Interim Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds Under the Exceptional Events Rule

United States Environmental Protection Agency

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Acronyms

AAQ	Affects Air Quality
ADEQ	Arizona Department of Environmental Quality
AQS	Air Quality System
BACM	Best Available Control Measures
BMP	Best Management Practice
CAA	Clean Air Act
CCR	Clear Causal Relationship
CFR	Code of Federal Regulation
CLASS	Clean Air Support System
DAQEM	Department of Air Quality and Environmental Management (Clark County, NV)
DRI	Desert Research Institute
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GIS	Geographic Information System
HAURL	Human Activity Unlikely to Recur at a particular Location
HF	Historical Fluctuations
MAG	Maricopa Association of Governments (Arizona)
MODIS	Moderate Resolution Imaging Spectroradiometer
MSM	Most Stringent Measure
nRCP	not Reasonably Controllable or Preventable
NAAQS	National Ambient Air Quality Standards
NEBF	No Exceedance But For the event
NSR	New Source Review
NWS	National Weather Service
RACM	Reasonably Available Control Measures
PM	Particulate Matter
SCAQMD	South Coast Air Quality Management District (California)
SIL	Significant Impact Level
SJV	San Joaquin Valley
SIP	State Implementation Plan
TOEM	Tapered Element Oscillating Microbalance
UNLV	University of Nevada, Las Vegas
WEG	Wind Erodibility Group
WGA	Western Governors' Association
WRAP	Western Regional Air Partnership

1. Highlights

The EPA developed this document to assist air agencies[1] in meeting the requirements of the Exceptional Events Rule[2] (EER) for high wind dust (i.e., particulate matter) events[3] and to provide example recommended elements for exceptional event demonstrations. High winds can entrain and transport particulate matter (PM) to a monitoring site. These particles can consist of both PM_{10} (i.e., particles less than or equal to 10 micrometers (μm) in diameter) and $PM_{2.5}$ (i.e., particles less than 2.5 μm in diameter). High wind dust events can include both PM_{10} and $PM_{2.5}$.

Purpose of this Document

The purpose of this document is to provide assistance and illustration to air agencies implementing the EER for high wind dust events.[4] This interim document provides guidance and interpretation of the EER rather than imposing any new requirements and shall not be considered binding on any party. If and when the EPA takes a regulatory action that relies on a decision to exclude data under the EER, the EPA will consider and appropriately respond to public comments received on any aspect of a supporting exceptional events demonstration submittal.

The EPA recognizes the limited resources of the air agencies that prepare and submit exceptional event demonstration packages and of the EPA regional offices that review these demonstration packages. One of the EPA's goals in developing this document and the other exceptional event implementation guidance[5] is to establish clear expectations to enable affected agencies to better manage resources as they prepare the documentation required under the EER. Submitters should prepare and submit the appropriate level of supporting documentation, which will vary on a case-by-case basis using the weight-of-evidence approach. The EPA anticipates that the resources needed to prepare (and review) high wind dust exceptional event packages, and demonstrations for other event types, will decrease as we continue to identify ways to streamline the process and continue to build our database of example demonstrations and analyses. The EPA acknowledges that extreme exceptional events may justify more limited demonstration packages.

To Whom Does this Document Apply?

High wind dust events are typically a phenomenon experienced in the western United States where rainfall is seasonal, creating dry and dusty landscapes. Therefore, this document may be of most use to the states from the Great Plains (North Dakota, South Dakota, Nebraska, Kansas,

[1] References to "air agencies" are meant to include state, local, and tribal air agencies responsible for implementing the EER.
[2] "Treatment of Data Influenced by Exceptional Events; Final Rule", 72 FR 13560, March 22, 2007.
[3] The term "high wind dust event" is used in this document to refer to the same type of event that was discussed as a "high wind event" in the EER. The EPA believes the term "high wind dust event" more clearly describes the referred-to event.
[4] This interim guidance document presents examples to illustrate specific points. These examples are not necessarily required for all demonstrations.
[5] Other interim exceptional event guidance materials include the following: "Interim Guidance to Implement Requirements for the Treatment of Air Quality Monitoring Data Influenced by Exceptional Events" memorandum from Stephen D. Page, EPA Office of Air Quality Planning and Standards to Regional Air Directors, March 29, 2013, and the "Interim Exceptional Events Rule Frequently Asked Questions." Air agencies can find additional information and examples of exceptional event submissions and best practice components at the EPA's Exceptional Events website located at http://www.epa.gov/ttn/analysis/exevents.htm.

Oklahoma, and Texas) and west. Generally, this includes the states that comprise the Western Regional Air Partnership, which is most of EPA Regions 6, 7, 8, 9, and 10.

Guiding Principles for the Development of this Document

1. Air agencies should not be held accountable for exceedances due to exceptional events that were beyond their control at the time of the event.
2. It is desirable to implement reasonable controls to protect public health.[6]
3. Clear expectations will enable the EPA and other air agencies to better manage resources related to the exceptional events process.

Definition of a High Wind Dust Event

A high wind dust event includes both the high wind and the dust that the wind entrains and transports to a monitoring site. The event is not merely the occurrence of the high wind.

Elements for the Technical Demonstration of High Wind Dust Events

- Air agencies' demonstrations must address the following six technical elements under the EER before the EPA can concur on a high wind dust event demonstration:

1. whether the event was not reasonably controllable or preventable (nRCP)
2. whether there was a clear causal relationship (CCR)
3. whether there would have been no exceedance or violation but for the event (NEBF)
4. whether the event affects air quality (AAQ)
5. whether the event was caused by human activity unlikely to recur or was a natural event (HAURL / Natural Event)
6. whether the event was in excess of normal historical fluctuations (HF)

If a demonstration does not sufficiently address any one of the above, the EPA will not be able to concur with the request to exclude data under the EER.

- During the EPA's review of several high wind dust events flagged by air agencies as exceptional events, the EPA has found that the following EER elements play a significant role in air agencies' supporting documentation: nRCP, CCR, and NEBF.

- The EPA has also found for a high wind dust event that satisfying the requirements for nRCP, CCR, and HF criteria also generally satisfies the requirements for two elements identified by statute: AAQ and Natural Event.

- The EPA has not set pass/fail statistical criteria for the HF element, but will use a weight-of-evidence approach to assess each demonstration on a case-by-case basis. The air agency's role in satisfying this element is to provide analyses and statistics and conclude that the provided data show that the event was in excess of normal historical fluctuations. The EPA

[6] With respect to exceptional events, Section 319 of the Clean Air Act states the following guiding principles (among others);

(i) the principle that protection of public health is the highest priority

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(iv) the principle that each State must take necessary measures to safeguard public health regardless of the source of the air pollution

will review the information provided by the air agency. Events do not necessarily have to be rare to satisfy this element.

- While not listed as a technical element required by the EER, wind data (e.g., wind speed and direction) will generally play a vital role in informing the EPA's decision on elements such as whether the event was not reasonably controllable or preventable and establishing a clear causal relationship.

Not Reasonably Controllable or Preventable

- Exceedances caused in whole or in part by anthropogenic dust sources within the air agency's control are unlikely to be eligible for treatment as exceptional events under the EER, even under conditions of elevated winds, unless the air agency shows that the event, including the emissions from the anthropogenic dust sources, was not reasonably controllable or preventable. The EPA intends to evaluate whether an event was not reasonably controllable or preventable at the time of the event by taking into account the wind speed; the controls in place; the controls required in the State Implementation Plan (SIP), which depends on an area's attainment status; the frequency and severity of exceedances; contributing sources; benefits of the controls; costs of controls; and other factors.

- The EPA also judges the reasonableness of controls based on the technical information that was available to the air agency at the time the event occurred. The EPA generally expects air agencies to already have the technical information needed to reasonably control sources within nonattainment areas.

- The degree of event-specific information and data necessary for demonstrating "not reasonably controllable or preventable" will generally be less for sustained wind speeds at or above the high wind threshold and greater for speeds below that the threshold. The high wind threshold is the minimum threshold wind speed capable of overwhelming reasonable controls on anthropogenic sources (i.e., significant emissions from controlled sources) or causing emissions from natural undisturbed areas. The EPA recommends that air agencies establish area-specific high wind thresholds based on local or applicable conditions and information. If an agency is unable to develop an area-specific high wind threshold, the EPA will generally accept a threshold of a sustained wind of 25 mph for areas in the West provided the agencies submit evidence of this as the level at which they expect stable surfaces (i.e., controlled anthropogenic and undisturbed natural surfaces) to be overwhelmed. In identifying a high wind threshold, the EPA does NOT intend to set a bright line as to what speed constitutes a high wind dust event or to categorically concur with all events with sustained winds above a given threshold.

- An air agency has the option of submitting a prospective controls analysis in advance or with a demonstration package. Described in more detail in Section 3.7.1, a prospective controls analysis is a generic[7] review of an area's *existing* windblown dust controls and high wind threshold. In the prospective controls analysis, the air agency would provide information on attainment status, identify natural and anthropogenic windblown dust sources and emissions, provide the status of SIP submittals (if applicable), and identify the high wind threshold up to

[7] "Generic" means a general review rather than a review specific to an identified event.

which the collective windblown dust controls are expected to be effective. If the EPA approves the prospective controls analysis, an air agency's subsequent high wind exceptional event packages could reference the approved set of controls in the prospective controls analysis and show that the wind speed for the event in question is at or above the high wind threshold established in the prospective controls analysis. Air agencies would also include in their demonstration some positive showing that control requirements were being met on the day in question. In this manner, the prospective controls analysis could facilitate the EPA's review and evaluation of the not reasonably controllable and preventable criterion. An EPA-approved prospective controls analysis would generally be effective to serve this purpose for a minimum of three years.

- The EPA and the submitting air agency may also consider developing a *voluntary* High Wind Action Plan. Air agencies can develop High Wind Action Plans to document their plans to implement needed controls on newly-identified sources that could emit dust during subsequent high wind events. A High Wind Action Plan is an optional mechanism to implement necessary controls more expeditiously than with the normal regulatory planning process. Preparation of such a plan and its approval by the EPA could promote a common understanding between the air agency and the EPA about whether subsequent high wind dust events are not reasonably controllable or preventable.

Clear Causal Relationship

As described in Section 3.3, air agencies can use the following example analyses to establish a clear causal relationship:

- analyses showing that the event in fact occurred and that emissions were transported in the direction of the monitors where measurements were recorded
- the size of the area affected by the emissions
- comparison to non-event days
- the spatial and temporal relationship between the event, transport of emissions, and recorded concentrations

No Exceedance But For the Event

The NEBF demonstration may be relatively straightforward for areas with typical concentrations on non-event days well below the applicable National Ambient Air Quality Standards (NAAQS). However, demonstrating NEBF becomes increasingly difficult if concentrations on non-event days during the same season exceed the standard and/or if the contribution of non-event pollution sources produce concentrations near the applicable NAAQS.

Disclaimer

The Exceptional Events Rule is the source of the regulatory requirements for exceptional events and exceptional event demonstrations. This document provides guidance and interpretation of the Exceptional Events Rule rather than imposing any new requirements and shall not be considered binding on any party. Any determination that an event is exceptional made on the basis of this guidance will need documentation to support the decision. If and when the EPA takes a regulatory action that relies on a decision to exclude data under the Exceptional Events Rule, the EPA will consider and appropriately respond to any public comments received on any aspect of a supporting exceptional events demonstration submittal.

2. Overview of Exceptional Events Rule

The EER and the preamble describe specific criteria for an event to be considered an "exceptional event" for purposes of exclusion of air quality data from regulatory decisions and acknowledge that "natural events" can be recurring.

2.1 Definition of the "Event" for High Wind Dust Events

In high wind dust events, the meteorological phenomenon (i.e., wind) is purely natural and thus can be classified as a natural event, but the pollution from the event may be a mixture of natural sources (e.g., undisturbed soil) and anthropogenic sources (e.g., soil disturbed by human activity, emissions from sand and gravel facilities, etc.). The EPA generally classifies high wind dust events as "natural events" in cases where windblown dust is entirely from natural sources or where all significant anthropogenic sources of windblown dust have been reasonably controlled.[8] This long-standing policy was established in the Natural Events Policy which provided that:

> "Ambient PM-10 concentrations due to dust raised by unusually high winds will be treated as due to uncontrollable natural events under the following conditions: (1) the dust originated from nonanthropogenic sources, or (2) the dust originated from anthropogenic sources controlled with best available control measures (BACM)."[9]

For the purposes of this guidance, we are defining a high wind dust event as the combination of high wind and the dust that the wind entrains and transports to a monitoring site. Uncontrollable windblown dust emissions only occur in the presence of high wind. Therefore, for exceptional events purposes, it is appropriate to consider both the emissions and the corresponding high wind as the "event."

2.2 Evidence Necessary to Support Exceptional Events Requests

The EPA promulgated the Exceptional Events Rule in 2007, pursuant to the 2005 amendment[10] of Clean Air Act (CAA) Section 319. The EER added 40 CFR §50.1(j), (k) and (l); §50.14; and §51.930 to the Code of Federal Regulations. These sections contain definitions, criteria for EPA approval, procedural requirements, and requirements for air agency demonstrations, all of which

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[8] The EPA will generally consider human activity to have played little or no *direct* role in causing emissions of the dust generated by high wind for purposes of the regulatory definition of "natural event" if contributing anthropogenic sources of the dust are reasonably controlled, regardless of the amount of dust coming from these reasonably controlled anthropogenic sources, and thus the event could be considered a natural event. In such cases, the EPA believes that it would generally be a reasonable interpretation of its regulations to find that the anthropogenic source had "little" direct causal role. If anthropogenic sources of windblown dust that are reasonably controllable but that did not have those reasonable controls applied at the time of the high wind event have contributed significantly to a measured concentration, the event would not be considered a natural event. See preamble to the EER at 72 FR 13566, f.n. 11.

[9] "Areas Affected by PM10 Natural Events" (the PM10 Natural Events Policy), memorandum from Mary D. Nichols, Assistant Administrator for Air and Radiation, to EPA Regional Offices, May 30, 1996. EPA's position that windblown emissions from controlled anthropogenic sources would be considered natural is reflected in the preamble to the EER at 72 FR 13566, f.n. 11.

[10] Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU), section 6013 amending CAA §319, became law August 10, 2005; available at http://thomas.loc.gov/cgi-bin/query/z?c109:H.R.3:

must be met before the EPA can concur under the EER on the exclusion of air quality data from regulatory decisions.

The definition of an exceptional event given in 40 CFR §50.1(j) parallels the statutory definition of Section 319 of the CAA and itself contains certain criteria for approval by the EPA:

- The event "affects air quality."
- The event "is not reasonably controllable or preventable."
- The event is "caused by human activity that is unlikely to recur at a particular location or [is] a natural event."[11]

Additional criteria for the EPA approval to exclude data affected by a high wind dust event are given (with some repetition of key phrases) in 40 CFR §50.14(a) and (b)(1).[12] Under these provisions the air agency must:

- "demonstrat[e] to EPA's satisfaction that such event caused a specific air pollution concentration at a particular air quality monitoring location."
- "demonstrate a clear causal relationship between the measured exceedance or violation of such standard and the event …"
- "demonstrat[e] to EPA's satisfaction that an exceptional event caused a specific air pollution concentration in excess of one or more national ambient air quality standards at a particular air quality monitoring location and otherwise satisfies the requirements of this section [regarding schedules, procedures and submission of demonstrations]."

Under 40 CFR §50.14(c)(3)(iv),[13] the air agency demonstration to justify exclusion of data must provide evidence that:

A. "The event satisfies the criteria set forth in 40 CFR §50.1(j)" for the definition of an exceptional event (see above);

B. "There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area";

C. "The event is associated with a measured concentration in excess of normal historical fluctuations, including background"; and

D. "There would have been no exceedance or violation but for the event".

The definition of an exceptional event provided in 40 CFR § 50.1(j) explicitly excludes "stagnation of air masses or meteorological inversions, a meteorological event involving high temperatures or lack of precipitation, or pollution relating to source noncompliance."[14] Exceedances due to these events would not be eligible for exclusion under the EER. For

[11] A natural event is further described in 40 CFR 50.1(k) as "an event in which human activity plays little or no direct causal role."
[12] §50.14 (b)(2) and (b)(3) contain criteria relevant only to firework events and prescribed fire events.
[13] Prior to the publishing of the 2010 CFR the citation was §50.14(c)(3)(iii)
[14] For further explanation see "Treatment of Data Influenced by Exceptional Events; Final Rule," 72 FR 13577, (March 22, 2007).

example, if sources out of compliance with fugitive dust or other rules contributed significantly to an exceedance, then the exceedance would not be excluded as due to an exceptional event.

2.3 Mitigation Requirement

40 CFR §51 Subpart Y includes mitigation requirements at 51.930. While the EER does not require that air agencies submit mitigation measures to the EPA as part of the demonstration package (or otherwise), Subpart Y requires that "[a] State requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the national ambient air quality standards." Section 4 of this document addresses the mitigation requirement.

2.4 Process Requirements per EER

In addition to identifying technical demonstration requirements, the EER specifies the process an air agency must follow to request data exclusion:

- "A State shall notify EPA of its intent to exclude one or more measured exceedances of an applicable ambient air quality standard as being due to an exceptional event by placing a flag in the appropriate field for the data record of concern which has been submitted to the AQS database..." 40 CFR § 50.14(c)(2)(i).

- The placement of the flags and the submittal of an initial event description must be done "not later than July 1st of the calendar year following the year in which the flagged measurement occurred."[15] 40 CFR § 50.14(c)(2)(iii).

- "A State that has flagged data as being due to an exceptional event and is requesting exclusion of the affected measurement data shall, after notice and opportunity for public comment, submit a demonstration to justify data exclusion to EPA not later than the lesser of, 3 years following the end of the calendar quarter in which the flagged concentration was recorded or, 12 months prior to the date that a regulatory decision must be made by EPA. A State must submit the public comments it received along with its demonstration to EPA." 40 CFR § (50.14(c)(3)(i)).

- With the submission of the demonstration, the air agency "must document that the public comment process was followed." 40 CFR § (50.14(c)(3)(iv)).

[15] This language references the general schedule in the EER. When the EPA promulgates a new or revised NAAQS, we may also promulgate changes to this schedule to allow air agencies to flag and submit documentation for data relevant to the new/revised NAAQS.

3. Evidence to be Included in a High Wind Dust Event Demonstration Package

As discussed in Section 2.2, the EER identifies technical elements (i.e., criteria or evidence) that an air agency must address and demonstrate before the EPA can concur that an exceedance is due to an exceptional event. Table 1 shows the complete list of technical elements air agencies must submit and satisfy as part of a demonstration for high wind dust events. The EPA cannot concur on an air agency's request to exclude data under the EER if the air agency has not met these criteria.

Table 1. EER Technical Demonstration Elements Required by the EER for High Wind Dust Events

Element	Abbreviation	Section of this Document Containing Additional Explanation
affects air quality*	AAQ	3.4
not reasonably controllable or preventable	nRCP	3.1
caused by human activity unlikely to recur at a particular location OR a natural event[16]*	HAURL / Natural Event	3.5
clear causal relationship between the measurement and the event	CCR	3.3
no exceedance or violation but for the event	NEBF	3.6
the event is associated with a measured concentration in excess of normal historical fluctuations, including background	HF	3.2

*These elements are typically met when the other elements have been satisfied.

The EPA uses a "weight-of-evidence" approach in reviewing air agency requests for data exclusion under the EER. Evidence and narrative that constitute a strong demonstration for one element can also be part of the demonstration for another element, but cannot make up for the absence of or insufficient explanation supporting another element. A strong demonstration for one requirement could, however, influence the persuasiveness of the demonstration for another.

In reviewing the supporting documentation in several high wind dust event demonstrations, the EPA has found the following EER elements play a significant role: nRCP, CCR, and NEBF. The criterion that the event be in excess of normal historical fluctuations (HF) is a technical element that the EPA expects to be satisfied by the submittal of data as outlined in Section 3.2. In addition to satisfying the HF criterion, these data are expected to inform the CCR and NEBF demonstrations.

[16] High wind dust events are considered natural events if sources are entirely natural or if contributing anthropogenic sources are reasonably controlled and therefore it is not relevant to consider whether the event was caused by human activity unlikely to recur.

The EPA has generally found that for high wind dust events, air agencies can meet the requirements of two elements identified by statute, AAQ[17] and Natural Event, by satisfying the requirements for nRCP, CCR, and HF. While not identified as a separate demonstration element in Table 1, wind data (e.g., wind speed and direction) is vital in informing the EPA's decision regarding "not reasonably controllable or preventable" and "clear causal relationship."

Finally, the EPA recommends that air agencies begin their technical demonstration for a high wind dust event with a conceptual model of how the event occurred. An air agency's conceptual model can use text and/or schematics to identify and describe the relationship between various phenomena (e.g., weather and dust emissions) that caused an exceedance. In its simplest form, the conceptual model could be a narrative description of how the event unfolded and resulted in the exceedance(s). The conceptual model may be similar to a report abstract and should help tie the various rule criteria together into a cohesive explanation of the event.

Sections 3.1-3.6 of this document describe and clarify each element identified in Table 1. Section 6 provides example analyses and a recommended structure for the preparation of demonstration packages for high wind dust events.

In summary, the technical demonstration for a high wind dust event package should include the following technical elements:

- Not Reasonably Controllable or Preventable - Analyses and descriptions should show that the event was not reasonably controllable or preventable. ***Required by EER.***

- Clear Causal Relationship - Analyses and descriptions should show that there was a clear causal relationship between the ambient concentration measurement under consideration and the event that is claimed to have affected the air quality in the area. ***Required by EER***.

- No Exceedance But For the Event - Analyses and descriptions should show that there would have been no exceedance or violation but for the event. ***Required by EER***.

- Affects Air Quality - Statutory technical element that is generally satisfied once the submitter provides historical fluctuations analyses (HF), establishes a clear causal relationship (CCR), and provides explicit information indicating satisfaction of requirement through clear causal and historical fluctuations showings. ***Required by EER.***

- Natural Event - Statutory technical element that is generally satisfied once the submitter shows the event to be not reasonably controllable or preventable (nRCP), establishes a clear causal relationship (CCR), and provides information demonstrating these requirements have been met. ***Required by EER***.

[17] The preamble to the EER clarifies the AAQ criteria in section V.B. (p. 13569) by stating that the following criteria establish that the event affected air quality: "there is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area" and "the event is associated with an unusual measured concentration beyond typical fluctuations including background." On this basis AAQ is satisfied once CCR has been demonstrated and evidence for HF has been provided.

- Historical Fluctuations – Air agencies should provide analyses and descriptions in the format suggested in this document. The EPA will review this information in a weight-of-evidence showing. *Required by EER.*

- Wind Data - Data on wind speed and direction support the technical elements required by the EER such as CCR and nRCP. *Recommended, but not required by EER.*

- Conceptual Model - Narrative summary at the beginning of a demonstration package describing how the event unfolded to produce elevated PM at the monitor(s) that recorded the exceedance(s) and providing context for the supporting elements. *Recommended, but not required by EER.*

3.1 Not Reasonably Controllable or Preventable (nRCP)

Exceedances caused in whole or in part by anthropogenic dust sources within the air agency's control are unlikely to be eligible for treatment as exceptional events under the EER, even under conditions of high winds, unless the air agency shows that the event (i.e., dust entrained by high winds) was not reasonably controllable or preventable. The EPA evaluates whether an event was not reasonably controllable or preventable at the time of the event by taking into account controls in place and wind speed, along with other factors.[18] The factors and approach identified in this section should assist air agencies in developing adequate high wind dust exceptional event demonstration packages and promote consistency. The EPA will consider each package on a case-by-case basis per the EER. If and when the EPA takes a regulatory action that relies on a decision to exclude data under the Exceptional Events Rule, the EPA will consider and appropriately respond to any public comments received on whether the event was "not reasonably controllable or preventable."

3.1.1 Controls on Natural versus Anthropogenic Sources

According to the definition of an exceptional event, the event must be "not reasonably controllable or preventable" (40 CFR § 50.1(j)). For *natural* sources of dust, a high wind dust event can generally be considered to be not reasonably controllable or preventable[19], if winds are high enough to cause emissions from natural undisturbed areas. For *anthropogenic* sources of dust, a high wind dust event may also be considered to be not reasonably controllable or preventable if:

1. The anthropogenic sources of dust have reasonable controls in place.
2. The reasonable controls have been effectively implemented and enforced.
3. The wind speed was high enough to overwhelm the reasonable controls.

Reasonable controls on anthropogenic sources (item 1 on the list above) are generally fundamental to the event being not reasonably controllable or preventable. An event with both anthropogenic and natural components can be considered a "natural" event if the anthropogenic

[18]See SJV Attainment Affirmation, 73 FR 14687, for a prior high wind dust event in which the EPA considered controls and wind speed, along with other factors.
[19] The EPA expects that in most cases it would not be reasonable to have controls on natural sources, but this will be evaluated for each event.

component is reasonably controlled. Air agencies should demonstrate that natural events are reasonably controlled by showing that no additional controls are reasonable for the event. Additionally, "reasonable controls" refers to a collection of reasonably controlled sources. The term "not reasonably controllable or preventable" refers to the *event* (i.e., dust entrained by high winds), rather than to any particular source. Further, in determining whether the event is not reasonably controllable or preventable, the EPA will consider whether the **collection** of anthropogenic sources has been reasonably controlled. For anthropogenic sources, it is the high wind overwhelming the collection of reasonable controls, that have been effectively implemented and enforced, that may support a determination that the event is not reasonably controllable or preventable.

For purposes of evaluating high wind dust exceptional events in the West, the EPA will generally use the definitions of natural and anthropogenic windblown dust emissions that have been developed in the *Western Regional Air Partnership (WRAP) Fugitive Dust Handbook*.[20] According to the *WRAP Fugitive Dust Handbook*, all mechanically suspended dust from human activities should be considered anthropogenic emissions, while windblown dust from lands not disturbed or altered by human activity should be considered natural emissions. Furthermore, windblown dust from surfaces that have been significantly disturbed or altered by humans should be categorized as anthropogenic emissions. Such surfaces may include: undeveloped lands[21], construction and mining sites, material storage piles, landfills, vacant lots, agricultural lands, roadways, parking lots, artificially exposed beds of natural lakes and rivers, exposed beds of artificial water bodies, areas subject to off-road vehicle activity, and areas burned by prescribed fires. Natural sources may include: naturally-dry river and lake beds; barren lands; sand dunes; exposed rock; sea spray from natural water bodies; non-agricultural grass, range, and forest lands; areas burned by wildfires; and glacial silt.

The EPA generally considers dust entrained by high wind from undisturbed land (e.g., undisturbed desert) to be not reasonably controllable or preventable, because of the likely disturbance to natural ecosystems and the cost of treating large land areas. The EPA also generally considers that windblown dust from previously disturbed land that is being allowed to fully return to natural conditions by effective prevention of any new disturbance is also not reasonably controllable or preventable, provided that there are no reasonable active measures that air agencies can take to control dust during the transition back to natural conditions.[22] While emissions from most other natural sources of windblown dust could be similarly not reasonably controllable, the EPA will consider those on a case-by-case basis. In areas where events recur, the EPA may request increased characterization of the natural sources (e.g., historical surface disturbance, water diversions, vegetation changes, etc.).

While the EPA generally does not expect controls on emissions from natural sources (e.g., undisturbed land) for an event to be not reasonably controllable or preventable, the EPA generally does expect reasonable controls to be in place on the windblown anthropogenic

[20] *WRAP Fugitive Dust Handbook*, Prepared for Western Governors' Association, Countess Environmental (WGA Contract No. 30204-111), September 7, 2006. Available at http://www.wrapair.org/forums/dejf/fdh/index.html
[21] Undeveloped lands refer to those that are disturbed for purposes of development but not yet developed.
[22] An example of such a measure might be the restoration of all or part of natural surface water flows.

contribution to the concentration measured during the event.[23] Experience in several areas in the western United States has shown that it may be practical and reasonable to apply dust-suppression controls to some disturbed lands and other anthropogenic dust sources, and that these controls may help limit ambient concentrations of PM during high wind dust events, up to certain wind speeds. For example, some areas in the west have successfully controlled dust with measures such as water or chemical stabilization of disturbed areas such as construction zones, or limiting disturbance activities on windy days. If reasonable controls on windblown anthropogenic sources were in place, then the event would be considered "not reasonably controllable or preventable" and would satisfy the nRCP element of the definition of an exceptional event. That is, an air agency can generally meet the nRCP element for high wind events by identifying the contributing anthropogenic sources of windblown dust for a particular event and showing that reasonable controls were in place, effectively implemented, and enforced (as appropriate). The prior preparation of and the EPA's approval of a prospective controls analysis or high wind action plan (see Sections 3.7.1 and 3.7.2) addressing all the anthropogenic sources that might contribute during wind events can alleviate the need for this showing in each event case. For each event with windblown anthropogenic contributions, it is important that an air agency show that the exceedance occurred despite the implementation of those reasonable controls (i.e., to show that wind speeds were high enough to overwhelm the reasonable controls). The prior establishment of a high wind threshold (see Section 3.1.4 below) can make this showing less resource intensive per event. The EPA will evaluate the reasonableness of controls based on the controls that should have been in place given the information the air agency had when the event occurred (see Section 3.1.2 for factors that the EPA will consider in determining the reasonableness of the controls). The level of detail required to demonstrate that reasonable controls were in place, implemented/enforced, and overwhelmed by high winds, will depend upon the wind speed of the event relative to the high wind threshold if one has been established (see Section 3.1.4 and 3.1.5).

Typically, measured ambient air concentrations during an event will include some contribution from natural or anthropogenic sources whose emissions are not affected by high wind, for example transportation and industrial point sources: these are considered non-event sources. Non-event sources are not subject to the nRCP requirement of the EER, but an air agency may apply full-time or event-dependent controls on such sources as part of its attainment/maintenance SIP or as part of meeting the mitigation requirement under 40 CFR §51.930.

3.1.2 Factors Considered in Determining the Reasonableness of Controls

This section describes an approach for determining the reasonableness of the controls in place. Among other factors to consider, reasonableness needs to be judged in light of the technical information available to the air agency at the time the event occurred. The EPA would generally consider air agencies experiencing the following scenarios and/or with the following technical information to have had technical information indicating the need for high wind dust controls:

- More than one expected exceedance per year from high wind dust

[23] See the "Jurisdiction Reasonableness Factor" in Table 2. *Example Factors Considered in Determining the Reasonableness of Controls* for additional clarification of reasonable controls for emissions from out-of-state sources.

- Exceedances due to windblown dust when the sustained wind speed is less than the high wind threshold (or default) for the area
- Requirement for high wind dust BACM resulting from either nonattainment status or previous Natural Events Action Plan (NEAP)[24]
- Formal communication from the EPA indicating the need for high wind dust controls
- Promulgation of new/revised Federal rules that would require controls on particular sources

The EPA would not generally expect high wind dust controls in areas with no history of high wind dust exceedances.

The set of control requirements mandated by the area's designation status is an important factor used in evaluating reasonableness (see Section 3.1.2.2 for additional detail). Table 2 shows example factors that the submitter and the EPA may consider when assessing the reasonableness of controls as part of the nRCP criterion. Table 2 is not intended to be all-inclusive or quantitative.

Table 2. Example Factors Considered In Determining the Reasonableness of Controls.

"Reasonableness" Factor	**Description of "Reasonableness" Factor**
1. Control requirements based on area attainment status	The reasonableness of the controls depends upon historical concentrations and designation status.
2. Frequency and severity of past exceedances	More stringent controls may be reasonable if an area experiences frequent[25] and/or severe[26] exceptional event exceedances due to high winds than if the area has experienced only non-recurring[27] and/or mild isolated exceedances.[28]
3. Ease and effectiveness of control implementation	The EPA may consider cost-effective and readily deployable controls more reasonable.
4. Use of measures that are in widespread use	Controls that are considered "standard practices" and/or measures in widespread use for dust control in other areas would be considered more reasonable.

[24] On May 30, 1996, Mary D. Nichols, Assistant Administrator for Air and Radiation issued a memorandum to EPA regional offices entitled, "Areas Affected by PM_{10} Natural Events." The policy, known as the PM_{10} Natural Events Policy, or simply the Natural Events Policy, set forth procedures for protecting public health through the development of a Natural Events Action Plan, which implements Best Available Control Measures (BACM) for human-generated particulate emissions in areas that could violate the PM_{10} NAAQS due to natural events. Promulgation of the Exceptional Events Rule superseded the Natural Events Policy.

[25] Frequent is enough exceedances from high wind dust events to cause of violation of the NAAQS.

[26] A severe exceedance could be a 24-hour average PM_{10} concentration > 250 $\mu g/m^3$.

[27] Non-recurring is less than one high wind dust event per year.

[28] A mild isolated exceedance could be, for example, an exceedance close to the standard at one monitoring site.

Table 2. Example Factors Considered In Determining the Reasonableness of Controls.

"Reasonableness" Factor	**Description of "Reasonableness" Factor**
5. Jurisdiction	Air agency demonstration submittals should address the status of control measures for interstate and international transport. However, the EPA also anticipates that air agency demonstrations can generally satisfy the "not reasonably controllable or preventable" criterion with less detailed characterization of sources in the upwind state or country than of sources in the same state as the affected monitor.[29]
6. Controls on primary sources expected to have contributed to the event	Were primary sources of anthropogenic windblown dust controlled during the event?
7. Significant contribution of sources to the exceedance	There is no defined *de minimis* emission rate or ambient contribution that limits which sources should be considered for control, and the EPA will review this on a case-by-case basis. However, as a starting point, we believe it is generally reasonable to consider source categories that may contribute 5 μg/m^3 or more to an exceedance of the 150 μg 24-hour PM_{10} standard.[30] In some cases (i.e., wind speeds above the high wind threshold) it may not be necessary to consider sources down to 5 μg, while in other situations it may be appropriate to consider sources below 5 μg. This starting point may be revisited should the PM_{10} NAAQS be revised. *De minimis* levels for $PM_{2.5}$ have not been clearly established.

[29] Considering the sovereignty issues associated with interstate and international transport, the EPA believes that "reasonable control" showings generally can rely on the concept that it is not reasonable to expect the downwind state (i.e., the state submitting the demonstration) to require the upwind country or state to have implemented controls on sources sufficient to limit event-related air concentrations in the downwind state. As with any demonstration submittal, the submitting (downwind) state should sufficiently identify all natural and anthropogenic contributing sources of emissions (both in-state and out-of-state) to show the causal connection between an event and the affected air concentration values. A submitting state may provide a less detailed characterization of sources in the upwind state or country than of sources within its jurisdiction. After completing the source characterization, the submitting state should assess whether emissions from sources within its jurisdiction (i.e., in-state sources) were not reasonably controllable or preventable. Although the submitting state should also provide available information on the status of control measures for emissions from out-of-state sources, the submitting state may determine based on available information that the "not reasonably controllable or preventable" criterion is satisfied in light of the state's inability to require controls of the upwind state. When assessing emissions transported from other states or countries, the submitting state can say that it characterized the out of state sources, determined that these sources contributed to the noted exceedance or violation, and determined, based on jurisdictional boundaries and other available information, that contributing emissions from the upwind state or country were not reasonably controllable or preventable. Submitting states are further required to submit evidence/statements supporting the other exceptional event criteria (i.e., clear causal relationship, but for, human activity unlikely to recur or a natural event, affects air quality, and historical fluctuations). The EPA refers the reader to Question 23 in the "Interim Exceptional Events Rule Frequently Asked Questions" for additional information on this topic.

[30] 5μg is the "significant impact level" (SIL) used in NSR permitting to decide whether an individual source has a significant contribution to a 24-hr PM_{10} NAAQS violation, based on 40 CFR 51.165(b)(2), and so is used here for a similar use.

Table 2. Example Factors Considered In Determining the Reasonableness of Controls.

"Reasonableness" Factor	Description of "Reasonableness" Factor
8. Overall benefit of controls	There may be benefits to controlling even small anthropogenic sources. Reducing ambient concentrations may have a public health benefit.

3.1.2.2 Consideration of attainment status in judging reasonableness

For the anthropogenic sources to be considered to be reasonably controlled, the EPA anticipates that it is reasonable for an air agency to have the controls required for an area's attainment status. Generally, the EPA does not expect areas classified as attainment, unclassifiable, or maintenance for a NAAQS to have the same level of controls as areas that are nonattainment for the same NAAQS. Also, if an area has been recently designated to nonattainment but has not yet been required to implement controls, the EPA will expect the level of controls that is appropriate for the planning stage.

3.1.2.3 Consideration of BACM/RACM

Although Reasonably Available Control Measures (RACM) and Best Available Control Measures (BACM) for windblown dust are not necessarily required to have been in place at the time of the event for all areas, they are measures that the EPA and affected agencies have identified as being reasonable. The CAA requires BACM for serious PM_{10} nonattainment areas and RACM in moderate PM_{10} nonattainment areas. Therefore, for such areas, the EPA will use the local list of BACM or RACM measures (as applicable) as a reference point to review the reasonableness of controls. The control measures evaluated should be related to windblown dust. Having BACM/RACM in place during the time of the event is an important consideration, but may not be sufficient on its own. For example, BACM/RACM measures may be insufficient if they are not related to windblown dust, if the SIP has not been recently reviewed or revised, or if they focus on air quality issues during specific periods without high winds, such as winter stagnation events. Generally, the EPA will consider windblown dust BACM to constitute reasonable controls if these measures have been reviewed and approved in the context of a SIP revision for the emission source area within the past three years. In some cases, a lower level of control could be reasonable, while in other cases it could be reasonable to require controls more stringent than current BACM or RACM (e.g., upon start-up or identification of a significant new source of emissions). Other areas (i.e., attainment, maintenance, or unclassifiable areas) are not required to have put BACM in place and also may not have implemented RACM. In these cases, the EPA may use local RACM measures, where available, along with other RACM measures that may be appropriate for the location and source categories, as the reference point. RACM/BACM lists may be *a reference point, but not the sole means,* by which the EPA assesses the reasonableness of controls. If an air agency believes that the EPA should not use RACM/BACM as the reference point for reasonable controls, the air agency should provide supporting rationale and an alternative reference point in the demonstration package.

If an air agency has identified agricultural activities as contributing to event-related windblown dust emissions, the air agency may also identify applied U.S. Department of Agriculture / Natural Resources Conservation Service-approved conservation management practices designed to effectively reduce fugitive dust air emissions and prevent loss of soil during high winds.

3.1.3 Implementation and Enforcement of High Wind Dust Control Measures

As stated in Section 3.1.1, the second criterion that the EPA generally will consider in its determination of whether the event meets the nRCP criterion is implementation and enforcement (where appropriate) of control measures on contributing sources of dust. In their demonstration submittals, air agencies should submit available inspection reports and/or notices of violations (NOVs) in upwind areas to show that all reasonable controls were implemented and functioning properly at the time of the event.[31] The EPA recognizes that records may not be available for all events. Cases where relevant control measures were not being fully implemented or properly enforced, but reasonably could and should have been, are unlikely be eligible for data exclusion under the Exceptional Events Rule.

3.1.4 Consideration of Wind Speed

The third condition stated in Section 3.1.1 for the EPA to consider for the nRCP criteria for an event with anthropogenic sources is whether the wind speed was high enough to overcome reasonable controls. In all cases (i.e., those including natural and/or anthropogenic sources) wind speed informs the rigor of the nRCP analysis. It is important to note that the EPA is not setting a bright line as to what speed constitutes a high wind dust event or to categorically concur with all events with sustained winds above a given level. This section describes how the EPA will generally use wind speed in its evaluation of the nRCP criterion.

Typically, undisturbed desert landscapes in the west have a natural crust that protects the surface and tends to prevent windblown dust emissions. Similarly, many reasonably-controlled anthropogenic sources (e.g., disturbed surfaces) employ techniques that stabilize surfaces to reduce or prevent emissions since disturbed surfaces are a primary source of anthropogenic dust. Numerous studies have been conducted to determine the minimum wind speed capable of overwhelming reasonable controls on anthropogenic sources or causing emissions from natural undisturbed areas. The speed at which this occurs varies by location, depending on characteristics of the local landscape (e.g., soil type and characteristics, vegetation) and controls (See Appendix A). The EPA recommends that agencies develop a high wind threshold for each area experiencing high wind dust events (see Appendix A3 for additional information on the development of a high wind threshold). Appropriate area-specific thresholds should consider local conditions and the variation in control strategies and specify a minimum wind speed above which these controls would be overwhelmed. If nonanthropogenic sources are a significant source of emissions for a particular area, a high wind threshold may also be based on the level of wind speed capable of causing emissions from those specific natural undisturbed areas. This approach is consistent with the Natural Events Policy where the EPA recommended that the air agencies define the conditions in which BACM level controls were overwhelmed. The area-specific high wind threshold should be representative of conditions (i.e., sustained wind

[31] The EPA recognizes that agencies have varied methods of permitting and enforcement and does not expect all agencies to have these records for all events. Agencies should, however, make a general showing that they are enforcing controls to a reasonable degree (not necessarily on the particular day of the event). If an air agency identifies several categories of anthropogenic sources as significant or likely contributors to an event, the air agency should also describe in the demonstration the means used to determine compliance with reasonable control requirements for each category.

speeds[32]) that are capable of overwhelming reasonable controls (whether BACM, RACM, or other) on anthropogenic sources and/or causing emissions from natural undisturbed areas. The threshold is not intended to represent the minimum wind speed at which *any* level of emissions could occur (e.g., aerodynamic entrainment), but rather when significant emissions begin due to reasonable controls or natural undisturbed areas becoming overwhelmed. Air agencies can develop/identify and submit their high wind threshold in advance of submittal of the demonstration package, with a letter of intent, with a demonstration package, as part of a prospective controls analysis, or as part of a High Wind Action Plan. If an agency is unable to develop an area-specific high wind threshold, the EPA generally will accept a threshold of a sustained wind of 25 mph for areas in the west provided the agencies support this as the level at which they expect stable surfaces (i.e., controlled anthropogenic and undisturbed natural surfaces) to be overwhelmed.[33] If the EPA has specific information based on relevant studies to choose an alternative high wind threshold, the EPA will notify the air agency once this information has been submitted. Throughout this document, the term "high wind threshold" will be used to define the minimum threshold wind speed capable of overwhelming reasonable controls on anthropogenic sources (i.e., significant emissions from controlled sources) or causing emissions from natural undisturbed areas.

Generally, if a demonstration can show that the sustained wind speed was at or above the high wind threshold at or proximately upwind of the location of the exceedance, then two streamlined approaches are available to meet the nRCP criterion:

1. Rely on an already-approved prospective controls analysis. A set of controls for an area could be approved with the high wind threshold in advance of submittal of a package for a specific event (see Section 3.7.1). Once the prospective controls analysis was approved, additional information on controls for specific packages would typically be limited to information on enforcement and implementation.
2. Conduct a basic controls analysis. Minimal amounts of information on sources and controls would be required for each event (see Section 3.1.5 and 3.1.5.1).

If the sustained wind speed for an event was below the high wind threshold, the EPA will still consider the package and possibly concur but will generally require that the air agency submit additional controls information as described in the comprehensive controls analysis (See section 3.1.5 and 3.1.5.2).

The EPA believes that streamlined information (i.e., a pre-approved prospective controls analysis or a basic controls analysis) is generally sufficient when wind speeds are at or above the high wind threshold because, in this situation, controls to prevent windblown dust are likely to become overwhelmed. Thus, the event is more likely to be not reasonably controllable or preventable. If most controls on wind-blown dust become overwhelmed at or above the high wind threshold, air agencies would likely find it difficult to identify additional reasonable controls that could be put into place to reduce windblown dust.

In contrast, if the wind speeds associated with the event are below the threshold levels required to initiate dust emissions from natural or stable (i.e., reasonably-controlled) sources, the EPA

[32] See Section 6.2.2.2 for details on the calculation of sustained wind speed.
[33] The 25 mph threshold is based on studies conducted on natural surfaces.

may ask air agencies to submit more detailed information (i.e., a comprehensive controls analysis) to satisfy the nRCP requirement. The EPA believes air agencies should submit a comprehensive controls analysis when wind speeds are below the high wind threshold because events with wind speeds below this threshold should entrain very little dust from natural and reasonably-controlled disturbed surfaces. Further, the EPA anticipates that windblown emissions would include significant contributions from sources that are neither natural nor reasonably-controlled. Thus, the event is less likely to be not reasonably controllable or preventable. In these cases, air agencies should identify the various land areas contributing to the event, discuss the controls in place on those land areas, and determine whether those controls were reasonable based on those factors identified in Section 3.1.2.

3.1.5 Controls Analysis for Individual Events

Air agency demonstration submittals should include a controls analysis for each specific high wind dust event. The extent of the controls analysis should primarily depend upon the level of the wind speed relative to that of the high wind threshold for the area. A basic controls analysis may be sufficient for cases when the sustained wind speed at the source area[34] is greater than or equal to the high wind threshold, while a comprehensive controls analysis may be necessary when sustained wind speeds are below the high wind threshold (Table 3). If an air agency has not prospectively determined the high wind threshold for the area, then this determination, or establishing that the default threshold of 25 mph applies, should be the first step in the controls analysis.[35] Next, the EPA recommends that air agencies develop their nRCP analysis to evaluate the sustained wind speed during the event. This process may indicate that only the streamlined basic controls analysis is needed. See Section 6.3.2.2 for wind speed considerations for nRCP.

Table 3. Summary of Recommended Controls Analysis Elements for not Reasonably Controllable or Preventable Demonstration

Control Analysis Elements	Basic Controls Analysis	Comprehensive Controls Analysis
Description of anthropogenic sources within the area and existing controls	X	X
Description of natural sources within the area and existing controls	X	X
Statement regarding reasonableness of controls	X	X
Explanation that emissions occurred despite controls	X	X
Identification and implementation status of controls previously recommended by the EPA as reasonable, if applicable	X	X
Evidence of effective implementation and	X	X

[34] Cases where dust was entrained by sustained winds at or above the high wind threshold upwind of the monitor and subsequently 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 high wind 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 (and/or satellite plume imagery) as part of the nRCP or CCR demonstration.

[35] See Appendix A3 for additional discussion related to establishing area-specific high wind thresholds.

Table 3. Summary of Recommended Controls Analysis Elements for not Reasonably Controllable or Preventable Demonstration

Control Analysis Elements	Basic Controls Analysis	Comprehensive Controls Analysis
enforcement of reasonable controls, if applicable		
Back trajectories of source area		X
Source apportionment		X
Source-specific emissions inventories		X

3.1.5.1 Basic controls analysis

The most basic controls analysis should include a brief description of local/upwind sources that were suspected to significantly contribute to the event and a description of the controls on the anthropogenic sources in place at the time of the event (e.g., local BACM measures). The EPA also generally expects evidence that the controls determined to be reasonable, if any, were effectively implemented and appropriately enforced. For the sources identified, the analysis should explain how significant dust emissions occurred despite having reasonable controls in place (e.g., that controls were overwhelmed by high wind). In addition to identifying controls on anthropogenic sources, it is important that the analysis indicate whether the natural sources could have been reasonably-controlled. If the EPA recommended controls improvements as part of a previous high wind dust exceptional event review then the controls analysis should address the reasonableness and potential impact of these control improvements. See Section 6.3.2.3 for examples of a basic control analysis.

Even if a prospective controls analysis has been approved and included as part of the basic controls analysis, the air agency should identify likely contributing sources in the upwind source area and discuss appropriate controls if these were not discussed in the prospective controls analysis.

3.1.5.2 Comprehensive controls analysis

When events occur under conditions with sustained wind speeds below the high wind threshold, the EPA and the air agency should further consider the appropriateness, implementation, and enforcement of controls. For example, exceedances can occur when reasonable controls are in place but not properly enforced. Or, new or newly recognized uncontrolled sources may be contributing to the exceedance. In these cases, the demonstration generally would need to be more detailed and compelling for the EPA to concur. Examples of more detailed analyses include: back-trajectories of source area, source apportionment, day specific emissions inventories of specific sources in source area, and evidence of effective implementation and enforcement, where appropriate, of controls. In addition to identifying controls on anthropogenic sources, it is important that a submitting agency indicate whether any natural sources could have been reasonably-controlled. As with the basic controls analysis, if the EPA recommended controls improvements as part of a previous high wind dust exceptional event review, then the controls analysis should address how these controls improvements have been addressed. See Section 6.3.2.4 for an example of a comprehensive controls analysis.

3.1.6 Consideration of Controls on Tribal Lands

When reviewing the "reasonableness of controls" element within tribal exceptional event demonstration submittals, the EPA will consider both controls on tribal sources and cultural factors for tribal lands. For example, the EPA could consider tribal cultural factors and subsequently identify "reasonable" controls. It might have been reasonable for the tribal government to encourage the use of certain practices, but not to have required them as a matter of tribal law.

3.2 Historical Fluctuations (HF)

Air agencies should include data showing historical fluctuations of concentration in the area in their demonstration package and make a conclusion as to whether the agency considers the data to be outside the normal historical fluctuations. This information satisfies the HF criterion and serves as an important basis for the CCR, NEBF, and AAQ criteria (see Table 2). The more a concentration stands out from historical concentrations, the more plausible it is that the event was the cause of the exceedance. The objective of the HF analysis is to give a full and accurate portrayal of the historical context for the claimed event day. The EPA suggests the following analyses:

1. comparison of concentrations on the claimed event day with past historical data (3-5 years), with previous high wind dust events identified
2. percentile rank of concentration relative to annual data with and without high wind dust events
3. percentile rank of concentration relative to seasonal data with and without high wind dust events
4. comparison of concentrations on the claimed event day with a narrower set of similar days

Because the methods of analyses influence the conclusions that can properly be drawn from the historical fluctuation statistics (e.g., percentile calculations are dependent on the number of data points included), the EPA recommends specific analyses, statistics, and calculations as described in Section 6.3.3 of this document.

It is important to note, however, that there is no outcome of the "historical fluctuation" statistical comparison that, by itself, can guarantee that the CCR and NEBF elements will also be successfully demonstrated. The EPA will use a weight-of-evidence approach to assess each demonstration and comparison of the concentrations during event(s) in question with historical concentration data on a case-by-case basis. The EPA acknowledges that natural events, such as high wind dust events, can recur and still be eligible for exclusion under the EER. Therefore, events do not necessarily have to be rare to satisfy this element.

3.3 Clear Causal Relationship (CCR)

40 CFR §50.14(c)(3)(iv) requires demonstration of a clear causal relationship between the ambient concentration measurement under consideration and the event that is claimed to have affected the air quality in the area. The CCR demonstration must show that dust from high wind caused an exceedance of the NAAQS. The CCR demonstration establishes causality between the event and a portion of the ambient concentration. Simply showing that high wind was coincident with high concentrations may not establish causality. A correlation between high wind and high concentrations is important, but does not independently demonstrate that windblown dust from the natural undisturbed and/or reasonably controlled anthropogenic sources caused the high concentrations. CCR demonstrations should include analyses showing that the event in fact occurred and that emissions were transported in the direction of the monitors recording the elevated concentration measurements. CCR analyses should support the conceptual model and address the concepts identified in Table 4. Section 6.3.4 provides examples of the quantitative analyses that air agencies can perform.

Table 4. Example Evidence and Analyses for CCR Demonstration

Example CCR Evidence	Types of Analyses/Information to Support Evidence
1. Occurrence and geographic extent of the event	Special weather statements, advisories, news reports, nearby visibility readings, measurements from monitoring stations, satellite imagery
2. Transport of emissions related to the event in the direction of the monitor(s) where measurements were recorded	Wind direction data showing that emissions from sources identified as part of the nRCP demonstration were upwind of the monitor(s) in question, satellite imagery
3. Spatial relationship between the event, sources, transport of emissions, and recorded concentrations	Map showing likely source area, wind speeds, wind direction, and PM concentrations for affected area during the time of the event, trajectory analyses
4. Temporal relationship between the high wind and elevated PM concentrations at the monitor in question	24-hour time series showing PM concentrations at the monitor in question in combination with sustained and maximum wind speed data at area where dust was entrained
5. Chemical composition and/or size distribution of measured pollution that links the pollution at the monitor(s) with particular sources or phenomenon	Chemical speciation data from the monitored exceedance(s) and sources; size distribution data
6. Comparison of event-affected day(s) to specific non-event days	Comparison of concentration and wind speed to days preceding and following the event;; comparison to high concentration days in the same season (if any) without high wind; comparison to other high wind days without elevated concentrations (if any); comparison of chemical speciation data

Example CCR Evidence	Types of Analyses/Information to Support Evidence
7. Historical comparison of PM concentration and wind speed (e.g., 3-5 years) data	Identification of historical trends or relationships between wind speed and PM concentrations.

A demonstration may be less compelling if there is evidence that is inconsistent with the conceptual model of how the event caused the exceedance. For example, if the agency describes the event as a *regional* dust storm, then the EPA anticipates that monitors within the same *regional scale* to be similarly affected by the dust storm. Comparison of concentrations and conditions at other monitors could thus be very important for the demonstration of a clear causal relationship. Alternatively, eliminating plausible non-event causes may also support a causal relationship to the high wind dust event. (See Section 6.3.4.7 for an example of eliminating alternative hypotheses.)

3.4 Affects Air Quality (AAQ)

The AAQ element is generally supported by historical fluctuations in concentration data (HF) and demonstrated as part of the clear causal relationship (CCR).[36] Submitting agencies that provide HF analyses and conclusions and that demonstrate the CCR element will, generally, have also satisfied the "affects air quality" (AAQ) part of the definition of an exceptional event. The demonstration should nevertheless identify this element and describe how meeting the HF and the CCR criteria also satisfies the AAQ element.

3.5 Caused by Human Activity Unlikely to Recur at a Particular Location (HAURL) or a Natural Event (Natural Event)

According to both the regulatory and statutory definition, an exceptional event must be "an event caused by human activity that is unlikely to recur at a particular location *or* a natural event." High wind dust events that meet the criteria established in this guidance document would be considered natural events, thus an analysis of whether the event is a HAURL will not generally be relevant. A natural event is defined as "an event in which human activity plays little or no direct causal role" (40 CFR §50.1(k)). An event involving windblown dust solely from undisturbed natural sources is clearly a natural event. However, many high wind dust events affecting the ambient monitoring network include significant contributions from anthropogenic

[36] In the definition of "exceptional event", 40 CFR §50.1(j) begins: "Exceptional event means an event that affects air quality…" The preamble clarifies this in section V.B. *What Does It Mean for an Event To "Affect Air Quality"?* (p. 13569) :

> Under the Final Rule, the demonstration to justify data exclusion must provide a justification that: (a) The event qualifies in accordance with section IV.D. and if applicable, with the EPA policies and guidance for certain events as described in section IV.E, (b) there is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area, (c) the event is associated with an unusual measured concentration beyond typical fluctuations including background, and (d) there would have been no exceedance or violation but for the event (discussed in section V.C). *The second and third criteria establish that the event affected air quality.* [emphasis added]

In this passage, the second criterion is (b) "clear causal relationship", and the third is (c) "concentration beyond typical fluctuations". These are the same as the EER requirements for CCR ("clear causal relationship") and HF ("in excess of normal historical fluctuations") at 40 CFR §50.14(c)(3)(iii)(B) and (C).

sources of dust, and their treatment under the EER is more complicated. In these cases, the EPA generally treats a high wind dust event as a natural event when the anthropogenic component of the wind-driven emissions was not reasonably controllable or preventable (see footnote 8).

The EPA is unlikely to consider as "natural" high wind dust event exceedances that include a significant contribution of windblown dust from anthropogenic sources that were not reasonably-controlled. In addition, the EPA is not likely to consider high dust concentrations outside the period of high wind as due to a natural event or as part of the high wind dust event that immediately precedes or follows the high dust concentration (e.g., dust from rock-crushing or tilling that precedes or follows period of high wind is not likely part of the high wind dust event). In both of the above cases, the EPA would assume that human activity played a direct causal role and therefore these exceptional events claims could only be considered under the criterion of "human activity unlikely to recur."[37] For the case in which high dust concentrations occur outside the period of high wind, if continuous monitoring data are available, an air agency may be able to narrow or specify the timeframe for the exceptional event and submit a demonstration for the identified data and not for the entire period of elevated concentration.

Since anthropogenic sources of windblown dust must be reasonably-controlled for the event to be considered a natural event under the EER, the air agency must demonstrate that the criterion for nRCP is met (see Section 3.1). Further, to satisfy the EER, air agencies must also demonstrate that the windblown dust generated by high wind has a clear causal relationship (CCR) to the measured exceedance. In summary, the EPA will generally consider a high wind dust event to be a natural event if the air agency successfully demonstrates both the nRCP and CCR elements.

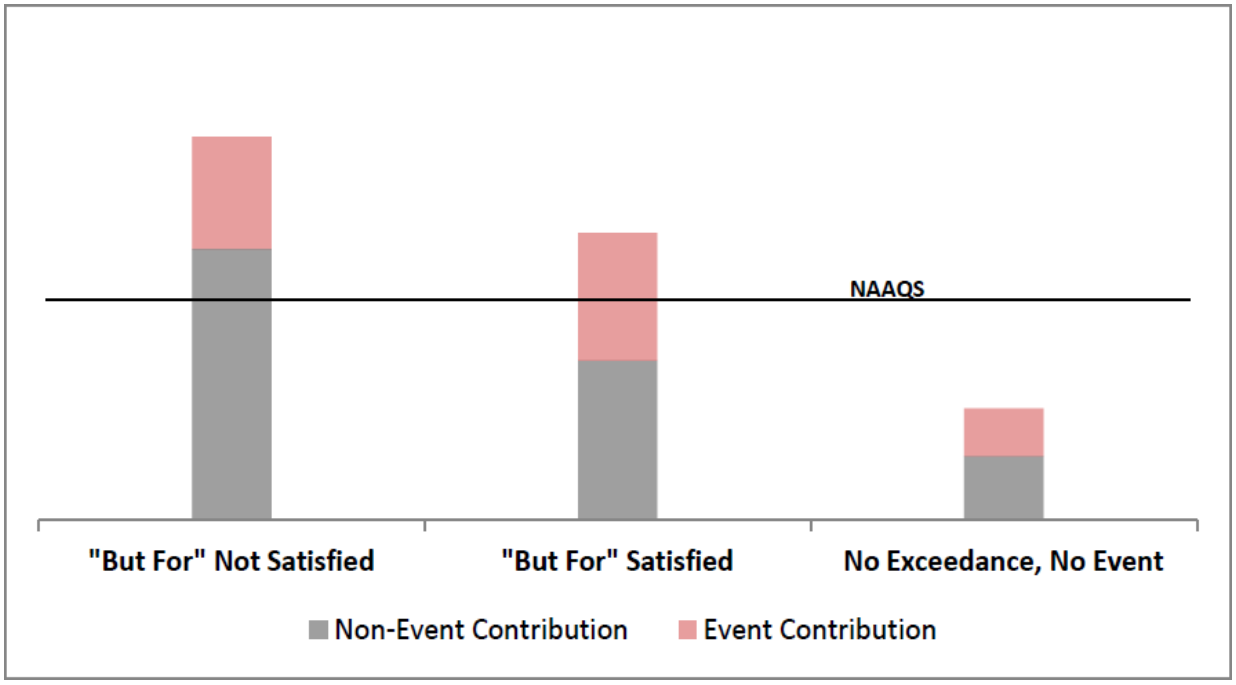
3.6 No Exceedance or Violation But For the Event (NEBF)

40 CFR 50.14(b)(1) directs the EPA to exclude data only where an air agency demonstrates that an event caused a concentration in excess of a NAAQS. This means that there was a concentration in excess of the NAAQS when the event occurred that would have been below the NAAQS if the event had not occurred. §50.14(c)(3)(iv)(D) requires the air agency to submit evidence that "[t]here would have been no exceedance or violation but for the event."[38] Figure 1 depicts the NEBF concept.

[37] In theory, a high wind dust event for which anthropogenic sources were not reasonably controlled could be considered an HAURL exceptional event if the event satisfies certain criteria, including being unlikely to recur. However, if the event (which includes the dust from both natural and anthropogenic sources) was not "not reasonably controllable or preventable" then the event does not meet the definition of an exceptional event. For this reason, the EPA does not believe it is useful to pursue a line of reasoning that would consider a high wind dust event to be an HAURL exceptional event. If the very unlikelihood of recurrence of similarly high winds means that controls in addition to those that were in place would not have been reasonable, the event can be considered for treatment as a natural event and must then meet the criteria laid forth in the EER and explained in this document.

[38] In addition, Section 319 of the Clean Air Act requires that a clear causal relationship must exist between the measured exceedances and the exceptional event, meaning that exceptional events dealt with in the EER must be exceedances.

Figure 1. Depiction of the Concept of No Exceedance But For the Exceptional Event.



This analysis generally does not need a single or precise approximation of the estimated air quality impact from the event. The EPA is not prescribing the type of analysis that air agencies should perform to satisfy this regulatory requirement, but air agencies should show that the measured concentration would have been below the applicable NAAQS without the influence of the high wind dust event. For most cases, the EPA expects a *quantitative* NEBF analysis. For events where the typical concentrations on non-event days are well below the applicable NAAQS, the NEBF demonstration may be relatively straightforward and a qualitative NEBF demonstration may be acceptable. However, demonstrating NEBF becomes increasingly complex if concentrations on non-event days during the same season exceed the standard and/or if the contribution of non-event pollution sources produce concentrations near the applicable NAAQS. For example, if days without high winds that neighbor the claimed event day were near the standard (e.g., 150 $\mu g/m^3$ for PM_{10}), the NEBF analysis would generally need to be very detailed to show that the exceedance would not have happened but for the high wind dust event. Examples of how to conduct the NEBF analysis are provided in Section 6.3.7.

The NEBF demonstration builds upon and will be informed by the nRCP and CCR analyses and further supported by information provided for HF. To illustrate the NEBF and CCR relationship, if there is no CCR, then NEBF becomes moot since there is no portion of the exceedance that can clearly be attributed to the event. For these reasons, the EPA recommends that the air agency complete the NEBF analyses after it completes all other analyses.

3.7 Optional Analyses for nRCP Requirement

3.7.1 Prospective Controls Analysis

As stated in Section 3.1.1, a high wind dust event that includes anthropogenic sources can generally meet the nRCP criterion if:

1. The anthropogenic sources of dust have reasonable controls in place.
2. The reasonable controls have been effectively implemented and enforced.
3. The wind speed was high enough to overwhelm the reasonable controls.

A prospective controls analysis is an optional, generic[39] review of the current windblown dust controls (item 1 above) and the high wind threshold (item 3 above) for an area. This optional step would likely occur in advance of the EPA's review of any particular event. In the prospective controls analysis, the air agency would provide information on attainment status, identify natural and anthropogenic windblown dust sources and emissions, provide the status of SIP submittals (if applicable), and identify the wind speed up to which the collective windblown dust controls are expected to be effective (see Section 6.2 for details on how to prepare a prospective controls analysis). Air agencies could submit their prospective controls analysis in advance of an agency submittal and the EPA review of any specific demonstration submittal, with the letter of intent, or with their demonstration package submittal. Once the EPA approves a prospective controls analysis, air agencies could reference this pre-approved analysis in subsequent packages for events with winds above the established/approved high wind threshold to satisfy items 1 and 3 above and provide information on implementation and enforcement of controls (item 2 above). In this manner, the prospective controls analysis could streamline the evaluation of the not reasonably controllable and preventable criterion.

The EPA review and approval of controls identified in the prospective controls analysis would typically be effective for a minimum of three years. After the three-year time period, the EPA will notify the agency if the EPA intends to re-review the controls. In some limited cases, the EPA may re-review the controls within the three-year timeframe if information on sources or enforcement suggests that controls may be inadequate or not implemented/enforced. The EPA may also re-evaluate the controls identified in the prospective controls analysis when an area that does not typically have recurring high wind dust events experiences unexpected recurrent events.

If the EPA has approved a SIP revision to windblown dust controls within the past three years of the event, then the submitting agency can use the SIP-approved controls to satisfy item 1 of a prospective controls analysis.

3.7.2 High Wind Action Plan

3.7.2.1 Purpose

Air agencies can develop High Wind Action Plans to document their plans to implement needed controls on newly-identified anthropogenic sources that could emit dust during subsequent high wind events (similar to the process used in a Natural Events Action Plan). Preparation of such a

[39] "Generic" means a general review rather than a review specific to an identified event.

plan and its approval by the EPA could promote a common understanding between the air agency and the EPA about whether subsequent high wind dust events are not reasonably controllable or preventable. In addition, the High Wind Action Plan could document current windblown dust controls and current and/or planned mitigation measures as part of 40 CFR 51.930.

3.7.2.2 How Does the High Wind Action Plan Option Work?

The EPA will judge the reasonableness of controls based on information that was available to the air agency at the time of the event (see Section 3.1.2). However, in the course of preparing or reviewing a high wind dust exceptional event demonstration submittal, the air agency or the EPA may identify previously unknown sources that should be subject to reasonable controls as these additional controls could minimize the likelihood or the health impact of future events. If all other contributing known sources meet the "not reasonably controllable or preventable" criterion, the EPA may determine that an unknown or unidentified source at the time of the event meets the "not reasonably controllable or preventable" criterion based on the rationale that a source was not reasonably controllable if its existence was not known. However, the EPA will generally not consider the nRCP criteria to have been met if the previously unknown source continues to contribute to future events unless the agency has promptly taken all reasonable steps to control the source after its discovery. Air agencies that believe they have a previously unknown or unidentified source contributing to an exceedance or violation should clearly identify this situation in their exceptional events demonstration submittal.

The High Wind Action Plan provides an *optional* mechanism that may facilitate a mutual understanding between the affected air agency and the EPA regarding the control expectations for future events in which the previously unidentified source contributed. This optional plan may also facilitate the EPA's concurrence on an air agency's request to exclude data associated with future events while the air agency implements controls on previously unidentified sources. A High Wind Action Plan does not, however, replace the planning actions required under the Clean Air Act based on an area's attainment status. For example, a PM_{10} serious nonattainment area is still required to implement BACM. In this type of case the High Wind Action Plan can address sources identified after an air agency has implemented BACM.

An air agency can submit a High Wind Action Plan with the exceptional events demonstration package or as a separate submittal.[40] Establishing a High Wind Action Plan to address additional reasonable controls should consist of the following steps:

1. Air agency identifies and initiates actions to implement reasonable control measures.
2. Air agency develops and provides an opportunity for public comment on draft High Wind Action Plan incorporating planned and completed actions to implement reasonable controls on previously unidentified sources.
3. Air agency submits and the EPA approves the High Wind Action Plan
4. Air agency completes implementation of, or makes needed adjustments to, reasonable control measures as identified through public comment and the EPA review process.

[40] If an air agency submits the High Wind Action Plan separately from the exceptional event demonstration package, the air agency should provide an opportunity for public comment as the High Wind Action Plan would be part of the basis for the EPA's decision on subsequent events.

The EPA recognizes that the process by which previously unidentified sources needing reasonable controls are subsequently controlled could involve some period of time, such as the timeframe associated with the defined steps in issuing or revising construction or operating permits or in making adjustments to local ordinances. The EPA believes that a High Wind Action Plan could identify the previously unknown contributing source (e.g., newly cleared, previously vegetated property), identify the desired reasonable controls (e.g., erosion control fencing and surface stabilization), and identify the process by which the air agency intends to pursue implementing these controls (e.g., residential construction permit). The EPA further believes that this process could be informed by public comment and the EPA's review. Air agencies choosing to develop a High Wind Action Plan will generally have six months from the time the EPA notifies the agency of the need for reasonable controls on newly-identified sources to submit an adequate (i.e., approvable) plan that identifies reasonable control measures.[41] If the air agency meets this timeframe for submittal of a plan and the air agency has promptly taken all reasonable steps to control the source after its discovery, then the EPA will generally consider anthropogenic sources contributing to high wind dust events that occur within the six-month timeframe to be reasonably-controlled (assuming wind speeds are high enough to overwhelm those reasonable controls).

If an air agency does not undertake measures to implement agreed-upon reasonable controls on the newly identified source, the EPA would generally not be able to concur on future high wind exceptional events in which the newly-identified source contributes to exceedances or violations of a NAAQS. Under this scenario, the EPA and the air agency would include associated event data in planning decisions.

Once approved and implemented, an air agency's High Wind Action Plan is effective for three years and would generally facilitate the EPA's ability to determine that identified sources have reasonable controls for events where wind speeds exceed the high wind threshold. As with any exceptional event, the nRCP evaluation for future events that occur under an approved High Wind Action Plan would consider whether controls were implemented effectively according to the High Wind Action Plan. While the High Wind Action Plan is not in itself enforceable, the EPA's concurrence of exceptional events would generally be contingent on implementation of the plan (i.e., the newly-identified sources generally would not be considered to meet the nRCP criterion if the High Wind Action Plan is not implemented).[42]

3.7.2.3 Content of a High Wind Action Plan

At a minimum, a High Wind Action Plan to address new sources should include the following:

- identification of sources and proposed controls

[41] The specific timeframe for plan development (i.e., six months or an alternate period) may vary by area and on a case-by-case basis. A plan to implement some reasonable controls (e.g., tarps on new gravel piles) may be developed in less than six months while a plan to implement more complex reasonable controls (e.g., installation of water sprays) may take a longer. Similarly, the determination of whether implementation of controls was prompt and reasonable will depend on the circumstances.

[42] Note that if and when the EPA takes a regulatory action that relies on a decision to exclude data under the Exceptional Events Rule, the EPA will consider and appropriately respond to any public comments on whether the event was "not reasonably controllable or preventable."

- an assessment of reasonableness
- timeframes for implementation
- a plan for enforcement, if appropriate

The High Wind Action Plan should also identify the current high wind threshold and whether this threshold should be revised as a result of the newly identified controls. As mentioned previously, a High Wind Action Plan could also document mitigation measures and current controls, especially if these were not included in a previous demonstration package.

3.7.2.4 Comparison of a Natural Events Action Plan and High Wind Action Plan

The concept of a High Wind Action Plan originated from the Natural Events Action Plan (NEAP) concept established by the Natural Events Policy. Table 5 presents a comparison of the two plans.

Table 5. Comparison of Natural Events Action Plan and High Wind Action Plan.

Element	Natural Events Action Plan	High Wind Action Plan
Establish public notification and education programs	Required component of plan.	Optional component of plan to address mitigation requirement for EER (40 CFR 51.930).
Minimize public exposure to high levels of windblown dust	Required component of plan.	Optional component of plan to address mitigation requirement for EER (40 CFR 51.930).
Current reasonable controls on known contributing controllable sources	Required component of plan (BACM).	Required component of plan (but not necessarily BACM).
Identify and begin implementing reasonable controls in place on newly-identified contributing controllable sources	Required component of plan.	Required component of plan.
Re-evaluate the controls	Every five years.	≥ 3 years or if high wind dust patterns change and suggest new sources.
Timeframe for plan submittal	Within 18 months of violation.	Within 6 months from the EPA's notification of newly-identified uncontrolled source(s).
Timing of EE decision on concurrence	Prior to NEAP submittal.[43]	Per schedule discussed in Section 5.2.
High wind threshold	Required part of Natural Events Policy[44] but not	Required component of optional plan.

[43] Unless the NEAP was not adhered to (e.g., BACM never implemented for previous events).

Element	Natural Events Action Plan	High Wind Action Plan
	specifically required to be included in NEAP.	

3.7.2.5 Attainment status and the role of High Wind Action Plan

The High Wind Action Plan can be a useful tool for any area that has newly identified sources requiring reasonable controls. An area's attainment status may, however, partially determine when an air agency might develop a High Wind Action Plan.

Attainment/Unclassifiable/Maintenance Areas. The EPA agrees that generally controls are not expected for the *first* high wind dust exceptional event in a PM *attainment* area because it is generally not reasonable to expect air agencies to undertake control efforts that have not been required to meet a NAAQS. However, if an area has a second high wind dust event in a 3-year period, then the EPA generally will consider the area to "have a history" of high wind dust events. Considering this "history," the EPA would not likely concur on an air agency's subsequent (e.g., after the second event) request to exclude data if emissions from uncontrolled sources result in an exceedance or violation. If an attainment area experiences a second high wind dust event in a 3-year period and the EPA determines that the concentrations are attributable to sources that could be reasonably controlled going forward, the EPA may ask the submitting agency to develop and implement an adequate High Wind Action Plan. The EPA would then determine whether to concur with the air agency's request to exclude data if all other EER criteria have been met. The EPA would also consider the HWAP going forward.

Nonattainment Areas. A PM nonattainment area is expected to have reasonable controls in place, but there may be new sources or improved controls that are identified after the original implementation of the reasonable controls. Additionally, during high wind conditions, sources outside the designated nonattainment area may contribute to violations in the nonattainment area. The EPA will consider the wind speeds in the event(s) in question relative to the high wind threshold in determining if additional controls are reasonable. In cases where additional reasonable controls are needed, the EPA may do one of the following:

1. Request that the submitting agency develop and implement an adequate High Wind Action Plan. Determine whether to concur with an air agency's request to exclude data if all other EER criteria have been met. Consider the HWAP going forward. Subsequent events with wind speeds above the high wind threshold could similarly be concurred upon.

2. Nonconcur in the absence of additional actions beyond what is required by the SIP and its associated deadlines. In these cases, the EPA would not remove the events from regulatory decisions. As a result, the event-related concentrations may play a role in regulatory actions such as a clean data finding or a failure to attain decision. For example,

[44] "Areas Affected by PM10 Natural Events" (the PM10 Natural Events Policy), memorandum from Mary D. Nichols, Assistant Administrator for Air and Radiation, to EPA Regional Offices, May 30, 1996, page 7, "The conditions that create high wind events vary from area to area with soil type, precipitation and the speed of wind gusts. Therefore, the State must determine the unusually high wind conditions that will overcome BACM in each region or subregion of the State."

this option may be most sensible to all parties early in a planning cycle when an agency is working on implementing controls that are expected to result in significant improvements in an area's dust control.

3. Nonconcur and conduct a SIP call. If the EPA identifies a major deficiency in the SIP controls, then the EPA may choose to nonconcur and issue a SIP call to expedite implementation of reasonable controls on particular sources.

The EPA intends to work with the air agency to determine which approach listed above, or other approach, will get reasonable controls in place most effectively and efficiently.

4. Mitigation

The EER was promulgated pursuant to Section 319 of the Clean Air Act which contains a provision providing that in promulgating regulations, the EPA shall follow the principle that each air agency "must take necessary measures to safeguard public health regardless of the source of the air pollution..." This provision was the basis for the mitigation requirements in 40 CFR §51.930 and the requirement in the EER at 40 CFR §50.14(c)(1)(i) that all air agencies must "notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard." The language at 40 CFR §51.930 requires that:

"(a) A State requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the national ambient air quality standards. At a minimum, the State must:

(1) Provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard;

(2) Provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event; and

(3) Provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events."

Although the language at 40 CFR §51.930 does not require the preparation or submittal of a mitigation plan, it does require that the air agency develop and implement processes and measures that could easily become the elements of a formal, written plan. The mitigation criteria focus on specific measures and actions to protect public health, rather than on measures that control or prevent emissions associated with a specific event. So, a mitigation plan may include measures that apply to emissions sources in general (e.g., dust suppression or covering techniques for mineral processing) rather than those measures or controls that might be discussed in the "not reasonably controllable or preventable" portion of an event demonstration (e.g., controls/measures X, Y, and Z were in place on sources A, B, and C during the time of the event). A mitigation plan may also include procedures and responsibilities for public alerts and sheltering advisories. Because having a mitigation plan in place will help air agencies meet the EER requirements at 40 CFR §50.14(c)(1)(i) related to public notification more systematically, the EPA encourages the development and submittal of a mitigation plan with the demonstration package if one has not already been adopted.

5. Process Issues for Exceptional Events Including High Wind Dust Events

5.1 Demonstrations Package Submittal and Review

The EPA encourages air agencies to engage in regular communication with the EPA to prepare complete demonstration packages that meet the requirements of the EER as interpreted by this document, but that also avoid unnecessary detail and the associated preparation effort. The EPA will make its concurrence decision based on information presented by the air agency, possibly with other information that the EPA may have or generate. Determinations on Exceptional Event demonstrations do not constitute final agency action until they are relied upon in a regulatory decision such as a finding of attainment or nonattainment which will be made through notice-and-comment rulemaking process.

5.2 Timeframes

The EPA recommends the following timeframes for exceptional events processes as outlined in Table 6 below.

Table 6. Timeframe for Exceptional Event Processes.

Exceptional Event Demonstration Action	Timing	Timing Specified by EER?
Air agency submits a prospective controls analysis	Any time in advance of the EPA's review of a particular event or set of events.	No
1. Air agency places flags in AQS	Flags and an initial event description should be placed in AQS either in accordance with the special schedules promulgated with new or revised NAAQS or in accordance with the general schedules for submission of data to the AQS database (i.e., within 90 days of the end of the previous quarter) but not later than July 1st of the calendar year following the event in which the flagged measurement occurred	Yes
2. Air agency submits letter of intent to submit a package *(optional)*	To promote early communication, the EPA suggests that air agencies provide a letter of intent to submit a demonstration package for flagged data in AQS as soon as possible after the agency identifies the significance of the event, if possible within 12 months from the event occurrence.[45] This is an optional step that would alert the EPA of an air agency state's intention to submit a package for	No

[45] The Letter of Intent is an optional step and the EPA recognizes that states may need additional time to prepare and submit demonstration packages particularly where the basis of the exclusion is violating an annual standard or a 3-year design value. Similarly, a state could consider submitting an annual letter of intent if annual submittal makes sense for resource planning or for historically seasonal events. If a state decides to submit a letter of intent, the EPA recommends that it be submitted as expeditiously as possible following the state identifying the event or events as having significance.

Exceptional Event Demonstration Action	Timing	Timing Specified by EER?
	a flag. See Appendix C for an example letter of intent.	
3. The EPA responds to an air agency's notice of intent and informs the air agency of the EPA's review plans.	Anticipated to be within 60 days of receipt of letter of intent to submit a package from air agency. The EPA response will provide the regional office's best assessment of the priority that can be given to the submission once received and any case-specific advice the EPA may have to offer for the preparation of the demonstration. The EPA will generally give priority to exceptional event decisions that affect near-term regulatory decisions.	No
4. Air agency submits exceptional event package to the EPA	The EER allows air agencies to submit packages up to 3 years following the end of the calendar quarter in which the event occurred, or 12 months prior to the date that a regulatory decision must be made by the EPA, whichever is sooner. Schedules are generally tailored in 40 CFR Part 50 when NAAQS revisions result in initial designations for new NAAQS.	Yes
5. Air agency submits High Wind Action Plan (optional)	Submit with EE package or within 6 months from the EPA's notification of newly-identified uncontrolled source(s).	No
6. The EPA completes initial review of exceptional event package & sends letter to air agency outlining preliminary assessment of completeness of package/need for additional information[46]	Anticipated within 120 days of receipt by the EPA.	No
7. Air agency provides supplemental information requested by the EPA, if needed	Requested within timeframe identified by the EPA in the initial review letter (step 4). This will typically be 60 days from receipt of the letter from the EPA. The EPA recognizes that air agencies may need more than 60 days to prepare and submit some types of supplemental information. The EPA is willing to work with agencies on supplemental timeframes; however, the mandatory timing of EPA actions may	No

[46] The EPA may also ask for additional information during later steps (e.g., as part of the final review (step 8)).

Exceptional Event Demonstration Action	Timing	Timing Specified by EER?
	limit the response time the EPA allows.	
8. The EPA final review of EE package	The EPA intends to make a decision regarding event concurrence as expeditiously as necessary if required by a near-term regulatory action, but no later than 18 months following submittal of a complete package.	No

5.3 Public Comment

If an air agency submits substantial supplemental information to the EPA after the air agency's initial opportunity for public comment, the air agency may need to provide an additional opportunity for public comment. The EPA will make a case-by-case decision regarding supplemental opportunities for public comment during the demonstration preparation, submittal, and review process and will inform the air agency of this decision. As part of this decision, the EPA may consider potential impact and/or expressed public interest in the claimed event, data uncertainty, historical application of demonstration approach, etc. Additionally, certain regulatory actions that may rely on exceptional event data exclusions (e.g., proposed designation or redesignation classifications and attainment determinations) require the EPA to provide an opportunity for public comment prior to the EPA's taking final Agency action.

If an additional opportunity for public comment is needed, the air agency should submit the additional information to the EPA within the timeframe outlined in step 7 above and then make the information available for public comment. Once the opportunity for public comment has closed, the air agency should submit the public comments, if any, along with the air agency's responses, to the EPA within 30 days of the close of the public comment period. If air agencies do not submit High Wind Action Plans as part of the exceptional event demonstration package, air agencies should also provide opportunity for public comment for the Plan.

6. Recommendations for Preparing High Wind Dust Exceptional Event Demonstrations

Section 6 provides practical information on preparing and evaluating exceptional events demonstrations for high wind dust events based on the guidance in this document and the EPA's experience from demonstrations that the EPA has reviewed since the promulgation of the EER. Section 6.1 provides the general, suggested framework to prepare a high wind dust event demonstration. Section 6.2 outlines the suggested steps to creating a prospective controls analysis. Section 6.3 provides details and examples for the technical elements. The EPA encourages air agencies to include a description of mitigation strategies as part of the demonstration although submission of a mitigation plan is not a regulatory requirement.

6.1 Framework for Preparing Evidence to Support a High Wind Dust Exceptional Event

While the technical elements outlined in the EER suggest that each element can be demonstrated independently, many of the elements are linked. The EPA suggests the following approach to a demonstration, as depicted in Figure 2.

Optional Pre-Step. Provide a prospective controls analysis to the EPA for approval, which can subsequently be used to supplement the evidence in step 2.

Step 1. Develop a conceptual model of how the event unfolded and resulted in the exceedance(s).

Step 2. Address not Reasonably Controllable or Preventable (nRCP).

- Identify high wind threshold (see Appendix A)
- Calculate sustained wind speed: wind speed will inform whether a basic or comprehensive controls analysis is recommended.
- Assess general wind direction and identify potential sources
- Develop controls analysis

Step 3. Present Historical Fluctuations analyses and a conclusion for the EPA's review of whether the event was in excess of normal historical fluctuations (HF).

Step 4. Address Clear Causal Relationship (CCR).

- Conduct CCR analyses
  - Consider whether CCR identified sources not addressed in nRCP.

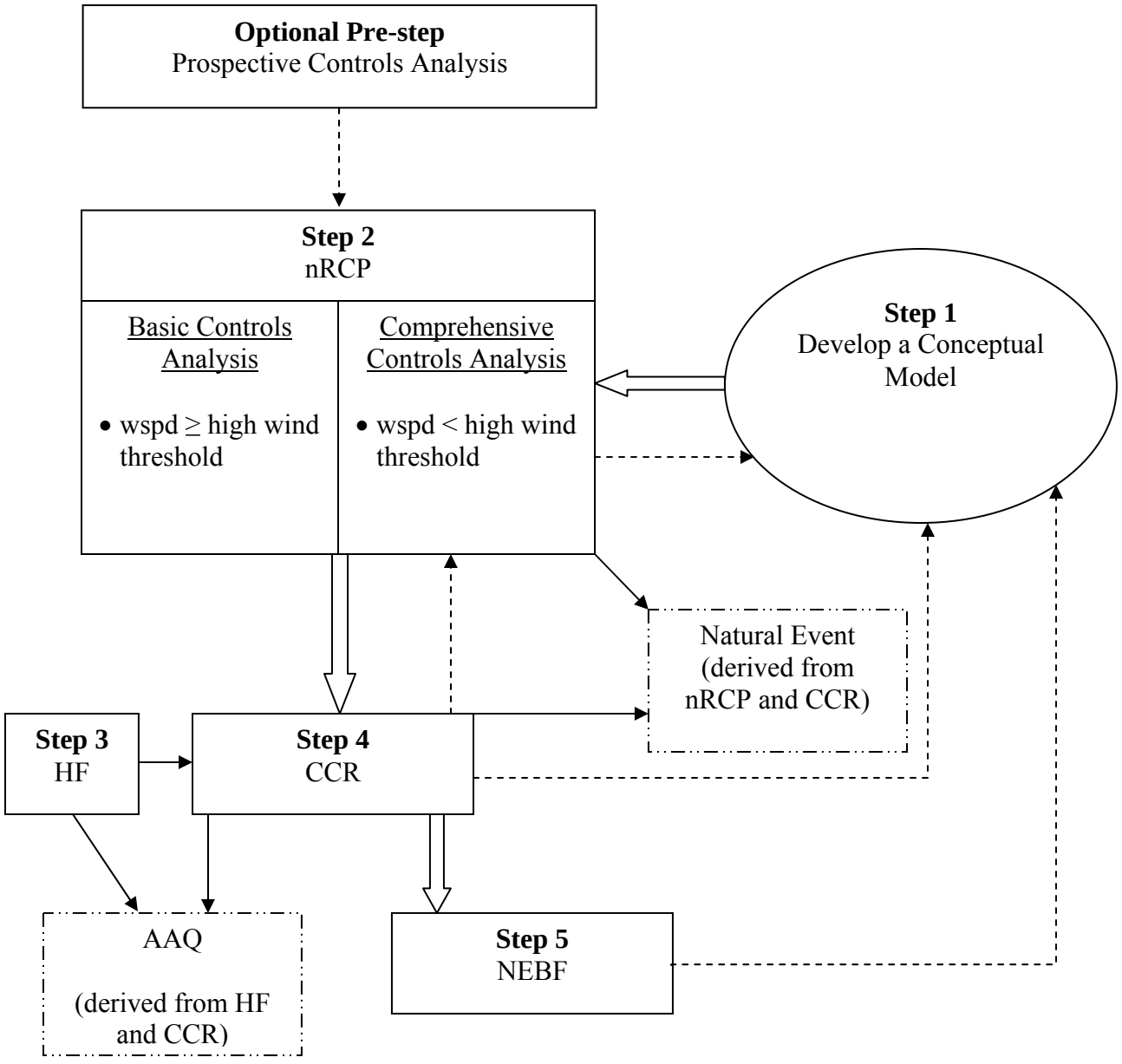
Step 5. Provide information that AAQ has been met by providing HF analyses and demonstrating CCR. Once an air agency completes the HF and CCR analyses, then it will generally also have satisfied the Affects Air Quality (AAQ) element.

Step 6. Provide information that Natural Event has been satisfied by demonstrating nRCP and CCR. Once an air agency completes the nRCP and CCR analyses, then it will generally also have satisfied the Natural Event element.

Step 7. Address No Exceedance But For the event (NEBF) only after all previous criteria have been satisfied.

The EPA recommends reviewing and revising the conceptual model, if necessary, after the air agency completes each identified step.

Figure 2. Suggested order for preparing technical elements for demonstration packages for high wind dust events.



6.2 Preparing a Prospective Controls Analysis (Optional)

An air agency's request for a prospective determination of reasonable controls, independent of a specific exceptional event request, should include the following elements:

1. Statement of which NAAQS (i.e., pollutant, date of relevant NAAQS, averaging time), area (e.g., Ventura County, California) and time period (e.g., January 1, 2012 – December 31, 2015) are to be covered by the prospective determination.

2. Statement of the area's attainment status for the pollutants (e.g., serious nonattainment with an extended attainment date for the 2006 24-hour $PM_{2.5}$ standard) and resultant required CAA control level (e.g., nothing, RACT, RACM, BACT, BACM and/or Most Stringent Measures (MSM)).

3. Current emissions inventory quantifying natural (if available) and anthropogenic sources of the pollutants and identifying all those the air agency considers significant.

4. Information on whether sources are reasonably controlled.

5. Chronology of agency SIP (and NEAP) submittals to address the required CAA control level and the EPA's actions on these submittals. This should identify whether the submittals relied on any commitment for subsequent action and whether the EPA actions were less than full approval. *The air agency's request for a prospective determination should summarize the status of SIP submittals and the EPA's action for each significant source category. The EPA will consider this in its review.*

6. Summary of all exceptional event requests and other exceedances for the pollutants in the area over the last 10 years. This should include the number, location, cause (sources) and the EPA's action for all requests.

7. Discussion of any and changes to presence/understanding/requirements for controls and/or emission sources since the EPA's approval in #5 including:
    a. Significant evolution in understanding of control levels in #2 (e.g., while 15 ppm was approved as BACM in 2001, 4 ppm is now widely accepted as BACM).
    b. Significant changes in the emissions inventory since #5 suggests possible additional significant sources (e.g., past planning efforts focused on wood-smoke, but recent information suggests significant wind-blown dust sources as well).
    c. Exceptional event requests and other exceedances discussed in #6 (e.g., newly recurring exceptional event requests might suggest a new source that lacks reasonable controls despite previous EPA approval of controls and an attainment demonstration).

8. A wind speed threshold up to which controls are expected to be effective (i.e., high wind threshold (See Section 3.1.4 and Appendix A)). Should address controlled anthropogenic sources as well as undisturbed natural surfaces.

Upon review of the prospective controls analysis, the EPA will approve, disapprove, or request additional information. The EPA generally anticipates approving prospective controls determinations when all of the following occur:

- The air agency provides all the above items.
- The EPA has fully approved the required CAA control level in #5.
- The EPA has confirmed fulfillment of all underlying commitments in #5.
- The air agency certifies there are no additional considerations in #7 and the EPA agrees.
- The EPA agrees with the wind threshold (#8).

The EPA is not likely to approve prospective determinations if any of the following occur:

- The air agency's request does not include all the items listed above.
- The air agency has not demonstrated the required CAA control level in #5.
- The air agency has not confirmed fulfillment of commitments in #5.
- Considerations in #7 indicate that some significant sources are lacking reasonable controls and/or implementation of controls.
- The EPA disagrees with the wind threshold (#8).

The EPA may subsequently approve an initially unapprovable prospective controls analysis, if the submitting air agency revises the demonstration to address the EPA's concerns (e.g., missing elements are provided, the high wind threshold is altered, or new information on existing controls is provided). If the EPA identifies the need for reasonable controls on additional sources, then the EPA may not approve the prospective controls analysis until the submitting agency develops, submits, and establishes a plan (e.g., High Wind Action Plan) to implement the needed controls.

6.3 Recommended Methods for the Technical Elements of a High Wind Dust Exceptional Events Package

This section contains recommendations and examples for preparing and demonstrating the technical elements for high wind dust events. These recommendations and examples do not represent all analyses that air agencies could or should complete as part of a high wind dust exceptional events package. The examples were taken from EPA Region 9 analyses and the following high wind dust event demonstration packages that air agencies submitted to the EPA Region 9:[47]

[47] Full exceptional event demonstration packages are available as follows:
- Anaheim (SCAQMD, event date: October 13, 2008) at http://www.aqmd.gov/pub_edu/notice_exceptional_events_2009.html
- Assessment of Qualification for Treatment under the Federal Exceptional Events Rule: High Particulate (PM10) Concentration Event in the Phoenix Area on April 30, 2008. Technical report prepared by the Arizona Department of Environmental Quality, Air Quality Division. August 16, 2010.
- State of Arizona Exceptional Event Documentation for the Events of July 2nd through July 8th 2011, for the Phoenix PM10 Nonattainment Area. Report prepared by Arizona Department of Environmental Quality (ADEQ), March 8. 2012.

- Anaheim (October 13, 2008), South Coast Air Quality Management District (SCAQMD)
- Phoenix (April 30, 2008; July 2-8, 2011), Arizona Department of Environmental Quality (ADEQ)

6.3.1 Step 1: Develop a Conceptual Model

A demonstration package for a high wind dust event should include a conceptual model of how the event occurred. A conceptual model is generally used to describe various concepts and their relationships. For exceptional events, the conceptual model should identify the various phenomena (e.g., high wind conditions and emissions) that occurred that resulted in the exceedance. In its simplest form, this could be a narrative description of how the event unfolded and resulted in the exceedance(s). The conceptual model could be similar to an abstract and should help tie the various rule criteria together into a cohesive explanation of the event. Air agencies could include the following information in the conceptual model:

- Description of weather phenomena that resulted in high wind
- Description of sources (land areas, industrial sources, other anthropogenic sources, natural sources, types of PM/dust) likely entrained by the high wind
- Explanation of the path by which the dust reached the monitor(s)
- Description of and map showing relevant monitors, topography, and other relevant geographic features that assist in understanding how the event developed and resulted in the exceedance.
- Description of how the event day differs from non-event days
- Description of concentration and wind patterns for the exceeding monitor(s) and for surrounding area

The following is an example conceptual model narrative.[48]

> Southern California's South Coast Air Basin (Basin) consists of 10,743 square miles and consists of Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino Counties. The population of the Basin is approximately 16 million people, with approximately 11 million gasoline powered vehicles and 300,000 diesel vehicles. The coastal plain contains most of the population of the Basin, which is surrounded by tall mountains, including the San Gabriel Mountains to the north, the San Bernardino Mountains to the northeast, and the San Jacinto Mountains to the east. The coastal range of the Santa Ana Mountains separates the inland part of Orange County from Riverside County. The proximity of the Pacific Ocean to the west has a strong influence on the climate, weather patterns and air quality of the Basin. The mountains also have a significant impact on the wind patterns of the Basin. Offshore winds flow down slope and are warmed and dried by compressional heating, gaining momentum through the passes and canyons. Northeasterly winds, known as Santa Ana winds, typically account for the

[48] Letter dated November 22, 2010 to Matthew Lakin, Manager Air Quality Analysis Office USEPA Region 9, from Karen Magliano, Chief Air Quality Data Branch California Air Resources Board, transmitting final report dated August 5, 2010 entitled, "Analysis of Exceptional Events Contributing to High PM10 Concentrations in the South Coast Air Basin on October 13, 2008."

highest wind events in the Basin, occurring several times each year. Onshore high-wind events also occur with the strongest winds typically occurring in the mountains and deserts.

Violations of the PM_{10} NAAQS were recorded at the South Coast Air Basin Anaheim monitoring station on October 13, 2008, due to high winds. The 24-hour mass concentration at Anaheim was measured with a federal equivalent method (FEM) Tapered Element Oscillating Microbalance (TEOM) continuous monitor, with a midnight-to-midnight 24-hour average concentration of 199 $\mu g/m^3$. This was not a sampling day for the Federal Reference Method (FRM) filter measurements in the Basin. While no other PM_{10} measurements exceeded the federal standard level (150 $\mu g/m^3$), other stations in the Basin had elevated concentrations during the same period.

A strong Santa Ana wind event developed on October 13th, causing very high northerly through easterly winds in the mountains and deserts, especially through and below the wind-favored passes and canyons in the Basin. National Weather Service (NWS) weather stations measured extremely high peak wind gusts throughout the day in areas upwind of the high SCAQMD PM_{10} stations, including: 87 mph by in [*sic*] the Santa Ana Mountains of Orange County (Freemont Canyon RAWS); 87 mph in the San Gabriel Mountains of Los Angeles County (Chilao RAWS); 79 mph in the Malibu Hills of Los Angeles County; 61 mph at Ontario International Airport in San Bernardino County; 55 mph at Corona Airport in Riverside County; 51 mph at Chino Airport in San Bernardino County and 41 mph at the Santa Ana – John Wayne Airport in Orange County.
Due to the widespread winds, sources of the windblown dust were both natural areas, particularly from the mountains and deserts, and BACM-controlled anthropogenic sources. The timing of this event is verified with the high wind observations and reports of reduced visibility and blowing sand and dust, in conjunction with the hourly TEOM and BAM PM_{10} measurement data from nearby monitors in the Basin, when available.

The following maps support the conceptual model:

- Map of the South Coast Air Basin Showing Air Monitoring Stations and Forecast Areas
- Map of South Coast Air Basin with Selected Cities and Topography
- Map of South Coast Air Basin PM_{10} Monitors

6.3.2 Step 2: Address not Reasonably Controllable or Preventable (nRCP)

The nRCP demonstration should identify the natural and anthropogenic emissions believed to have contributed to the event and indicate how they were not reasonably controllable or preventable. Generally, the nRCP will include identification of natural sources and whether they are reasonably controllable, and identification of anthropogenic sources and the associated reasonable controls.

6.3.2.1 Identify source areas and source categories expected to have contributed to the event

The EPA recommends that the first step of the nRCP demonstration is to identify the likely source area and source categories expected to have contributed to the event. The source areas and

categories can be general, such as, "The area upwind of the monitor includes portions of the Santa Ana Mountains to the NE of the station and extending down into the Basin. Sources of the windblown dust were both natural areas, particularly from the mountains and deserts, and BACM-controlled anthropogenic sources."[49] Identifying the geographic references on a map informs the analysis.

6.3.2.2 Consideration of wind speed

The demonstration should indicate what the expected high wind threshold is for the local area and whether the sustained wind speed exceeded this level (See Appendix A2 and A3 for information on developing a high wind threshold). The wind speed data do not necessarily have to be at the location of the exceedance, but they should represent the source area generating the emissions. The EPA recognizes that official and reliable wind measuring stations may be spatially sparse, especially in rural areas. There may be also be occasions when official wind stations do not record significant winds during an event. In these instances, the submitting air agency should consult with the appropriate EPA regional office regarding use of wind speed or other appropriate data. Generally, the EPA will accept that high winds could be the cause of a high 24-hour average PM_{10} or $PM_{2.5}$ concentration if there was at least one full hour in which the hourly average wind speed was above the area-specific high wind threshold. Potential issues arise when determining the hourly average wind speed if wind speeds are not recorded at specified intervals throughout each hour. While some sources of wind speed data use hourly averages, other data sources employ 1 - 5 minute ("short-period") averages. When the available wind speed data consist of only the wind speed during a fixed short period of each hour (e.g., the first or last five minutes of each hour) or the wind speed during the variable short period when wind speed was at its maximum during the hour, the EPA will generally accept that the hourly average wind speed was above the threshold if the reported short-period wind speed was above the threshold. Where wind speed is recorded at specified intervals throughout each hour, agencies should use all recorded data to calculate the hourly average wind speed.[50] The EPA may, however, consider multiple occurrences of high wind measured at these shorter averaging times as part of the weight-of-evidence demonstration. At a minimum, demonstrations should include the maximum sustained wind speed for each hour of the event and also the number of periods above the high wind threshold.

The EPA notes that The National Climate Center has started archiving the 2-minute winds for every 2-minute period of each hour for all ASOS stations in the country. Almost all sites have data since March 2005, with most archiving data since 2000. The EPA has further developed a preprocessor to AERMOD, called AERMINUTE, that takes short-period wind speed observations and calculates an hourly average wind that can be fed into AERMET, the AERMOD meteorological processor. The AERMINUTE output is user friendly. AERMET can also accept, process, and calculate hourly average wind speeds from sub-hourly data with a resolution equal or greater than 5-minutes from sources other than AERMINUTE.

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[49] Letter dated November 22, 2010 to Matthew Lakin, Manager Air Quality Analysis Office USEPA Region 9, from Karen Magliano, Chief Air Quality Data Branch California Air Resources Board, transmitting final report dated August 5, 2010 entitled, "Analysis of Exceptional Events Contributing to High PM10 Concentrations in the South Coast Air Basin on October 13, 2008."

[50] While the National Weather Service defines a "sustained wind" as the wind speed determined by averaging observed values over a two-minute period, the EPA believes that it would take a longer period of high wind speeds to raise enough dust to significantly influence measured 24-hour average values of PM10 or PM2.5

The EPA will consider shorter-term "snapshots" of wind data such as National Weather Service hourly summaries as part of the weight-of-evidence demonstration.

Generally, the EPA recommends using NWS data or the National Climate Data Center. Where meteorological data are not available for a particular area and such data are critical for the demonstration, agencies may substitute modeled surface wind speeds for actual measured data. Models that agencies can use to develop estimates for actual measured wind speed surface measurements include MM5, WRF, and, possibly, NAM. Wind speed data from a multitude of sources and with different averaging times, including model outputs may be included in a high wind dust event demonstration.

6.3.2.3 Basic controls analysis

Generally, if the wind speed data is at or above the area-specific high wind threshold, the air agency can provide a basic controls analysis to show that the event was not reasonably controllable or preventable (see Section 3.1.5.1). A basic controls analysis should identify all contributing emission sources in upwind areas and provide evidence that those sources were reasonably controlled, whether anthropogenic or natural.

A basic controls analysis would include a brief description of local/upwind sources contributing to the event and a description of the controls on the anthropogenic sources in place at the time of the event (e.g., local BACM measures). In general, the EPA anticipates all upwind areas of disturbed soil to be potential contributing sources. For the sources identified, the submitter should explain that dust emissions occurred despite having reasonable controls in place (e.g., controls that overwhelmed by high wind). After reviewing the demonstration, the EPA may ask for additional information on specific sources.

An example of a basic controls analysis for the anthropogenic sources in a nonattainment area is:[51]

> This requirement is met by demonstrating that despite reasonable and appropriate measures in place, the October 13, 2008 wind event caused the NAAQS violation. During this event, there were no other unusual PM_{10}-producing activities occurring in the Basin and anthropogenic emissions were approximately constant before, during and after the event. SCAQMD has implemented regulatory measures to control emissions from fugitive dust sources and open burning in the South Coast Air Basin. Implementation of Best Available Control Measures (BACM) in the Basin has been carried out through SCAQMD Rule 403 (Fugitive Dust), as well as source-specific rules. With its approvals of the South Coast PM_{10} Attainment Plans in the State Implementation Plan (SIP), EPA has concluded that this control strategy represents BACM and Most Stringent Measures (MSM) for each significant source category, and that the implementation schedule was as expeditious as practicable.

[51] Letter dated November 22, 2010 to Matthew Lakin, Manager Air Quality Analysis Office USEPA Region 9, from Karen Magliano, Chief Air Quality Data Branch California Air Resources Board, transmitting final report dated August 5, 2010 entitled, "Analysis of Exceptional Events Contributing to High PM10 Concentrations in the South Coast Air Basin on October 13, 2008."

- SCAQMD Rule 403 establishes best available fugitive dust control measures to reduce fugitive dust emissions associated with agricultural operations, construction/demolition activities (including grading, excavation, loading, crushing, cutting, planning, shaping or ground breaking), earth-moving activities, track-out of bulk material onto public paved roadways, and open storage piles or disturbed surface areas.
- SCAQMD Rule 1156, Further Reductions of Particulate Emissions from Cement Manufacturing Facilities, is a source-specific rule that applies to all operations, including material handling, storage and transport at cement manufacturing facilities. It restricts visible emissions from facility operations, open piles, roadways and unpaved areas and requires enclosed systems for loading, unloading and transfer of materials. Other operations must employ wind fencing and wet suppression systems or be enclosed with permitted control equipment.
- SCAQMD Rule 1157, PM_{10} Emissions Reductions from Aggregate and Related Operations, is a source-specific rule applicable to all permanent and temporary aggregate and related operations that produce sand, gravel, crushed stone or quarried rocks. Like Rule 1156, this rule restricts the discharge of fugitive dust emissions into the atmosphere through plume opacity tests and limiting visible plume travel to within 100 feet of the operation. This rule requires: prompt removal of material spillage; stabilization of piles with dust suppressants; the control of loading, unloading, transferring, conveyors, and crushing or screening activities with dust suppressants or other control methods; stabilization of unpaved roads, parking and staging areas; sweeping of paved roads; and the use of track-out control systems.
- SCAQMD Rule 1158, Storage, Handling, and Transport of Coke, Coal and Sulfur, is a source-specific rule that applies to any facility that produces, stores, handles, transports or uses these materials. This rule restricts visible emissions and requires that piles be maintained in enclosed storage and that unloading operations be conducted in enclosed structures with water spray systems or venting to permitted air pollution control equipment. It also has specific requirements to control emissions from roadways, other facility areas, and conveyors and the loading of materials.
- SCAQMD Rule 1186, PM_{10} Emissions from Paved and Unpaved Roads and Livestock Operations, requires rapid removal of paved road dust accumulations and establishes a treatment schedule for unpaved roads, street sweeper procurement standards, and design standards for new road construction. SCAQMD Rule 1186.1, Less-Polluting Sweepers, requires procurement of alternative-fueled equipment when governmental agencies replace street sweepers.
- SCAQMD Rule 444, Open Burning, ensures that open burning is conducted in a manner that minimizes emissions and impacts, and that smoke is managed to protect public health and safety. This rule requires authorization for agricultural and prescribed fire, limited to days that are predicted to be meteorologically conducive to smoke dispersion and that will not contribute to air quality that is unhealthy for sensitive groups or worse. It also restricts residential and waste burning.

- SCAQMD Rule 445, Wood Burning Devices, reduces pollution from wood-burning fireplaces and other devices through requirements for new construction, curtailment of wintertime wood burning in specified areas when poor air quality is forecast and restriction of the sale of unseasoned firewood. The SCAQMD Healthy Hearths program provides public education on how to reduce air pollution from wood burning and encourages the conversion to natural gas burning fireplaces through an incentive program.

October 13, 2008 was designated an agricultural and prescribed wildland "no-burn" day, in accordance with SCAQMD rule 444. The $PM_{2.5}$ 24-hour averages at all stations in the Basin, including Anaheim, were well below the 24-hour $PM_{2.5}$ NAAQS and the PM_{10} was estimated to be composed of 87% PM-Coarse particles ($PM_{10-2.5}$) and only 13 percent $PM_{2.5}$. This shows that mostly crustal material comprised the PM_{10} mass and not transported or locally generated urban pollution or combustion sources.

A survey of the SCAQMD complaint records and inspection reports for Anaheim and all other areas of the Basin indicated no evidence of unusual particulate emissions on October 13, 2008 other than related to the strong winds. The complaints are summarized in Table 2-7 from the SCAQMD Clean Air Support System (CLASS) database for complaints and compliance actions. Due to the windy conditions, SCAQMD compliance staff responded to 17 complaints related to windblown dust on October 13. Most were in Riverside and San Bernardino County, but two were in Orange County with no further compliance action taken. No Notices of Violation or Notices to Comply were issued in the Basin for fugitive dust on this day. Several complaints were directly related to the strong winds and windblown dust that overwhelmed the strict fugitive dust controls that are enforced in the Basin. The control methods were generally effective throughout the Basin, but were apparently overwhelmed in several instances by the strong, gusty winds, causing windblown dust and sand to be entrained in the atmosphere.

In addition to the information provided in the example above, the basic controls analysis should also include an explanation of why the control measures should be considered as reasonable. For example, an explanation could include statements similar to: "the source area is within the boundaries of a serious nonattainment area and therefore control measures required to reduce windblown dust as part of the area's approved SIP should suffice as reasonable controls, as additional controls, beyond what is currently required, are economically and technically infeasible." The basic controls analysis should also ensure that the controls discussed include controls for disturbed areas and materials open storage areas susceptible to winds, as well as controls on production sources such as materials loading and unloading.

While the above example provided a basic controls analysis for anthropogenic sources in a non-attainment area, an area attaining the NAAQS can similarly present the current rules, if any, and how the identified rules are reasonable given the attainment status.

In addition to identifying controls on anthropogenic sources, it is important to indicate whether the natural sources could have been reasonably-controlled. For example, the following statement could fulfill this need: "Wind speeds were high enough to entrain dust from natural areas including undisturbed mountain and desert areas upwind of the monitor. Emissions from these

sources were not reasonably controllable due to the cost of applying controls over such a large land area and because of the detrimental effect on the natural ecosystem that could result." Finally, if the EPA recommended controls improvements (e.g., as part of a previous high wind dust exceptional event review) then the controls analysis should address how these controls improvements have been addressed.

6.3.2.4 Comprehensive controls analysis

Generally, if the wind speed data is below the area-specific high wind threshold, the air agency will be asked to provide a comprehensive controls analysis to show that the event was not reasonably controllable or preventable (see Section 3.1.5.2). Significant emissions from reasonably-controlled anthropogenic or natural sources are not expected below the high wind threshold, and therefore the analysis should further consider whether all contributing sources are reasonably-controlled. Comprehensive controls analysis could include detailed analyses such as back-trajectories indicating specific sources in the upwind area, a day specific inventory of the contribution for significant sources, detailed descriptions of controls and their effective implementation and enforcement (where appropriate), and also include a detailed explanation of why the control measures should be considered as reasonable.

For a comprehensive controls analysis, the EPA will place significantly more weight on the wind speed data associated with high particulate matter concentrations and will likely expect more detailed demonstrations as sustained wind speeds decrease below the applicable high wind threshold. The EPA may be unable to concur on some of these cases.

One type of analysis that an air agency could use when developing a comprehensive controls analysis is a source contribution analysis, similar to the analysis presented below, for multiple hours of the day. For most events, a single back trajectory may not account for wind direction fluctuations during the event and may not accurately capture all the sources that may be contributing to the exceedance, and where continuous PM measurements are available, trajectories for hours with the greatest PM concentrations are most critical. Also, when moderate winds are responsible for high levels of measured particulate matter, considerably more attention should also be placed on the hours of the day preceding the event to adequately assess the sources contributing to the exceedance that may have influenced particulate matter concentrations before the arrival of the claimed event.

Following is an example of a methodology of a back-trajectories and inventory for a comprehensive controls analysis:[52]

> Back-trajectories were plotted in 5-minute links based on 5-minute average wind speed and wind direction data recorded at the West 43rd Avenue station. The back-trajectory plot for April 30, 2008 is shown in the following figure. These back-trajectories revealed that winds accompanying peak PM_{10} concentrations typically blew from the west-southwest to the West 43rd Avenue station, crossing a mosaic of agricultural, residential, industrial, and riverbed lands. GIS files were used to determine the zoned uses of all

[52] Assessment of Qualification for Treatment under the Federal Exceptional Events Rule: High Particulate (PM10) Concentration Event in the Phoenix Area on April 30, 2008. Technical report prepared by the Arizona Department of Environmental Quality, Air Quality Division. August 16, 2010.

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

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

PM_{10} emissions were calculated for each back-trajectory hour using emission factors derived from the Nickling and Gillies data, 5-minute wind speed averages recorded at the West 43rd Avenue monitoring station, and the land use acreage along each back-trajectory computed by MAG staff. The emission factor equations were used to compute PM_{10} emissions for each 5-minute portion of each back-trajectory hour. For each 5-minute period, the measured average wind speed was compared to the threshold friction velocity calculated at a 10-meter height to determine whether the threshold wind speed necessary to the generation of windblown PM_{10} on each land use, undisturbed and disturbed, had been exceeded. If the threshold velocity was exceeded, the appropriate Nickling and Gillies emission factor equation was used to compute PM_{10} emissions in units of gm/cm2-sec. Emissions for each 5-minute period within each hour and within each land use category were converted to units of lb/acre-hr and then summed to produce hourly average PM_{10} emission rates per land use category. The emission rates for the other land use categories and the 2nd hour were calculated using a similar methodology. The land use category emission rates were then multiplied by the acreages within each appropriate land use category to derive PM_{10} emissions for each back-trajectory hour by land use category. The PM_{10} emissions for each of the back-trajectory hours on each exceedance day were summed together to calculate total emissions over each exceedance day back-trajectory by land use category. These land use category emissions were then grouped by anthropogenic and nonanthropogenic categories to assess the relative contribution of nonanthropogenic sources to exceedances recorded at the West 43rd Avenue monitoring station during 2008. A summary of the results of these calculations for the April 30, 2008 exceedance day is presented in the following table.

Table 5-2. Anthropogenic and Nonanthropogenic Windblown PM_{10} Emissions From W. 43rd Ave. Monitor Back-Trajectory Lands on April 30, 2008

Land Use Category	PM_{10} Emissions (lb)		% of Anthropogenic
	Anthropogenic	Nonanthropogenic	
Vacant/Undisturbed	-	0	
Vacant/Disturbed	1,501	-	20.7%
Agriculture/Undisturbed	0	-	0.0%
Agriculture/Disturbed	0	-	0.0%
Construction/Undisturbed	0	-	0.0%
Construction/Disturbed	277	-	3.8%
Passive-Restricted/Undisturbed	-	0	
Passive-Restricted/Disturbed	0	-	0.0%
Riverbed/Undisturbed	-	8,234	
Riverbed/Disturbed	2,408	-	33.3%
Sand & Gravel Landfill/Undisturbed	0	-	0.0%
Sand & Gravel Landfill/Disturbed	3,053	-	42.2%
Other		-	
Total	7,240	8,234	
% of Grand Total	46.8%	53.2%	

The analysis should also include information on whether controls on anthropogenic sources were appropriately implemented and enforced during the time of the event. In addition to identifying controls on anthropogenic sources, it is important to indicate whether the natural sources could have been reasonably-controlled. Available inspection reports and/or notices of violations (NOVs) in upwind areas should be submitted, if available. The EPA recognizes that agencies have varied methods of permitting and enforcement and does not expect *all* agencies to have these records for *all* events. The EPA does, however, ask agencies to make a general showing that the agency has a program in place to ensure controls are being enforced as appropriate (even if no specific evidence exists for the particular day of the event). The EPA will also consider the overall compliance rates for specific source categories in determining whether reasonable controls were in place.

The controls analyses when wind speeds are below the high wind threshold should address whether control improvements were recommended by the EPA (e.g., as part of a previous high wind dust exceptional event review). If controls improvement had been previously recommended then the controls analysis should address how these controls improvements have been implemented.

6.3.3 Step 3: Present Historical Fluctuations (HF) Analyses

As described in Section 3.2, the historical fluctuations (HF) analyses and an air agency conclusion will aid the EPA's review and will also inform CCR, NEBF, and AAQ. Specific analyses generally expected to provide the historical context for the event include:

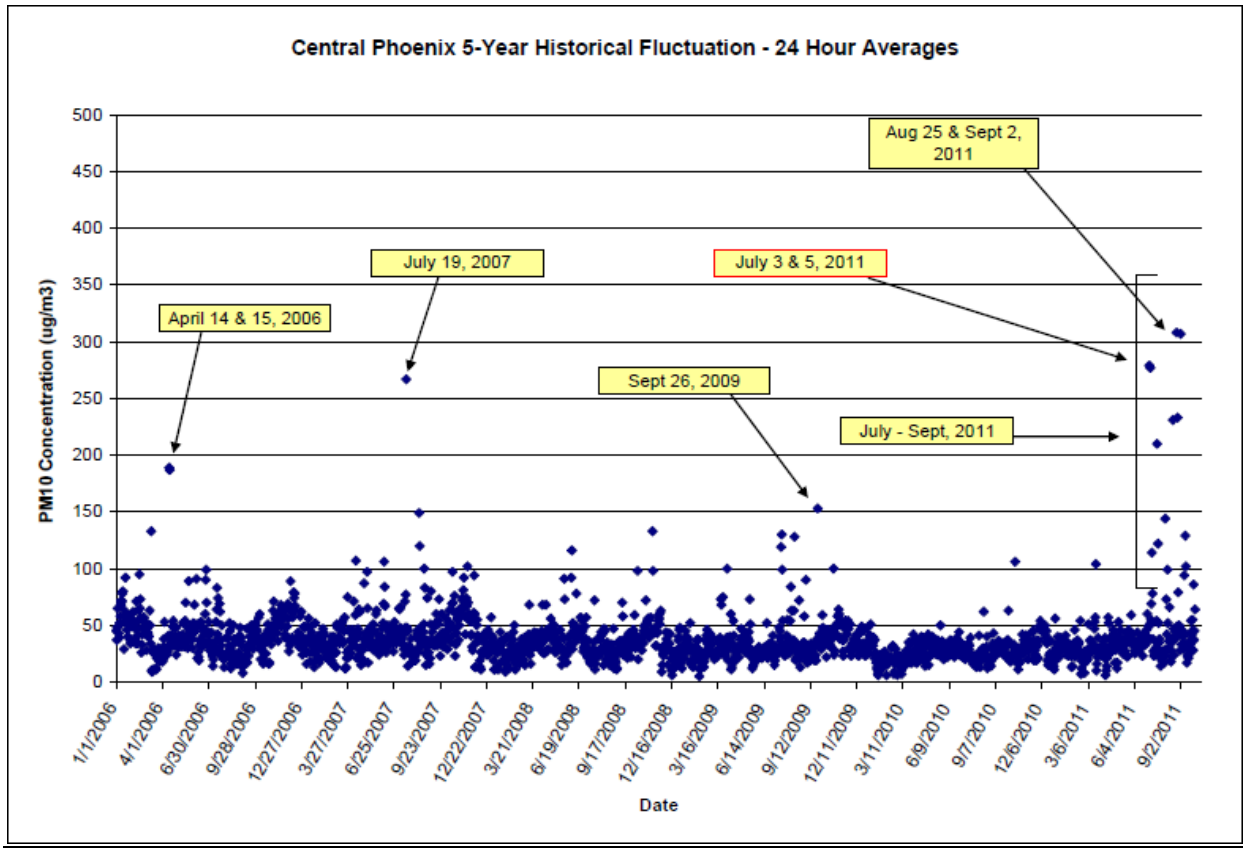
1. A time series for concentration for the event area for the previous three years, or longer if available, with high wind dust events identified: Concentration data should be 24-hour concentrations for each day. Depending on the quantity of data, it may be appropriate to present monthly maximums (note that it is not appropriate to present monthly-averaged daily data or any other average of the daily data as this masks other high values). It is appropriate to identify information such as: seasonal or monthly 24-hour means, other event days, and relevant standards. The following figure[53] is an appropriate example of this type of analysis.

2. Percentile rank of concentration relative to annual data with and without all high wind dust events: The percentile rank of the 24-hour average PM concentration should be provided for the event day relative to all measurement days over the previous three years or longer. To ensure statistical robustness, the EPA generally recommends that submitting agencies to include a minimum of 300 data points in this calculation. If the sampling schedule is 1-in-6 day sampling then the EPA generally recommends that this percentile rank include five years of data (60 sample days/year for five years provides 300 data points). Higher frequency sampling can utilize fewer years of data

[53]State of Arizona Exceptional Event Documentation for the Events of July 2nd through July 8th 2011, for the Phoenix PM10 Nonattainment Area. Report prepared by Arizona Department of Environmental Quality (ADEQ), March 8. 2012.

but not fewer than three years. If three years of data are not available, consult with the EPA.

3. Percentile rank of concentration relative to seasonal data with and without all high wind dust events: The percentile rank of the 24-hour average PM concentration should be provided for the event day relative to all measurement days for the season (or appropriate alternative 3-month period) of the event over the previous three years or longer. It is appropriate to use the same time horizon as used for the percentile calculated relative to annual data.



6.3.4 Step 4: Address Clear Causal Relationship (CCR)

As described in Section 3.3, the following types of evidence can support the CCR demonstration:

- Occurrence and geographic extent of the event
- Transport of emissions related to the event in the direction of the monitor(s) where measurements were recorded
- Spatial relationship between the event, sources, transport of emissions, and recorded concentrations
- Temporal relationship between the high wind and elevated PM concentrations at the monitor in question
- Chemical composition and/or size distribution of measured pollution that links the pollution at the monitor(s) with particular sources or phenomena
- Comparison of event-affected day(s) to specific non-event days

Each of these types of evidence is treated in detail below. Note that information generated in this portion of the demonstration submittal may result in revisions to the conceptual model and controls analysis. As the flow diagram (Figure 2) suggests, preparation of a high wind dust exceptional event package is not necessarily a step-wise process.

6.3.4.1 Occurrence and geographic extent of the event

Air agencies can provide the following information to help establish the occurrence and geographic extent of the event: special weather statements, advisories, news reports; nearby visibility readings; measurements from monitoring stations; MODIS and other satellite maps; and description of weather conditions that created the high wind.

- Special weather statements, advisories, news reports on both predictions and occurrence of the event:
  SCAQMD provided the following information for an exceptional event showing for Anaheim ***(Note that Appendices from the SCAQMD demonstration submittal are referenced in the excerpt below, but they are not provided as part of this document or the example).***

> The National Weather Service had predicted this first strong Santa Ana event of the season well in advance and Governor Schwarzenegger issued a press release on October 10 to prepare the state for Santa Ana winds and the associated wildfire potential (see Appendix A.7).
>
> The Appendix to this document (Sections A.2 through A.6) contains the forecast discussions, short-term forecasts (nowcasts), fire weather forecasts, warnings and significant wind reports, as available from the NWS Los Angeles/Oxnard and San Diego Forecast Offices, whose areas of responsibility cover the Basin and much of southern California. These show that the strong Santa Ana wind event was well predicted in advance, warning the public of potentially damaging winds and windblown dust and sand, along with reduced visibilities.
>
> NWS advisories and warnings for high winds (Appendix, Section A.5) were already in place on October 12, extending through Tuesday, October 14, or longer. A Wind Advisory is issued by NWS when sustained winds of 30 to 39 mph are expected for 1 hour or longer. A High Wind Warning is issued when sustained winds of 40 mph or more are expected for 1 hour or longer, or for wind gusts of 58 mph or more with no time limit. NWS Oxnard issued High Wind Warnings on October 12, extending through the period for the Los Angeles and Ventura County Mountains and Wind Advisories for the Santa Monica Mountains, the Ventura County coastal and interior valleys, the Santa Clarita Valley, the Los Angeles County San Fernando Valley, and the Ventura and Los Angeles County coasts, including Downtown Los Angeles. NWS San Diego issued High Wind Warnings for the San Bernardino and Riverside County valleys (Inland Empire) and the Santa Ana mountains and foothills and Wind Advisories for the San Bernardino County mountains, Orange County coastal areas, the Riverside County mountains, the San Diego County mountains, and the San Diego County valleys, In short, High Wind Advisories and Warnings were in place for most of the South Coast Air Basin and much of southern California to warn the public of this high

wind event. Northeasterly winds with sustained speeds in the 35 to 45 mph range were predicted throughout the region, along with damaging gusts to 70 mph, especially in the mountains and below passes and canyons in the Inland Empire. Hazardous driving conditions were predicted, especially through and below canyons and passes, as well as blowing dust and sand with reduced visibility, broken tree limbs and downed power lines.

The AQMD Meteorology Section predicted high winds for October 13 in the Coachella Valley for AQMD Rule 403.1, which requires specific actions in this area when wind gusts exceed 25 mph. While there are no other AQMD rule requirements to forecast winds in the Basin, the daily forecast discussion by AQMD issued on October 12 for Monday, October 13 predicted the strong winds. A smoke advisory was already in effect in the morning of October 12 and the strong winds were prominent in the forecast discussion, as follows:

- *SMOKE ADVISORY for Sunday: Concentrations of fine particulates may reach Unhealthy for Sensitive Groups or higher in areas of Los Angeles County directly impacted by smoke from a wildfire in the Angeles National Forest north of Pacoima.*

- *Monday will be mostly clear, windy and warmer as the offshore Santa Ana winds strengthen. Gusty winds through and below canyons and passes will cause elevated particulate concentrations due to windblown dust and possibly continued wildfire activity.*

PM10 predictions were increased throughout the Basin for October 13 and agricultural and prescribed burning was prohibited with a No-Burn declaration for the entire Basin. AQMD issued a Smoke and Windblown Dust Advisory in the morning of October 13, reproduced in the Appendix, Section A.10, that warned of the likelihood of strong Santa Ana winds causing high PM10 concentrations in several areas of the Basin, including Central Orange County (Forecast Area 17, including Anaheim), as follows:
In addition, strong Santa Ana winds will likely cause PM10 concentrations to reach Unhealthy for Sensitive Groups concentrations or higher in areas throughout the Basin downwind of the winds areas. This includes any areas where windblown dust is visible, especially through and below passes and canyons, until the winds subside. Wind prone areas are likely to include: the San Bernardino Valley (Areas 32, 33, 34, 35), Riverside County Valleys (Areas 22, 23, 24, 25, 26), Orange County (Areas 16, 17, 18, 19, 20) and the Los Angeles County northern and southern coastal areas (Areas 2 and 4).

- Nearby visibility readings:
  SCAQMD supplied the visibility readings and ADEQ submitted the visibility pictures for nearby airports during Arizona events.

- MODIS satellite maps:
  SCAQMD provided the following maps showing the spatial distribution of windblown dust.

- Description of weather conditions that created the high wind:
  SCAQMD provided the following description of weather conditions around the time of the event:

> An upper level trough of low pressure moved through California, between October 9 and 11. The low pressure system did not create much rain in California during this period, but temperatures were cool throughout the state. By Sunday, October 12, the backside of the trough was over California, providing upper level support for a developing strong Santa Ana wind event. The strong pressure gradients that developed between the high and low pressure aloft created strong winds. The National Weather Service (NWS) 500 millibar (MB) analyses every 12 hours between 0400 PST on October 12 and 0400 PST on October 14 are shown in the Appendix, Section A.11. The winds over California at the 500 MB pressure level started out northwesterly in the morning of October 12 with speeds to 81 mph (70 knots), then became more northerly by the morning of Monday, October 13 with speeds to 57 mph (50 knots). The strong northerly flows aloft, coupled with strong northeasterly surface pressure gradients, enhanced the offshore flows at the surface.
>
> The passage of the low pressure trough aloft brought the first strong cold front of the season at the surface. Section A.12 in the Appendix shows the NWS sea-level pressure analyses, every three hours between 1600 PST on October 12 and 0100 PST on October

14. By 1600 PST October 12, the surface low and cold front was over the northeastern border of New Mexico and high pressure was building over northern Nevada, increasing the northerly gradients. By 0100 PST on October 13, the high pressure over Nevada had increased to 1033 MB, strengthening the gradient flows across California. By 0700 PST, the area of high pressure had expanded and peaked at 1037 MB. The strength of the high pressure remained nearly the same through the rest of the day, while the broad area of high pressure slowly moved to the east, causing the winds to shift from northerly to northeasterly, then easterly throughout the day. The strong pressure gradients caused strong winds, especially in southern California as the flow of cold air from the area of high pressure further enhanced the winds as it flowed across the mountains. Some gusty winds had already been observed on October 12, but they increased considerably in the early morning of October 13.

This is the classic Santa Ana wind pattern that brings strong winds to southern California. High pressure builds over the Great Basin desert region of the western United States in the cold air behind the front with lower pressure off the southern California coast. This pressure gradient creates strong north through northeasterly winds, enhanced by thermal gradients due to denser cold air over the Great Basin. The relatively cool air from the Great Basin deserts flows over the southern California mountains, gaining momentum on the lee side. The downslope flow causes compressional warming and drying of the air in the South Coast Air Basin. This combination of strong wind, high temperatures and low relative humidities make these Santa Ana conditions highly conducive to wildfires in southern California.

The AQMD Meteorology Section routinely analyzes sea-level pressure gradients in southern California to assess winds and air pollution potential. The Summation Pressure Gradient (SPG) is a good indicator of the strength of the flow and whether it is onshore (positive) or offshore (negative), where

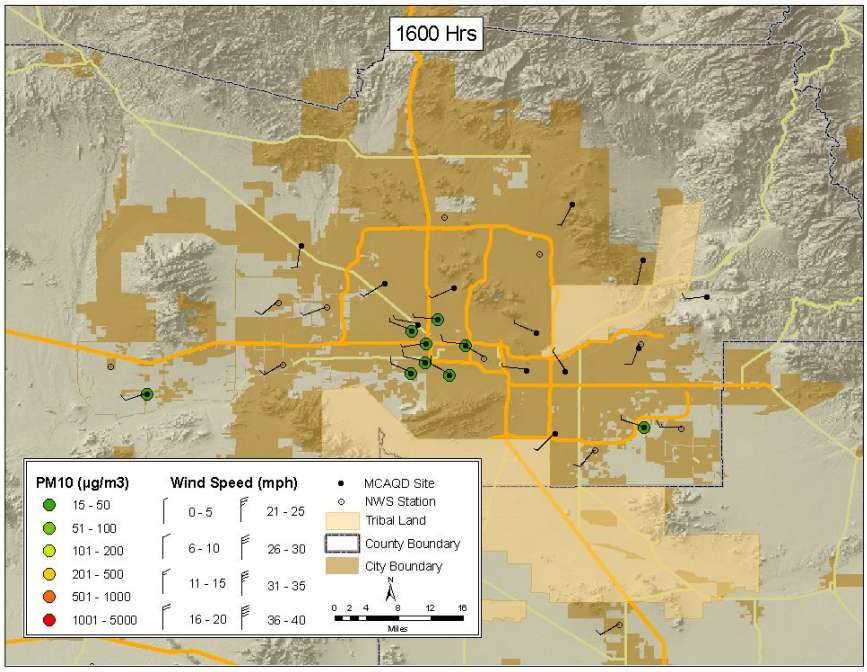
SPG = (SAN-LAS)[54] + (LGB-DAG)[55] + (RIV-DAG)[56]

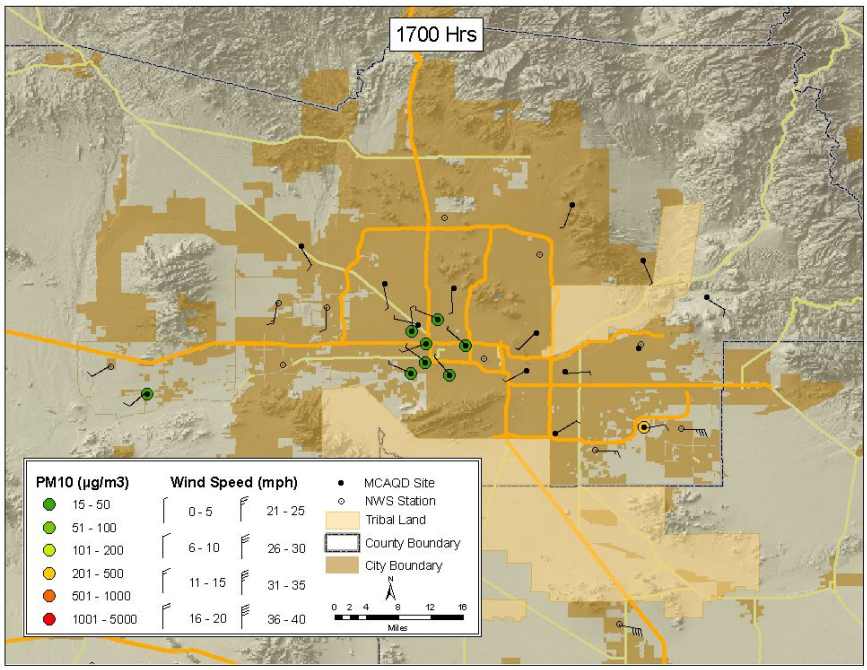
In the morning of October 12, the 0700 PST SPG was −5.5 MB, indicating moderate offshore flow. At the same time in the morning of October 13, the SPG strengthened to −14.7 MB, indicating a stronger offshore gradient. The gradient was enhanced by the upper level pattern and thermal gradient as described above, to create a strong wind event, especially for several hours through the morning of October 13.

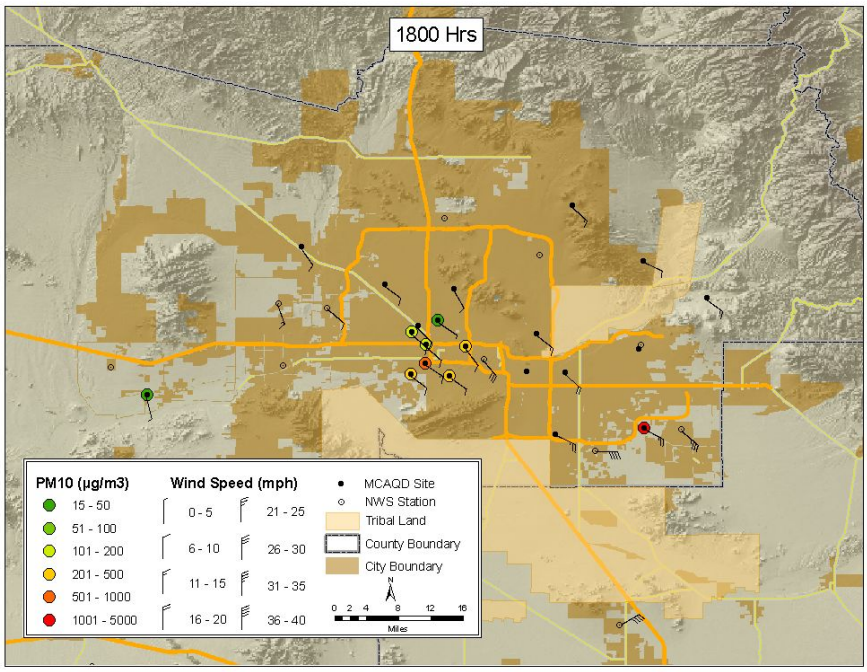
- Measurements from monitoring stations:
  The following figures show the kind of analyses based on measurements from air monitoring and meteorological stations that could be used to show the occurrence and geographic extent of the event.[57] The figures also show that only when the wind speeds

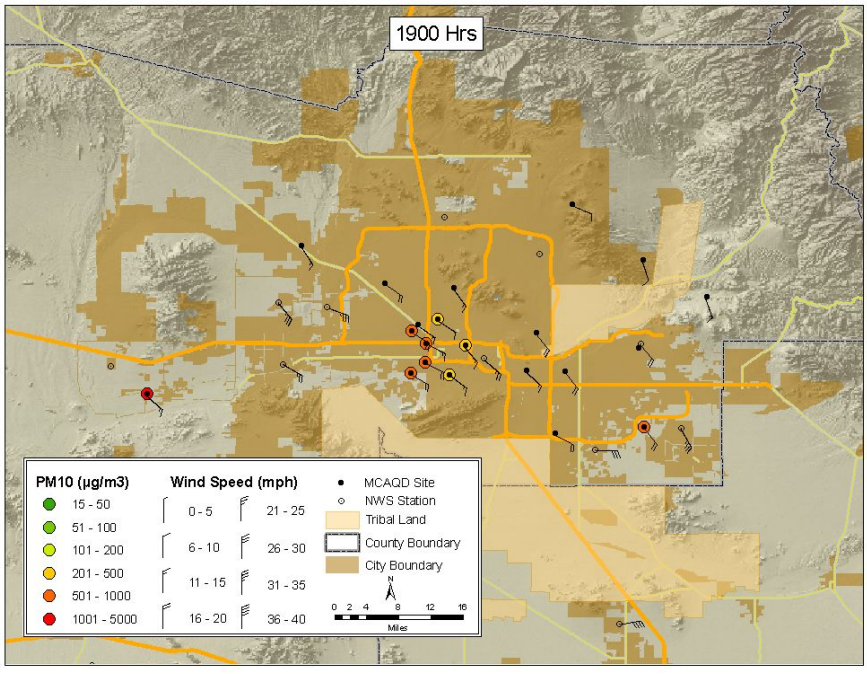
[54] Sea Level Pressure difference between San Diego and Las Vegas
[55] Sea Level Pressure difference between Long Beach and Daggett
[56] Sea Level Pressure difference between Riverside and Daggett
[57] EPA Region 9. ArcGIS analysis using PM10, wind speed, and wind direction data from AQS.

became elevated did PM_{10} concentrations also become elevated, supporting the causal relationship.



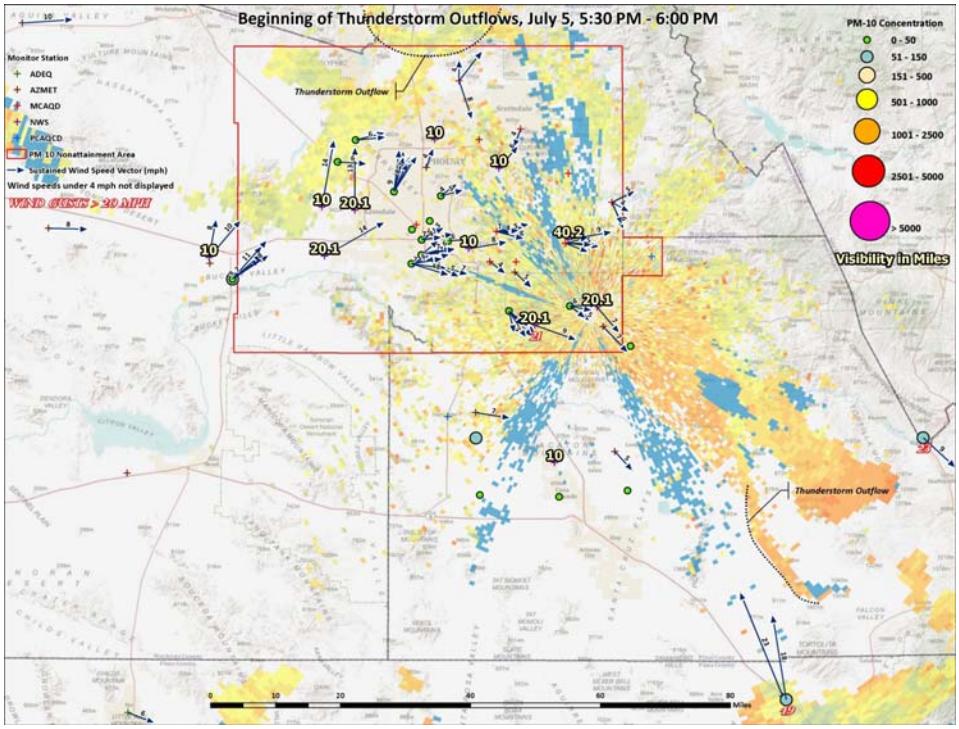


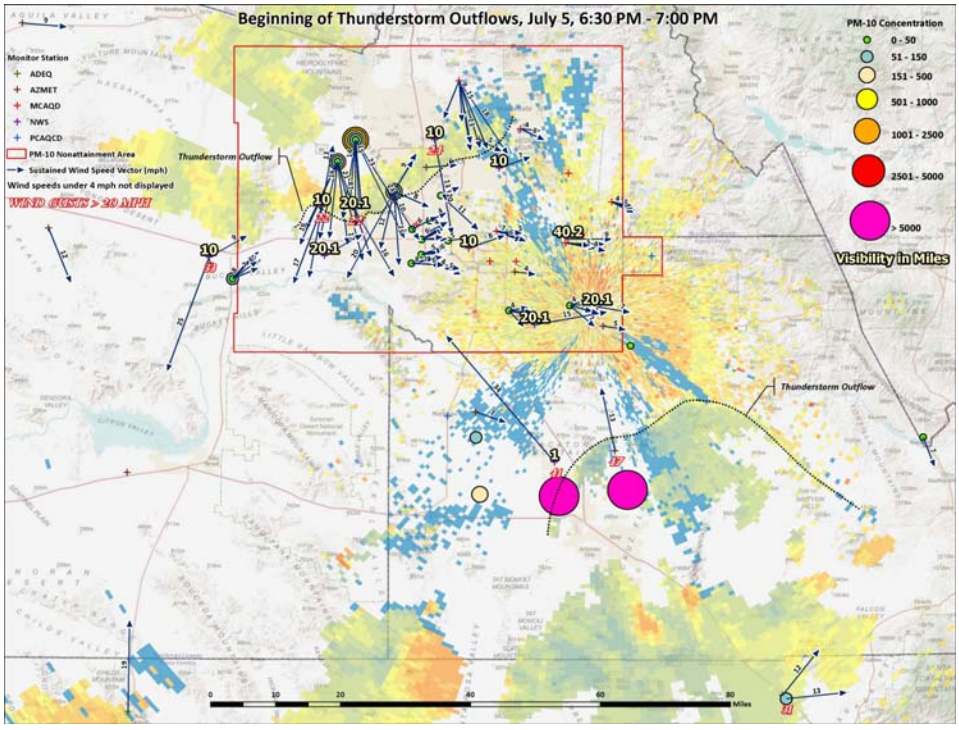


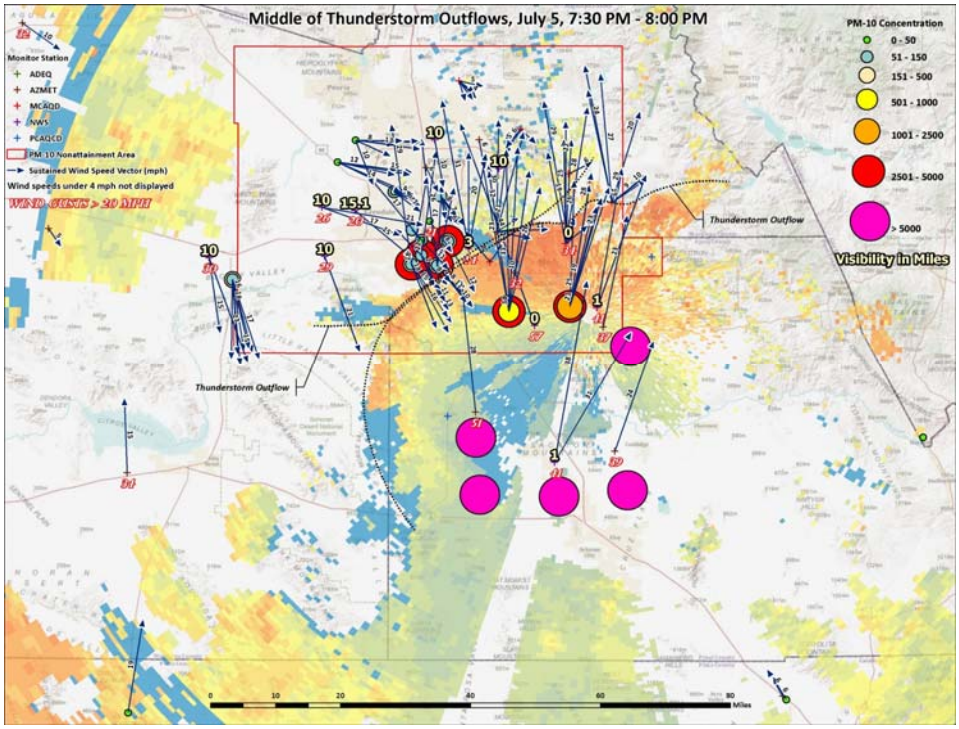


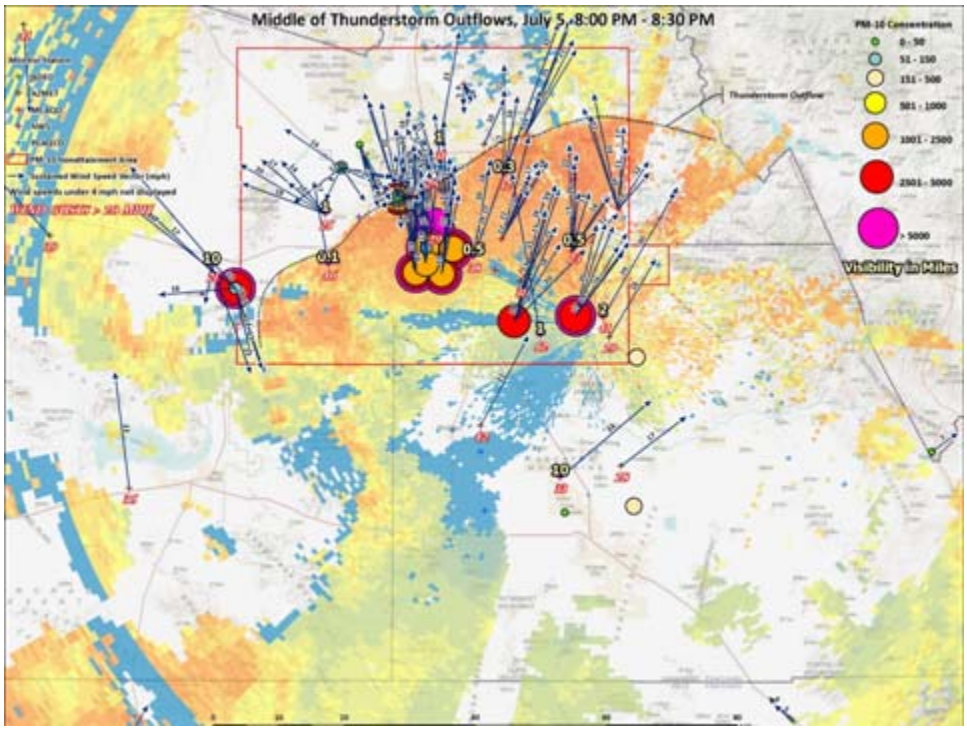
Further analysis may include more refined GIS data combined with surface measurements from various sources. The EPA acknowledges that there are few areas, except large metropolitan areas that have the number of monitors to document the sequential nature of an event. The following is an example[58] of the type of analysis that can occur with these types of resources.

[58] ADEQ


Beginning of Thunderstorm Outflows, July 5, 5:30 PM - 6:00 PM
PM-10 Concentration
0 - 50
51 - 150
151 - 500
501 - 1000
1001 - 2500
2501 - 5000
> 5000
Visibility in Miles
Monitor Station
ADEQ
AZMET
MCAQD
NWS
PCAQCD
PM-10 Nonattainment Area
Sustained Wind Speed Vector (mph)
Wind speeds under 4 mph not displayed
WIND GUSTS > 20 MPH
Thunderstorm Outflow
Thunderstorm Outflow
10
10
10
20.1
20.1
10
40.2
20.1
20.1
10
0 10 20 40 60 80 Miles


Beginning of Thunderstorm Outflows, July 5, 6:30 PM - 7:00 PM
PM-10 Concentration
0 - 50
51 - 150
151 - 500
501 - 1000
1001 - 2500
2501 - 5000
> 5000
Visibility in Miles
Monitor Station
ADEQ
AZMET
MCAQD
NWS
PCAQCD
PM-10 Nonattainment Area
Sustained Wind Speed Vector (mph)
Wind speeds under 4 mph not displayed
WIND GUSTS > 20 MPH
Thunderstorm Outflow
Thunderstorm Outflow
10
10
10
20.1
20.1
10
40.2
20.1
20.1
1
0 10 20 40 60 80 Miles

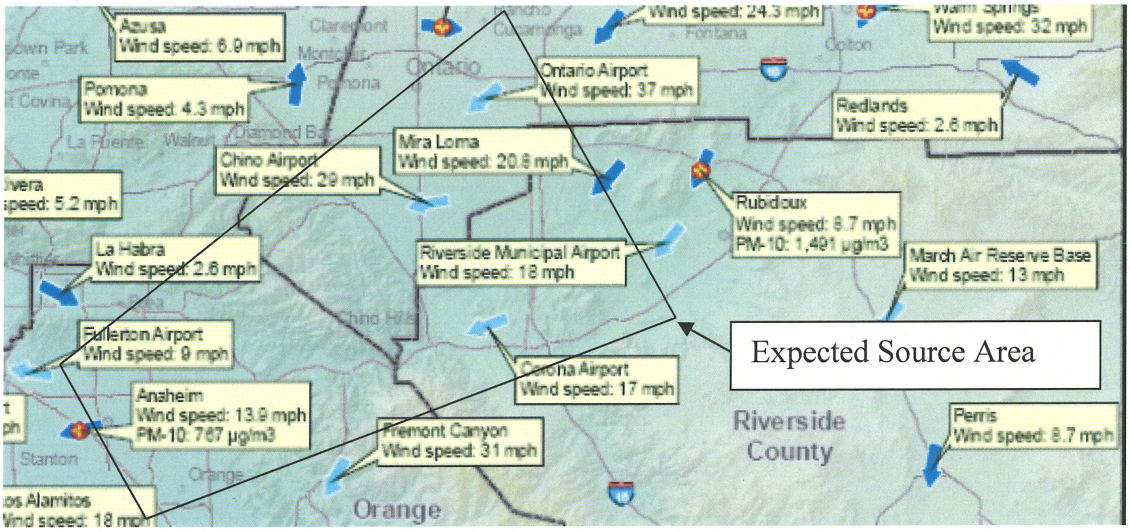




6.3.4.2 Transport of emissions related to the event in the direction of the monitor(s) where measurements were recorded

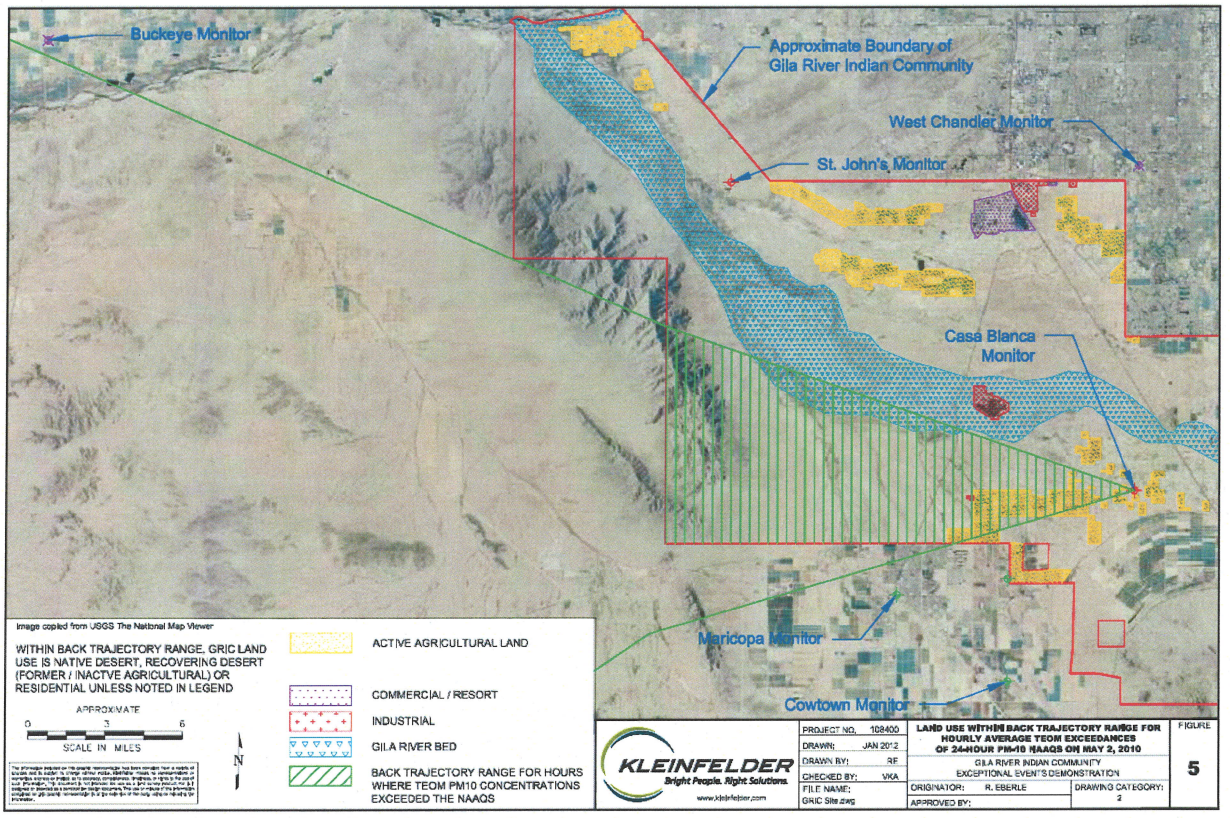
Example information to support transport of event-related emissions in the direction of monitor includes wind direction data showing that emissions from sources identified as part of the nRCP demonstration were upwind of the monitor(s) in question.

- Map showing local sources and wind direction[59]
  Note that the topography gives an indication of sources in this map. Ideally, the likely significant sources such as agriculture fields, desert areas, mountains, and industrial sources would be identified (see next example).



- Back Trajectories:
  Even if extensive comprehensive controls analysis is not needed, a back-trajectory analysis as shown in Section 6.2.2.5 would be appropriate as part of the CCR demonstration. Note that HYSPLIT trajectories that cover hundreds of miles are of limited use if the sources of dust are local. The example[60] below uses 1-hour back trajectories based on local surface wind measurements during periods of high PM_{10} and GIS data to identify contributing source categories as well as the geographic extent of the event. The total area between the green lines represents the range of hourly back trajectories during periods of high PM_{10}, while the hatched green area represents the portion of the total area that is located with the Gila River Indian Community boundaries (signified by the solid red line).

[59] EPA Region 9
[60] GRIC

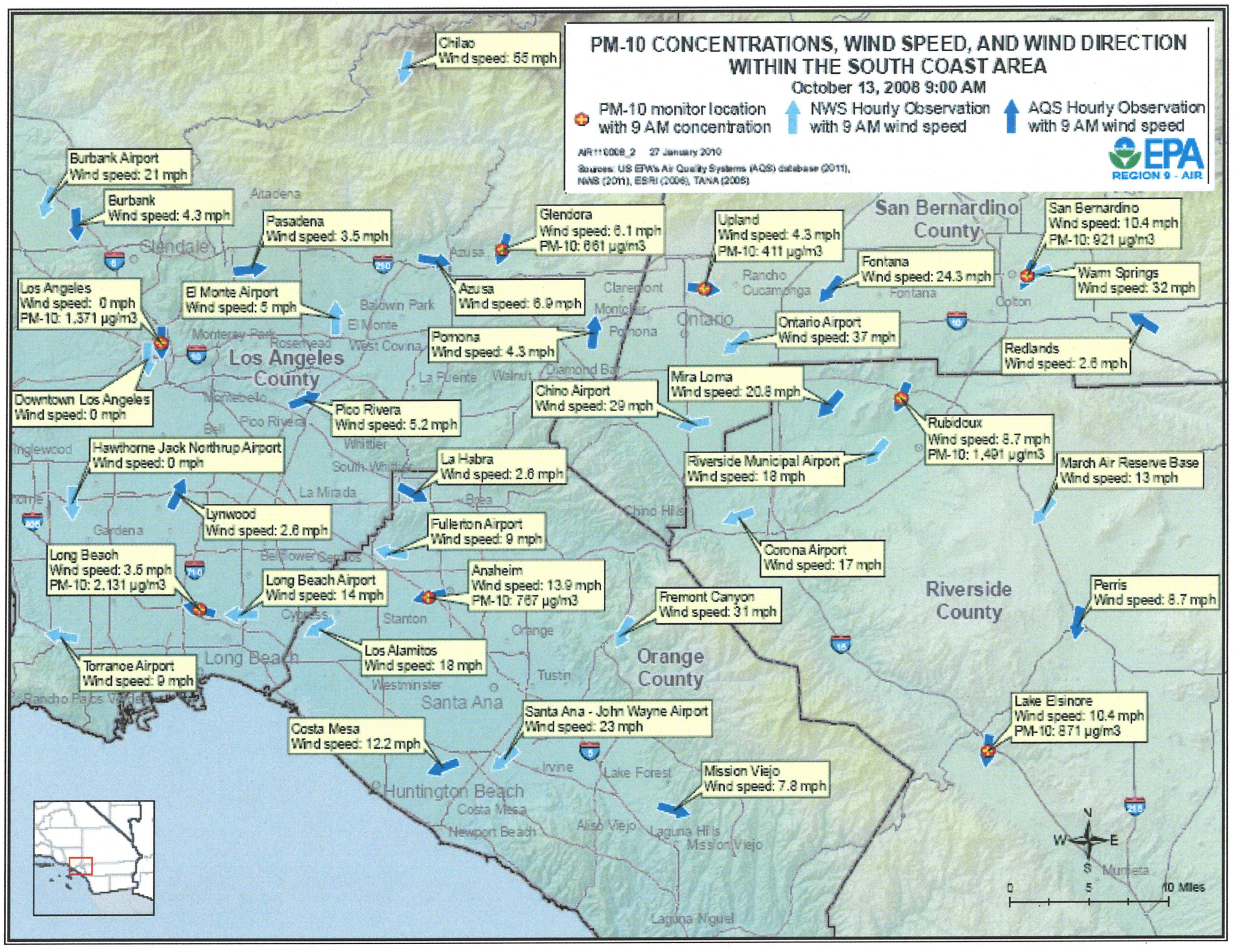


- Wind roses:
  A wind rose for periods of the event day showing wind speed and direction at or near the concentration monitor, coupled with a description of the area suggested by the wind rose, could provide evidence of where the dust was transported from. This approach may not suffice for situations where the sources of dust are not proximate to the monitor.

6.3.4.3 Spatial relationship between the event, sources, transport of emissions, and recorded concentrations

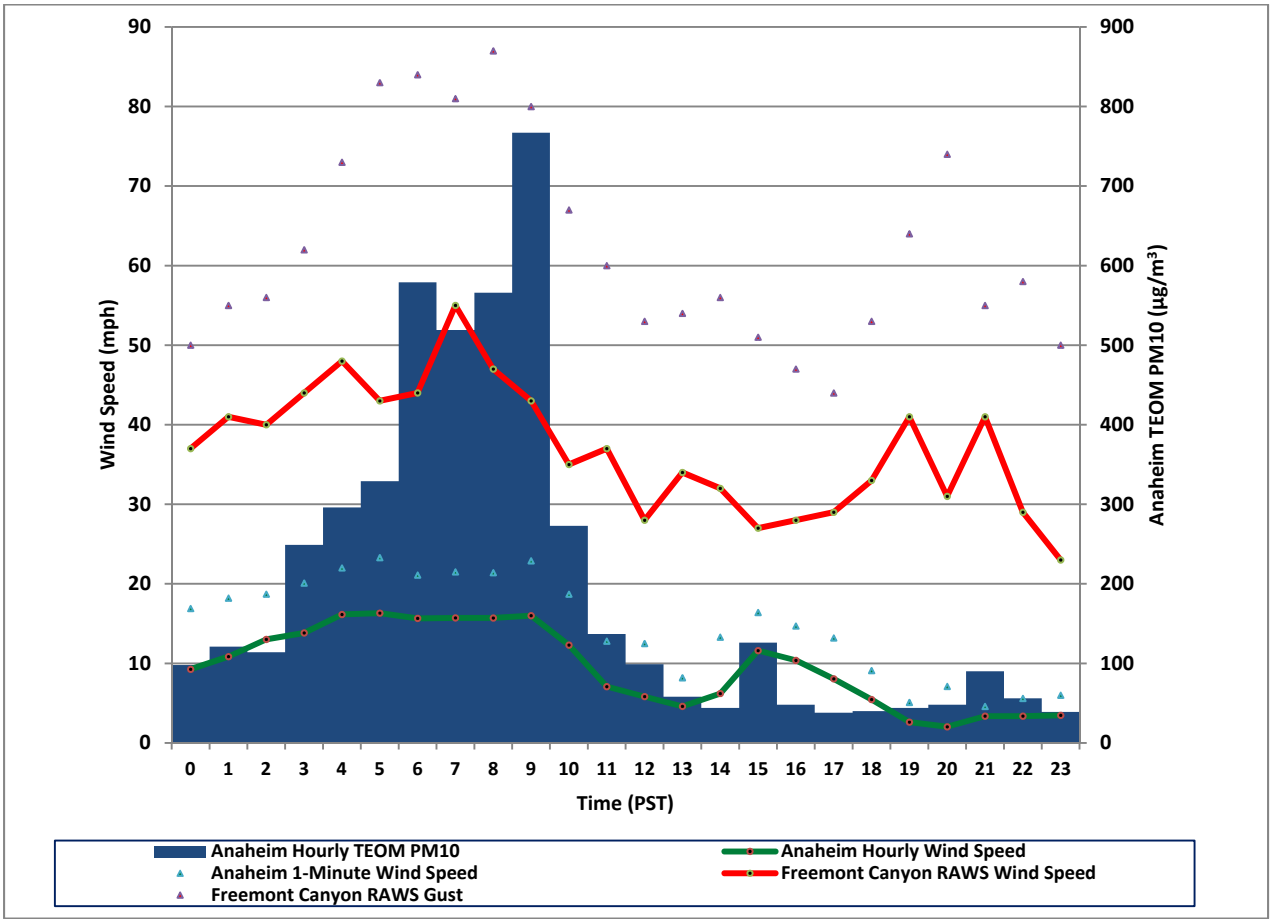
The type of information that would support this evidence could be a map showing likely source area, wind speeds, wind direction, and particulate matter concentrations for the affected area during the time of the event: see the example figure below.[61]

[61] EPA Region 9



6.3.4.4 Temporal relationship between the high wind and elevated PM concentrations at the monitor in question

Evidence for establishing the temporal relationship can include 24-hour time series showing PM concentrations at the monitor in question in combination with sustained and maximum wind speed data at the area where emissions originated. As shown below, it is most informative to include the sustained wind speed data and the concentration data on the same figure.



6.3.4.5 Similarity of chemical composition of measured pollution with that expected from sources identified as upwind

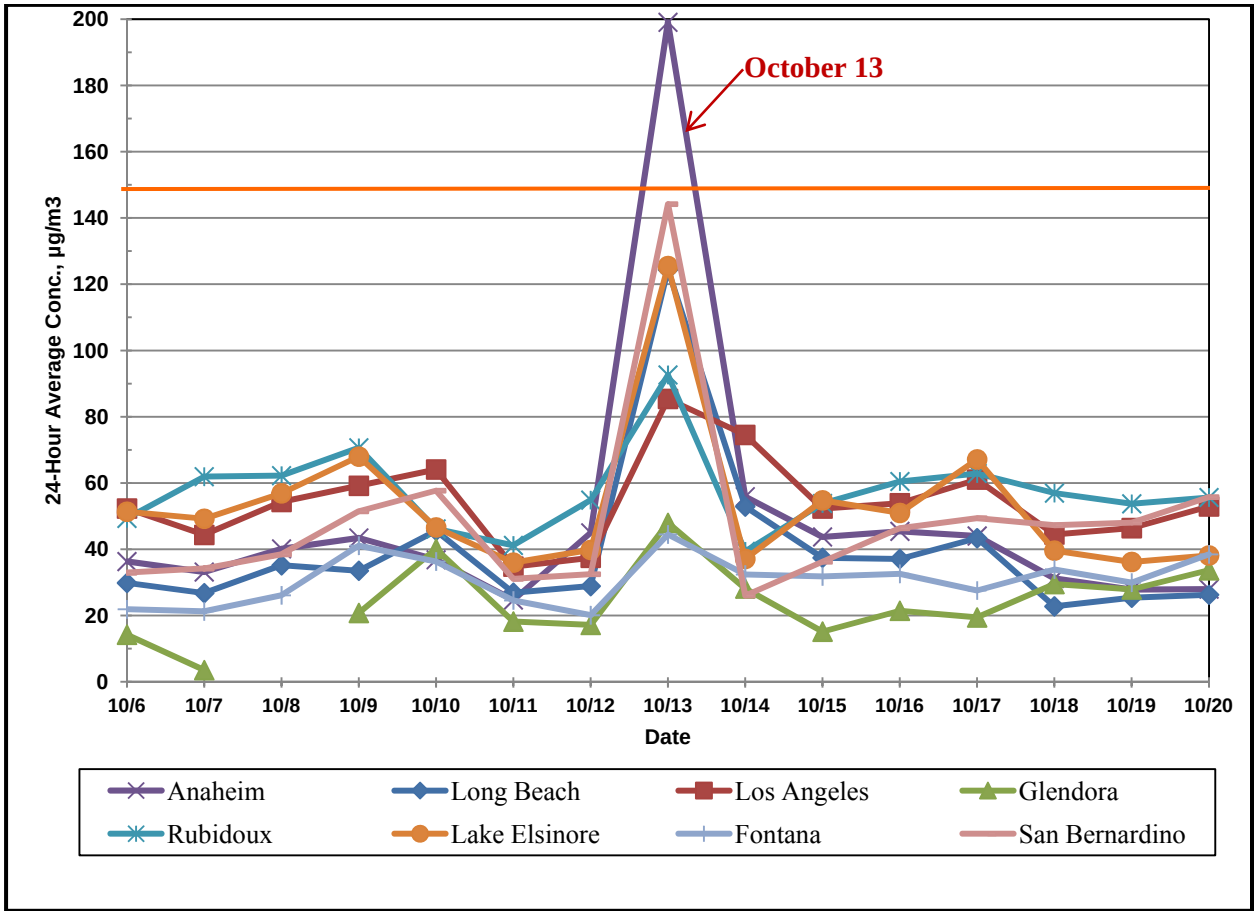
This evidence could include chemical speciation data from the monitored exceedance(s) and sources or size distribution data. These data are not always available, but should be included wherever possible. The EPA will post an example of this type of analysis to the EPA exceptional events website as one becomes available.

6.3.4.6 Comparison of event-affected day(s) to specific non-event days:

The following types of analyses could be part of this piece of evidence:

- comparison of concentrations and wind speed in the area to days preceding and following the event
- comparison of concentration data to specific days that are similar to the event day with respect to emissions and meteorology
- comparison to other high wind days without elevated concentrations
- comparison of chemical composition (if available)

The following figure is an example of a comparison of concentrations in the area to days preceding and following the event.[62]



6.3.4.7 Alternative Hypotheses

Eliminating other possible non-event causes supports the claimed causal relationship to the high wind event, although conclusively proving the absence of all possible or plausible other causes is not required or expected. For example, SCAQMD provided the following:

> Three wildfires were reported in southern California on October 13, fanned by the strong, dry Santa Ana winds, two in the San Gabriel Mountains north of the San Fernando Valley and one at Camp Pendleton in the north coastal part of San Diego County. Only one of these, the Marek Fire, was active during the early morning hours when the hourly PM_{10} concentrations spiked at Anaheim. Also, the northeasterly wind flows throughout the period, make it unlikely the smoke or ash from the fires contributed significantly to the PM_{10} measured at Anaheim. Crustal material from windblown dust was the primary

[62]Letter dated November 22, 2010 to Matthew Lakin, Manager Air Quality Analysis Office USEPA Region 9, from Karen Magliano, Chief Air Quality Data Branch California Air Resources Board, transmitting final report dated August 5, 2010 entitled "Analysis of Exceptional Events Contributing to High PM10 Concentrations in the South Coast Air Basin on October 13, 2008."

> component of the measured PM_{10}, as confirmed by comparing with the $PM_{2.5}$ measured on this day. Prescribed, agricultural or residential burning did not appear to have added any significant amount of PM_{10} to the concentrations measured in the Basin; these activities were not permitted on this day. The $PM_{2.5}$ portion of PM_{10}, which would indicate combustion sources, was very small throughout the Basin. PM_{10} was emitted from some BACM-controlled sources (mainly agricultural and construction activities) as BACM controls were locally overwhelmed by the high winds. Natural particulate sources areas also contributed to the measured PM_{10}, particularly the upwind mountain and desert areas.

6.3.5 Address Affects Air Quality (AAQ)

Once sufficient HF analyses have been provided and CCR has been demonstrated the event will generally have been considered to have affected air quality at the exceeding monitor, and thus the AAQ element will have been met. The demonstration should include a statement that AAQ has been met by providing HF analyses and demonstrating CCR.

6.3.6 Address [HAURL] / Natural Event

Once both CCR and nRCP have been demonstrated, the event will generally be considered a natural event, thus satisfying the [HAURL]/Natural Event element. The demonstration should include a statement that the Natural Event criterion has been met by demonstrating nRCP and CCR.

6.3.7 Step 5: Address No Exceedance But For the Event (NEBF)

The NEBF demonstration generally builds on information gathered to support other elements of an exceptional event demonstration. Further, if the exceptional events demonstration fails on a different element then the NEBF analysis becomes moot since there is no portion of the concentration than can be attributed to an exceptional event. For these reasons, the EPA suggests that air agencies complete the NEBF demonstration last after addressing all other EER elements.

6.3.7.1 Qualitative NEBF
If non-event pollution levels are typically significantly below the NAAQS during the season of the event then a qualitative NEBF may be adequate. The following is provided as an example:[63]

> Activities that generate anthropogenic PM_{10} were approximately constant in the Basin immediately preceding, during and after the event. Activity levels in the Basin were typical for the time of year and PM_{10} emissions control programs were being implemented, not only for fugitive dust-generating activities, but also for agricultural burning in the Basin. Furthermore, due to the forecasts for high winds on October 13, the SCAQMD compliance teams were ready to act quickly to fugitive dust complaints to

[63]Letter dated November 22, 2010 to Matthew Lakin, Manager Air Quality Analysis Office USEPA Region 9, from Karen Magliano, Chief Air Quality Data Branch California Air Resources Board, transmitting final report dated August 5, 2010 entitled "Analysis of Exceptional Events Contributing to High PM10 Concentrations in the South Coast Air Basin on October 13, 2008."

minimize emissions and to enforce mitigation methods like watering and soil stabilization.

Vehicular traffic, cooking and residential fires do not directly cause PM_{10} 24-hour NAAQS violations in the Basin. Activity levels in the Basin were typical for the time of year and PM_{10} emissions control programs were being implemented, for fugitive dust-generating activities, as well as open burning. With the unsettled conditions on October 13, such emissions would not contribute significantly to the PM_{10} measured. There were reasonable and appropriate measures in place to control PM_{10} in the Basin on October 13, 2008, including SCAQMD Rules 403, 444, 445, 1156, 1157, 1158 and 1186.

Examining the make-up of the PM_{10} in the Basin on this day using $PM_{2.5}$ data, the coarse particles ($PM_{10-2.5}$), which are associated with windblown dust, represent well over 75% of the total PM_{10} mass collected in the Basin. The three wildfires that were burning in the Basin, one of which started on October 12 and two other after the high hourly PM_{10} concentrations started, were not the primary cause of the high PM_{10}. $PM_{2.5}$ remained relatively low throughout the Basin on this day with no exceedance of the 24-hour NAAQS. While there were no PM_{10} filters collected on this day for laboratory analyses for soluble potassium, an indicator of wood smoke, the predominance of coarse particles, the timing of the fires and the lack of supporting wind directions to bring smoke to Anaheim provide support the conclusion that while there could have been a minor contribution from the wildfires, it was relatively small portion of the PM_{10} measured.

Based on the data provided in this report, SCAQMD concludes that there would not have been exceedances of the PM_{10} NAAQS in the Basin on October 13, 2008 if high winds were not present. Even if the extreme 99.5 percentile concentration for the Basin, 139.5 $\mu g/m^3$, were used as the background concentration to compare to the measured PM_{10} concentrations, the particulate contribution from the high wind event clearly caused these exceedances. The causal connection of the measured PM_{10} and the strong winds in the Basin, and throughout southern California, along with the high contribution of fugitive dust to the PM_{10} mass indicate that but for the high wind event this NAAQS violation would not have occurred.

6.3.7.2 Quantitative NEBF

A quantitative NEBF analysis is particularly informative if concentrations on days without events during the same season exceed, or approach, the standard and/or if the contribution of non-event pollution produces concentrations near the applicable NAAQS. An example of a quantitative NEBF analysis will be incorporated in this document as one becomes available.

6.4 Prepare High Wind Action Plan (optional)

A High Wind Action Plan is primarily used to document controls on additional sources that need reasonable controls for future events to be considered not reasonably controllable or preventable. If an air agency discovers (an) uncontrolled source(s) of dust during the course of the event demonstration, the air agency may choose to submit a High Wind Action Plan, either separately or along with the demonstration package. Alternatively, the EPA may identify a source

previously unidentified by the air agency that the EPA considers to be reasonably controllable. In this case, an air agency could submit a High Wind Action Plan following the submission of the demonstration package. A High Wind Action Plan addresses sources that could reasonably be controlled to minimize the occurrence of future events and would generally include the following information:

- Source(s) targeted for controls
- Description of controls
- Oversight/enforcement plan, including on/before event days
- Implementation timeline
- Documentation of effective implementation and enforcement
- The high wind threshold for the collective set of high wind dust sources, including those previously subject to reasonable controls and those that are being proposed for reasonable controls in the High Wind Action Plan (refer to Appendix A3 for determining this threshold).

The EPA has not established a particular format for the High Wind Action Plan but notes that most of the information recommended for an approvable High Wind Action Plan was included in a Natural Events Action Plan (see Section 3.7.2). Therefore, a NEAP may be a useful template. When the High Wind Action Plan is submitted with a demonstration package, the EPA recommends including it as an appendix and referencing it in the nRCP section. As mentioned in Section 3.7.2, air agencies can submit the High Wind Action Plan before, with, or after submittal of a demonstration package.

Appendix A1. Summary of Studies on Windblown Dust Emissions

Windblown dust is often but not always a controllable and preventable form of PM_{10} pollution. To ensure effective implementation of the EER, it is useful to determine the wind speed at which windblown dust no longer becomes reasonably controllable. Agencies may develop a high wind threshold for each area experiencing high wind dust events. Appropriate area-specific thresholds would consider local conditions, sources, and controls and specify a speed above which these controls would be overwhelmed. This approach is consistent with the Natural Events Policy where the EPA recommended that the air agencies define the conditions in which BACM level controls were overwhelmed. If an agency is unable to develop an area-specific wind threshold, the EPA will generally accept a default threshold of 25 mph for areas in the west provided the agencies support this as the level at which they expect stable surfaces (i.e., controlled anthropogenic and undisturbed natural surfaces) to be overwhelmed. Areas with local data supporting of an area-specific high wind threshold should submit this information to the EPA for review and approval.

The default 25 mph high wind threshold is mainly based on extensive windblown dust emissions research performed by the University of Nevada, Las Vegas (UNLV). The Clark County Department of Air Quality and Environmental Management (DAQEM) contracted with the Department of Civil and Environmental Engineering, University of Nevada, Las Vegas (UNLV) to conduct field studies to generate refined wind-blown PM_{10} emissions factors for stable natural, and unstabilized, disturbed surfaces.[64] The latest study was performed in 2004 using a portable wind tunnel at 31 locations in the Las Vegas valley that represented nine different soil groups.[65] All of the test sites were determined to be stable through the same methods as outlined in DAQEM's fugitive dust rules for open areas and vacant lots and thus provide a consistent measure of "stable" conditions.[66] The sites chosen for the wind tunnel tests were determined to be stable "as-is" (i.e. no physical stabilization was performed to alter the site conditions).These same test sites were then intentionally destabilized and subsequently retested using the same wind tunnel approach that had been used on the previously stabilized surfaces. A summary of the 2004 field study results can be seen in Figure ES-1. The 2004 data show that non-linear increases in PM_{10} flux generally begin to occur at sustained 10 meter velocities exceeding 25 mph. Note that the Clark County study found small amounts of entrainment below 25 mph. The small PM_{10} fluxes observed at lower winds speeds could be attributed to aerodynamic entrainment, which occurs primarily when fine particles are lifted directly off the ground and remain elevated. While it is expected that small amounts of aerodynamic entrainment could occur when wind speeds are below 25 mph, these are not expected to result in exceedances in most western areas, particularly the desert areas such as in Clark County.

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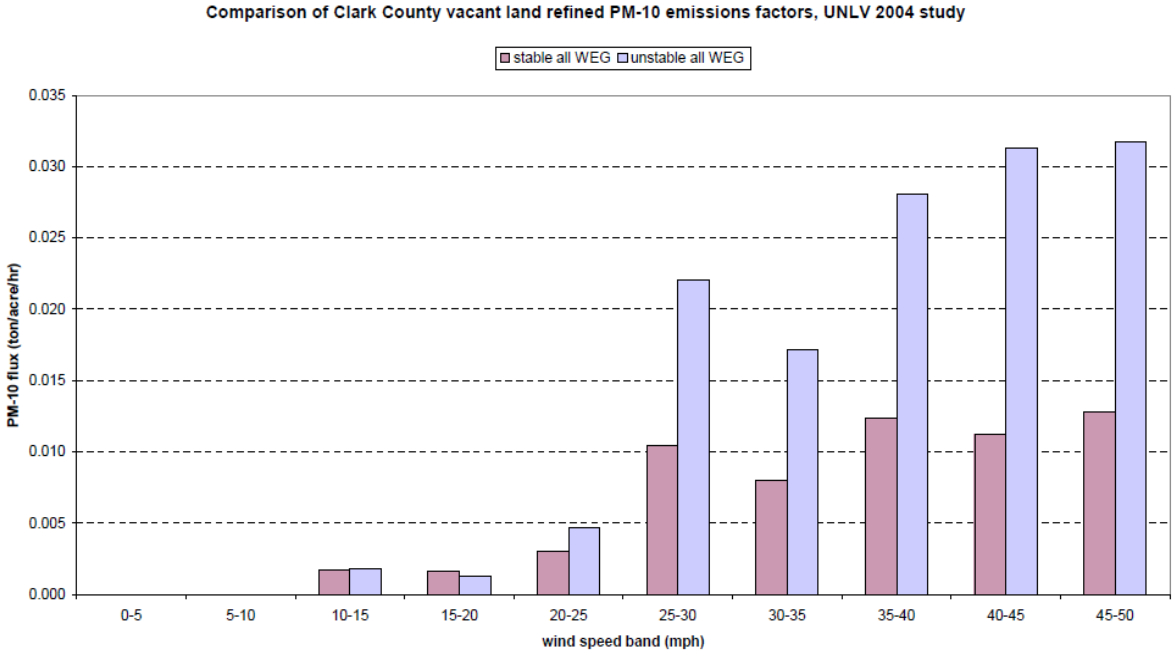
[64] Refined PM_{10} Aeolian Emission Factors for Native Desert and Disturbed Vacant Land Areas. Final Report, June 30, 2006, http://www.clarkcountynv.gov/Depts/daqem/Documents/Planning/SIP/PM10/App_E_-Refined%20Emission%20Factors.pdf.

[65] Sites were characterized in terms of Wind Erodibility Groups (WEGs).

[66] Clark County Department of Air Quality and Environmental Management Air Quality Regulations, Section 90 – Fugitive Dust from Open Areas and Vacant lots, Subsection 90.4. Test Methods, revised 12/17/2002.

Figure ES-1 – Summary of wind-blown geometric mean PM-10 Emissions factors, averaged over all wind erodibility groups. UNLV 2004 wind tunnel field study. Error bars omitted to clarify differences between wind speed bands.

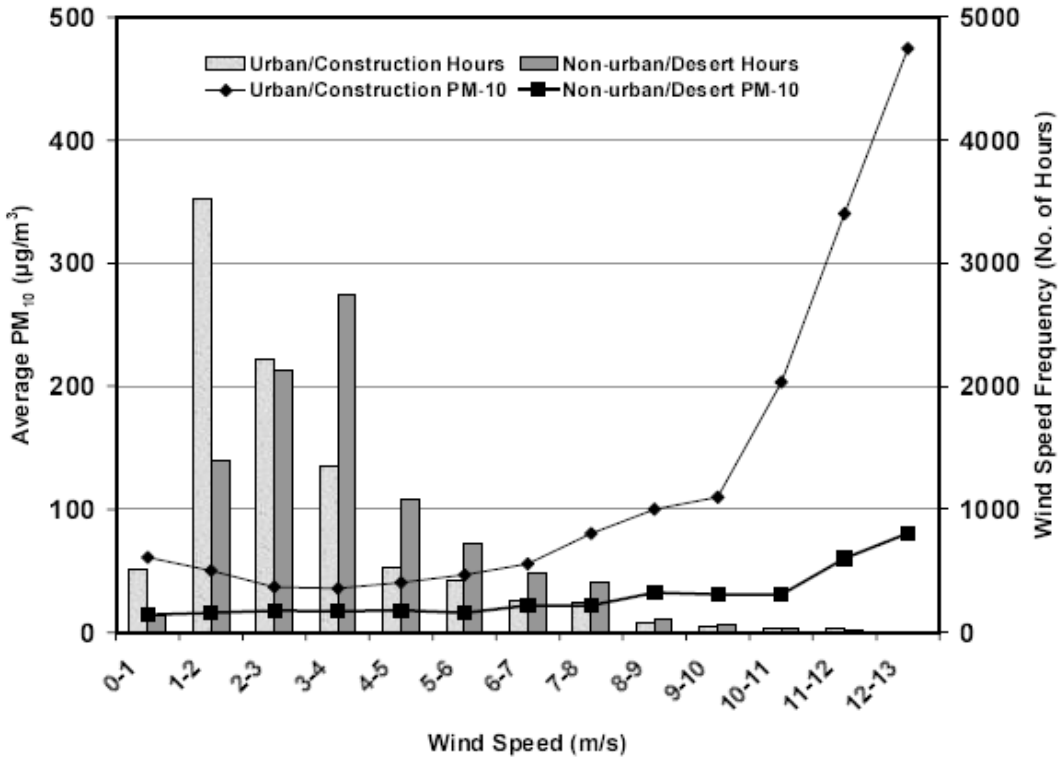


The EPA believes that for Clark County and areas similar to it, these results clearly differentiate emissions from stable and disturbed conditions and provide a reasonable baseline for establishing a high wind threshold for exceptional events purposes.

Furthermore, studies conducted by the Desert Research Institute (DRI) in Clark County, NV have concluded that windblown desert dust contributes to approximately 20% of measured PM_{10} in urban areas and that only desert soils that have been disturbed by anthropogenic activities are large emitters under common high wind conditions.[67] These studies also conclude that windblown PM_{10} from urban/disturbed surfaces are not seen until 10 meter hourly average wind speeds are greater than 7 m/s (16 mph), while nonurban desert show a significant increase in PM_{10} emissions only when hourly average wind speeds are greater than 11 m/s (25 mph). See Figure 3-1 for a graphical representation of these data. The authors note that these results refute the argument that most urban dust derives from natural surfaces.

[67] Watson, J.G. and Chow, J.C. 2000. Reconciling Urban Fugitive Dust Emissions Inventory and Ambient Source Contribution Estimates: Summary of Current Knowledge and Needed Research. *DRI Document No. 6110.4F*.

Figure 3-1.. Average PM_{10} classifed by wind speed from hourly beta attenuation monitor (BAM) measurements at an Urban/Construction site and a Non-Urban/Desert site near Las Vegas, NV during 1995 (Chow and Watson, 1997b; Chow et al., 1999). Wind speeds were measured at 10 m above ground level.



These results are also consistent with results obtained from wind tunnel studies performed throughout the state of Arizona.[68] These studies suggest that windblown dust emissions from scrub desert and dune flat areas occur when wind speeds are greater than 11.3 m/s (25 mph) and 18.31 (41 mph), respectively. The same study revealed that surfaces that had been disturbed by anthropogenic activities began to produce emissions when wind speeds ranged from 5.11 m/s (11 mph) to 8.11 m/s (18 mph). The effect of surface disturbance on threshold wind speeds was further examined for a number of natural desert soils by a number of researchers.[69] The main

[68] Nickling, W.G. and Gillies, J.A. 1989. Emission of Fine Grained Particulates From Desert Soils. In *Paleoclimatology and Paleometeorology: Maodern and Past Patterns of Global Atmospheric Transport*. Leinen, M. and Sarnthein, M., (Eds.) Kluwer Academic Publishers. 133-165.

[69] Gillette, D.A. 1980. Threshold Velocities for Input of Soil Particles into the Air by Desert Soils. *Journal of Geophysical Research*. 85: 5621-5630; Gillette, D.A. 1982. Threshold Friction Velocities and Rupture Moduli for Crusted Desert Soils for the Input of Soil Particles into the Air. *Journal of Geophysical Research*. 87: 9003-9015; Belnap, J. 2007. Wind Erodibility of Soils at Fort Irwin, California (Mojave Desert), USA, Before and After Trampling Disturbance: Implications for Land Management. *Earth Surface Processes and Landforms.* 32: 74-84; Belnap, J. 1998. Vulnerability of Desert Biological Soil Crusts to Wind Erosion: The Influences of Crust Development, Soil Texture, and Disturbance. *Journal of Arid Environments.* 39: 133-142.

conclusion was that disturbance of soils profoundly lowers the threshold friction velocity of desert soils.

In the EPA's weight-of-evidence analysis of high wind dust events, the EPA will generally assume that sustained wind speeds above the applicable high wind threshold (area specific or 25 mph default) are capable of overwhelming reasonable controls on anthropogenic sources or causing emissions from natural undisturbed areas in arid, semi-arid, or seasonally dry regions, such as in Clark County, NV. The EPA will generally further assume that wind speeds below this threshold will entrain more dust emissions per acre or square mile from disturbed anthropogenic sources that have not been reasonably-controlled than from natural surfaces and stabilized disturbed surfaces.

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Appendix A2. Summary of Available Relevant Literature Related to Establishing Area-Specific High Wind Thresholds

Alfaro, S. 2004. Estimation of PM20 Emissions by Wind Erosion: Main Sources of Uncertainties. *Geomorphology*, 59: 63-74.

Alfaro, S. 2001 Modeling Mineral Aerosol Production by Wind Erosion: Emission Intensities and Aerosol Size Distributions in Source Areas. *Journal of Geophysical Research*, 106: NO. D16, 18075-18084.

Benlap, J. and Gillette, D. 1998. Vulnerability of Desert Biological Soil Crusts to Wind Erosion: the Influences of Crust Development, Soil Texture, and Disturbance. *Journal of Arid Environments.* 39: 133-142.

Brazel, A.J. and Nickling, W.G. 1986. The Relationship of Weather Types to Dust Storm Generation in Arizona (1965-1980). *Journal of Climatology*. 6: 255-275.

Brazel, A.J. and Nickling, W.G. 1984. Temporal and Spatial Characteristics of Arizona Dust Storms (1965-1980). *Journal of Climatology.* 4: 645-660.

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Appendix A3. Methods for Establishing Area-Specific High Wind Thresholds

As explained in Appendix A1, the EPA primarily based the 25 mph threshold on extensive windblown dust emissions research performed by the University of Nevada, Las Vegas (UNLV). During UNLV's studies, researchers used a wind tunnel to quantify emissions from undisturbed areas meeting the definition of "stable" surfaces within Clark County's (Nevada) BACM level fugitive dust regulations and mechanically disturbed open areas. The research performed by UNLV is one of the few field studies that clearly relate BACM level control of windblown dust from open areas and PM_{10} emissions. The EPA believes that the study results clearly differentiate emissions from these two types of conditions and provide a reasonable baseline for establishing a high wind threshold that generally can be used for exceptional events purposes for such areas.

While the UNLV study stands out as the most definitive source of information concerning wind speeds capable of overwhelming BACM for open area windblown dust sources and/or causing emissions from natural undisturbed areas, the EPA believes that other sources of information can be used to develop an area-specific high wind threshold.

First, the EPA encourages state, local, and tribal agencies to evaluate the existing windblown dust literature identified in Appendix A2 when developing an area-specific threshold and determine if any of the preexisting information is applicable to their area.

Secondly, while full-scale windblown dust emissions field studies are not always feasible, agencies may deploy temporary monitoring stations or use existing monitoring data to evaluate the effects of wind speed on different source categories. For example, as explained in Appendix A1, DRI used existing monitoring sites in Clark County to evaluate the relationship between urban/construction and non-urban/desert conditions.[70] While this data was independent of the detailed wind tunnel emissions studies performed by UNLV in the same area, the results were similar: nonurban desert show a significant increase in PM_{10} emissions only when wind speeds are greater than 11 m/s (25 mph). The EPA believes that this is valid method for determining an area-specific threshold, but the use of existing monitoring sites (or temporary sites) to establish a wind speed/PM relationship for different source categories should be carefully evaluated for representativeness. For example, sites used to evaluate emissions from natural undisturbed desert areas should not be located downwind of any potential anthropogenic sources, as the influence from such sources would lower the expected high wind threshold. Also, simply correlating PM to wind speed without assessing representativeness of the monitoring site locations does not provide useful information for exceptional events purposes.

Finally, area and/or source specific research may be performed, if needed. Specific information on the techniques used to assess windblown dust emissions can be found within the literature listed in Appendix A2.

[70] Watson, J.G. and Chow, J.C. 2000. Reconciling Urban Fugitive Dust Emissions Inventory and Ambient Source Contribution Estimates: Summary of Current Knowledge and Needed Research. *DRI Document No. 6110.4F*.

Regardless of the method used, an area-specific high wind threshold should be consistent with the requirements of the EER, specifically nRCP, and representative of wind speeds capable of overwhelming reasonable controls or causing emissions from natural undisturbed areas. The EPA generally does not intend to approve the use of an area-specific threshold if these basic principles are not upheld. The EPA encourages the state, local, and tribal agencies responsible for developing an area-specific threshold to consult with their respective regional office during the development process.

Appendix B1. Checklist for High Wind Exceptional Events Demonstration Submission

Completeness Checklist for High Wind Dust Exceptional Events.

Instructions: This checklist is provided as a guideline to help submitting agencies identify the types of information and analyses to include in an exceptional events demonstration package. In some cases (e.g., wind speeds above the identified high wind threshold), agencies will not need to include all parameters under each criterion. The EPA encourages agencies to include a completed checklist with their submitted exceptional events demonstration package. Note that completion of this checklist does not indicate that the event in question is concurrable nor does it guarantee a "complete" package. The EPA may ask for clarification or additional information to support a specific criterion.

Site Name/AQS ID: _____

Pollutant: _____

Date(s): _____

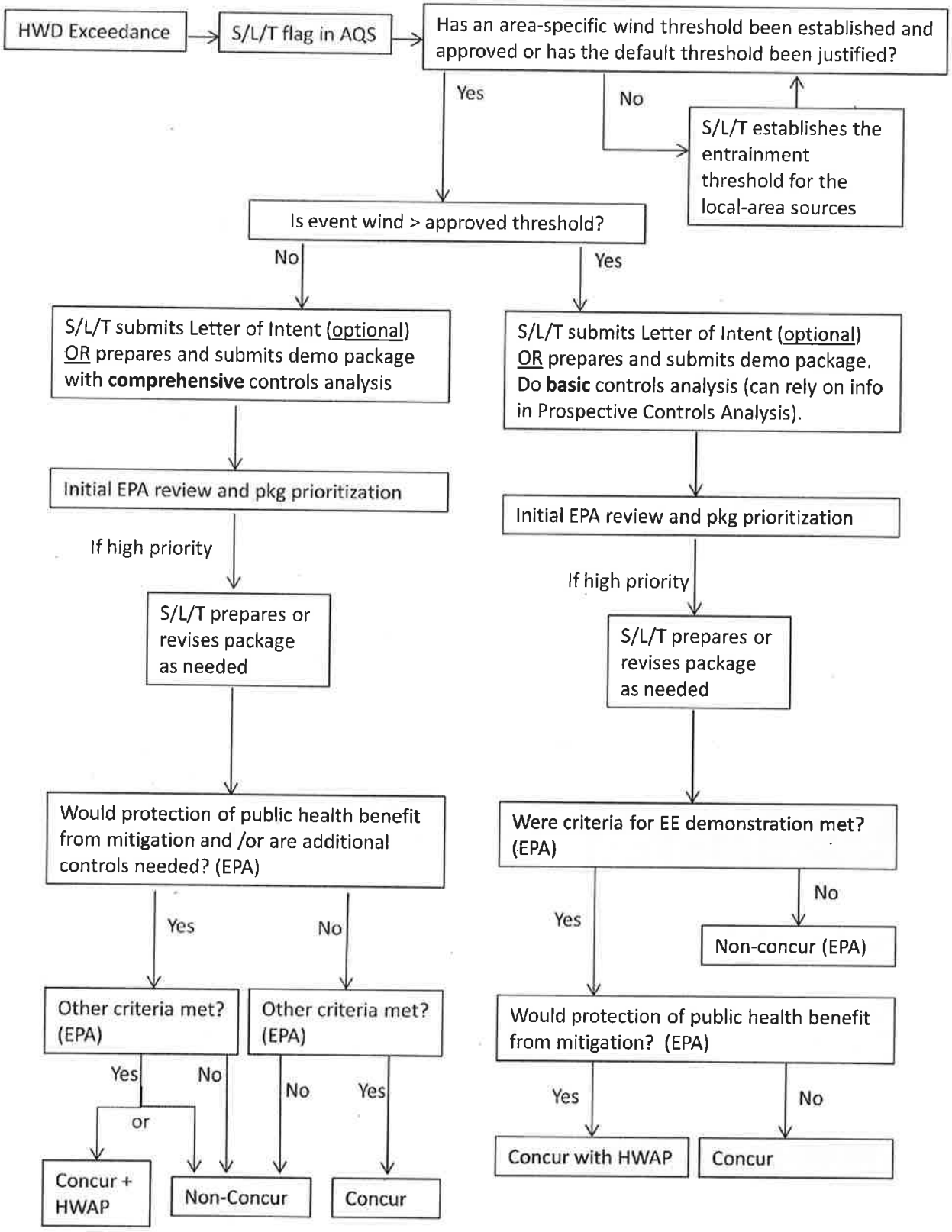
Procedural Criteria		EPA Use
Did an exceedance of the NAAQS occur?	[Y/N]	
Were data flagged by July 1st of following year (or by another appropriate deadline associated with a new or revised NAAQS)?	[Y/N]	
Was there a 30-day public comment period? Is documentation for the comment period included?	[Y/N] [Y/N]	
If public comments were received, are the public comments and responses included?	[Y/N]	
Was the package submitted within 3 years of the end of the quarter in which the event occurred and 12 months prior to the date that any regulatory decision must be made by the EPA (or by another appropriate deadline associated with a new or revised NAAQS)?	[Y/N]	

(over)

Evidence	**Information Included**	**Page(s)**	EPA Use
Conceptual Model			
-description of weather phenomena resulting in high wind	[Y/N]	[page #]	
-description of what sources were likely entrained by the high wind	[Y/N]	[page #]	
-explanation of the path by which the dust reached the monitor(s)	[Y/N]	[page #]	
-map showing relevant monitors, topography, other relevant geographic features	[Y/N]	[page #]	
-description of how the event day differs from non-event days	[Y/N]	[page #]	
-description of concentration and wind patterns for the exceeding monitor(s) and surrounding area	[Y/N]	[page #]	
Wind Statistics			
-max sustained wind (Hourly avg)	[X mph]	[page #]	
- max sustained wind (1-5 min avg)	[X mph]	[page #]	
-max gust (1 min avg)	[X mph]	[page #]	
-wind trajectories included?	[Y/N]	[page #]	
-other:	[list other wind analyses]	[page #]	
nRCP			
-Area-specific high wind threshold (default = 25mph)	[25 mph]	[page #]	
-sources contributing to event identified, including anthropogenic vs. natural?	[Y/N]	[page #]	
-controls identified for anthropogenic sources? (note: level of control analysis depends on wind speed)	[Y/N]	[page #]	
-are natural sources not reasonably controllable?	[Y/N]	[page #]	
-was a High Wind Action Plan included?	[Y/N]	[page #]	
HF			
-were time-series analyses for concentration and wind data included?	[Y/N]	[page #]	
-annual comparison to historical data (wind and concentrations)	[%ile]	[page #]	
-seasonal comparison to historical data (wind and concentrations)	[%ile]	[page #]	
CCR (=> AAQ & / Natural Event)			
-were spatial analyses included, establishing a	[Y/N]	[page #]	

spatial relationship between the event, sources, transport of emissions, and recorded concentrations?			
-were temporal analyses included, establishing a temporal relationship between the high wind and elevated PM concentrations at the monitor?	[Y/N]	[page #]	
-comparison of event-affected day(s) to specific non-event days?	[Y/N]	[page #]	
-was the dust shown to be from the sources discussed in the nRCP section?	[Y/N]	[page #]	
-were alternative hypotheses discussed?	[Y/N]	[page #]	
-was a causal (not just correlational) relationship established?	[Y/N]	[page #]	
NEBF			
-was a "but for" analysis included?	[Y/N]	[page #]	

Appendix B2. Flowchart of Potential Review Process



Appendix C. Sample Letter of Intent

September 16, 2011

Matthew Lakin
U. S. Environmental Protection Agency, Region 9
75 Hawthorne Street
Mail Code: AIR-7
San Francisco, CA 94105

SUBJECT: Exceptional Event Documentation
District: San Luis Obispo APCD
Event Type: PM2.5 - Wildfire/Smoke Impact
Event Date: August 14, 2009

Site	AQS No	POC	Pollutant/Monitor	Concentration
Atascadero	060798001	3	PM2.5 FEM BAM	51.6 $\mu g/m^3$

Dear Mr. Lakin:

The San Luis Obispo County Air Pollution Control District (APCD) submitted Exceptional Event Documentation on July 22, 2010 to the U. S. Environmental Protection Agency and the California Air Resources Board (CARB) that addresses wildfire emission impacts on PM2.5 concentrations at the Atascadero monitoring station on August 14, 2009. This data has been appropriately flagged in the AQS data base. The EPA was notified of the intent to submit this documentation via a CARB email on June 21, 2010. CARB provided comments to the APCD and the APCD revised and resubmitted the report to CARB on May 25, 2011. On June 15, 2011, CARB provided additional comments to the APCD illustrating how the documentation should be specifically modified to ensure acceptance by EPA.

Before the APCD proceeds with further modifications to the documentation based on CARB comments, the APCD respectfully requests that EPA provide feedback as to whether EPA will act on this Exceptional Event Documentation package. In addition, please indicate whether the 2009 data year will be used for future San Luis Obispo County PM2.5 attainment demonstrations.

The Exceptional Event Documentation dated July 22, 2010 is located on the APCD website:

http://www.slocleanair.org/air/pdf/2010/ExceptionalEventAug_14_2009_AtascaderoPM2.pdf

The revised working draft dated May 25, 2011 that was submitted to CARB for comment is located on a not-public location on the APCD website:

http://www.slocleanair.org/air/epa.php

If you have need for additional materials, please contact me at (805) 781 5743 or garcemont@co.clo.ca.us.

Sincerely,

Gary Arcemont
Air Quality Specialist

GJA/arr

cc: Karen Magliano, ARB