Technical Review of 2018 PM_{10} Exceptional Event Demonstrations, dated October 09, 2020

Introduction

The U.S. Environmental Protection Agency (EPA) promulgated the original Exceptional Events Rule (EER) in 2007, hereafter referred to as "2007 EER," pursuant to the 2005 amendment of the Clean Air Act Section (CAA) 319. The 2007 EER was in effect until September 30, 2016, when a revised EER was promulgated by the EPA (See, 81 FR 68216, October 3, 2016) hereafter referred to as "2016 EER." The subject Exceptional Event Demonstration hereafter referred to as "demonstrations," was submitted in accordance with the 2016 EER. The Exceptional Event federal regulations are found at 40 CFR 50.14.

In the demonstrations, the New Mexico Environment Department (NMED) requests the EPA concur that the subject measurements of particulate matter of less than or equal to10 micrometers in diameter (PM_{10}) which exceeds the National Ambient Air Quality Standard (NAAQS) be excluded from the data set used for certain regulatory decisions, as outlined in the 2016 EER. After considering the information provided and using a weight of evidence analysis as provided in the demonstrations, the EPA shall concur or non-concur with the Air Quality System (AQS) database flagging of each exceedance of the NAAQS and the state's demonstrations. For the purposes of this document, there is a "demonstration" for each exceedance day or wind event.

Procedural Requirements

The 2016 EER includes certain scheduling and procedural requirements as specified in 40 CFR 50.14(c) that an air agency must follow: 1. Public Notification; 2. Initial Notification of the Potential EE; and 3. Submission of the demonstration. For example, data claimed to be caused by an exceptional event must be flagged in the AQS database by the air agency. The air agency is also to provide the EPA with an initial notification for the potential exceptional event and conduct a 30-day public comment period for the demonstration. Failure to meet the procedural requirements results in the EPA non-concurrence with the AQS flagging of the exceedances.

In accordance with 40 CFR 50.14(c), the NMED flagged the subject exceedances in AQS as "High Winds" events, i.e., the "RJ" qualifier flags. The NMED submitted an initial notification to the EPA on July 16, 2018. The NMED solicited public input on the draft demonstrations from September 2, 2020, through October 2, 2020. The NMED met the scheduling and procedural regulatory provisions of the 2016 EER for the demonstrations.

Required Demonstration Content

In accordance with 40 CFR §50.14(c)(3), a demonstration to justify data exclusion must address the criteria discussed below.

1) A narrative conceptual model.
   a) Pursuant to 40 CFR §50.14(c)(3)(iv)(A), the demonstration shall provide a narrative conceptual model that describes the event(s) and how emissions from the event(s) led to the exceedance or violation at the affected monitor. The demonstration includes a narrative conceptual model for each exceedance.

2) Evidence there was a clear causal relationship between exceedance and event.
   a) Pursuant to 40 CFR §50.14(c)(3)(iv)(B), the demonstration shall provide evidence that there was a clear causal relationship between the measurement under consideration and the event claimed to have affected the air quality in the area. The clear causal criterion is addressed below for each exceedance.

3) Analyses comparing event influenced concentrations to other concentrations at the monitors.
   a) Pursuant to 40 CFR §50.14(c)(3)(iv)(C), the demonstration shall provide an analysis of the exceedance compared to measurements at the same monitor at other times. The historical data comparison criterion is addressed below for each exceedance.

4) Evidence the event was not reasonably controllable or preventable.
   a) Pursuant to 40 CFR §50.14(c)(3)(iv)(D), the demonstration shall provide evidence the event was both not reasonably controllable and not reasonably preventable.
      i) Not Reasonably Preventable - In accordance with 40 CFR §50.14(b)(5)(iv), the air agency will not be required to provide a case-specific justification that the event was not reasonably preventable for a high wind dust event. As discussed in more detail below for the clear causal criterion that includes the not reasonably preventable criterion, the NMED showed that a high wind dust event caused each exceedance. Therefore, the NMED was not required to provide a case-specific justification for the not reasonably preventable criterion.
      ii) Not Reasonably Controllable, Undisturbed Land Sources - A high wind threshold is defined by 40 CFR §50.1(q) as the minimum wind speed capable of causing particulate matter emissions from natural undisturbed lands in the area affected by a high wind dust event. The NMED showed wind speeds were sustained above the high wind threshold for each exceedance. Therefore, emissions from upwind undeveloped lands met the not reasonably controllable criterion and could not have been reasonably controlled.
      iii) Not Reasonably Controllable, Anthropogenic Sources – This criterion is addressed below for each day of exceedance.

5) Evidence the event was caused by human activity unlikely to recur or was a natural event
   a) According to 40 CFR §50.14(c)(3)(iv)(E), the demonstration must provide evidence that the event was a human activity unlikely to recur or was a natural event. In accordance with 40 CFR §50.14(b)(5)(ii) and (b)(8), a high wind dust event is considered a natural event if the demonstration shows all anthropogenic sources are reasonably controlled.
   b) As discussed below for the clear causal criterion, the NMED showed that a high wind dust event caused each exceedance. Also as discussed below for the reasonable control of anthropogenic sources criterion, the NMED showed that the anthropogenic sources were reasonably controlled for each exceedance. Therefore, the high wind dust event that caused each exceedance is a natural event.

6) Records of a 30-day public comment period with copies of and responses to comments
   a) Pursuant to 40 CFR §50.14(c)(3)(v)(A), the demonstration shall provide evidence the air agency conducted a 30-day comment period. The demonstration must include records of the 30-day public comment period conducted for the demonstration. The NMED did not receive comments during the public comment period. The NMED provided records of the 30-day public comment period conducted for the demonstration.

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Summary

The NMED asserts that 7 wind events in calendar year 2018 caused 18 exceedances of the NAAQS level for PM_{10} from 5 monitors on 5 sites in Luna and Dona Ana Counties, New Mexico. The measurements exceeded the NAAQS level of 150 micrograms per cubic meter ($\mu g/m^3$) for PM_{10} using 24-hours averaging time.

Exceedance Day	Anthony 35-013-0016	Chaparral 35-013-0020 POC 2	Desert View 35-013-0021 POC 2	Holman 35-013-0019 POC 2	Deming 35-029-0003 POC 2
March 15	**200**		**229**		
April 12	**204**	**202**	**325**		**227**
April 13	**225**	**326**	**328**		
May 2	**259**	**215**	**264**	**251**	
June 2				**158**	
June 3		**186**			
June 13					**186**

Table of 2018 PM_{10} Exceedances ($\mu g/m^3$) in Demonstrations

The NMED operates 5 monitor sites in Dona Ana County (Chaparral, West Mesa, Anthony, Desert View, Holman) and 1 site in Luna County (Deming) which report PM_{10} NAAQS comparable data. NMED operates a Manual (35-013-0016-81102-1, POC 1) and Continuous (35-013-0016-81102-2, POC 2) PM_{10} monitor at the Anthony site.

TCEQ operates 5 sites in adjacent El Paso County. Four report PM_{10} NAAQS comparable data (Ojo 48-141-1021, Ivanhoe 48-141-0029, Riverside 48-141-0038, Van Buren 48-141-0693). One site report non-NAAQS comparable data (Chamizal 48-141-0044).

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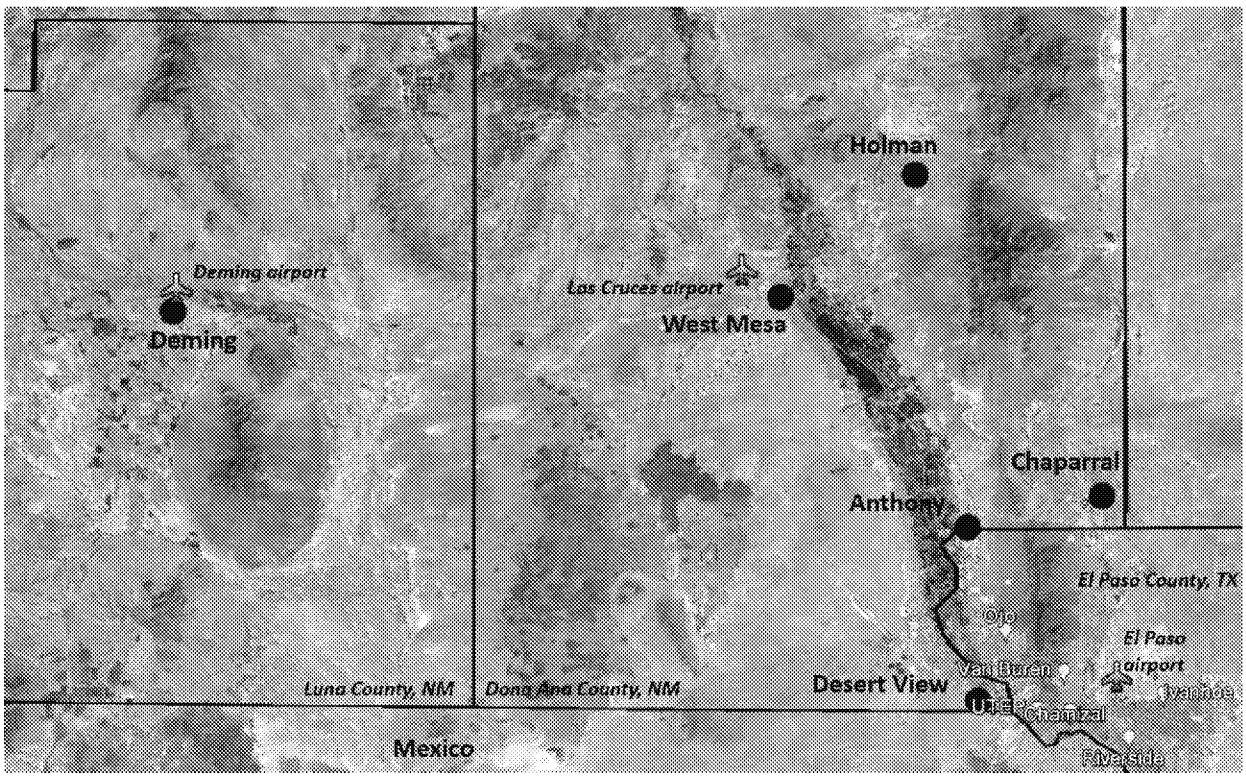


Map of area, PM_{10} monitor sites, and local airports

General Background on EPA Review

The NMED claims the exceedances were caused by high wind dust events. A high wind dust event is defined by 40 CFR §50.1(p) as an event that includes the high-speed wind and the dust the wind entrains and transports to a monitor site. On April 4, 2019, the EPA released guidance for the preparation of demonstrations for high wind dust events (*Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Influenced by high wind dust events Under the 2016 Exceptional Event Rule*, EPA-457/B-19-001, April 2019) (hereinafter "Guidance").

A high wind threshold is defined by 40 CFR §50.1(q) as the minimum wind speed capable of causing particulate matter emissions from natural undisturbed lands in the area affected by a high wind dust event. As specified 40 CFR §50.14(b)(5)(iii), the EPA will accept a high wind threshold for New Mexico of a sustained wind of 25 miles per hour (mph). As stated in the preamble to the 2016 EER (81 FR 68257-68258), the high wind threshold clarified the "level of evidence needed to demonstrate not reasonably controllable" and "should be representative of conditions that are capable of overwhelming reasonable controls…on anthropogenic sources and/or causing emissions from natural undisturbed areas."

Per the April 2019 Guidance, "[w]hen evaluating measured sustained wind speeds, EPA will generally accept that the sustained wind was at or above the area-specific high wind threshold in cases where there was at least one full hour in which the hourly average wind speed was at or above the area specific high wind threshold. EPA will consider a sustained wind speed based on shorter averaging times (e.g., 1 to 5 minutes) on a case-by-case basis. EPA may also consider multiple occurrences of high wind measured at

shorter averaging times as part of the weight-of-evidence demonstration, even if the hourly average was not above the threshold." [pg. 13]

"Meteorological events involving high temperatures or lack of precipitation (*i.e.*, … drought) also do not directly cause pollutant emissions and are not considered exceptional events. However, [these] conditions …may promote occurrences of…high wind dust events, which do directly cause emissions." [pg. 4]

"Cases where dust was entrained by sustained winds at or above the high wind threshold upwind of the monitor and …transported at lower wind speeds to the monitor could still qualify for the basic controls analysis category, but in such cases, the state should show that sustained winds were at or above the… threshold in the expected source area. Cases of long-range transport (*e.g.*, >50 miles) could still qualify for a basic controls analysis but air agencies may need to include supplementary analyses such as a trajectory analysis…or satellite plume imagery…" [pg 16, footnote 28]

Per the April 2019 Guidance, the EPA intends to use a tiered approach for evaluating whether a demonstration shows that a high wind dust event and its emissions were not reasonably controllable. Large-scale and high-energy high wind dust events are Tier 1. Tier 2 events have sustained wind speeds at or above the high wind threshold. Tier 3 are all other events. None of the subject events qualify as a Tier 1 event. [See pgs. 14-16]

Per the concurrence prohibition of 40 CFR 50.14(b)(9), the EPA cannot concur on AQS flagged exceedances unless the Mitigation Plan requirement has been met. Air agencies are required to submit Mitigation Plans for areas with known, recurring events (See 40 CFR 51.930). The 2016 EER promulgation notified air agencies with areas initially subject to the Mitigation Plan requirements.

With the 2016 EER promulgation, the EPA notified NMED that Dona Ana and Luna Counties are subject to the Mitigation Plan requirement for PM_{10} data influenced by high wind dust events. The required NMED Mitigation Plan was submitted on September 25, 2018, and on October 29, 2018, the EPA deemed the plan complete. The NMED met its Mitigation Plan obligations. Therefore, the concurrence prohibition of 40 CFR 50.14(b)(9) does not preclude the EPA from concurring with the subject exceedances.

Other Information

In this document, use of "page x' or 'figure x" are a reference to a page or figure in the demonstrations. The NMED uses meteorological data from the La Union (35-013-0008) site as a proxy for the Anthony site (page 5). The La Union site is about 5 miles south southwest of the Anthony site. In the demonstration, the terms "Wind Gust" and "Wind Max" reflect instantaneous wind data.

The high wind threshold is expressed in miles per hour (mph). The NMED uses meter per second (m/s) for wind speed in the demonstration. Meteorological data in AQS expresses wind speed in knots. In this document, wind speed data has been converted to mph.

NOAA provides airport meteorological data (www.ncdc.noaa.gov/cdo-web/datatools/lcd) and reported storm events information (www.ncdc.noaa.gov/stormevents/). NOAA HYSPLIT modeling using archived weather data is available at (ready.arl.noaa.gov/HYSPLIT_traj.php).

MARCH 15, 2018

The exceedances occurred on March 15, 2018, hereafter referred to as the "exceedance day", at monitor sites in Dona Ana County. The monitors and exceedances are:

Site Name	Monitor AQS ID	Exceedance, Measurement
Anthony	35-013-0016-81102	200 $\mu g/m^3$
Desert View	35-013-0021-81102	229 $\mu g/m^3$

MARCH 15, 2018, EXCEEDANCE DAY, clear causal relationship.
In the demonstration, NMED states "As the event unfolded, the wind blew from the southwest throughout the border region."

Table 3-2 on page 2 shows hourly wind data from the Anthony and Desert View monitor sites for certain hours on the exceedance day. Hourly wind speeds did not exceed 25 mph at either the Anthony or Desert View sites. The table below shows the winds at Desert View, however, exceeded 25 mph for at least 5 minutes on several occasions between 1:30 pm and 2:20 pm. Wind gusts of 35 and 42 mph were measured at the Anthony and Desert View sites, respectively.

Hour	**Wind speed (mph)**
1:35pm	28
1:40pm	27
2:10pm	25.5
2:20pm	25

Figures 3-7 and 3-8 on pages 7 and 8 shows the frequency distribution of wind direction correlated with PM_{10} data at Anthony and Desert View for the hours when PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. The figures show most of the winds were from the southwest with some from the west.

Figure 3-4 on page 4 shows hourly wind speed data at the Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming monitor sites on the exceedance day. The winds exceeded 25 mph for multiple hours at Chaparral, Holman, Deming, and West Mesa. The winds at Desert View approached the 25-mph high wind threshold. AQS data shows the winds at Chaparral peaked at 22 mph for multiple hours. Chaparral was upwind of Anthony on the exceedance day.

On the exceedance day, AQS data shows the hourly wind speeds at the Santa Teresa monitor site (AQS ID 35-013-0022) reached 25 mph during the 2:00 pm hour and exceeded it during the 5:00 pm hour. Santa Teresa is near the Mexico border about 16 miles southwest of Anthony and about 6 miles west of Desert View.

On the exceedance day, AQS data shows the hourly wind speeds at the Ojo monitor site in El Paso County reported elevated hourly wind speeds between 18 and 22 mph for multiple hours. The hourly

wind speed at Ojo peaked at 4:00 pm at 21 mph. Ojo is the closest of the El Paso County monitor sites to New Mexico at about 5 miles northeast of Desert View and 10 miles southeast of Anthony. Both the Chamizal, and Socorro monitor sites in El Paso County also reported elevated hourly wind speeds that peaked at between 20 and 26 mph.

The Las Cruces airport is about 27 miles northwest of Anthony. On the exceedance day, winds at the airport were reported at 26 mph for multiple hours. During this period, the winds were from the west southwest, and gusts reached 49 mph. The overall weather type for the exceedance day was sunny with afternoon haze, dust and smoke beginning at 4:00 pm (Weather Type HZ:7|FU|HZ).

The Deming airport is in Luna County about 68 miles northwest of Anthony. On the exceedance day, winds at the airport exceeded 28 mph for multiple hours. During this period, the winds were from the west southwest, and gusts reached 50 mph. The overall weather type for the exceedance day was sunny. During the hours of 12:00 pm to 3:00 pm weather type was listed as haze, smoke and blowing dust (Weather Type HZ:7|FU|HZ).

The El Paso airport is about 18 miles southeast of Anthony. On the exceedance day winds at the airport peaked at 38 mph. From about 12:30 pm to 6:00 pm, the weather type was shown as blowing dust (Weather Type BL DU), gusts reached 54 mph, and the winds were from the west southwest. The overall weather type for the exceedance day was broken clouds and "Dust, volcanic ash, blowing dust, blowing sand or…obstruction" (Weather Type BL|DU|DU).

The narrative on page 6 and Figure 3-3 on page 3 discusses the National Weather Service (NWS) wind advisory forecast for the southwestern New Mexico area on the exceedance day.

The NOAA Storm Events Database shows that on the exceedance day, high windstorm events were reported in various Dona Ana County areas with wind gusts over 60 mph. The events started about 2 pm and ended between 4 pm and 6 pm.

Figure 3-5 on page 6 shows a satellite image taken on the exceedance day. The NMED indicates the image shows dust plumes in Mexico along the southeastern New Mexico and El Paso areas.

Figure 3-14 on page 11 shows the 24-hours PM_{10} measurements from the Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming monitor sites on the exceedance day. While Desert View and Anthony measured exceedances, the other site measurements were above the monitor averages: Chaparral 133 $\mu g/m^3$ (average 16 $\mu g/m^3$), West Mesa 53 $\mu g/m^3$ (average 16 $\mu g/m^3$), and Deming 97 $\mu g/m^3$ (average 23 $\mu g/m^3$). The Chaparral measurement was the closest to the NAAQS level of 150 $\mu g/m^3$.

The PM_{10} manual monitors in El Paso County sampled on the exceedance day. AQS data shows the 24-hours measurements were above the monitor averages: Socorro 114 $\mu g/m^3$ (average 30 $\mu g/m^3$), Riverside 69 $\mu g/m^3$ (average 29 $\mu g/m^3$), Ivanhoe 56 $\mu g/m^3$ (average 20 $\mu g/m^3$), Van Buren 91 $\mu g/m^3$ (average 30 $\mu g/m^3$). Ojo is the closest at about 5 miles northeast of Desert View and 10 miles south of Anthony. Van Buren and Ivanhoe are approximately 7 and 15 miles east of Desert View, respectively. Riverside and Socorro are about 13 and 19 miles southeast of Desert View, respectively.

The Chamizal site in El Paso County reports PM_{10} non-NAAQS comparable measurements. On the exceedance day, Chamizal 24-hours measurement of 144 $\mu g/m^3$ is above the site average of 25 $\mu g/m^3$. Chamizal is about 8 miles east of Desert View.

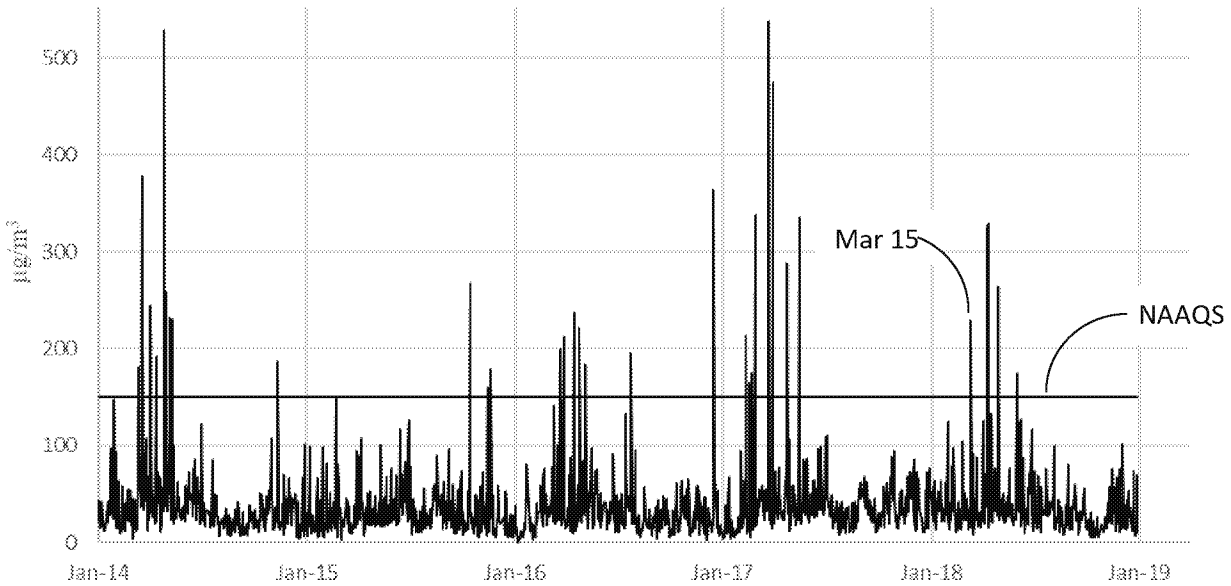
Figures 3-10 and 3-11 on page 9 show the hourly wind speeds and PM_{10} data at Anthony and Desert View on the exceedance day. The elevated hourly PM_{10} measurements correlate with elevated wind speeds.

Figure 3-9 on page 8 shows the hourly PM_{10} data at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming on the exceedance day. The elevated PM_{10} data correlate with elevated hourly wind speeds shown in Figure 3-4 on page 4.

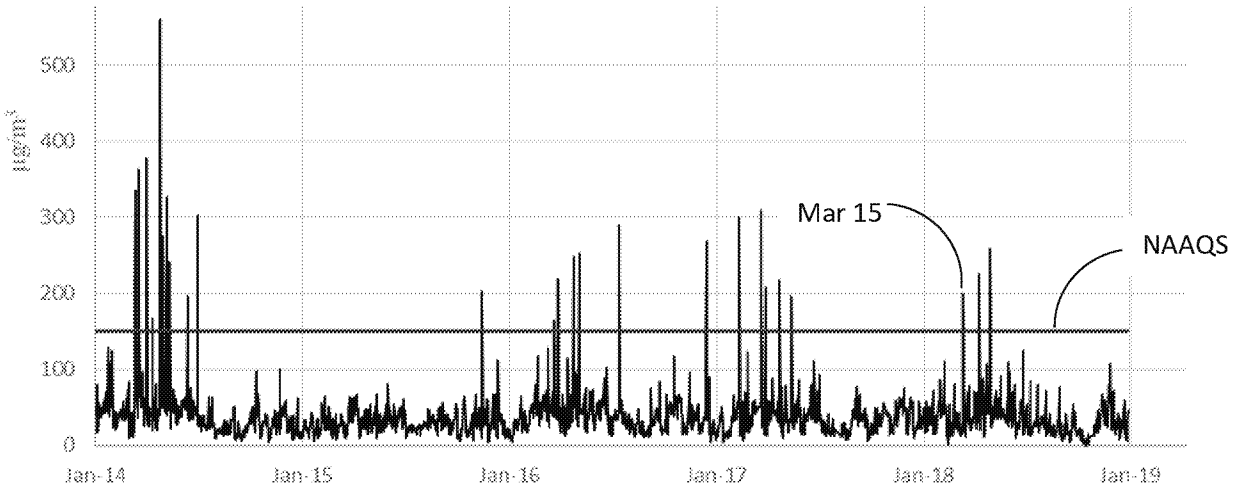
There are independent weather reports, evidence of blowing dust, and wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitors correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedance are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion and using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedances at the monitors on the exceedance day.

MARCH 15, 2018, EXCEEDANCE DAY, analyses comparing event concentrations to other concentrations at the monitor.

The graphs below reflect the 24-hours monitor data from 2014 to 2019 for the Desert View and Anthony sites. The site measurements for the days surrounding the exceedance day did not approach the NAAQS level. The measurements on the exceedance day are above the 95th percentile of historical site data.



24-hours Measurements, Desert View PM_{10} Monitor, 35-013-0021-81102-2



24-hours Measurements, Anthony PM_{10} Monitor, 35-013-0016-81102-1

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at these monitors indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the exceedances and the wind incident on the exceedance day.

MARCH 15, 2018, EXCEEDANCE DAY, not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources - The 25 mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at Desert View and Anthony did not exceeded the threshold on the exceedance day. While the hourly wind speeds at Desert View did not reach the threshold, the winds exceeded 25 mph for 5 minutes at different times during the elevated dust event. The Anthony site experienced multiple gusts that approached 25 mph during the timeframe of the elevated PM. The next closet meteorological station at the El Paso airport did measure wind speeds above 25 mph for multiple hours. The elevated winds were mostly from the southwest with some from the west.

The Desert View monitor site is in the city of Sunland Park, New Mexico. The city has a population of about 15,000. The Desert View site is located on the western city limits. Beyond the city to the west, except for a nearby landfill, there are undeveloped lands all the way to the Arizona border. The Texas and Mexico borders are about 1 mile to the northeast, and 3/4 of a mile to the south of Desert View, respectively. To the southeast of Desert View, there are undeveloped lands to the Mexico border. On the exceedance day, there could have been upwind anthropogenic sources in about 1 mile of lands in the city of Sunland Park before reaching the Texas border. The demonstration does not discuss any specific sources in the city of Sunland Park nor controls for the sources. The city of El Paso, Texas, extends to about 18 miles east of Desert View. Beyond the city of El Paso to the east is mostly undeveloped Texas lands for hundreds of miles.

Anthony, New Mexico is a small city in Dona Ana County with a population of about 9,300. A portion of the city of Anthony is currently in non-Attainment for PM_{10}. The Anthony monitor site is in the non-attainment area about 700 feet north of the Texas border. To the west of the city is mostly undeveloped lands all the way to the Arizona border. To the southeast of the monitor are lands in Texas. The developed land of the city extends about one mile to the east of the Anthony monitor site. Further to the east there is the Chaparral community in Dona Ana County, and the active Permian Basin oil field close to the Texas border. Generally, most of the land to the east is arid and undeveloped.

The NMED indicates anthropogenic sources near the monitor sites include disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

The NMED indicates that natural areas of the Chihuahua Desert in Dona Ana, Luna, and Hidalgo Counties are the most likely sources, under NMED's jurisdiction, contributing to the high wind blowing dust event. Other natural sources located in Texas and Chihuahua, Mexico likely also contributed to the exceedances on this day.

Portions of the city of Anthony were upwind of the Anthony site on the exceedance day. The demonstration provides information on the Anthony SIP. Due to recurring impacts from non-anthropogenic sources deemed to contribute significantly to PM_{10} exceedances, the EPA waived the area attainment deadline for the Anthony SIP. The SIP was approved more than 6 years before the exceedance day; however, because of the waiver the NMED is not obligated to revise the SIP. See 40 CFR 50.14(b)(8)(v). Therefore, during the demonstration review, the EPA considered the Anthony SIP limited controls, e.g., treat and pave area roads as funding allows, as part of the review of whether anthropogenic sources were reasonably controlled on the exceedance day. Appendix C of the demonstration provides a letter from the city of Anthony dated September 18, 2019, that reports on the status of local dust control efforts including road paving.

Portions of Dona Ana County were upwind of the Anthony and Desert View monitor sites on the exceedance day. The demonstration provides information on the Dona Ana County Dust ordinance. The ordinance requires a plan for dust controls on disturbed site. The controls required by the ordinance would have applied to any upwind disturbed sites in the county. The NMED indicates the implementation and enforcement of any controls occur at the local level. During the subject widespread high wind event, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at the Anthony and Desert View sites.

Figure 3-6 on page 7 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the models with the trajectories ending at the "start" of the exceedance day wind event, at the Anthony monitor site location. The results show that the winds could have been in Chihuahua Mexico prior to reaching the Anthony and Desert View sites. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

APRIL 12, 2018

The exceedances occurred on April 12, 2018, hereafter referred to as the "exceedance day", at monitor sites located in Dona Ana County. The monitor and exceedance are:

Site Name	Monitor AQS ID	Exceedance Measurement
Anthony	35-013-0016-81102-1	204 $\mu g/m^3$
Chaparral	35-013-0020-81102-2	202 $\mu g/m^3$
Deming	35-029-0003-81102-2	227 $\mu g/m^3$
Desert View	35-013-0021-81102-2	164 $\mu g/m^3$

APRIL 12, 2018, EXCEEDANCE DAY, clear causal relationship.
In the demonstration, the NMED states "[a]s the event unfolded, the wind blew from the southwest throughout the border region."

Table 4-2 on page 14 shows hourly wind data from the Desert View, Chaparral, and Deming monitor sites for certain hours on the exceedance day. The maximum hourly wind speed at Desert View was 22 mph. The maximum hourly wind speed for Deming was 32 mph. The maximum hourly wind speed at Chaparral was 26 mph. The maximum hourly wind speed at La Union was 26 mph.

Figure 4-7 on page 19, Figure 4-8 and 4-9 on page 20, and Figure 4-10 on page 21 shows the frequency distribution of wind direction correlated with PM_{10} data at Anthony, Chaparral, Deming, and Desert View for the hours when PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. The figure shows the winds were from the west, south, and southwest.

Figure 4-4 on page 16 shows hourly wind data at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming monitor sites, on the exceedance day. The winds at all the sites started to elevate about 6:00 am with notable spikes from 10 am to 6 pm on the exceedance day. While the winds at Desert View approached the threshold, only the winds at West Mesa, Holman, Chaparral, La Union, and Deming exceeded 25 mph.

On the exceedance day, AQS data shows the hourly wind speeds at the Santa Teresa monitor site reached a peak of 25 mph at 3 pm. Santa Teresa is about 6 miles west of Desert View.

On the exceedance day, AQS data shows the hourly wind speeds at the Skyline (AQS ID 48-141-0058) and Van Buren monitor site in El Paso County exceeded 25 mph for multiple hours. Skyline and Van Buren are about 11 miles northeast, and 7 miles east of Desert View, respectively. The hourly winds at the Ascarate monitor site (AQS ID 48-141-0055) reached 25 mph at 3 pm. Ascarate is about 11 miles east of Desert View. Ivanhoe and Chamizal also had elevated hourly wind speeds that peaked at between

21 and 26 mph at about 1 pm. Ivanhoe and Chamizal are about 8 and 15 miles east of Desert View, respectively. The monitor sites in El Paso County were not upwind of Desert View on the exceedance day.

The Las Cruces airport is about 40 miles north of Desert View. On the exceedance day the winds at the airport exceeded 25 mph from 12 pm through midnight. The winds were from the southwest, and gusts reached 49 mph. The overall weather type for the day was clear and sunny (Weather Type CLR).

The El Paso airport is about 11 miles east of the Desert View site. On the exceedance day the winds at the airport exceeded 25 mph from 10 am through midnight. The winds were from the west southwest, and gusts reached 48 mph. The overall weather type for the day was 'Dust, volcanic ash, blowing dust, blowing sand or…obstruction' (Weather Type BL|DU).

The Deming airport is about 74 miles northwest of Desert View. On the exceedance day winds at the airport exceeded 25 mph from 11 am through midnight and wind gusts reached 54 mph. The winds were from the west southwest. From 2:50 pm through 5:30 pm the weather type was 'Haze, blowing dust ash…obstruction' (Weather Type HZ|FU|HZ).

Figure 4-20 on page 26 shows the 24-hours PM_{10} measurements from the Anthony, West Mesa, Chaparral, Holman, Desert View (light blue line), and Deming (green line) monitor sites on the exceedance day. The 24-hours PM_{10} measurements at the Desert View, Anthony, Deming, and Chaparral sites were above NAAQS level of 150 $\mu g/m^3$. Holman approached the NAAQS 149 $\mu g/m^3$. West Mesa was above the average 69 $\mu g/m^3$ (average 16 $\mu g/m^3$).

Samples were not collected on the exceedance day from the El Paso County PM_{10} NAAQS comparable monitors.

The Chamizal site in El Paso County reports PM_{10} non-NAAQS comparable measurements. On the exceedance day, Chamizal did not report any 24-Hour data. Chamizal is about 8 miles east of Desert View.

Figure 4-11 on page 21 shows hourly PM_{10} measurements Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. There were several spikes between 10:30 am to 5:00 pm. The elevated PM_{10} measurements correlate with elevated wind speeds shown on Figure 4-4.

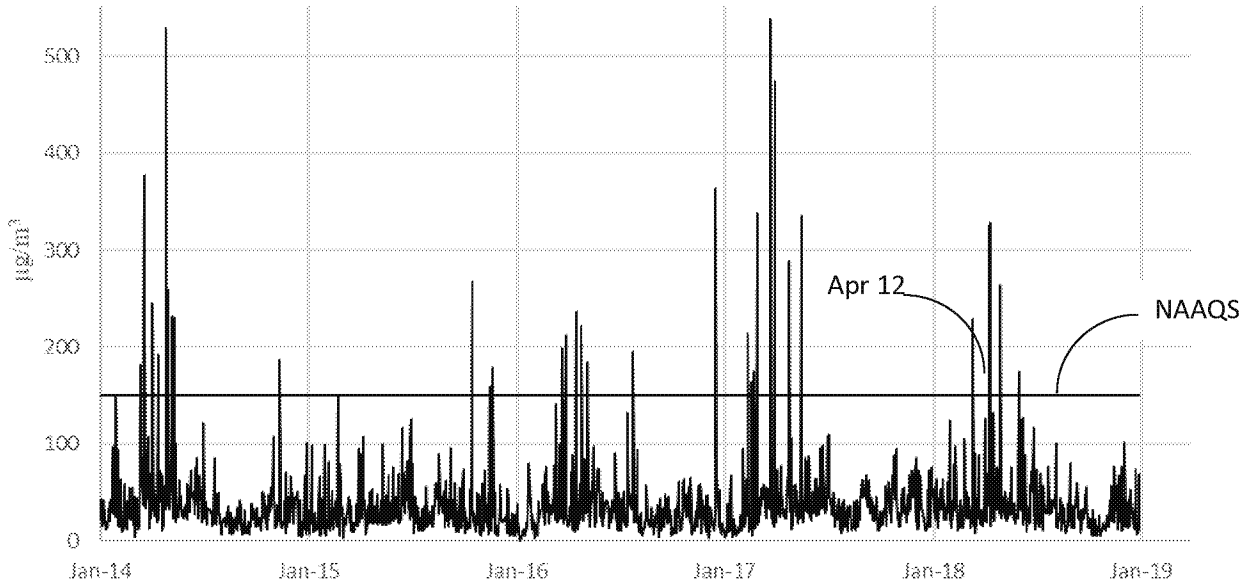
Figures 4-12 and 4-13 on page 22 shows the hourly wind speed and PM_{10} data at Anthony and Chaparral on the exceedance day. Figures 4-14 and 4-15 on page 23 shows the hourly wind speed and PM_{10} data at Deming and Desert View on the exceedance day. The elevated PM_{10} measurements correlate with elevated wind speeds.

There are independent weather reports, evidence of visibility impairment from blowing dust, and wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitors correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedances are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence

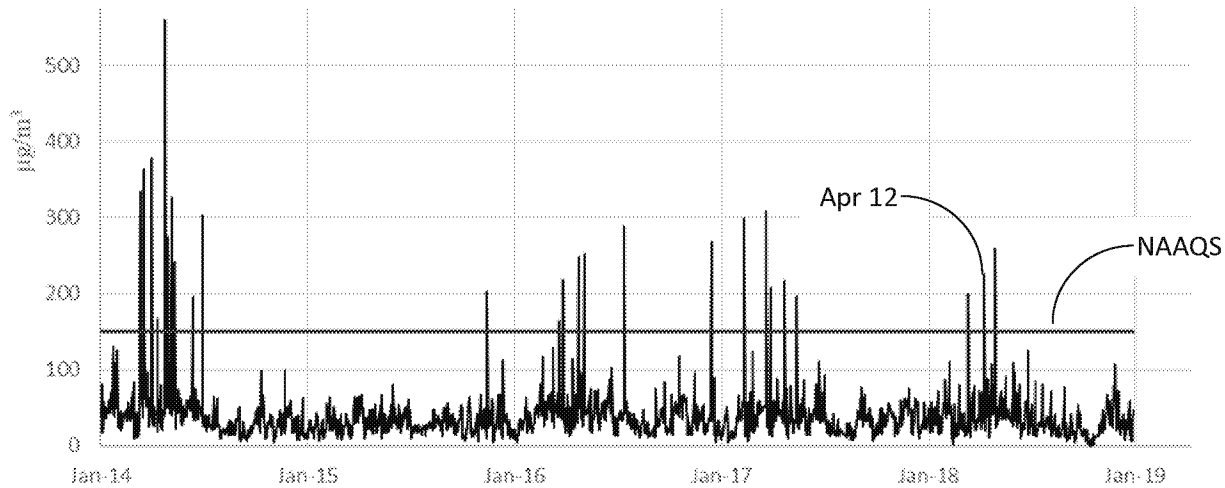
approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedances at the monitors on the exceedance day.

APRIL 12, 2018, EXCEEDANCE DAY, analyses comparing event influenced concentrations to other concentrations at the monitor.

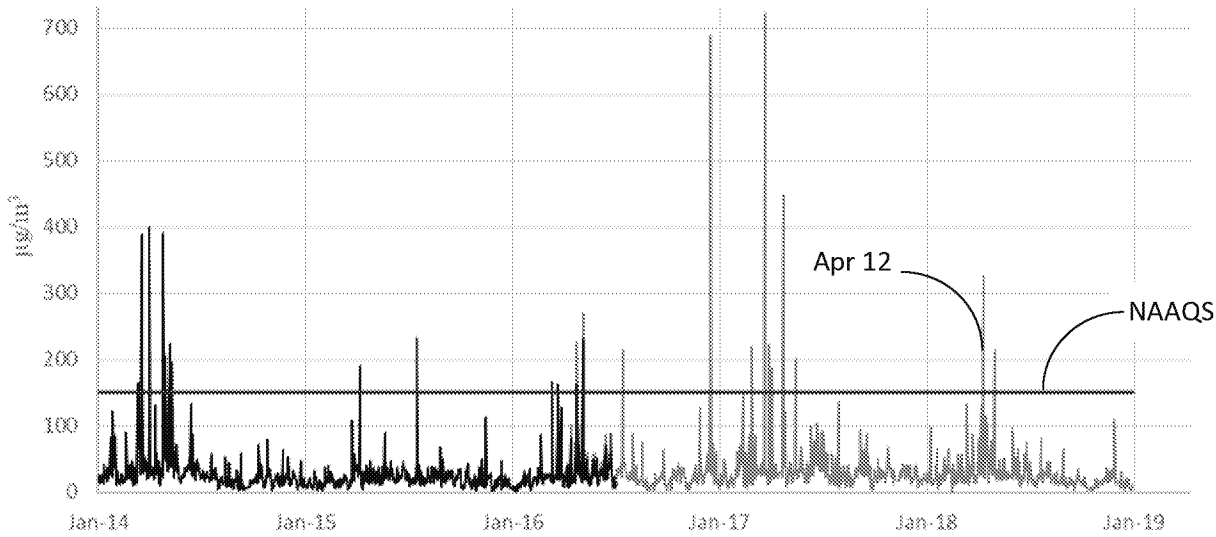
The graph below reflects the 24-hours monitor data from 2014 to 2019 for the Desert View site. The site measurements for the days surrounding the exceedance day did not approach the NAAQS level, except for April 13, another event day. The measurement on the exceedance day is above the 95th percentile of historical site data.



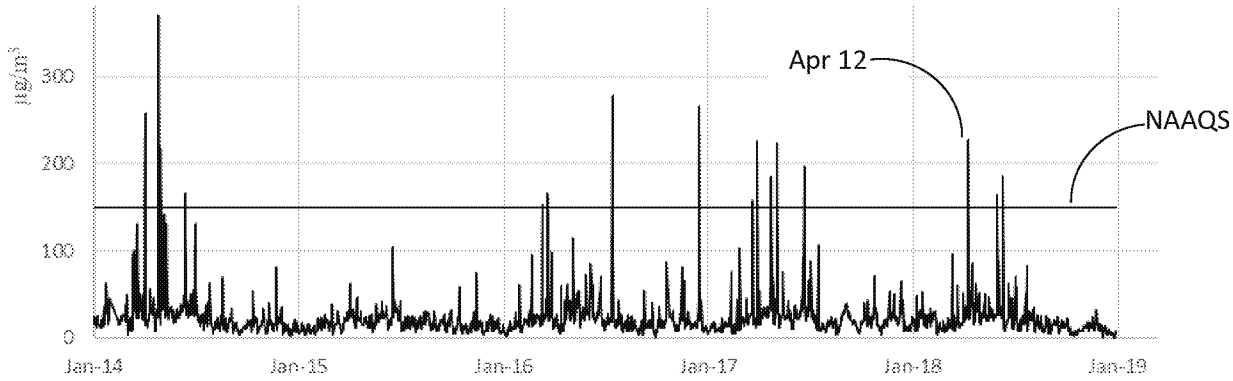
24-hours Measurements, Desert View PM_{10} Monitor, 35-013-0021-81102-2



24-hours Measurements, Anthony PM_{10} Monitor, 35-013-0016-81102-1



24-hours Measurements, Chaparral PM_{10} Monitor, 35-013-00206-81102-2
[Note: Black line is Manual monitor POC 1, Gray line is Continuous monitor POC 2]



24-hours Measurements, Deming PM_{10} Monitor, 35-029-0003-81102-2

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at these monitors indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the exceedances and the wind incident on the exceedance day.

APRIL 12, 2018, EXCEEDANCE DAY, not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources – The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at Chaparral, Deming, and La Union exceeded the 25-mph high wind threshold. Desert View were elevated but did not exceed the threshold on the exceedance day. The winds at Desert View reached a maximum hourly wind speed

of 22 mph, and there were gusts of wind speeds that reached 43 mph during the event. Also winds at the upwind Santa Teresa site were 25 mph for over 2 hours.

See discussion about the March 15, 2018, exceedance for information about the location of the Desert View site in the city of Sunland Park. During the hours of highest impact on the monitor, the winds were from the west and southwest. The Desert View site is located on the western city limits. The Texas and Mexico borders are about 1 mile to the northeast, and ¾ of a mile to the south of Desert View, respectively. To the south of Desert View, there are undeveloped lands to the Mexico border. To the west, except for a nearby landfill, and to the northwest, except for the city of Deming in Luna County, there are undeveloped lands all the way to the Arizona border.

See discussion about the March 15, 2018, exceedance for information about the location of the Anthony site. During the hours of highest impact on the monitor, the winds were from the west and southwest. The Anthony city limits are about 0.5 miles west of the Anthony monitor site. To the west of the city is mostly undeveloped lands all the way to the Arizona border. The Texas and Mexico borders are about 700 feet to the south and 20 miles to the southwest of the Anthony site, respectively. The developed land of the city extends about one mile to the east of the Anthony monitor site. Further to the east there is the Chaparral community in Dona Ana County, and the active Permian Basin oil field close to the Texas border. Generally, most of the land to the east is arid and undeveloped.

Chaparral New Mexico is a remote unincorporated community in Dona Ana County with about 15,000 residents on about 59.2 square miles. The population density is about 250 residents per square mile. In comparison, Albuquerque and El Paso have populations densities of 3,000 and 2,500 residents per square mile, respectively. Vegetation is sparse in the Chaparral community residential areas. Most of the roads in the community are unpaved.

The city of Deming with a population of about 15,000, is the only city in Luna County, New Mexico. The city is located 33 miles north of the Mexico border. Except for the city of Deming, a village close to the Mexico border and some agricultural fields, the land in the county is undeveloped. The Deming monitor site is at the airport within the city limits. During the hours of highest impact on the monitor, the winds were from the west and northwest. To the west and northwest of the monitor are about 3 miles of developed and undeveloped lands within the city. Beyond the city limits to the west and northwest are undeveloped lands to the Arizona border.

The NMED indicates anthropogenic sources near the monitor sites includes disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

Portions of the city of Anthony were upwind of the Chaparral and Anthony monitor sites on the exceedance day. The demonstration provides information on the Anthony PM_{10} SIP. Due to recurring impacts from non-anthropogenic sources deemed to contribute significantly to PM_{10} exceedances, the EPA waived the area attainment deadline for the Anthony SIP. The SIP was approved more than 5 years before the exceedance day, however, because of the waiver the NMED is not obligated to revise the SIP.

See 40 CFR 50.14(b)(8)(v). Therefore, during the demonstration review, the EPA considered the Anthony SIP limited controls, e.g., treat and pave area roads as funding allows, as part of the review of whether anthropogenic sources were reasonably controlled on the exceedance day. Appendix C of the demonstration provides a letter from the city of Anthony dated September 18, 2019, that reports on the status of local dust control efforts including road paving.

Portions of Dona Ana County were upwind of the Desert View, Anthony, and Chaparral monitor sites on the exceedance day. Portions of Luna county and the city of Deming were upwind of the Deming monitor site. The demonstration provides information on the cities of Deming, Las Cruces, Dona Ana, and Luna counties dust ordinances. The ordinances require a plan for dust controls on disturbed sites. The controls would have applied to any upwind disturbed sites in the cities, counties, and the Chaparral community on the day of the exceedance. The NMED indicates the implementation and enforcement of any controls occurs at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at Desert View, Anthony, Holman, West Mesa, Chaparral, and Deming.

Mexico was upwind of Desert View, Anthony, and Chaparral on the exceedance day. Figure 4-6 on page 19 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the models with the trajectories ending at the "start" of the exceedance day wind event, at the Anthony monitor site location. The results show that the winds could have been in Mexico prior to reaching the monitoring sites. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

APRIL 13, 2018

The exceedances occurred on April 13, 2018, hereafter referred to as the "exceedance day," at monitor sites located in Dona Ana County. The relevant monitor and exceedance are:

Site Name	Monitor AQS ID	Exceedance Measurement
Anthony	35-013-0016-81102-2	225 $\mu g/m^3$
Chaparral	35-013-0020-81102-2	326 $\mu g/m^3$
Desert View	35-013-0021-81102-2	328 $\mu g/m^3$

APRIL 13, 2018, EXCEEDANCE DAY, Clear Causal Relationship
In the demonstration, NMED states "[a]s the event unfolded, the wind blew from the west-southwest throughout the border region."

Table 5-2 on page 29 provides hourly wind speed measurements from the Anthony, Chaparral, and Desert View monitor sites for certain hours on the exceedance day. At 7:00 am, winds at Chaparral

exceeded 25 mph for multiple hours. Winds at Desert View also exceeded 25 mph, with gusts over 25 mph throughout the day. Winds at the Anthony site peaked at 15 mph, with gusts above 25 mph throughout the day. Winds at the La Union site exceeded 25 mph for multiple hours starting at 7:00 am.

Figure 5-6 and 5-7 on page 34 shows the frequency distribution of wind direction correlated with PM_{10} data at Anthony and Chaparral for the hours when PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. Figure 5-8 on page 35 shows the frequency distribution of wind direction correlated with PM_{10} data at Desert View. The figures show the winds were from the west-southwest.

Figure 5-3 on page 31 shows hourly winds at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. Except for Anthony, all sites exceeded 25 mph for at least one hour.

On the exceedance day, AQS data shows the hourly wind speeds at the Santa Teresa site exceeded 25 mph for multiple hours. Santa Teresa is about 6 miles west of Desert View.

On the exceedance day, AQS data shows the hourly wind speeds at the Chamizal, Ascarate, and Skyline monitor sites in El Paso County exceeded 25 mph for multiple hours.

The Las Cruces airport is about 40 miles north of Desert View. On the exceedance day, winds at the airport exceeded 25 mph for multiple hours. During this time, the winds were from the west southwest, and gusts reached 45 mph. Winds were elevated until about midnight.

The El Paso airport is about 11 miles east of Desert View. On the exceedance day, winds at the airport exceeded 25 mph for multiple hours. During this period, the winds were from the west southwest, gusts reached 55 mph, and weather was "blowing" and "widespread dust" (Weather Type BL DU:5). The overall weather for the day was 'Dust, volcanic ash, blowing dust, blowing sand or obstruction' (Weather Type DU).

The Deming airport is about 74 miles northwest of Desert View. On the exceedance day, winds at the airport exceeded 25 mph for multiple hours. During this period, the winds were from the west, gusts reached 49 mph, and weather type was smoke and haze (Weather Type HZ| FU HZ). The overall weather type for the exceedance day was haze (Weather Type HZ).

Figure 5-4 on page 32 is a satellite image which shows dust plumes in Mexico. The time stamp for the image is 10:47 AM MDT which correlates with the higher PM_{10} readings. The plumes appear to be travelling from the southwest to the northeast.

The narrative on page 33 discusses the NWS wind advisory forecast on the exceedance day. Strong winds were predicted from the west with wind gusts up to 45 mph. High winds were expected from midnight on the exceedance day until 4:00 pm.

The NOAA Storm Events Database shows that on the exceedance day, high windstorm events were reported in various Dona Ana and El Paso Counties areas with wind gusts from 50 to 60 mph. As the storm system exited, blowing dust was confined to the far southeast plains and much of southern New Mexico.

Figure 5-16 on page 39 shows the 24-hours PM_{10} measurements from Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. Measurements were above monitor averages: West Mesa 106 $\mu g/m^3$, (average 16 $\mu g/m^3$), Deming 111 $\mu g/m^3$ (average 23 $\mu g/m^3$), and Holman 103 $\mu g/m^3$ (average 26 $\mu g/m^3$).

The PM_{10} manual monitors in El Paso County did not sample on the exceedance day. The PM_{10} continuous monitor at the Chamizal site in El Paso County reports non-NAAQS comparable data. On the exceedance day, the Chamizal monitoring data shows a void. Chamizal is about 8 miles east of Desert View.

Figure 5-9 on page 36 shows hourly PM_{10} measurements at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. The elevated PM_{10} measurements correlate with the elevated wind speeds shown on Figure 5-3.

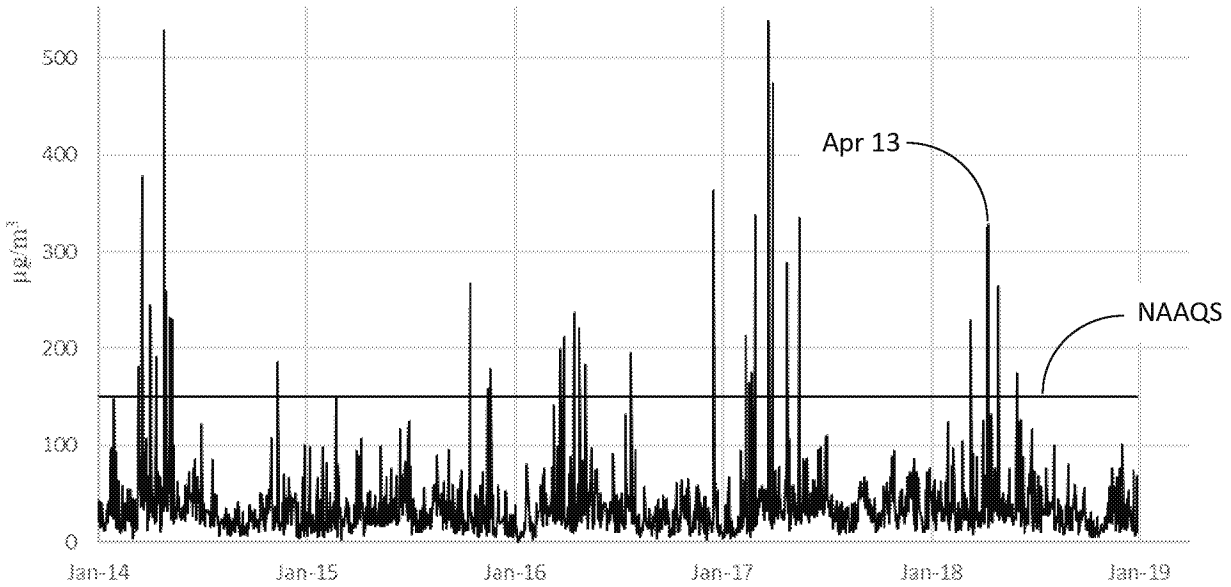
Figure 5-10 on page 36 shows wind speed and PM_{10} measurements at Anthony, on the exceedance day. The elevated PM_{10} measurements correlate with elevated wind speeds.

Figures 5-11 and 5-12 on page 37 shows wind speed and PM_{10} measurements at Chaparral and Desert View, on the exceedance day. The elevated PM_{10} measurements correlate with elevated wind speeds.

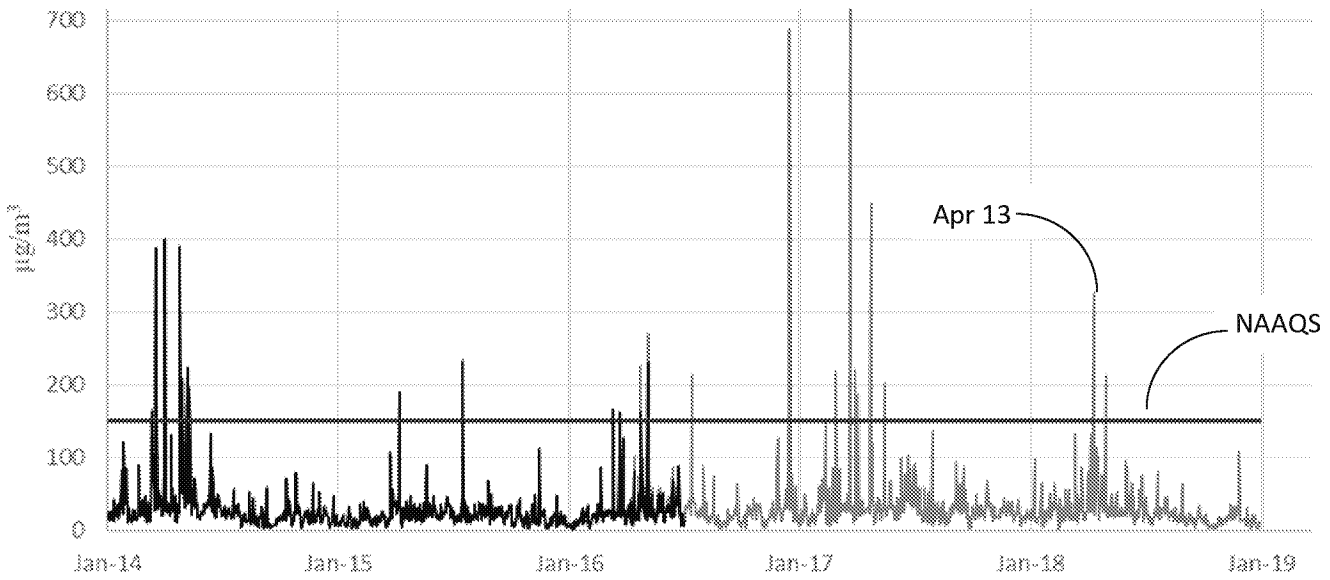
There are independent weather reports, evidence of blowing dust, and wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitors correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedances are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedances at the monitors on the exceedance day.

APRIL 13, 2018, EXCEEDANCE DAY, Analyses comparing event influenced concentrations to other concentrations at the monitors.

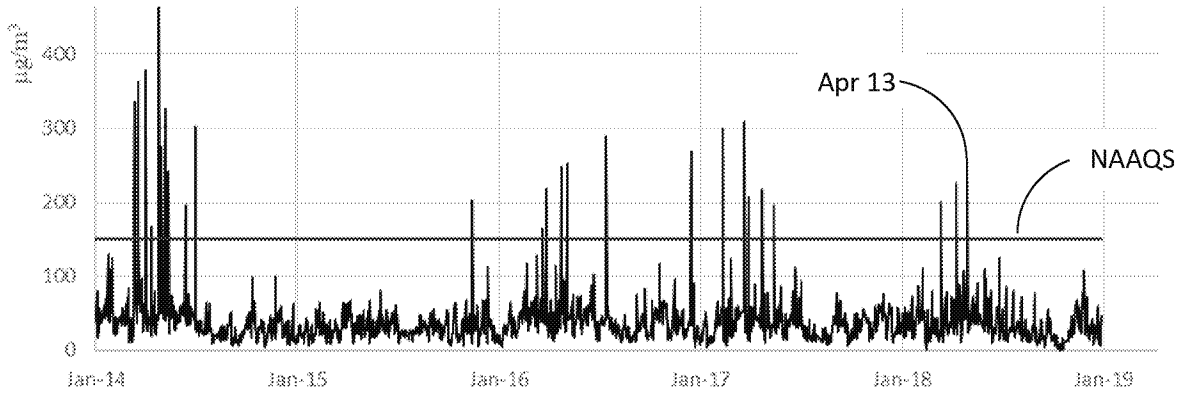
The graphs below reflect the 24-hours monitor data from 2014 to 2019 for the Desert View, Chaparral, and Anthony sites. The site measurements for the days surrounding the exceedance day did not approach the NAAQS level, except for April 12, another event day. The measurement on the exceedance day is above the 95th percentile of historical site data.



24-hours Measurements, Desert View PM_{10} Monitor, 35-013-0021-81102-2



24-hours Measurements, Chaparral PM_{10} Monitor, 35-013-0020-81102



24-hours Measurements, Anthony PM_{10} Monitor, 35-013-0016-81102-1

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at these monitors indicates a deviation from normal concentrations occurred and supports the clear causal relationship between the monitored exceedances and the wind incident on the exceedance day.

APRIL 13, 2018, EXCEEDANCE DAY, not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources – The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at Desert View and Chaparral exceeded the threshold on the exceedance day. Wind speed measured at Anthony did not exceed the threshold, however winds at the nearby La Union site did. These elevated winds were from the west and southwest.

See discussion about the March 13, 2018, exceedance for information about the location of the Desert View site in the city of Sunland Park. During the wind incident, the winds were from the west. Desert View is on the western city limits. To the west, except for a nearby landfill, there are undeveloped lands all the way to the Arizona border. The Texas and Mexico borders are about 1 mile to the northeast, and ¾ of a mile to the south of Desert View, respectively.

The NMED indicates in the demonstration that anthropogenic sources near the monitor sites include disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The demonstration does not specifically identify any potential upwind anthropogenic sources or controls on the sources, on the exceedance day. The demonstration has information about controls for potential upwind anthropogenic sources.

Portions of the Dona Ana County were upwind of Desert View on the exceedance day. The demonstration provides information on the Dona Ana County Dust ordinance. The ordinance requires a plan for dust control on disturbed sites. The controls would have applied to any upwind disturbed sites in the county on the exceedance day. The NMED indicates the implementation and enforcement of any

controls occurs at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at Desert View.

Figure 5-5 on page 33 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the models with the trajectories ending at the "start" of the exceedance day wind event, at the Desert View monitor site location. The results show that the winds could have been in Arizona and northwestern New Mexico prior to reaching Desert View. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

MAY 2, 2018

The exceedance occurred on May 2, 2018, hereafter referred to as the "exceedance day," at the monitor sites located in Dona Ana County. The relevant monitors and exceedances are:

Site Name	Monitor AQS ID	Exceedance, Measurement
Anthony	35-013-0016-81102-1	259 $\mu g/m^3$
Chaparral	35-013-0020-81102-2	215 $\mu g/m^3$
Desert View	35-013-0021-81102-2	264 $\mu g/m^3$
Holman	35-013-0019-81102-2	251 $\mu g/m^3$

MAY 2, 2018, EXCEEDANCE DAY, clear causal relationship.
In the demonstration, the NMED indicates "[a]s the event unfolded, the wind blew from the southwest throughout the border region."

Table 6-2 on pages 42 and 43 shows hourly wind data from the Chaparral, Holman, and West Mesa, monitor sites, for certain hours on the exceedance day. Winds at the sites exceeded 25 mph for multiple hours.

Figures 6-7, 6-8, 6-9, and 6-10 on pages 48-50 shows the frequency distribution of wind direction correlated with PM_{10} data at Anthony, Chaparral, Desert View, and Holman for the hours when PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. The winds were from the west and southwest.

Figure 6-3 on page 44 shows hourly wind data at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. The Chaparral and Holman sites experienced hourly wind speeds that exceeded 25 mph for multiple hours. The Desert View and Anthony sites approached the threshold.

On the exceedance day, AQS data shows the hourly wind speeds at the Santa Teresa site exceeded 25 mph for multiple hours. Santa Teresa is about 23 miles southwest of Chaparral site and about 6 miles west of Desert View.

On the exceedance day, AQS data shows the hourly wind speeds at the La Union site exceeded 25 mph for multiple hours. La Union is about 5 miles south southwest of the Anthony site.

On the exceedance day, AQS data shows the hourly wind speeds at the Chamizal, Ascarate, and Skyline monitor sites in El Paso County exceeded 25 mph for multiple hours and at the Ivanhoe and Van Buren monitoring sites approached the wind threshold.

The Las Cruces airport is about 40 miles north of Desert View. On the exceedance day winds at the airport exceeded 25 mph for multiple hours. During this period, the winds varied from west southwest to west northwest, gusts reached 51 mph, and weather type was smoke and haze from 3:35 through 5:00 pm (Weather Type HZ:7|FU| HZ). The overall weather type for the exceedance day was Clear (Weather Type CLR).

The El Paso airport is about 11 miles east of the Desert View site. On the exceedance day winds at the airport exceeded 25 mph for multiple hours. During this period, the winds varied from west southwest to west northwest, gusts reached 46 mph, and weather type was "blowing" and "widespread dust" (Weather Type BL:5|DU:5). The overall weather type for the exceedance day was "Dust, volcanic ash, blowing dust, blowing sand or…obstruction" (Weather Type DU).

The Deming airport is about 74 miles northwest of Desert View. On the exceedance day winds at the airport exceeded 25 mph for multiple hours in the afternoon During this period, the winds varied from west southwest to west northwest, gusts reached 45 mph, and weather type was clear (Weather Type CLR).

Figure 6-20 on page 55 shows the 24-hours PM_{10} measurements at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming, on the exceedance day. Anthony, Chaparral, Desert View, and Holman 24-hours measurements exceeded the NAAQS level of 150 $\mu g/m^3$. Other sites measurements approached the NAAQS level or were elevated: West Mesa had a measurement of 111 $\mu g/m^3$ which is above the monitor average of 26 $\mu g/m^3$, Deming had a measurement of 52 $\mu g/m^3$ which is above the monitoring average of 23 $\mu g/m^3$.

The PM_{10} manual monitors in El Paso County sampled on the exceedance day. The 24-hours measurement at Socorro exceeded the NAAQS level, i.e., 158 $\mu g/m^3$. The other 24-hours measurements were elevated: Ivanhoe 85 $\mu g/m^3$ (average 20 $\mu g/m^3$), Riverside 126 $\mu g/m^3$ (average 29 $\mu g/m^3$), Van Buren 134 $\mu g/m^3$ (average 30 $\mu g/m^3$), and Ojo 137 $\mu g/m^3$ (average 23 $\mu g/m^3$). There is no 24-hours measurement from the PM_{10} continuous Chamizal monitor in El Paso County on the exceedance day.

Figure 6-4 on page 46 and the narrative on page 45 provide information and photo imagery captured from the El Paso Ranger Station shows the extent of the limited visibility in the region during the exceedance day. The photo is oriented in a south orientation towards Juarez, MX. The NWS forecast strong winds and blowing dust for parts of Dona Ana and El Paso Counties on the exceedance day. The

areas in Dona Ana County include the Desert View and Chaparral sites. A wind advisory remained in effect from 2:00 pm to 9:00 pm in the evening on the exceedance day.

Figure 6-5 on page 47 shows a satellite image of dust plumes in Mexico and Texas. The image was taken at 12:30 pm on the exceedance day. The plumes appear to be travelling from the southwest to the northeast toward El Paso and NMED's monitoring sites.

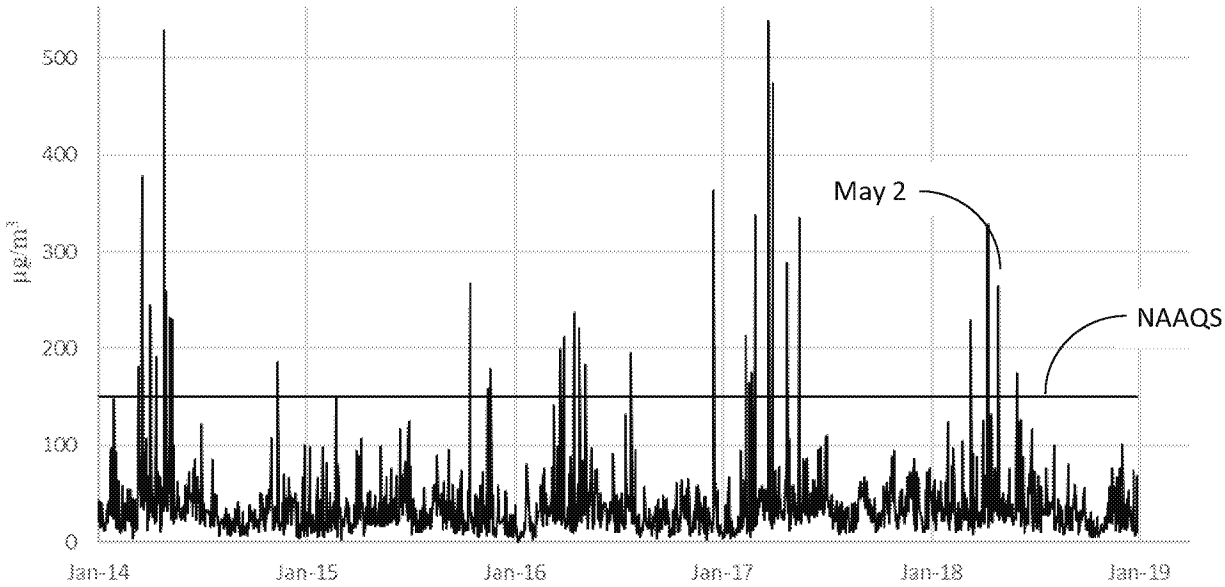
Figure 6-11 on page 52 shows hourly PM_{10} measurements at Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming on the exceedance day. The elevated PM_{10} measurements correlate with elevated wind speeds shown on Figure 6-3.

Figures 6-12, 6-13, 6-14, and 6-15 on pages 51 and 52 show both hourly wind speeds and PM_{10} measurements at the Anthony, Chaparral, Desert View and Holman sites on the exceedance day. The elevated PM_{10} measurements at the sites correlate with elevated wind speeds.

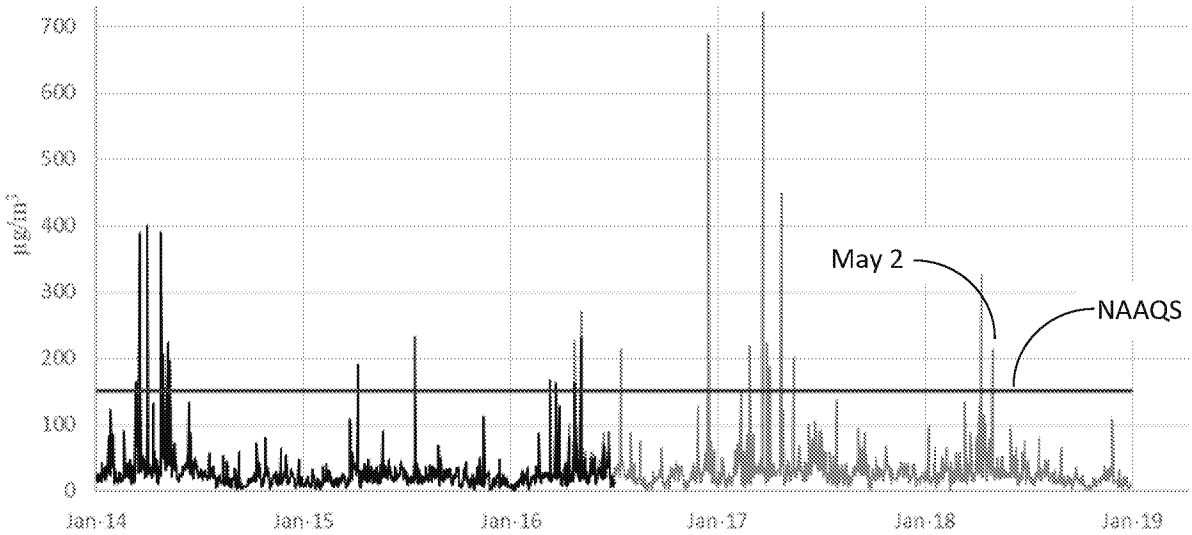
There are independent weather reports, evidence of blowing dust, and hourly wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitors correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedance are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedance at the monitors on the exceedance day.

MAY 2, 2018, EXCEEDANCE DAY, analyses comparing event influenced concentrations to other concentrations at the monitor.

The site measurements for the days surrounding the exceedance day did not approach the NAAQS level. The measurements on the exceedance day are above the 95th percentile of historical site data. The graphs below reflect the 24-hours monitor data from 2014 to 2019 for the Desert View, Chaparral, Anthony, and Holman sites.

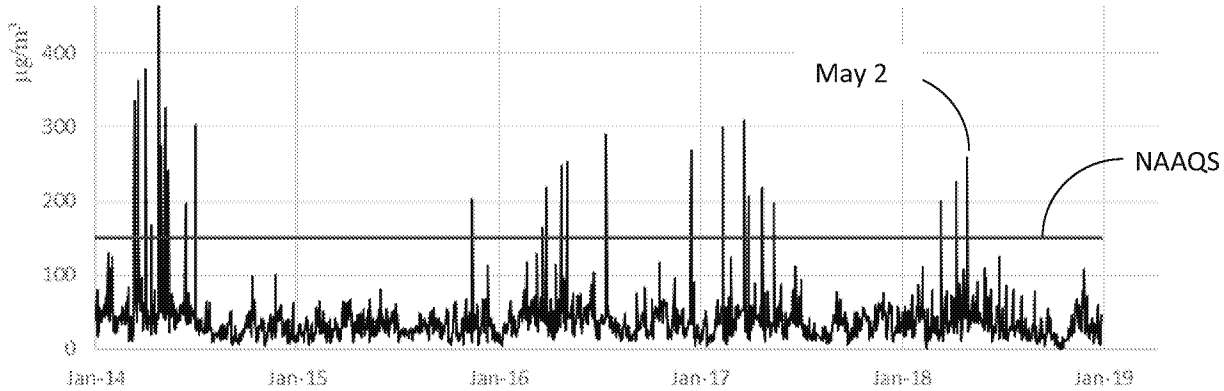


24-hours Measurements, Desert View PM_{10} Monitor, 35-013-0021-81102-2

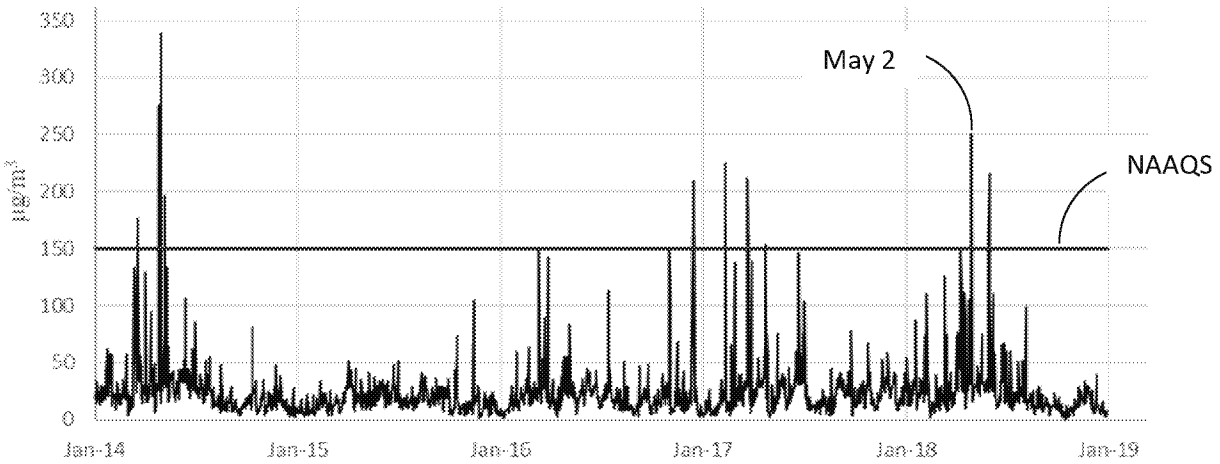


24-hours Measurements, Chaparral PM_{10} Monitor, 35-013-00206-81102-2

[Note: Black line is Manual monitor POC 1, Gray line is Continuous monitor POC 2]



24-hours Measurements, Anthony PM_{10} Monitor, 35-013-0016-81102-1



24-hours Measurements, Holman PM_{10} Monitor, 35-013-0019-81102-2

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at these monitors indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the exceedances and the wind incident on the exceedance day.

MAY 2, 2018, EXCEEDANCE DAY, not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources – The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at the Holman and Chaparral sites exceeded the threshold on the exceedance day. Hourly wind speeds measured at the Anthony and Desert View sites did not exceed the threshold continuously but did have gusts throughout the day that exceeded the threshold. The winds were from the west and southwest.

See discussion about the March 15, 2018, exceedance for information about the location of the Desert View site in the city of Sunland Park. The Desert View site is located on the western city limits. The Texas and Mexico borders are about 1 mile to the northeast, 3/4 of a mile to the south of Desert View, respectively. To the southwest of Desert View, there are undeveloped lands to the Mexico border. To the west, except for a nearby landfill, there are undeveloped lands all the way to the Arizona border.

See discussion about the April 12, 2018, exceedance for information about the location of the Chaparral site. The Texas and Mexico borders are about 2.5 miles to the south, and 24 miles to the southwest of the Chaparral monitor site, respectively. Residential areas or potential anthropogenic upwind sources extend to about 2 miles west and south of the Chaparral site. Beyond the residential areas to the south there are about 7 miles of undeveloped lands and then the northern suburbs of El Paso. Beyond the

residential areas to the west, with a few exceptions such as the city of Anthony, there are undeveloped lands to the Arizona border. Residential areas extend to about 1 mile southwest of the Chaparral site. Further to the southwest, there are lands in the state of Texas, the unincorporated La Union community in New Mexico, and undeveloped lands to the Mexico border.

See discussion about the May 2, 2018, exceedance for information about the location of the Anthony site. During the hours of highest impact on the monitor, the winds were from the west. The Anthony city limits are about 0.5 miles west of the Anthony monitor site. Beyond the city to the west undeveloped lands exist to the Arizona border. The Texas and Mexico borders are about 700 feet to the south and 20 miles to the southwest of the Anthony site, respectively.

The Holman monitor site is in Dona Ana County northeast of the city of Las Cruces. The land within a one-half radius of the site is undeveloped. Further to the east there are some large residential lots in Dona Ana County, and the active Permian Basin oil field close to the Texas border. Generally, most of the land to the east is arid and undeveloped.

The NMED indicates anthropogenic sources near the monitor sites includes disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

Portions of the city of Anthony were upwind of the Anthony and Chaparral sites on the exceedance day. The demonstration provides information on the Anthony SIP. Due to recurring impacts from non-anthropogenic sources deemed to contribute significantly to PM_{10} exceedances, the EPA waived the area attainment deadline for the Anthony SIP. The SIP was approved more than 5 years before the exceedance day, however, because of the waiver the NMED is not obligated to revise the SIP. See 40 CFR 50.14(b)(8)(v). Therefore, during the demonstration review, the EPA considered the Anthony SIP limited controls, e.g., treat and pave area roads as funding allows, as part of the review of whether anthropogenic sources were reasonably controlled on the exceedance day. Appendix C of the demonstration provides a letter from the city of Anthony dated September 18, 2019, that reports on the status of local dust control efforts including road paving.

Portions of the Dona Ana County were upwind of Anthony, Desert View, Holman and Chaparral on the exceedance day. The demonstration provides information on the Dona Ana County Dust ordinance. The county ordinance applies in unincorporated communities in the county. The ordinance requires a plan for dust control on disturbed sites. The controls would have applied to any upwind disturbed sites in the county or the unincorporated communities of Chaparral and La Union on the exceedance day. The NMED indicates the implementation and enforcement of any controls occurs at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at Desert View and Chaparral.

Desert View is located about 3/4 of a mile north of the Mexico border. The Mexico border is about 24 miles southwest of Chaparral. Mexico was upwind of Anthony, Holman, Desert View, and Chaparral on the exceedance day. Figure 6-6 on page 48 shows the results of a NOAA HYSPLIT Model 6 hours

backward trajectories. The NMED ran the models with the trajectories ending at the "start" of the exceedance day wind event, at the Anthony monitor site location. The results show that the winds could have been in Chihuahua, Mexico prior to reaching Anthony and El Paso, TX. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

JUNE 2, 2018

The exceedance occurred on June 2, 2018, hereafter referred to as the "exceedance day," at the monitor site in Dona Ana county. The relevant monitor and exceedance is:

Site Name	Monitor AQS ID	Exceedance Measurement
Holman	35-013-0019-81102-2	158 $\mu g/m^3$

JUNE 2, 2018, EXCEEDANCE DAY, clear causal relationship.
In the demonstration, the NMED indicates "[a]s the event unfolded, the wind blew from the east throughout the border region."

Table 7-2 on page 58 shows hourly wind speeds at the Anthony, and Holman monitor sites for certain hours on the exceedance day. The winds exceeded 25 mph at Holman for multiple hours beginning at 7:00 pm.

Figure 7-5 on page 62 shows the frequency distribution of wind direction correlated with PM_{10} data at the Holman monitor site, for the hours when PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. The winds at Holman were from the east.

Figure 7-3 on page 58 shows hourly wind speeds at Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. The winds at Holman exceeded 25 mph for multiple hours.

The Las Cruces airport is about 17 miles southwest of Holman. On the exceedance day winds at the airport were between 15-20 mph from 7:00 pm till after midnight. During this period, the winds were from the northeast, gusts reached 26 mph, and weather type was clear. The overall weather type was clear (Weather Type CLR).

The El Paso airport is about 46 miles southeast of the Holman site. On the exceedance day, winds at the airport were above 25 mph for multiple hours. During this period, the wind direction was predominately from the northeast, gusts reached 30 mph, and weather type was clear. The overall weather type for the exceedance day was clear (Weather Type CLR).

The Alamogordo White Sands airport is about 48 miles northeast of the Holman Site. On the exceedance day, winds at the airport were between 18-22 mph beginning after 7:00 pm. During this period, the wind direction was predominately from the northeast, gusts reached 28 mph, and the overall weather type for the exceedance day was clear (Weather Type CLR).

Figure 7-9 on page 65 shows the 24-hours PM_{10} measurements from Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. The Holman site exceeded the NAAQS level and most of the other measurements were above average: Anthony 108 $\mu g/m^3$ (average 36 $\mu g/m^3$), West Mesa 70 $\mu g/m^3$ (average 16 $\mu g/m^3$), Chaparral 97 $\mu g/m^3$ (average 16 $\mu g/m^3$), Deming 29$\mu g/m^3$ (average 23 $\mu g/m^3$), and Desert View 97 $\mu g/m^3$ (average 16 $\mu g/m^3$).

The PM_{10} manual monitors in El Paso County did not sample on the exceedance day. The PM_{10} continuous monitor at the Chamizal site in El Paso County reports non-NAAQS comparable data. On the exceedance day, the Chamizal 24-hours measurement of 24 $\mu g/m^3$ is below the NAAQS level of 150 $\mu g/m^3$. Chamizal is about 50 miles southeast of Holman.

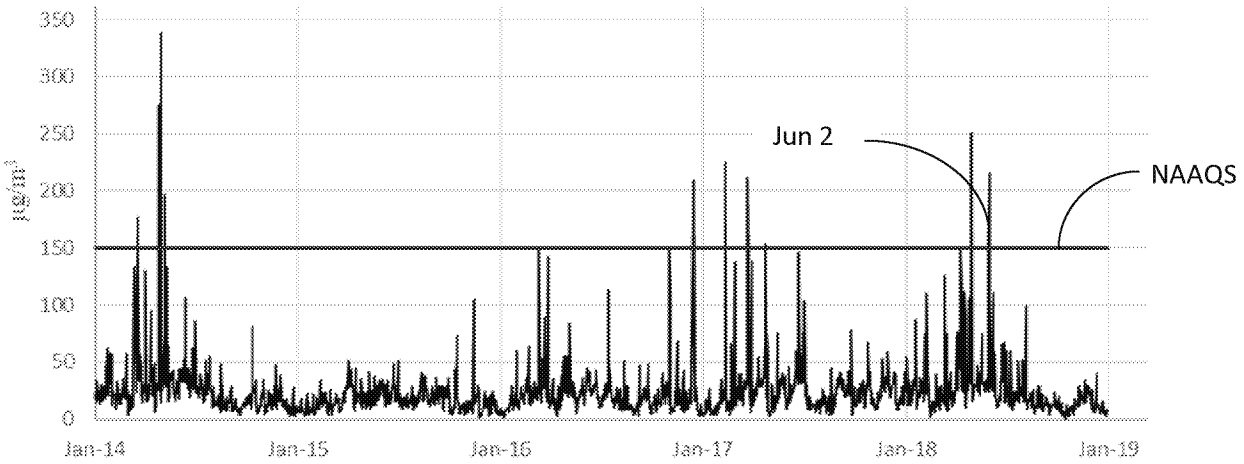
The narrative on page 60 discusses the NWS wind and blowing dust advisory issued for portions of southwestern New Mexico and west Texas on the exceedance day. The NWS predicted gusts around 50 mph. The advisory also warned about reduced visibility.

Figures 7-6 and 7-7 on page 63 show the hourly wind speeds and PM_{10} measurements at Holman on the exceedance day. The elevated PM_{10} measurements correlate with the elevated wind speeds.

There are independent weather reports, evidence of blowing dust, and hourly wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitor correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedance are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedance at the monitor on the exceedance day.

JUNE 2, 2018, EXCEEDANCE DAY, analyses comparing event influenced concentrations to other concentrations at the monitor.

The graph below reflects the 24-hours monitor data from 2014 to 2019 for the Holman site. The site measurements for the days surrounding the exceedance day did not approach the NAAQS level. The measurements on the exceedance day are above the 95th percentile of historical site data.



24-hours Measurements, Holman PM_{10} Monitor, 35-013-0019-81102-2

Based on the analyses and statistics, the comparison of the exceedance to the historical concentrations of PM_{10} at this monitor indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the monitored exceedances and the wind incident on the exceedance day.

JUNE 2, 2018, EXCEEDANCE DAY, not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources – The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at Holman exceeded 25 mph on the exceedance day.

The Holman monitor site is in Dona Ana County northeast of the city of Las Cruces. The land within a one-half radius of the site is undeveloped. During the hours of highest impact on the monitor, the winds were from the east and northeast. To the northeast is the White Sands National Monument and undeveloped lands. Further to the east there are some large residential lots in Dona Ana County, and the active Permian Basin oil field close to the Texas border. Generally, most of the land to the east is arid and undeveloped.

The NMED indicates anthropogenic sources near the monitor site include disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

Portions of Dona Ana County were upwind of the Holman monitor site. The demonstration provides information on the Dona Ana county dust ordinance. The ordinance requires a plan for dust controls on disturbed sites. The controls would have applied to any upwind disturbed sites in the cities and county on the day of the exceedance. The NMED indicates the implementation and enforcement of any controls occurs at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impact at Holman.

Figure 7-4 on page 61 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the model with the trajectories ending at the "start" of the wind event, at the Holman site. The results show the winds may have been in southwestern Texas and central eastern New Mexico, including the White Sands National Monument prior to reaching Holman. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

JUNE 3, 2018

The exceedance occurred on June 3, 2018, hereafter referred to as the "exceedance day" at monitor sites in Dona Ana and Luna County. The relevant monitor and exceedance are:

Site Name	Monitor AQS ID	Exceedance, Measurement
Deming	35-029-0003-81102-2	164 $\mu g/m^3$
Desert View	35-013-0021-81102-2	174 $\mu g/m^3$
Holman	35-013-0019-81102-2	215 $\mu g/m^3$

JUNE 3, 2018, EXCEEDANCE DAY, Clear Causal Relationship.
In the demonstration, the NMED indicates "[a]s the event unfolded, the wind blew from the southeast throughout the border region."

Table 8-2 on page 69 shows hourly wind speed data from the Deming, Desert View, and Holman monitor sites for certain hours on the exceedance day. Wind speeds at the Holman site exceeded 25 mph for multiple hours. Wind speeds at Deming and Desert View approached the 25 mph threshold, with wind gusts exceeding 25 mph throughout the day.

Figure 8-3 on page 70 shows hourly wind speeds at Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. Wind speeds at the Holman site exceeded the threshold for multiple hours. Other sites approached the threshold throughout the day.

Figures 8-5 through 8-7 on pages 72 and 73 shows the frequency distribution of wind direction correlated with PM_{10} data at the Deming, Desert View, and Holman monitor sites when the PM_{10} measurements exceeded 150 $\mu g/m^3$ on the exceedance day. The winds were from the east southeast predominately.

On the exceedance day, AQS data shows the hourly wind speeds at the Santa Teresa site approached and exceeded 25 mph for multiple hours. Santa Teresa is about 6 miles west of Desert View.

On the exceedance day, AQS data shows the hourly wind speeds at the Ivanhoe, Chamizal, Ascarate, and Skyline monitor sites in El Paso County were between 15 and 18 mph for multiple hours.

The Deming airport is about 74 miles northwest of Desert View. On the exceedance day winds at the airport exceeded 25 mph for multiple hours. During this period, the winds varied from the east southeast, gusts reached 37 mph, and weather type included smoke and haze (Weather Type HZ:7|FU|HZ). The overall weather type for the exceedance day was clear.

The Las Cruces airport is about 17 miles southwest of Holman and 40 miles north of Desert View. On the exceedance day, winds at the airport approached 25 mph for multiple hours. During this period, the winds were from the southeast, gusts reached 34 mph, and the weather type for the exceedance day was drizzle and thunderstorms (Weather Type DZ TS). The overall weather type for the exceedance day was clear.

The Alamogordo White Sands airport is about 48 miles northeast of the Holman site. On the exceedance day winds at the airport exceeded 25 mph for multiple hours. During this period, the winds varied from the north northwest, shifting to the east southeast in the afternoon, gusts reached 47 mph, and weather type included smoke, haze, and thunderstorms in the vicinity (Weather Type VCTS HZ FU). The overall weather type for the exceedance day was clear.

The El Paso airport is about 11 miles east of the Desert View site. On the exceedance day winds at the airport exceeded 25 mph for multiple hours. During this period, the winds varied from the east southeast to the south, gusts reached 48 mph, and weather type included "blowing" and "widespread dust" as well as thunderstorms and rain (Weather Type BL, DU:5, TS RA). The overall weather type for the exceedance day was scattered clouds (Weather Type SCT).

Figure 8-15 on page 77 shows the 24-hours PM_{10} measurements from the Anthony, West Mesa, Chaparral, Holman, Desert View, and Deming monitor sites on the exceedance day. The measurements at Desert View, Deming and Holman exceeded the NAAQS level of 150 $\mu g/m^3$. Anthony, West Mesa, and Chaparral measurements where above average levels: Anthony 112 $\mu g/m^3$ (average 36 $\mu g/m^3$), West Mesa 74 $\mu g/m^3$ (average 16 $\mu g/m^3$), and Chaparral 97 $\mu g/m^3$ (average 16 $\mu g/m^3$).

The PM_{10} manual monitors in El Paso County did not sample on the exceedance day. The PM_{10} continuous monitor at the Chamizal site in El Paso County reports non-NAAQS comparable data. On the exceedance day, the Chamizal 24-hours measurement of 56 $\mu g/m^3$ is above the site average of 25 $\mu g/m^3$. Chamizal is about 8 miles east of Desert View.

The narrative on page 71 discusses the issues that prevented satellite imagery from being obtained on the exceedance day. The issues included dense cloud cover and increased smoke from wildfires in northern Mexico.

The narrative on page 71 discusses the NWS forecast of severe thunderstorm watch, "Damaging winds, dense blowing dust, hail and heavy rainfall and impaired visibility for parts of southwestern New Mexico and West Texas" on the exceedance day.

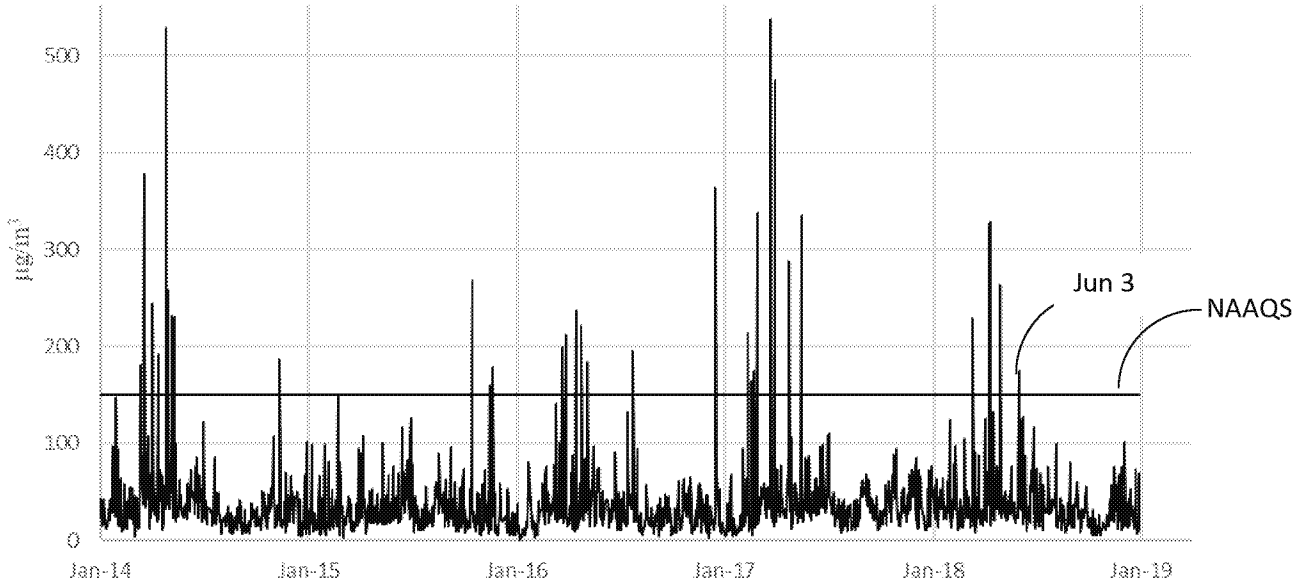
Figure 8-8 on page 74 shows the hourly PM_{10} measurements from Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. The elevated PM_{10} measurements at the sites correlate with elevated wind speeds shown in Figure 8-3.

Figures 8-9 through 8-11 on pages 74 and 75 show hourly wind speed and PM_{10} measurements at the Desert View, Deming, and Holman monitor sites on the exceedance day. The elevated PM_{10} measurements at the sites correlate with the elevated wind speeds.

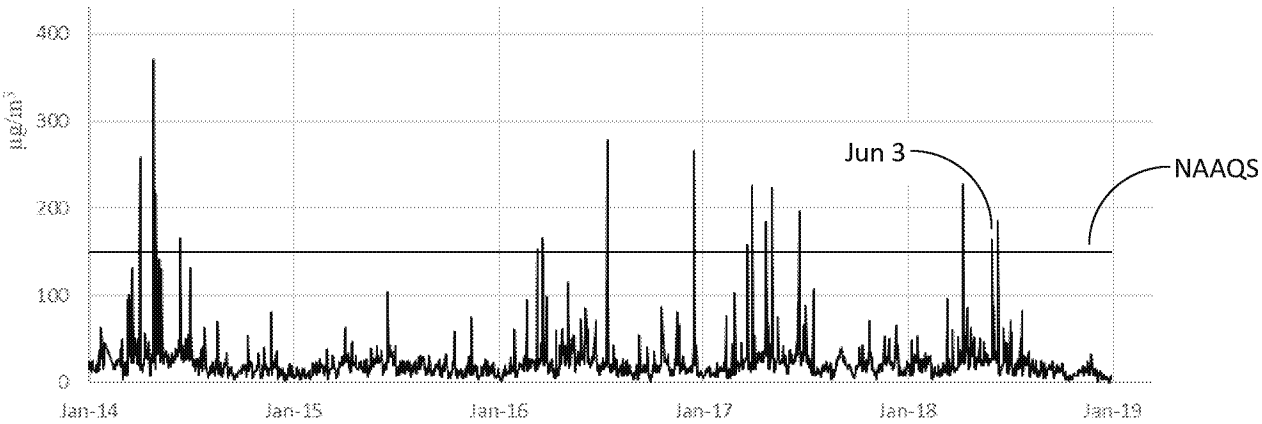
There are independent weather reports, evidence of blowing dust, and hourly wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitors correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedance are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedance at the monitors on the exceedance day.

JUNE 3, 2018, EXCEEDANCE DAY, analyses comparing event influenced concentrations to other concentrations at the monitor.

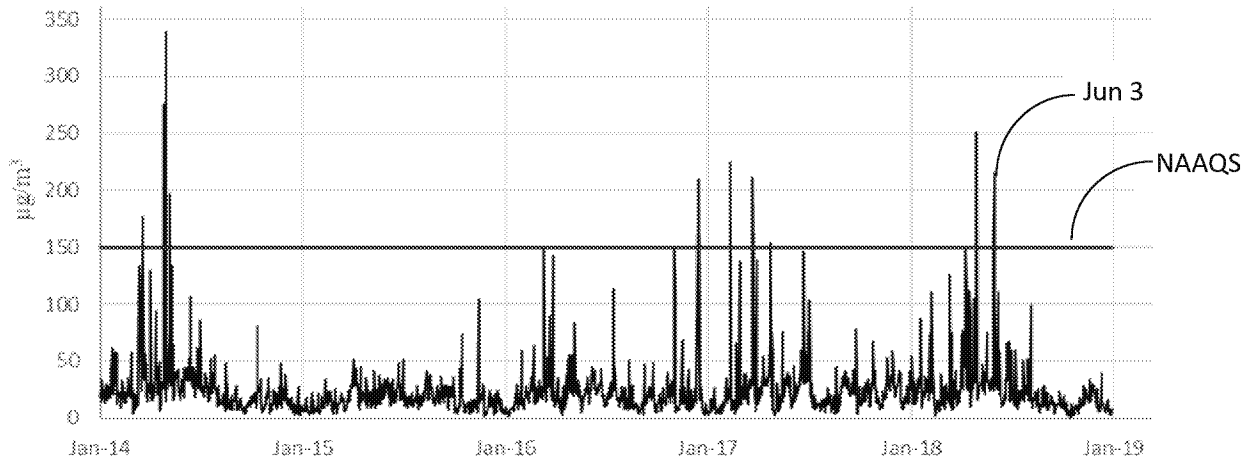
The graphs below reflect the 24-hours monitor data from 2014 to 2019 for the Desert View, Deming, and Holman sites. The sites measurements for the days surrounding the exceedance day did not approach the NAAQS level except for Holman, which had an exceedance the previous day. The measurements on the exceedance day are above the 95th percentile of historical site data.



24-hours Measurements, Desert View PM_{10} Monitor, 35-013-0021-81102-2



24-hours Measurements, Deming PM_{10} Monitor, 35-029-0003-81102-2



24-hours Measurements, Holman PM_{10} Monitor, 35-013-0019-81102-2

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at these monitors indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the monitored exceedances and the wind incident on the exceedance day.

JUNE 3, 2018, EXCEEDANCE DAY, Not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources - The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at the Holman site exceeded the threshold on the exceedance day. Desert View and Deming monitor sites approached the threshold.

See discussion about the March 15, 2018, exceedance for information about the location of the Desert View site in the city of Sunland Park. During the hours of highest impact on the monitor, the winds were from the east and southeast. The Desert View site is located on the western city limits. The Texas and Mexico borders are about 1 mile to the northeast, and 3/4 of a mile to the south of Desert View, respectively. To the southeast of Desert View, there are undeveloped lands to the Mexico border. To the west, except for a nearby landfill, there are undeveloped lands all the way to the Arizona border. On the exceedance day, there could have been upwind anthropogenic sources in about 1 mile of lands in the city of Sunland Park. The demonstration does not discuss any specific sources in the city of Sunland Park nor controls for the sources. The city of El Paso, Texas, extends to about 18 miles east of Desert View. Beyond the city of El Paso to the east is mostly undeveloped Texas lands for hundreds of miles.

See discussion about the April 12, 2018, exceedance for information about the location of the Deming site. During the hours of highest impact on the monitor, the winds were from the west. To the west of the Deming monitor for about 3 miles, is a mix of developed and undeveloped land within the city of Deming city limits. Beyond the city limits to the west, there are undeveloped lands to the Arizona border.

See discussion about the May 2, 2018, exceedance for information about the location of the Holman site. During the hours of highest impact on the monitor, the winds were from the east and southeast. Generally, most of the land to the east is arid and undeveloped.

The NMED indicates anthropogenic sources near the monitor sites includes disturbed surface areas, residential properties, vacant lots, dirt roads, and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

The city of Las Cruces, Deming, Luna County, or Dona Ana County were upwind of Holman, Desert View, or Deming monitor sites on the exceedance day. The demonstration provides information on the

cities and counties dust ordinances. The ordinances require a plan for dust control on disturbed sites. The controls would have applied to any upwind disturbed sites in the cities, counties and unincorporated Chaparral and La Union communities on the exceedance day. The NMED indicates the implementation and enforcement of any controls occur at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at the Holman, Desert View and Deming sites.

Mexico may have been upwind of Desert View, Deming, and Holman on the exceedance day. Figure 8-4 on page 72 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the model with the trajectories ending at the "start" of the wind event, at the Holman monitor site. The results show the winds may have been in Texas and Mexico prior to reaching Holman. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.

JUNE 13, 2018

The exceedance occurred on June 13, 2018, hereafter referred to as the "exceedance day" at a monitor site in Dona Ana County. The relevant monitor and exceedance are:

Site Name	Monitor AQS ID	Exceedance Measurement
Deming	35-029-0003-81102-2	186 $\mu g/m^3$

JUNE 13, 2018, EXCEEDANCE DAY, Clear Causal Relationship.
In the demonstration, the NMED states "[a]s the event unfolded, the wind blew from the southeast throughout the border region."

Table 9-2 on page 80 shows hourly wind speed measurements from the Anthony, Deming, and West Mesa monitor sites for certain hours on the exceedance day. The table shows hourly wind speeds exceeded 25 mph for one hour at Deming. The maximum hourly wind speed measured at Anthony was 9 mph. The maximum hourly wind speed measured at West Mesa was 21 mph. Maximum wind gusts of 53, 21 and 45 mph were measured at the Deming, Anthony and West Mesa, sites, respectively.

Figure 9-5 on page 84 shows the frequency distribution of wind direction correlated with PM_{10} data at the Deming site when PM_{10} concentrations exceeded 150 $\mu g/m^3$ on the exceedance day. The winds were from the southeast.

Figure 9-3 on page 81 shows hourly wind speeds at Deming, Anthony, Desert View, Chaparral, Holman, and West Mesa on the exceedance day. The winds at Deming exceeded 25 mph for at least one hour. The winds at Holman, West Mesa and Chaparral approached but did not reach 25 mph.

On the exceedance day, AQS data shows the hourly wind speeds at the Holman site approached 25 mph for multiple hours. Holman is about 63 miles east slightly northeast of Deming.

On the exceedance day, AQS data shows the hourly wind speeds at the Chamizal and Ascarate monitor sites in El Paso County were between 15-18 mph for multiple hours.

The Deming airport is where the monitoring site is located. On the exceedance day, winds at the airport exceeded 25 mph for multiple hours. During this period, the winds were from the southeast and gusts reached 48 mph. From 1:00 pm to 2:00 pm the weather type was "Thunderstorms in the vicinity" (Weather Type VCTS:7), which then shifted for the next several hours to "Haze and smoke" (Weather Type HZ:7|FU).

The Las Cruces airport is about 48 miles east of Deming. On the exceedance day winds at the airport exceeded 25 mph for at least 30 minutes. During this period, the winds were from the west southwest and gusts reached 37 mph. From about 4:00 pm to 5:00 pm the weather type for the exceedance day was "Haze and smoke" (Weather Type HZ:7|FU).

Figure 9-9 on page 87 shows the 24-hours PM_{10} measurements from Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. Deming exceeded the NAAQS level and the other measurements were above average: Anthony 81 $\mu g/m^3$ (average 36 $\mu g/m^3$), Desert View 82 $\mu g/m^3$ (average 39 $\mu g/m^3$), Chaparral 65 $\mu g/m^3$ (average 16 $\mu g/m^3$), West Mesa 61 $\mu g/m^3$ (average 16 $\mu g/m^3$) and Holman 58 $\mu g/m^3$ (average 26 $\mu g/m^3$)

The PM_{10} manual monitors in El Paso County did sample on the exceedance day. AQS data shows the 24-hours measurements were above the monitor averages: Socorro 42 $\mu g/m^3$ (average 30 $\mu g/m^3$), Riverside 43 $\mu g/m^3$ (average 29 $\mu g/m^3$), Ivanhoe 54 $\mu g/m^3$ (average 20 $\mu g/m^3$), Van Buren 59 $\mu g/m^3$ (average 30 $\mu g/m^3$), and Ojo De Agua 52 $\mu g/m^3$ (average 23 $\mu g/m^3$). The PM_{10} continuous monitor at the Chamizal site in El Paso County reports non-NAAQS comparable data. On the exceedance day, the Chamizal 24-hours measurement of 75 $\mu g/m^3$ is above the site average of 25 $\mu g/m^3$.

The narrative on page 82 explains that satellite imagery was not available during the event due to the development of dense cloud cover.

The NWS shorter-term NOW forecast excerpt on page 83 gives details on downburst wind gusts and locally dense blowing dust.

Figure 9-7 on page 85 shows hourly wind speeds and PM_{10} measurements at Deming on the exceedance day. The elevated PM_{10} measurements correlate with elevated wind speeds.

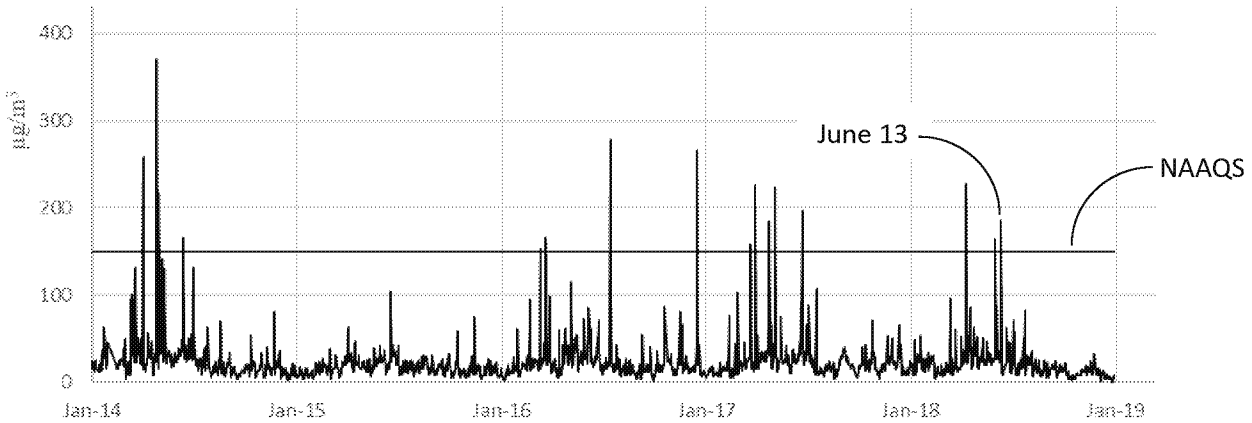
Figure 9-6 on page 85shows the hourly PM_{10} measurements from Chaparral, Anthony, Desert View, Deming, Holman, and West Mesa on the exceedance day. Elevated PM_{10} measurements correlate with elevated wind speeds shown in Figure 9-3.

There are independent weather reports, evidence of blowing dust, and hourly wind data which showed that on the exceedance day the area experienced a widespread wind incident with entrained particulate

matter. The demonstration showed that elevated hourly PM_{10} measurements at the monitor correlated with elevated wind speeds measured on the exceedance day. The likelihood that anthropogenic sources caused the exceedance are discussed below in the Not Reasonably Controllable criterion. Based on the EPA review of the clear causal relationship criterion using a weight of evidence approach to the information provided, the NMED showed that a high wind dust event clearly caused the PM_{10} exceedance at the monitor on the exceedance day.

JUNE 13, 2018, EXCEEDANCE DAY, Analyses comparing event influenced concentrations to other concentrations at the monitor.

The site measurements for the days surrounding the exceedance day did not approach the NAAQS level. The measurements on the exceedance day are above the 95th percentile of historical site data. The graph below reflects the 24-hours monitor data from 2014 to 2019 for the Deming site.



24-hours Measurements, Deming PM_{10} Monitor, 35-029-0003-81102-2

Based on the analyses and statistics, the comparison of the exceedances to the historical concentrations of PM_{10} at the monitor indicates a deviation from normal or typical concentrations occurred. This supports the clear causal relationship between the monitored exceedance and the wind incident on the exceedance day.

JUNE 13, 2018, EXCEEDANCE DAY, Not reasonably controllable or preventable.
See discussion above for additional information on the requirements for the EPA review and analysis of this overall criteria.

Not Reasonably Controllable, Anthropogenic Sources - The 25-mph high wind threshold is the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources. As discussed previously for the clear causal criterion, hourly wind speeds measured at Deming exceeded the threshold on the exceedance day. The winds were from the southeast.

See discussion about the April 12, 2018, exceedance for information about the location of the Deming site. To the south of the site for about 2 miles, there is a mix of developed and undeveloped land within the city of Deming limits. To the east of the site 47 miles, there is undeveloped lands and the city of Los

Cruces. Except for the city of Deming, a village close to the Mexico border and some agricultural fields, the land in Luna County is undeveloped. Deming is about 33 miles north of the Mexico border.

The NMED indicates anthropogenic sources near the monitor sites includes disturbed surface areas, residential properties, vacant lots, dirt roads and storage piles. The NMED also indicates no unusual sources were operational and point source emissions were constant before, during, and after the wind incident. The demonstration does not provide information about any specific potential anthropogenic sources, nor controls on the sources, on the exceedance day. The demonstration does, however, provide general information about controls for potential anthropogenic sources within the state's jurisdiction.

Portions of the city of Deming and Luna County was upwind of Deming on the exceedance day. The demonstration provides information on the county dust ordinance. The ordinance requires a plan for dust control on disturbed sites. The controls would have applied to any upwind disturbed sites in the county or Deming community on the exceedance day. The NMED indicates the implementation and enforcement of any controls occurs at the local level. During the subject widespread high wind event, however, the emissions from the extensive upwind undeveloped lands likely dominated the impacts at Deming on the exceedance day.

Figure 9-4 on page 83 shows the results of a NOAA HYSPLIT Model 6 hours backward trajectories. The NMED ran the model with the trajectories ending at the "start" of the wind event, at Deming. The results show the winds may have been in southern and eastern New Mexico and Arizona prior to reaching Deming. Any upwind anthropogenic sources in Arizona are outside the state of New Mexico's jurisdiction. The state is not required to address the reasonably controllable criteria for sources outside its jurisdiction, 40 CFR 50.14(b)(8)(vii).

Based on the limited scope of potential anthropogenic upwind sources within the state jurisdiction, the possible controls on the sources, the widespread nature of the weather event, and the likelihood that emissions from high winds on extensive upwind undeveloped arid lands contributed significantly to the impacts, the demonstration showed that contributing anthropogenic activities were reasonably controlled on the exceedance day.