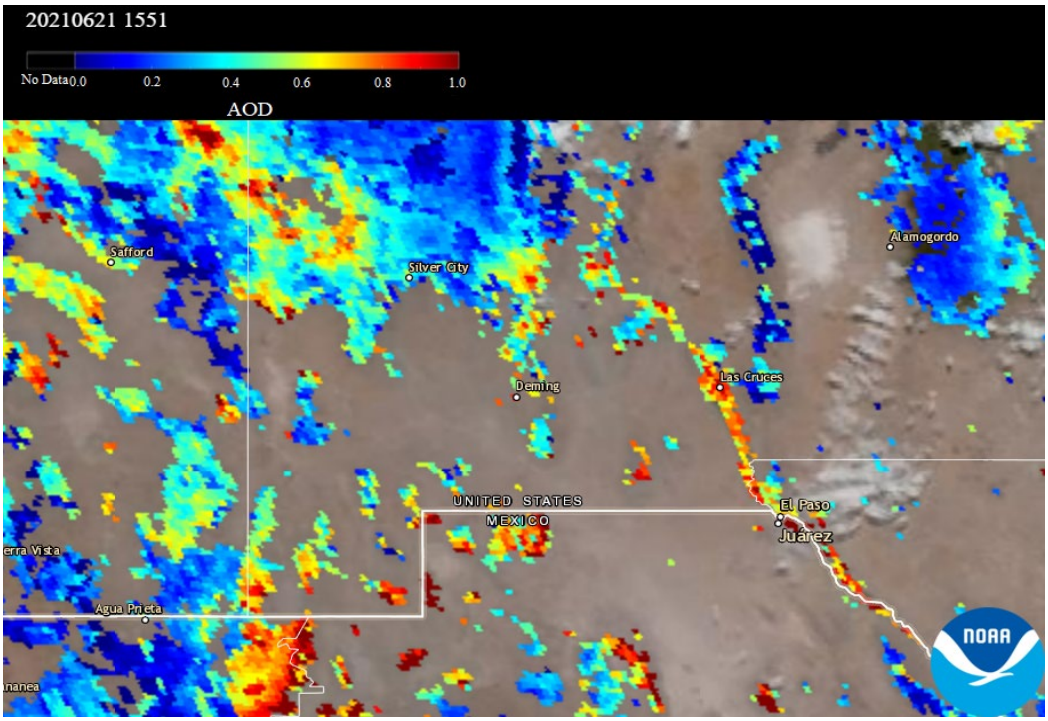


Figure 12-11. GOES-16 geostationary satellite Aerosol Optical Depth composite (0900-1200 MST) showing southwestern New Mexico, southeast Arizona, northern Chihuahua and western Texas. Imagery obtained from NOAA Aerosol Watch website.

The VIIRS Deep Blue Aerosol Ångström Exponent product from the joint NASA/NOAA Suomi National Polar orbiting Partnership (Suomi NPP) satellite, in this case, is employed for over-land use to determine aerosol particle size and atmospheric aerosol loading. Pixels pass high-quality assurance tests and the Ångström exponent is defined between 412-470 nm for 'bright' surfaces, and 470-670 nm for 'dark' surfaces. Sensor/algorithm resolution is 6 km at nadir, imagery resolution is 2 km at nadir, and daily temporal resolution. Green colors suggest optical dominance of areas with dust or coarse particles and values less than 1. Areas with shades of blue suggest optical dominance of smoke or fine particulates associated with combustion and values greater than 1. Notice the areas around NMED monitoring sites contain a heavy presence of dust in comparison to smoke at the 1503 hour as depicted by the large spatial coverage of green colored pixels in comparison to the minimal blue shading present for this day (Figure 12-12).

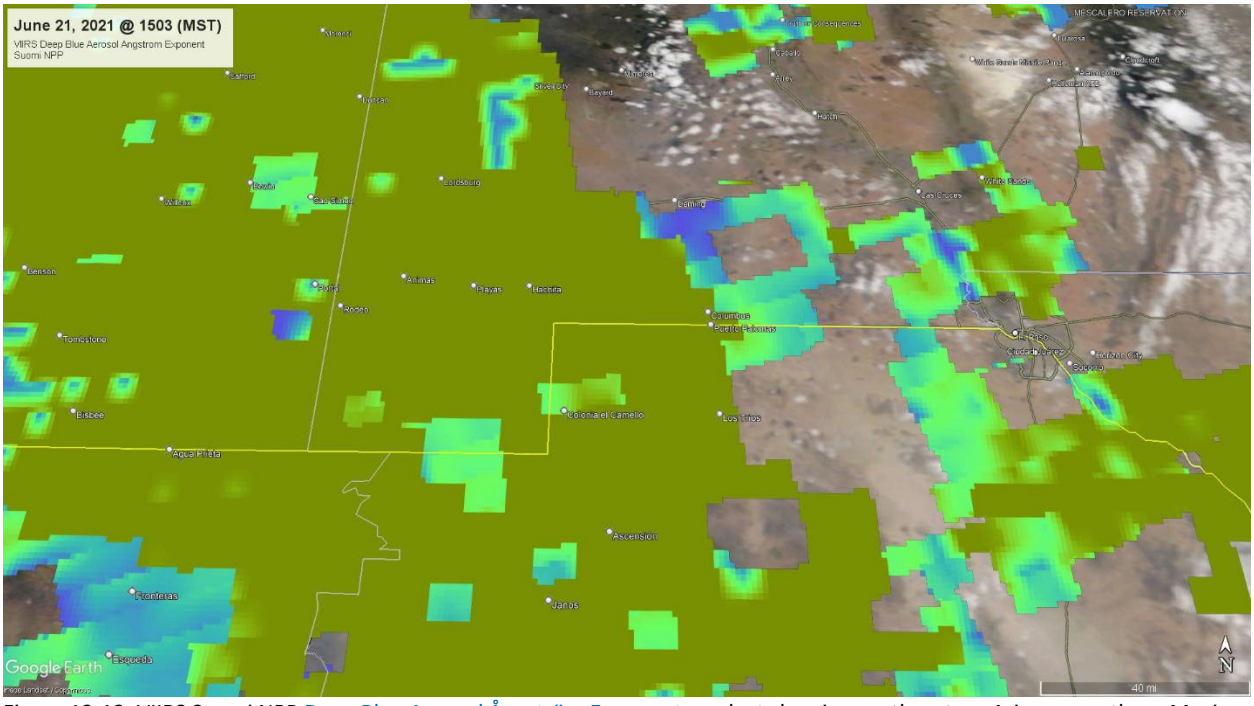


Figure 12-12. VIIRS Suomi NPP Deep Blue Aerosol Ångström Exponent product showing southeastern Arizona, northern Mexico, southwestern New Mexico, and west Texas for June 21, 2021, at the 1503 hour (MST). Courtesy of NASA Worldview and the Deep Blue Science Team.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this event. A Hazardous Weather Outlook is issued by NWS when a potentially hazardous meteorological event is expected to occur that could potentially disrupt normal activity such as a thunderstorm. A description of the potentially hazardous weather is described to warn residents and give them plenty of time to plan ahead. This was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook can be found below:

"Isolated to scattered thunderstorms are expected to develop this afternoon…gusts over 50 mph will be possible…winds will also transport smoke into the area…produce blowing dust for the desert lowlands and major metro areas this afternoon and early evening..."

The El Paso NWS Twitter tweet radar showing the outflow boundary thunderstorms approaching the NMED monitoring sites at the 1600 hour forecasted with gusty winds of 30 mph possible (Figure 12-13).

PM_{10} concentrations were exacerbated by the wildfire smoke that was produced by the Gila National Forest's Bullard, Johnson, and Lampbright fires. In addition, Arizona's Tonto National Forest's Telegraph fire contributed to wildfire smoke impacts. The fire and smoke reports provide information as to the areas impacted by the wildfire smoke and the progress made to extinguish the fire (Figures 12-14 through 12-17).

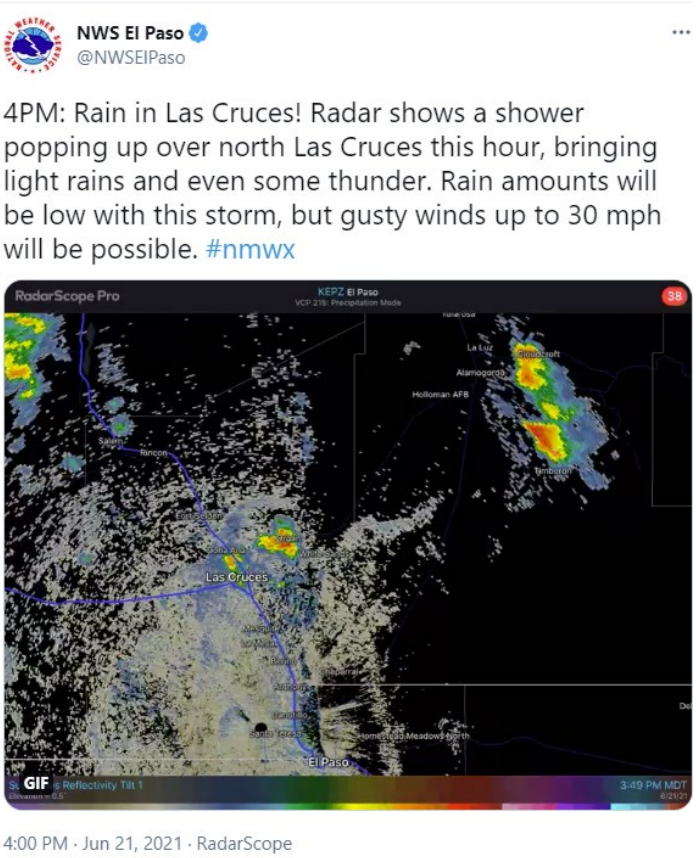


Figure 12-13. El Paso NWS Twitter tweet showing outflow boundary approaching NMED monitoring stations at the 1600 hour.

Gila NF: New Start on Silver City Ranger District – Bullard Fire

JUNE 21, 2021 BY GILA NATIONAL FOREST PUBLIC AFFAIRS 0 COMMENTS

Location: western side of Burros Mountains, in Park Canyon and Kelly Chimney Canyon, Grant County, NM

Start Date: June 20, 2021 **Size: ~200-300 acres** **Cause: Lightning**

Vegetation: Pinyon Juniper and grass **Total Personnel**: **15**

Containment: 0%

Resources: 2 Type 6 and 1 Type 4 engines

Summary: The strategy for this fire is full suppression with a confine and contain strategy, to protect the private inholdings along the Redrock Road, and limit impacts to range infrastructure. Due to the rugged terrain, firefighters are using a mix of direct and indirect tactics to contain the fire and protect values at risk. Today, firefighters will work to keep the fire north of the Redrock Road and scout opportunities to engage the fire south of Bullard Peak. The 5000-acres Bar 6 Prescribed Fire (2021) will limit fire spread to the east and help limit impacts to the Oak Grove subdivision.

Objectives: Provide for public and firefighter safety. Protect private inholdings and range infrastructure.

Weather: Hot conditions with thunderstorms are expected this afternoon. Sudden and erratic strong wind gusts could develop near storms. Temperatures today should be somewhat cooler than yesterday, with hotter temperatures returning Wednesday.

Figure 12-14. Gila National Forest Bullard Fire Report for June 21, 2021. Courtesy of NM Fire Information.

Johnson Fire Update for June 21, 2021

JUNE 21, 2021 BY GILA NATIONAL FOREST PUBLIC AFFAIRS 0 COMMENTS

Location: Johnson Canyon, west of McKenna Park. 3 miles west of Gila Cliff Dwellings, Wilderness Ranger District, Catron County, NM

Start Date: May 20, 2021 **Size:**
~85,590 acres **Cause: Lightning**
Vegetation: Ponderosa Pine and Grass **Total**
Personnel: **153** **Containment: 9%**

Resources: 1 Interagency Hotshot crews, 1 handcrew module, 1 Type 2 Initial Attack crew, 8 Type 6 Engines, 3 Water Tenders, and 2 Type 3 Helicopters.

Summary: Crews remain actively engaged on the northwest side improving lines and conducting structure assessments in the Willow Creek area. The northern side of the fire is being monitored by horseback. Crews will mop-up small heat signatures within the northeast corner of the fire. The southeast flank along Hell and Water Canyons remains active as it approaches the Gila River. The southern flank of the fire is being monitored by air.

Objectives: Provide for public and firefighter safety and allow fire to play its natural role on the landscape. Values at risk are the Gila Cliff Dwellings National Monument, White Creek Cabin, and sensitive aquatic species in the Gila Wilderness.

Fire Behavior: Moderate, with flanking, creeping, and backing.

Closures: Due to hazardous fire conditions in the Johnson Fire area, an Emergency Area Closure order has been issued by the Gila National Forest for public health and safety. A large portion of the Gila Wilderness is CLOSED. For a copy of the order and maps see: https://inciweb.nwcg.gov/incident/7493/ **As a reminder "The Celebration Site-Skates area," Johnson Fire Camp is closed to camping. For further information call 575-536-2250 (M-F 8:00 – 4:00 p.m.) or 575-519-0103 (any time before 7:00 p.m.)**

Weather: Hot conditions with thunderstorms are expected this afternoon. Sudden and erratic strong wind gusts could develop near storms. Temperatures today should be somewhat cooler than yesterday, with hotter temperatures returning Wednesday.

Air Quality: The Highway 180 corridor and Silver City will see moderate smoke this morning from fires burning in Arizona and New Mexico. Smoke will concentrate in low lying areas in the early mornings and dissipate as the day heats up. Smoke from the Johnson Fire will be visible from NM Highway 15, NM Hwy 35, and US Highway 180. Smoke monitors have been placed at Gila Center (Unit #1076), Silver City (Unit #1074), Cliff (Unit #1054), Glenwood (Unit #1075), T or C (Unit #1036), Socorro (Unit #1035) and Quemado (Unit # 1073) to assess smoke impacts in New Mexico, and can be viewed at https://app.airsis.com/USFS/UnitMap. Please see the New Mexico Department of Health site, also known as 5-3-1, https://nmtracking.org/fire for guidance on mitigating your smoke exposure. Smoke-sensitive individuals and people with respiratory problems are encouraged to take precautionary measures by staying inside during heavy smoke periods and avoiding outdoor activities. **Announcement**: **If you visit the Gila National Forest, remember that fire danger is very high and Stage 1 Fire Restrictions are in effect. For detailed information, visit** https://www.fs.usda.gov/alerts/gila/alerts-notices

Figure 12-15. Gila National Forest Johnson Fire Report for June 21, 2021. Courtesy of NM Fire Information.

Lampbright Fire – Grant County – June 20, 2021

JUNE 20, 2021 BY WMASON 0 COMMENTS

The Lampbright Fire is located on private land north of Highway 152 near Mimbres. The fire is estimated at 20 acres, and 0% contained. Structures are located one mile east of the fire, but there is no immediate threat or evacuations at this time. Firefighters are scouting safe areas to engage the fire. Water drops from a Type 3 helicopter helped to moderate fire behavior allowing crews to work on securing containment lines. Lightning started the Lampbright Fire just after 3:00 p.m. this afternoon. Multiple local and federal resources are on the scene. Additional personnel from the Forestry Division are en route.

Start Date & Time: 6/20/21 @ 1510
Start Location: North of Highway 152, near Mimbres, Grant County
Latitude: 32 deg 50.023 min
Longitude: 107 deg 59.547 min
Cause of Fire: lightning
Area Vegetation: pinon/juniper and grass
Acres Burned: 20
Ownership(s): Private

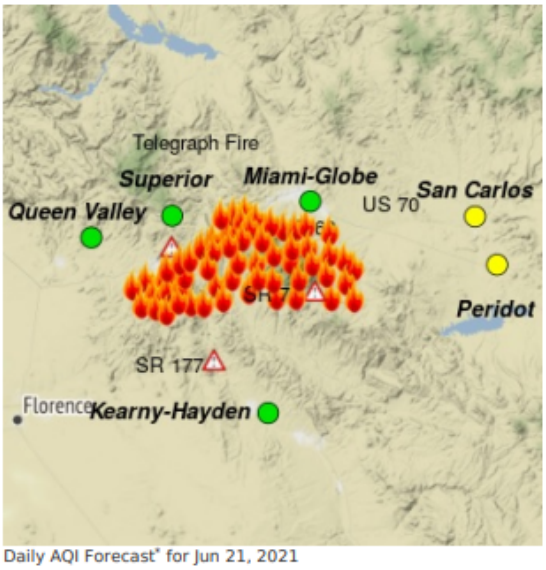
Figure 12-16. Gila National Forest Lampbright Fire Report for June 21, 2021. Courtesy of NM Fire Information.

Smoke Outlook for 6/21 - 6/22
Eastern Arizona Telegraph Fire
Issued at: 2021-06-21 08:04 MDT

Fire
The Telegraph fire is at 180,566 acres and 67% contained. Moderate to active fire activity was observed yesterday as it continued to move southeast and south of Pinal Mountain into Dripping Springs area. Satellite heat signatures are showing the bulk of the active fire along the Dripping Springs Mountains, Icehouse Canyon and El Capitan areas this morning. Expect this activity to continue through the day. Stronger west to southwest winds may increase fire activity this afternoon.

Smoke Today
Light smoke was observed this morning and moving to the east and northeast of the fire. Winds should continue out of this direction, leaving minimal smoke impacts throughout the forecast area. Smoke from the Backbone fire may move into the area later this afternoon and this may cause some increase in haze and upper level smoke.

Do I need to be concerned?
While it's always smart to pay attention to air quality where you live, some people may be at greater risk from particle pollution. They include: • People with or that have had Covid-19 • Cardiovascular disease (diseases of the heart and blood vessels) • People with lung disease, including asthma and COPD • Older adults • New or expectant mothers may also want to take precautions to protect the health of their babies.



Daily AQI Forecast* for Jun 21, 2021

Station	Yesterday hourly (6a noon 6p)	Sun 6/20	Forecast* Comment for Today -- Mon, Jun 21	Mon 6/21	Tue 6/22
Peridot	No hourly data		Light to at times moderate smoke throughout the day.		
Superior	No hourly data		Light smoke throughout the day.		
Kearny-Hayden	No hourly data		Light smoke throughout the day.		
San Carlos	No hourly data		Light smoke to at times moderate smoke throughout the day..		
Miami-Globe	No hourly data		Light smoke throughout the day.		
Queen Valley	No hourly data		Light smoke throughout the day.		

Issued 2021-06-21 08:04 MDT by David Finnan - david.finnan@usda.gov

Air Quality Index (AQI)	Actions to Protect Yourself
Good	None
Moderate	Unusually sensitive individuals should consider limiting prolonged or heavy exertion.
USG	People within Sensitive Groups* should **reduce** prolonged or heavy outdoor exertion.
Unhealthy	People within Sensitive Groups* should **avoid all** physical outdoor activity.
Very Unhealthy	Everyone should avoid prolonged or heavy exertion.
Hazardous	Everyone should avoid any outdoor activity.

***Disclaimer:** This forecast is based on fine particulates only; ozone is not included. Forecasts may be wrong; use at own risk. Use caution as conditions can change quickly. See your health professional as needed. Smoke sensitive groups should take appropriate precautions.

Additional Links
Arizona Dept. of Environmental Quality -- https://tinyurl.com/9frddrv5

Issued by USFS Wildland Fire Air Quality Response Program -- www.wildlandfiresmoke.net
Eastern Arizona Current Outlook -- tools.airfire.org/outlooks/EasternArizona
*Smoke and Health Info -- www.airnow.gov/index.cfm?action=smoke.index

Figure 12-17. Smoke Outlook Report for Eastern Arizona Tonto National Forest Telegraph Fire for June 21, 2021. Courtesy of InciWeb – Incident Information System.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from areas of northern New Mexico into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 12-18). This analysis supports the hypothesis that dust plumes originated in northern Mexico, Texas, and New Mexico before being transported to downwind monitoring sites.

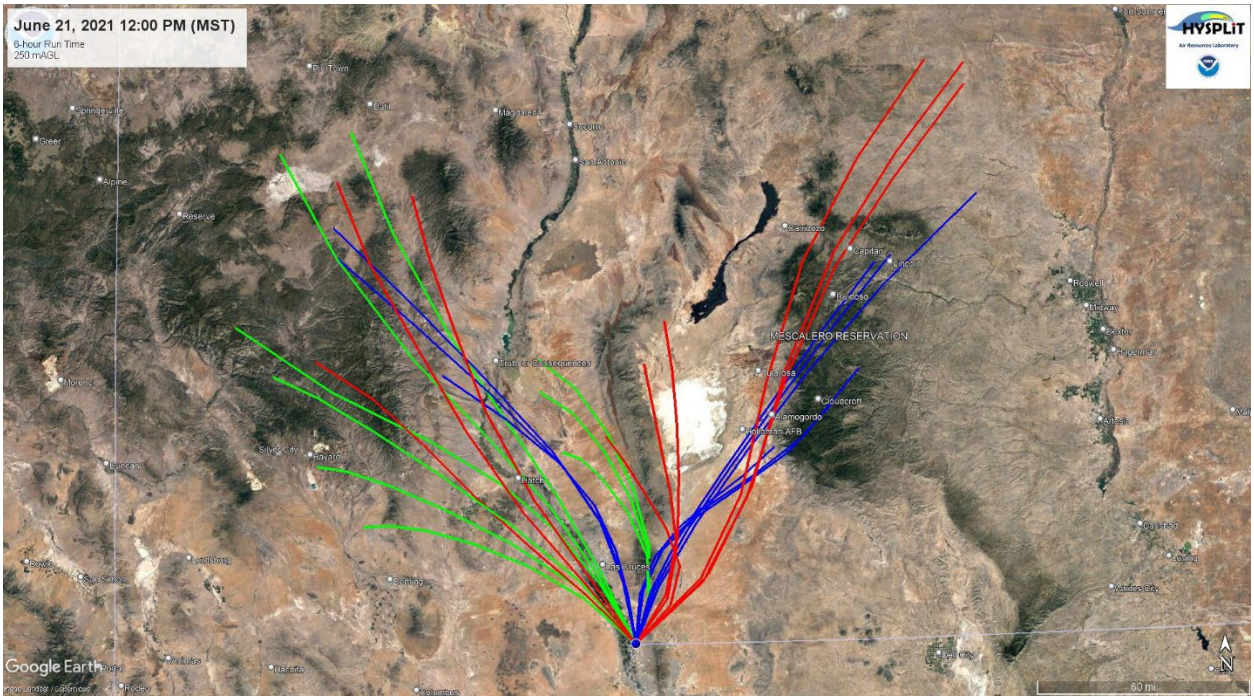


Figure 12-18. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 12-19 and 12-20) were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0000 -2300 hour). During the event, winds blew from the northeast to the southeast directions 82% and southwest direction 18% of the time coinciding with peak PM_{10} concentrations for the Chaparral Monitoring site. In addition, winds blew from the west to the northeast through the southern directions 100% of the time coinciding with peak PM_{10} concentrations for the Desert View Monitoring site. Multi-wind directions are consistent with mesoscale convective events and is dependent on the location of the monitor placement in regard to the mountain range and the direction the outflow boundaries are traveling. In this case, the two consecutive events are consistent with a shift from the westerly winds in the morning to the easterly winds in the afternoon once the backdoor cold front arrives to the Borderland.

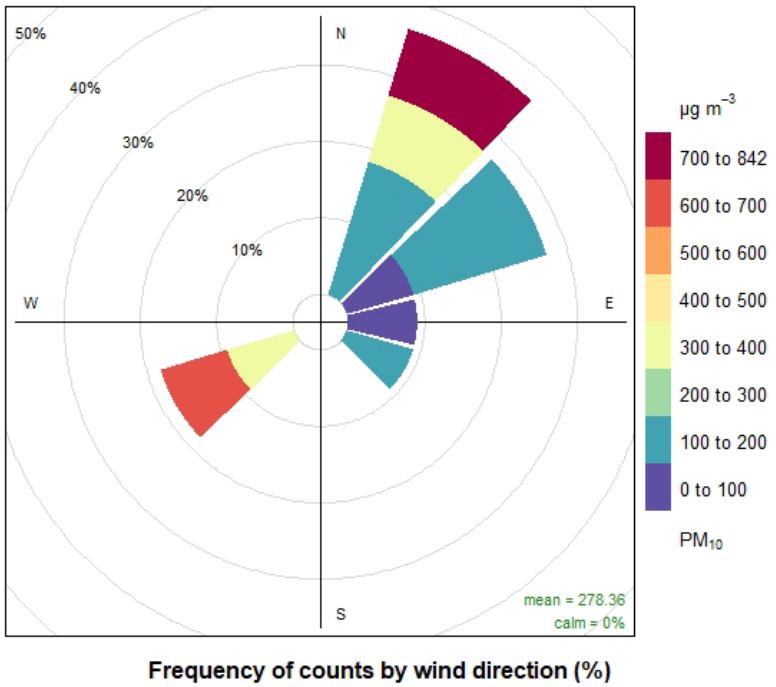


Figure 12-19. Pollution rose for the Chaparral monitoring site.

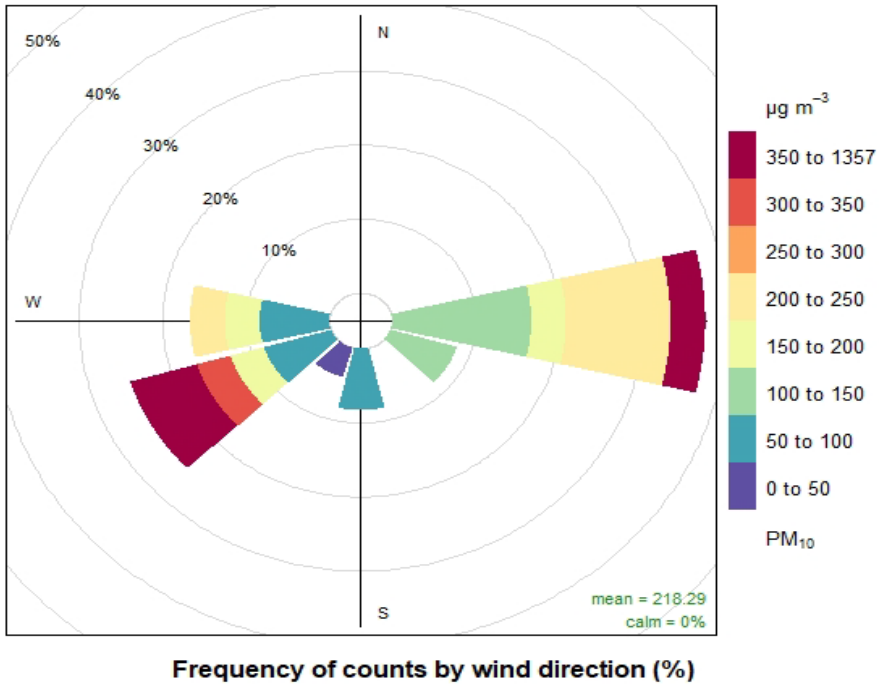


Figure 12-20. Pollution rose for the Desert View monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong multidirectional west to the northeast through the southern direction winds from the beginning at the 0400 hour intermittently lasting through the 2300 hour. During this time, peak hourly PM_{10} concentrations ranged from 107 to 1357 µg/m^3 were recorded

at the West Mesa and Desert View monitoring sites, respectively (Figure 12-21). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 6.1 to 10.6 m/s were recorded at the Anthony and TCEQ's Chamizal monitoring sites during the peak PM_{10} concentrations of the event, respectively. The time series plot in Figures 12-22 and 12-23 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

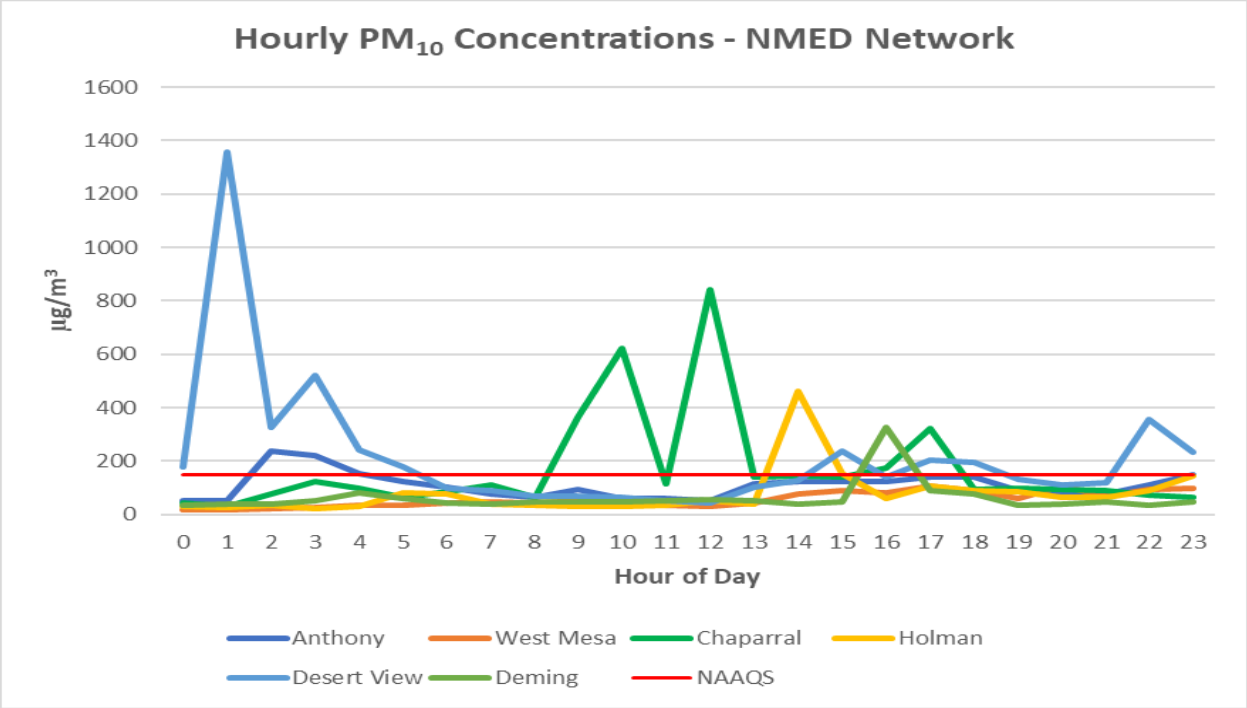


Figure 12-21. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

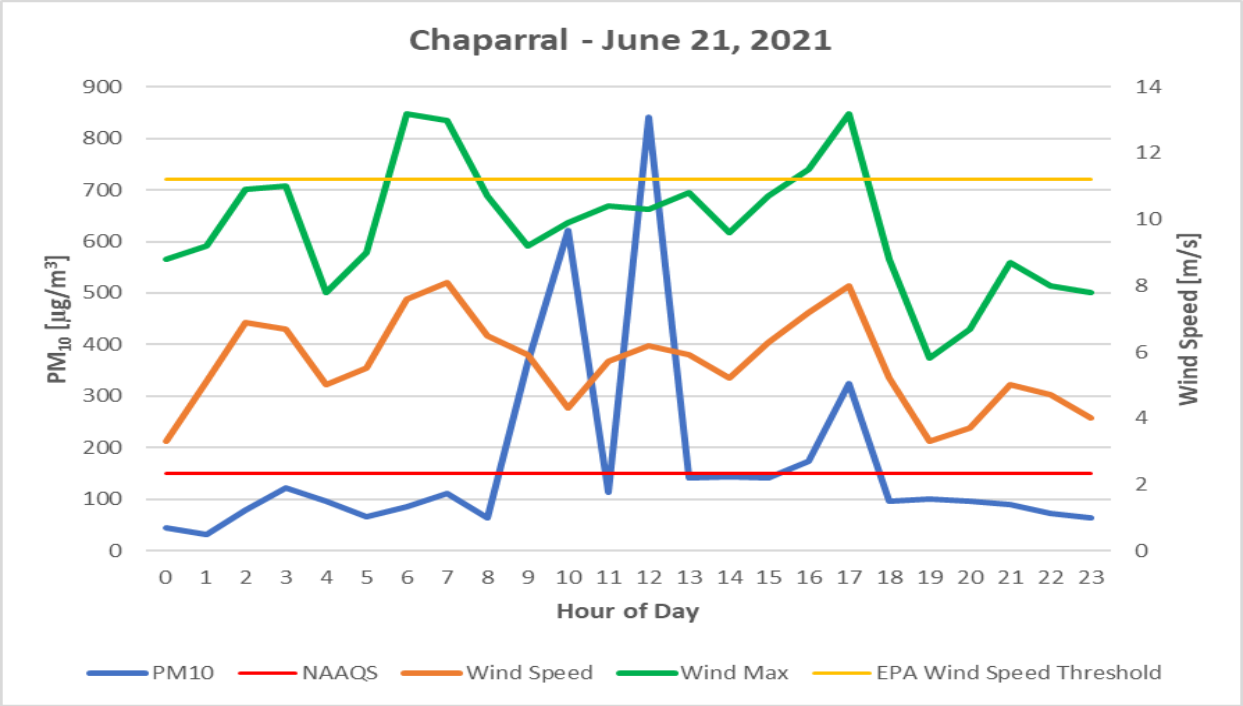


Figure 12-22. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

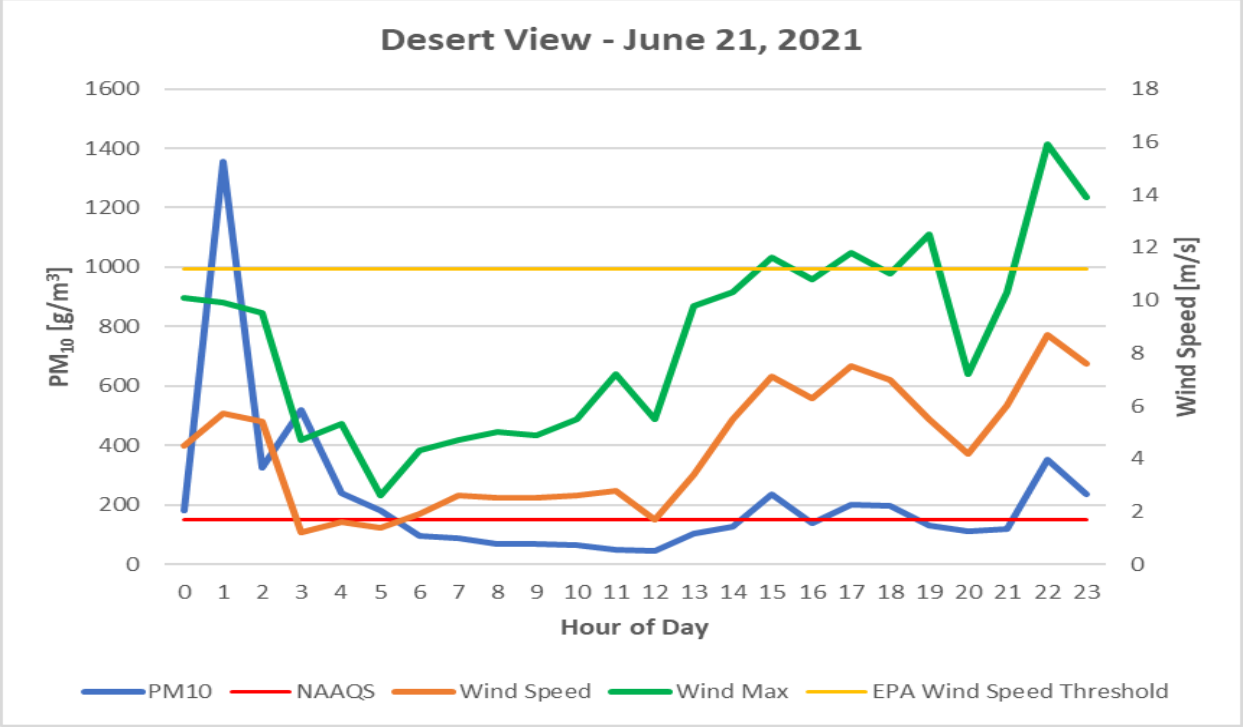


Figure 12-23. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED Chaparral and Desert View monitoring sites recorded 26 (Chaparral) and 32 (Desert View) exceedances of the PM_{10} NAAQS (Figures 18-2 and 18-3 in Appendix A). The maximum 24-

hour average PM_{10} concentration at these sites were 721 (Chaparral) and 734 (Desert View) µg/m^3 recorded in 2017 and 2019, respectively. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 12-24, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 91 µg/m^3, except for the previous June 20, 2021, and following June 22, 2021, event days, demonstrating the influence high winds have on PM_{10} concentrations in the area.

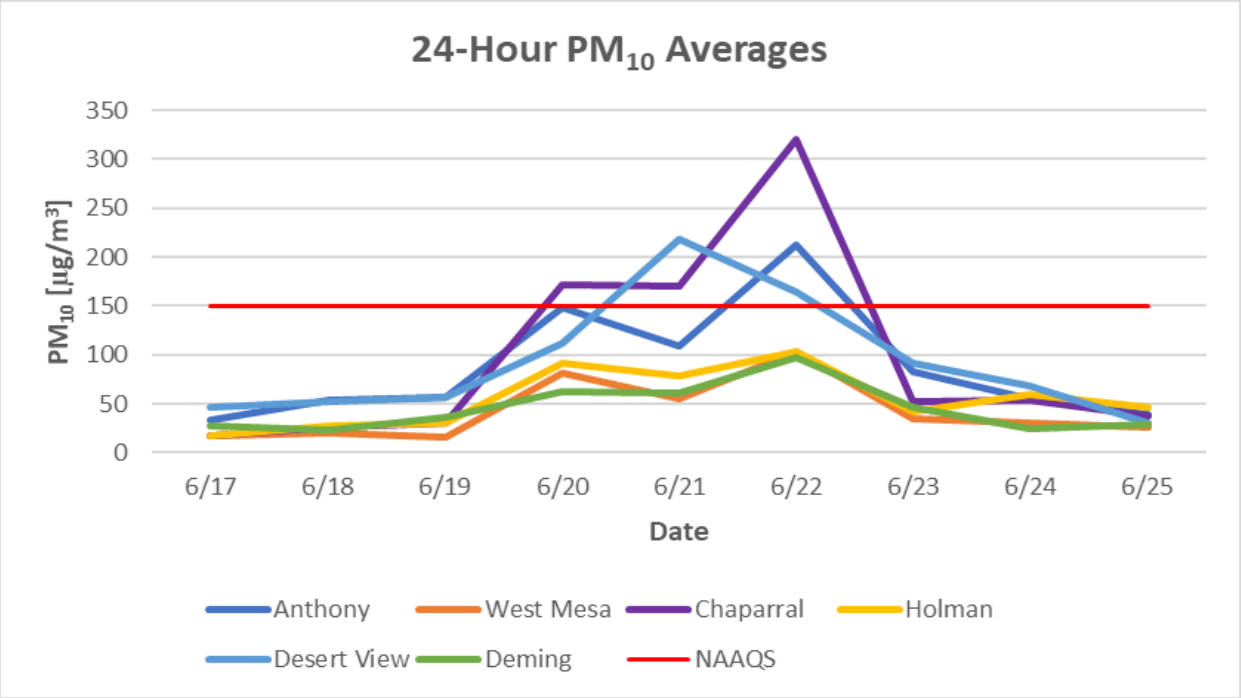


Figure 12-24. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for this day 170 (Chaparral) and 218 (Desert View) µg/m^3 are above and near the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at the Chaparral monitoring site. The monitored PM_{10} 24-hour averages of 170 (Chaparral) and 218 (Desert View) µg/m^3 are above and near the 99th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship

exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

13. HIGH WIND EXCEPTIONAL EVENT: June 22, 2021

Conceptual Model

Thunderstorm outflow caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Anthony, Desert View, and Chaparral monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 13-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0016	6CM Anthony	212 µg/m^3	5.1 m/s	13 m/s
RJ	35-013-0020	6ZK Chaparral	320 µg/m^3	9.4 m/s	17.4 m/s
RJ	35-013-0021	6ZM Desert View	165 µg/m^3	8 m/s	15.4 m/s

Table 13-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

As the tail end of yesterday's backdoor cold front exits the region to the west the winds will begin to shift from southeast to the southwest later into the evening as outflow storm activity is expected to develop. At the 1800 hour, an area of high-pressure moved over New Mexico as yesterday's backdoor cold front was exiting the region (Figure 13-1). Aloft, the high-pressure ridge was sitting directly over New Mexico. the increased humidity in the upper-air columns and near record high temperatures set-up afternoon outflow boundary conditions. As the event progressed this high-pressure gradient traveled east and aligned itself with New Mexico and the surface wind direction and the outflow boundary (Figure 13-2). Convective forced outflow winds allowed winds aloft to suddenly mix down, dramatically increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust in a relatively short period of time.

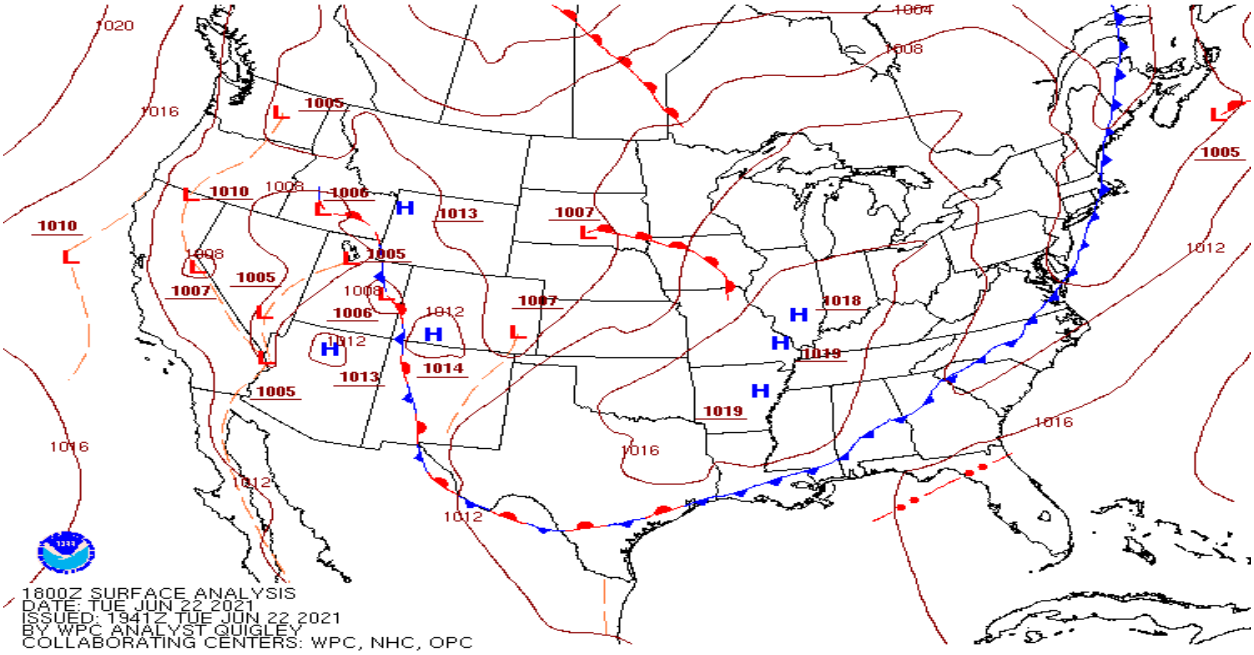


Figure 13-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

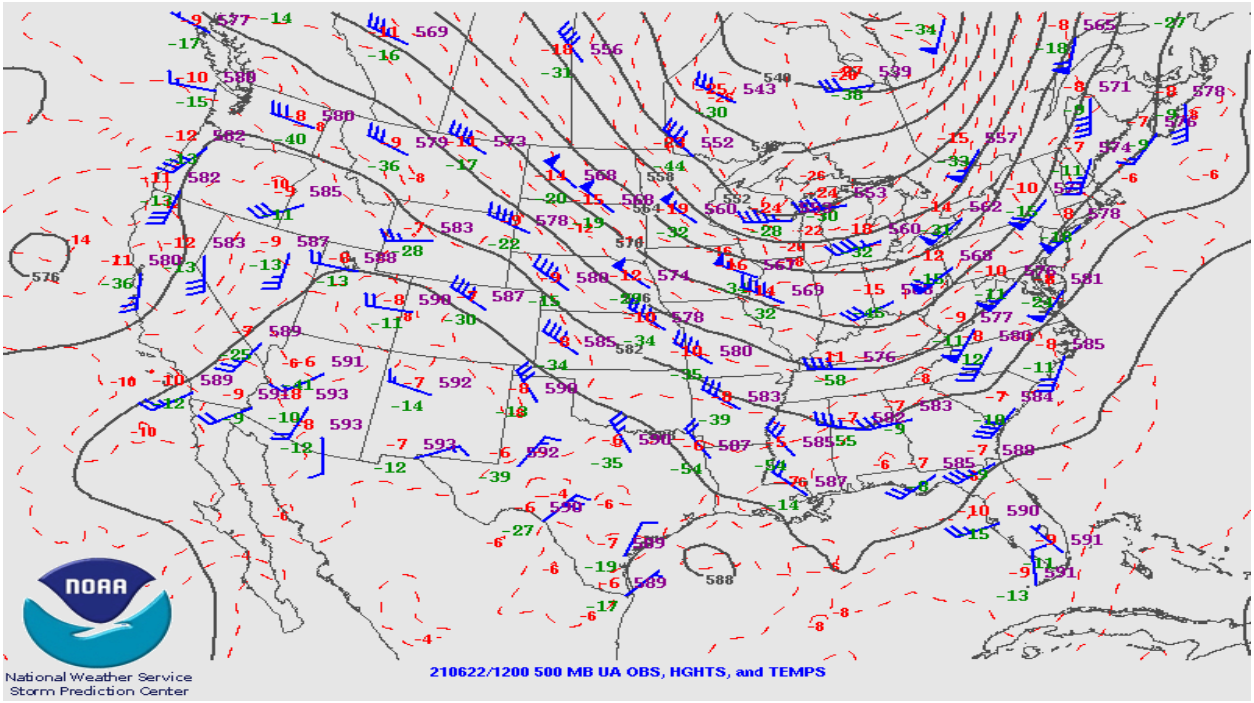


Figure 13-2. Upper air weather map for June 22, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Chaparral and West Mesa monitoring sites beginning at the 2100 hour, intermittently lasted through the 2300 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 1800 hour. Hourly concentrations remained elevated through the 2300 hour. Table 13-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Anthony			Chaparral			West Mesa		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
1800	63	1	3.5	61	1.7	3.8	68	2.5	4.4
1900	110	0.5	2.2	78	1.5	2.5	632	4.9	21.4
2000	2478	4.2	13	3370	6.3	16.2	434	11.3	18.3
2100	757	4.4	11.7	2088	9.4	17.4	70	7.7	11.4
2200	259	3.8	8.8	688	8.7	16	117	12.1	20
2300	31	2.3	7.4	78	5.1	11.1	19	9.8	19.9

Table 13-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day which normally accompanies localized storm cells during a typical monsoon season. Forecasts predicted strong winds as the storm approached the area with the area of high-pressure tracking from west to east at southern New Mexico in the morning and moving across New Mexico into west Texas in the afternoon. The systems movement across the area timed well with setting up the perfect conditions for convective forced outflow winds that suddenly moved into the area this night. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the morning and evening, especially in the desert areas of southern New Mexico (Figure 13-3).

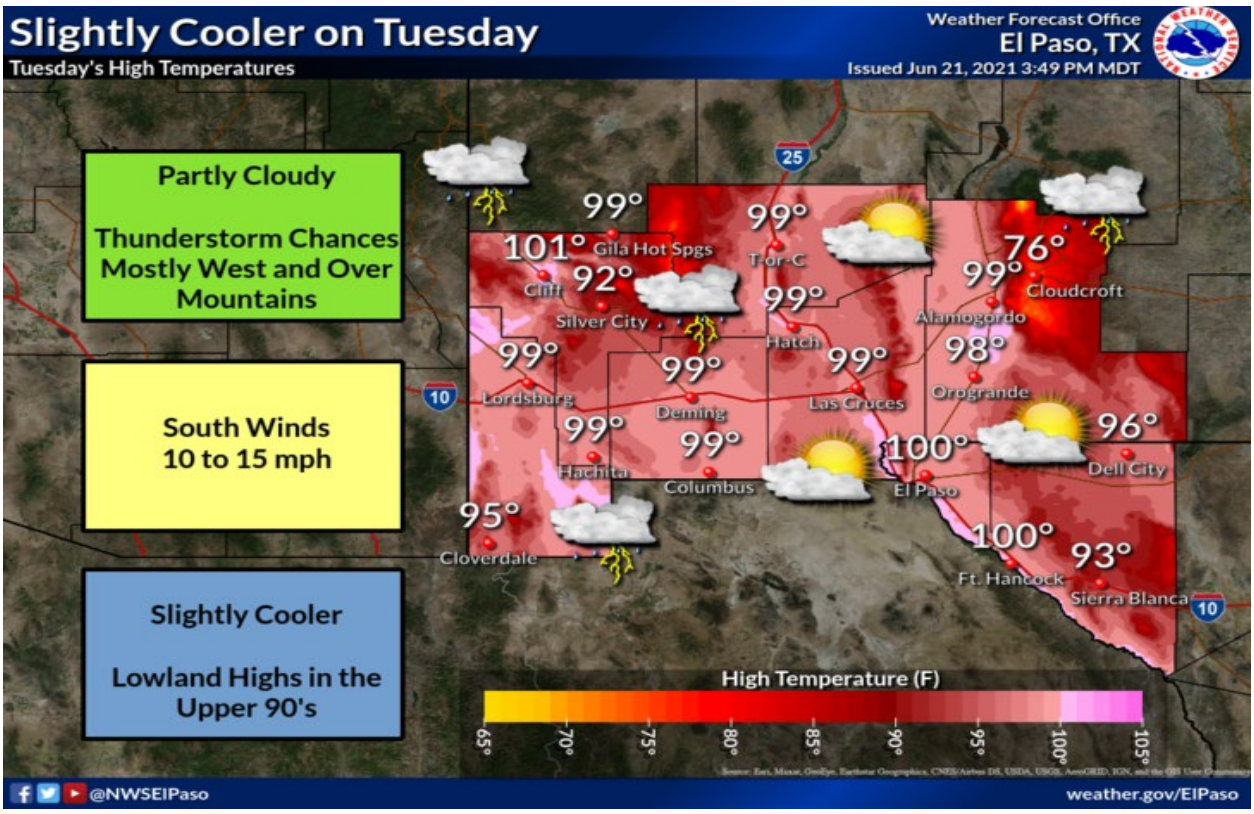


Figure 13-3. NWS GraphiCast forecast product for June 22, 2021.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The West Mesa monitoring site recorded wind speeds above this threshold for a total of 2 hours for the 2000 and 2200 hours (Figure 13-4).

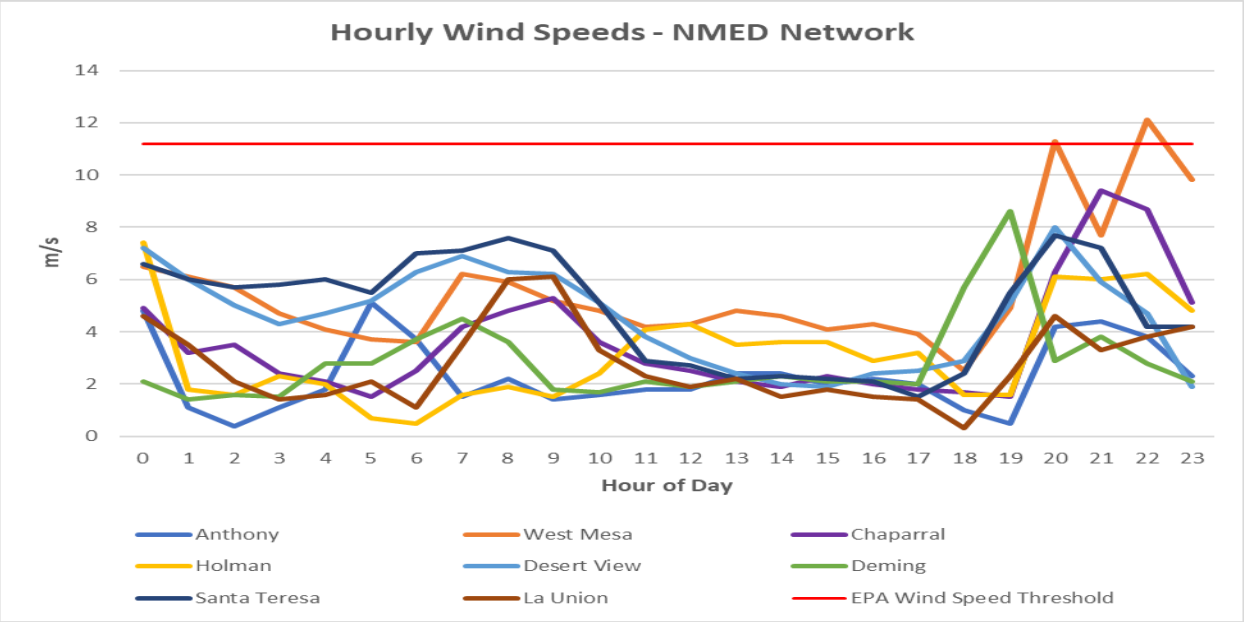


Figure 13-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Otero, Eddy, Lea, and Chavez Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Texas and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the GOES-16 geostationary satellite Aerosol Optical Depth imagery product with dust plumes observed as warm colors originating upwind of NMED's monitoring site near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 13-5). The dust plumes of interest appear to be limited to Mexico, orientated in a northwest fashion and traveling toward El Paso and NMED's monitoring site at the time of the satellite observation (1721 MST) that captured the imagery.

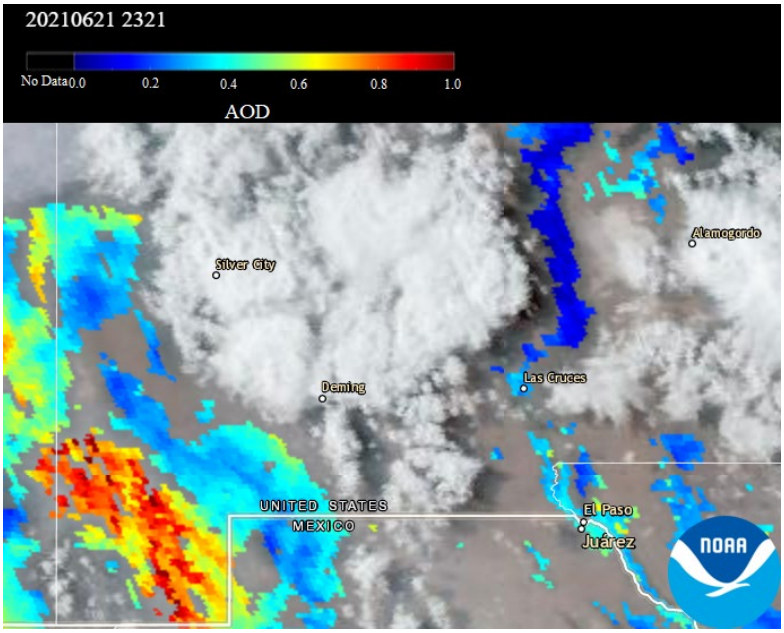


Figure 13-5. GOES-16 geostationary satellite Aerosol Optical Depth imagery product showing southwestern New Mexico, northern Chihuahua and western Texas. Imagery obtained from NASA's LAADS DAAC website.

The VIIRS Deep Blue Aerosol Ångström Exponent product from the joint NASA/NOAA Suomi National Polar orbiting Partnership (Suomi NPP) satellite, in this case, is employed for over-land use to determine aerosol particle size and atmospheric aerosol loading. Pixels pass high-quality assurance tests and the Ångström exponent is defined between 412-470 nm for 'bright' surfaces, and 470-670 nm for 'dark' surfaces. Sensor/algorithm resolution is 6 km at nadir, imagery resolution is 2 km at nadir, and daily temporal resolution. Green colors suggest optical dominance of areas with dust or coarse particles with values less than 1. Areas with shades of blue suggest optical dominance of smoke or fine particulates associated with combustion with values greater than 1. Notice the area around NMED monitoring sites contain a heavier presence of dust in comparison to smoke at the 1444 hour (Figure 13-6).

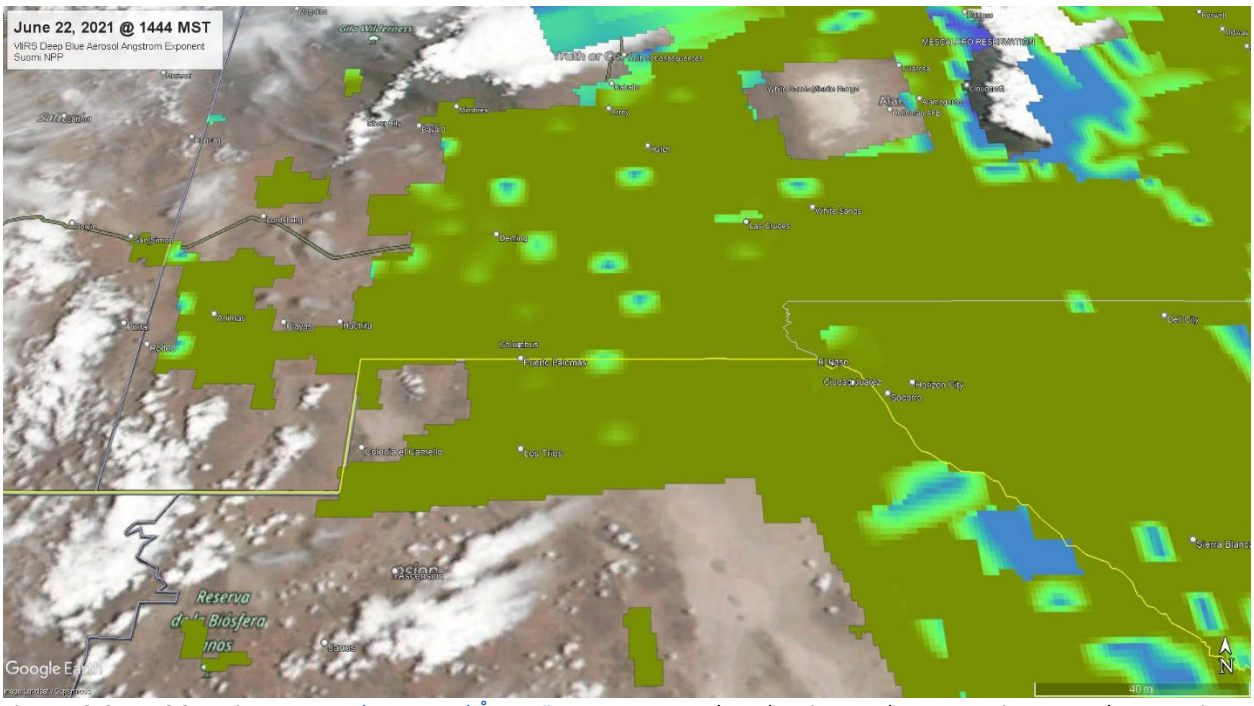


Figure 13-6. VIIRS Suomi NPP Deep Blue Aerosol Ångström Exponent product showing southeastern Arizona, northern Mexico, southwestern New Mexico, and west Texas for June 22, 2021, at the 1444 hour (MST). Courtesy of NASA Worldview and the Deep Blue Science Team

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this event. A Hazardous Weather Outlook is issued by NWS when a potentially hazardous meteorological event is expected to occur that could potentially disrupt normal activity such as a thunderstorm. A description of the potentially hazardous weather is described to warn residents and give them plenty of time to plan ahead. This was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook can be found below:

"Isolated to scattered thunderstorms…could produce strong winds up to 55 MPH with blowing dust and poor visibility."

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from areas

of northern Mexico and west Texas into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 13-7). This analysis supports the hypothesis that dust plumes originated in northern Mexico and west Texas before being transported to downwind monitoring sites.

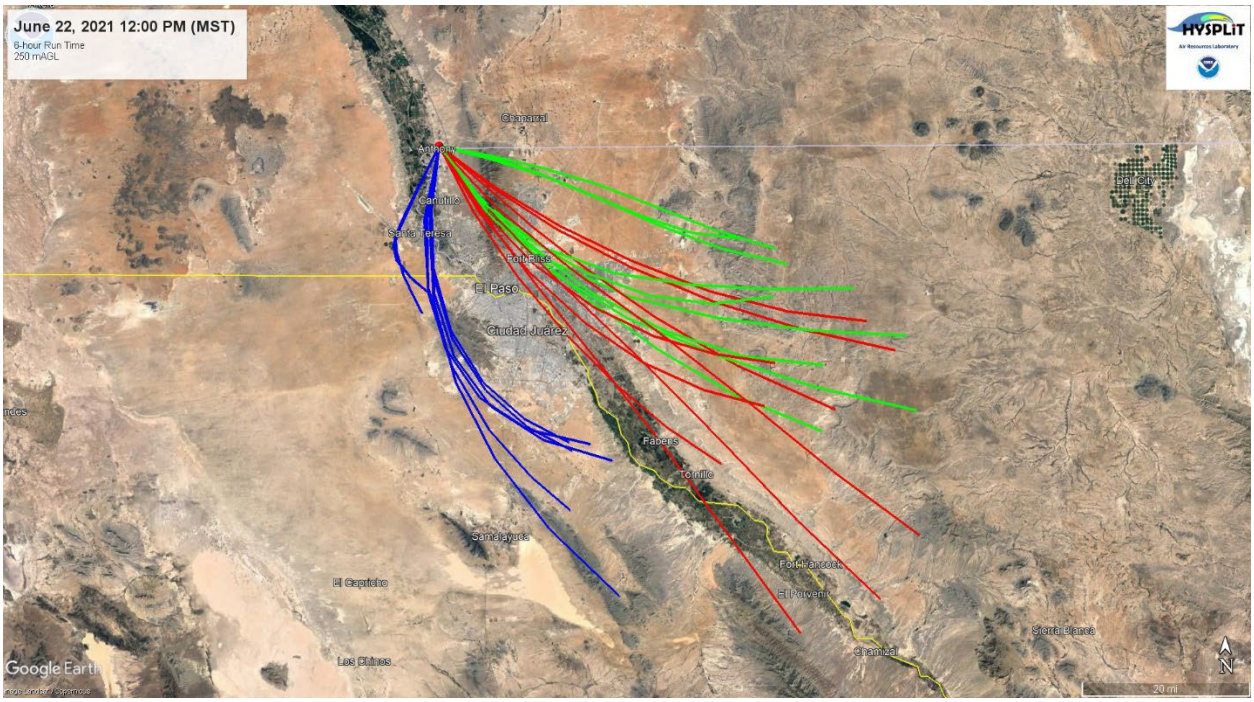


Figure 13-7. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 13-8 through 13-10) were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (1800 -2300 hour). During the event, winds blew from the west through the south-southwest directions 100% of the time for the Anthony monitoring site, from the east to the west-southwest through the southern directions 100% of the time for the Chaparral monitoring site, the east-southeast through the west-northwest directions 100% of the time for the Desert View monitoring site, coinciding with peak PM_{10} concentrations

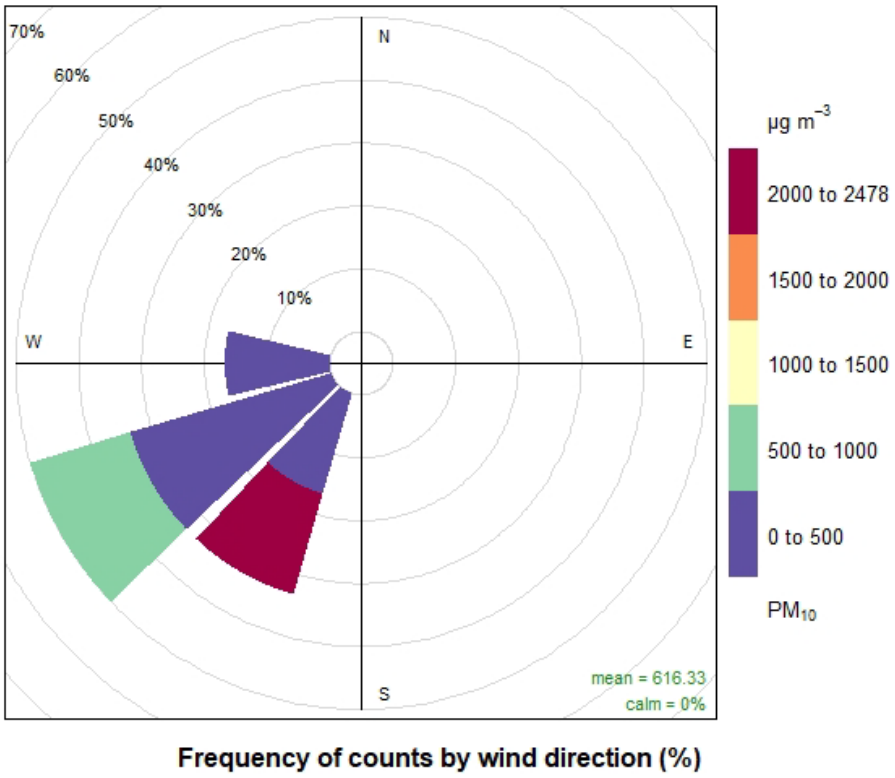


Figure 13-8. Pollution rose for the Anthony monitoring site.

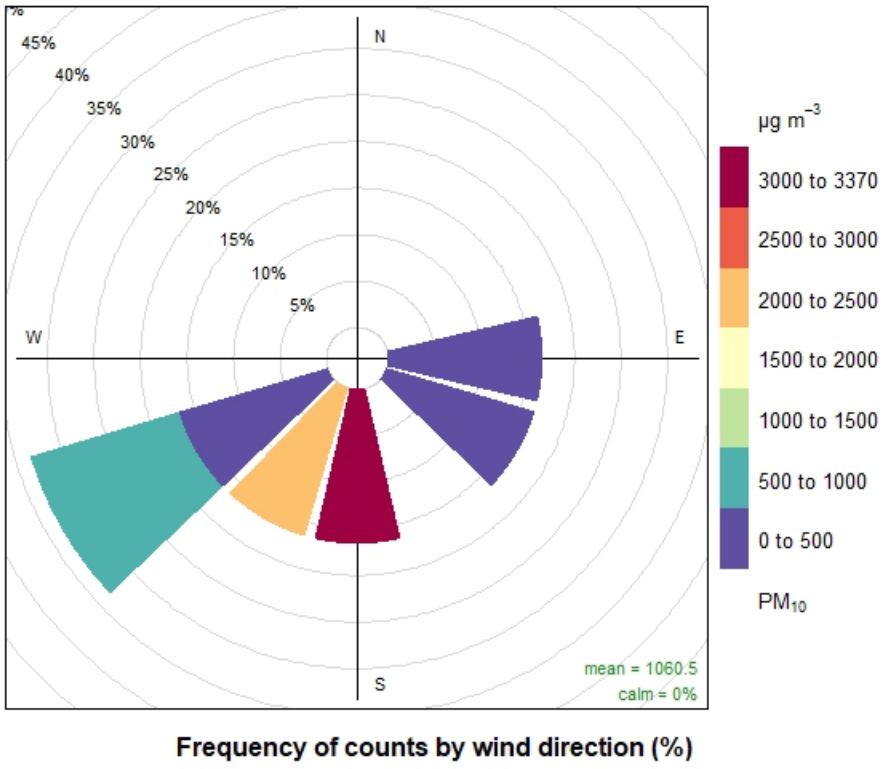


Figure 13-9. Pollution rose for the Chaparral monitoring site.

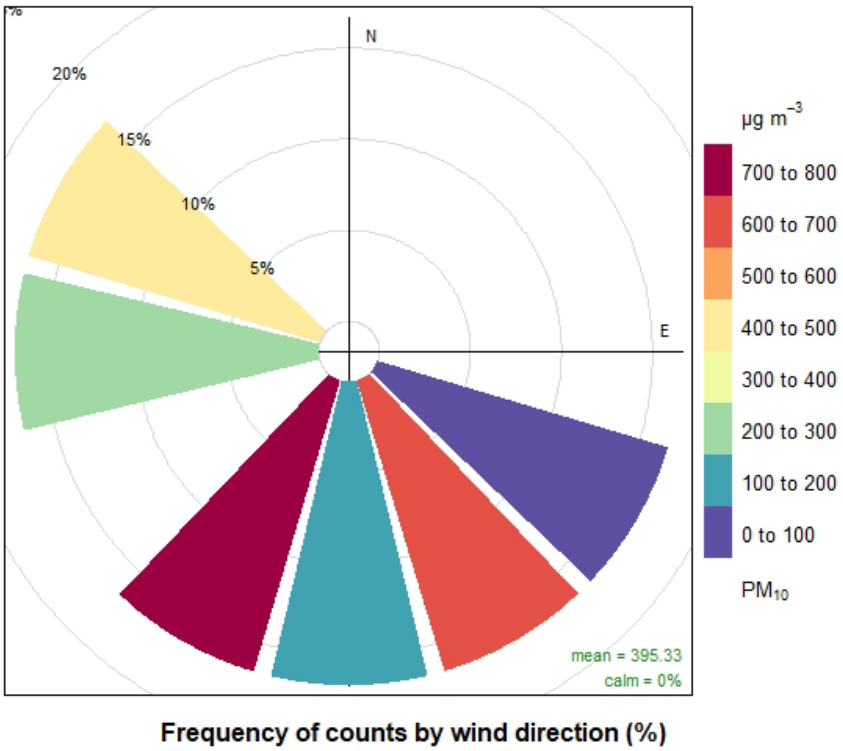


Figure 13-10. Pollution rose for the Desert View monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong multidirectional southeast through the southwest wind directions beginning at the 2000 hour and lasting through the 2300 hour recorded at NMED monitoring sites. During this time, peak hourly PM_{10} concentrations ranged from 371 to 3370 µg/m^3 were recorded at the Deming and Chaparral monitoring sites, respectively (Figure 13-11). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 5.1 to 12.1 m/s were recorded at the Anthony and West Mesa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figures 13-12 through 13-14 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

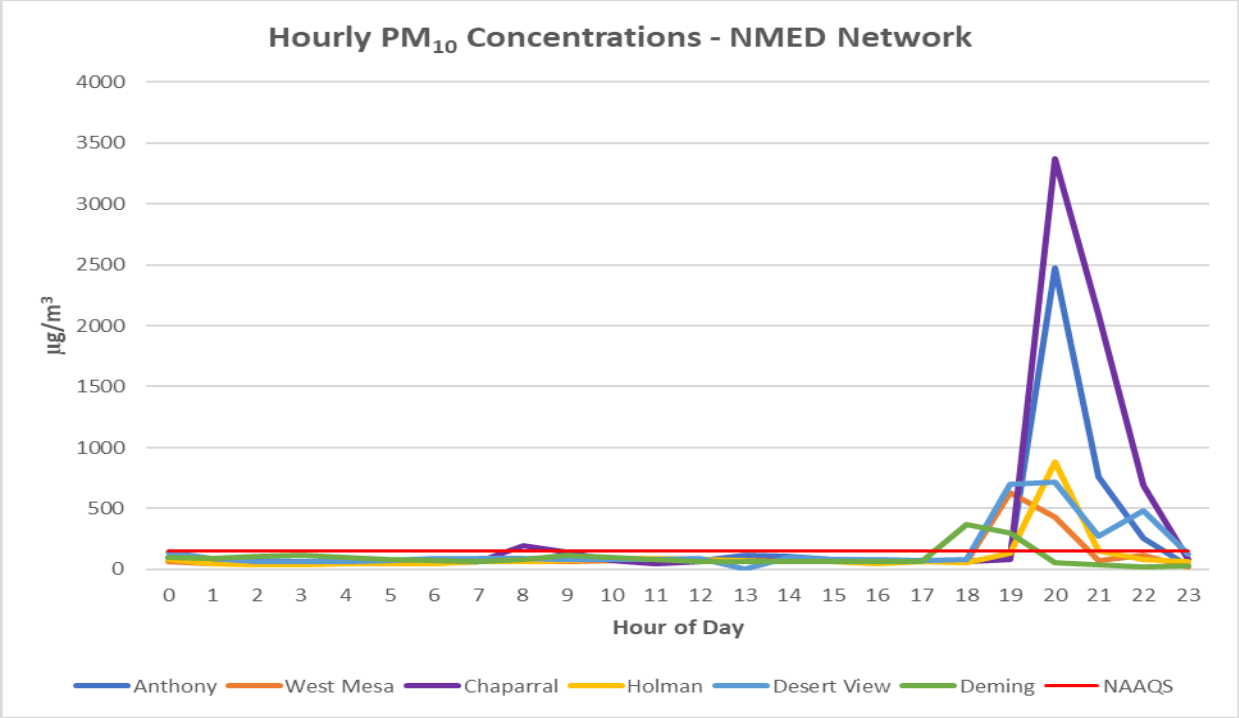


Figure 13-11. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

Figure 13-12. Anthony monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

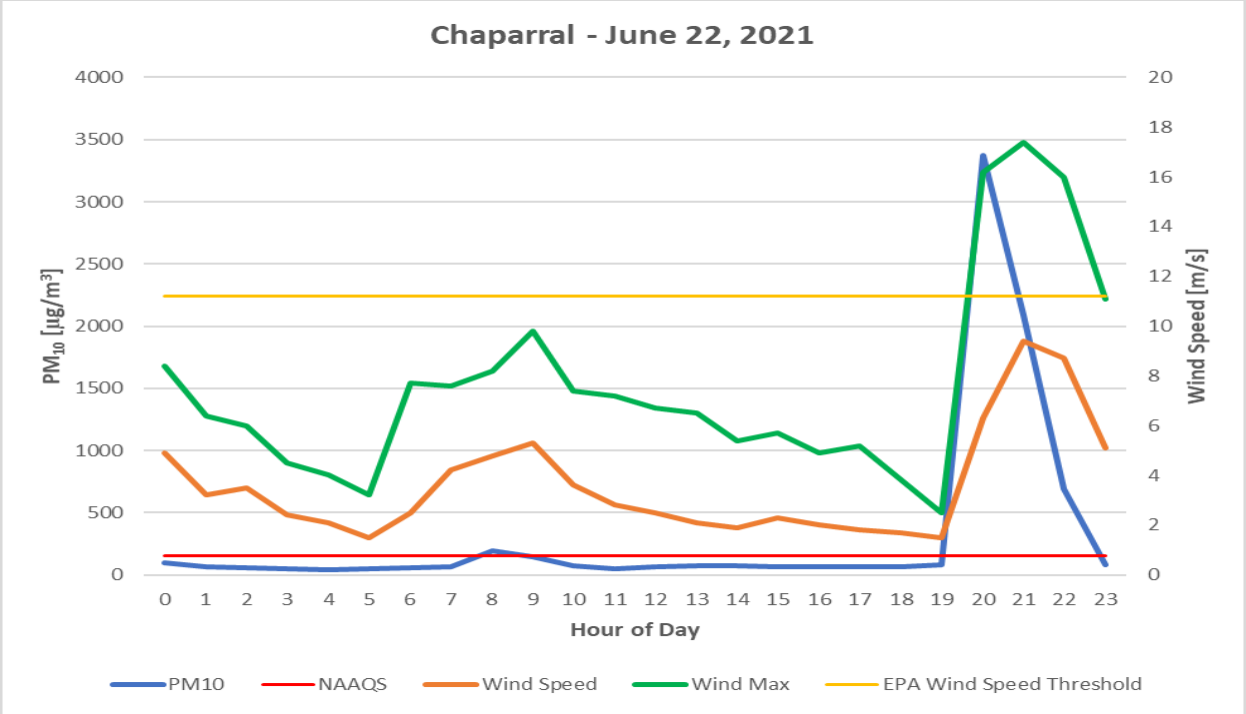


Figure 13-13. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

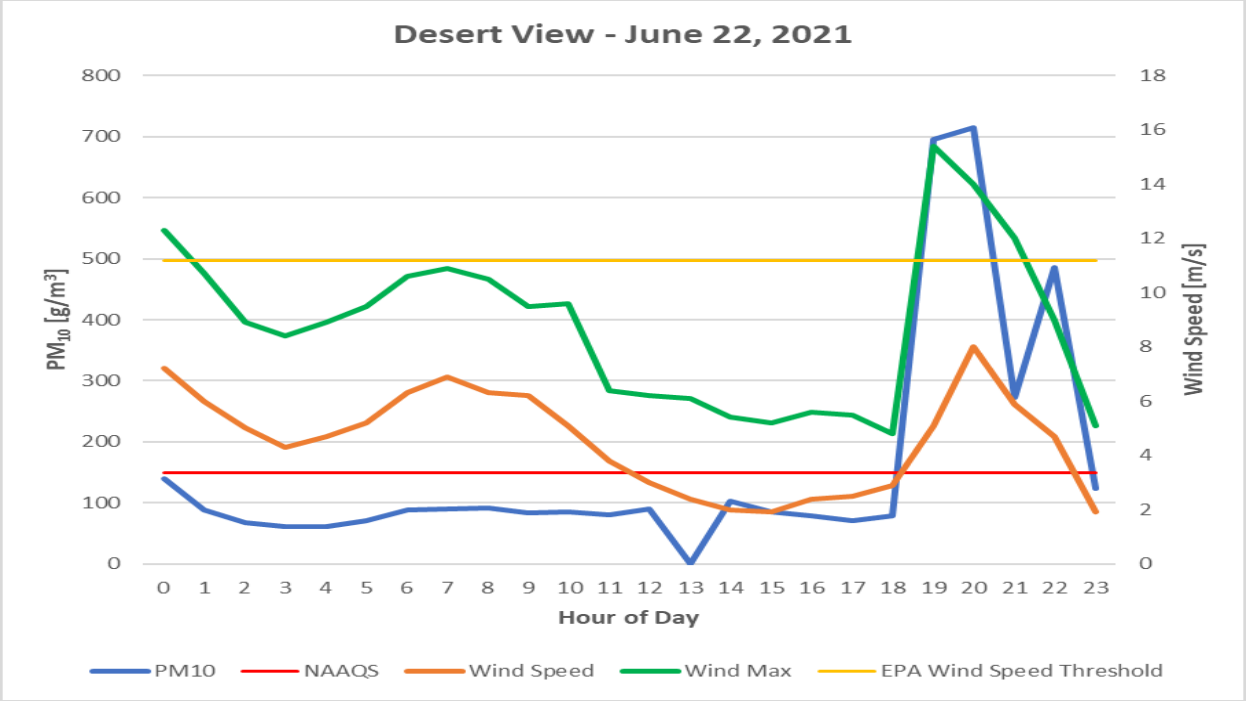


Figure 13-14. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED Anthony, Chaparral, and Desert View monitoring sites recorded 24 (Anthony), 26 (Chaparral), and 32 (Desert View) exceedances of the PM_{10} NAAQS (Figures 18-1 through 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentrations at these sites were 506 (Anthony), 721 (Chaparral), and 734 (Desert View) µg/m^3 recorded in 2017 (Chaparral) and 2019 (Anthony and Desert View). High wind blowing dust events in southern New Mexico can occur at any time of the year, such as this monsoonal event, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 13-15, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event days. Daily averages for the days surrounding the event did not surpass 91 µg/m^3, except for the June previous 20, 2021, and June 21, 2021, exceedance event days, demonstrating the influence high winds have on PM_{10} concentrations in the area.

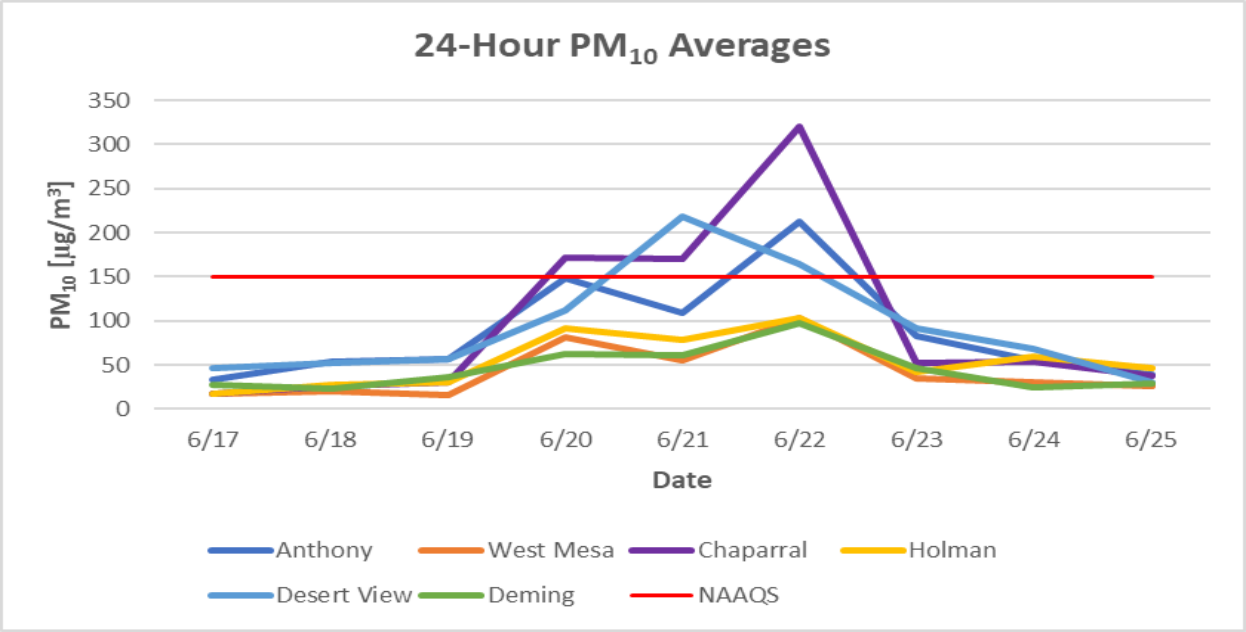


Figure 13-15. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after the three consecutive exceedance dates.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for these days 212 (Anthony), 320 (Chaparral), and 165 (Desert View) µg/m^3 are above the 99th percentile of historical data, except Desert View which is above the 95th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at the Anthony, Chaparral, and Desert View monitoring sites. The monitored PM_{10} 24-hour average of 212 (Anthony), 320 (Chaparral), and 165 (Desert View) µg/m^3 are above the 99th percentile of data, except for Desert View which is above the 95th percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

14. HIGH WIND EXCEPTIONAL EVENT: October 12, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana and Luna Counties resulting in an exceedance of the PM_{10} NAAQS at the Anthony, Desert View, Holman, West Mesa and Deming monitoring sites on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 14-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0016	6CM Anthony	295 µg/m^3	10.2 m/s	19 m/s
RJ	35-013-0021	6ZM Desert View	208 µg/m^3	10.5 m/s	18.4 m/s
RJ	35-013-0019	6ZL Holman	219 µg/m^3	15.1 m/s	22 m/s
RJ	35-013-0024	6WM West Mesa	189 µg/m^3	16 m/s	24.2 m/s
RJ	35-029-0003	7E Deming	193 µg/m^3	13 m/s	20.2 m/s

Table 14-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

A strengthening Pacific storm system will be moving into southern New Mexico with the strongest and gustiest winds developing in the afternoon. The center of the low-pressure system will slowly move across the Four Corners. As the storm system moved through the state, a pressure gradient formed over southwestern Texas, southwestern New Mexico and northern Mexico. At the 1800 hour, an area of low-pressure moved over southern New Mexico in a northwest to southeast direction (Figure 14-1). Aloft, the low-pressure center of the storm system hovered over northern Arizona. As the event progressed this low-pressure gradient traveled east and aligned itself with New Mexico and the surface wind direction (Figure 14-2). Strong convective forced winds allowed winds aloft to mix down, dramatically increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust, especially on the western faces of the Organ and Franklin Mountain Ranges.

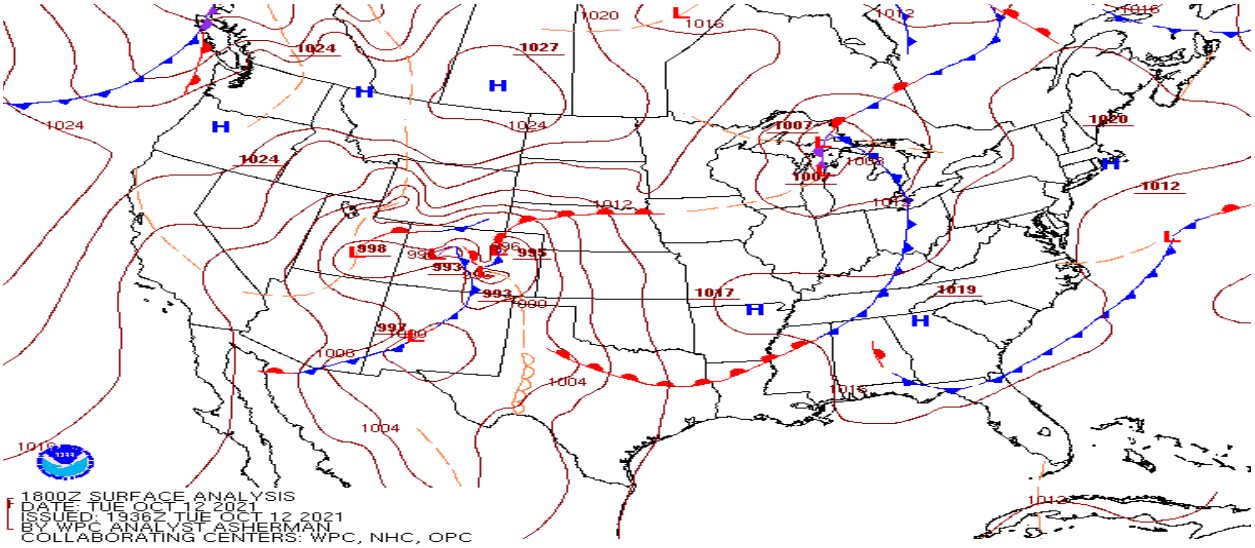


Figure 14-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

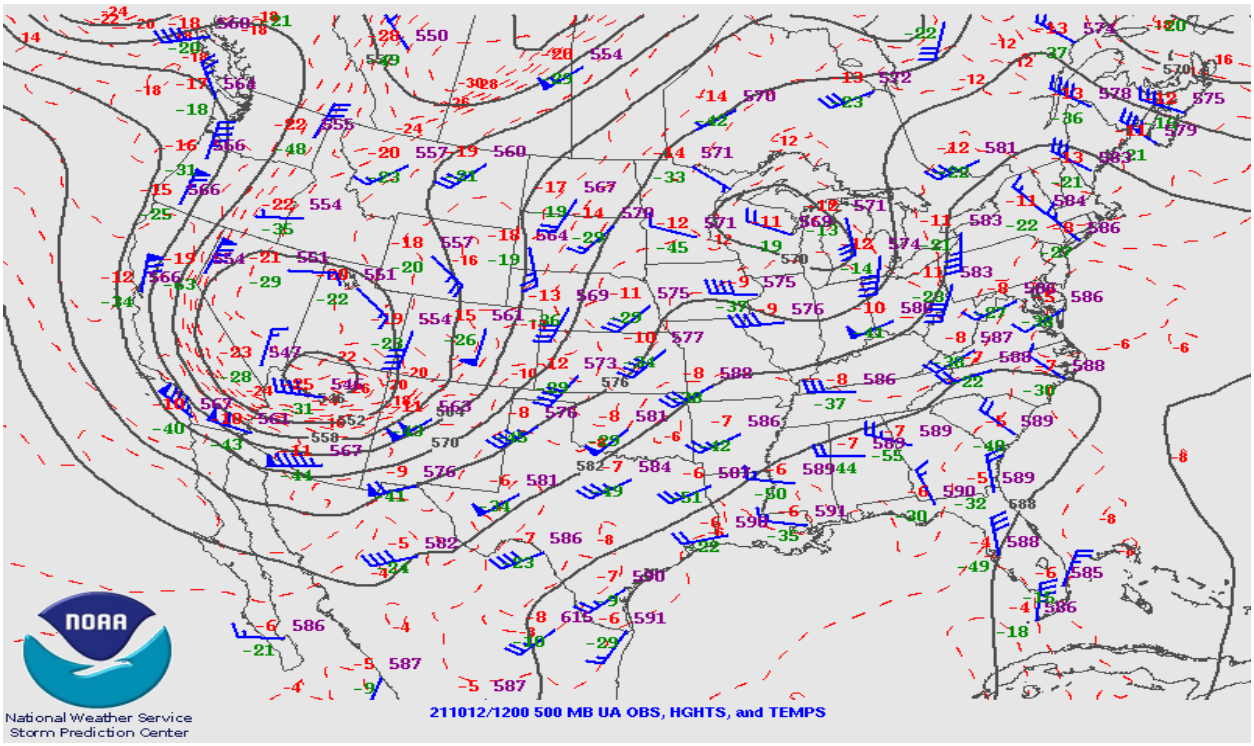


Figure 14-2. Upper air weather map for October 12, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0800 hour and lasting through the 1600 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0700 hour. Hourly concentrations remained elevated through the 1700 hour. Table 14-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Deming			West Mesa			Desert View		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0700	63	2.9	5.3	178	5.4	10.8	51	3.6	9.3
0800	88	4.3	13.6	95	9.3	19.5	105	7.1	12.1
0900	766	11.6	18.6	195	13.6	20.4	107	7.1	12.8
1000	925	13	20.2	649	15.5	22.6	183	7.1	12.7
1100	481	12.1	19.6	991	16	24.2	263	7.8	14.6
1200	322	11.1	16.8	647	15.1	22.6	451	9	17.2
1300	310	12.7	19.2	561	15.2	24	686	8.9	18.4
1400	239	11.6	17.6	361	14.7	21.6	1277	9.9	18.2
1500	156	10.6	14.9	105	11.9	17.8	534	10.5	18
1600	146	9.7	14.9	68	10.1	15	515	10.4	18
1700	107	8.8	16.7	73	9.3	15	175	7.7	15.9

Table 14-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this day which normally accompany localized storm cells during a typical monsoon season. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east at southern New Mexico in the morning and moving across New Mexico into west Texas in the afternoon. The systems movement across the area timed well with convective forced winds that moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the evening, especially in the desert areas of southern New Mexico (Figure 14-3).

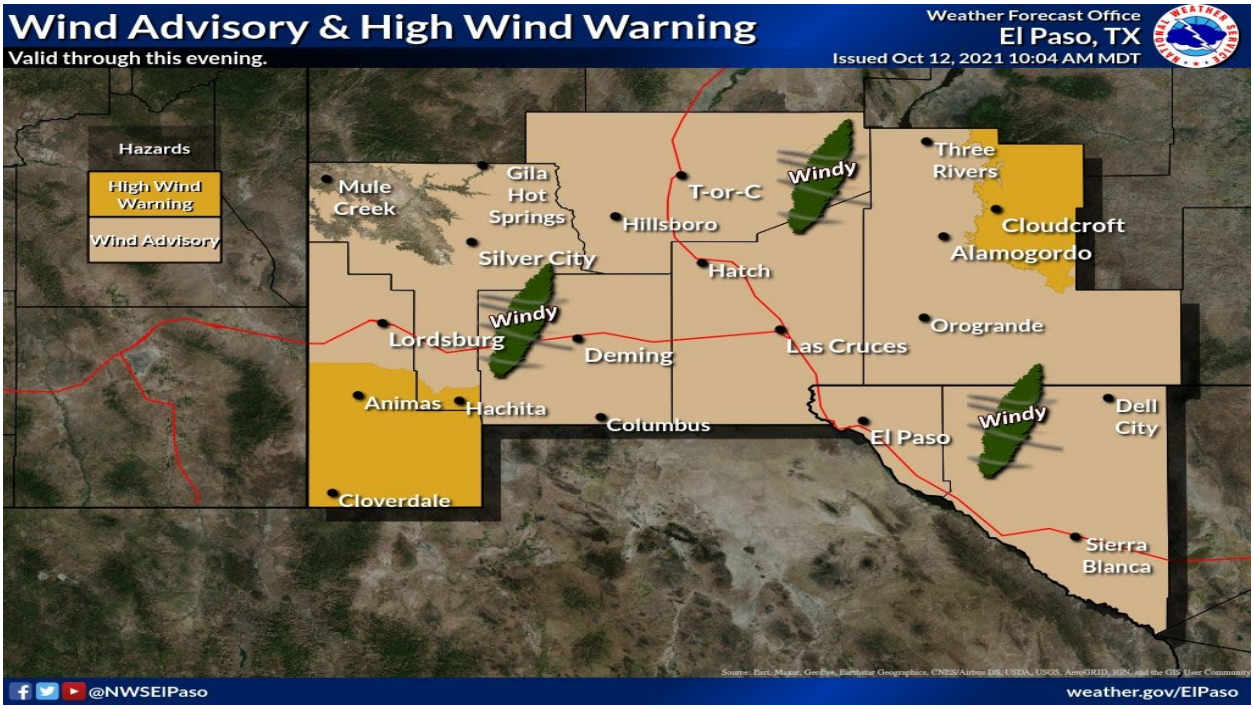


Figure 14-3. NWS GraphiCast forecast product for October 12, 2021.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. All NMED monitoring sites, except for the Anthony and Desert View monitoring sites recorded wind speeds above this threshold for a total of 8 hours beginning at the 0900 hour and continuing through the 1600 hour (Figure 14-4).

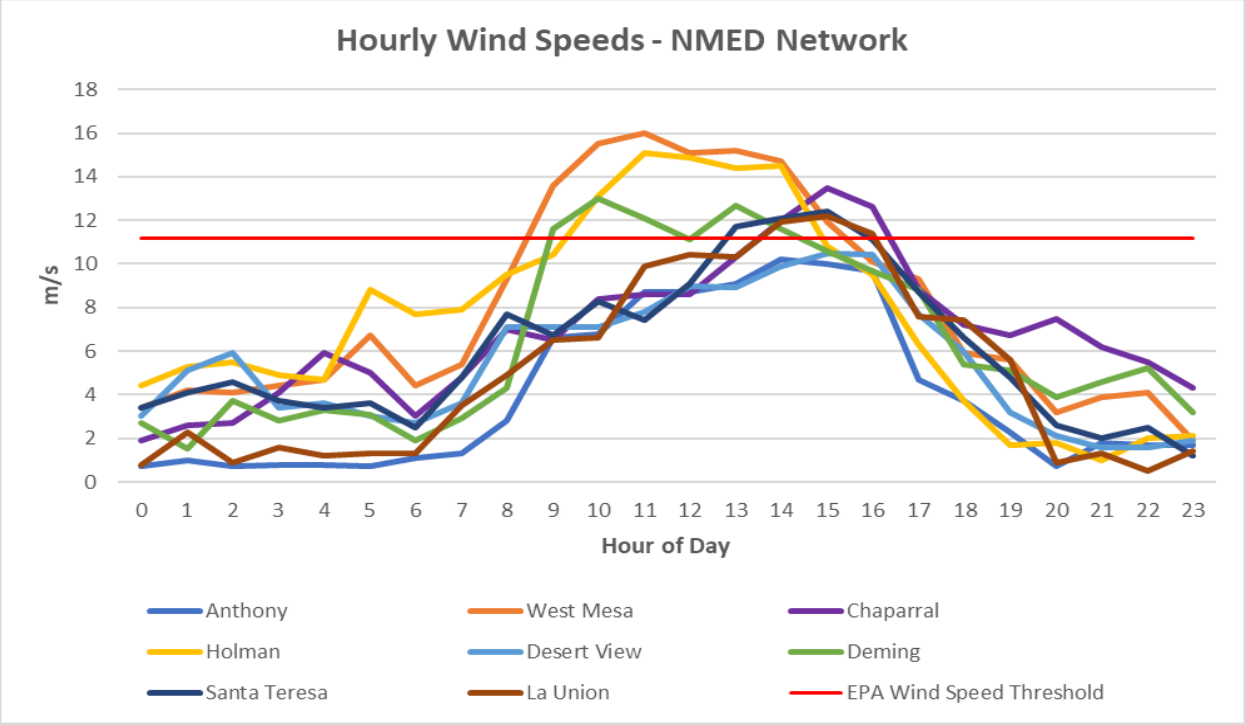


Figure 14-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the GOES-16 geostationary satellite RGB dust product with dust plumes observed as bands of pink originating upwind of NMED's monitoring site near Ascension and Janos, Chih. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 14-5). The dust plumes of interest appear to be limited to Mexico, orientated in a northeast fashion and traveling toward El Paso and NMED's monitoring site at the time of the satellite image (1831Z) that captured the imagery.

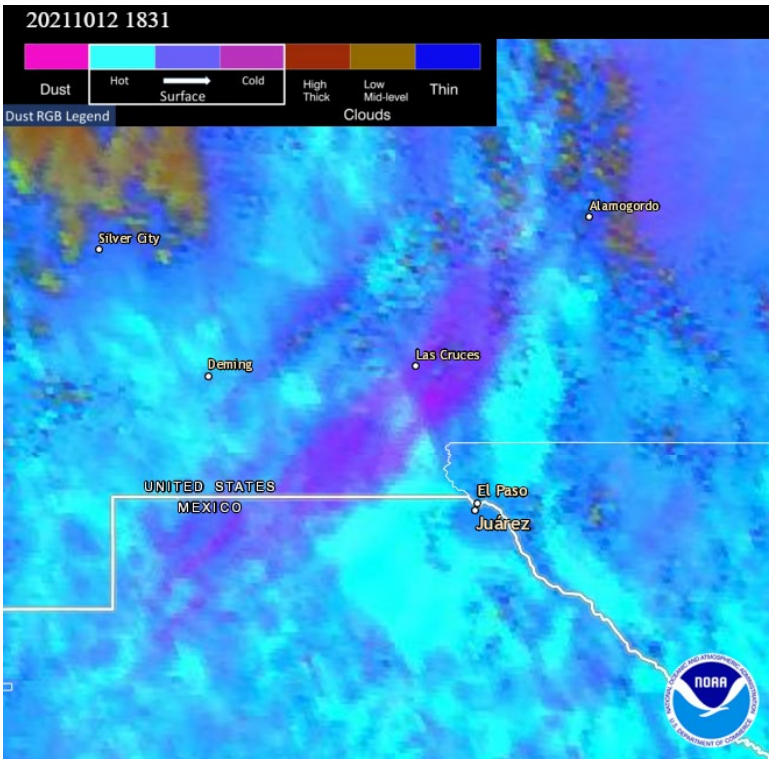


Figure 14-5. GOES-16 geostationary satellite RGB dust product showing southwestern New Mexico, northern Chihuahua and western Texas. Imagery obtained from AerosolWatch website. Note areas of pink bands are dust plumes oriented in a southwest to northeast direction.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Wind Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. This was in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"Windy conditions expected today…Isolated blowing dust, difficult driving conditions, and minor damage to structures and trees are possible."

An image taken from the New Mexico Department of Transportation's traffic cam website the afternoon of October 12, 2021, shows the visible dust in the air this day. The view of the Organ Mountains and the City of Las Cruces in the background are obscured by the heavy presence of particulate matter in the air from high wind blown dust sources (Figure 14-6).

Figure 14-6. NMDOT traffic cam overlooking east from west Las Cruces Scenic View Rest Area location. Notice the visible haze in the air.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from areas of New Mexico into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 14-7). This analysis supports the hypothesis that dust plumes originated in northern Mexico, Arizona, and New Mexico before being transported to downwind monitoring sites.

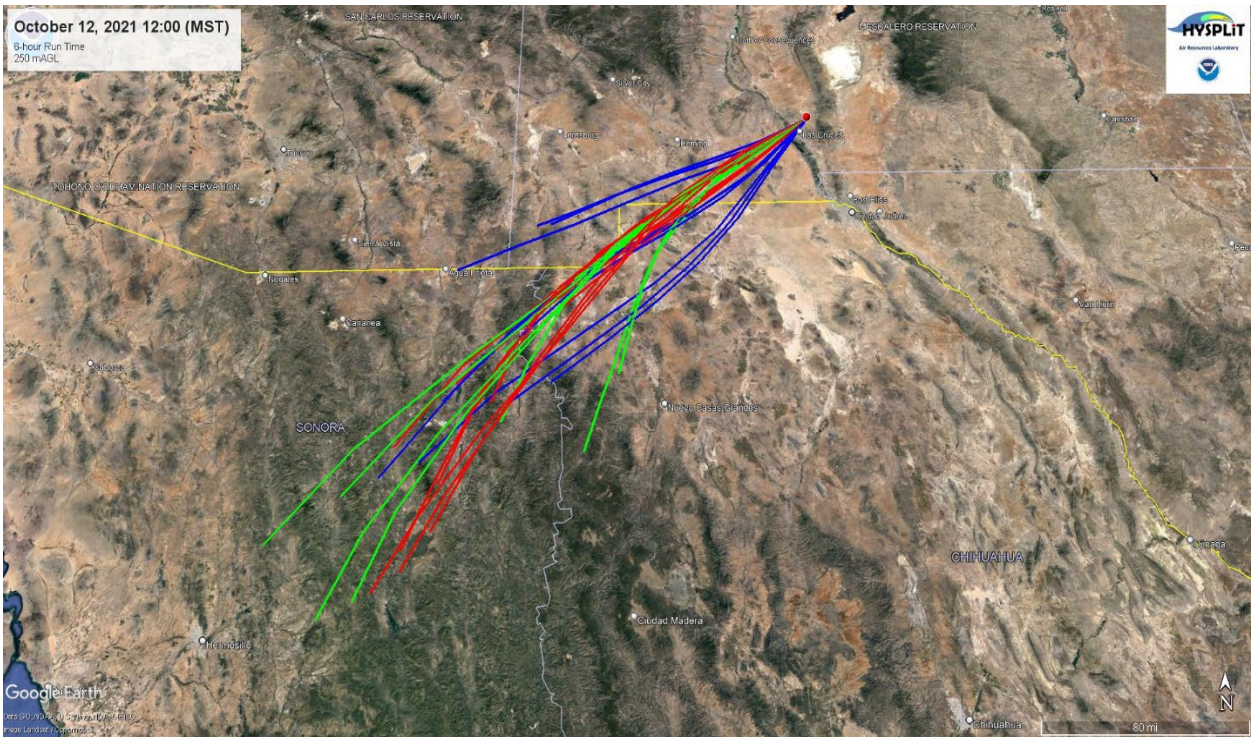


Figure 14-7. HYSPLiT back-trajectory analyses using the Ensemble mode for the Holman monitoring site.

Wind Direction and Elevated PM_{10} Concentrations

Pollution roses (Figures 14-8 through 14-12) were created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0700 -1700 hour). During the event, winds blew from the west through the south 86% and from the east direction the remaining 14% of the time for the Anthony monitoring site, from the west-northwest through the west-southwest to the south direction 100% of the time for the Desert View monitoring site, from the west-southwest through the south to the south-southeast direction 100% of the time for the Holman monitoring site, from the west-northwest through the west-southwest to the south direction 100% of the time at the West Mesa monitoring site, from the west-southwest through the south to the south-southeast direction 100% of the time for the Deming monitoring site coinciding with peak PM_{10} concentrations.

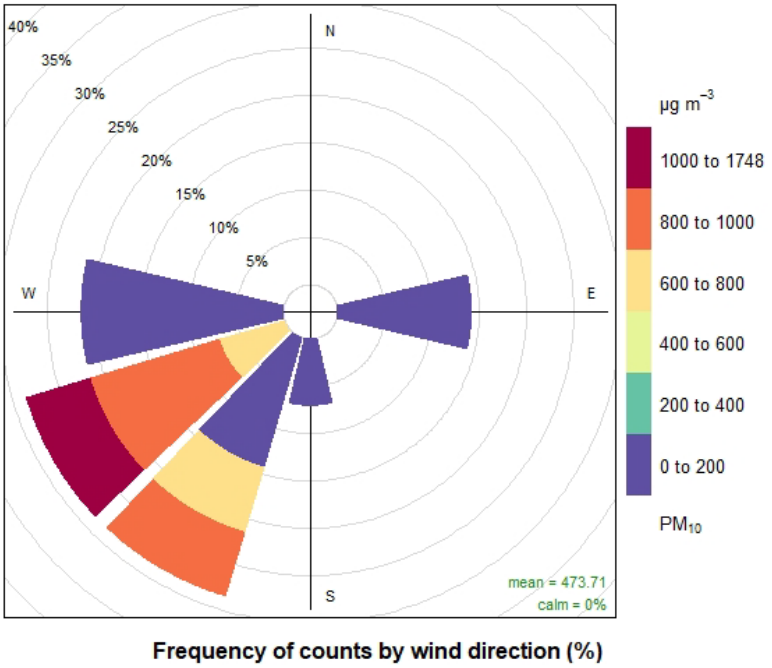


Figure 14-8. Pollution rose for the Anthony monitoring site.

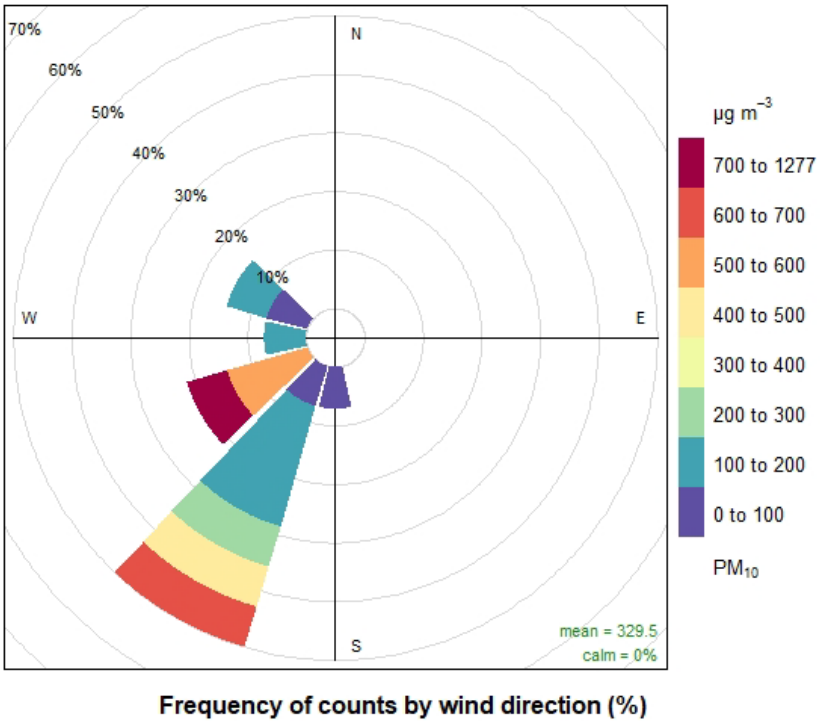


Figure 14-9. Pollution rose for the Desert View monitoring site.

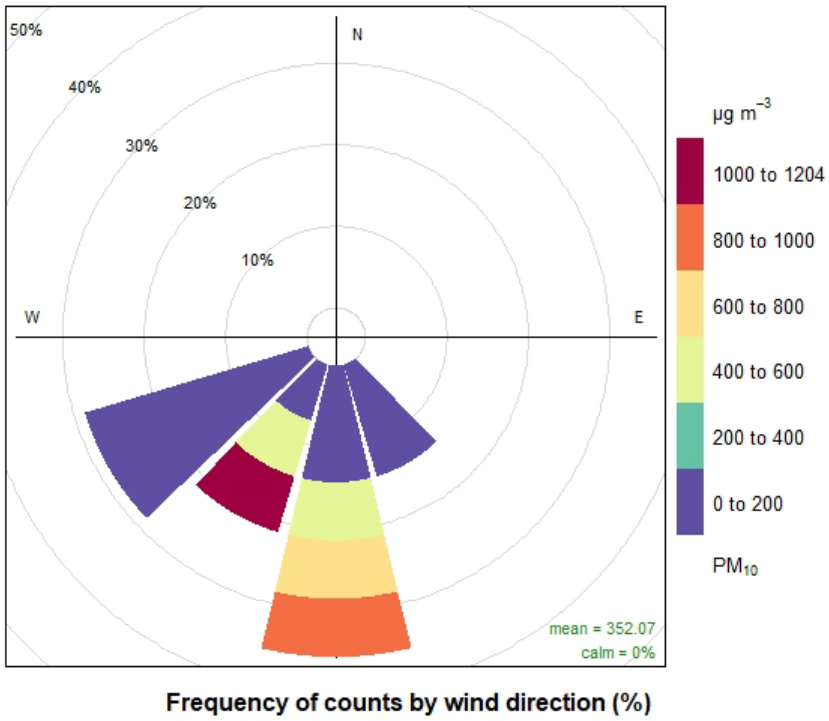


Figure 14-10. Pollution rose for the Holman monitoring site.

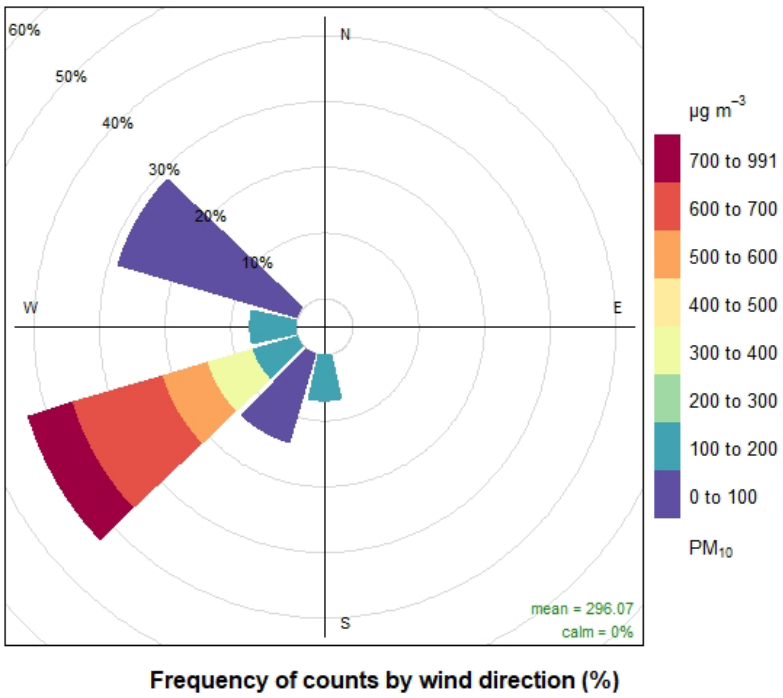


Figure 14-11. Pollution rose for the West Mesa monitoring site.

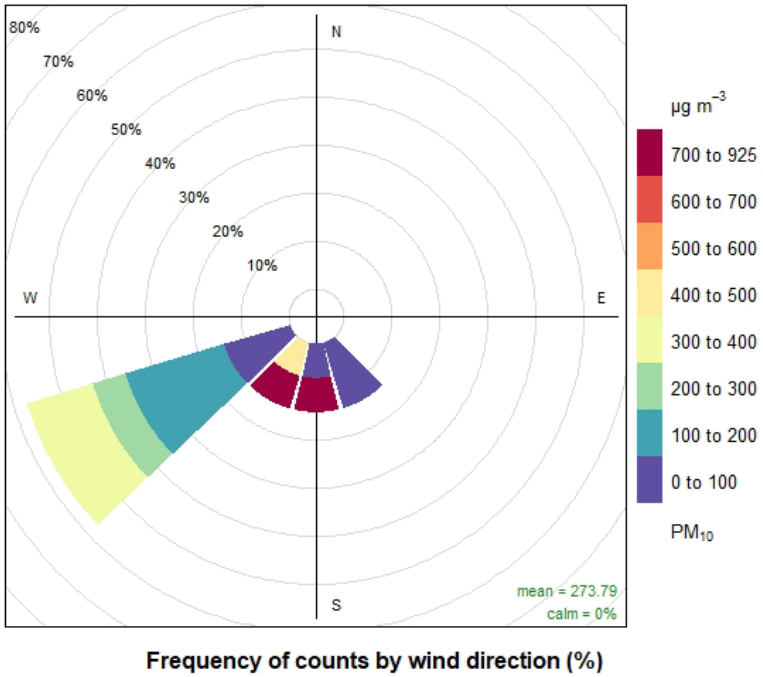


Figure 14-12. Pollution rose for the Deming monitoring site.

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southwest winds beginning at the 0800 hour and lasting through the 1700 hour. During this time, peak hourly PM_{10} concentrations ranged from 451 to 1748 µg/m^3 were recorded at the Chaparral and Anthony monitoring sites, respectively (Figure 14-13). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 10.2 to 16 m/s were recorded at the Anthony and West Mesa monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 14-14 through 14-18 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

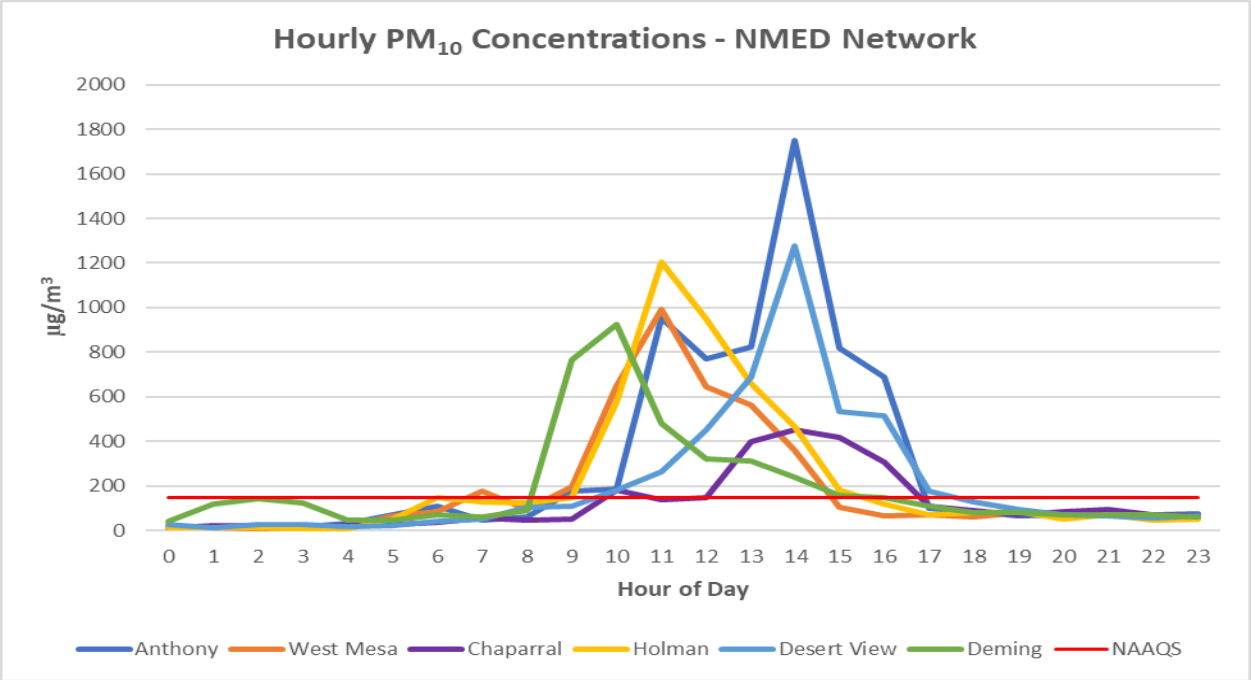


Figure 14-13. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

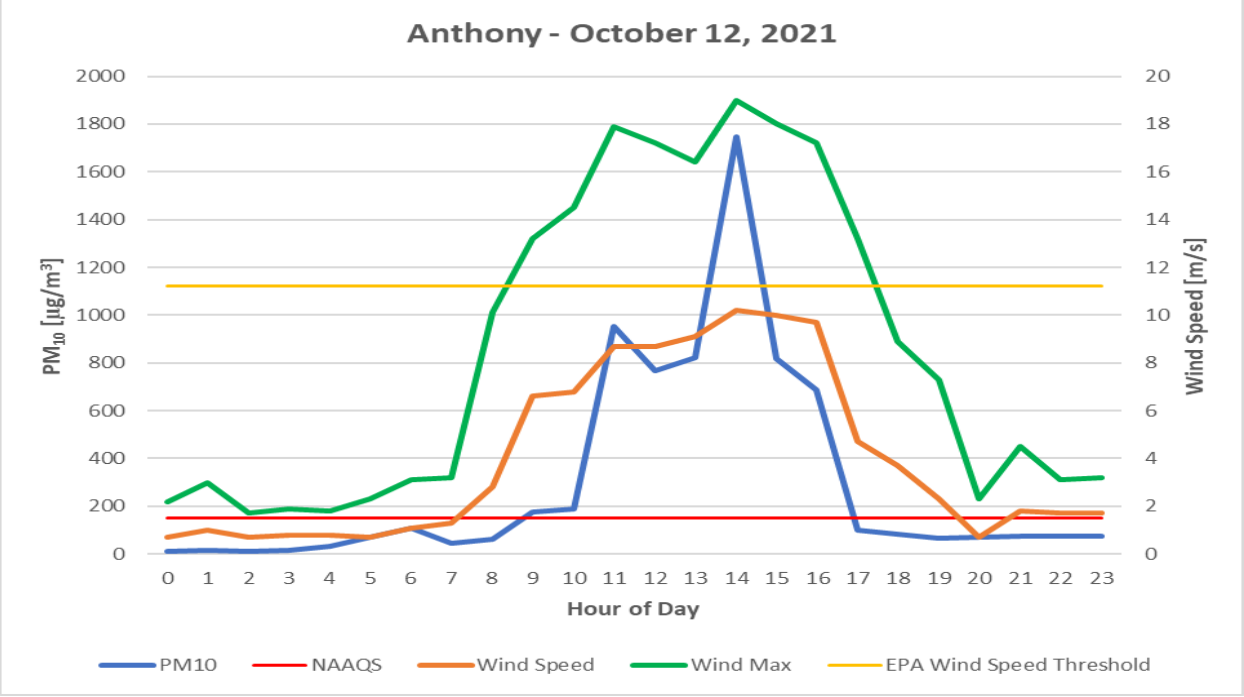


Figure 14-14. Anthony monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

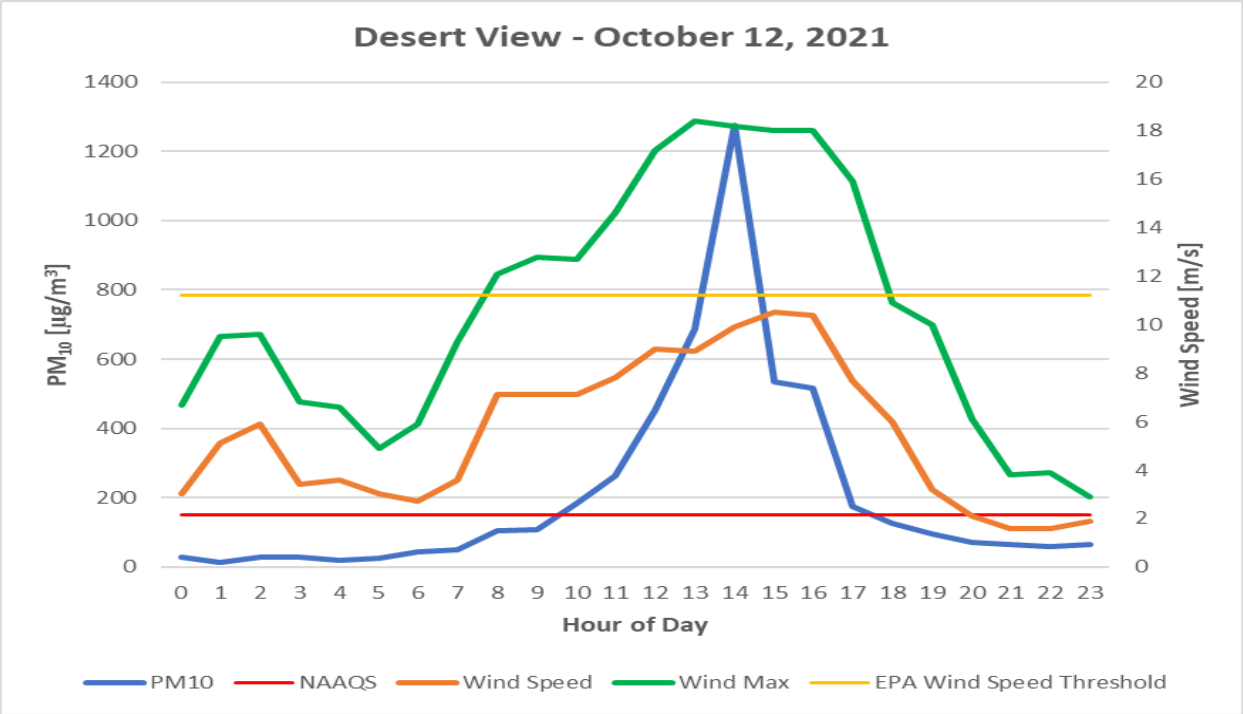


Figure 14-15. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

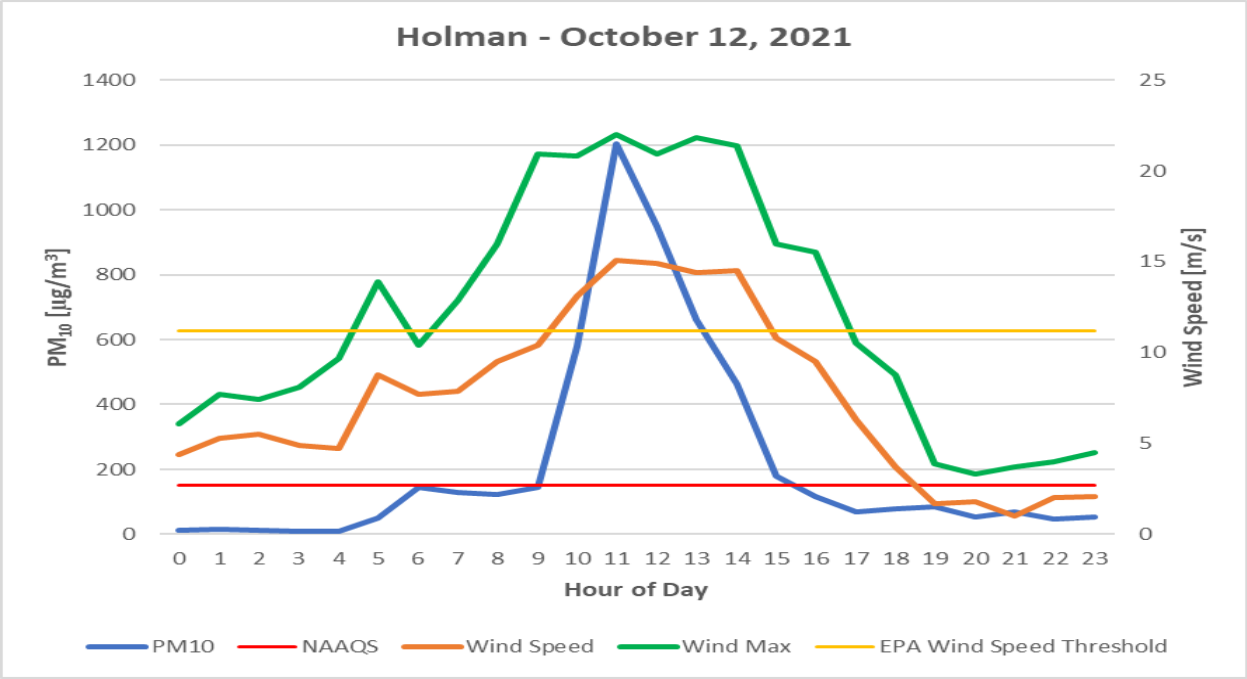


Figure 14-16. Holman monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

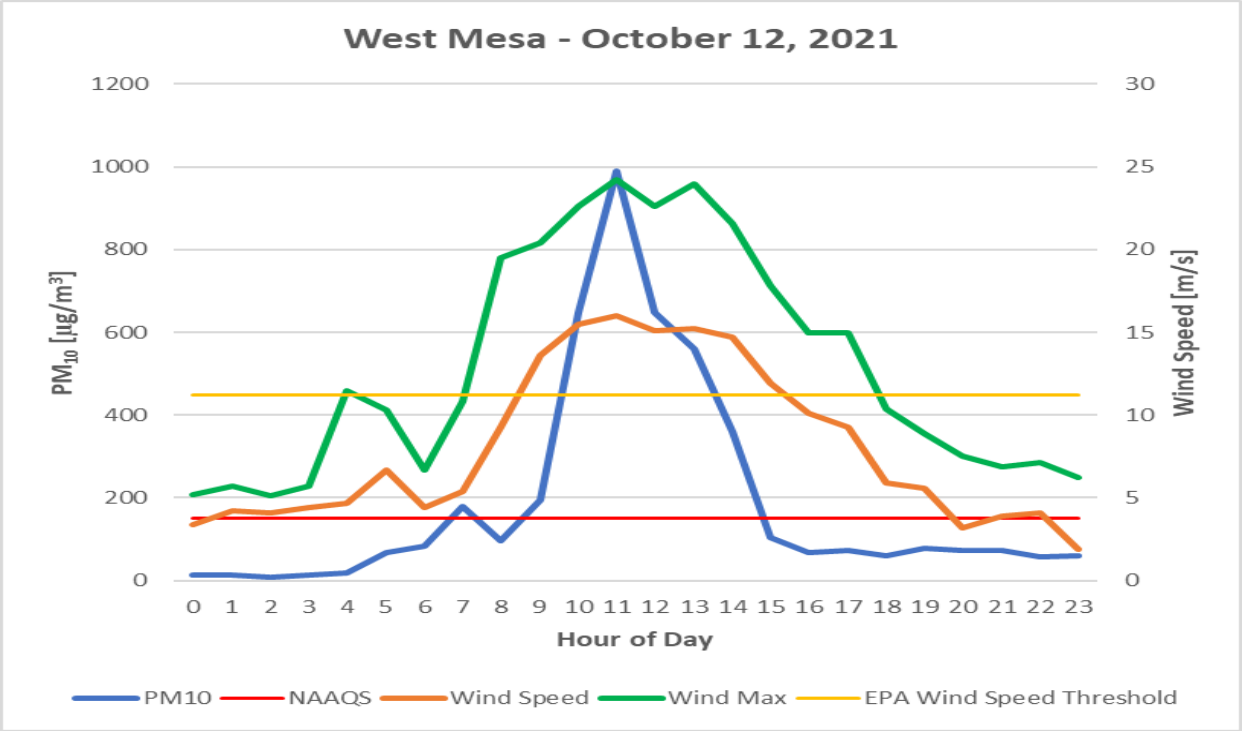


Figure 14-17. West Mesa monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

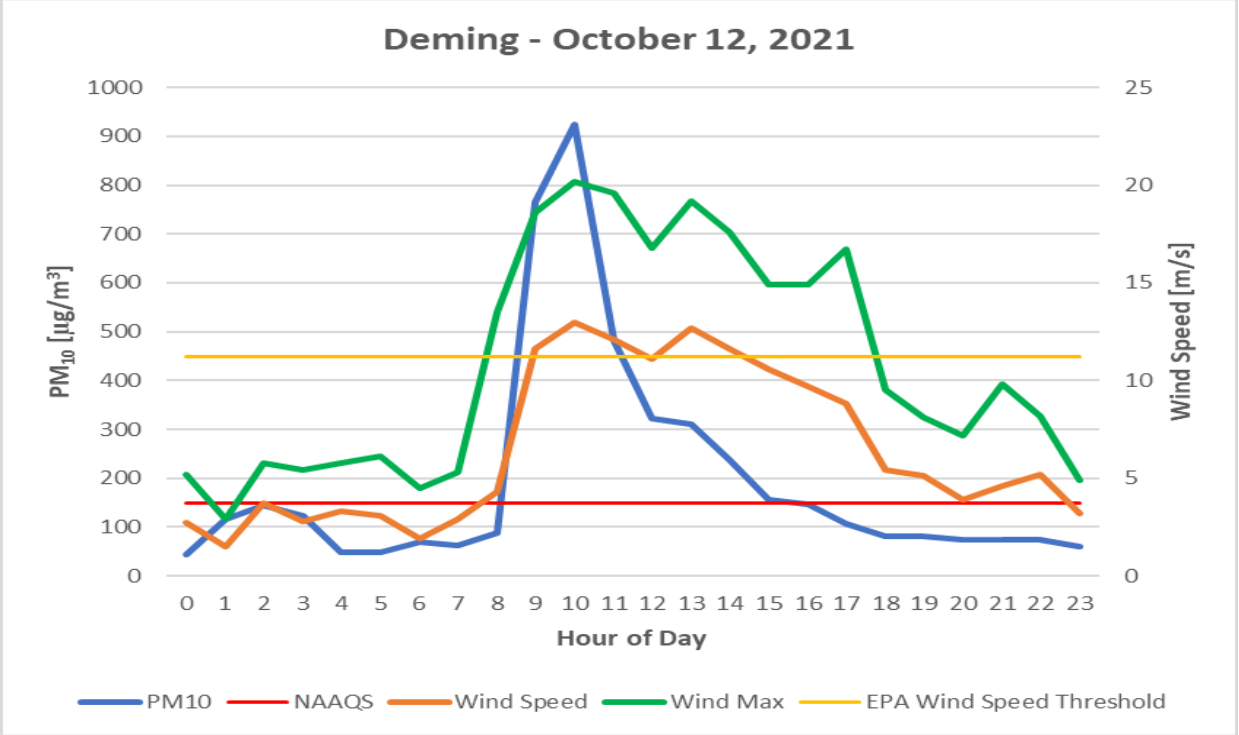


Figure 14-18. Deming monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, NMED monitoring sites recorded 24 (Anthony), 32 (Desert View), 9 (Holman), 4 (West Mesa), and 14 (Deming) exceedances of the PM_{10} NAAQS (Figures 18-1 through 18-6 in Appendix A). The maximum 24-hour average PM_{10} concentrations at these sites were 506 (Anthony), 734 (Desert View), 691 (Holman), 351 (West Mesa), 721 (Deming) µg/m^3 all recorded in 2019. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 14-19, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 62 µg/m^3 demonstrating the influence high winds have on PM_{10} concentrations in the area.

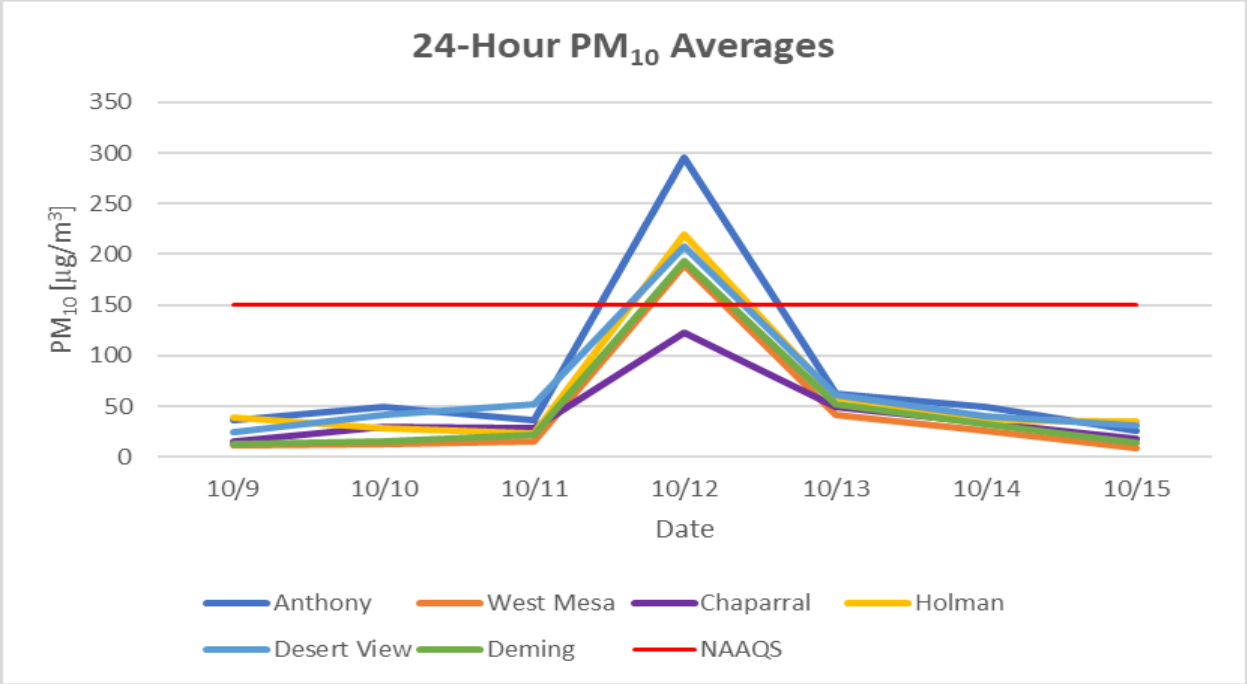


Figure 14-19. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded values for this day 295 (Anthony), 208 (Desert View), 219 (Holman), 189 (West Mesa), and 193 (Deming) µg/m^3 are all above or near the 99th percentile of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at the Anthony, Desert View, Holman, West Mesa, and Deming monitoring

sites. The monitored PM_{10} 24-hour averages of 295 (Anthony), 208 (Desert View), 219 (Holman), 189 (West Mesa), and 193 (Deming) $\mu g/m^3$ are all above or near the 99^{th} percentile of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

15. HIGH WIND EXCEPTIONAL EVENT: December 6, 2021

Conceptual Model

A backdoor cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Desert View monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 15-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0021	6ZM Desert View	213 µg/m^3	7.5 m/s	67.5 m/s

Table 15-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

This strong backdoor cold front will develop at its strongest over the Central Plains with strong upper and mid-level jet streams over the High Plains. Early in the morning as the main storm system moved into the state, a pressure gradient formed over the Borderland as moisture decreased and winds increased from the tightening of gradients and a deepening of the lee surface trough over western Colorado. At the 1800 hour, an area of low-pressure moved over the Borderland as the cold front progressed from the northeast direction (Figure 15-1). Aloft, the trailing trough hovered over the High Plains with an area of low-pressure centered over the Gulf of California. Early in the morning hours this low-pressure aloft traveled east and aligned itself with New Mexico and the surface wind direction (Figure 15-2). As the cold front approached the Borderland the mixing, increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust.

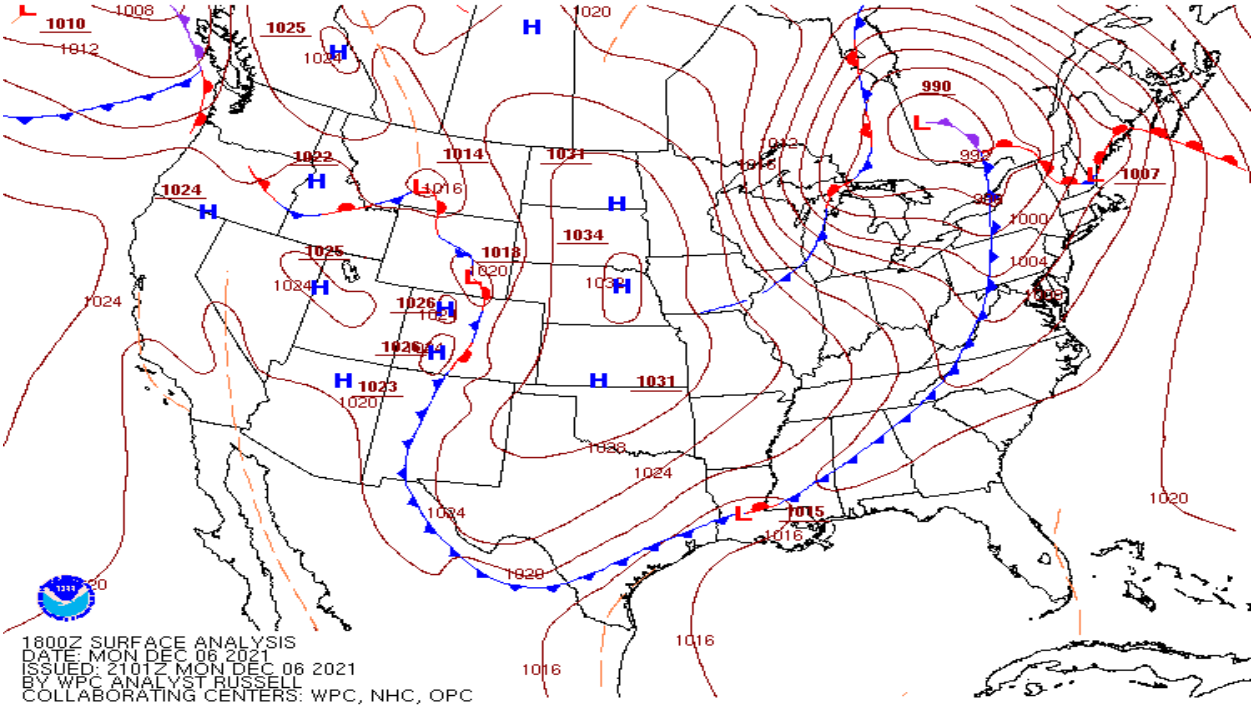


Figure 15-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

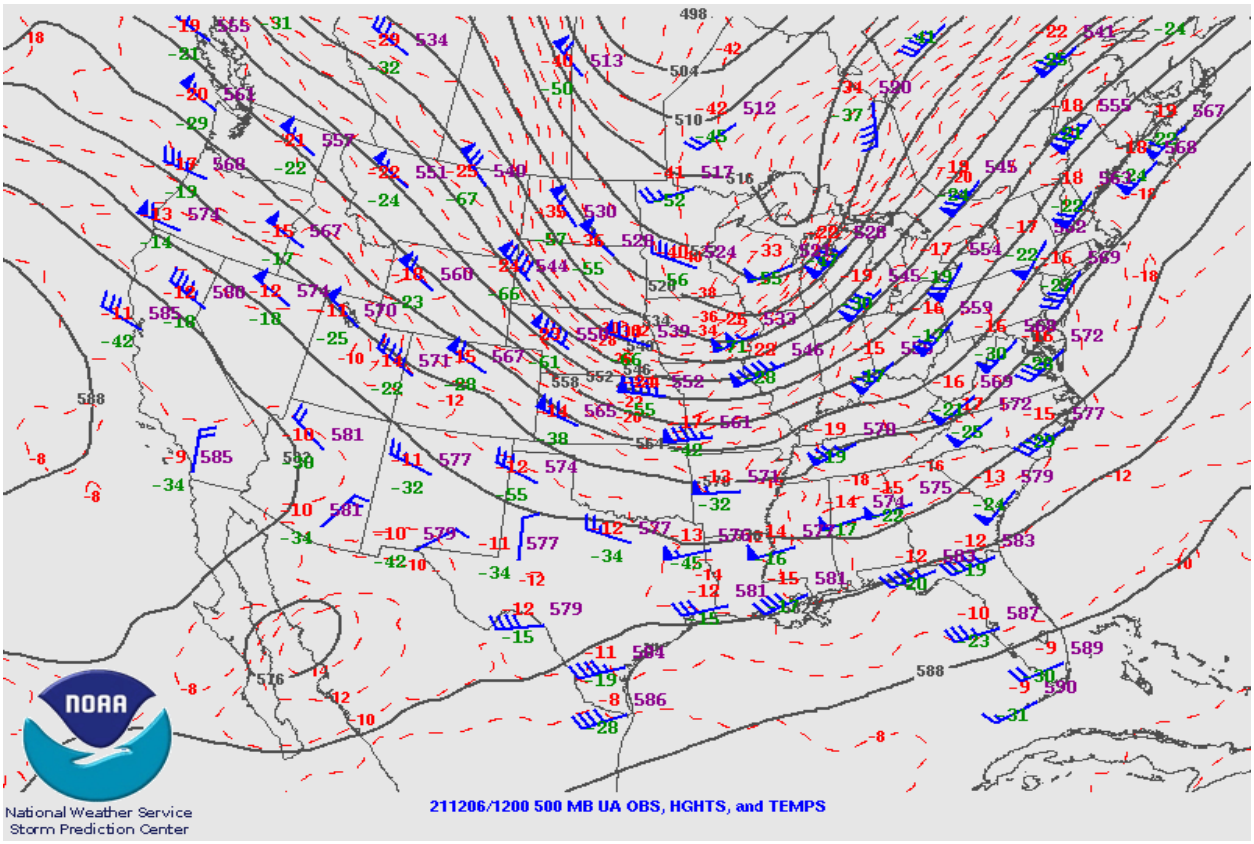


Figure 15-2. Upper air weather map for December 6, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the winds aloft blew from the northeast while the surface winds blew from the east southeast throughout the border region. These high velocity winds passed over large areas of desert within New Mexico, Texas and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Unfortunately, sustained hourly wind speeds exceeding 9 m/s (~20 mph) were not recorded at NMED monitoring sites, however, wind speeds at the upwind Texas Commission for Environmental Quality's (TCEQ) Amarillo, TX; 24th Avenue, C1025 monitoring site beginning at the 2100 hour December 5, 2021, and lasting through the 0100 hour December 6, 2021 (Figures 15-3 and 15-4). PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, West Mesa and Deming monitoring sites beginning at the 0600 hour. Hourly concentrations remained elevated through the 2300 hour. Table 15-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Desert View			Deming			West Mesa		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0200	7	1	25.1	9	1.7	32.9	5	0.6	1.9
0300	9	1.1	67.5	12	1.3	53.7	7	1	2.3
0400	14	2.6	33.8	14	1.6	25.5	9	2	3.3
0500	56	4.4	16.3	17	1.4	15.6	5	1.5	3.5
0600	273	5.8	12.1	9	0.6	36.1	5	1.2	2.9
0700	637	5.6	11.4	34	0.5	38.3	68	3.2	7.9
0800	583	7	9.8	36	3.2	21.9	237	7	10.5
0900	478	7.3	10.4	88	5.5	9.3	151	5.8	9.1
1000	307	7.5	12.9	110	4.3	16.7	144	7.2	10.8
1100	241	7.2	14	44	1.4	58.4	144	6.3	9.3
1200	227	6.9	12.7	70	1.6	45	175	5.3	7.7
1300	146	5.9	12.5	166	2.3	28.5	188	4.3	8
1400	173	5.4	11.7	151	2.5	18.8	183	3.3	5.6
1500	156	5	11.8	171	2.3	20.3	151	3.4	5.4
1600	161	4.2	10.8	161	1.9	17.9	112	3.1	5.3
1700	205	3.7	11	178	1.7	23.8	127	2.8	4.9
1800	324	4.1	11.3	156	1.2	20.4	114	3.1	4.2
1900	364	3.4	12.1	132	0.9	58	110	2.9	3.4
2000	298	3.8	13.5	127	1	47.4	102	3.2	4
2100	168	4.6	9.1	153	1.8	19.6	144	3.8	4.3

Table 15-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

CAMS 1025 Amarillo 24th Avenue C1025 **Select a different site**

Month: Day: Year: Time Format:

December 5 2021 12 Hour (AM/PM) Generate Report Plot Data

Green underline for validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at Amarillo 24th Avenue C1025 for **Sunday, December 5, 2021**. All times shown are in CST.

Parameter Measured	Morning												Afternoon												Parameter Measured	POC
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00		
Wind Speed	11.7	14.1	15.9	16.9	17.4	17.2	16.9	16.2	17.2	15.5	13.3	13.1	13.3	11.9	11.3	11.3	9.3	4.7	***3.5***	3.7	3.8	22.1	**31.0**	29.3	Wind Speed	1
Resultant Wind Speed	11.5	13.9	15.6	16.6	17.1	17.0	16.7	16.0	16.9	15.3	13.1	12.8	13.0	11.4	10.9	11.1	9.1	4.6	***3.4***	3.6	3.4	20.6	**29.8**	28.0	Resultant Wind Speed	1
Resultant Wind Direction	205	224	231	224	230	237	239	237	243	250	252	246	247	263	257	260	254	**270**	254	261	221	21	28	***17***	Resultant Wind Direction	1
Maximum Wind Gust	19.7	27.7	28.9	29.2	28.3	28.1	27.2	27.8	27.3	25.0	24.5	21.8	22.3	19.6	18.8	18.1	18.5	13.3	5.7	***5.0***	7.4	49.1	**52.8**	48.8	Maximum Wind Gust	1
Outdoor Temperature	47.1	49.6	51.7	49.3	49.0	48.5	48.8	48.0	49.1	51.6	55.8	60.3	65.4	68.7	70.7	**72.0**	71.8	69.1	65.8	66.1	61.0	55.1	41.8	***35.4***	Outdoor Temperature	1
Parameter Measured	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Parameter Measured	POC
	Morning												Afternoon													

Figure 15-3. TCEQ's Amarillo, TX 24th Avenue C1025 monitoring station 1-hour meteorological data for December 5, 2021. Courtesy of TCEQ.

CAMS 1025 Amarillo 24th Avenue C1025 **Select a different site**

Month: **Day:** **Year:** **Time Format:**

December 6 2021 12 Hour (AM/PM) Generate Report Plot Data

Green underline for validated data

The table below contains hourly averages for all the pollutants and meteorological conditions measured at Amarillo 24th Avenue C1025 for **Monday, December 6, 2021**. All times shown are in CST.

Parameter Measured	Morning												Afternoon												Parameter Measured	POC
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00		
Wind Speed	25.9	22.8	18.5	19.3	19.1	16.2	9.9	6.4	6.7	9.8	9.8	7.8	6.2	3.5	5.0	5.9	10.7	8.8	9.2	7.3	10.9	12.7	17.4	18.0	Wind Speed	1
Resultant Wind Speed	24.3	21.2	17.4	17.7	18.0	15.5	9.3	6.1	6.4	9.4	9.3	7.5	5.5	0.9	3.3	5.3	10.4	8.7	9.1	7.3	10.8	12.6	17.1	17.8	Resultant Wind Speed	1
Resultant Wind Direction	13	11	11	10	13	13	6	352	350	12	35	34	14	93	126	167	161	175	171	162	161	163	172	176	Resultant Wind Direction	1
Maximum Wind Gust	43.8	38.6	30.9	32.9	34.7	27.9	19.8	12.2	12.0	16.4	15.4	16.6	12.8	8.4	11.5	10.8	19.1	14.3	15.5	11.3	18.4	21.1	32.8	31.8	Maximum Wind Gust	1
Outdoor Temperature	33.3	31.9	30.8	29.3	27.6	26.2	24.8	23.0	23.4	25.4	27.8	30.0	32.8	35.4	37.5	39.4	39.3	38.1	35.6	32.9	31.8	31.6	32.5	31.9	Outdoor Temperature	1
Parameter Measured	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Parameter Measured	POC
	Morning												Afternoon													

Figure 15-4. Amarillo, TX 24th Avenue C1025 monitoring station 1-hour meteorological data for December 6, 2021. Courtesy of TCEQ.

Meteorologists forecasted the high wind blowing dust event to occur this day, a strong back door cold front moved across the western border of Texas and eastern New Mexico. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from east to west just south of the High Plains in the late-night hours of December 5, 2021 and moving across New Mexico during the early morning hours of December 6, 2021. The systems movement across the area timed well with the convective mixing that was generated during the deep trough to the east as peak winds aloft moved into the area peaking around midnight at the source areas of the Texas Panhandles which includes Amarillo, TX as the strong cold front progressed through the area. Many outlets also forecasted a high probability of a strong backdoor cold front which typically creates entrained dust and haze throughout the area, especially in the desert areas of southern New Mexico during periods of prolonged drought (Figure 15-5).

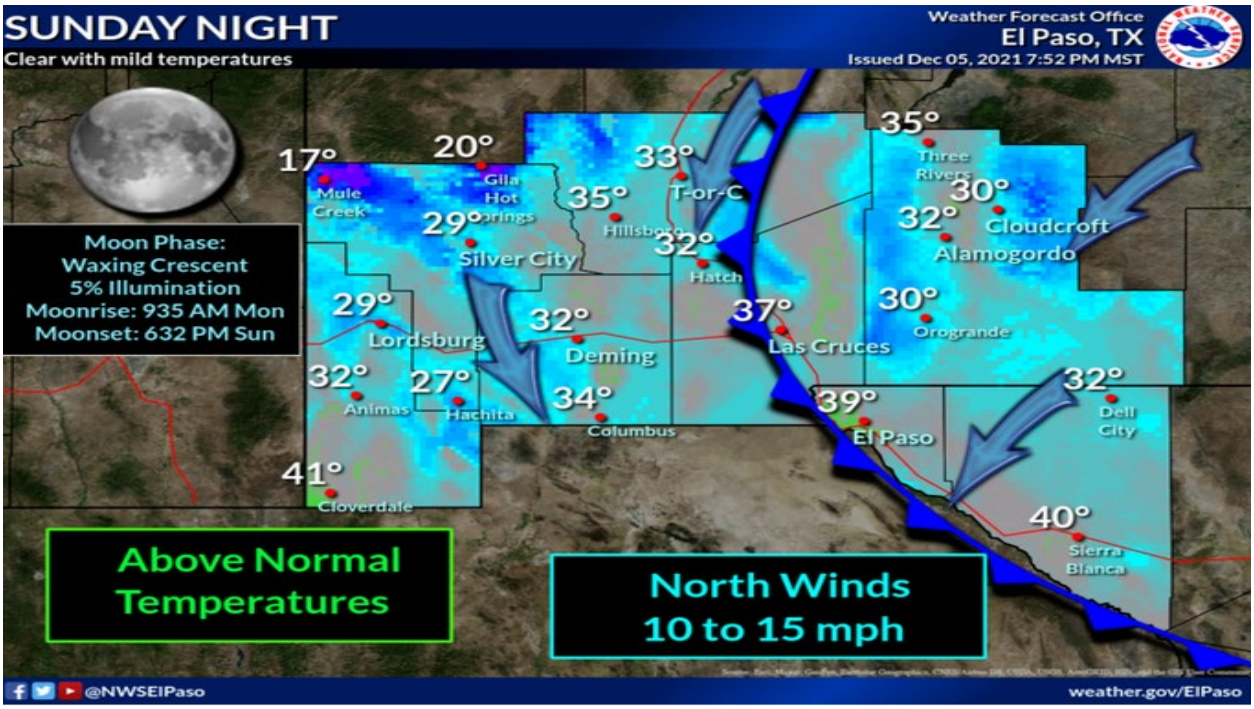


Figure 15-5. NWS GraphiCast for southern Doña Ana County showing strong eastern backdoor cold front.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. Unfortunately, no NMED monitoring sites recorded wind speeds above this threshold (Figure 15-6). However, the wind speeds at the upwind source area, TCEQ's Amarillo 24th C1025 monitoring site reached the wind speed threshold for a total of 3 hours beginning at the 2200 hour December 5, 2021, lasting through the 0000 hour December 6, 2021 (Figures 15-3 and 15-4).

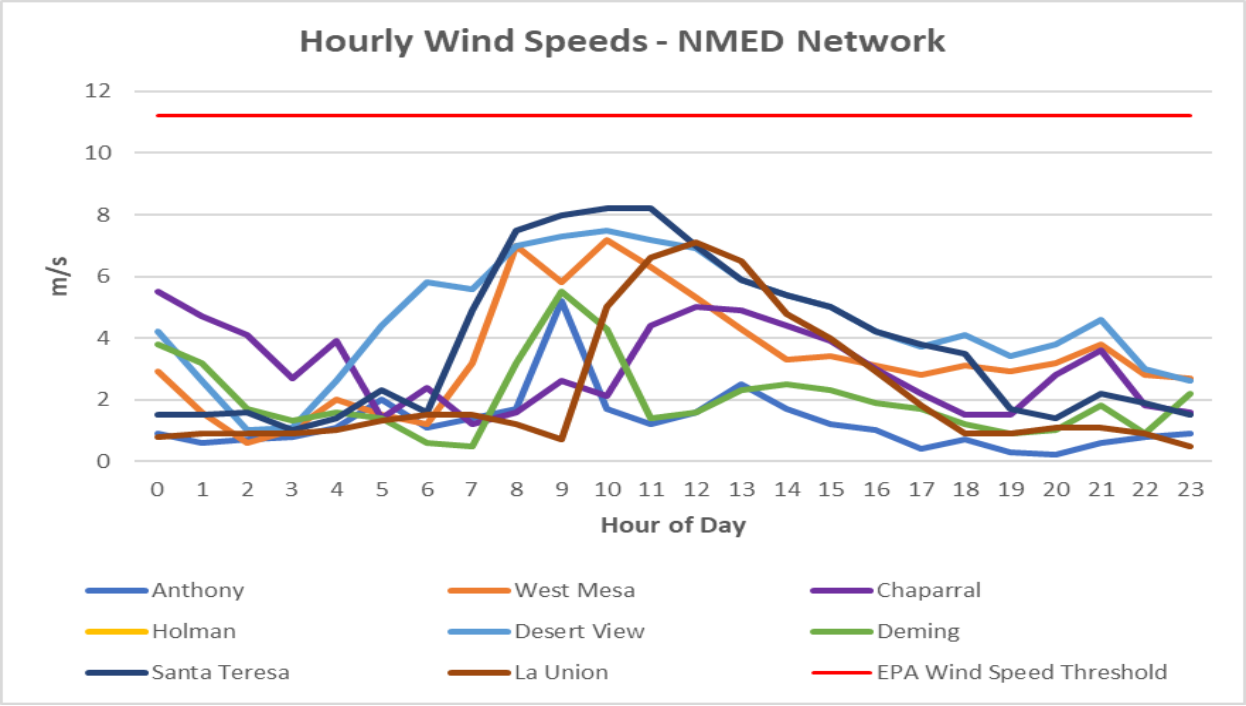


Figure 15-6. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Otero, Eddy, Lea, and Chavez Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in the High Plains, Texas' Panhandles, West Texas, and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the Sentinel 5P satellite TROPOMI Aerosol Optical Index product imagery with dust plumes originating upwind of NMED's monitoring sites near Ciudad Juarez, Chih. which are represented as warmer colors based on the density of the concentrations observed. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas of southwestern New Mexico and west Texas (Figure 15-7). The dust plumes of interest appear to concentrate in northern Chih., Mexico, southwestern New Mexico and west Texas located near El Paso and NMED's monitoring sites at the time of the satellite pass (1310 MST) that captured the imagery. In addition, the GOES-16 geostationary satellite captured the progression of the cold front from the

northeast continental United States with a distinct line of disturbance accompanied by a wall of dust lofted into the air (Figure 15-8).

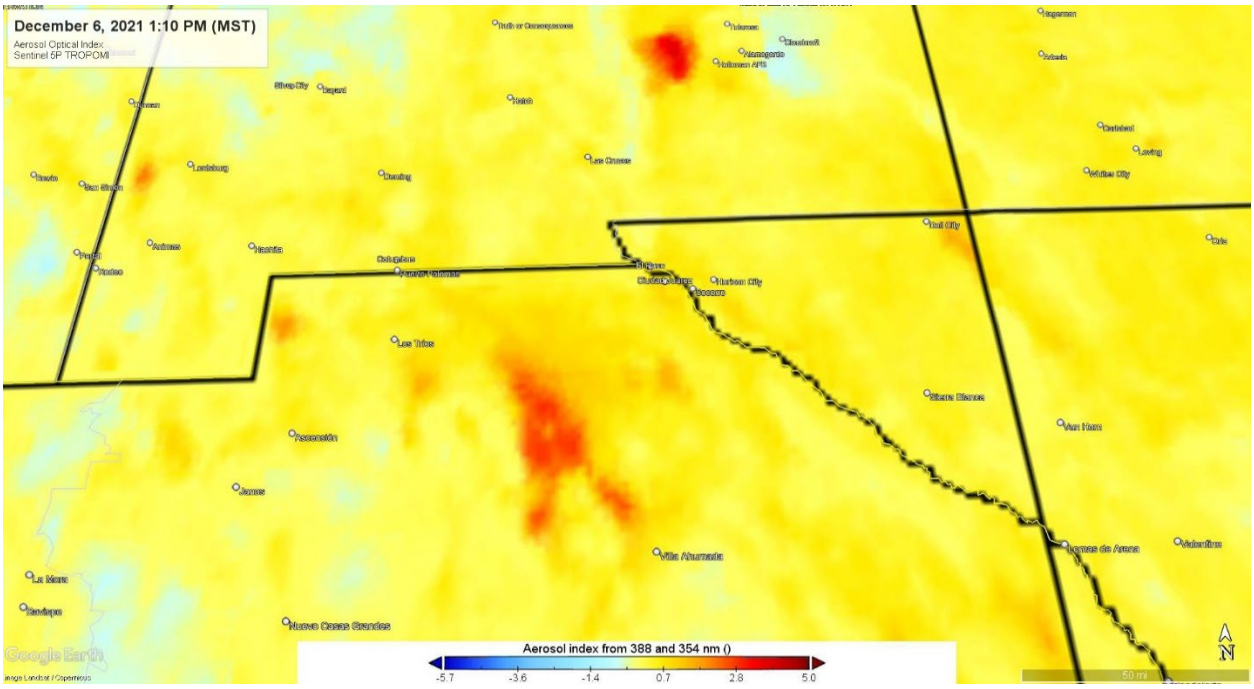


Figure 15-7. Sentinel 5P TROPOMI Aerosol Optical Index product satellite imagery taken December 6, 2021, at 1310 MST. Image courtesy of EarthData.

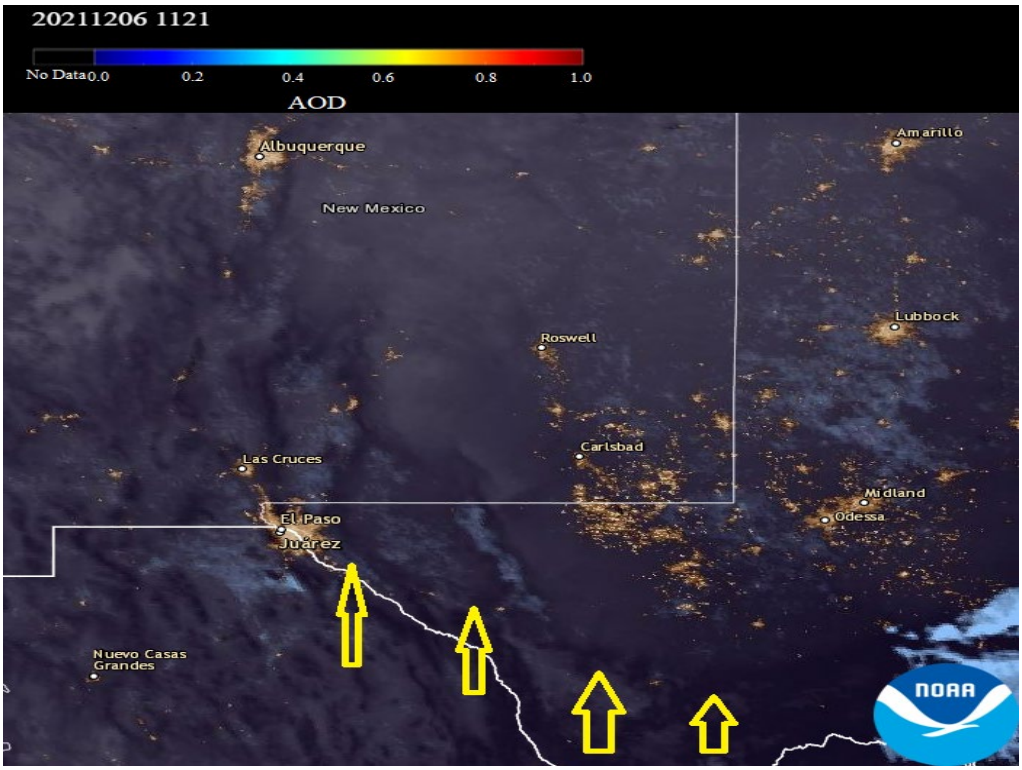


Figure 15-8. GOES-16 geostationary satellite image showing early morning strong backdoor cold front convective event December 6, 2021, at the 0501 MST hour. Note the dust plume progressing towards NMED monitoring sites behind cold front. Image provided courtesy of NOAA AerosolWatch website.

Weather Statements, Advisories, News and Other Media Reports Covering the Event
The Amarillo National Weather Service (NWS) issued a Wind Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. This was in place for the source areas of the Texas Panhandles to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"A Wind Advisory remains in effect for the south-central and southeastern parts of the Texas Panhandles through 10 AM this morning for north winds of 25 to 35 mph with higher gusts."

The El Paso NWS Twitter tweet provides a photo of observable ground level early morning haze during the sunrise of December 6, 2021, posted 07:56 from the Santa Teresa NWS office (Figure 15-9) and the monthly December Weather Digest photo later in the afternoon showing the observable dust in the air obscuring the view of the Organ Mountains looking due east taken from west Las Cruces, near the Picacho Hills Country Club subdivision (Figure 15-10).

Figure 15-9. Tweet from NWS of El Paso Twitter feed showing observed early morning haze.

Figure 15-10. El Paso NWS December Weather Digest photo showing dust obscuring view of Organ Mountains observed from west Las Cruces looking due east.

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled through Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring sites from the rural areas of southeastern New Mexico, northern Mexico and the High Plains including the Texas Panhandles. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 15-11). This analysis supports the hypothesis that dust plumes originated in the High Plains including the Texas Panhandles, northern Mexico, and east-southeastern New Mexico before being transported to downwind monitoring sites.

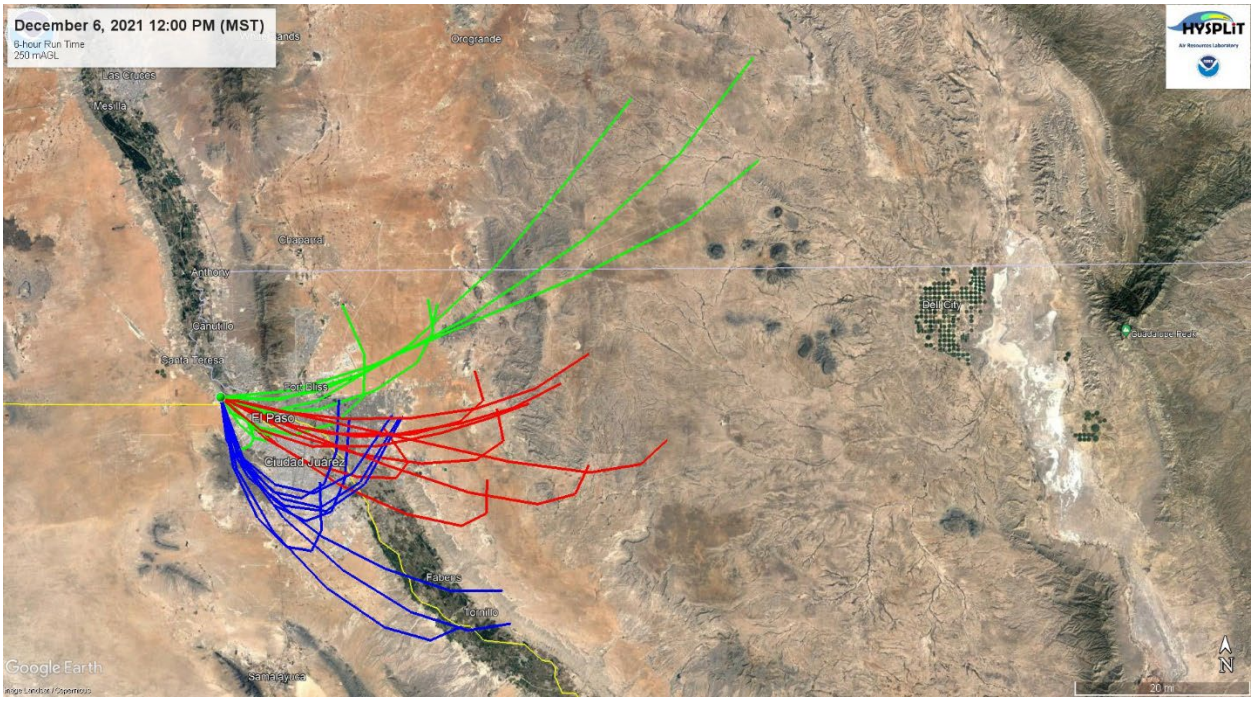


Figure 15-11. HYSPLiT back-trajectory analyses using the Ensemble mode for Desert View Monitoring site

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 15-12) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m³ (0600 -2100 hour). During the event, winds blew from the east-southeast direction 100% of the time for the Desert View monitoring site coinciding with peak PM_{10} concentrations.

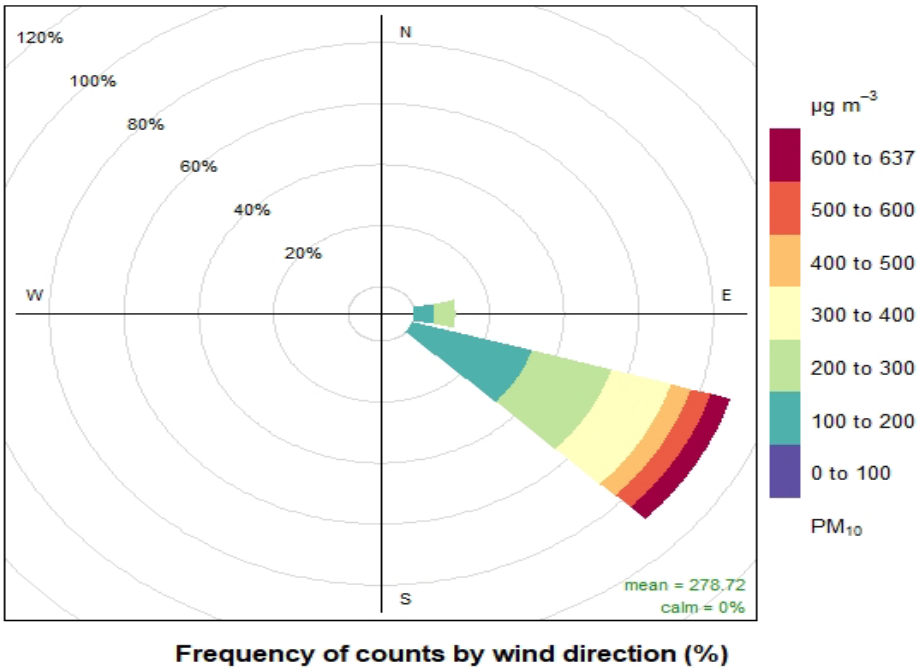


Figure 15-12. Pollution rose for the Desert View monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong southeasterly winds beginning at the 2100 hour December 5, 2021 and lasting through the 0000 hour December 6, 2021, from the source area TCEQ's Amarillo, TX monitoring site. Approximately six hours later, peak hourly PM_{10} concentrations ranged from 161 to 637 µg/m^3 at the Holman and Desert View monitoring sites, respectively (Figure 15-13). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 5.2 to 15.2 m/s were recorded at the Anthony and the TCEQ's Amarillo, TX: 24th Avenue, C1025 monitoring sites, respectively, during the times that contributed to the peak PM_{10} concentrations of the event. The time series plot in Figure 15-14 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

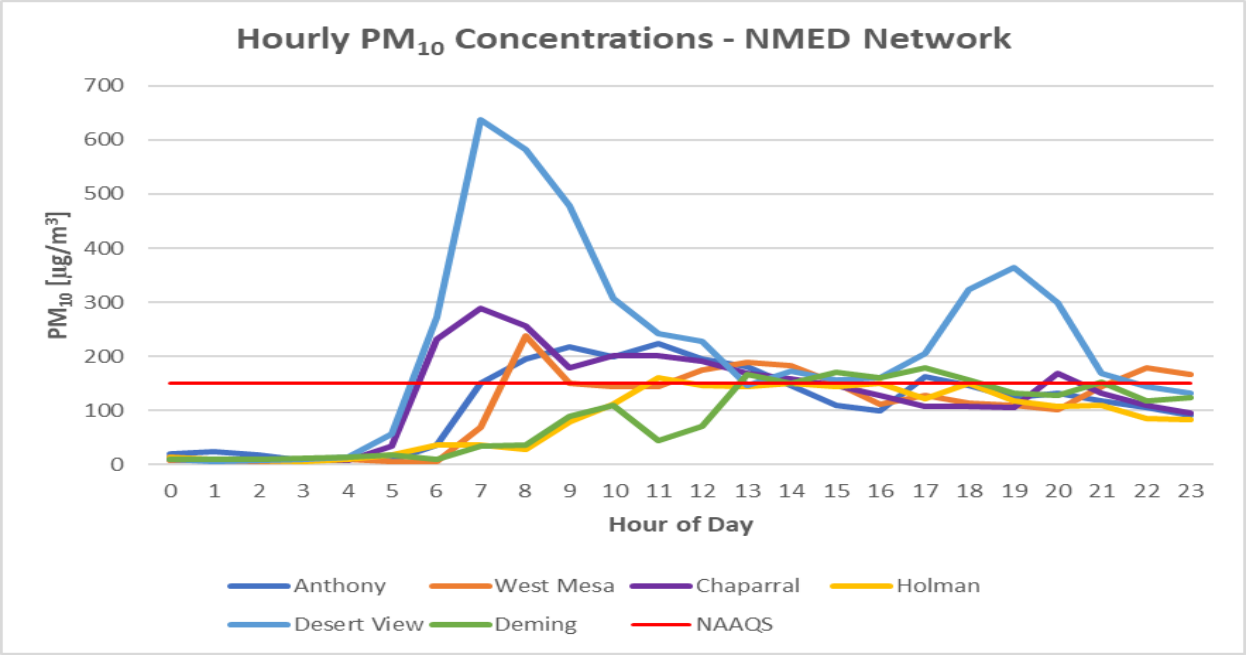


Figure 15-13. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

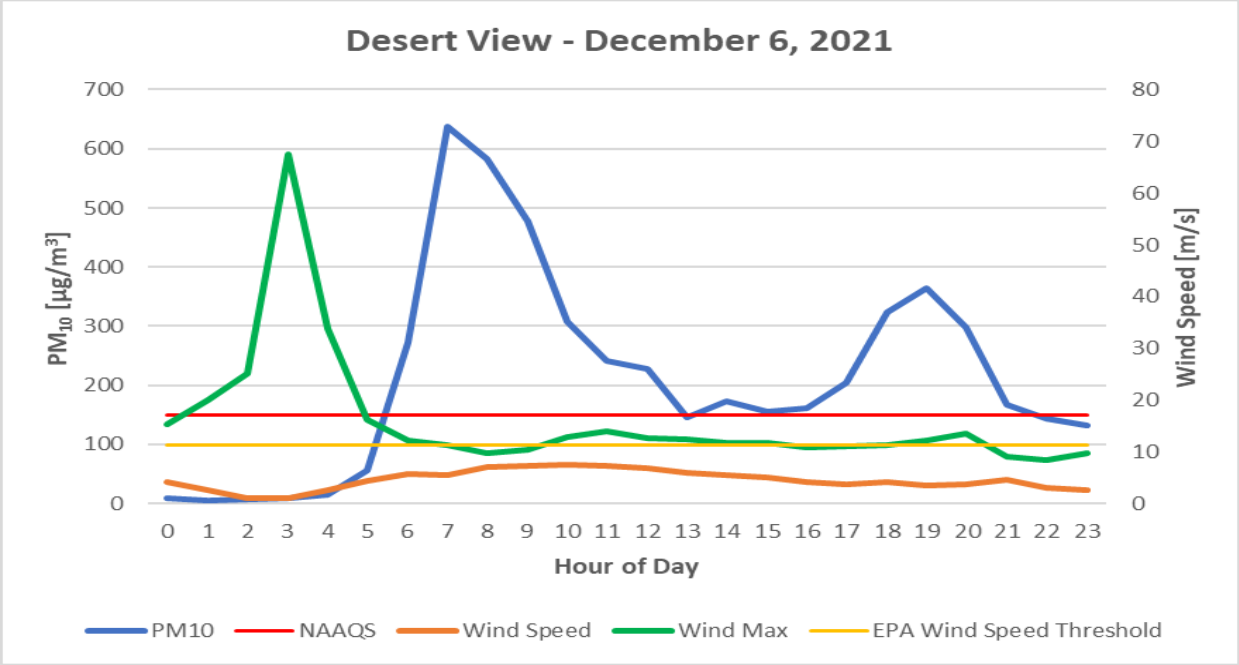


Figure 15-14. Desert View monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Desert View monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-2 in Appendix A). The maximum 24-hour average PM_{10} concentrations at this site was 721 µg/m^3, recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 15-15, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event, except for the following event date of December 9, 2021. Daily averages for the days surrounding the event did not surpass 108 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

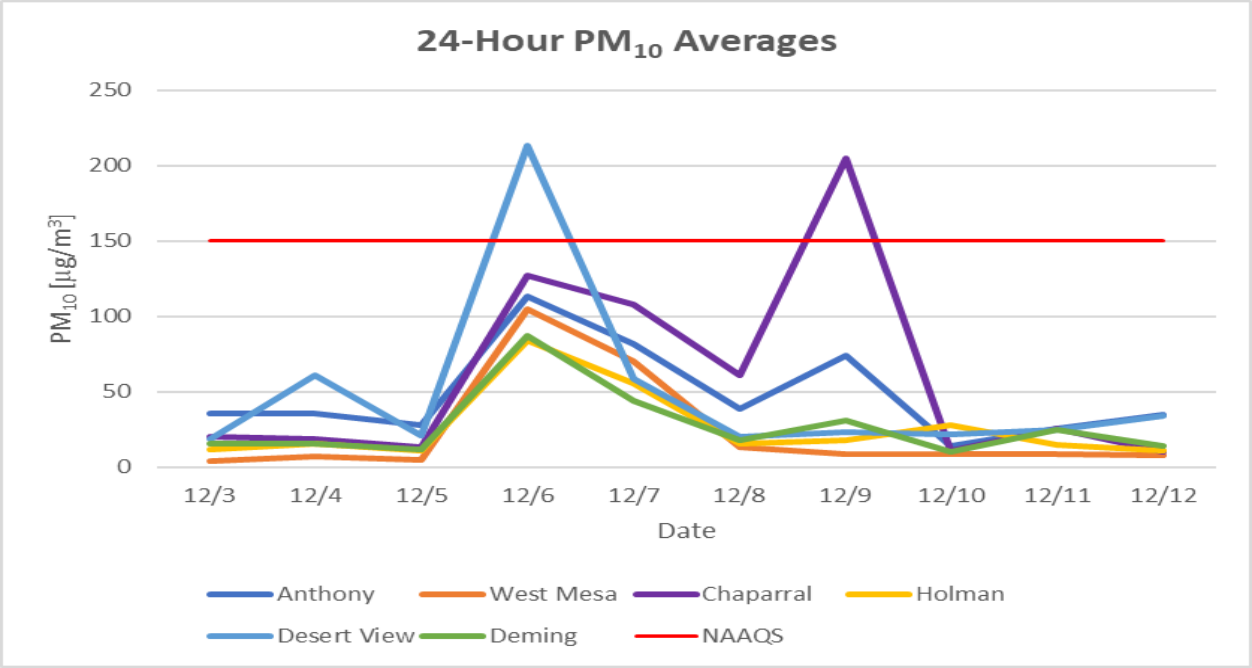


Figure 15-15. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (213 µg/m^3) is near the 99th percentiles of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (213 µg/m^3) is near the 99th percentiles of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

16. HIGH WIND EXCEPTIONAL EVENT: December 9, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Chaparral monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 16-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0020	6ZK Chaparral	205 µg/m^3	10.2 m/s	19.1 m/s

Table 16-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

An upper-level Pacific storm system will develop over the Pacific Northwest. Later in the afternoon as the main storm system moves into the state along with a cold front, a pressure gradient forms over the Borderland as moisture and winds increase from the tightening of gradients and a deepening of the lee surface trough to the east. At the 1800 hour, an area of low-pressure moved over eastern Colorado (Figure 16-1). Aloft, the trailing trough hovered over the coast of the Pacific Northwest. As the day progressed this low-pressure aloft traveled east and aligned itself with New Mexico and the surface wind direction (Figure 16-2). Trough dynamics plus downslope warming to the east generated a deep trough, increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust, especially on the east slopes of mountain ranges.

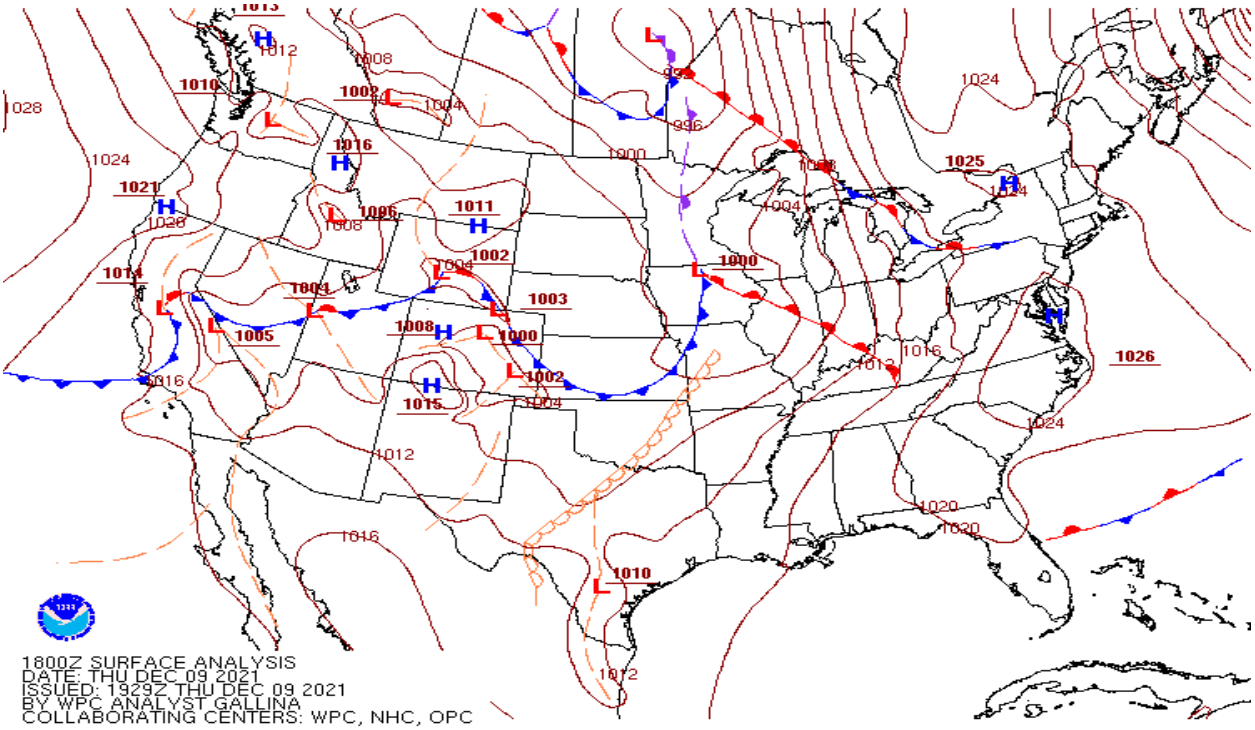


Figure 16-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

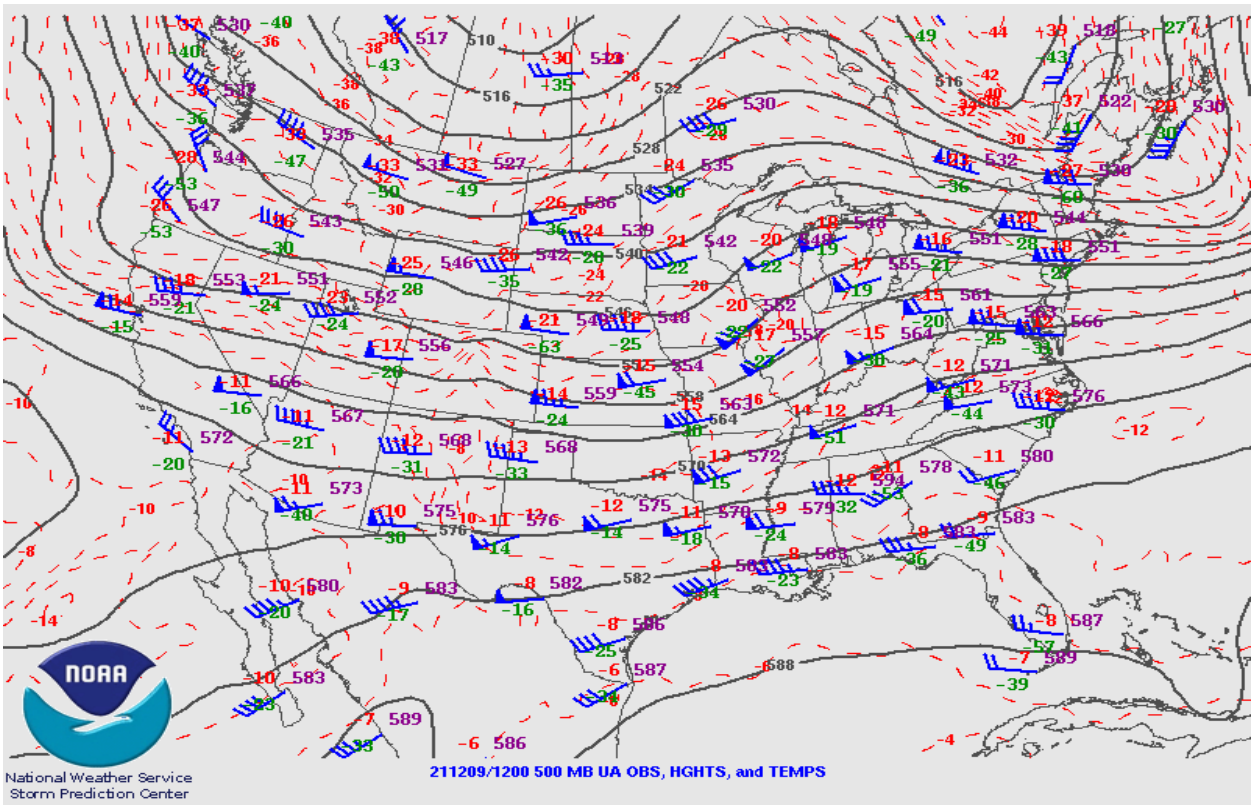


Figure 16-2. Upper air weather map for December 9, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the west-southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Chaparral monitoring site beginning at the 2100 hour and lasted through the 2200 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony and Chaparral monitoring sites beginning at the 1200 hour. Hourly concentrations remained elevated through the 2200 hour. Table 16-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event. In addition, peak five-minute wind speed data for the Santa Teresa and Chaparral monitoring sites provides a consistent depiction of the NWS Area Forecast Discussion which describes the difference in increased wind speeds from the east side of the Franklin Mountains versus the west side due to a venturi effect the mountain range creates (Table 16-3).

Hour	Desert View			Chaparral			Anthony		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
1100	53	1	2.9	56	4.5	8	27	1.1	3.6
1200	46	1.1	2.8	871	4.9	12.1	415	4.6	10.9
1300	36	1.4	4	398	6.9	12.5	149	5.1	10.5
1400	41	1.9	4.6	80	4.6	8.7	92	3.8	7.7
1500	34	2.5	4.8	22	3.6	7.2	31	2.6	5
1600	31	2.5	4.4	22	3.4	9.6	56	1.7	3.7
1700	56	2.8	4.4	51	4.9	10.4	58	2.2	5.3
1800	73	4.2	5.6	285	7.5	13.9	68	2.3	6.7
1900	46	2.2	4.8	107	7.7	14.1	19	3	5.6
2000	48	1.6	4.9	342	8	16.1	17	2.9	5.8
2100	46	3.1	6.4	2212	10.2	19.1	46	5.1	10.4
2200	34	1.5	3.1	276	10	16.9	268	6.1	11.4

Table 16-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Hour	Santa Teresa		Chaparral	
	Wind Speed (m/s)	Wind Gust (m/s)	Wind Speed (m/s)	Wind Gust (m/s)
2100	5.2	7.7	8.8	13.6
2105	5	7.2	9.5	13.8
2110	4.2	6.5	9	13.5
2115	4.4	6.2	10.7	17.7
2120	4.2	7.1	10.5	16.1
2125	4.4	6.5	8.9	14.3
2130	5.9	8.2	10.2	18.2
2135	6.1	8.6	12.4	17.5
2140	8	13	11.7	19.1
2145	8.3	13	10.5	17.3
2150	7.2	11.1	9.5	16.3
2155	8.4	11.7	10.6	18.3
2200	7.9	11	11.4	16.4
2205	8.6	11.8	9.7	15.5
2210	8.3	13	9.6	13.3
2215	7.5	12	8.1	12.6
2220	9.4	13	10.7	16.9
2225	9.1	12.3	9.4	13.8
2230	9.7	14.4	11.3	16.5
2235	7.8	10.8	10.4	15

Table 16-3. Peak five-minute wind speed data for the Santa Teresa and Chaparral monitoring sites.

Meteorologists forecasted the high wind blowing dust event to occur this day from the cold front and upper-low from the Pacific Northwest, aloft as the upper-deep trough moved across New Mexico. Forecasts predicted stronger winds as the storm approached the area with the area of low-pressure tracking from west to east just south of the Pacific Northwest in the morning with a trailing trough moving across New Mexico in the afternoon. The systems movement across the area timed well with daytime heating and mixing generating a deep trough to the east as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the evening, especially in the desert areas of southern New Mexico.

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The Chaparral monitoring site recorded five-minute wind speeds above this threshold for a total of twenty sustained minutes at the 2135, 2140, 2200, and 2230 hours (Table 16-3). Unfortunately, one-hour wind speeds failed to meet the threshold for this day (Figure 16-3).

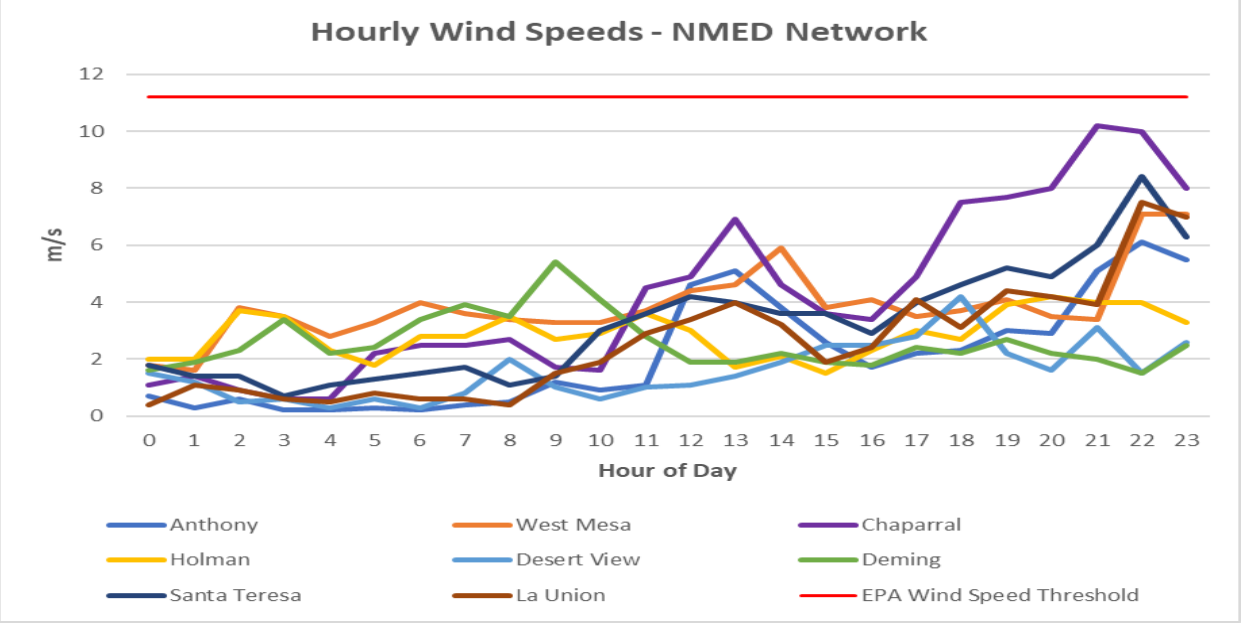


Figure 16-3. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis
Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures
Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event
Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery
The event was captured on the Sentinel 5P satellite TROPOMI Aerosol Optical Index product imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. which are represented as warmer colors based on the density of the concentrations observed. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 16-4). The dust plumes of interest appear to be

limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1354 MDT) that captured the imagery.

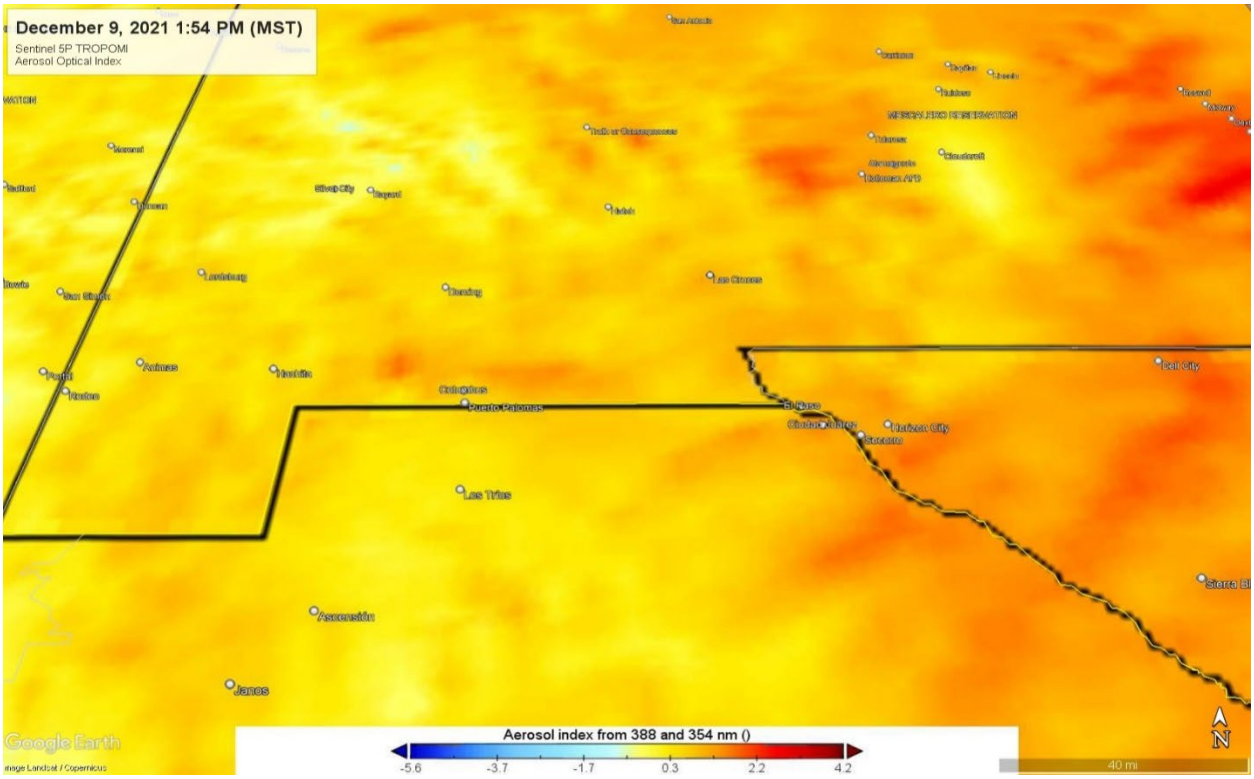


Figure 16-4. Sentinel 5P satellite TROPOMI Aerosol Optical Index product imagery December 9, 2021, at 1354 (MST). Image provided by NOAA EarthData

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Hazardous Weather Outlook for this event. A Hazardous Weather Outlook is issued by NWS when a potentially hazardous meteorological event is expected to occur that could potentially disrupt normal activity such as a thunderstorm. A description of the potentially hazardous weather is described to warn residents and give them plenty of time to plan ahead. This was issued for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Hazardous Weather Outlook can be found below:

"...approaching Pacific storm system and cold front…breezy afternoon conditions…evening and overnight the storm system brings increased moisture and potential for isolated to scattered rain and mountain snow showers. Winds will also increase over area mountains and east slopes."

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 16-5). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

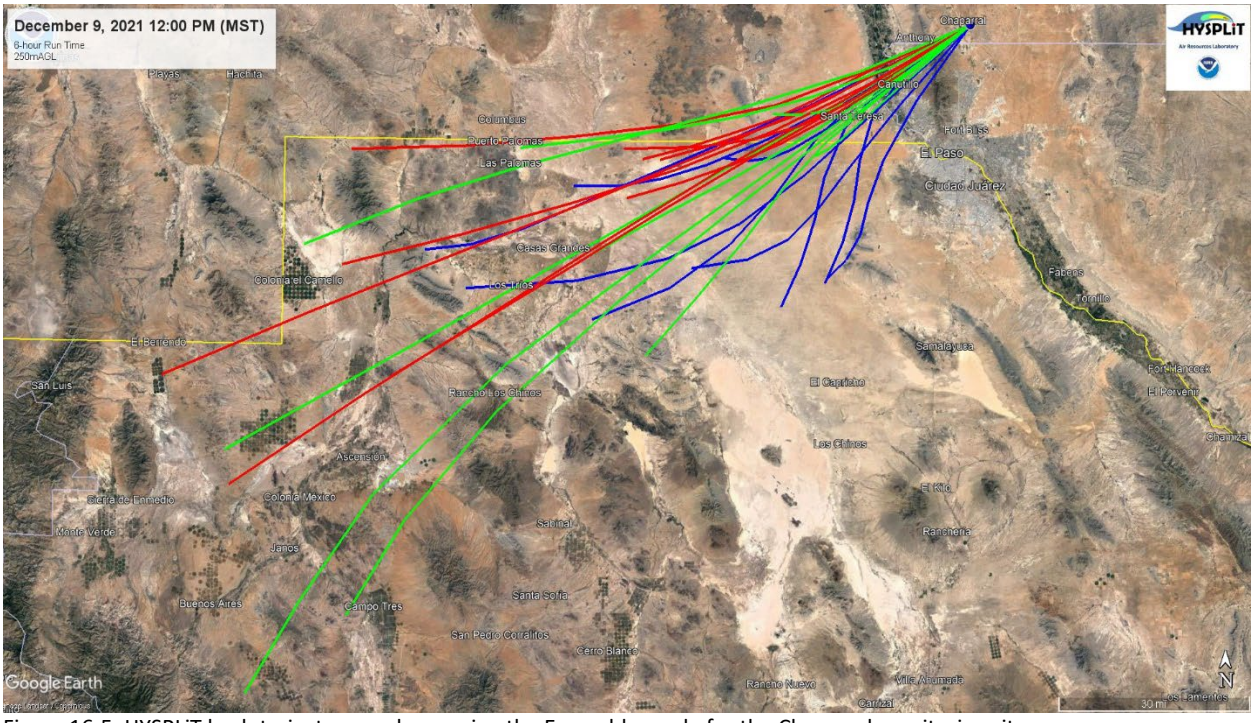


Figure 16-5. HYSPLiT back-trajectory analyses using the Ensemble mode for the Chaparral monitoring site

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figures 16-6) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m³ (1200 -2200 hour). During the event, winds blew from the south-southwest 100% of the time coinciding with peak PM_{10} concentrations.

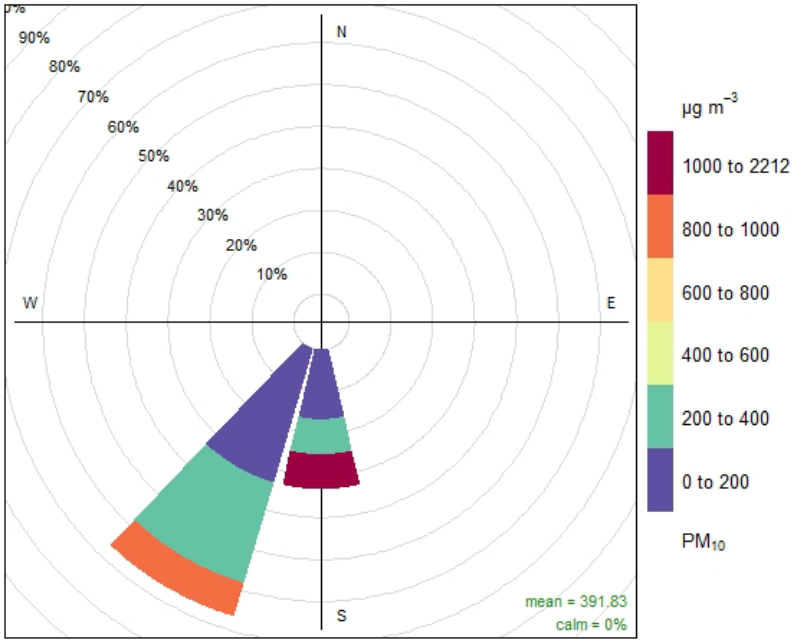


Figure 16-6. Pollution rose for the Chaparral monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong west-southwesterly winds beginning at the 2100 hour and lasting through the 2200 hour. During this time, peak hourly PM_{10} concentrations ranged from 41 to 2212 µg/m^3 at the West Mesa and Chaparral monitoring sites, respectively (Figure 16-7). Although not all NMED monitoring sites recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained average wind speeds of 4.2 to 12.4 m/s were recorded at the Holman and Chaparral monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 16-8 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

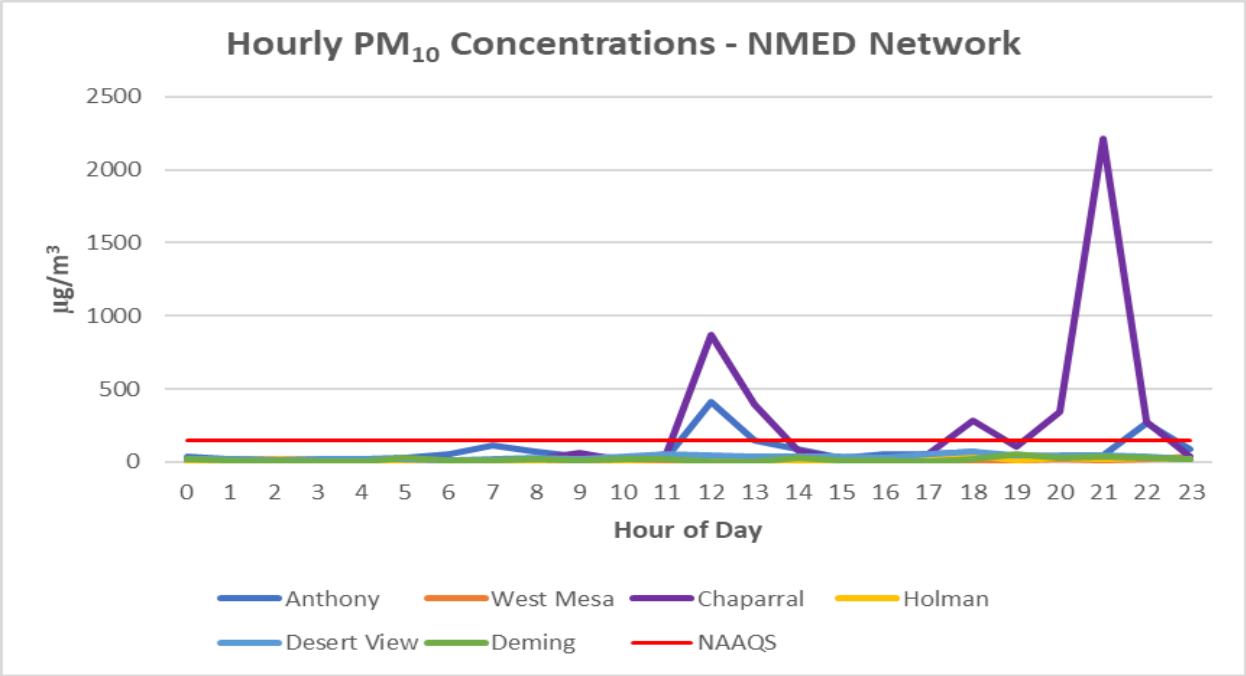


Figure 16-7. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

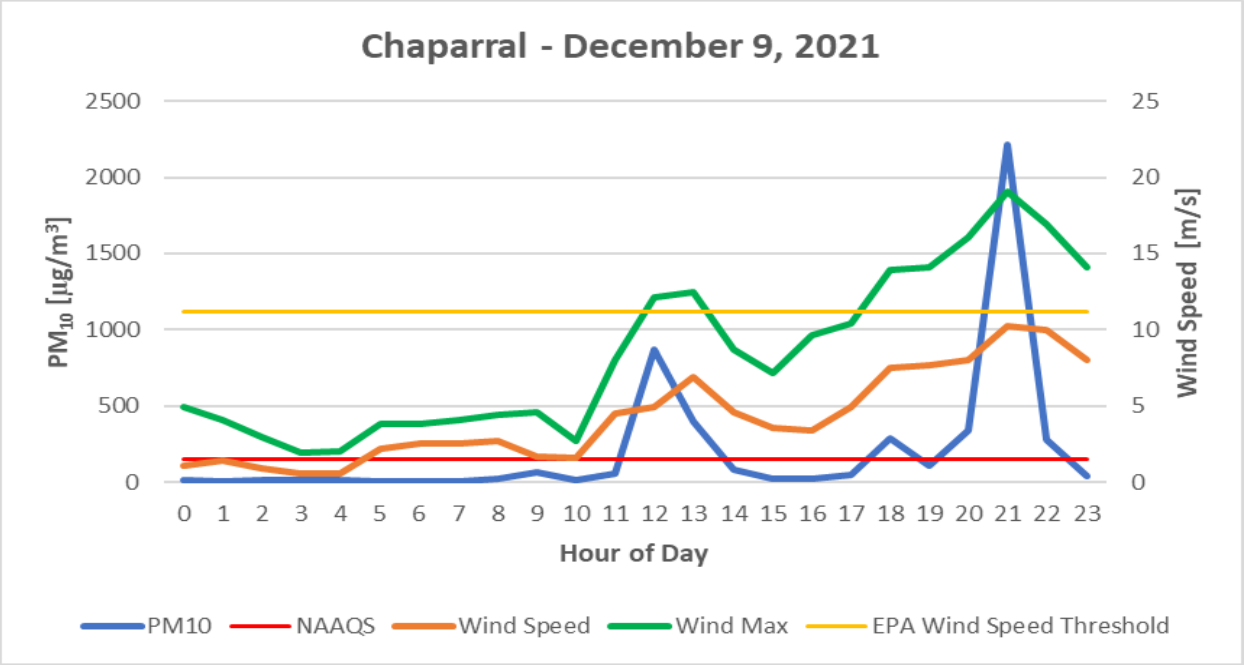


Figure 16-8. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Chaparral monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-3 in Appendix A). The maximum 24-hour average PM_{10} concentrations at this site was 721 µg/m^3, recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 16-9, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event, except for the previous event date of December 6, 2021. Daily averages for the days surrounding the event did not surpass 108 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

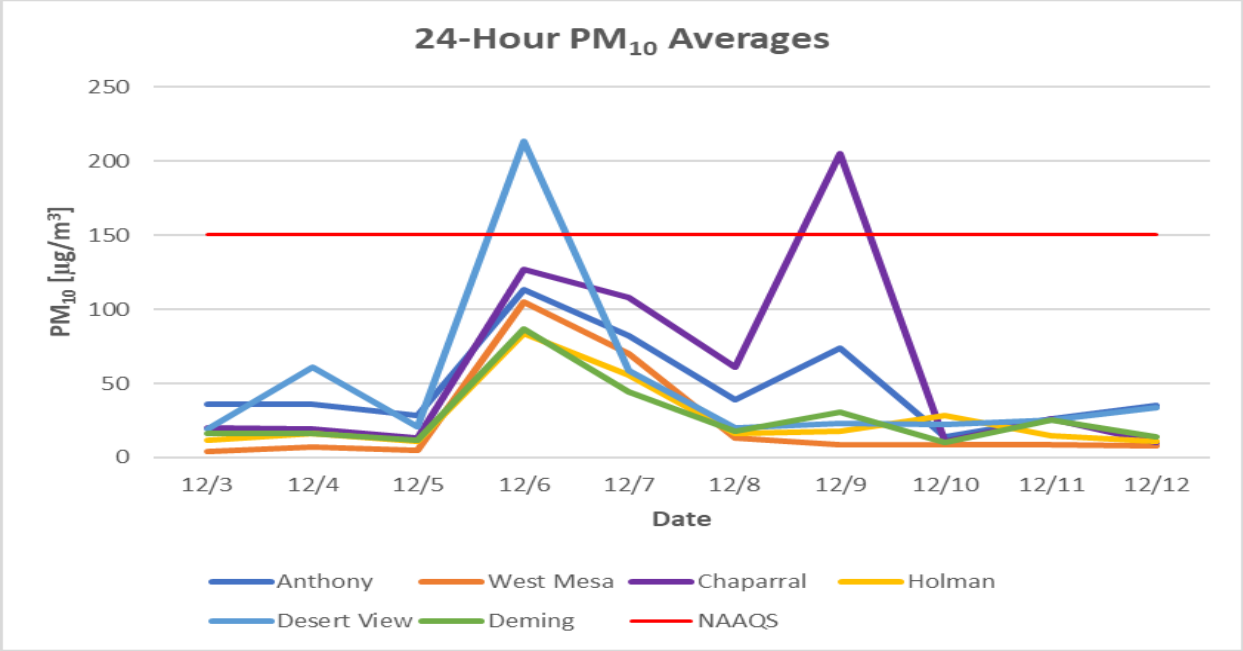


Figure 16-9. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (205 µg/m^3) is above the 99th percentiles of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (205 µg/m^3) is above the 99th percentiles of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

17. HIGH WIND EXCEPTIONAL EVENT: December 24, 2021

Conceptual Model

A Pacific cold front caused high winds and blowing dust in Doña Ana County resulting in an exceedance of the PM_{10} NAAQS at the Desert View monitoring site on this date. In accordance with the EER, the AQB submitted this data to EPA's AQS database and flagged it (coded as RJ) as a high wind dust event (Table 17-1).

AQS Flag	AQS ID	Site Name	24-Hour Average Concentration	Max 1-Hour Wind Speed	Max Gust
RJ	35-013-0021	6ZM Desert View	277 µg/m^3	10.4 m/s	19 m/s

Table 17-1. 2021 PM_{10} Data flagged by NMED for exclusion pursuant to the EER.

Today's very active Pacific cold front begins with a high-pressure system in the morning followed by a shortwave trough embedded within another trough in the Pacific Northwest in the afternoon progressing into the evening. This shortwave trough combined with a strong upper-level Baja jet stream will transfer down to the lower-levels creating lee-cyclogenesis conditions along area mountains. At the 1800 hour, cold fronts are progressing northwest through northern New Mexico from the Four Corners and the Baja of California (Figure 17-1). Aloft, the trailing trough hovered over the coast of southern California. As the day progressed this low-pressure aloft traveled east and aligned itself with New Mexico and the surface wind direction (Figure 17-2). Trough dynamics plus downslope warming to the east generated deep lee-cyclogenesis, increasing the surface wind velocities and providing the turbulence required for vertical mixing and entrainment of dust.

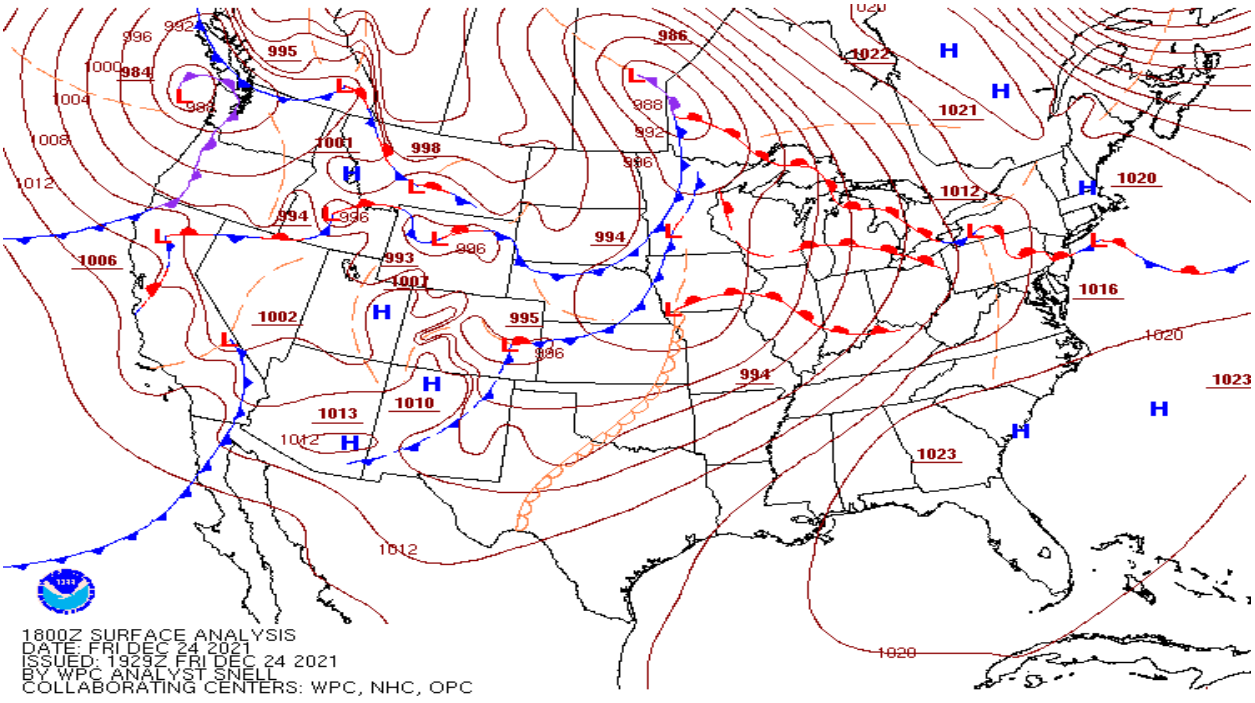


Figure 17-1. Surface weather map showing storm (surface low), cold fronts and isobars of constant pressure (red lines).

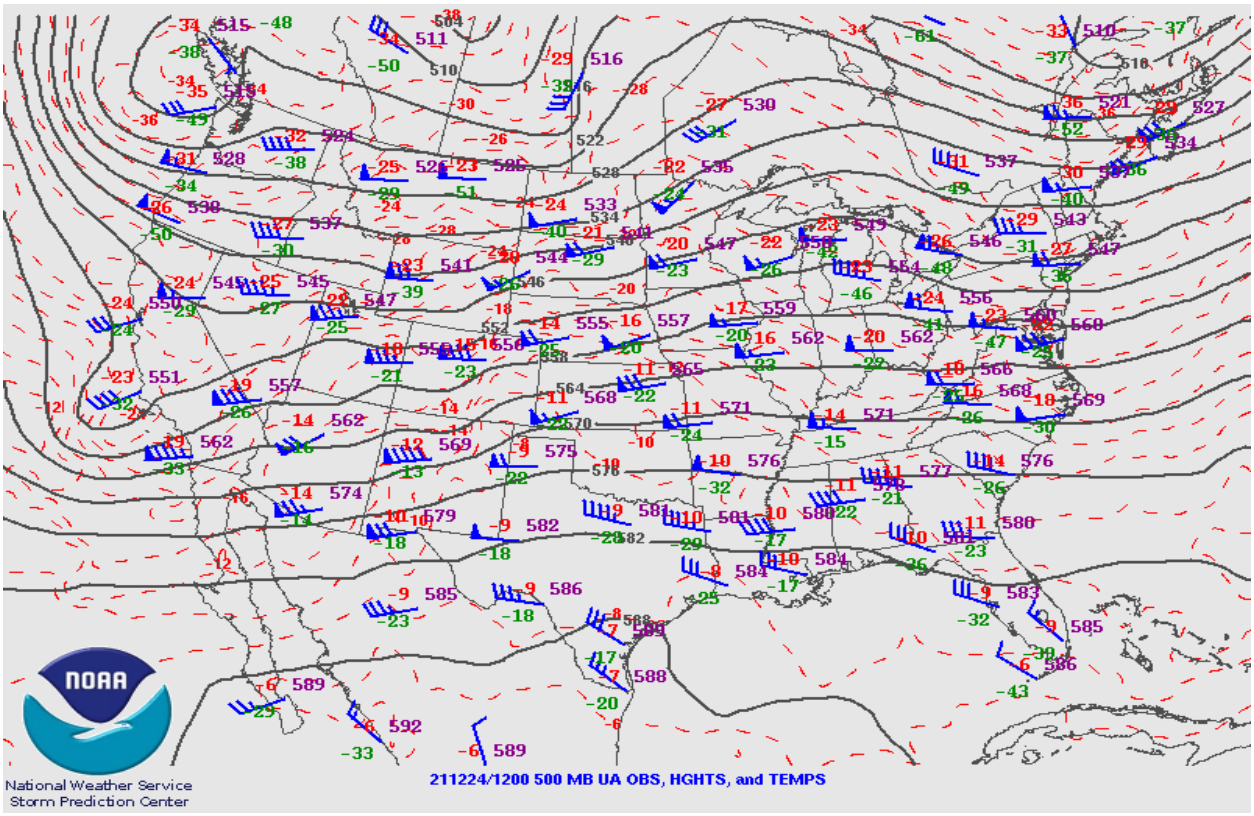


Figure 17-2. Upper air weather map for December 24, 2021, at the 1200 hour. Wind barbs depict wind speed (knots) and direction.

As the event unfolded, the wind blew from the west-southwest throughout the border region. These high velocity winds passed over large areas of desert within New Mexico and Mexico. Anthropogenic sources of dust near NMED's monitoring sites include: disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles.

The co-occurrence of high winds and elevated levels of blowing dust, little to no point sources in the area, and the high hourly and daily PM_{10} concentrations support the assertion that this was a natural event, specifically a high wind dust event. Sustained hourly wind speeds exceeding 9 m/s (~20 mph) were recorded at the Anthony, Chaparral, Holman, West Mesa, Santa Teresa, La Union, and Deming monitoring sites beginning at the 0400 hour and lasted through the 2000 hour. PM_{10} concentrations began to exceed the NAAQS at the Anthony, Desert View, Chaparral, Holman, and Deming monitoring sites beginning at the 0900 hour. Hourly concentrations remained elevated through the 1600 hour. Table 5-2 below summarizes hourly PM_{10} concentrations, wind speeds, and wind gusts during the event.

Hour	Desert View			Holman			Deming		
	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)	PM_{10} ($\mu g/m^3$)	Wind Speed (m/s)	Wind Gust (m/s)
0700	9	2.6	5.2	-3	4.5	6.4	7	3	5
0800	9	1.9	8.2	5	5.5	8.7	9	4.5	10
0900	46	5.1	10.6	53	7.9	12.9	332	9.6	16.1
1000	95	6.4	11.1	129	10.4	14.7	305	9.4	17.6
1100	107	6.5	12.4	80	11.1	16.2	1648	13.5	19
1200	1404	8.7	16.6	239	11.7	17.9	51	8.7	15.9
1300	1804	9.8	18.7	90	8.8	15.2	14	4.8	12.6
1400	1531	10.2	19	53	8.6	13.1	44	8	13.4
1500	1125	10.4	18.7	44	8.5	12.5	19	7.9	12.4
1600	298	8.4	15.3	29	8.1	12	9	6.7	11.2
1700	61	5.4	9.3	19	5.4	9.8	7	4.9	9
1800	24	2.7	7.4	9	3.4	6.7	5	3.7	5.5

Table 17-2. Hourly PM_{10}, wind speed and wind gust data during the peak hours of the event.

Meteorologists forecasted the high wind blowing dust event to occur this Christmas Eve, beginning with a high-pressure system in the morning with an abnormally hot and dry start today. Aloft an upper trough moved across New Mexico and at the same time the Pacific cold fronts moved into the region around noon and progressed into the evening to create lee-cyclogenesis along area mountains. Forecasts predicted strong winds as the storm approached the area with the area of low-pressure tracking from west to east just south of the Four Corners in the morning and moving across New Mexico in the afternoon. The systems movement across the area timed well with daytime heating and mixing generating a deep trough to the west as stronger winds aloft moved into the area. Many outlets also forecasted a high probability of blowing and entrained dust throughout the area and haze in the afternoon, especially in the desert areas of southern New Mexico (Figure 17-3).

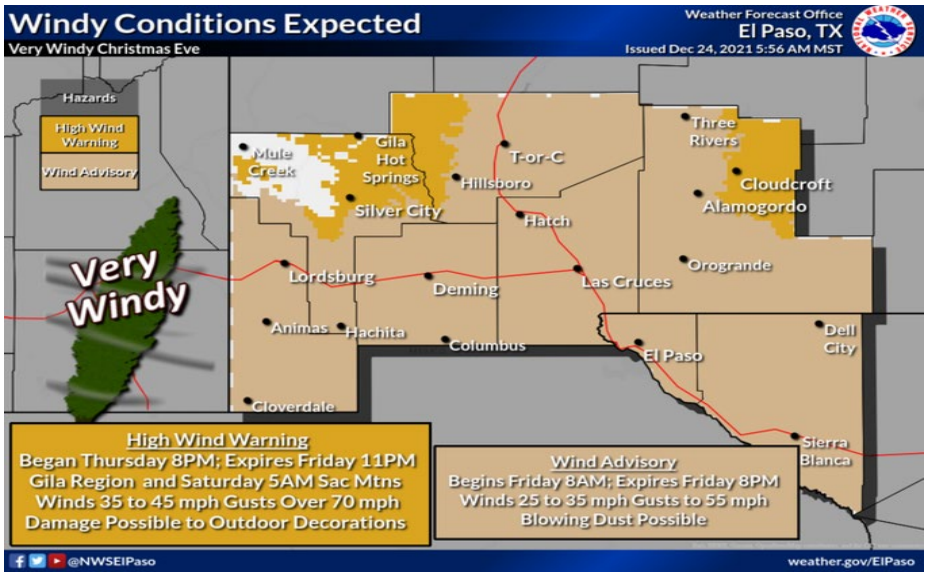


Figure 17-3. NWS GraphiCast of high wind and blowing dust advisory

Not Reasonably Controllable or Preventable (nRCP)

Not Reasonably Preventable

This demonstration does not provide a showing of not reasonably preventable pursuant to 40 CFR 50.14(b)(5)(iv) that states, in part, "the State shall not be required to provide a case-specific justification for a high wind dust event."

Not Reasonably Controllable

The documentation provided in this section demonstrates that the wind speeds and other meteorological conditions overwhelmed the reasonable control measures in place for anthropogenic sources, causing emissions of dust that were transported to NMED's monitors.

Sustained Wind Speeds

EPA has indicated 11.2 m/s (25 mph) as the wind speed threshold at which natural or controlled anthropogenic sources will emit dust. The West Mesa and Holman monitoring sites recorded wind speeds above this threshold for 5 hours from the 1100 to the 1500 hour (Figure 17-4). The wind speeds at the upwind Santa Teresa, La Union, and Deming monitoring sites also reached the high wind threshold.

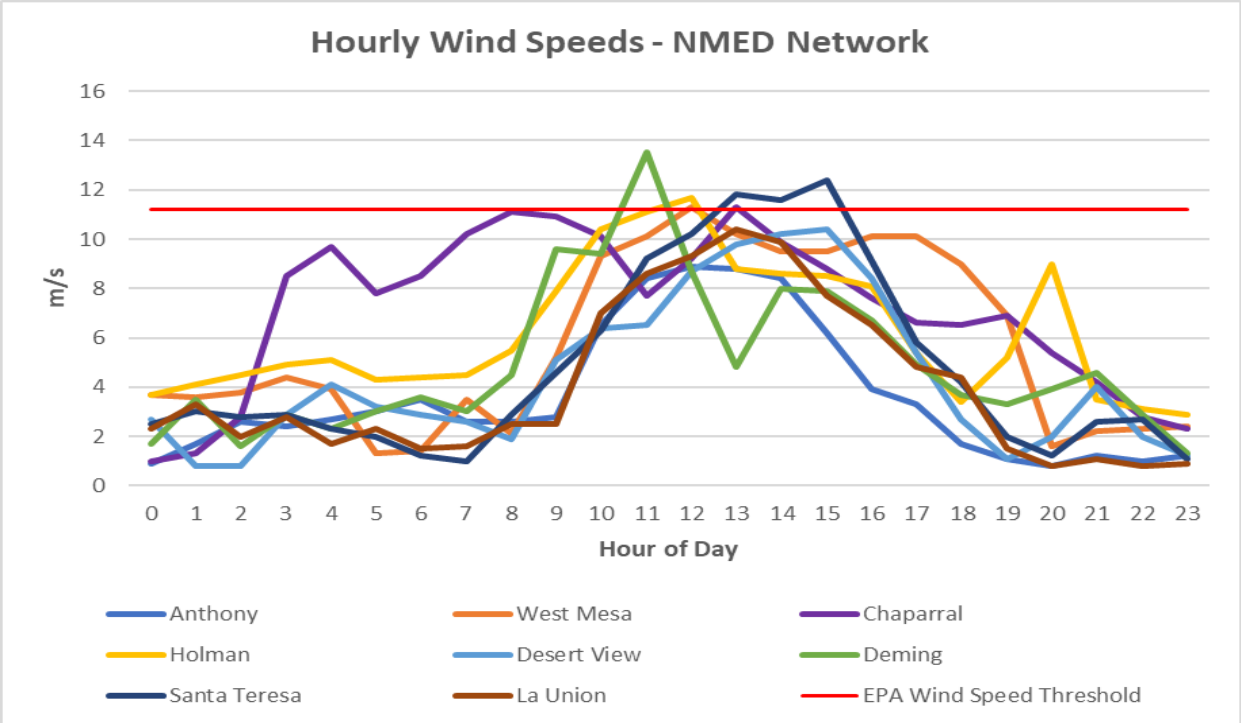


Figure 17-4. Wind speeds at NMED monitoring sites in Doña Ana and Luna Counties.

Level of Controls Analysis

Based on the sustained winds speeds monitored in the area during the event a basic controls analysis will be provided.

Basic Controls Analysis

Implementation and Enforcement of Control Measures

Reasonable controls for anthropogenic sources of dust are based on an area's attainment status for the PM_{10} NAAQS. It is not reasonable for areas designated as attainment, unclassifiable or maintenance to have the same level of controls as areas that are nonattainment for the standard. However, southern New Mexico has a long history of high wind blowing dust events with NMED developing a nonattainment SIP for the Anthony Area and NEAPs for the remaining portion of Doña Ana County and all of Luna County. As discussed in the Background section, NMED worked with local governments to help them develop and adopt dust control ordinances based on BACM. Based on the area's attainment status and SIP waiver, NMED believes these ordinances constitute reasonable controls.

The ordinances developed and adopted under the NEAPs are implemented and enforced at the local level with NMED playing a supporting role to ensure effective and enforceable implementation of control measures. Under the regulatory framework applicable to the two counties, NMED's purview does not include oversight of the extent of the effectiveness and enforcement of local ordinances. However, NMED believes that these ordinances are appropriately implemented at the local level.

Suspected Source Areas and Categories Contributing to the Event

Anthropogenic sources of dust in New Mexico include disturbed lands, construction and demolition activities, vacant parking lots and materials handling and transportation. Area sources account for a much larger portion of overall PM_{10} emissions than point sources. On the day of the event, no unusual PM_{10} producing activities occurred and anthropogenic point source emissions remained constant before, during and after the event. Natural areas of the Chihuahuan Desert in Doña Ana, Luna, Hidalgo, and Grant Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other area sources located in Arizona and Chihuahua, MX likely contributed to the exceedance on this day. Controlling dust from the natural desert terrain is cost prohibitive and falls outside NMED's jurisdiction when it is transported from intrastate and international sources.

The documentation and analysis presented in this section demonstrates that all identified sources that may have caused or contributed to the exceedance were reasonably controlled, implemented and enforced at the time of the event, therefore emissions associated with the high wind dust event were not reasonably controllable or preventable.

Clear Causal Relationship (CCR)

Occurrence and Geographic Extent of the Event

Satellite Imagery

The event was captured on the Sentinel 5P satellite Aerosol Optical Depth product imagery with dust plumes originating upwind of NMED's monitoring sites near Ascension and Janos, Chih. which are represented as warm colors with the intensity increasing with denser concentrations in the air. This area is largely rural with the largest area sources of PM originating from agricultural activities as well as the vast desert areas and playas in northern Mexico (Figure 17-5). The dust plumes of interest appear to be limited to Mexico, orientated in a southwest to northeast fashion and traveling toward El Paso and NMED's monitoring sites at the time of the satellite pass (1221 MDT) that captured the imagery.

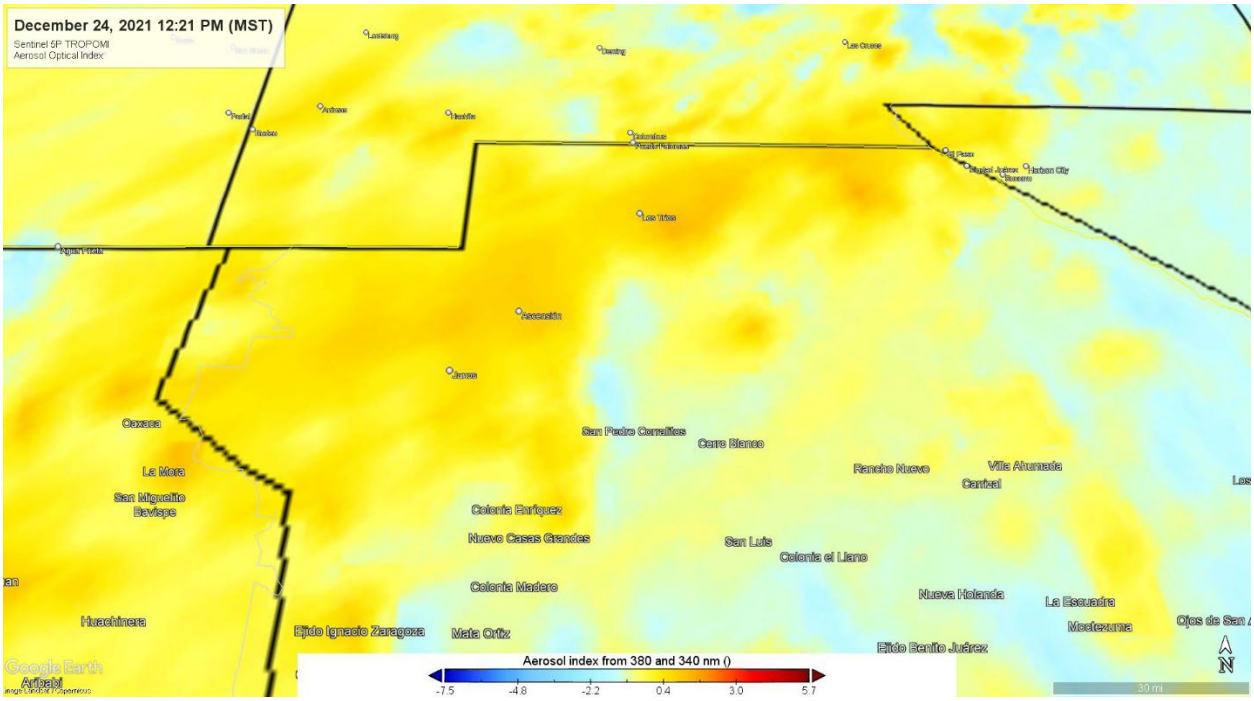


Figure 17-5. Sentinel 5P TROPOMI Aerosol Optical Index Product Satellite imagery. Courtesy of NOAA Earthdata.

Weather Statements, Advisories, News and Other Media Reports Covering the Event

The National Weather Service (NWS) issued a Wind Advisory for this date. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. This was in place for southwestern New Mexico and west Texas to warn the public of the high wind event. An excerpt from the NWS Wind Advisory can be found below:

"...Wind Advisory from 8 AM this morning to 8 PM MST this evening … Strong westerly winds of 35 to 45 mph… and gusts to 55 mph in the lowlands are expected today across the Borderland. Blowing dust is also possible during the afternoon hours…"

Spatial and Transport Analysis

HYSPLiT Backtrajectory Analysis

A back-trajectory analysis using the HYSPLIT (NOAA Air Resources Laboratory HYSPLIT transport and dispersion model (Draxler et al., 2015; Rolph et al., 2017) shows that the air masses traveled from Chihuahua, MX into the southern New Mexico and El Paso, TX area and on to the NMED monitoring site. The model was run using GDAS meteorological data for the six hours preceding the start of elevated PM_{10} concentrations during the event (Figure 17-6). This analysis supports the hypothesis that dust plumes originated in MX before being transported to downwind monitoring sites.

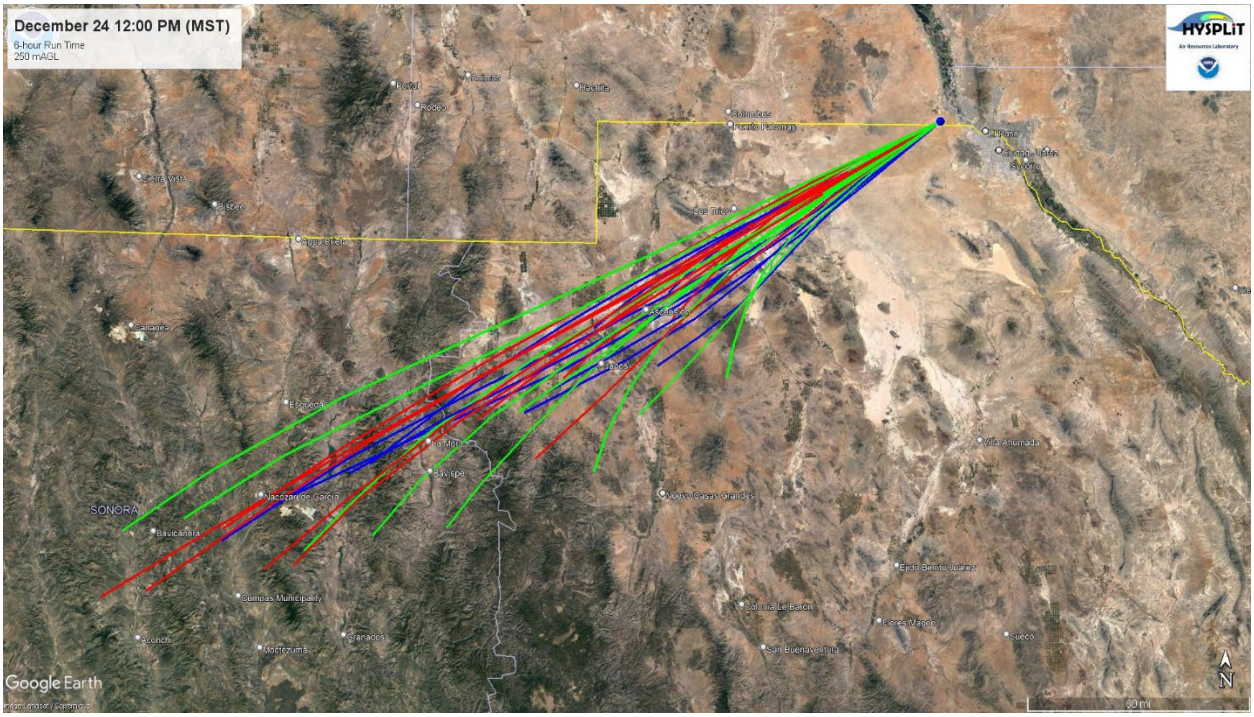


Figure 17-6. HYSPLiT back-trajectory analyses using the Ensemble mode for Desert View Monitoring site

Wind Direction and Elevated PM_{10} Concentrations

A pollution rose (Figure 17-7) was created for the hours of the event when PM_{10} concentrations exceeded 150 µg/m^3 (0900 -1600 hour). During the event, winds blew from the west-northwest through the south-southwest directions 100% of the time coinciding with peak PM_{10} concentrations.

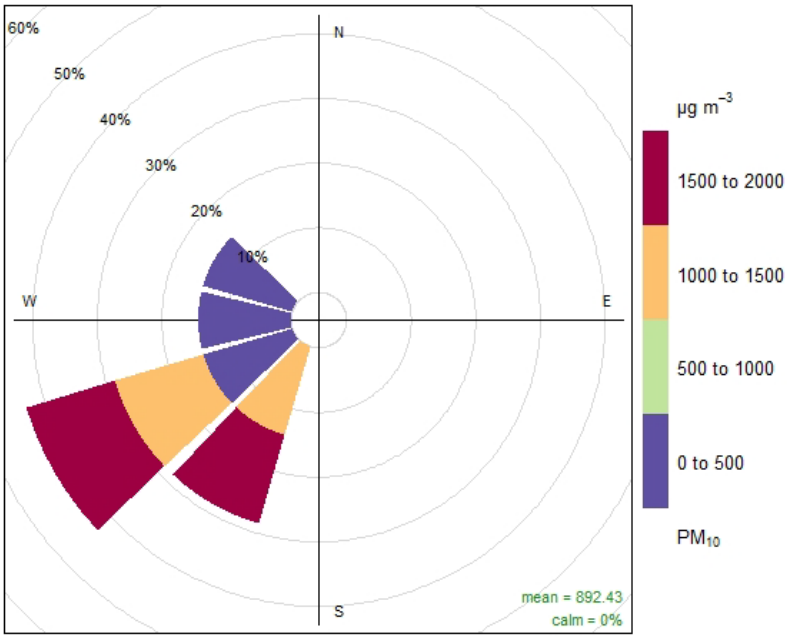


Figure 17-7. Pollution rose for the Desert View monitoring site

Temporal Relationship of High Wind and Elevated PM_{10} Concentrations

The high wind blowing dust event generated strong west-southwesterly winds beginning at the 0400 hour and lasting through the 2000 hour. During this time, peak hourly PM_{10} concentrations ranged from 68 to 1804 µg/m^3 were recorded at the West Mesa and Desert View monitoring sites, respectively (Figure 17-8). As the Desert View monitoring site recorded an exceedance of the NAAQS, hourly PM_{10} data spiked at approximately the same time throughout the network. Sustained hourly average wind speeds of 8.9 to 13.5 m/s were recorded at the Anthony and Deming monitoring sites, respectively, during the peak PM_{10} concentrations of the event. The time series plot in Figure 17-9 demonstrates the correlation between elevated levels of PM_{10} and high winds for this event.

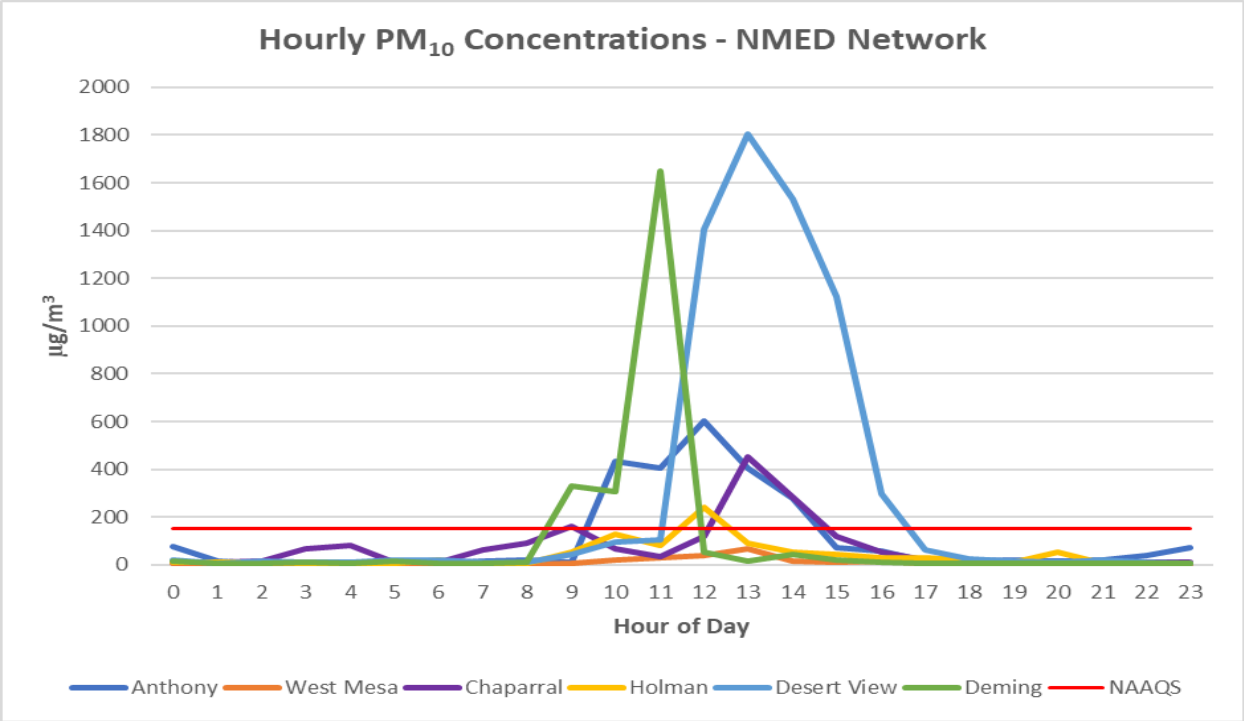


Figure 17-8. NMED monitoring network hourly PM_{10} data for the high wind blowing dust event.

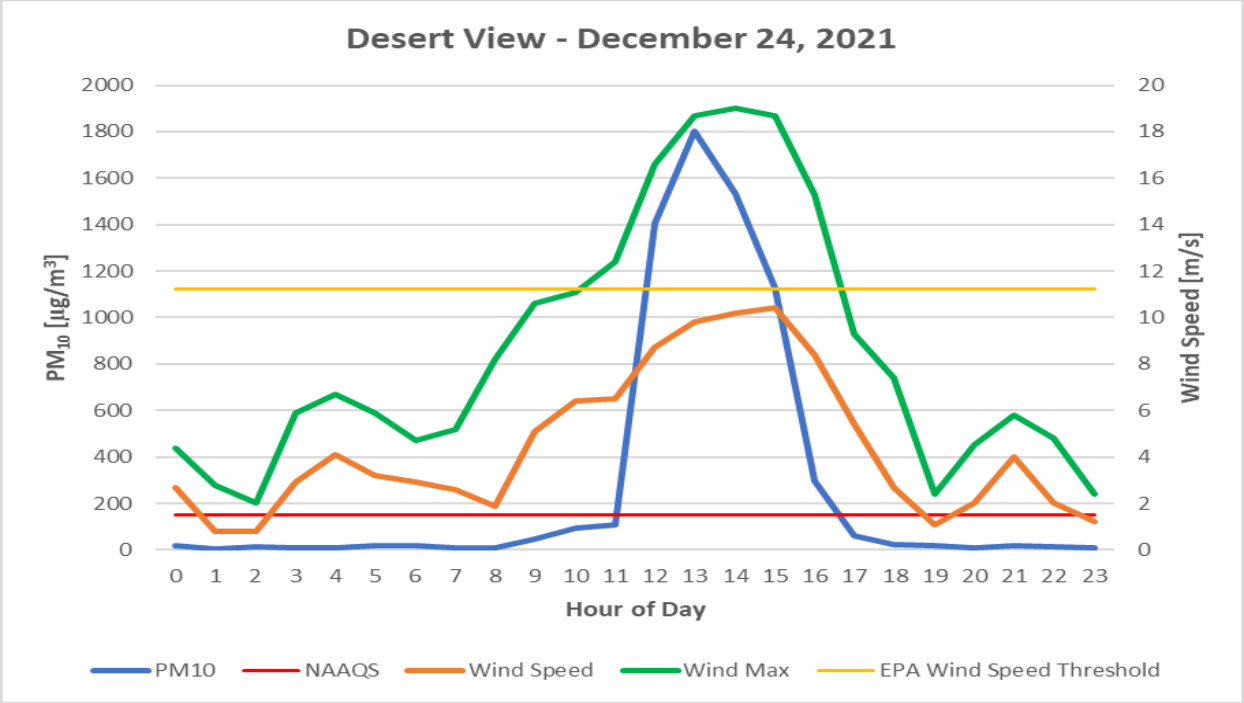


Figure 17-9. Chaparral monitoring site hourly PM_{10} and wind speed data for the high wind blowing dust event.

Historical Concentrations Analysis

Annual and Seasonal 24-Hour Average Fluctuations

From 2016-2020, the Desert View monitoring site recorded 26 exceedances of the PM_{10} NAAQS (Figure 18-2 in Appendix A). The maximum 24-hour average PM_{10} concentrations at this site was 721 µg/m^3, recorded in 2017. High wind blowing dust events in southern New Mexico can occur at any time of the year, but the majority of these days occur during the spring windy season, from March through May. NMED has documented that all exceedances have been caused by high wind blowing dust events.

Spatial and Temporal Variability

As demonstrated in Figure 17-10, all NMED monitoring sites recorded elevated 24-hour average PM_{10} concentrations compared to the days preceding and following the event. Daily averages for the days surrounding the event did not surpass 51 µg/m^3, demonstrating the influence high winds have on PM_{10} concentrations in the area.

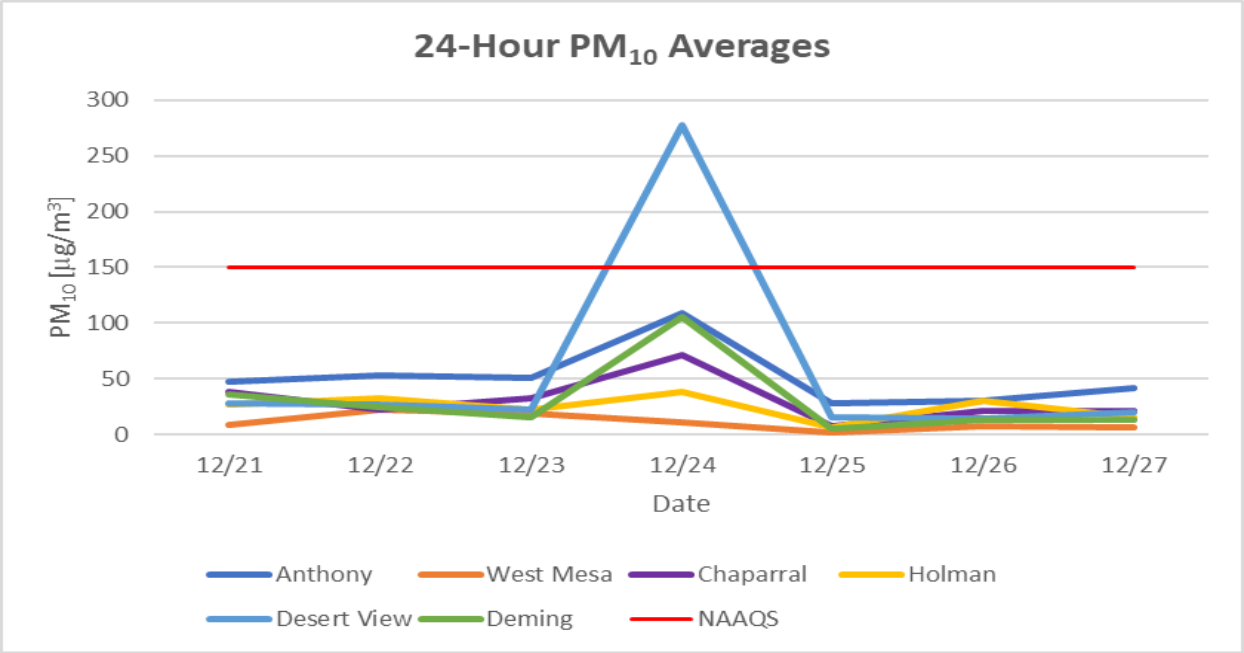


Figure 17-10. 24-Hour PM_{10} averages recorded at NMED monitoring sites for the event day and three days before and after.

Percentile Ranking

Table 18-1 in Appendix A shows the 24-hour average PM_{10} data distribution recorded at NMED monitoring sites, including high wind blowing dust events flagged with a request to exclude data in the AQS database for exceedances of the standard from 2016-2020. The recorded value for this day (277 µg/m^3) is above the 99th percentiles of historical data.

CCR Conclusion

On this day a high wind blowing dust event occurred, generating PM_{10} emissions that resulted in elevated concentrations at NMED monitoring sites. The monitored PM_{10} 24-hour average (277 µg/m^3) is above the 99th percentiles of data monitored over the previous five years. Meteorological conditions were consistent with past event days and elevated PM_{10} concentrations. The comparisons and analyses provided in the CCR section of this demonstration support NMED's position that the event affected air quality in such a way that a clear causal relationship exists between the high wind blowing dust event and the monitored exceedance on this day, satisfying the CCR criterion.

Natural Event

The CCR and nRCP analyses show that this was a natural event caused by high wind and blowing dust. Based on the documentation provided in this demonstration, the event qualifies as a natural event. The exceedance associated with the event meets the regulatory definition of a natural event at 40 CFR 50.14(b)(8). This event transported windblown dust from natural and anthropogenic sources that have been reasonably controlled and accordingly, NMED has demonstrated that the event is a natural event and may be considered for treatment as an exceptional event.

18. Appendices

Appendix A Historical Five-Year Annual 24-Hour PM_{10} Concentrations

Anthony Monitoring Site

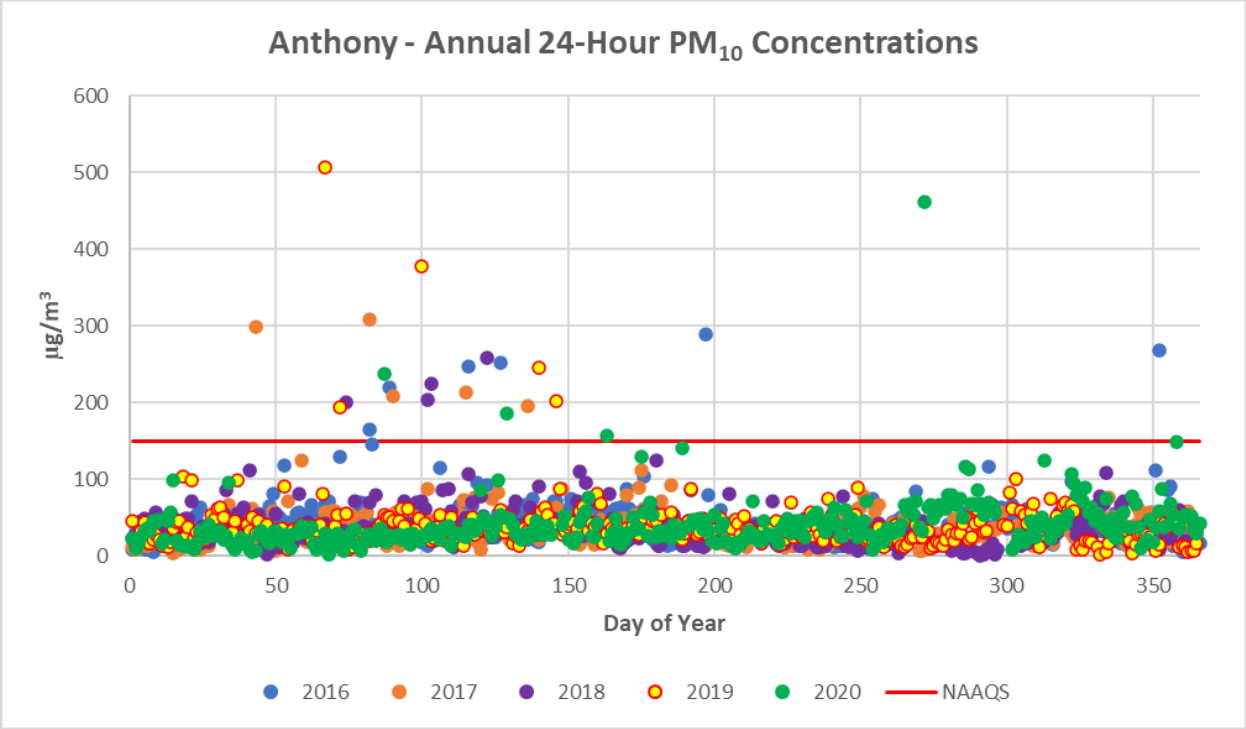


Figure 18-1. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the Anthony monitoring site.

Desert View Monitoring Site

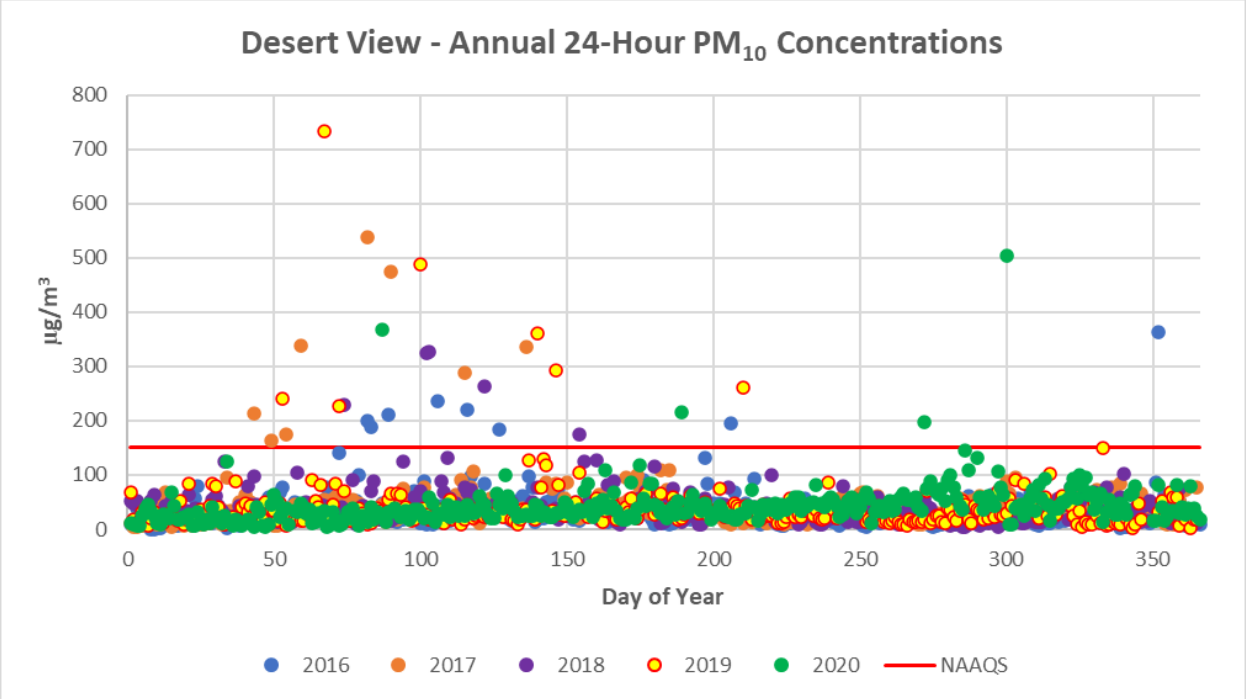


Figure 18-2. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the Desert View monitoring site.

Chaparral Monitoring Site

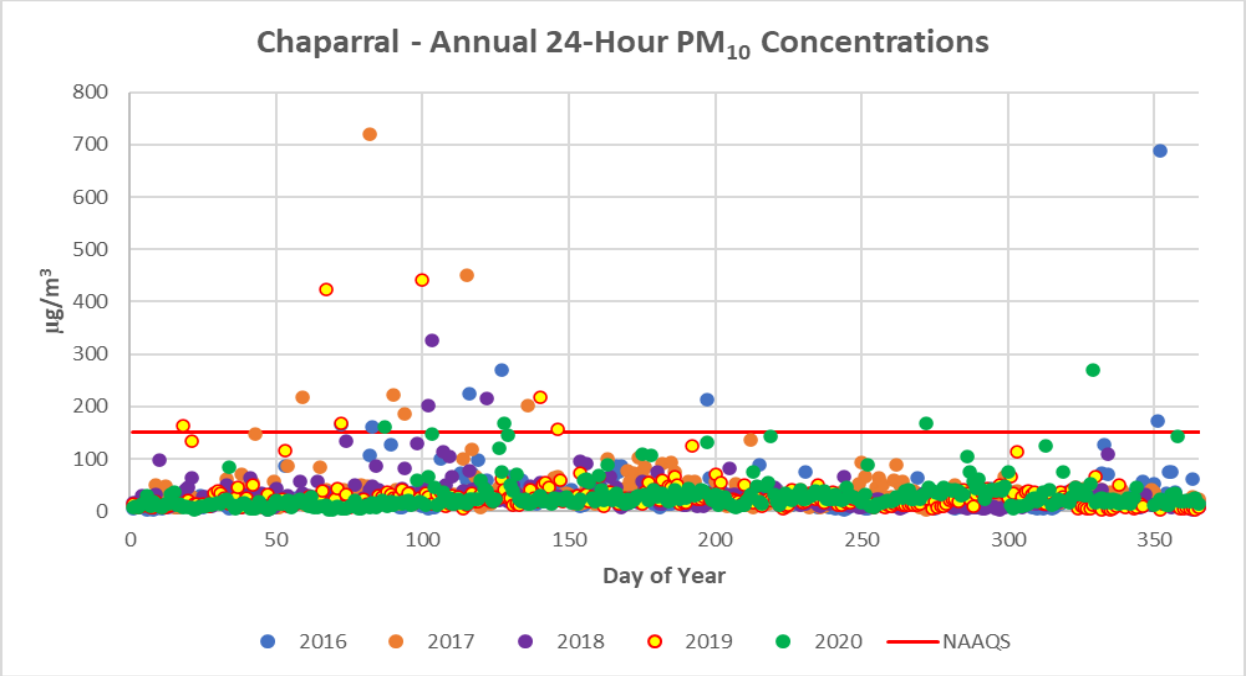


Figure 18-3. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the Chaparral monitoring site.

West Mesa Monitoring Site

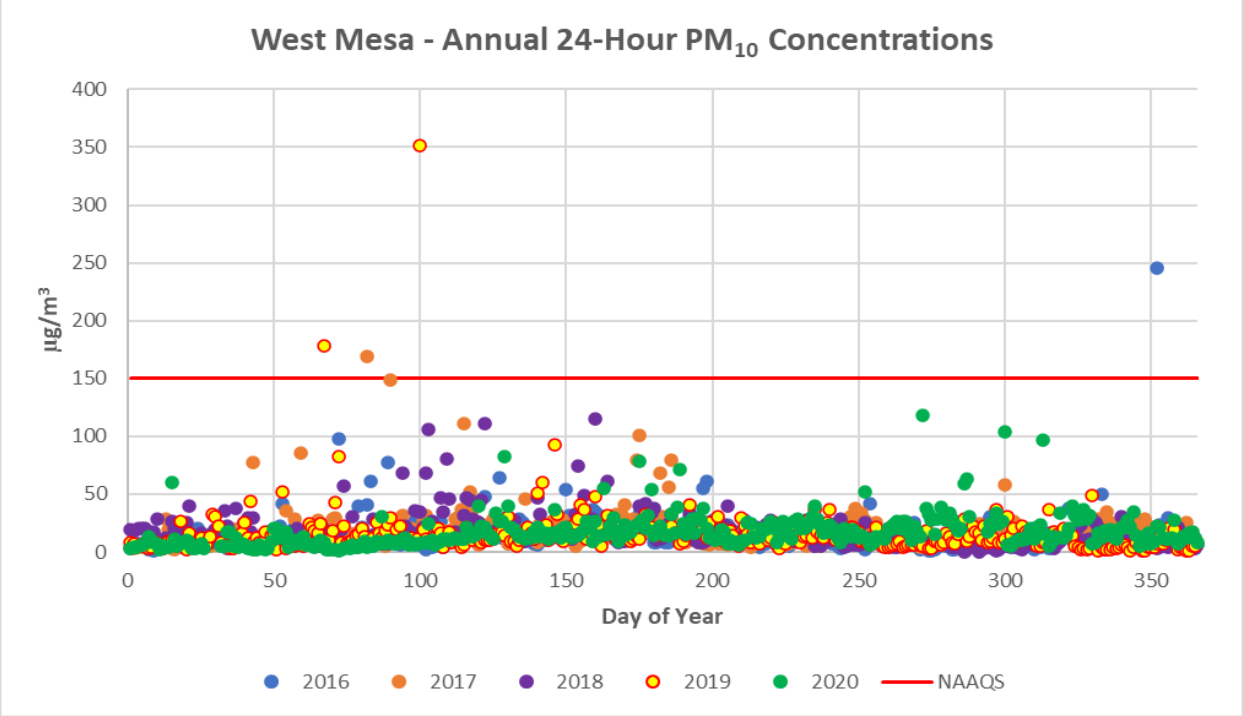


Figure 18-4. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the West Mesa monitoring site.

Holman Monitoring Site

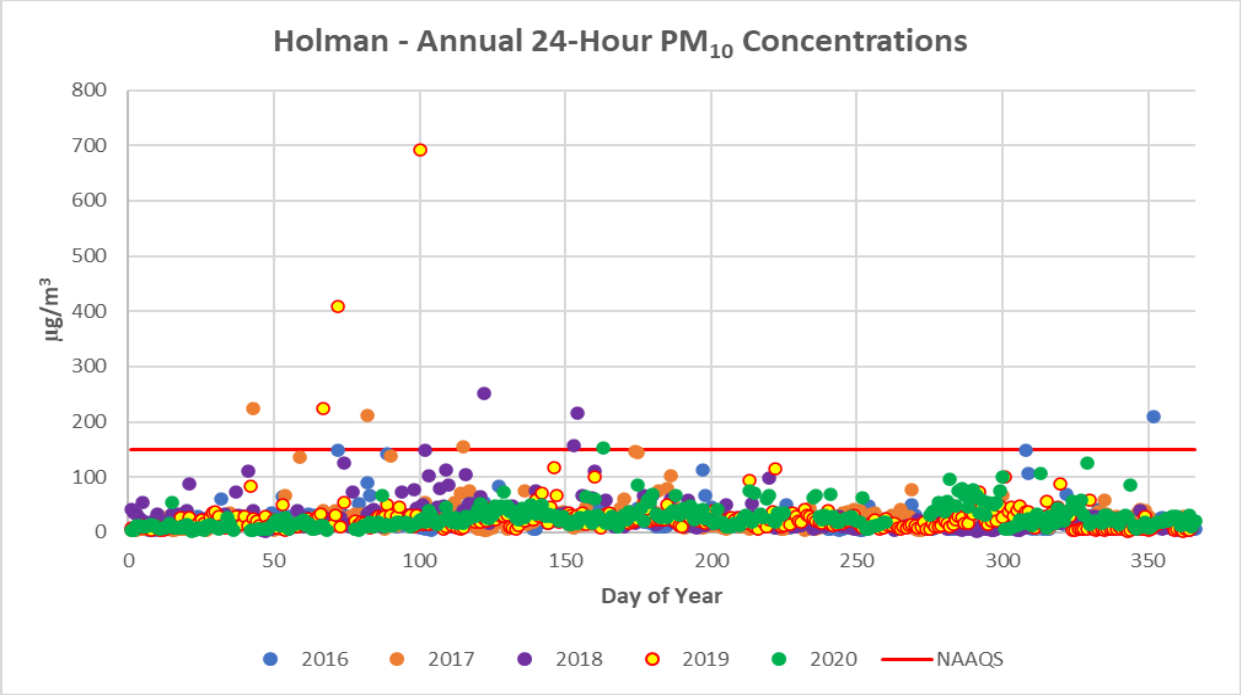


Figure 18-5. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the Holman monitoring site.

Deming Monitoring Site

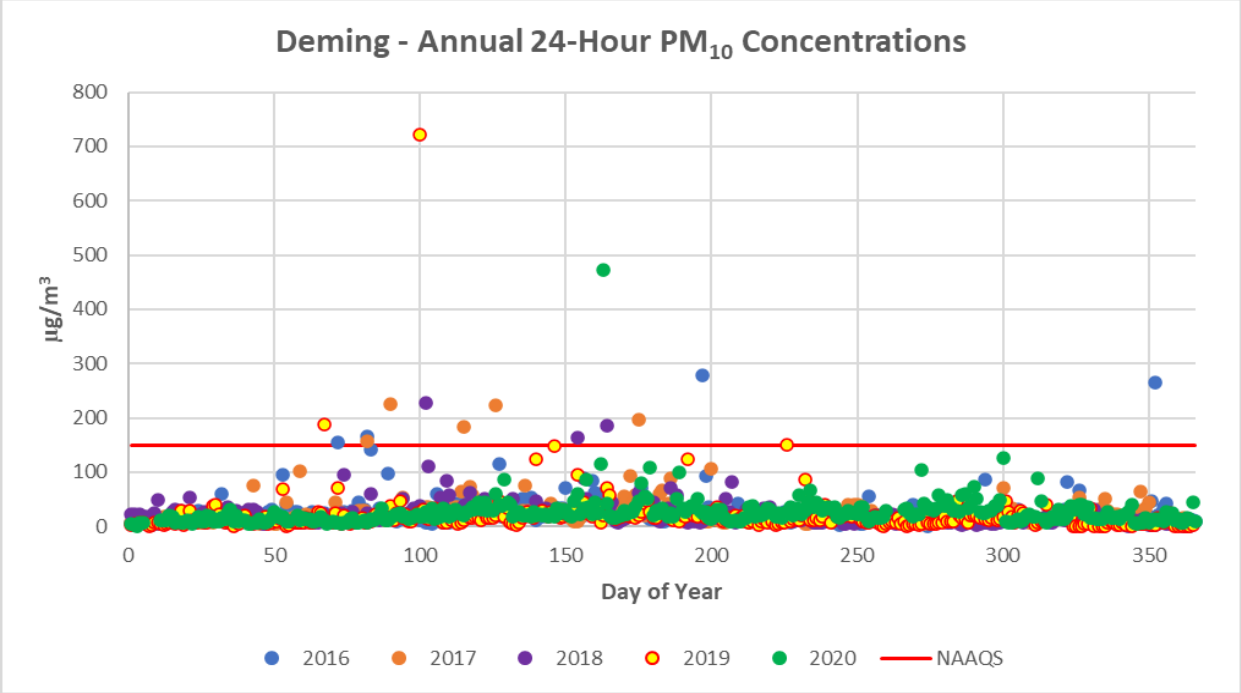


Figure 18-6. Five-year trend (2016-2020) 24-hour PM_{10} concentrations for the Deming monitoring site.

Monitoring Network Statistics

Statistic\Monitoring Site	Anthony	West Mesa	Chaparral	Holman	Desert View	Deming
Max	506	351	721	691	734	721
99th Percentile	200	80	168	138	230	128
95th Percentile	80	37	74	63	86	54
75th Percentile	47	19	33	29	45	26
50th Percentile	33	13	22	20	31	18
25th Percentile	23	8	14	12	19	11
5th Percentile	11	4	6	5	9	5
Mean	39	16	30	25	39	23

Table 18-1. NMED monitoring sites PM_{10} 24-hour average data distribution. Includes data flagged in AQS for exclusion due to high wind blowing dust events (RJ).

Appendix B Initial Notification Letter

MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

July 29, 2022

Jeff Robinson
Branch Chief
U.S. EPA Region 6
1201 Elm Street, Ste. 500
Mail Code: 6ARPM
Dallas, TX 75270

Re: 2021 Exceptional Event Demonstration for PM_{10} Exceedances Caused by High Wind

Dear Mr. Robinson:

This letter serves as formal notification that the New Mexico Environment Department (NMED) will develop and submit a demonstration to exclude 2021 PM_{10} air monitoring data influenced by exceptional events pursuant to 40 CFR Parts 50 and 51. NMED proposes to submit this demonstration to EPA by December 31, 2022.

The data requested for exclusion affects the regulatory determination that Luna and Doña Ana Counties attain the 1987 PM_{10} National Ambient Air Quality Standard (NAAQS). In addition, affected data impacts the classification of the Anthony PM_{10} nonattainment area. Please find a list of dates and monitoring data requested for exclusion enclosed as attachment A.

If you or your staff have any questions or comments, please contact Armando Paz of my staff at (505) 629-3242 or armando.paz@state.nm.us.

Respectfully,

Elizabeth Kuehn
Digitally signed by Elizabeth Kuehn
Date: 2022.07.21 13:05:47 -06'00'

Elizabeth Bisbey-Kuehn
Air Quality Bureau Chief
New Mexico Environment Department

Cc: Michael Baca, NMED AQB
Armando Paz, NMED AQB
Frances Verhalen, EPA R6
Joshua Madden, EPA R6

Enc: Attachment A

Attachment A-2021 PM_{10} Exceptional Events

Date	Type of Event	AQS Flag	AQS ID	Site Name	Exceedance Concentration
01/19/2021	High Wind	RJ	35-013-0019	6ZL Holman	361 µg/m³
	High Wind	RJ	35-013-0021	6ZM Desert View	187 µg/m³
	High Wind	RJ	35-013-0016	6CM Anthony	284 µg/m³
03/13/2021	High Wind	RJ	35-013-0021	6ZM Desert View	196 µg/m³
03/14/2021	High Wind	RJ	35-013-0020	6ZK Chaparral	308 µg/m³
03/16/2021	High Wind	RJ	35-013-0019	6ZL Holman	408 µg/m³
	High Wind	RJ	35-013-0024	6WM West Mesa	234 µg/m³
	High Wind	RJ	35-013-0021	6ZM Desert View	769 µg/m³
	High Wind	RJ	35-013-0020	6ZK Chaparral	542 µg/m³
	High Wind	RJ	35-013-0016	6CM Anthony	541 µg/m³
	High Wind	RJ	35-029-0003	7E Deming	157 µg/m³
04/17/2021	High Wind	RJ	35-013-0021	6ZM Desert View	183 µg/m³
05/03/2021	High Wind	RJ	35-013-0020	6ZK Chaparral	291 µg/m³
05/08/2021	High Wind	RJ	35-013-0020	6ZK Chaparral	166 µg/m³
06/13/2021	High Wind	RJ	35-013-0019	6ZL Holman	182 µg/m³
	High Wind	RJ	35-013-0024	6WM West Mesa	308 µg/m³
	High Wind	RJ	35-013-0021	6ZM Desert View	439 µg/m³
06/20/2021	High Wind	RJ	35-013-0021	6ZM Desert View	172 µg/m³
06/21/2021	High Wind	RJ	35-013-0021	6ZM Desert View	218 µg/m³
	High Wind	RJ	35-013-0020	6ZK Chaparral	170 µg/m³
06/22/2021	High Wind	RJ	35-013-0021	6ZM Desert View	165 µg/m³
	High Wind	RJ	35-013-0020	6ZK Chaparral	320 µg/m³
	High Wind	RJ	35-013-0016	6CM Anthony	212 µg/m³
10/12/2021	High Wind	RJ	35-013-0019	6ZL Holman	219 µg/m³
	High Wind	RJ	35-013-0024	6WM West Mesa	189 µg/m³
	High Wind	RJ	35-013-0021	6ZM Desert View	208 µg/m³
	High Wind	RJ	35-013-0016	6CM Anthony	295 µg/m³
	High Wind	RJ	35-029-0003	7E Deming	193 µg/m³
12/06/2021	High Wind	RJ	35-013-0021	6ZM Desert View	213 µg/m³
12/09/2021	High Wind	RJ	35-013-0020	6ZK Chaparral	205 µg/m³
12/24/2021	High Wind	RJ	35-013-0021	6ZM Desert View	277 µg/m³

Appendix C Public Comment

STATE ENVIRONMENT DEPARTMENT SEEKS PUBLIC COMMENT ON EXCEPTIONAL EVENTS DEMONSTRATIONS

(Santa Fe, NM) –The New Mexico Environment Department Air Quality Bureau has completed draft exceptional events demonstrations for periods exceeding federal air quality standards for particulate matter in southern New Mexico during calendar years 2021. This document demonstrates to the U.S. Environmental Protection Agency that dust storms generated by high winds, rather than man-made sources, caused exceedances of the national standard for particulate matter in the air. Without this demonstration, certain areas of the state would be in violation of federal standards and subject to stricter air quality rules and requirements designed to meet and maintain the standard in the future. The level of the federal air standards for particulate matter is protective of public health.

The New Mexico Environment Department is seeking public comment on the draft documents through December 8, 2022. The document is available for review at the Environment Department's field offices and website at https://www.env.nm.gov/public-notices-2/ or by contacting the Department at (505) 629-3242.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Kathryn Becker, Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

For more information and to submit comments, please contact Armando Paz, Environmental Analyst, NMED Air Quality Bureau at (505) 629-3242 or at armando.paz@env.nm.gov.

###

EL DEPARTAMENTO DE MEDIO AMBIENTE DEL ESTADO SOLICITA COMENTARIOS DEL PÚBLICO SOBRE DEMOSTRACIONES DE EVENTOS EXCEPCIONALES

(Santa Fe, NM) -La Oficina de Calidad del Aire del Departamento de Medio Ambiente de Nuevo México ha completado el borrador de demostraciones de eventos excepcionales para periodos que exceden los estándares federales de calidad del aire para material particulado en el sur de Nuevo México durante los años naturales 2021. Este documento demuestra a la Agencia de Protección Ambiental de los Estados Unidos que las tormentas de polvo generadas por vientos fuertes, y no por fuentes artificiales, causaron excedencias del estándar nacional de material particulado. Sin esta demostración, algunas zonas del estado estarían incumpliendo los estándares federales y estarían sujetas a normas y requisitos de calidad del aire más estrictos diseñados para cumplir y mantener el estándar en el futuro. El nivel de los estándares federales del aire para el material particulado protege la salud pública.

El Departamento de Medio Ambiente de Nuevo México solicita comentarios del público sobre el borrador de los documentos hasta el 8 de diciembre de 2022 inclusive. El documento está disponible para su revisión en las oficinas locales del Departamento de Medio Ambiente y en el sitio web en https://www.env.nm.gov/public-notices-2 o comunicándose con el Departamento llamando al (505) 629-3242.

El NMED no discrimina por motivos de raza, color, nacionalidad, discapacidad, edad o sexo en la administración de sus programas o actividades, como lo exigen las leyes y reglamentos aplicables. El NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de las consultas relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluyendo el Título VI de la Ley de Derechos Civiles de 1964, con sus enmiendas; la Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, el Título IX de las Enmiendas de Educación de 1972, y la Sección 13 de las Enmiendas de la Ley Federal de Control de Contaminación del Agua de 1972. Si tiene alguna pregunta sobre este aviso o cualquiera de los programas, políticas o procedimientos de no discriminación del NMED, o si cree que ha sido discriminado con respecto a un programa o actividad del NMED, puede ponerse en contacto con: Kathryn Becker, coordinadora de no discriminación, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. También puede visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para saber cómo y dónde presentar una queja por discriminación.

Para obtener más información y presentar comentarios, póngase en contacto con Armando Paz, analista medioambiental de la Oficina de Calidad del Aire del NMED, llamando al (505) 629-3242 o escribiendo a armando.paz@env.nm.gov.

###

Appendix D ANTHONY PM_{10} STATE IMPLEMENTATION PLAN

REVISION TO THE

NEW MEXICO PM10 STATE IMPLEMENTATION PLAN

FOR ANTHONY, NEW MEXICO

Prepared by the
New Mexico Environment Department
Air Quality Bureau

November 8, 1991

Roy A. Walker

Approved
Roy Walker, Chairman
Environmental Improvement Board

11/8/91
Date

I. Background

A. History

Soil in Anthony and the surrounding region tends to be sandy and friable. This, in concert with the sparse vegetation, low rainfall and gusty winds inherent to the region, can result in relatively high levels of naturally occurring rural fugitive dust. In 1987, New Mexico petitioned EPA and was granted Rural Fugitive Dust Area (RFDA) designation for Anthony. This designation was based on a list of criteria which included reviews of air sampling data, particulate emission sources, available control strategies and demographics. Under the RFDA policy, it was recognized that exceedances of the particulate matter ambient standard were primarily due to blowing dust inherent to the region and thus the development of control strategies would be pointless.

With the implementation of the 1990 Clean Air Act Amendments (CAAA), EPA discontinued the RFDA program. Under the CAAA, all areas violating the PM10 standard prior to January 1, 1989 were designated non-attainment whether or not the particulate matter could actually be controlled. PM10 is defined as particulate matter with an aerodynamic diameter less than or equal to 10 microns. EPA adopted the National Ambient Air Quality Standards (NAAQS) for PM10 in July of 1987. These standards limit the PM10 24-hour average to 150 micrograms per cubic meter (ug/m^3) and the annual arithmetic mean to 50 ug/m^3.

All non-attainment areas, including Anthony, have been initially classified as moderate. EPA may subsequently redesignate moderate areas as serious, subjecting them to stricter control requirements. This may happen if an area cannot practicably attain the PM10 standard by the moderate area deadline of December 31, 1994, or if the State fails to submit a PM10 State Implementation Plan revision by the November 15, 1991 deadline. However, the CAAA also provides for a waiver to the attainment date for areas where non-anthropogenic emissions contribute significantly to a NAAQS violation. As discussed in this plan, the Department believes a waiver is appropriate for Anthony and that further controls for serious areas are unwarranted.

The State Implementation Plan or SIP contains all federally required air quality plans and regulations developed to ensure that the provisions of the federal Clean Air Act and its amendments are satisfied. This includes the attainment and maintenance of the NAAQS. New Mexico's air quality SIP, first adopted in 1972, incorporates the control strategies and regulations found necessary to meet these standards.

The purpose of this revision to the New Mexico SIP is to address the mandatory federal requirements for PM10 non-attainment areas applicable to Anthony. In those moderate PM10 non-attainment areas where the State's control strategy cannot demonstrate attainment by the applicable date mandated in the Act, EPA requires the State to document that its control strategy represents the application of the available control measures to all source categories. Available control measures include those which are technologically and economically feasible for the area. The State has considered partial implementation of control measures where full implementation is not feasible. In addition, the State has addressed the impacts of individual source categories on ambient air levels, legal responsibility for and enforceability of chosen control measures and relevant quantitative milestones. Sources whose emissions are shown to be insignificant ("de minimis") are excluded from further consideration.

B. Anthony, NM and Surrounding Region

The community of Anthony is located in south central New Mexico, just east of where the Rio Grande first crosses the border into Texas. Las Cruces, New Mexico, with a population of 62,126 (1990 census) lies 35 kilometers (km) to the north. El Paso, Texas, with a population of 515,342 (1990 census) lies 30 km to the south. Although the community of Anthony, New Mexico, is not incorporated as a municipality, its 1990 population as a Census Designated Place (CDP) was 5160. Anthony, Texas, directly across the border to the south, is incorporated and has a population of 3,328. The County of Dona Ana (in which both Anthony and Las Cruces are situated) had a 1990 population of 135,510. Figure 1 presents a map of Dona Ana County. Figure 2 is a map of Anthony, including the designated non-attainment area (sections 35 and 36 of Township 26 south, Range 3 east).

The south (Mesilla) valley, created by the Rio Grande, is defined in this report as extending south of Las Cruces to north of El Paso (Texas). The valley is about five kilometers wide, narrowing towards El Paso and bordered by the West Mesa and, to the east, by the Franklin Mountains. Unless otherwise noted, demographic information does not include the Texan (south-eastern) portion of the valley.

Of the 21 communities in Dona Ana County, only Las Cruces, Sunland Park, Hatch and Mesilla (adjoining Las Cruces) are incorporated. The reason is financial. Most communities lack the tax base necessary to support a municipal government. As a result, the county carries the burden for roads, planning and other services. Unfortunately, the county's tax base is also weak. Approximately 86 percent of the county is non-taxable (state or federally owned) land. Much of the county's work is funded by state or federal grants. For example, 75 to 100% of road work money (depending on the project) is provided by the state.

Preliminary (1990 estimated) census figures support the common observation that the area is poor:

	Median Yearly Household Income	Per Capita Yearly Income
United States	$27,000	$13,900
New Mexico	$20,500	$9,600
Dona Ana County	$17,300	$7,400
South Valley	$14,900	$5,300

While the median yearly household income in the south valley is low, at 55% of the national average, the per capita income is even less, at only 38%. This area has a higher percentage of children, elderly and unemployed, all of which require services while not necessarily paying taxes. The 1990 census results verify that New Mexico and Dona Ana County residents are younger than the national average and live in larger households:

	Median Age	Persons per household
United States	32.9	2.63
New Mexico	31.3	2.74
Dona Ana County	27.9	2.92
Anthony CDP	NA	3.96

It is estimated (1980 census) that approximately 30% of the valley's population is over 16 years of age and works. The 1990 census results indicate that 40% of Anthony's population is 16 years of age or younger and that 23% of Anthony's households have one or more persons who are 60 years old or older. The County estimates that 16% of the population receives unemployment benefits in any given year, with 8% unemployed for 15 or more weeks per year. In 1980, 28% of all families were below the poverty level (compared to 22% nationally).

Anthony's population has been doubling in size each decade, with (New Mexico) populations of 1700 in '70, 3200 in '80 and 5160 in '90. This growth is not expected to slow. The population is swelling due to the birthrate and to incoming immigrants looking for work. In 1980, about one quarter of the population was foreign born, mostly from Mexico. Since then, the 1987 Amnesty law has allowed hundreds of Mexican laborers to establish legal residence in the Mesilla valley. Many have subsequently brought their families.

The opening of a new border crossing and the continuing expansion of El Paso will further stimulate growth in the area. Anthony is particularly attractive to developers as the community has municipal sewer service. Without such service, state regulations limit the minimum size of residential plots to 3/4 acre. Only three communities in the south valley (Santa Teresa, Sunland Park and Anthony) have sewage treatment plants. State funds have been allotted to double the capacity of the Anthony plant over the next 2 years.

C. Air Quality Data

The State has been monitoring PM10 in Anthony since March of 1988. Air quality data is included in Appendix A. As of the end of the second quarter of 1991, a total of twelve PM10 24-hour averages greater than the standard have been recorded. Four of these exceedances occurred within the first month of monitoring. The state measured 7, 4 and 1 exceedances in 1988, 1989 and 1990, respectively. There have been no exceedances measured in the first two quarters of 1991. This downward trend is also reflected in Figure 3, where the monthly averages tend to drop with each passing year.

Prior to 1990, the standard for the annual arithmetic mean was also exceeded. The annual arithmetic means have been calculated using the method described in 40 CFR Part 50 appendix K. These values include high wind and flagged data. The annual arithmetic mean for 1991 reflects only the first two quarters of the year.

The 24-hour and annual mean exceedances are listed in Table 1. Half of the 24-hour exceedances occurred on windy days. Two have been flagged by EPA as exceptional events, and the state has requested that the four additional high wind days also be flagged. As seen in Figure 3, PM10 concentrations and exceedances tend to be higher during the windier seasons of Spring and Fall. Exceedances which occurred on low wind days were possibly caused by atmospheric inversions trapping locally generated dust.

The filters which recorded the 1989 and 1990 exceedances have been analyzed and are discussed in Appendix B. Analysis has shown that the particulates in the air on both high and low wind days are characteristic of, and likely derived from, local soils. Meteorological data presented is from the La Union monitoring tower, 11 km southwest of Anthony.

II. Emission Sources and Control Strategies

In accordance with the April 2, 1991 EPA policy document titled PM-10 Moderate Area SIP Guidance, all listed and known area and point source categories have been analyzed for the Anthony area. The Guidance requires that anthropogenic (man-made) source categories with significant emissions be analyzed for the technical and economic feasibility of implementing control measures. For point sources, such measures are called "RACT" or "reasonably available control technology". For area sources, these measures are called "RACM" or "reasonably available control measures". The EPA guidance document described above includes a list of RACT and RACM strategies to be considered. Indications of the legal responsibility for and enforceability of chosen control measures and relevant quantitative milestones are also required.

PM10 emission sources within Dona Ana county and the Anthony non-attainment area are discussed below and in Table 2. Where particulate emissions from any specific category were determined to be de minimis or insignificant, the category was dropped from further consideration for the implementation of RACT or RACM. As shown, all source categories are being currently controlled and/or are de minimis. As such, the application of quantitative milestones or contingency plans are not relevant. The greatest source of PM10 in Dona Ana county, windblown soil from partially vegetated areas such as range lands and desert, is non-anthropogenic.

A. Point Sources

Industrial point sources of PM10 have been analyzed to determine their impacts on Anthony and the appropriateness of retrofitting reasonably available control technology or RACT. Because Anthony is located on the New Mexico-Texas border, the point source analysis included sources within Texas. An emission inventory was compiled and used as input for dispersion modeling to predict the impact on Anthony.

In the past, several cotton gins operated in this area. These gins, included in the emission inventory (Table 2) and modeling summary (Appendix C), have all been closed within the last year in order to consolidate their operations into a single, larger gin near Vado (11 km north of Anthony). Anticipated PM10 emissions from the new gin are 1.14 pounds per hour. The gin is to operate a maximum of 24 hours per day for 4 months of each year (mid-September to mid-January).

There are no other industrial point sources of any size in or adjacent to Anthony located within New Mexico. This determination is based on a search of all existing emission inventory, permitting, and registration files. The closest point sources to Anthony in New Mexico are both located in Sunland Park which is approximately 23 km away. All PM10 point sources within 50 km of Anthony were included regardless of size. Using this criterion, three sources besides the cotton gins were identified. One of the three sources, Ribble Construction, is a portable sand and gravel plant which had been located 30 km from Anthony but is currently not in Dona Ana County.

The Texas Air Control Board furnished the Department with a complete PM10 point source inventory which has been compiled for the El Paso PM10 SIP. For purposes of this analysis, the six sources closest to Anthony were included. Even though it is located 26 km from Anthony, the Asarco Smelter was included due to its high PM10 emission rate. The two point sources closest to Anthony

are located across the state line in Texas. These facilities, Proler International and Border Steel, are each within 5 km of Anthony.

A summary of the point source emission inventory and modeling inputs, outputs and results are included as Appendix C to this revision. Maximum impact due to these sources was modeled using ISCST (version 90346). It was determined that the most representative meteorological data was from a station in Las Cruces. One full year of meteorological data (1990) was used. The maximum predicted 24-hour impact from all historical and current point sources was 2.86 ug/m3. The cumulative annual average was predicted to be 0.69 ug/m3.

These two values are extremely low and considered to be de minimis, especially when compared to the 24-hour and annual PM10 standards of 150 ug/m3 and 50 ug/m3 respectively. For comparison, EPA non-attainment new source review requirements in 40 CFR Part 51, Appendix S establish significance levels which define when a major source is causing or contributing to a violation of a NAAQS. Impacts below these Appendix S concentrations are deemed de minimis. The Department has used these same values in AQCR 702-Permits to define sources impacting non-attainment areas. For PM10, the significance values are 5 ug/m3 and 1 ug/m3 for the 24-hour and annual standards, respectively. Not only does each point source in the analysis have an ambient impact below these concentrations, but the cumulative impact of all sources combined is below these significance levels.

Based on the modeling analysis, the Department finds industrial point sources have no significant impact on air quality in Anthony. As allowed by the EPA SIP Guidance for PM10 Moderate Areas, it is not necessary to consider the appropriate level of RACT to be required of point sources because the current impact is de minimis. There would be no improvement in PM10 concentrations in Anthony brought about through additional controls on point sources. In addition, there is no reason to conduct any other more advanced modeling analysis regarding point sources when their impact is very clearly minimal.

Regarding future emissions from point sources, the Department recognizes that Anthony is officially designated non-attainment for PM10. As such existing requirements for new sources locating in or impacting Anthony in AQCR's 702 and 709 will be applied and followed. The Department will also strive to meet EPA guidance on non-attainment new source review issued in response to the 1990 Amendments prior to revising AQCR's 702 and 709 when this is possible.

EPA recently promulgated new test methods (201 and 201A) for PM10 and proposed test method 202 for measurement of condensible particulate emissions. Although this SIP revision contains no emission limits, any future source given PM10 emission limits will be required to use appropriate EPA approved test methods.

B. Area Sources

Available emission inventories indicate that the majority of PM10 emissions in New Mexico are from area sources. Area sources include fugitive and reentrained dust from roads, fugitive dust from sparsely vegetated surfaces, range lands and agricultural areas, motor vehicles and residential woodburning.

1. Unpaved Roads

The Dona Ana County Planning Department has estimated that almost 10 miles, or about 1/3, of the streets in Anthony are unpaved. Traffic along unpaved roads is observed to be slow, an apparent attempt to minimize dust. PM10 emissions from unpaved roads in the non-attainment area are estimated to be 36.7 tons per year (see Table 2 for calculations).

Area residents are eager to have these streets paved, or at least improved. However, County and State funds only cover 2 road projects per year in each (Road Commissioner) district. Anthony shares District 2 with 5 other communities. As a result, progress has been slow. However, some streets have been primed (sprayed with oil) or treated by double penetration (grading, oil and large aggregate, oil and small aggregate) until funds are available to pave them. Priming is expected to last about a year. Double penetration treatment should last 5 to 6 years. Last year, 4 streets were primed in Anthony. Other streets were treated (double penetration) in conjunction with the installation of new sewer lines.

In the 1986 EPA Rural Fugitive Dust Area Study in Grant County, New Mexico, researchers determined that:

> "The possible control strategies for the area are limited due to the nature of the dust sources. Because agricultural tilling and wind erosion represent negligible dust sources, common controls such as conservation tilling and acreage stabilization are unwarranted. Since the greatest source of dust is generated by vehicular traffic on dirt roads, the control having the greatest effect would be paving or treating the dirt roads. This form of dust control may prove to be cost prohibitive. Grant County road officials estimated paving costs to be $80,000 per mile. This would amount to $2,000 per ton of particulates removed assuming paving would eliminate the 22,997 tons/year particulates reported in [the 1983] NEDS. The county paved a total of 3 miles in 1985."

It is not clear whether EPAs cost estimate has been annualized, or if it includes the continuing costs of maintaining and repaving these roads. However, the Division agrees that the cost to government of paving public roads as a form of dust control is prohibitive. This cost has risen since the 1986 Grant County report. The Dona Ana County Road Department estimates that one mile of (hot mix) paved road costs $4.59 per square yard, or $108,000 per mile (40 foot width). This 26% cost increase translates to an estimated control cost of $2520 per ton of particulate. Assuming that 47% of the total suspended particulate is PM10 (PM10 SIP Development Guide, EPA, June 1987), the cost of controlling PM10 by paving roads may be estimated at approximately $5360 per ton.

The County and State continue to pave and treat roads as expeditiously as funding allows. However, to pave all of the unpaved roads in Anthony (assuming a road width of 24 feet) will cost approximately $693,000 (1991 dollars). Paving as a PM10 control strategy is economically infeasible.

Recent growth in the area has raised concerns about the creation of additional unpaved residential roads. A number of low-cost housing developments have been built or proposed in the region. The recently revised Land Subdivision Regulations of Dona Ana County (December 11, 1990) require most developers to pave newly established roads. If these streets are up to (hot mix) code, the county will annex and maintain them. The New Mexico Constitution prohibits the county from paving or maintaining private roads.

2. Paved Roads

The Dona Ana County Road Department is responsible for maintaining the paved public roads in Anthony. This includes clean-up after heavy rains or winds have deposited soil onto paved roads. Climate has not necessitated the salting of roads in the winter. Due to a lack of funding, sidewalks are rare in Anthony and street sweepers are operated on a complaint basis only.

The State has estimated PM10 emissions due to re-entrained dust from paved roads to be 0.7 tons per year. These emissions are considered de minimis.

3. Haul Trucks

By policy, all Dona Ana County haul trucks are covered. Most commercial trucks are covered as well, in order to avoid material loss and complaints from broken windows. Emissions from these sources are considered de minimis.

4. Unvegetated Areas

Dona Ana County receives less than 9 inches of rain per year. This scarcity of water virtually guarantees an abundance of dry, dusty yards, vacant lots and ball fields. All of these fugitive dust sources are adjacent to (and up wind of) the monitor. The only ballfield in Anthony is about 1000 feet southwest of the monitor. This well used ballpark is devoid of plantlife, and the parking area and adjacent road are unpaved.

Nearer the monitor, the (historically) paved parking lot on which the monitors sit is now either ground to dust and gravel or simply covered with dust and gravel. A vacant lot sits across the street (south and slightly west). Although the nearest streets are paved, there are no curbs, sidewalks or lawns. A partially vegetated vacant lot sits due east of the monitors (emissions from this vacant lot are shown in Figures 21 and 22 of Appendix B).

Clearly, these sources can be significant, although during high winds dust from surrounding range land may dominate impacts on the monitor site. However, for a region in which virtually all areas not covered by pavement or buildings are sparsely vegetated and subject to wind erosion, feasible control strategies are not forthcoming. Irrigated crop lands and school lawns are notable exceptions; however, in the desert not all areas can be irrigated. In fact, water pressures in the overextended residential water system in Anthony are often feeble and erratic. Even with the planned improvements to the system, area water resources cannot sustain the kind of groundcover necessary to prevent wind erosion. It is technologically infeasible to vegetate the surrounding area with ground cover.

Earth moving activities further raise dust. An ordinance regarding the grading of land has recently been developed by the County Road Department. The new ordinance requires individuals to obtain a permit and to water while grading.

5. Trash Burning

New Mexico Air Quality Control Regulation (AQCR) 301, included as Appendix G, prohibits the burning of refuse in towns the size of Anthony. It is also illegal to burn trash in Dona Ana County (Dona Ana County Ordinance No. 79-1, Section III.E). Violators may be fined up to $300 or sentenced to up to 90 days in jail for each offense of the County regulation, and fined up to $1000 per day for violation of the State regulation. In addition, the transfer facility where residents deposit their trash will not accept the remains of

burnt trash. This policy was instituted after smoldering garbage ignited and destroyed one of their bins. The county is also developing a system to provide household pick-up. These efforts reduce both blowing trash and trash burning.

PM-10 emissions due to the burning of trash are considered well controlled and de minimis.

6. Wood Burning (home heating)

The 1990 census information regarding the use of wood burning for home heating is not yet available. According to the 1980 census for Anthony, 'House heating fuel' use was 71% utility gas, 27% bottled, tank or LP gas, 2% electricity and zero wood, fuel oil, coal or other fuel. However, it is not clear how many migrants, illegals or illiterate were included in the 1980 census, or how many of these individuals winter in Anthony. The 1990 results will likely be higher, as woodstoves became more popular during the 1980's. Although fireplaces have always been common, the regional practice is to use them on Christmas Eve and not for general home heating.

Woodsmoke contributions to PM10 exceedances would be most significant on low wind days in the winter. However, the filter analyses described in Appendix B have shown that wood smoke was not a significant contributor to any of the exceedances, including the exceedance which occurred on the (low wind) Christmas Eve of 1989. Based on filter analyses and available information, emissions from these sources are considered de minimis.

7. Off-road recreational vehicles

Due to low income levels, off-road recreational vehicles are uncommon in or around Anthony. Although some of these vehicles were observed near Sunland Park, aerial photographs do not show any areas near Anthony with the distinctive patterns of off-road vehicle use.

8. Agricultural and range lands

A report describing the PM10 contributions from rural land soils in the Anthony area is included as Appendix D. As documented in that report and in Appendix F (correspondence from the Soil Conservation Service), Dona Ana County's croplands are in compliance with the Food Securities Act. The EPA PM10 Moderate Area SIP Guidance: Final Staff Work Product (April 1991) lists, as an available fugitive dust control measure, reliance "upon the soil conservation requirements... of the Food Security Act to reduce emissions from agriculture operations." Thus, the favored RACM for agricultural land is already in place. PM10 emissions from these areas are not considered significant.

As discussed in Appendix D, open burning (for weed control) is not commonly practiced in this area. However, New Mexico Air Quality Control Regulation (AQCR) 301 (Open Burning) is included as reference in Appendix G. AQCR 301 was most recently revised in February of 1983.

The federal Bureau of Land Management (BLM) leasing requirements are designed, in part, to minimize overgrazing. In fact, the average carrying capacity for allotments in the area is less than two animal units per (640 acre) section per year. However, the soil composition of regional rangelands are inherently susceptible to wind erosion, regardless of impacts from humans. Estimated potential PM10 emissions from rangelands, based on soil types and natural vegetation, are high, approximately 150 tons per acre per year, and apt to contribute significantly to windy day exceedances (Control of Open Fugitive

Dust Sources, EPA-450/3-88-008, September 1988). There are no range lands within the Anthony non-attainment area. However, approximately 86%, or 3350 square miles, of Dona Ana county are classified as range lands. This represents potential countywide emissions of 502,584 tons per year. Similar desert soils in Mexico, Arizona, Texas, California and other parts of New Mexico are also likely PM10 contributors during high wind seasons. Long range transport of PM10 is an established phenomenon. The State finds that these emissions, while significant, should not be considered anthropogenic.

C. Summary

The State finds all point and area sources of PM10 in or effecting the Anthony non-attainment area to be de minimis, with the exception of unpaved roads, unvegetated and sparsely vegetated areas, and range lands. Of these, the paving of roads is economically infeasible and enhancement of ground cover in the area or region is technologically infeasible. Emissions from range lands are considered non-anthropogenic. The State is aware of no additional reasonable or available control measures for anthropogenic sources of PM10 in the Anthony area.

III. Attainment Feasibility and Waivers

The State finds the attainment of the PM10 NAAQS in Anthony by the required deadline impracticable. Although the continuing efforts of County, State and Federal agencies have reduced dust levels within the area, the State is not confident that the implemented control strategies can prevent exceedances which are predominantly non-anthropogenic. As acknowledged by EPA in the establishment of the RFDA program and current waiver provisions, high winds, friable soils and low annual rainfall are not within regulatory control.

Under section 188(f) of the CAAA, the EPA Administrator may waive the attainment date if he or she determines that non-anthropogenic (natural) sources of PM10 contribute significantly to a violation of the PM10 NAAQS in the area. The State believes this to be the case in Anthony, as filter analyses have shown that the overwhelming contributor to PM10 violations is airborne soil. Although some of this soil may originate from unpaved roads, a significant portion arises from regional terrain which is sandy, dry and only partially vegetated.

The State understands that a waiver of the attainment date does not release it from full implementation of its moderate area SIP requirements. Despite significant economic hardship and onerous control costs, anthropogenic sources of PM10 are being controlled as rapidly as practicable.

IV. Conclusion

The State and County have been working steadily to reduce PM10 levels in Anthony. Existing roads are being paved as quickly as funding allows. Permitting regulations in both New Mexico and Texas are designed to prevent industrial source contributions to PM10 violations. Agricultural and range lands are being managed as recommended and required by Federal agencies.

These State, County and Federal efforts have been successful. Whereas in 1988, the first year of PM10 monitoring, seven exceedances were measured, in 1989 four were measured and in 1990 only one. No exceedances have been

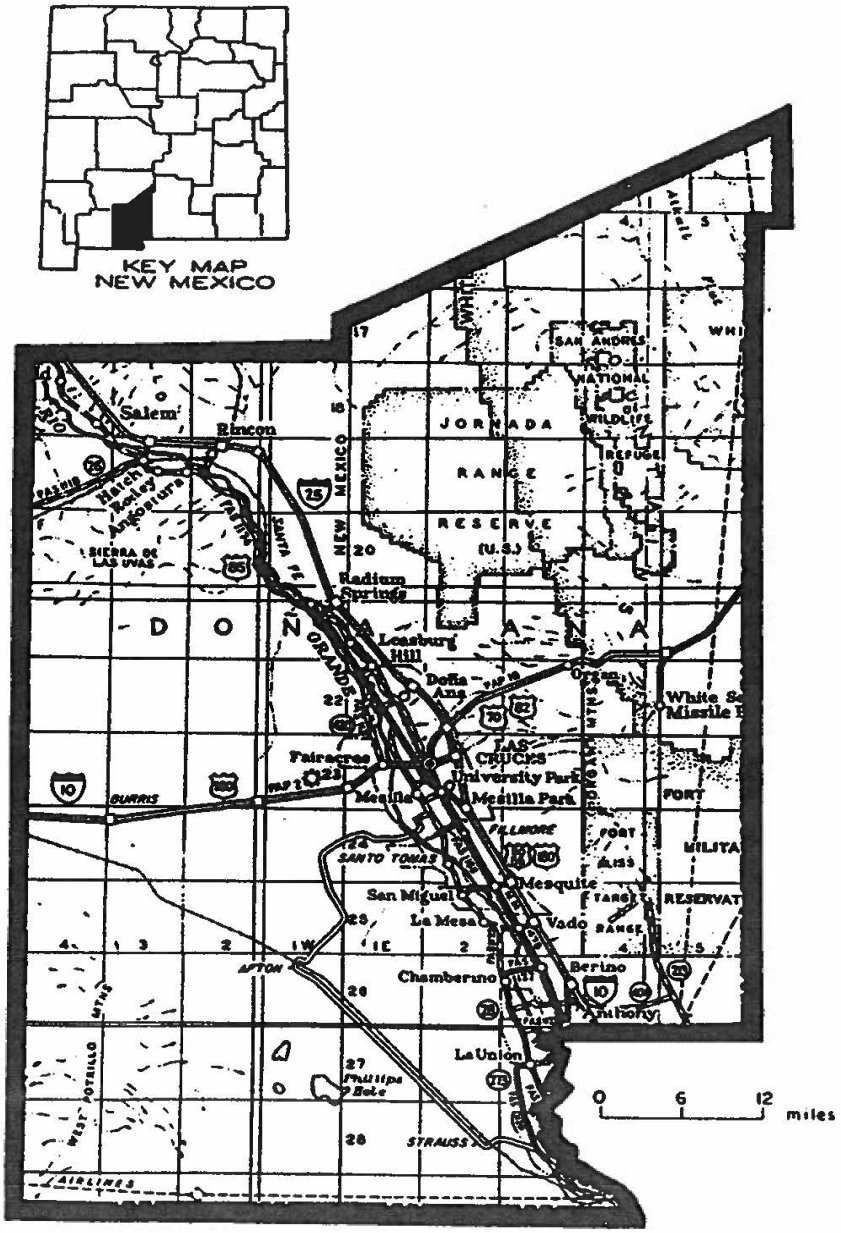
measured to date in 1991. Likewise, the annual arithmetic mean in 1990 was significantly lower than those measured previously.

However, the region continues to be dry and sparsely vegetated. Recent improvements in air quality may be the result of fortunate climactics. Dust storms and dust devils will continue to occur, especially in the Spring. Non-anthropogenic sources persist and will, at times, prevail. This was acknowledged in EPA's acceptance of Anthony as an RFDA.

The State remains committed to the dust control measures implemented by Dona Ana County, moderate area control strategies as agreed to in this SIP submittal and to the established air quality monitoring schedule. However, the State is requesting a waiver of the moderate area attainment deadline of December 31, 1994. While efforts towards the mitigation of anthropogenic sources continue, recurring non-anthropogenic sources thwart ambitions of consistent attainment.

Appendices:

A. Air Quality Data
B. PM10 Exceedances at Anthony and Sunland Park, New Mexico
C. Air Quality Dispersion Modeling Summary for Anthony PM10 SIP
D. PM10 Contributions from Rural Land Soils and Open Burning
E. Dona Ana County Soils Information from the Soil Conservation Service
F. Soil Conservation Service Correspondence Regarding Food Security Act
G. Air Quality Control Regulation 301



DOÑA ANA COUNTY

NOTE: ALL OF THIS COUNTY IS LOCATED WITHIN THE RIO GRANDE BASIN

Figure 1

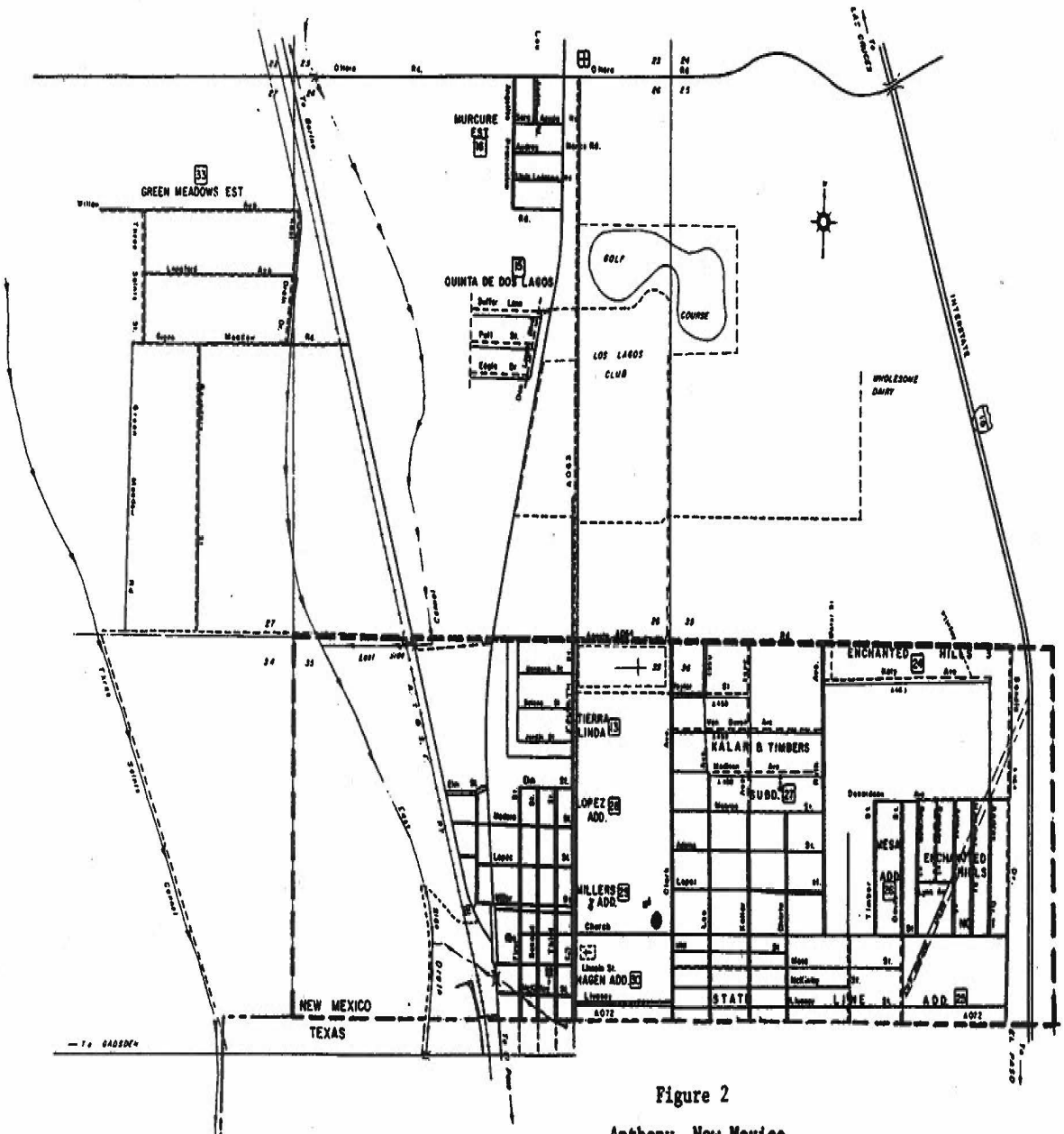
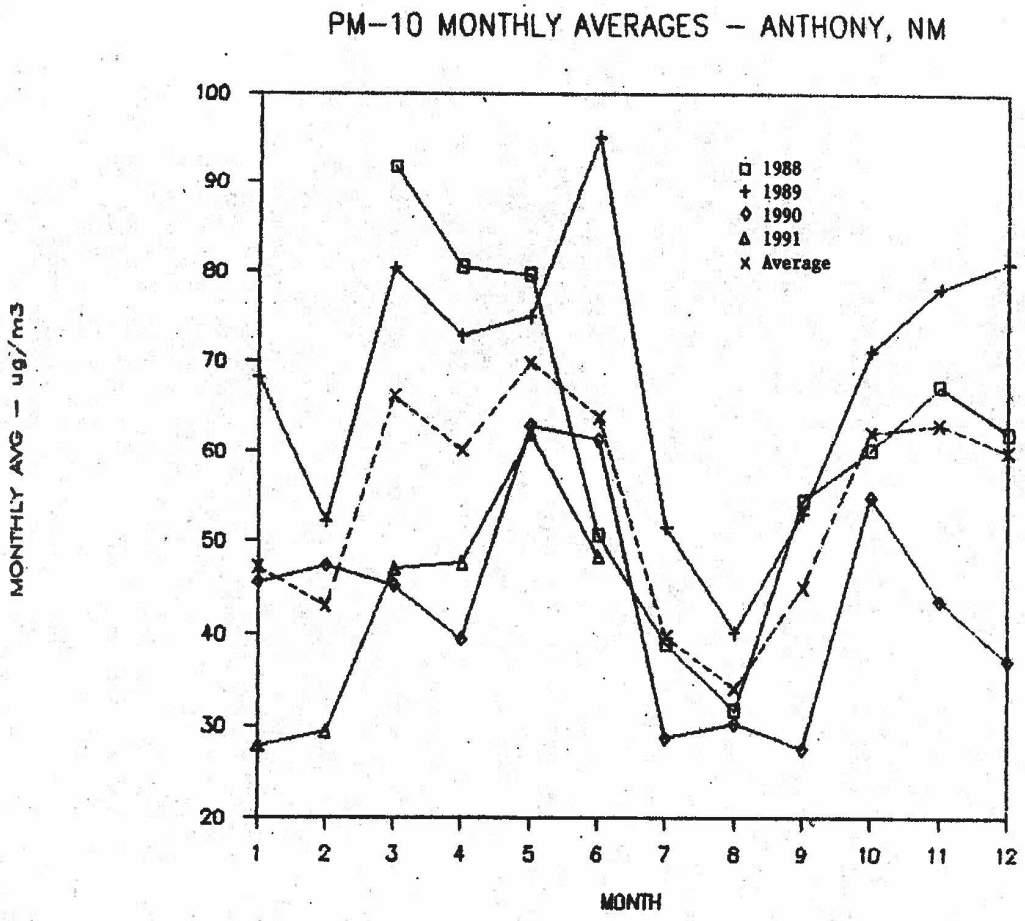


Figure 2

Anthony, New Mexico
Dona Ana County Engineering Dept.
1986

Paved Roads ---- Unpaved Roads
Non-attainment Area ● - PM10 Monitoring Site
Note: Fourth St. and Green Meadows Est have since been paved
1 inch equals 1500 feet

Figure 3



Total Number Exceedances in Each Month:	0	0	5	1	2	0	0	0	0	1	0	2

Table 1
PM10 Exceedances at Anthony, New Mexico

24-Hour Average (Standard: 150 ug/m3)

Date	Concentration (ug-PM10 /m3)	Remarks
3/10/88	170	High wind day (1)
3/19/88	151	
3/28/88	227	
3/29/88	226	
4/21/88	223	High wind day (1)
5/01/88	154	High wind day (1)
12/31/88	173	
3/03/89	297	Flagged as exceptional event
6/13/89	202	High wind day (1)
10/27/89	176	
12/24/89	176	
5/19/90	198	Flagged as exceptional event

(No exceedances recorded in first 2 quarters of 1991)

(1) Requested to be flagged as an exceptional event

Annual Arithmetric Mean (Standard: 50 ug/m3)

Year	Concentration (ug-PM10 /m3)	
1988	59	
1989	68	
1990	44	(2)
1991	44	(3)

(2) In compliance with standard
(3) First two quarters only

Table 2
PM10 Emission Inventory
(Tons per Year)

Source	Area		Notes
	Dona Ana County	Anthony Non-Attainment Area	
Point Sources			(1)
Joab Incin.	7.5	0	
Ribble Asphalt	13.1	0	
El Paso Electric	46.0	0	
Santo Tomas Gin	1.4	0	(2)
Santo Tomas Short	1.4	0	(2)
Chamberino Coop	1.8	0	(2)
Mesa Farmer's Coop	0.9	0	(3)
Area Sources			(4)
Unpaved Roads	N/A	36.7	(5)
Paved Roads	N/A	0.7	(6)
Rangelands/Desert	502,584	0	(7)

Notes:

(1) Emission estimates derived from permit files and AIRS data base. Only sources in New Mexico are included in this table. Sources in both New Mexico and Texas are listed and modeled in Appendix C.

(2) Closed down as of January, 1991. While in operation, these cotton gins ran a maximum of 24 hours a day, 4 months per year (September 15 - January 15). Also closed in January was the Anthony Gin in Texas, just across the state line and near the southwest corner of the Anthony non-attainment area.

(3) Opened October 1991, to replace closed gins. Permitted to operate a maximum of 24 hours a day, 4 months per year (September 15 - January 15).

(4) Specific emission estimates regarding haul trucks, trash burning, wood burning, off-road vehicles and agricultural practices are not available but are expected to be minimal (see text).

(5) Calculated to be 36.74 tons/yr using AP-42 (Section 11.2.1) and CARB (Calif. Air Resources Board) factors, County estimates and observation:

Emission Factor, EF = $k\ (5.9)\ (s/12)\ (S/30)\ (W/3)^{0.7}\ (w/4)^{0.5}\ (d/365)$ lb/VMT

Where: k (particle multiplier) = 0.49 for PM-10 (from CARB)
s (silt) = 15% (AP-42)
S (speed) = 20 mph (observation)
W (weight) = 3 tons (AP-42, observation)
w (wheels) = 4 (observation)
d (dry days per year) = 305 (AP-42)

Emissions = (EF) (VMT per day) (m) (365 days/year) / (2000 lb/ton)

Where: EF = 2.013 lb/VMT (calculated above)
VMT (vehicle miles traveled) = 10/day (CARB for equivalent areas)
m (miles of unpaved roads) = 10 (County estimate)

(6) Calculated using AP-42 (Section 11.2.5) (which recommends a PM-10 emission factor of 0.018 lb/VMT for local streets) and above assumptions for 20 miles of paved roads: (0.018)(10)(20)(365)/(2000) = 0.657 t/y

(7) Non-Anthropogenic Source

City of Anthony

820 HWY 478 / P.O. Box 2663
Anthony, New Mexico 88021
(575) 882-2983 Office / (575) 882-2978 Fax
www.cityofanthonynm.com

September 18th, 2019

Armando Paz
Environmental Analyst
New Mexico Environment Department
Air Quality Bureau – Control Strategies
2301 Entrada del Sol
Las Cruces, NM 88001

Via Email: Armando.Paz@state.nm.us

RE: Public Record Request

We are in receipt of your email dated September 12th, 2019. In request for dust ordinance or any City controls of implemented to help minimize the impact from manmade sources.

City of Anthony has not passed any environmental ordinance, we have received NMED funds that is helping us with designing South Anthony Arroyo which is underway. In 2016 we used CMAQ Funds to build walking paths from Duffer to O'hara that contribute to air quality. Streets that have been paved since we became a City are:- John Hinkley, One block of Lopez and Acosta, Putter Circle, 4th Street, Clark St, Nancy Domenici.

If you have any questions or require additional information, please contact me on 575-882-2983 or Email: emotongo@cityofanthonynm.org

Sincerely,
City of Anthony

Esther Motongo
City Clerk

Appendix E DUST CONTROL ORDINANCES

Las Cruces Dust Control Ordinance

ARTICLE V. - STANDARDS FOR EROSION CONTROL[5]

Footnotes:

--- (**5**) ---

Editor's note—Ord. No. 2657, § I(exh.A), adopted July 16, 2012, repealed the former art. V., §§ 32-301, 32-302, and enacted a new art. V as set out herein and became effective Oct. 1, 2012. The former art. V pertained to similar subject matter and derived from: Ord. No. 1789, § I, adopted Apr. 3, 2000; and Ord. No. 1929, §§ I, II, adopted Aug. 5, 2002.

Sec. 32-301. - Soil erosion control.

(a) Introduction. Intense and sporadic rainfall or wind are typically the culprits of soil erosion in this region. When rain impacts the earth, water runoff transports loose soil through hydrologic actions, while soil and dust are moved by their inclusion in adjacent wind. These items compose the primary forces that cause sediment erosion of our soils. To prevent this erosion, there are different sediment control measures available to minimize and control these erosions.

(b) Purpose and intent of this section. The purpose of this section is to comply with all federal, state and local codes and regulations in order to protect upstream and downstream properties, the city's MS4 system, and all natural waterways from erosion.

(c) Erosion control. Erosion control is necessary on any location where contaminated flowing water or blowing soil/dust may threaten the health and safety of the adjacent areas and its occupants. Control measures shall be implemented and maintained to minimize and/or prevent entrainment of soil into water runoff or wind from both disturbed and undisturbed areas. Control measures for any development within the city limits shall conform to the provisions set forth in chapter 32 and chapter 34 of the Las Cruces Development Code.

(Ord. No. 2657, § I(exh. A), 7-16-12)

Sec. 32-302. - Wind erosion control.

(a) Purpose and intent of this article.

(1) The purpose of this section is to protect and maintain the natural environment and to reduce the health effects caused by the creation of fugitive dust, equal or greater than PM10, consistent with the policies of the city's comprehensive plan and the natural events action plan for Dona Ana County. In addition, the ordinance attempts to limit property damage due to blowing sand and particulate matter caused by anthropogenic (manmade) activities. This article shall accomplish the requirements of these planning documents by requiring mitigation measures for activities that create fugitive dust.

(2) The intent of this section is to minimize the contribution of manmade dust production on a regular basis. This chapter is also intended to realize that fugitive dust creation does occur due to the natural environment and natural events however when careful and effective dust control measures are implemented on those sources which by their nature are prone to dust creation, the overall impact from these natural events can be minimized.

(b) Applicability. The provisions of this article shall apply to any activity, equipment, operation and/or practice, manmade or man-caused, capable of generating fugitive dust or windblown particulate matter.

(1) Exemptions: The following activities are automatically exempted from the provisions of this article:

a. Regular agricultural operations; including home gardening, including cultivating, tilling, harvesting, growing, the raising of farm animals or fowl, excluding unpaved roads associated with such operations.

b. Governmental activities during emergencies, life threatening situations or in conjunction with any officially declared disaster or state of emergency.

c. Operations conducted by essential service utilities to provide electricity, natural gas, oil and gas transmission, cable television, telephone, water and sewage during service outages and emergency disruptions.

d. This article shall not apply to the generation of airborne particulate matter from undisturbed lands.

(c) Application for exclusions. Waiver from specific requirements of this article shall be made to the building official or designee for approval. Requests shall include a documented justification statement including full description of reasons for the waiver and the concurrence of the waiver by adjacent downwind (historic wind directions) development(s) and occupants within a reasonable affected distance. The distance shall be determined on a case by case basis dependent on the scope and scale of the project/activity seeking the waiver.

(d) Definitions. Terms and words used in this article shall have the following meanings except where any narrative portion specifically indicates otherwise:

"Activity" or "activities" means any land stripping, earthmoving, trenching, road construction and demolition or renovation of manmade facilities.

"Air contaminant" means smoke, vapor, charred paper, dust, soot, grime, carbon, fumes, gases, odors, particulate matter, windborne matter, or any other material in the outdoor atmosphere.

"Anthropogenic" means created or caused by human activity.

"Chemical/organic stabilizer" means any nontoxic chemical or organic dust suppressant other than water which meets any specifications, criteria, or tests required by any federal, state or local water agency and is not prohibited for use by the U.S. Environmental Protection Agency or any applicable law, rule or regulation.

"Construction and demolition activities" means any on-site activities preparatory to or related to building alteration, rehabilitation, removal or razing, or improvement on real property, including the placement and upkeep of mobile or manufactured homes or buildings. "Construction" also means construction of roadway systems including, arterials, expressways, interstates, tunnels, overpasses, bridges, interchanges, residential and commercial streets within a subdivision, and airport runway improvements.

"Control measures" (CM's) means techniques or methods specifically identified within the construction documents or wind erosion control plan used to prevent or reduce the emission and/or airborne transport of fugitive dust and dirt.

"Disturbed area" means any area in which the soil will be altered by grading, leveling, scraping, cut and fill activities, excavation, brush and timber clearing, grubbing, and unpaved soils on which vehicle operations and/or construction activities will occur.

"Dust" or "dust emissions" means the finest particulates within the soil that may be transported and deposited by a blowing wind initiated by a surface disturbance that could present a health or safety hazard to the adjacent area or its occupants.

"Dust generating operation" means any activity capable of generating fugitive dust, including, but not limited to, activities associated with creating a disturbed area, construction and demolition activities, and the movement of vehicles on unpaved roadways or parking areas.

"Dust suppressant" means a chemical compound or mixture of chemical compounds added with or without water to a dust source for purposes of preventing air entrainment.

"Emission" means an air contaminant, or the act of discharging an air contaminant, visible or invisible that could cause a health and safety hazard to the adjacent area and its occupants.

"Erosion" means the inclusion and transportation of the soil surface particles by wind or water.

"Fugitive dust" means particles lifted into the ambient air by manmade and natural disturbance activities such as the movement of soil, vehicles, equipment, blasting and wind.

"Grading" means the construction process consisting of stripping, excavating, filling, stockpiling or combination thereof, including the land in its excavated or filled condition.

"Haul road" means a road constructed for, or used for, the purpose of hauling construction materials, or to provide access to one or more construction sites or industrial operations.

"High wind event" means a climatological occurrence in which the average wind speed exceeds a threshold in which fugitive dust will be generated from undisturbed areas, naturally covered areas, disturbed areas, and construction sites, regardless of reasonably available control measures implementation. The average wind speed for high wind events is a sustained wind speed of 25 miles per hour or greater.

"Inactive disturbed area" means any disturbed surface area on which active operations have been suspended.

"Land stripping" or "land stripping activity" means removal of all or any portion of existing vegetation, or natural soil surfacing, from parcels of land by various means.

"Maintenance" means the checking, repairing, and replacement of various dust CM's to insure their continued workability.

"MS4 utility" municipal separate storm sewer system; is a stormwater conveyance or system or conveyances that are owned by a state, city, town, village, or other public entity that discharges into waters of the U.S.

"Natural cover" means any vegetation, or natural ground surface, which exists on the property, prior to any construction activity. This includes areas which have been previously restored to undisturbed conditions.

"Owner" or "operator" means any person or entity who owns, leases, operates, controls, or supervises an affected facility or a stationary source of which an affected facility is a part.

"Palliative" means any agent used to lessen or reduce dust emissions.

"Particulate matter" (PM), are tiny particles of solid matter suspended in the air.

"$PM_{2.5}$" means particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

"PM_{10}" means particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers (smaller than the diameter of a human hair).

"PM_{10} emissions" means finely divided solid or liquid material, with an aerodynamic diameter less than or equal to a nominal ten micrometers emitted to the ambient air.

"Sand" means small loose grains of disintegrated rock. Sand is finer than a granule and coarser than silt, with grains between 0.06 and 2.0 millimeters in diameter.

"Silt" means small loose grains of disintegrated rock, finer than sand with grains between 0.004 and 0.06 millimeters in diameter. These particles are typically easily transported by surface breezes.

"Silt fence" means a temporary sediment control device consisting of a synthetic filter fabric stretched across and attached to supporting posts and entrenched along its bottom. Typically these fences are primarily designed for water erosion control.

"SWPPP" stormwater pollution prevention plan, means a document that defines the construction activities and best practices/control measures are to being installed to retain the stormwater pollution and prevents it from leaving a construction site.

"Track-out control" means a device to remove mud or soil from a vehicle before the vehicle enters a paved public road and prevent contamination into an adjacent MS4 city utility(s).

"Undisturbed" means land or property which is in its natural condition and has not been stripped or graded. Exception is if the property has been revegetated and the soil and vegetative groundcover is now mature.

"Unpaved road" means a road which is not paved with a formal hardened surfacing but instead has a running surface of either crushed gravel or native soil. Such roads are typically for low use and slow traffic. Their ability to produce dust from traffic is well known.

"Vacant lot" means a subdivided or unsubdivided parcel of land which contains no buildings or structures of a temporary or permanent nature, excluding perimeter walls or fences.

"Visible emissions" means any emission which contains particulate matter which are visually detectable without the aid of instruments.

"Wind erosion control plan" (WECP) means a document used to list control measures to be used for the activities being undertaken to prevent fugitive dust or windblown particulate matter and mitigate the escape of these materials beyond the property lines(s) of the originating site(s).

"Wind fence" means a fence made of small, evenly spaced wooden slats (similar to a snow fence) or fabric. They are erected to reduce wind velocity and to trap blowing sand. They may be used as perimeter controls around open construction sites to keep sediments from being blown off-site. The spaces between the fence slats allow wind and sediment to pass through but reduce the wind's speed, allowing transported soil particles to deposit along the fence.

"Wind speed" means the average wind velocity, or gusts regardless of direction, felt on the surface of a soil surface. A hand-held anemometer or an established station may be used to measure the ground surface wind speed at a specific point within a specific site.

"Wind speed test" means an on-site test of the wind speed measured at zero to two feet above the ground surface. This test is taken and certified by a City of Las Cruces construction inspector or codes enforcement officer using a portable hand-held anemometer standing at a specific approved point within the development (+/- 2 feet).

(e) Wind erosion control plan (WECP) requirements. In addition to standards established in subsequent sections of this article, any construction or demolition operation that is subject to this article, a WECP shall be required, excluding general property maintenance e.g., weed management. The WECP shall be designed by the project design engineer for subdivisions, larger scale commercial and industrial projects or infrastructure projects to specifically counter the potential of the sites' soil wind erosion. The contractor or property owner may prepare WECP in other situations. The WECP outlines the potential activities that may create dust and the mitigation steps to be taken for an existing or proposed activity. This WECP is a flexible and dynamic document which may be amended throughout the project to reflect the correct control measures used on the site or project. The initial WECP shall be submitted as a separate document along with the required construction plans for the proposed activity. The

following shall constitute the minimum information required within the WECP and description for control measures as part of any activity:

(1) Name(s), addresses and phone number(s) of person(s) responsible for the preparation, submittal and implementation of the control plan and responsible for the dust generating operations.

a. Copies of the general liability insurance policy for the property owner and contractor(s) responsible for dust generating operations.

(2) A plot plan or plat of survey of the site which describes:

a. The total area of land surface to be disturbed and the total area of the entire project site, in acres or square feet, depending on scale;

b. The operation(s) and activities to be carried out on the site;

c. All actual and potential sources of fugitive dust emissions on the site;

d. Delivery, transport and storage areas for the site, including types of materials stored and size of piles.

(3) A description of control measures (CM's) or combination thereof to be applied during all periods of dust generating operations and periods of inactivity to each of the fugitive dust sources described on the plot plan or plat. For each source identified a primary and contingency control measure must be identified and at least one control measure must be implemented. The same control measure(s) may be used for more than one dust generating activity. Specific details must include:

a. Listing by the design engineer, or preparer of the wind erosion containment alternatives that could be used on the specific project;

b. Locate projected application areas on the construction site for specific erosion control treatments;

c. If dust suppressants are to be applied, then the type of suppressant, method, frequency, and intensity of application, the number and capacity of application equipment to be used, and any pertinent information on environmental impacts and/or certifications related to appropriate and safe use for ground applications;

d. The specific surface treatment(s) and/or other CM's utilized to control material track-out and sedimentation where unpaved and/or access points join paved surfaces; and

e. For each fugitive dust source at least one CM shall be designated as a contingency measure in the original control plan. Should the original CM prove ineffective, immediate and effective implementation of the contingency measure(s) shall be required. Any change in the application of a CM must be immediately, or as soon as practicable, forwarded to the building official or designee for review and approval.

(f) Wind erosion control plan review and approval. Review and approval of the WECP and proposed CM's shall be the responsibility of the building official or designee. Approval may be conditioned to require additional measures, actions, or other activities, in addition to those actions proposed within the control plan documentation.

(g) Implementation. Approval and issuance of the building and/or subdivision construction permit(s) and the approval of all outlined CM's contained within the WECP or description shall mandate the implementation of listed CM's by the developer, contractor, builder, owner, and/or agents as part of construction activities.

(h) Other violation prohibited. Implementation of CM's shall not allow the creation of other violations of these standards or other provisions of the Municipal Code.

(i) General activity standards. No person shall cause, allow, or permit diffusion of visible emissions of fugitive dust or windblown dirt/sand beyond the property boundary line within which the emissions become airborne, without taking necessary and feasible precautions to control the generation of

airborne or windblown particulate matter. The operation(s) which is causing or contributing to the emissions may be required to temporarily cease the activity or operation until necessary and feasible precautions are taken.

(1) Groundcover removal is prohibited. No person shall disturb the topsoil or remove groundcover on any property within the city limits and thereafter allow the property to remain vacant or undeveloped unless listed readily available CM's have been placed to prevent generation of windblown dust or soil in accordance with this section.

(2) Soil moving activities shall cease when wind speeds exceed 25 mph. Soil moving activities may recommence when either the wind speeds decrease or as soon as effective control measures are implemented during the high wind event which contain the emissions.

(3) Vacant land—Weed management.

a. For all vacant or undeveloped lots or parcels, weed eradication is limited to the removal of weeds only by mowing or individual hand digging. Adjacent natural vegetation should not be removed.

b. Clearing of the entire property is prohibited.

c. All mature trees and major shrubs shall be protected from damage to continue their role in the prevention of soil erosion.

(4) Storage of materials and material transport. No person shall cause, allow, or permit dust producing material to be stacked, piled, or otherwise stored for a period exceeding 24 hours or permit transportation of materials likely to give rise to airborne dust without taking precautions to prevent the creation of fugitive dust. Actions shall be taken to ensure that such areas or uses shall be covered, moistened, compacted, or applied with a chemical dust suppressant, or other applicable CM's to prevent fugitive dust creation.

a. Earth or other material deposited from trucks or earth moving equipment shall be removed from paved streets by the person responsible for such deposits.

b. Stockpiling materials in paved streets, public or private, is prohibited.

(5) Parking time delay agreements. For businesses that have an approved parking time delay agreement and corresponding business license with the city, the agreement shall include submittal of a WECP and implementation of CM's during the approved delay period prior to pavement installation. All parking areas with an approved parking time delay must be surfaced in accordance with the provisions of chapter 38 of the Las Cruces Municipal Code.

(6) Continuous activity operations. For existing, on-going, and/or permanently-sited institutional, governmental, commercial and/or industrial facilities or operations which may continuously generate fugitive dust or windblown particulate matter, individual WECP's with corresponding CM's shall be submitted to the community development department for approval. Approval shall be made by the building official/community development director or designee and shall be communicated in writing to the property/business owner. Letters of approval and approved control plans shall be kept at the property subject to this provision. A new WECP shall be submitted every three years and reviewed for effectiveness. The provisions of the approved WECP shall be implemented as needed to eliminate the creation of airborne fugitive dust or particulate matter.

(j) Construction activity standards. These standards shall apply for all design and construction activities on property within the city limits including, but not limited to, subdivisions, large lot residential, office, commercial and industrial construction:

(1) No person shall cause, allow, or permit a building or its appurtenances, or a building or subdivision site to be constructed, used, altered, repaired, demolished, cleared, leveled, or the earth to be moved or excavated, without taking precautions to limit excessive amounts of particulate matter from becoming airborne. Dust or windblown soil and sand shall be kept to a minimum by the application of good practices such as approved dust suppressant or soil stabilizer, paving,

compaction, covering, landscaping, continuous wetting, controlling access and vehicle speeds, or other approved CM's.

(2) Track-out control is required to be placed at the exits onto a paved road for any development or construction site that is one acre or greater, or in which any material is being hauled on- or off-site. Track-out controls may be provided using the following:

a. Gravel pad, consisting of a layer or layers of washed gravel, rock or crushed rock at least one inch in diameter, 20 feet wide, 50 feet long (or as long as the longest haul truck).

b. Grizzly, at least 20 feet long with bars being at least three inches tall and spaced six inches apart.

c. Wheel washers or pressure sprayers.

d. Other approved method.

Track-out devices shall be routinely cleaned or replaced as necessary to maintain effectiveness. Any bulk material or dirt tracked onto a paved right-of-way, public or private, shall be cleaned up as soon as practical but in no instance longer than 24 hours to prevent it from entering a MS4 utility.

(3) Subdivision requirements.

a. For all subdivisions, a WECP shall be prepared, submitted and reviewed for approval as part of the overall construction permit application of the subdivision construction drawings through the community development department.

b. Developers of the subdivision shall be allowed to grade for the subdivision only after complete subdivision construction drawing approval and permit issuance. No separate grading permit shall be allowed nor shall any grading be allowed beyond the phase of the development that is under construction.

c. The developer shall construct and maintain a perimeter wind fence or dust barrier with a minimum height of three feet along the perimeter of the area of disturbance where the activity or construction could impact downwind developed areas. In addition, all interior yard walls that run predominantly north-south should be constructed, or replaced by maintained wind fences, during the initial project construction phase to create additional wind breaks and buffers.

(4) Grading requirements.

a. A SWPPP, erosion control plan and WECP must be submitted, reviewed and approved by the city prior to any site disturbance or construction activities that equal one acre or more of land. All site erosion control measure must correspond with the erosion control and/or the SWPPP document, and be property maintained for the duration of construction or until final site stabilization has been established.

b. Clearing, except that necessary to establish CM's, shall not begin until all required CM's have been installed and the site has been inspected.

c. Phasing shall be required on all sites disturbing greater than 30 acres, with the size of each phase to be established at plan review and as approved by the City of Las Cruces. A detailed sequence of construction of the project site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping must be submitted. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation of temporary erosion and sediment control measures, and establishment of permanent vegetation. All areas that have been cleared of significant portions of its vegetative cover and will remain so for 30 days or longer without appreciable construction activity shall be seeded and mulched within 14 days of being disturbed. If seeding or another vegetative erosion control method is used, germination shall be evident within two weeks or the city may require the

site to be reseeded or a nonvegetative option employed. Irrigation may be required to establish vegetative cover.

(5) Large lot residential, office, commercial and industrial requirements. For all large lot residential properties, in which the total area is one-half acre or greater, and for all office, commercial, industrial, institutional or governmental construction activities, a WECP shall be prepared, submitted and reviewed as part of the building permit submittal by the community development department.

a. Grading activities shall only be allowed to commence after building plan approval and permit issuance. Site improvement only development permits may be considered based on all of the following:

1. The site is three acres or less; and

2. Dust emissions on the affected lot must be permanently suppressed by providing the required landscaping and paving all required parking areas and driving aisles. All disturbed building pads must be suppressed as to prevent the creation of fugitive dust until such time as building placement occurs; and

3. The anticipated amount of time between site development and building construction is 30 days or less. If more than 30 days passes the building pad shall be re-vegetated or fenced off with a minimum three-foot high wind fence capable of controlling fugitive emissions.

(6) Cessation of operations. Once construction has commenced, stabilization measures must be immediately installed to ensure that fugitive dust and windblown particulate matter creation is suppressed during the approved construction phase, including weekends, after-hours and holidays. A permanent stabilization via re-vegetation, landscaping, paving or the application of dust suppressants or wetting shall be required for projects once the inactive period exceeds 60 days.

(7) City construction projects. Construction activities by the city shall require the provision of a WECP with the construction drawings. This applies to those projects not part of a subdivision i.e., road construction or utility replacements, or buildings not issued building permits by the city i.e., new city buildings or utility substations. Compliance with both the WECP and outlined CM's shall be the responsibility of the contractor and subject to verification by the public works department, utilities department or community development department's building/project inspectors or the city project management staff.

(k) Control measures. Control measures are methods which can be utilized to limit the creation of fugitive dust or windblown particulate matter. CM's are to be identified within the WECP and once approved need to be implemented in accordance with this article for all dust or windblown particulate matter generating activities within the city limits. CM's shall include, but not be limited to:

(1) Designing subdivisions or building sites to utilize existing, pre-development grades;

(2) Watering disturbed areas on a regular basis throughout the daily construction activities, including periods of inactivity;

(3) Applying palliatives or chemical soil suppressant/stabilizer for idle construction periods;

(4) Constructing and maintaining wind barrier fences. Such fencing should be a minimum of three feet in height with 50 percent or less porosity and be placed adjacent to roadways or property boundaries to reduce the amount of windblown material leaving a site. The barriers may also be placed within a site to create wind buffers;

(5) Re-seeding or re-vegetation of graded or disturbed areas along with associated watering until mature vegetation is established;

(6) Grading for street and utility placement only as part of subdivision construction;

(7) Building all interior and perimeter cinder block, rockwalls, and retaining walls as part of the overall construction of subdivisions and not part of the individual building permit for each lot. Walls shall serve as wind breaks and help to reduce the entrainment of dust and the spread of windblown particulate matter;

(8) Grading the building pad site only plus five feet in all directions of the pad site;

(9) Retaining natural vegetation during the construction phase of building excluding the building pad site;

(10) Utilizing existing or natural vegetation as part of the required landscaping for the site as elsewhere required within these design standards, to limit grading activities, to promote water conservation, and to reduce dust generation;

(11) Installing non-natural landscaping or vegetation in the latter part of construction to reduce the amount of disturbed area and the potential for dust generation;

(12) Implementing any other proposed dust suppressing agent or activity approved by the building official or designee, especially those that have been developed to be effective in our particular area;

(13) Combining any two or more of the above items;

(14) Inspections: The City of Las Cruces through its designated agent(s) shall make inspections as required and either shall approve that portion of the work completed or shall notify the permittee that the work fails to comply with the WECP as approved. A copy of the City of Las Cruces approved WECP shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify the applicable City of Las Cruces department.

(l) Corrections, effective date and enforcement.

(1) Correction of condition. If the community development department, code enforcement section of the police department, or other city personnel document that a person is in noncompliance with any of the provisions contained within the article above, he or she will notify the person, in writing, by phone or in person, of that fact and specify a period of time in which the person must achieve compliance. Failure to comply within the timeframe determined by the city constitutes grounds for a notice of violation per the city's enforcement ordinances. Correction of condition may include the amendment of plans to reflect additional or new control measures to be taken in the event that original measures prove to be insufficient or ineffective. Nothing herein shall prevent separate enforcement being taken in accordance with chapter 18 (Nuisances), LCMC.

(2) Remedial action. The city community development department, its designated agent and any other authorized city representative, after proper notice, may enter upon any real property where dust or windblown particulate matter is being generated and take such remedial and corrective action as he or she deems necessary when the owner, occupant, operator, or any tenant, lessee, or holder of any possessory interest or right in the involved land fails to do so.

(3) Costs. Any costs incurred in connection with any remedial or corrective action taken by the city, pursuant to this section, shall be assessed against the owner of the property involved. Failure to pay the full amount of such incurred costs shall result in a lien against the property. The lien shall remain in full force and effect until all costs have been fully paid, which may include costs of collection and reasonable attorney fees.

(4) Effective date. For all existing emission sources governed by this article, the activity must be completed within six months of the effective date or be brought into full compliance. For existing, on-going, and/or permanently-sited institutional, governmental, commercial and/or industrial facilities or operations, the wind erosion control provisions of this article shall be submitted in writing, approved, and implemented within six months of the effective date of this article.

(5) Liability. All persons owning, operating, or in control of any equipment or property who shall cause, permit, or participate in any violation of this article shall be individually and collectively liable to any penalty or punishment imposed by and under the Municipal Code for the city.

(6) Offenses. Any person who violates any provision of this article, including, but not limited to, any application requirement; any permit condition; any fee or filing requirement; any duty to allow or carry out inspection, or any requirements by the city is guilty of a petty misdemeanor and shall pay a fine of not more than $500.00 as levied by the municipal court. Each day of violation may constitute a separate offense.

(Ord. No. 2657, § I(exh. A), 7-16-12)

Secs. 32-303—32-399. - Reserved.

Las Cruces Recommended BACM

City of Las Cruces®
PEOPLE HELPING PEOPLE

Community Development Department
Permitting and Inspections Section
PO Box 20000, Las Cruces, New Mexico 88004
Offices located at 700 N. Main St, Las Cruces, New Mexico 88001
Phone (575) 528-3106 Fax (575) 528-3155

FUGITIVE DUST CONTROL METHODS

The following are suggested dust control methods that may be used to control the fugitive dust created or attributed to operations listed below.

The use of these controls methods **DOES NOT** assure compliance with the Las Cruces Municipal Code Section 32-302. Wind Erosion Control. The use of multiple methods may be necessary for the control of fugitive dust.

Land Clearing Activities

Control Methods	Description
A. Watering	1. Application by means of trucks and/or hoses during land clearing operations.
B. During periods of high winds	1. Apply non-toxic chemical stabilizers per manufacturer's directions, and prior to expected high wind events. 2. Apply water as necessary, and prior to expected high wind events. 3. Stop work activities temporarily.

Earthmoving Activities

Control Methods	Description
A. Watering	1. Application of water by means of trucks, hoses, and/or sprinklers at sufficient frequency and quantity prior to, during, and after earthmoving operation. 2. Pre-application of water to the depth of the proposed cuts or equipment penetration.
B. Pre-grading planning	1. For projects to be phased: time the grading to coincide with the construction phases.

	2. Grade entire project but apply non-toxic chemical stabilizers or ground cover to inactive disturbed surface areas where construction is scheduled to begin more than 60 days after earthmoving activity is complete.
C. Chemical stabilizers	1. Most effective in areas that are not subject to daily disturbances. 2. Apply per manufacturer's instructions.
D. Wind fencing	1. Three to five foot high with 50% or less porosity, adjacent to roadways and property/boundary lines. 2. Normally used in conjunction with watering or non-toxic chemical stabilizers. 3. Use trees and shrubs for long-term stabilization of site.
E. Operate on-road haul vehicles appropriately	1. Mix material with water prior to loading and/or wet surface of material after loading. 2. Do not overload vehicle. Freeboard should not be less than 3". 3. Remove spillage from body of truck after loading and unloading of truck. 4. Empty loader slowly and keep bucket close to the truck while dumping. 5. Apply water as necessary during loading operation.
F. Operate off-road haul vehicles appropriately	1. Mix material with water prior to loading and/or wet surface of material after loading. 2. Empty loader slowly and keep bucket close to the truck while dumping. 3. Apply water as necessary during loading operations.
G. Alternative haul vehicles	1. Use bottom-dumping haul vehicles.
H. During periods of high winds	1. Apply chemical stabilizers per manufacturer's directions prior to expected high wind events. 2. Apply water as necessary prior to expected high wind events. 3. Stop work activities temporarily.

Storage Piles

Control Methods	Description
A. Watering	1. Application methods include spray bars, hoses, and water trucks. 2. Frequency of application will vary with site-specific conditions and soil/gravel type.
B. Wind sheltering	1. Install three-sided barriers with no more than 50% porosity equal to material height.
C. Chemical stabilizers	1. Best for use on storage piles subject to infrequent disturbances.
D. Altering loading and unloading procedures	1. Confine loading and unloading procedures to the downwind side of storage piles. 2. May need to be used in conjunction with wind sheltering.
E. Coverings	1. Tarps, plastic, or other material can be used to as temporary covering. 2. When used – covering must be anchored to prevent wind from removing them.
F. During periods of high winds	1. Apply chemical stabilizers per manufacturer's directions prior to expected high wind events. 2. Apply water as necessary prior to expected high wind events. 3. Install temporary covers.

Disturbed Surface Areas or Inactive Construction Sites

Control Methods	Description
A. Chemical stabilizers	1. Most effective when used on areas where active operations have ceased. 2. Apply per manufacturer's directions.
B. Watering	1. Apply at sufficient frequency and quantity to develop a surface crust.
C. Wind fencing	1. Three to five foot high with 50% or less porosity, adjacent to roadways and property/boundary lines. 2. Normally used in conjunction with watering or non-toxic chemical stabilizers.

D. Vegetation	1. Establish as quickly as possible when active operations have ceased.
E. Prevent access	1. Install fencing around the perimeter of the property. 2. Install "No Trespassing" signs.
F. Site access improvements	1. Stay on established routes.
G. During periods of high winds	1. Apply chemical stabilizers per manufacturer's directions prior to expected high wind events. 2. Apply water as necessary prior to expected high wind events.

Unpaved Roads and Shoulders

Control Methods	Description
A. Paving or chip sealing	1. Requires routine maintenance by watering or dry/wet sweeping to control fugitive dust.
B. Chemical stabilization	1. Not recommended for high volume or heavy equipment traffic use. 2. Apply per manufacturer's directions.
C. Watering	1. Need sufficient quantities to keep the surface moist. 2. Required application frequency will vary according to soil type, weather conditions, and amount of vehicle traffic.
D. Reduced speed	1. May need to be used with watering or non-toxic chemical stabilizers
E. Gravel/recycled asphalt	1. Restrict access or redirect traffic to reduce vehicle trips.
F. Location	1. Locate haul roads as far from existing housing as possible.
G. Site access improvements	1. Stay on established routes.
H. During periods of high winds	1. Apply chemical stabilizers per manufacturer's directions prior to expected high wind events. 2. Apply water as necessary prior to expected high wind events. 3. Stop work and vehicle activity temporarily.

Paved Road Track-Out

Control Methods	Description
A. Wheel washers	1. Should be placed where vehicles exit unpaved areas onto paved areas. 2. May be adjusted to spray entire vehicle including bulk-stored material in haul vehicles.
B. Sweep/Clean roadways	1. Either dry or wet sweeping may be used – dependent on soil type and moisture content.
C. Cover haul vehicles	1. All vehicles shall be covered when moving.
D. Site access improvements	1. Install a gravel pad or grizzly/shaker at the access point to your site. 2. Designate a single site entrance and exit. 3. Stay on established routes.
E. During periods of high winds	1. Clean streets with water flushing.

Doña Ana County Dust Ordinance

Chapter 172. EROSION CONTROL

[HISTORY: Adopted by the Board of County Commissioners of Doña Ana County 12-15-2000 by Ord. No. 194-00. Amendments noted where applicable.]

GENERAL REFERENCES

General penalty — See Ch. 1, Art. III.
Design and construction standards — See Ch. 157.
Flood damage prevention — See Ch. 207.
Grading permits — See Ch. 217.
Land use and zoning — See Ch. 250.

Roads — See Ch. 279.
Subdivision of land — See Ch. 300.

Article I. General Provisions

§ 172-1. Authority and purpose.

The Board of Commissioners of Doña Ana County is authorized by statute, in particular NMSA § 4-37-1, to enact ordinances to protect and promote the health, safety, and general welfare of the residents of the unincorporated areas of Doña Ana County. The purpose of this chapter is to protect and maintain the natural environment and to reduce the negative health effects caused by the creation of fugitive dust, more specifically "PM10," which refers to a size of particulate matter within dust that has been identified by the scientific and medical communities and by the federal Environmental Protection Agency (EPA) as a significant health risk in high concentrations in the air. This chapter is enacted consistent with the goals and policies of the Comprehensive Plans for Doña Ana County and for the Las Cruces Extraterritorial Zone, and as a part of the New Mexico Environment Department's Natural Events Action Plan (NEAP) for Doña Ana County and the State of New Mexico. This chapter shall accomplish the requirements of these documents by preventing, limiting, or mitigating the effects of activities which create fugitive dust (which includes PM10s) or have a tendency to make land more vulnerable to natural erosion forces that create fugitive dust. The objective of this chapter is to ensure that all surface disturbance activities use erosion control measures to mitigate visible fugitive dust on an ongoing basis for the protection of health and safety of the residents of Doña Ana County. This chapter also attempts to ensure that when natural events do occur, such as fugitive dust creation through high winds, the contribution of human-generated dust is limited in its negative health and safety impacts. Emissions that are regulated by federal or state law to require filtering or similar treatment prior to release into the air are not considered "fugitive," and are not regulated by this chapter.

§ 172-2. Applicability.

Under the conditions outlined below, the provisions of this chapter shall apply to any human activity, operation and/or practices, or any condition caused by human activity, which generates dust, causes water erosion, or makes the land more vulnerable to erosion by natural erosion forces. In the development of County land for public purposes, County policies shall be consistent with the purposes of this chapter, and shall be conducted so as to minimize the creation or aggravation of erosive forces.

§ 172-3. Interpretation and conflict.

Where this chapter imposes greater restrictions than those imposed by other rules, regulations, agreements, or County ordinances or resolutions, the provisions of this chapter shall be prevailing and controlling. Where two or more provisions of this code are conflicting, the most restrictive shall apply.

§ 172-4. Appeals.

A determination that a property requires an erosion control plan (ECP) or erosion mitigation plan (EMP), or that a proposed ECP or EMP is insufficient, or both, shall be subject to administrative appeal to the County Manager, and then to the Board of County Commissioners. A property owner wishing to appeal a determination shall request an appeal in writing, directed to the County Manager.

§ 172-5. New development.

Any development that requires a permit under any County ordinance, other than for construction of a single-family dwelling unit (multiple applications within a subdivision shall not apply), shall require an erosion control plan to be submitted consistent with Article II. Grading for all construction, including single-family

dwelling units, shall be limited to the building pad site, pond and driveway plus an additional five feet in all directions from these areas.

§ 172-6. Existing conditions.

The owner of any property that is determined to be in a condition vulnerable to erosion by natural forces due to human development of the property may be required to submit an erosion mitigation plan (EMP) consistent with Article II, if the condition of the property is determined to pose a significant health threat due to the nature or extent of the vulnerable condition of the property, or its location near concentrations of vulnerable populations, such as of school children, or ill or elderly persons.

§ 172-7. Exempt activities.

Although Doña Ana County encourages the use of reasonable erosion control measures in all activities, the following activities are exempt from the regulations and restrictions of this chapter:

A. Regular agricultural operations covered by the Right to Farm Act, NMSA §§ 47-9-1 through 47-9-7, including cultivating, tilling, growing, and harvesting crops, and the raising of farm animals or fowl.
B. Governmental activities during life-threatening situations or other emergencies, or in connection with any officially declared disaster or state of emergency.
C. Operations conducted by essential service utilities to provide electricity, natural gas, oil and gas transmission lines, telephone, water and sewage during or to avoid service outages and emergency disruptions.
D. Temporary use of unpaved roads and parking lots that generate fewer than 20 vehicle trips per day for fewer than three successive calendar days.

§ 172-8. Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

ACTIVE OPERATIONS
Any human activity that is capable of generating or generates visible fugitive dust, including bulk material storage, handling and processing; earth moving; construction, renovation and demolition activities; and the movement of motorized vehicles on any unpaved roadways and parking areas.

BULK MATERIAL
Sand, gravel, soil, aggregate and any other inorganic or organic solid matter capable of releasing visible fugitive dust.

CHEMICAL SOIL STABILIZATION/SUPPRESSION
A method of dust control implemented by any person to mitigate PM10 emissions by applying asphaltic emulsions, acrylics, adhesives, or any other approved materials that are not prohibited for use by the New Mexico Environment Department, the Environmental Protection Agency, or any other law, rule, or regulation.

DISTURBED AREA
Any area in which the soil will be altered by grading, leveling, scraping, cut-and-fill activities, excavation, brush and timber clearing, grubbing, and unpaved soils on which vehicle operations and/or movement will or has occurred.

DUST-GENERATING OPERATION
Any activity capable of generating fugitive dust, including, but not limited to, activities associated with creating a disturbed area, construction and demolition activities, and the movement of vehicles on unpaved roadways or parking areas.

DUST SUPPRESSANT
Water, hygroscopic materials, or nontoxic chemical stabilizers used as a treatment to reduce visible fugitive dust emissions. Dust suppressants shall be used as recommended by the manufacturer and in concentrations and application frequencies sufficient to prevent violation of this chapter.

EROSION CONTROL MEASURES (ECMs)
Techniques used to limit the emission and/or airborne transport of fugitive dust from its original site to accomplish satisfactory results for temporary and/or extended suppression of dust and PM10 emission(s).

EROSION CONTROL PLAN (ECP)
A written description of all reasonably available control measures (RACMs) to be implemented at a work site and/or in transit to and from a work site for any earth moving, construction, or potential dust-generating operation. Such written description may be incorporated into building and construction plans or a separate document submitted with said plans.

FUGITIVE DUST
Any particulate matter entrained in the ambient air that is caused from man-made and natural activities without first passing through a stack or duct designed to control flow, including, but not limited to, emissions caused by movement of soil, vehicles, equipment, and windblown dust. Excluded particulate matter includes matter emitted directly from the exhaust of motor vehicles, or from other combustion devices, portable brazing, soldering or welding equipment, and pile drivers.

HIGH WIND CONDITIONS
On-site hourly average wind speed greater than 15 miles per hour, gusts of 20 miles per hour, or an active wind
advisory issued by the National Weather Service for Doña Ana County.

NATIVE PLANTS
Plants that are indigenous to the state or have been imported from other places and have become established in
wildlands without cultivation. *Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I).*

NATURAL COVER
Any vegetation that exists on the property, prior to any construction activity or achieved through vegetation restoration back to a natural state, including the placement of sod.

PALLIATIVE
Any agent used to lessen or reduce dust emissions.

PARTICULATE MATTER
Any material emitted or entrained into the air as liquid or solid particulate, with the exception of uncombined water.

PM10

Particulate matter, both filterable and condensable, with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

REASONABLY AVAILABLE CONTROL MEASURE (RACM)
Any device, system, process modification, apparatus, technique, or control measure, or combination thereof, which results in the lowest emissions rate possible taking into consideration the RACMs' technological and economical feasibility as determined by approval of the erosion control plan.

STABILIZED or STABILIZATION
The ongoing process necessary to reduce the fugitive-dust-generating capability of a surface by paving, dust suppression, watering, compacting or revegetating the disturbed surface sufficient to prevent a violation of this chapter.

TRACK-OUT
Visible bulk material deposited upon a paved public or private roadway and capable of going airborne due to mechanical actions.

Article II. Development Standards and Process

§ 172-9. Erosion control plan (ECP) required.

Other than for a single-family dwelling unit, any grading, construction, demolition, or other development requiring a permit or other form of approval under any County ordinance shall have an approved erosion control plan (ECP) in place prior to receiving a permit. The ECP may be separate documents or incorporated as part of required building and/or construction plans.

§ 172-10. ECP documentation.

Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I). The following shall constitute the minimum information required within the ECP to be submitted as part of an application for building and/or subdivision construction to describe the erosion control measures (ECMs) proposed for the project. For all subdivisions, ECMs shall be outlined and approved as part of the overall review of the subdivision construction drawings through the Engineering and Community Development Departments.

A. Name(s), address(es) and phone number(s) of person(s) responsible for the preparation, submittal and implementation of the ECP, and for the dust-generating operations generally.

B. A site plan or plat of survey of the site that describes:

   (1) The total area of land surface to be disturbed and the total area of the entire project site, in acres or square feet, depending on scale.
   (2) The operation(s) and activities to be carried out on the site.
   (3) All anticipated sources of fugitive dust emissions on the site.
   (4) Temporary drainage and/or ponding facilities to minimize soil erosion and localized flooding of adjacent properties from water utilized on site for development or for dust control.
   (5) Delivery, transport and storage areas for the site, including types of materials to be stored, and proposed maximum sizes of stockpiles for different types of materials.

C. A description of ECMs or combination thereof to be applied during all periods of dust-generating operations to each of the fugitive dust sources described on the site plan or plat. For each source

identified, at least one control measure must be implemented. The same control measure(s) may be used for more than one dustgenerating activity. Specific details must include:

(1) If dust suppressants are to be applied, the type of suppressant, method, frequency, and intensity of application, the number and capacity of application equipment to be used, and any pertinent information on environmental impacts and/or certifications related to appropriate and safe use for ground applications;
(2) The specific surface treatment(s) and/or other ECMs utilized to control material track-out and sedimentation where unpaved and/or access points join paved surfaces;
(3) For each fugitive dust source, at least one auxiliary ECM designated as a contingency measure shall be described in the original control plan. Should the original ECM in the control plan prove ineffective, immediate and effective implementation of the contingency measure shall obviate the requirement of submitting a revised control plan; and
(4) ECMs to be implemented prior to any period of inactivity of 10 days or more, due to any reason other than extended rainfall.

D. A description of ECMs or combination thereof to be used to minimize the negative effects of water usage on site during the development activities. All approved measures should be continued until final paving, wall or fence construction and landscaping is in place.

E. The person responsible for implementing the objectives of the ECP shall keep accurate records and document all activities in carrying out the ECP. These records shall be made available upon request by the County staff.

§ 172-11. ECP review and approval.

Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I). Review and approval of a proposed ECP shall be the responsibility of the County Engineering and Community Development Departments or their designees. Approval may be conditioned upon the implementation of additional measures, actions, or other activities, in addition to those included in the proposed ECP. Approval and issuance of the building and/or subdivision construction permit(s) and the approval of all outlined ECMs contained within the control plan or description shall constitute a mandate that the approved ECMs be implemented by the developer, contractor, builder, owner, and/or agents as part of construction activities.

§ 172-12. Erosion control measures (ECMs).

Erosion control measures included with an erosion control plan required by this chapter may include, but are not necessarily limited to, any one or more of the following measures:

A. General guidelines.

(1) Designing subdivisions or building sites to utilize existing, predevelopment grades;
(2) Watering disturbed areas on a regular and minimum basis throughout daily construction activities;
(3) Applying palliatives or chemical soil suppressant/stabilizer for idle construction periods;
(4) Constructing snow and/or wind fences;
(5) Reseeding or revegetation of graded or disturbed areas;
(6) Grading for street and utility placement only as part of subdivision construction;

(7) Building some or all interior and perimeter cinder block, rock walls, and retaining walls as part of the overall construction of all subdivisions and not part of the individual building permit for each lot;
(8) Retaining natural vegetation during the construction phase of buildings, excluding the building pad site;
(9) Utilizing existing or natural vegetation as part of the required landscaping for the site as elsewhere required within these design standards, to limit grading activities, to promote water conservation, and to reduce dust generation;
(10) Installing vegetation or nonnatural landscaping elements in the latter part of construction to reduce the amount of disturbed area and the potential for dust generation; or
(11) Implementing any other reasonable dust-suppressing agent or activity.

B. Active operations in construction areas and other land disturbances.

(1) Short-term control measures may include:
(a) Regularly scheduled wet suppression;
(b) Dust suppressants applied in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer;
(c) Upwind temporary windbreaks, including fabric fences with the bottom of the fence sufficiently anchored to the ground to prevent material from blowing underneath the fence;
(d) Starting construction upwind and stabilizing disturbed areas before disturbing additional areas; and/or
(e) Stopping active operations during high wind periods.

(2) Long-term control measures may include:
(a) Site stabilization using dust suppressants applied in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer;
(b) Reseeding using native grasses;
(c) Xeriscaping;
(d) Tree planting; and/or
(e) Permanent perimeter and interior fencing.

C. Specific construction guidelines. The following additional ECMs may be incorporated in a proposed ECP to mitigate the effects of the specified activities:

(1) Unpaved roadways.
(a) Paving using asphalt, recycled asphalt, asphaltic concrete, concrete, or double-penetration (consistent with subdivision or zoning requirements); *Editor's Note: See Ch. 250, Land Use and Zoning; and Ch. 300,Subdivision of Land.*
(b) Dust suppressants applied in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer;
(c) Regularly scheduled wet suppression; and/or
(d) The use of traffic controls, including decreased speed limits with appropriate enforcement; vehicle access restrictions and controls; road closures and barricades; and off-road vehicle access controls and closures.

(2) Trucks hauling bulk materials on public roadways.
(a) Properly secured tarps or cargo covering that covers the entire surface of the load;
(b) Dust suppressants applied in amounts and rates recommended by the manufacturer;

(c) Maintaining six inches of freeboard from the rim of the truck bed. "Freeboard" means the vertical distance from the highest portion of the load to the lowest part of the rim of the truck bed; and/or
(d) Preventing leakage from the truck bed, sideboards, tailgate or bottom dump gate.

(3) Bulk material handling.
(1) Spray bars;
(2) Wetting agents (surfactants) added to bulk material;
(3) Wet suppression through manual application;
(4) Dust suppressants added to bulk materials in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer;
(5) Stopping bulk material handling during high wind conditions;
(6) Reduced process speeds; and/or
(7) Reduced drop heights.

(4) Industrial sites.
(a) Pave roadways and parking area with asphalt, recycled asphalt, asphaltic concrete, and concrete;
(b) Regularly scheduled vacuum street cleaning;
(c) Regular wet suppression of unpaved areas;
(d) Dust suppression applied in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer;
(e) Wind breaks;
(f) Enclosures;
(g) Increased wet suppression applications during high wind conditions;
(h) Slowing active operations during high wind conditions; and/or
(i) Stopping active operations during high wind conditions.

(5) Demolition and renovation activities when asbestos-containing materials are not present. If asbestos containing material may be present, all demolition or renovation activity shall be performed in accordance with the federal standards referenced in 20 NMAC 11.64, Emission Standards for Hazardous Air Pollutants for Stationary Sources. In other instances, the following ECMs may be utilized:
(a) Constant wet suppression on the debris piles during demolition;
(b) Dust suppression applied on the debris piles in amounts and rates recommended by the manufacturer;
(c) Enclosures;
(d) Curtains or shrouds;
(e) Negative-pressure dust collectors; and/or
(f) Stopping demolition during high wind conditions.

(6) Milling, grinding or cutting of paved or concrete surfaces.
(a) Constant wet suppression;
(b) Ongoing clean up of milled, ground or cut material;
(c) Dust suppression applied in amounts and rates recommended by the manufacturer and maintained as recommended by the manufacturer.
(d) Enclosures;
(e) Negative-pressure dust collectors; and/or
(f) Curtains or shrouds.

(7) Pressure blasting operations.
   (a) Use of nonfriable abrasive material;
   (b) Curtains or shrouds;
   (c) Negative-pressure dust collectors;
   (d) Constant wet suppression; and/or
   (e) Ongoing clean up of abrasive material.

Article III. General Nonconstruction Activity Standards

§ 172-13. Ground cover removal prohibited.

No person shall disturb the topsoil or remove ground cover on any real property within the County unless reasonable actions are taken to prevent generation of dust caused by the disturbed condition.

§ 172-14. Weed eradication and dust suppression.

A. Weed eradication is limited to removal of specific weeds; clearing of the entire lot is prohibited.
B. Once weeds are removed or mowed, dust suppression can be achieved through watering, chemical suppressant application, or the expansion of natural vegetation areas on the site. Expansion of natural vegetation areas is encouraged.

§ 172-15. Storage of materials and material transport.

Actions shall be taken to ensure that materials storage and material transport areas or uses with the potential of becoming or generating fugitive dust and particulate matter shall be covered, moistened, compacted, or otherwise treated to prevent fugitive dust creation.

Article IV. Existing Conditions

§ 172-16. Existing human-created vulnerable conditions.

If the condition of a property is determined to pose a significant health threat, due to the nature or extent of existing development that makes the property vulnerable to natural erosion forces, or due to its location near concentrations of vulnerable populations, such as of school children, or ill or elderly persons, an erosion mitigation plan (EMP) shall be required.

§ 172-17. Determination.

Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I). The initial determination that a property is in such a condition may be made by any law enforcement or code enforcement or other County agent authorized to make such a determination, subject to review by the Community Development Director.

§ 172-18. Plan submission requirement.

Once the determination has been made in writing, the property owner shall be required to submit within 30 working days a proposed erosion mitigation plan, which may include any of the erosion control measures (ECMs) presented in this chapter, or other reasonable plans for eliminating or mitigating the vulnerable condition of the property. The plan may include a proposed timeline for implementation.

§ 172-19. Review of EMP.

Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I). Upon receipt of a proposed EMP by the County representative making the determination that a plan is required, the EMP shall be submitted for review to the County Engineering and Community Development Departments. The determination of whether the EMP is sufficient shall be made by the County Community Development Director or other authorized County staff member. If the plan is determined to be insufficient, that determination and the reasons therefor shall be provided to the applicant in writing, and the applicant shall be given 10 working days to revise the EMP to address the insufficiencies.

Article V. Enforcement

§ 172-20. Enforcement; penalty.

Editor's Note: Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I). Any violation of the provisions of this chapter, including any failure to implement any ECM of an approved ECP or EMP, may be subject to any penalties or remedies allowed by law, including NMSA § 4-37-3 and the general penalty set forth in Chapter 1, General Provisions, Article III, General Penalty. In addition, the County may enforce the provisions of this chapter through the procedures in Chapter 146, Dangerous Buildings, or any similar ordinance subsequently enacted. The County may also pursue injunctive relief or any other remedies available under the law.

Deming Dust Ordinance

DEMING, NEW MEXICO: CITY CODE

Title 11
BUILDING REGULATIONS

Chapter 5
WIND EROSION AND DUST CONTROL

11-5-1: DEFINITIONS:
11-5-2: PURPOSE; APPLICABILITY:
11-5-3: GENERAL PROVISIONS:
11-5-4: DUST CONTROL AND SOIL EROSION PLAN:
11-5-5: REASONABLY AVAILABLE CONTROL MEASURES (RACMS):
11-5-6: GENERAL AND NONCONSTRUCTION STANDARDS:
11-5-7: CORRECTION OF VIOLATIONS:
11-5-8: CITY NOT LIABLE:
11-5-1: DEFINITIONS:

As used in this chapter, the following words and terms shall mean:

AMBIENT AIR: That portion of the atmosphere, external to buildings, to which the general public has access. Land owned or controlled by the stationary source and to which public access is precluded by a fence, physical barriers, or other effective means is exempted from the ambient air.

APPLICANT: Any person, corporation, or public or private organization proposing a development which would involve disturbance to the natural terrain.

CHEMICAL SOIL STABILIZATION/SUPPRESSIVE: A method of dust control implemented by any person to mitigate emissions by applying petroleum resins, asphaltic emulsions, acrylics, adhesives, or any other approved material that are not prohibited for use by the city, the state environment department, the environmental protection agency, or any other law, rule, or regulation.

CLEARING: Any activity that removes the vegetative surface cover.

CONSTRUCTION DEMOLITION ACTIVITIES: Any on site activities preparatory to or related to building alteration, rehabilitation, removal or razing, or improvement on real property, including the placement and upkeep of mobile or manufactured homes or buildings. "Construction" also means construction of roadway systems including, arterials, expressways, interstates, tunnels, overpasses, bridges, interchanges, residential and commercial streets within a subdivision, and airport runway improvements.

DISTURBED AREA: Any area in which the soil will be altered by grading, leveling, scraping, cut and fill activities, excavation, brush and timber clearing, grubbing, and unpaved soils on which vehicle operations and/or movement will or has occurred.

DUST CONTROL AND SOIL EROSION PLAN: A written description of all reasonably available control measures (RACMs) to be implemented at a work site and/or in transit to and from a work site for any earthmoving, construction, or potential dust generating operation. Such written description may be incorporated into building and construction plans or a separate document submitted with said plans.

DUST GENERATION OPERATION: Any activity capable of generating fugitive dust, including, but not limited to, activities associated with creating a disturbed area, construction and demolition activities, and the movement of vehicles on unpaved roadways or parking areas.

EROSION AND DUST CONTROL PLAN: A set of plans indicating the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction.

EROSION CONTROL: A measure that prevents erosion.

EXCAVATE: Any act by which earth, sand, gravel, or any other similar material is dug into, cut, removed, displaced, relocated, or bulldozed, and includes the resulting conditions.

FILL: Any act by which earth, sand, gravel, or any other similar material is placed or moved to a new location aboveground. The fill is also the difference in elevation between a point of existing undisturbed ground and a designated point of higher elevation of the final grade.

FUGITIVE DUST OR DUST: Organic and inorganic particulate matter in quantities and of a duration that may with reasonable likelihood injure human or animal health or plant life, reduce safe visibility, cause property damage, or degrade visibility. Water vapor, steam, or particulate matter emissions emanating from a duct or stack of process equipment are not fugitive dust.

GRADING: Excavation or fill of material, including the resulting conditions thereof.

GRUBBING: The process of digging up and removing the roots, trunk, branches and stems of all plants in order to clear the land.

HIGH WIND EVENT: A climatological occurrence in which the average wind speed exceeds a threshold in which fugitive dust will be generated from undisturbed areas, naturally covered areas, disturbed areas, and construction sites, regardless of reasonably available control measure implementation. Notwithstanding other climatic conditions, the average wind speed for high wind events is a sustained wind speed of twenty five (25) miles per hour or greater.

LAND DISTURBING ACTIVITY: Any physical land development activity which includes such actions as clearance of vegetation, moving or filling of land, removal or excavation of soil or mineral resources or similar activities.

NATURAL COVER: Any vegetation which exists on the property, prior to any construction activity or achieved through vegetation restoration back to a natural state, including the placement of sod.

PALLIATIVE: Any agent used to lessen or reduce dust emissions.

PARTICULATE MATTER: Any material emitted or entrained into the air as liquid or solid particulate, with the exception of uncombined water.

START OF CONSTRUCTION: The first land disturbing activity associated with a development, including land preparation such as clearing, grading, and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

STRIPPING: Any activity that removes or significantly disturbs the vegetative surface cover, including clearing and grubbing operations.

VISIBLE DUST EMISSION: Dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of twenty percent (20%), for a period or periods aggregating more than three (3) minutes in any one hour.

WIND SPEED: The average wind velocity, regardless of direction, based on a sixty (60) minute average from the nearest weather report or PM10 monitoring station, or by a portable wind instrument located at the site. (Ord. 1144, 7-10-2006)

11-5-2: PURPOSE; APPLICABILITY:

A. Purpose And Intent: The purpose of this chapter is to protect and maintain the natural environment and to reduce the health effects caused by the creation of fugitive dust and wind erosion as a result of the operations and activities with new or existing construction and development. This chapter is also intended to limit the negative health and safety impacts when natural events do occur, such as fugitive dust creation through high winds. Also, the actions required within this chapter are not intended, necessarily, to cease all manmade dust generation activities when such natural events occur and the actions taken to reduce dust generation may be overcome by the natural occurrence.

B. Applicability: The provisions of this chapter are applicable to any situation involving any disturbance to the terrain, topsoil or vegetative ground cover, including grading, grubbing, stripping, cut and fill

activity and similar operations, upon any property within the city of Deming as provided for in this chapter. Compliance with the requirements as described in this chapter shall not be construed to relieve the owner/applicant of any obligations to obtain necessary state or federal permits.

C. Exemptions: Any person seeking an exemption from any of the provisions of this chapter shall submit a petition to the city building official for approval. The following activities are automatically exempted from the provisions of this chapter:

1. Regular agricultural operations, including cultivating, tilling, harvesting, growing, and the raising of farm animals or fowl, excluding unpaved roads associated with such operations.

2. Governmental activities during emergencies, health or life threatening situations or in conjunction with any officially declared disaster or state of emergency.

3. Operations conducted by essential service utilities to provide electricity, natural gas, oil and gas transmission, cable television, telephone, water and sewage during service outages and emergency disruptions.

4. Temporary use of unpaved roads and parking lots which generate less than twenty (20) vehicle trips per day for less than three (3) successive calendar days.

5. Excavations for cemeteries for burial of human or animal remains.

6. Existing quarry operations actively engaged in excavating rock, sand, and/or gravel. (Ord. 1144, 7-10-2006)

11-5-3: GENERAL PROVISIONS:

A. Each person shall use reasonably available control measures (RACMs) to prevent a violation of this chapter. No person shall allow fugitive dust, track out, or transported material from any active operation, open storage pile, paved or unpaved roadway or disturbed surface area, or inactive disturbed surface area to be carried beyond the property line, right of way, easement or any other area under control of the person generating or allowing the fugitive dust. Failure to comply with this subsection shall be a violation of this chapter.

B. No person shall permit building materials or any construction waste or other materials to be blown from the site by the wind.

C. Failure to comply with a fugitive dust control term or condition shall be a violation of this chapter.

D. A person whose violation of this chapter results in fugitive dust being deposited upon land beyond the limits of the permitted area shall take all actions necessary to remedy damage caused by a violation proven with credible evidence. Such remedies may include, but are not limited to, compensation, removal of the fugitive dust and/or repair of any damage, obtaining permission from property owners or operators before doing any work on the damaged property. It shall be a separate violation of this part to fail to remove the fugitive dust and repair the damage as specified in the written schedule or any extension agreed to by the person and the damaged property owner. No violation will occur if the

failure to perform the corrective actions is for any reason beyond the control of the person performing the work including, without limitation, acts of God or government preemption in connection with a national emergency or if the allegedly damaged property owner refuses to grant reasonable permission and access to conduct the remediation activities.

E. The city, in adopting this chapter, shall collect a twenty five dollar ($25.00) permit fee for review of a stand alone soil erosion and dust control plan. Otherwise, the fee will be considered as incorporated in other permit fees being collected at the time of the review. (Ord. 1144, 7-10-2006)

11-5-4: DUST CONTROL AND SOIL EROSION PLAN:

In order to obtain permit approval for any land disturbing activity involving a site of three thousand five hundred (3,500) square feet or more, and prior to the issuance of any building permit and prior to the commencement of any activity on the site, the applicant shall file with the building official a soil erosion and dust control plan and shall obtain the building official's approval of such plan. In assessing the plan, the building official may consult with any person, agency, or organization he or she deems appropriate.

The following constitutes the minimum information required in the control plan as part of any building or subdivision development:

A. Name, address and phone number of person(s) responsible for the preparation, submittal and implementation of the control plan.

B. A plot or plat of survey of the site which describes:

1. The total area of land surface to be disturbed and the total area of the entire project site, in areas or square feet, depending on scale;

2. The operation(s) and activities to be carried out on the site;

3. All actual and potential sources of fugitive dust emissions on the site.

C. A description of RACMs or combination thereof to be applied during all periods of dust generating operations to each of the fugitive dust sources described on the plot or plat. For each source identified at least one control measure must be implemented. The same control measure(s) may be used for more than one dust generating activity.

D. Approval and issuance of the building and/or subdivision construction permit(s) and the approval of all outlined RACMs contained within the control plan shall mandate the implementation of said RACMs by the developer, contractor, builder, owner, and/or agents as part of construction activities. (Ord. 1144, 7-10-2006)

11-5-5: REASONABLY AVAILABLE CONTROL MEASURES (RACMS):

Reasonably available control measures to be implemented in accordance with this chapter may include, but are not limited to, the following:

A. Using dust suppressants applied in amounts and rates recommended by the manufacturer;

B. Using wet suppression;

C. Upwind windbreaks, including fabric fences;

D. Starting construction at the location that is upwind from the prevailing wind direction and stabilizing disturbed areas before disturbing additional areas;

E. Stopping active operations during high wind;

F. Cleanup and removal of track out material;

G. Retaining natural vegetation during the construction phase of building excluding the building pad site;

H. Utilizing existing or natural vegetation as part of the required landscaping for the site;

I. Temporary seeding or revegetation for soil stabilization when grades are not ready for permanent seeding;

J. Surfacing with gravel or other mulch material of a size and density sufficient to prevent surface material from being airborne;

K. Mulching and crimping of straw or hay as specified;

L. Installing permanent perimeter and/or interior fence walls;

M. Designing subdivisions of building sites to utilize existing predevelopment grades;

N. Applying palliatives or chemical soil suppressant/stabilizer for idle construction areas;

O. Restricting access to lot by subcontractors by providing parking areas. (Ord. 1144, 7-10-2006)

11-5-6: GENERAL AND NONCONSTRUCTION STANDARDS:

A. Ground Cover Removal Prohibited: No person, no matter the size of the property, shall disturb the topsoil or remove ground cover on any real property within the city limits and thereafter allow the property to remain unoccupied, unused, vacant, or undeveloped unless reasonable actions are taken to prevent generation of dust. Such reasonable actions must be submitted to the building official in the form of a wind erosion and dust control plan and must be approved by the building official prior to any removal of ground cover by the applicant.

B. Vacant Land; Weed Eradication And Dust Suppression:

1. For all vacant or underdeveloped lots, weed eradication is limited to removal of specific weeds only through mowing or hoeing and not the removal of natural vegetation. Clearing of the entire lot is prohibited.

2. Once weeds are removed or mowed, dust suppression can be achieved through watering, chemical suppressant application, or the expansion of natural, nonweed vegetation areas on site. Natural vegetation shall consist of those plant varieties that are indigenous to New Mexico or that are determined to be native or natural plant varieties by the city building official.

C. Storage Of Materials: Actions shall be taken to ensure that such areas or uses with the potential of becoming or generating fugitive dust and particulate matter, shall be covered, moistened, compacted, or otherwise treated to prevent fugitive dust creation.

D. Existing Operations: For existing operations, ongoing, and/or permanently sited institutional, commercial and/or industrial facilities or operations which may continuously generate fugitive dust, individual control plans with the corresponding RACMs shall be submitted to the building official for approval. Approval shall be made by the building official or his or her designee and shall be communicated in writing to the property/business owner. (Ord. 1144, 7-10-2006)

11-5-7: CORRECTION OF VIOLATIONS:

A. Notification: Where a person fails to comply with control measures approved by the building official or with any provision of this chapter, the building official or his or her designee, or city code enforcement officer, shall notify the person of that fact and specify a period of time in which the person must achieve compliance. Failure to comply within a twenty four (24) hour minimum or within the time determined by the city constitutes grounds for a notice of violation. The building official may also issue a stop work order where a building permit has been issued. Correction of conditions may include the amendment of plans to reflect additional or new control measures.

B. Remedial Action: The city or its designated agent, after proper notice, may enter upon any real property where dust is being generated and take such remedial and corrective action as he or she deems necessary when the owner, occupant, operator, or any tenant, lessee, or holder of any possessory interest or right in the involved land fails to do so.

C. Costs: Any costs incurred in connection with any remedial or corrective action taken by the city, pursuant to this chapter, shall be assessed against the owner of the property involved. Failure to pay the full amount of such incurred costs shall result in a lien against the property. The lien shall remain in full force and effect until all costs have been fully paid, which may include cost of collection and reasonable attorney fees.

D. Effective Date: For all existing emission sources governed by this chapter, the activity must be completed within six (6) months of the effective date hereof or be brought into full compliance. For existing, ongoing, and/or permanently sited institutional, governmental, commercial and/or industrial facilities or operations, the dust control provisions of this chapter shall be submitted in writing, approved, and implemented within six (6) months of the effective date hereof.

E. Liability: All persons owning, operating, or in control of any equipment or property who shall cause, permit, or participate in, any violation of this chapter shall be individually and collectively liable to any penalty or punishment imposed by and under this code.

F. Offenses: Any persons who violate any provision of this chapter, including, but not limited to, any application requirement; any permit condition; any fee or filing requirement; any duty to allow or carry out inspection, or any requirement by the city is guilty of a misdemeanor and shall be punished as provided in section 1-4-1 of this code, and a separate offense shall be deemed committed on each day during or on which a violation occurs or continues. (Ord. 1144, 7-10-2006)

11-5-8: CITY NOT LIABLE:

A. Nothing contained in this chapter is intended to be construed to create or form the basis for any liability on the part of the city, or its officers, employees or agents for any injury or damage resulting from the failure of responsible parties to comply with the provisions of this chapter, or by reason or in consequence of any inspection, notice, order, certificate, building permit, permission or approval authorized or issued or done in connection with the implementation or enforcement of this chapter, or by reason of any action or inaction on the part of the city related in any manner to the enforcement of this chapter by its officers, employees or agents.

B. The building official, code enforcement officer, or other city employee charged with the enforcement of this chapter, acting in good faith and without malice on behalf of the city, shall not be personally liable for any damage that may accrue to persons or property as a result of any act required by the city, or by reason of any act or omission in the discharge of these duties. Any suit brought against the building official, code enforcement officer, or other city employee because of an act or omission performed in the enforcement of any provisions of this chapter shall be defended by the city.

C. Nothing in this chapter shall impose any liability on the city or any of its officers or employees for construction or cleanup of the erosion and sediment control measures listed herein. (Ord. 1144, 7-10-2006)

LUNA COUNTY BUILDING CODE ORDINANCE NUMBER 75

AN ORDINANCE PROVIDING FOR THE ESTABLISHMENT OF MINIMUM STANDARDS FOR CONSTRUCTION IN LUNA COUNTYAND FOR THE PROVISION OF PENALTIES, CIVIL REMEDIES, SEVERABILITY AND EFFECTIVE DATE.

Whereas, the health, safety and welfare of the residents of Luna County require the regulation of the erection, construction, maintenance, enlargement, moving, removal, conversion, occupancy, equipment, use, height, demolition, alteration, and repairs, of all buildings and/or structures within Luna County; and

Whereas, it is deemed necessary and desirable to ensure orderly and integrated development within Luna County in compliance with policies and guidelines set out in the Luna County Comprehensive Land Use Plan and all other County policies and regulations; and

Whereas, Luna County remains essentially rural in nature in which open space and the natural landscape predominate over the developed environment; rural lifestyles and rural based landowners are fostered; the conversion of undeveloped areas into sprawling low density development is reduced; and

Whereas, Section 4-37-1 NMSA 1978 provides all counties are granted the same powers as municipalities, and included in this grant of powers are those powers necessary and proper to provide for the safety, preserve the health, promote the prosperity and improve the order, comfort and convenience of Luna County and its inhabitants;

Whereas, Section 3-17-6, NMSA 1978 provides that a municipality may adopt by ordinance the conditions, provisions, limitations, and terms of a building code, plumbing code, electrical code fire prevention code, and any other code not in conflict with the laws of New Mexico;

NOW, THEREFORE BE IT ORDAINED BY THE LUNA COUNTY BOARD OF COUNTY COMMISSIONERS AS FOLLOWS:

ARTICLE 1 GENERAL PROVISIONS

1.1 Short Title: This Ordinance shall be known as the "Building Code Ordinance", and shall be referred to herein as "this Ordinance".

1.2 Purpose: This Ordinance shall provide for the regulation of all construction, whether residential or commercial or other use, including any additions, expansions, repairs, remodel, or renovation to any building or structures in Luna County; provide for the issuance of permits for such work; establish minimum standards of workmanship and materials to be used in such work; and provide for the inspection, administration, penalties and enforcement of the regulation.

1.3 Jurisdiction: This Ordinance shall provide for the regulation of construction activities within the County, but not within the boundaries of municipalities.

1.4 Interpretation and Conflict: The regulations provided herein are held to be the minimum standards necessary to carry out the purposes of this Ordinance. This Ordinance is not intended to interfere with, or abrogate or annul any other valid ordinance or statute. In the event the provisions of this Ordinance conflict with other County rules, regulations or ordinances pertaining to the subject matter herein, the provisions of this Ordinance shall prevail.

1.5 Meaning of Terms: Wherever the terms "Luna County Planning Director", "County Planning Director", or "Luna County Planner" appear in this Ordinance they shall be read and understood as including any other person or position authorized by the County Manager or the County Board of County Commissioners to administer or otherwise carryout the requirements of the Ordinance.

LUNA COUNTY CLERK NEW MEXICO

LUNA COUNTY-NM
KAREN SMYER, CLERK
201003201
1 of 13
08/12/2010 04:38:52 PM
BY ANDREA

1

1.6 Definitions:

"Agriculture": An agricultural use or activity requires a tract containing five (5) or more contiguous acres in active, current use for the production of farm crops for sale and profit, including vegetables, fruit, cotton, grain and other crops and the processing of crops to the generally recognizable minimum level of marketability and storage thereof on the premises; the open range grazing of livestock or irrigated pasture for grazing livestock; animal and poultry husbandry, dairy operations, floriculture and horticulture; and accessory uses customarily incidental to agricultural activities. Provided further that agriculture does not include commercial slaughter houses, meatpacking plants, fertilizer yards, or other similar animal related uses.

"Building": any structure used or intended for supporting or sheltering any use or occupancy.

"Building Official" shall mean the officer, or official, or inspector or other designated authority charged with the administration and enforcement of any Code, or the building official's duly authorized representative.

"Certificate of Compliance" shall mean a certificate issued to the property owner by the Luna County Code Compliance Officer or other designated County official, or a New Mexico State Building Official evidencing the fact that the requirements of this ordinance as set forth in this Ordinance, have been met.

"CID" State of New Mexico Construction Industries Division.

"Code" shall mean a standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law, any adopted uniform code pertaining to construction activities.

"Code Compliance Officer" shall mean the person designated by Luna County to enforce various County codes or ordinances.

"Community Liquid Waste System" A liquid waste system or sewerage system, publicly or privately owned and operated, including collection and treatment facilities constructed to serve one or more lots.

"Community Water System": A water system or utility, publicly or privately owned, that relies on surface and/or groundwater diversions other than wells permitted by the State Engineer under Section 72-12-1, NMSA, 1978, and that consists of common storage and/or distribution facilities operated for the delivery of water to multiple service connections. A community water supply system shall have sufficient water rights to serve all lots within the community. A community water system shall include mutual domestic water associations established in accordance with New Mexico law.

"Contiguous" refers to adjacent lots or parcels of land sharing a boundary line.

"County" shall mean Luna County, New Mexico.

"County Commission" shall mean the Board of County Commissioners of Luna County.

"Development" the use of any land; the carrying out of any building activity including construction, reconstruction, conversion or enlargement of any building or structure; the making of any material change in the use, or intensity of use, or appearance of any building, structure, or land; the establishment of a commercial parking lot or the dividing of land into lots, blocks, or parcels, including the construction of roads, the installation of water, sanitary sewer and stormwater management facilities or other utilities.

"Dwelling" any building or portion thereof, which is designed or used exclusively for residential purposes.

"Dwelling Unit, Accessory": A self contained living quarter attached to, or detached from, or under the same roof as the main or principal dwelling, located on the same site as the main or principal dwelling created by:

a) the conversion of an existing single family dwelling; or
b) the construction of an addition to an existing single family dwelling; or
c) the construction of a detached structure which is subordinate to the main of principal dwelling.

LUNA COUNTY-NM
KAREN SMYER, CLERK
201003201
2 of 13
08/12/2010 04:38:52 PM
BY ANDREA

2

The gross floor area of any such accessory dwelling unit shall be no larger than 50% of the gross floor area of the original main or principal dwelling.

"Dwelling, Apartment or Dwelling Multiple" a building or portion thereof that contains three (3) or more dwelling units, and for purposes of this Ordinance, includes residential condominiums. .

"Family" One (1) or more persons occupying a dwelling unit and living as a single housekeeping unit as distinguished from a group occupying a boarding house, dormitory, lodging house, or hotel, as herein defined.

"Fire Marshal" the Luna County Fire Marshall or a person discharging the duties of Fire Marshal.

"FPC" Fire Prevention Code.

"Flood Hazard Boundary Map" an official map issued by the Federal Emergency Management Agency, where the areas within special flood hazards are designated.

"Flood Prone Area" an area where a temporary condition of partial or complete inundation of normally dry land results from the unusual and rapid accumulation or runoff of surface waters.

"Footing" that portion of the foundation of a structure that spreads and transmits loads directly to the soil or piles.

"Grade Level" the lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than five (5) feet from the building, between the building and a line five (5) feet from the building.

"Habitable" as applied to any form of housing, such as manufactured homes, site built homes, or mobile homes, means that there are no known defects, damage or deterioration to the home which creates a dangerous or unsafe situation or condition. All plumbing, heating and electrical systems are in safe working order and must meet all applicable codes.

"IBC" International Building Code.

"IRC" International Residential Code.

"Inspector" shall mean the Luna County Building Inspector or the Code Compliance Officer or a person duly delegated by the Luna County Building Inspector or the Code Compliance Officer, or a person instructed or requested by the Luna County Building Inspector or the Code Compliance Officer to provide a written report with respect to any matter set out in this Ordinance.

"LCBO" shall mean the Luna County Building Official; see also Inspector and Building Official.

"Lot" shall mean a parcel of land occupied or intended for occupancy by one main building together with its accessory buildings and uses customarily incidental to it.

"Lot of Record" A lot which is part of a subdivision, the map or plat of which has been recorded in the office of the County Clerk of Luna County, or a lot described by metes and bounds or by survey plat prepared by a land surveyor licensed in the state of New Mexico, which has been recorded in the office of the County Clerk of Luna County.

"Modular Home" a standardized factory fabricated transportable building module not having a chassis or wheels of its own, designed and constructed in accordance with the International Building Code and intended to be placed on a permanent foundation and requires a building permit for installation.

"NFPA" National Fire Protection Association.

"NMBC" New Mexico Building Code.

"Non-Residential Property" a building or structure or parts thereof not occupied in whole or in part for the purposes of human habitation including the land and premises appurtenant thereto.

"Occupancy" shall mean the purpose that a building, or part thereof, is used or intended to be used.

"Officer" shall mean the Code Compliance Officer of Luna County, the person designated by Luna County to administer and enforce various codes and ordinances.

"Owner" shall mean any person, agent, firm or corporation having a legal or equitable interest in the property.

"Parcel" shall mean a unit of land capable of being described by location and boundaries and not dedicated for public or common use.

"Permit" shall mean an official document or certificate issued by the building official, the County Planner, or other authorized authority, as appropriate, authorizing performance of a specified activity.

"Person" shall mean a natural person including any individual, partnership, company, corporation, firm, association, trust, estate, foundation, state and federal agency, institution, county, city, town, village, or municipality or other legal entity, however organized.

"Property" shall mean any area, plot, or parcel of land in Luna County, which is under a common ownership or is separately identified for assessment by the Luna County Assessor's Office. Property shall include land under the ownership of the United States, the State of New Mexico, or any local government or school district entity. This definition is intended to be inclusive and not limiting, and shall therefore include all land within the boundaries of Luna County, New Mexico, except that the definition of property, and therefore this Ordinance, shall exclude property within the boundaries of the City of Deming and the Village of Columbus, and any hereafter incorporated municipality.

"Property Occupant" shall mean any person who is occupying any property, whether by legal right or without legal right.

"Property Owner" shall mean the person who is the recorded owner of any property according to the records contained in the Luna County Clerk's Office.

"Repair" shall mean the reconstruction, renewal, refinishing or refurbishing of all or any part of an existing building or structure, or property for the purpose of its maintenance.

"Residential Property" any property or building that is used, designed, or intended for use as a dwelling unit, dwelling, or apartment dwelling and includes the yards, accessory buildings and vacant property belonging to such property.

"Sewage" shall mean residential liquid wastes, commercial liquid wastes, industrial liquid wastes, and any drainage, but does not include storm water.

"Sewerage System" shall mean a system for transporting sewage owned and operated by Luna County, a municipality or a private disposal system approved by the state of New Mexico Environmental Department.

"Shall" shall be construed as mandatory.

"Site Built Residences" residences constructed at the permanent building site but which may incorporate the use of some prefabricated building components.

"Smoke Detector" an approved device that senses visible or invisible particles of combustion.

"Special Flood Hazard Area" land in the flood plain subject to a one percent or greater chance of flooding in any given year.

"Standards" the provisions and measures of physical conditions and occupancy set out in this Ordinance.

"Street or Road" shall mean all property dedicated or intended for public or private access to property, or subject to public easements therefore.

"Structure" shall mean that which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner. Without limiting the generality of the foregoing, structure shall include a wall, fence, sign or billboard.

"Temporary": applies to facilities or structures that are not of permanent construction, and are not intended to be permanently erected and maintained on a site. Tents and air supported structures are considered temporary for purposes of this Ordinance.

"Terrain Management" means the control of floods, drainage, and erosion and measures required for adapting proposed development to existing soil characteristics and topography.

"UMC" Uniform Mechanical Code.

"UPC" Uniform Plumbing Code.

"Utility Service" connection to an electrical service pole or other approved receptacle, or gas and water meter installation, but does not include electrical mainline extension or gas and water mainline extension or water main tap or meter box and setter installation.

"Use" shall mean the use for which land or buildings are occupied or maintained, arranged, designed, or intended.

"Variance" Any deviation from the Regulations of this Ordinance as approved by the Board of County Commissioners, where such variance will not be contrary to the public interest; however, the allowable use of the premises is not subject to change by variance.

"Wastewater" means the liquid-or water-carried wastes removed from residential properties, businesses, institutions and other uses, including bath and toilet wastes, laundry waste, and kitchen waste but not including toxic, hazardous, or industrial waste.

Words not Defined: Any word or term not defined in this Ordinance shall have the meaning ascribed to it in the Luna County Subdivision ordinance or the Luna County Zoning ordinance or the Deming/Luna County Extra-Territorial Zoning regulations, or they shall have their ordinary accepted meaning within the context with which they are used.

ARTICLE 2 BUILDING STANDARDS-GENERAL

2.1 Adoption of International Building code and Other Codes

Each and all of the regulations, provisions, penalties, conditions, terms and all appendices of the latest editions of:

2.1.1 International Building Code
2.1.2 International Residential Code
2.1.3 New Mexico Commercial Building Code
2.1.4 New Mexico Residential Code
2.1.5 National Electric Code
2.1.7 New Mexico Non-Load Bearing Straw Construction Building Code (Phase III)
2.1.8 New Mexico Plumbing Code
2.1.9 Uniform Plumbing and Mechanical Code
2.1.10 New Mexico Mechanical Code
2.1.11 New Mexico Electrical Code
2.1.12 New Mexico Electrical Safety Code (Phase III)
2.1.13 National Fire Protection Association, Fire Prevention Code
2.1.14 NFIP Regulations, 44 CFR, Section 60.3; Flood Insurance Study, and Flood Insurance Rate Map, effective October 19, 2010

Are hereby referred to, adopted and incorporated as fully as if set out verbatim herein and any amendments thereto, including the most recent additions, updates, revisions, or editions thereof.

2.2 Copies of Codes Available for inspection

One or more copies of applicable codes adopted in Article 2.1 of this Ordinance shall be available for review and inspection during regular business hours in the Office of the LCBO.

2.3 Fee Schedule

The Fee Schedule for Building Permits shall be established by the Luna County Board of County Commissioners. No permit shall be issued nor shall an application be considered complete prior to the receipt of said fee.

2.4 Building Permits Required

Any construction, residential or commercial or other use, any additions, expansions, repairs, remodel, or renovation to any building or structure, to include site built and modular buildings or structures, shall have a building permit issued by the LCBO or a New Mexico State Building Official, and follow procedures required by the Codes adopted in this ordinance. The Building Permit must be displayed in a conspicuous place at the building site. If the LCBO, or State Building Official or the Luna County Code Compliance Officer determines that the property for which a permit has been requested is in violation, has outstanding violations, or may be in non-compliance with any part of this Ordinance, or the Luna County Subdivision Ordinance, or any other applicable county, state or federal regulation, the LCBO, State Building Official or the Luna County Code Compliance Officer may deny issuance of the permit until such time as the property has been deemed compliant.

2.5 Exceptions to Requirement for Permits

a) One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11.15 m^2).
b) Fences not over 6 feet high.
c) Retaining walls that are not laterally supported at the top and that retain in excess of 36 inches (915mm) of unbalanced fill, unless supporting a surcharge or impounding class I, II or III-A liquids.
d) Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons (18,927L) and the ratio of height to diameter or width does not exceed 2 to 1.
e) Sidewalks and driveways not more than 30 inches (762mm) above grade and not over any basement or story below and which are not part of an accessible route.
f) Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
g) Temporary motion picture, television and theater stage sets and scenery.
h) Prefabricated swimming pools accessory to a group R-3 occupancy, as applicable in the NMRBC, which are less than 24 inches (610mm) deep, do not exceed 5,000 gallons (19,000L) and are installed entirely above ground.
i) Shade cloth structures constructed for nursery or agricultural purposes and not including services systems.
j) Swings and other playground equipment accessory to one- and two-family dwellings.
k) Window awnings supported by an exterior wall of group R-3, as applicable in the NMRBC, and group U occupancies.
l) Movable cases, counters and partitions not over 5 feet, 9 inches (1,753mm) in height.
m) Any work not otherwise regulated by the New Mexico construction codes and the CID rules.

2.6 Alternate Materials, Alternate Design and Methods of Construction

Pursuant to the International Building Code, and the International Residential Code, as amended from time to time, where materials, design and construction methods are specified in any of the Codes or Rules and Regulations adopted in Article 2 of this ordinance, alternate materials, design and methods of construction may be allowed provided any alternate has been approved, and is authorized by the Luna County Building Official (LCBO), or other authorized official.

The LCBO, or other authorized official, may approve any such alternate provided the LCBO, or other authorized official, is satisfied the proposed design is satisfactory and complies with the provisions of those codes and rules and regulations set out in Article 2 of this ordinance, and that the material and method of

work proposed is at least the equivalent of that prescribed in any of the codes and rules and regulations set out in Article 2 of this ordinance.

The LCBO, or other authorized official, shall require that sufficient evidence or proof to substantiate any claims made about alternate material, design or methods of construction. Without limiting the generality of the foregoing sentence, the LCBO may require a study and/or certificate of code compliance from a qualified engineer or architect as evidence or proof of claims made about alternate material, design, or methods of construction.

Whenever there is insufficient evidence of compliance with any of the provisions of this code or evidence that any material or construction does not conform to the requirements of this code, the LCBO, or other authorized official, may require tests by an approved agency as proof of compliance to be made at no expense to Luna County.

The details of any action by the LCBO, or other authorized official, granting approval of an alternate shall be recorded and retained in the files of the Luna County Building Official's Office or the County Planner's office.

2.7 Use of Waste Tires for Construction

2.7.1 No use of waste or scrap tires, baled or non-baled, or processed tires, or used tires for the construction of any building or structure is permitted on any site or lot in Luna County unless all of the following conditions are met to the satisfaction of Luna County:

a) such proposed use constitutes no environmental hazard and that it will not endanger the health or safety of the residents of Luna County. To this end, Luna County may require the owner or his/her authorized agent to produce and submit to the County an environmental impact assessment prepared by a qualified Environmental Consultant showing no adverse environmental impact. Prior to taking any decision, the County may consult with any state agency or it may engage its own consultant to undertake an oversight review of the environmental impact assessment prepared by the owner's or his/her authorized agent's consultant;

b) a building permit is obtained from the Construction Industries Division of the State of New Mexico;

c) written approval is obtained from the Fire Marshal, or other authorized official, which written approval shall state clearly that there is sufficient fire suppression measures in place on the lot or site; and, that in his/her opinion Luna County has the capability to effectively deal with any building or structure fire that may occur. The Fire Marshal may also prescribe specific fire prevention measures that shall be taken by the owner or his/her authorized agent;

d) the owner or his/her authorized agent shall submit design and construction plans to the County Planner and to the Construction Industries Division showing clearly the use of waste or scrap tires, or processed tires, and that such design complies with all requirements of the International Building Code. These drawings shall be stamped and signed by a professional engineer licensed in the State of New Mexico, or by an architect licensed in the State of New Mexico;

e) a financial guarantee in favor of Luna County, in the form of a bond, cashier's check, or other form satisfactory to the Luna County Attorney, and in an amount satisfactory to Luna County shall be posted with the County Clerk. The amount of the financial guarantee shall be sufficient to cover the full cost of any clean-up, disposal of materials, and the removal of all buildings and structures on the site or lot. The amount of the financial guarantee shall be in the sole discretion of Luna County. The owner, or his/her authorized agent shall keep the financial guarantee current. The County shall retain the right to request an increase in the

LUNA COUNTY-NM
KAREN SMYER, CLERK
201003201
7 of 13
08/12/2010 04:38:52 PM
BY ANDREA

7

financial guarantee as circumstances warrant. The financial guarantee shall be released at the time the project is completed to the satisfaction of the Building Official; and,

f) a permit for the proposed use is obtained from the Luna County Planning Department. The County shall not issue any permit unless and until it is fully satisfied that conditions set out in Article 2.6.1 a), b), c), d) and e) of this Ordinance have been fulfilled.

2.7.2 If the owner or his/her authorized agent, or any successor, fails to maintain full compliance with the conditions upon which approval of a proposed use is given, the County, after giving notice to comply, may revoke the permit. Upon revocation, all operations shall cease and site clean-up shall commence immediately.

2.8 On-Site Utility and Development Requirements

Approved on-site utilities, to include water, sewer, and electricity are prerequisite to issuance of a building permit. All housing units shall be connected to a waste disposal system permitted and approved by the New Mexico Environment Department, a domestic water well permitted by the New Mexico State Engineer, or be connected to an approved potable water utility whether private or municipal. For purposes of this section:

2.8.1 There shall be no multiple users connected to a domestic water well nor to any on-site liquid waste disposal system except for properly permitted community water systems and properly permitted cluster wastewater systems, or as otherwise provided herein.

2.8.2 All electrical, plumbing, and gas hookups shall be inspected and approved by an inspector of CID, as the case may be prior to occupancy and before a Certificate of Occupancy will be issued by the LCBO, or other authorized official.

2.8.3 Any water/well, sewer/septic, electric, or natural gas/LP utility provider that connects service to individual parcels before the land owner holds a valid building permit is in violation of this ordinance and the service shall be disconnected.

2.8.4 Any waste disposal system must be approved by the New Mexico Environment Department.

2.8.5 No building permit or other permit shall be issued until and unless the applicant for such permit can show to the satisfaction of the Luna County Planner, that the applicant has legal access to a lot or parcel of land either by means of a public road or by means of a properly recorded easement, and such access shall provide reasonable physical ingress and egress to and from the parcel of land.

2.9 Smoke Detectors

Smoke detectors shall be required in all dwelling units to include site built, and modular, occupied or installed after the effective date of this Ordinance.

2.10 Flood Hazard Installation Requirements

The Luna County Floodplain Manager is hereby appointed the Floodplain Administrator to administer and implement the Flood Hazard Installation provisions of this Ordinance and other appropriate sections of 44 CFR pertaining to floodplain management. No residential, commercial or other use or development shall be located or installed in a flood-prone area, such as a Flood Hazard Area as designated by the National Flood Insurance Rate Map for Luna County, or in, on, or over the path of an arroyo, or floodway without the prior approval of the County Floodplain Manager and the issuance of a floodplain development permit. All development and all construction related to such development shall comply with the minimum standards as adopted by, or may be amended by, the Federal Emergency Management Agency (FEMA). A new or replacement water supply system or sanitary sewage system may be required within a designated flood hazard area which shall be designed to minimize or eliminate infiltration of flood waters into the system as well as discharges from the system into flood waters, and the on-site waste disposal system must be located so as to avoid impairment of them or contamination from them during flooding.

2.11 Flood Hazard Installation Base Flood Elevation

All new construction and substantial improvements of structures designed for human occupancy being built in a special flood hazard area shall be constructed such that all electrical, heating, ventilation, plumbing and other service facilities are located so as to prevent water from entering or accumulating within the components during conditions of flooding and must meet one of the following conditions:

2.11.1 The lowest floor level elevated at least one (1) foot above the base flood elevation where base flood elevations are determined.

2.11.2 The lowest floor level, with respect to site built structures, elevated two (2) feet above the highest adjacent grade in areas where no base flood elevations are determined.

2.12 Flood Hazard Minimum Fill Requirement

Any building or structure to be constructed in "A" Zones, as designated by the National Flood Insurance Rate Map for Luna County, where no base flood elevations are determined, must have its lowest floor level constructed a minimum of two (2) feet above the highest adjacent grade. The material used to raise the lowest floor above the highest adjacent grade must be compacted to the satisfaction of the LCBO, the County Planner, or other authorized official, who may require that the landowner provide a report from a qualified geo-technical consultant that the soil is sufficiently compacted to accommodate the intended development. This section shall apply only to dwellings or structures erected or installed after the date of this ordinance as amended.

2.13 Storm Water, Grading, Drainage and Dust Control

2.13.1 No property owner shall alter the natural flow of storm water across their property in such a manner as to increase the flood hazard on other properties

2.13.2 Except for agricultural operations, no person shall clear any land of its natural vegetation without having in place and implementing a plan, approved by the Officer, to prevent soil, sand, dust, and building materials, construction waste or other materials from being blown by the wind from the said land. In the event the owner, lessee, occupant, or any agent or representative thereof having charge or control of such land fails or refuses to prevent such materials from being blown from the land by the wind, the County may take such corrective action as it deems advisable and the cost of doing so shall constitute a lien on the subject land.

2.14 Lighting

2.14.1 Lighting fixtures, lamps and their supports and connections shall be maintained in a safe and complete condition, without visible deterioration.

2.14.2 All properties that are being developed, remodeled, refurbished, or rehabilitated shall comply with the Night Sky Protection Act, NMSA 1978, § 74-12-1 through § 74-12-11.

2.15 Roofs

2.15.1 All roofs shall be kept clear of debris such as tires, concrete blocks, rocks, and other objects, materials, and structures not approved by the builder, manufacturer or installer, or for which a permit has not been issued.

2.16 Set-Back

2.16.1 All permitted structures shall have a twenty-five (25) foot set-back from the front property line, a five foot set-back from the side property line, and a five (5) foot set-back from the rear property line.

ARTICLE 3 ADMINISTRATION AND ENFORCEMENT

This Ordinance and all codes, rules, regulations and other provisions set out in said Ordinance shall be enforced by the Luna County Building Official (LCBO), who is certified by the State of New Mexico Construction Industries Division, and has such powers and duties as are enumerated in and set forth in the current provisions of the Codes adopted in Article 2 of this Ordinance, or by a Luna County Code Compliance Officer. Article 2 of this Ordinance may be enforced by an inspector employed by the State of New Mexico Construction Industries Division. The LCBO shall not enforce any code provisions pertaining to gas service installations or related matters.

3.1 Any Building Inspector of the Luna County Planning Office, and the Luna County Fire Marshall, and any Electrical Inspector of the State of New Mexico, and any Plumbing Inspector of the State of New Mexico, and any Environmentalist of the State of New Mexico Environment Department, and any Engineer or Technician or Technologist or Water Resource Specialist of the State Engineer's Office of the State of New Mexico, and any other qualified person, may be authorized by the Code Compliance Officer to help enforce the standards set out in this Ordinance, or may be requested by the Code Compliance Officer to give a written report, or other advice to aid in the administration and enforcement of this Ordinance.

3.2 Notice of Violation

3.2.1 In addition to the criminal penalties provided for in this Ordinance, any such violation, after reasonable efforts to secure voluntary compliance with this Ordinance have failed, shall be subject to abatement as follows:

a) Notice of Violation. (i) If, after inspection, or the observation of any County or State employee, the Officer is satisfied that a violation does exist, the Officer shall serve, or cause to be served by personal service, or send by prepaid registered mail to the owner of record of the property, or to the occupant or tenant of the property, or both, and to all persons shown by the records to have an interest in the property, a Notice of Violation setting out the particulars of the violation(s). The Notice shall establish that the abatement of the violation(s) by the owner, or occupant or tenant, or both, shall begin in not more than ten (10) days and shall be completed in not more than ninety (90) days after service of the Notice. The Notice shall be served at the owner's or occupant's or tenant's last known address; (ii) In the event a violation of this ordinance constitutes an immediate danger to the public health and safety, the notice provisions of this subsection shall not apply, and the violation may be prosecuted and abated immediately.

b) Placard. If the Officer is unable to achieve service under Article 3.2.1 a) he/she may place a placard containing the terms of the Notice in a conspicuous place on the property or building, and the placing of the placard shall be deemed to be sufficient service of the Notice on the Owner or other persons.

c) Extension of Time Frame for Abatement. Where the Officer is satisfied that there is good and sufficient reason to extend the time frame for abatement of the violation(s), he/she may extend the time frame set out in Article 3.2.1 a) above for a period of time not to exceed forty-five (45) days beyond the time period set out in the original Notice.

d) Failure to Correct. In the event the owner, occupant or tenant of the property where the violation exists, has failed to correct the violation(s) within the prescribed period of time, then the Officer shall issue a citation or file a complaint charging violation of this Ordinance with the Magistrate Court, or other appropriate court of jurisdiction, demanding that the owner of the property, or the occupant, or both, be held to answer to the Court for the violation.

3.3 Certificate of Occupancy/Compliance

LUNA COUNTY-NM
KAREN SMYER, CLERK 10
201003201
10 of 13
08/12/2010 04:38:52 PM
BY ANDREA

3.3.1 All buildings or structures, to include site built, and modular, whether titled or untitled are subject to this Ordinance and shall, prior to use, be inspected by the LCBO, or other authorized official.

3.3.2 Following the final inspection of a building or structure, the Officer will issue a Certificate of Occupancy/Compliance, when the building or structure is in compliance with the standards of this Ordinance.

3.4 Prohibition

3.4.1 The Code Compliance Officer may issue a Notice prohibiting the occupancy of any unsafe or uninhabitable building.

3.5 Citation Uniform Non-Traffic

3.5.1 The use of uniform non-traffic citation forms is authorized for use in enforcement of this Ordinance, except as otherwise provided.

3.6 Penalties and Remedies

Any person violating or failing, or refusing to comply with the provisions of this Ordinance and the Codes adopted may be prosecuted in any court of competent jurisdiction within the County, and shall be punished by a fine of not more than three hundred dollars ($300), the Board of County Commissioners may apply to the District Court for appropriate injunctive relief to compel compliance by any person whose conduct violates any provision of this Ordinance. The County shall be entitled to recover a reasonable attorney's fee if required to enforce this Ordinance through the issuance of a demand letter, or in enforcing any portion of this Ordinance in any Court of competent jurisdiction. After the effective date of this ordinance, all violations are subject to issuance of a citation.

3.7 Variance

3.7.1 It is the intention of the Board of County Commissioners that all variances be temporary in duration. The County Commission may grant a variance to the regulations set out in Article 4.2 of this Ordinance for the sole purpose of permitting one accessory dwelling unit on any property in Luna County on the following grounds only:

a) To provide living accommodation to an immediate member of the family of the owner-occupant of the principal dwelling unit which family member requires immediate and urgent care because he/she is disabled, physically or mentally infirm, has a disease which is or will become debilitating, or is incapable of being gainfully employed because of their condition. A certificate or letter signed by a physician licensed in the State of New Mexico attesting to the medical condition and the need for care of the family member who will occupy the accessory dwelling unit shall be required by the County Commission as proof of the medical condition.

3.7.2 The County Commission shall not grant any variance which will cause the County to incur or absorb any costs. In granting any variance the County Commission may impose such conditions as will:

a) Substantially secure the objectives of the standards set out in this Ordinance;

b) Not adversely affect the health safety and general welfare of the general public and the immediate property owners;

c) Impose whatever time limits may be reasonable and appropriate in the circumstances. Any variance granted shall be for a period of time not to exceed three (3) years from the date of granting such variance. If necessary, the variance may be renewed prior to the expiration of the term of the variance upon written application by the owner-occupant. Such renewal shall be for a period of

time not to exceed three (3) years. All variances granted by the County Commission must be renewed prior to the expiration of either the initial time limit imposed by the County Commission or any renewal period granted by the County Commission. There shall be no limits on the number of renewals provided the reason for the initial variance remains valid;

d) Impose conditions on the type, quality and design of any proposed construction;

e) Impose height limits;

f) Require buffering in the form of fencing and/or vegetation to protect and shield adjacent land uses;

g) Ensure compatibility with other development in the adjacent area. Compatibility as used here shall include, but is not limited to the following: land use, height, scale, density, water supply and liquid waste disposal facilities; and,

h) Accomplish any other purpose and effect deemed advisable and appropriate by the County Commission.

3.7.3 Procedure. The following procedure shall apply to all requests for a variance:

a) All requests for a variance shall be in writing and submitted to the Luna County Planner. The written request shall set out the following information:

i. a description of the specific variance requested;

ii. the reasons for the request;

iii. the supporting information, such as medical certificates, for such request;

iv. the period of time for which the variance is necessary (initial variance may be for a maximum three year period, subject to renewal);

v. a description of the action the owner-occupant will take to discontinue the use of, and remove, the additional accessory dwelling when the reason for the variance no longer exists.

b) The County Planner shall review the written request for variance for completeness and shall, within ten (10) days of receipt of the request, inform the applicant either that the request is complete or the nature of any additional information that is required. Until the request is complete, no further action shall be taken by the County Planner or the County Commission.

c) The County Planner shall confer with and seek the advice of the Code Compliance Officer and the County Attorney, as appropriate, with respect to the request for variance.

d) The County Planner shall notify all property owners within five hundred (500) feet of the subject property by first class regular mail at least ten (10) days prior to the County Commission meeting at which the variance application will be heard. Such notice shall briefly describe the nature of the variance and the date, time and location of the hearing.

e) The County Planner shall submit a written report together with his/her recommendation to the County Commission five (5) days prior to the hearing date.

f) The County Board of Commissioners shall hold a public hearing on all requests for a variance, or a renewal of a variance, under this section. The public hearing shall be held at a regularly scheduled County Commission meeting. The public hearing shall be considered a quasi-judicial proceeding to be conducted in accordance with quasi-judicial procedures adopted by the County Commission.

LUNA COUNTY-NM
KAREN SMYER,CLERK
201003201
12 of 13
08/12/2010 04:38:52 PM
BY ANDREA

12