

**Note to Users:** The EPA uses this document as a template when preparing our documentation to support a decision for a wildfire event that caused an O<sub>3</sub> exceedance. This technical support document (TSD) template clearly lays out the Exceptional Events Rule criteria and then overlays these criteria with the guidance elements that appear in the “Final Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations” (finalized in September 2016 concurrent with the revisions to the Exceptional Events Rule). We are providing this document as we believe it may also be helpful to air agencies as they prepare demonstrations for wildfire/O<sub>3</sub> events because it clearly identifies the analyses and content needed in a wildfire/O<sub>3</sub> demonstration.

**ENCLOSURE: TECHNICAL SUPPORT DOCUMENT FOR EPA CONCURRENCE ON [O<sub>3</sub>]  
EXCEEDANCES MEASURED IN [LOCATION (CITY/COUNTY) OF MEASUREMENT]  
ON [MONTH, DAY, YEAR] AS EXCEPTIONAL EVENTS**

[Include a very brief overview of event...]

In [timeframe of event occurrence, e.g., the spring of 2016], [Agency] identified that [wildfire(s) in (description of area)] may have caused ozone (O<sub>3</sub>) exceedances at [number of monitoring sites] O<sub>3</sub> monitoring sites operated by [Agency] on [Month, Day(s), Year of Event]. [Include language from demonstration that describes the event – should include wildfire names/locations] Under the Exceptional Events Rule, air agencies can request the exclusion of event-influenced data, and EPA can agree to exclude these data, from the data set used for certain regulatory decisions. The remainder of this document summarizes the Exceptional Events Rule requirements, the event and EPA’s review process.

**EXCEPTIONAL EVENTS RULE REQUIREMENTS**

EPA promulgated the Exceptional Events Rule in 2007, pursuant to the 2005 amendment of Clean Air Act (CAA) section 319. In 2016, EPA finalized revisions to the Exceptional Events Rule. The 2007 Exceptional Events Rule and 2016 Exceptional Events Rule revisions added sections 40 CFR §50.1(j)-(r), 50.14, and 51.930 to title 40 of the Code of Federal Regulations (CFR). These sections contain definitions, criteria for EPA approval, procedural requirements, and requirements for air agency demonstrations. EPA reviews the information and analyses in the air agency’s demonstration package using a weight of evidence approach and decides to concur or not concur. The demonstration must satisfy all of the Exceptional Events Rule criteria for EPA to concur with excluding the air quality data from regulatory decisions.

Under 40 CFR §50.14(c)(3)(iv), the air agency demonstration to justify data exclusion must include:

- A. “A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s);”

- B. “A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation;”
- C. “Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times” to support requirement (B) above;
- D. “A demonstration that the event was both not reasonably controllable and not reasonably preventable;” and
- E. “A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.”<sup>1</sup>

In addition, the air agency must meet several procedural requirements, including:

1. submission of an Initial Notification of Potential Exceptional Event and flagging of the affected data in EPA's Air Quality System (AQS) as described in 40 CFR §50.14(c)(2)(i),
2. completion and documentation of the public comment process described in 40 CFR §50.14(c)(3)(v), and
3. implementation of any applicable mitigation requirements as described in 40 CFR §51.930.

For data influenced by exceptional events to be used in initial area designations, air agencies must also meet the initial notification and demonstration submission deadlines specified in Table 2 to 40 CFR §50.14. We include below a summary of the Exceptional Events Rule criteria, including those identified in 40 CFR §50.14(c)(3)(iv).

### **Regulatory Significance**

The 2016 Exceptional Events Rule includes regulatory language that applies the provisions of CAA section 319 to a specific set of regulatory actions. As identified in 40 CFR §50.14(a)(1)(i), these regulatory actions include initial area designations and redesignations; area classifications; attainment determinations (including clean data determinations); attainment date extensions; findings of State Implementation Plan (SIP) inadequacy leading to a SIP call; and other actions on a case-by-case basis as determined by the Administrator. Air agencies and EPA should discuss the regulatory significance of an exceptional events demonstration during the Initial Notification of Potential Exceptional Event prior to the air agency submitting a demonstration for EPA's review.

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<sup>1</sup> A natural event is further described in 40 CFR §50.1(k) as “an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.”

## **Narrative Conceptual Model**

The 2016 Exceptional Events Rule directs air agencies to submit, as part of the demonstration, a narrative conceptual model of the event that describes and summarizes the event in question and provides context for analyzing the required statutory and regulatory technical criteria. Air agencies may support the narrative conceptual model with summary tables or maps. For wildfire O<sub>3</sub> events, EPA recommends that the narrative conceptual model also discuss the interaction of emissions, meteorology, and chemistry of event and non-event O<sub>3</sub> formation in the area, and, under 40 CFR §50.14(a)(1)(i), must describe the regulatory significance of the proposed data exclusion.

## **Clear Causal Relationship and Supporting Analyses**

EPA considers a variety of evidence when evaluating whether there is a clear causal relationship between a specific event and the monitored exceedance or violation. For wildfire O<sub>3</sub> events, air agencies should compare the O<sub>3</sub> data requested for exclusion with seasonal and annual historical concentrations at the air quality monitor to establish a clear causal relationship between the event and monitored data. In addition to providing this information on the historical context for the event-influenced data, air agencies should further support the clear causal relationship criterion by demonstrating that the wildfire's emissions were transported to the monitor, that the emissions from the wildfire influenced the monitored concentrations, and, in some cases, air agencies may need to provide evidence of the contribution of the wildfire's emissions to the monitored O<sub>3</sub> exceedance or violation.

For wildfire O<sub>3</sub> events, EPA has published a guidance document that provides three different tiers of analyses that apply to the "clear causal relationship" criterion within an air agency's exceptional events demonstration. This tiered approach recognizes that some wildfire events may be more clear and/or extreme and, therefore, require relatively less evidence to satisfy the rule requirements. If a wildfire/O<sub>3</sub> event satisfies the key factors for either Tier 1 or Tier 2 clear causal analyses, then those analyses are the only analyses required to support the clear causal relationship criterion within an air agency's demonstration for that particular event. Other wildfire/O<sub>3</sub> events will be considered based on Tier 3 analyses.

- **Tier 1:** Wildfires that clearly influence monitored O<sub>3</sub> exceedances or violations when they occur in an area that typically experiences lower O<sub>3</sub> concentrations.
  - *Key Factor:* seasonality and/or distinctive level of the monitored O<sub>3</sub> concentration. The event-related exceedance occurs during a time of year that typically has no exceedances, or is clearly distinguishable (*e.g.*, 5-10 ppb higher) from non-event exceedances.
  - In these situations, O<sub>3</sub> impacts should be accompanied by clear evidence that the wildfire's emissions were transported to the location of the monitor.
- **Tier 2:** The wildfire event's O<sub>3</sub> influences are higher than non-event related concentrations, and fire emissions compared to the fire's distance from the affected monitor indicate a clear causal relationship.

- *Key Factor 1*: fire emissions and distance of fire(s) to affected monitoring site location(s). Calculated fire emissions of NO<sub>x</sub> and reactive-VOC in tons per day (Q) divided by the distance from the fire to the monitoring site (D) should be equal to or greater than 100 tons per day/kilometers ( $Q/D \geq 100$  tpd/km). The guidance document provides additional information on the calculation of Q/D.
  - *Key Factor 2*: comparison of the event-related O<sub>3</sub> concentration with non-event related high O<sub>3</sub> concentrations. The exceedance due to the exceptional event:
    - is in the 99<sup>th</sup> or higher percentile of the 5-year distribution of O<sub>3</sub> monitoring data, OR
    - is one of the four highest O<sub>3</sub> concentrations within 1 year (among those concentrations that have not already been excluded under the Exceptional Events Rule, if any).
  - In addition to the analysis required for Tier 1, the air agency should supply additional information to support the weight of evidence that emissions from the wildfire affected the monitored O<sub>3</sub> concentration.
- **Tier 3**: The wildfire does not fall into the specific scenarios (*i.e.*, does not meet the key factors) that qualify for Tier 1 or Tier 2, but the clear causal relationship criterion can still be satisfied by a weight of evidence showing.
    - In addition to the analyses required for Tier 1 and Tier 2, an air agency may further support the clear causal relationship with additional evidence that the fire emissions caused the O<sub>3</sub> exceedance.

### **Not Reasonably Controllable or Preventable**

The Exceptional Events Rule requires that air agencies establish that the event be both not reasonably controllable and not reasonably preventable at the time the event occurred. This requirement applies to both natural events and events caused by human activities; however, it is presumed that wildfires on wildland will satisfy both factors of the “not reasonably controllable or preventable” element unless evidence in the record clearly demonstrates otherwise.<sup>2</sup>

### **Natural Event or Event Caused by Human Activity That is Unlikely to Recur**

According to the CAA and the Exceptional Events Rule, an exceptional event must be “an event caused by human activity that is unlikely to recur at a particular location *or* a natural event” (emphasis added). The 2016 Exceptional Events Rule includes in the definition of wildfire that “[a] wildfire that predominantly occurs on wildland is a natural event.” Once an agency provides evidence that a wildfire on wildland occurred and demonstrates that there is a clear causal relationship between the measurement under consideration and the event, EPA expects minimal documentation to satisfy the “human activity that is unlikely to recur at a particular location or a natural event” element. EPA will address wildfires on other lands on a case-by-case basis.

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<sup>2</sup> A wildfire is defined in 40 CFR §50.1(n) as “any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event.” Wildland is defined in 40 CFR §50.1(o) as “an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.”

## EPA REVIEW OF EXCEPTIONAL EVENTS DEMONSTRATION

On [Month DD, Year], [Agency] submitted an Initial Notification of Potential Exceptional Event for [X (number)] exceedances of the [Affected NAAQS (2015 8-hour O<sub>3</sub> standard)] [and 1 exceedance of the 24-hour PM<sub>2.5</sub> standard] that occurred at [monitoring stations] within [County, State (or other appropriate bounds)] on [Month, Day(s), Year of Event]. On [Month DD, Year], [Agency] submitted an exceptional events demonstration for [X (number)] exceedances of the [Affected NAAQS (2015 8-hour O<sub>3</sub> standard)] that occurred at [monitoring stations] within [County, State (or other appropriate bounds)] on [Month, Day(s), Year of Event].

### Regulatory Significance

EPA determined that the exclusion of [some of the exceedances of the O<sub>3</sub> standard] may have a regulatory significance for [indicate regulatory decision to be made (initial area designations for the 2015 8-hour O<sub>3</sub> standard)], and worked with [Agency] to identify the relevant exceedances and monitoring sites affected. Table 1 summarizes these exceedances.

Table 1: EPA [8-hour O<sub>3</sub>] Exceedance Summary

Exceedance Date	Monitor/Site Name	AQS ID	[8-hour Avg. (ppm)]
[Month, Day, Year]	[Monitor Site Name]	[XX-XXX-XXXX]	[0.0XX]

### Narrative Conceptual Model

[Agency's] demonstration provided a narrative conceptual model to describe how emissions from [indicate general location of subject fire(s)] caused O<sub>3</sub> exceedances at [the (name) monitoring station] and included [provide additional information about the narrative conceptual model and corresponding analyses as needed. Requirements and suggested documentation for inclusion in the conceptual model are provided in the wildfire O<sub>3</sub> guidance.]

Table 2: Documentation of Narrative Conceptual Model

Exceedance Date	Demonstration Citation	Quality of Evidence	Criterion Met?
[Month, Day, Year]	[Section X: p XX-XX]	Sufficient	[Yes/No]

### Clear Causal Relationship and Supporting Analyses

[Agency's] demonstration included [Description of demonstration's support for clear causal relationship requirements. For wildfire O<sub>3</sub> events, this discussion should include (according to the wildfire O<sub>3</sub> guidance):

- Comparison of the fire-influenced exceedance with historical concentrations
- Comparison of event data to the key factors for Tier 1 and/or Tier 2 (required for all tiers; key factor analysis provides context even for demonstrations that do not fully meet key factors and are subject to a lower tier)
- Evidence of transport of fire emissions from the fire to the monitor
- Tiers 2 and 3: Evidence that the fire emissions affected the monitor
- Tier 3: Additional evidence that the fire emissions caused the O<sub>3</sub> exceedance

*This section should explicitly address all of these requirements, as applicable.]*

[Agency] stated that the evidence presented demonstrates “[include conclusion statement from clear causal relationship analysis in the demonstration].”

The analysis included in the demonstration, specifically, [list the analysis included that EPA believes are compelling to the clear causal relationship], sufficiently demonstrates a clear causal relationship between the emissions generated by [XYZ wildfires] and the exceedances measured at [XYZ monitoring sites].

Table 3: Documentation of Clear Causal Relationship and the Supporting Analyses

Exceedance Date	Demonstration Citation	Quality of Evidence	Criterion Met?
[Month, Day, Year]	[Section X: p XX-XX]	Sufficient	[Yes/No]

**Not Reasonably Controllable or Preventable**

The Exceptional Events Rule presumes that wildfire events on wildland are not reasonably controllable or preventable [40 CFR §50.14(b)(4)]. [Agency’s] demonstration provided evidence that the wildfire event meets definition of wildfire. Specifically, [Agency] states that “[Include statement from demonstration w.r.t. wildfire on wildland].” Therefore, the documentation provided sufficiently demonstrates that the event was not reasonably controllable and not reasonably preventable.

Table 4: Documentation of not Reasonably Controllable or Preventable

Exceedance Date	Demonstration Citation	Quality of Evidence	Criterion Met?
[Month, Day, Year]	[Section X: p XX-XX]	Sufficient	[Yes/No]

**Natural Event or Event Caused by Human Activity That is Unlikely to Recur**

The definition of “wildfire” at 40 CFR §50.1(n) states, “A wildfire that predominantly occurs on wildland is a natural event.” [Agency’s] demonstration includes documentation that the event meets the definition of a wildfire and occurred predominantly on wildland. [Agency] has therefore shown that the event was a natural event.

Table 5: Documentation of Natural Event

Exceedance Date	Demonstration Citation	Quality of Evidence	Criterion Met?
[Month, Day, Year]	[Section X: p XX-XX]	Sufficient	[Yes/No]

**Schedule and Procedural Requirements**

In addition to technical demonstration requirements, 40 CFR §50.14(c) and 40 CFR §51.930 specify schedule and procedural requirements an air agency must follow to request data exclusion. Table 6 outlines EPA’s evaluation of these requirements. [Include any specific details regarding how these details were met, if needed.]

Table 6: Schedules and Procedural Criteria

	Reference	Demonstration Citation	Criterion Met?
Did the agency provide prompt public notification of the event?	40 CFR §50.14 (c)(1)(i)	[Section X: p X]	[Yes/No/NA]
Did the agency submit an Initial Notification of Potential Exceptional Event and flag the affected data in EPA's Air Quality System (AQS)?	40 CFR §50.14 (c)(2)(i)	[Section X: p X]	[Yes/No/NA]
Did the initial notification and demonstration submittals meet the deadlines for data influenced by exceptional events for use in initial area designations, if applicable? Or the deadlines established by EPA during the Initial Notification of Potential Exceptional Events process, if applicable?	40 CFR §50.14 Table 2 40 CFR §50.14 (c)(2)(i)(B)	[Month, Day, Year of Letter]	[Yes/No/NA]
Was the public comment process followed and documented? <ul style="list-style-type: none"> <li>• Did the agency document that the comment period was open for a minimum of 30 days?</li> <li>• Did the agency submit to EPA any public comments received?</li> <li>• Did the state address comments disputing or contradicting factual evidence provided in the demonstration?</li> </ul>	40 CFR §50.14 (c)(3)(v)	[Section X: p.X]	[Yes/No/NA]
Has the agency met requirements regarding submission of a mitigation plan, if applicable?	40 CFR §51.930(b)	[NA]	[Yes/No/NA]

**CONCLUSION**

EPA has reviewed the documentation provided by [Agency] to support claims that smoke from wildfires in [location] caused exceedances of the [Affected NAAQS (2015 8-hour O<sub>3</sub> standard)] at the [monitoring sites] on [Month, Day, Year]. EPA has determined that the flagged exceedances at [this/these monitoring site(s)] on [this/these day(s)] satisfy the exceptional event criteria: the event was a natural event, which affected air quality in such a way that there exists a clear causal relationship between the event and the monitored exceedance, and was not reasonably controllable or preventable. EPA has also determined that the [Agency] has satisfied the procedural requirements for data exclusion.