# Interim Exceptional Events Rule Frequently Asked Questions

**United States Environmental Protection Agency**

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**Note:** This May 14, 2013, document replaces the original document posted on May 13, 2013, to include the inadvertent omission of footnote 16 on page 28. There are no additional changes and document pagination is the same in both versions of this document.

# ATTACHMENT 1

## Interim Exceptional Events Rule Frequently Asked Questions

The Exceptional Events Rule of 2007[1] superseded the EPA's previous Exceptional Events guidance and policy documents and created a regulatory process codified at 40 CFR parts 50 and 51 (50.1, 50.14 and 51.930). The Exceptional Events Rule (EER) recognizes that each potentially eligible event can have different or unique characteristics, and thus, necessitates a case-by-case demonstration and evaluation. Therefore, the EER adopts a "weight-of-evidence" approach for reviewing each demonstration to justify excluding data affected by an exceptional event. The EPA acknowledges that extreme[2] exceptional events may justify more limited demonstration packages.

Air agencies and other stakeholders have raised technical questions and issues related to implementation since the EPA promulgated the EER. This Question and Answer (Q&A) document is intended to respond to some of these frequently asked questions and to provide guidance and clarification to air agencies[3] implementing the EER. 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 exceptional event implementation guidance is to establish clear expectations to enable affected air 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 under the weight-of-evidence approach. The EPA anticipates that the resources needed to prepare (and review) packages will decrease as we continue to identify ways to streamline the process and continue to build our database of example demonstrations and analyses. In addition, as noted above, the EPA acknowledges that extreme exceptional events may justify more limited demonstration packages.

For organizational ease, this document has been divided into the following topical sections:

A. Historical Fluctuations
B. "But For" Test
C. Exceptional Event Data Flagging Schedules
D. General AQS Procedures
E. General Exceptional Events Rule Applicability and Implementation Issues

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[1] "Treatment of Data Influenced by Exceptional Events; Final Rule," 72 FR 13563, March 22, 2007.
[2] Extreme exceptional events may justify a more limited demonstration package. Whether a particular event should be considered "extreme" for this purpose depends on the type and severity of the event, pollutant concentration, spatial extent, temporal extent, and proximity of the event to the violating monitor. Several meteorological phenomena that could be considered extreme events include hurricanes, tornadoes, haboobs, and catastrophic volcanic eruptions. The EPA addresses "extreme" high wind dust events in Question 17a in this document.
[3] References to "air agencies" are meant to include state, local, and tribal air agencies responsible for implementing the EER.

F. Exceptional Event Data Flagging for Air Quality Concentrations that Could Contribute to an Exceedance or Violation of the National Ambient Air Quality Standards

Each section contains related questions. Readers of this document can find additional information at the EPA's Exceptional Events website located at http://www.epa.gov/ttn/analysis/exevents.htm. The EPA's interim guidance documents and the exceptional events website present examples to illustrate specific points. The example analyses and level of rigor are not necessarily needed for all demonstrations.

**Disclaimer**

The Exceptional Events Rule is the source of the regulatory requirements for exceptional events and exceptional event demonstrations. This interim Q&A 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. Note: If and when the EPA takes a regulatory action that hinges on a decision to exclude data under the Exceptional Events Rule, the EPA will consider and appropriately respond to any public comments on any aspect of a supporting exceptional events demonstration submittal.

## A. Historical Fluctuations

> *40 CFR 50.14(c)(3)(iv): "The demonstration to justify data exclusion shall provide evidence that:*
> * * *
> *(C) The event is associated with a measured concentration in excess of normal historical fluctuations, including background;*

1. **Question:** Is the Exceptional Events Rule demonstration requirement to provide evidence to support "a measured concentration in excess of normal historical fluctuations, including background" a test that can be "passed" or "failed" based on the outcome of the statistical comparison? For example, must the concentration affected by an event exceed a specific percentile rank in the historical data?

   **Answer:** The "historical fluctuations" criterion is a test, but there is no specific percentile rank that the EPA will use to determine whether the test has been passed. The EPA will use a weight-of-evidence approach to review each demonstration on a case-by-case basis. The air agency's role in satisfying this element is to provide appropriate analyses and statistics and conclude that the provided data show that the event was in excess of normal historical fluctuations. The EPA will review the information provided by the air agency. "Normal historical fluctuations" will generally be defined by those days without events for the previous years. The EPA acknowledges that natural 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.

   The submittal of data showing how the event concentration compared with historical concentrations will help the EPA determine whether the air agency has satisfied the "clear causal relationship," "but for," and "affects air quality" criteria. Air agencies need to satisfy these EER criteria, as well as "not reasonably controllable or preventable," for the EPA to concur on an exceptional event claim. The EPA anticipates that less conclusive historical fluctuation comparisons will likely indicate less conclusive "clear causal relationship" and/or "but for" relationships. However, a demonstration without a historical fluctuations comparison would prevent the EPA from being able to approve exclusion of the data in question.

   The EPA recommends that each "historical fluctuation" demonstration submittal contain a minimum set of statistical analyses described in more detail in Questions 2 and 3. The EPA generally will consider submission of the identified statistical analyses to have met the requirement to "provide evidence."

   It is important to note, however, that there is no outcome of the "historical fluctuation" statistical comparison that, by itself, can guarantee successful demonstration of the clear causal relationship and "but for" elements. The EPA will consider in its weight-of-evidence approach the comparison of the concentrations during event(s) in question with historical concentration data. For example, a uniquely high concentration in an area (and season) with no previous exceedances, with a clear causal connection, and with no

evidence of any other plausible explanation would be a case in which the weight-of-evidence would generally indicate that the "but for" criterion has been demonstrated. In contrast, if the event-affected concentration does not stand out much from normally occurring exceedance concentrations for the same place and season, the statistical comparison generally will not by itself provide much support for "but for" in the weight-of-evidence consideration.

2. **Question:** What evidence does the EPA want included in the demonstration as part of a comparison of a measured concentration with normal historical fluctuations, including background?

   **Answer:** The EPA would prefer an analysis showing how the observed concentration compares to the distribution of historical concentrations. To aid the EPA's review, reduce requests for additional information, and facilitate the EPA's understanding of the air agency's position, a submitting air agency can consider providing some of the following types of statistics, graphics, and explanatory text:

   - Comparison of concentrations on the claimed event day with past historical data (see Question 3 for additional detail). The historical comparisons can be made on an annual and/or seasonal basis, depending on which is more appropriate. For example, if PM or ozone data at the location show clear seasonality (i.e., exceedances are nonexistent or extremely rare in some seasons but not others, or concentrations vary according to season due to meteorological conditions), discussing that information in the demonstration is likely appropriate. In contrast, if exceedances are likely throughout the year, analysis of annual data may be more appropriate. For seasonal comparisons, the EPA recommends using all available seasonal data from 3-5 years (or more, if available). The analysis should discuss the seasonal nature of pollution for the location being evaluated. Depending on the quantity of data, it may be appropriate to present monthly maximums; however, generally it is not appropriate to present monthly-averaged daily data or any other average of the daily data as this masks high values. Regardless of whether seasonal or annual data are presented, data are most helpful when provided in the form relevant to the standard that is being considered for data exclusion (see Question 30). Specific examples of analyses of annual and seasonal data, as well as analyses of historical speciated $PM_{2.5}$ fluctuations and spatial distribution fluctuations are included in the presentation located at http://www.epa.gov/ttn/analysis/docs/IdeasforShowingEEEvidence.ppt. Examples of graphics are also included in the response to Question 3.

   Additionally, it may be useful for the comparison of concentrations on the claimed event day with past historical data to label appropriate data points as being associated with concurred exceptional events, suspected exceptional events, or other unusual occurrences. As additional evidence to use in interpreting the data, it may also be useful to include comparisons omitting such points. The intent of these comparisons is to present a time series of concentration data for the event area, thereby fully and accurately portraying the historical context for the claimed event day.

- Comparison of concentrations on the claimed event day with a narrower set of similar days: Similar days could include neighboring days (*e.g.,* a time series of two weeks) and/or other days with similar meteorological conditions (possibly from other years). This type of comparison could demonstrate that the event caused higher concentrations than would be expected for given meteorological and/or local emissions conditions.

- Percentile rank of concentration relative to annual data. The percentile rank of the event-day concentration should be provided for the event day relative to all measurement days over the previous 3-5 years. To ensure statistical robustness, the EPA generally recommends that submitting agencies include a minimum of 300 data points in this calculation. The daily statistic (e.g., 24-hour average, maximum 8-hour average, or maximum 1-hour) should be appropriate for the form of the standard being considered for data exclusion (see Question 30).

- Percentile rank of concentration relative to seasonal data. The percentile rank of the event-day 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 3-5 years. It is generally appropriate to use the same time horizon as used for the percentile rank calculated relative to annual data.

*(Note: The use of percentile ranks is illustrative and should not be seen as a bright line to be passed or failed when comparing observed concentrations with historical values.)*

3. **Question:** How will the EPA consider the submitted "historical fluctuations" evidence when assessing whether the "but for" and "clear causal relationship" criteria are met?

   **Answer:** The EPA will review the submitted analyses showing how the observed concentration compares to the distribution of historical concentrations to determine whether the event is associated with a measured concentration in excess of normal historical fluctuations and will assess the other criteria, in part, based on this historical fluctuations comparison. When the observed concentration is higher than all or nearly all normal historical concentrations (i.e., concentrations when there was not an event), the EPA may need less additional evidence to demonstrate the "but for" finding. When the concentration is similar to or lower than a large number of normal historical values, the EPA may want additional evidence (*e.g.,* PM or VOC speciation data) to support the "but for" and "clear causal relationship" demonstration requirements. The additional evidence will help differentiate the concentration increment caused by the event in question from other, non-event causes.

   Stated another way, the EPA's intended use of the data is to review the historical fluctuations prong, which may influence how much information of other types is needed to successfully meet the other demonstration criteria (i.e., "but for" and "clear causal relationship") of 40 CFR § 50.14 based, in part, on the degree to which the measured concentration is in excess of normal historical fluctuations.

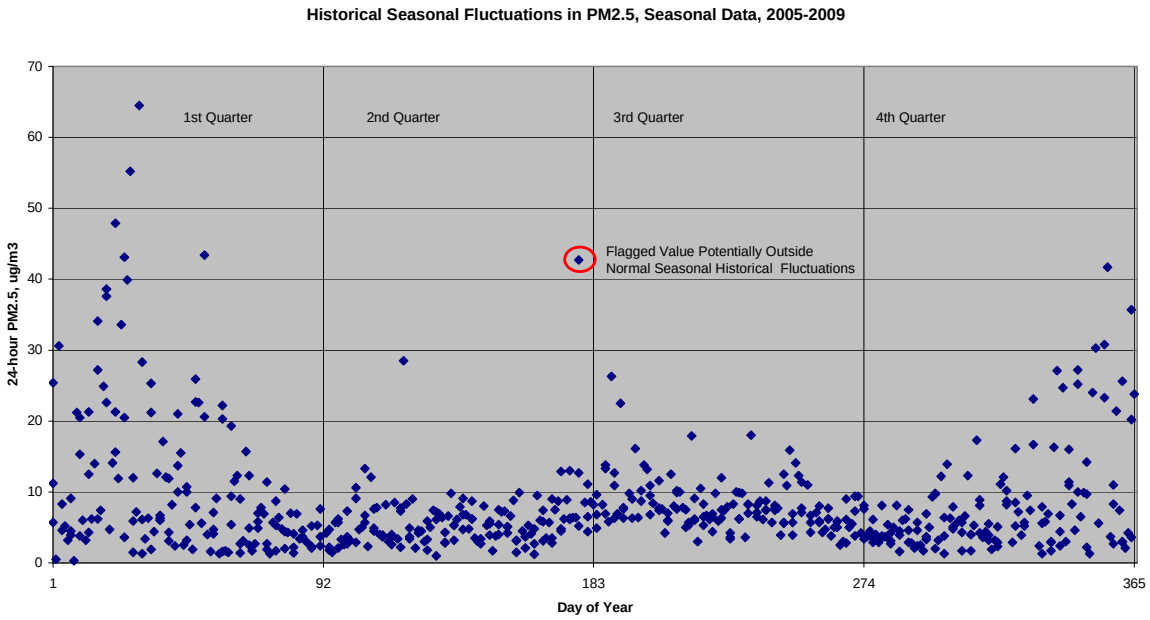
Submitting agencies are encouraged to discuss available historical fluctuation evidence with the appropriate EPA regional office prior to submitting the event demonstration package to determine if specific information might assist in the review process.

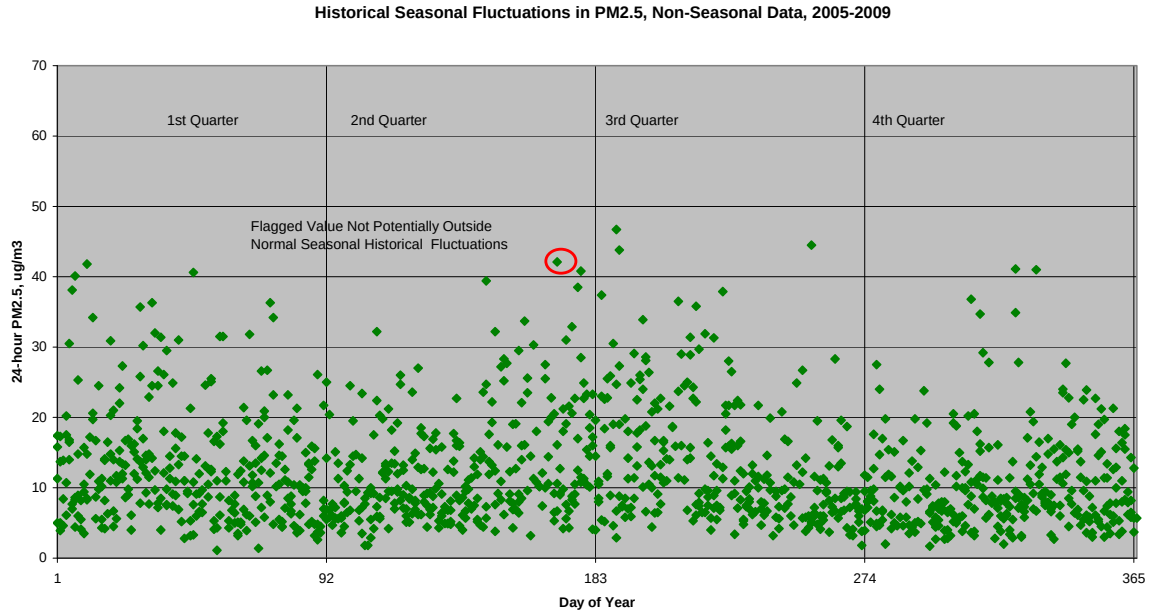
Additional Examples and Explanation Concerning "Historical Fluctuations" Evidence

*(Note: The discussion and graphics that follow illustrate the type of analyses and discussion that are described in this question and in Question 2 and that an air agency might include in a submittal showing that an event is associated with a measurement "in excess of normal historical fluctuations.")*

The evidence comparing the event-affected concentration with historical concentrations is most helpful to an air agency's demonstration if it shows that the event-affected concentration is high compared to all, or nearly all, historical concentrations generated by normal emissions and ambient conditions. This scenario makes it more plausible that the event caused the observed excess concentration rather than that some other causal event occurred on the same day as the known event. If similar events have been very rare in the past, it may be possible to make this point by labeling appropriate data points as being associated with concurred exceptional events, suspected exceptional events, or other unusual occurrences. To facilitate the EPA's understanding of the influence of these events, air agencies may also include comparisons omitting such points.

The following figures demonstrate the concept of seasonal emissions fluctuations. The first figure shows an exceedance level $PM_{2.5}$ value in late spring that is outside the range of the 3 to 5-year historical data set for non-wintertime $PM_{2.5}$, while the second figure shows a similar data value for a different part of the country where similar exceedance concentrations occur throughout the year, suggesting that some non-event process(es) can cause high concentrations all during the year. In the first case, a seasonal assessment of historical fluctuations generally would be appropriate, while annualized data analysis might be more appropriate for the second case to provide the most robust yet also representative historical data set.




4. **Question:** The Preamble to the EER states that less documentation or evidence may be needed to demonstrate that an event affected air quality for flagged data > 95th percentile than for values > 75th percentile. For ozone, $PM_{10}$ and 24-hour $PM_{2.5}$, in areas near the standard, exceedances are often near or above the 95th percentile of historical data. In these cases, will the EPA accept less documentation to demonstrate that an event affected air quality simply because an event-affected concentration is above the 95$^{th}$ percentile of the historical concentrations?

   **Answer:** The preamble statement paraphrased in the question above was intended to address National Ambient Air Quality Standards (NAAQS) that are based on averaging

periods of many days, such as annual, quarterly and/or 3-month rolling average NAAQS. NAAQS with 1-hour, 8-hour or 24-hour averaging periods only allow a small percentage of days to have concentrations above the level of the NAAQS. Flagging and excluding data falling at around the 75th percentile point of the historical concentrations are extremely unlikely to influence an area's attainment status with respect to such a short-term NAAQS. Data around the 75th percentile point can, however, affect compliance with NAAQS having a quarterly average, 3-month average, or annual average standard. For the annual $PM_{2.5}$ NAAQS, it is true that showing that the Exceptional Events Rule criteria are met will be more difficult for values near the 75th percentile point than for values near the 95th percentile point because it is more likely that values near the 75th percentile point are related to non-event causes.

Other questions and answers in this Q&A document address situations involving NAAQS with short averaging periods.

5. **Question:** Some pollutant demonstrations do not (or poorly) characterize the historical fluctuations of the observed concentrations at the monitor affected by the event. How can one judge whether the demonstration is adequate in this regard?

   **Answer:** As previously stated in the response to the historical fluctuations question, the EPA will review the submitted analyses showing how the observed concentration compares to the distribution of historical concentrations to assess whether the event is associated with a measured concentration in excess of normal historical fluctuations, and when assessing the exceptional event demonstration criteria of "affects air quality," "clear causal relationship," and "but for" causation. Because the "historical fluctuations" showing is not a statistical demonstration with any defined bright line, air agencies should consider submitting (with appropriate descriptions and discussion) the type of statistical analyses described in the responses to Questions 2 and 3. The EPA will review these analyses and look at both the relationship between the claimed concentration and historical concentrations and the strength of the data set to help inform the evidence needed to demonstrate the clear causal relationship and "but for" criteria.

   In the response to Question 2, we identified that air agencies completing historical fluctuation analyses should consider using 3 to 5 years of data to ensure a representative dataset. We recognize, however, that these data may not be available for all monitors and/or all pollutants. If data are not available, please consult with the reviewing EPA regional office.

## B. "But For" Test

*Section 319 of the Clean Air Act requires that "a clear causal relationship must exist between the measured exceedances of a national ambient air quality standard and the exceptional event to demonstrate that the exceptional event caused a specific air pollution concentration at a particular air quality monitoring location…" and that [States] can petition [EPA] to "[E]xclude data that is directly due to exceptional events from use in determinations…with respect to exceedances or violations."*

*The implementing language in the EER at 40 CFR 50.14(c)(3)(iv) states: "The demonstration to justify data exclusion shall provide evidence that:*
* * *
*(D) There would have been no exceedance or violation but for the event.*

6. **Question:** What types of evidence can air agencies include in a demonstration that ozone exceedances would not have occurred but for the effect of a fire event?

   **Answer:** Air Agencies may include any evidence that they consider relevant to the "but for" requirement recognizing that the effects of a fire on ozone are complex. Fire can generate ozone precursors, but it can also reduce solar radiation needed to drive ozone formation. Also, fire plumes containing ozone and ozone precursors can pass over a monitoring site without mixing down to ground level and affecting the monitored concentration. Additionally, wildfires often occur during the same seasons that exhibit high ozone caused by anthropogenic precursor emissions making it difficult to separate the wildfire contribution from a high ozone event that would have occurred without the fire.

   Examples of relevant evidence follow. The EPA recognizes that the following example analyses have limitations and may not conclusively or quantitatively demonstrate the "but for" criterion. For this reason, the EPA considers "but for" evidence using a weight-of-evidence approach on a case-by-case event basis.

   - Statistical evidence that shows that for the place, time of year, and prevailing weather conditions at the time of the event, past ozone data show no history of exceedances on days that were not affected by a fire event, or shows that exceedances were so infrequent as to make the fire at issue the more likely cause of the observed exceedance.
   - Unusual diurnal patterns of hourly or minute-by-minute ozone concentrations, such as a spike or peak other than at the normal time of day. This could be demonstrated by comparing the event pattern to the range of diurnal patterns exhibited on typical high ozone days.
   - Evidence that the normally good correlation between the affected monitor and a monitor clearly outside the area of influence of the fire was disrupted on the day of the fire event in a manner not seen on non-fire days.
   - Evidence that there were no known unusual emission releases from non-fire sources at the time of the fire event, such as from traffic due to a sports or entertainment event or source non-compliance.
   - Evidence that the plume from the fire passed over the location of the monitoring site and mixed down to ground level. This can include satellite images, wind data including HYSPLIT trajectories, visual smoke observations, and chemical analysis of PM filters showing elements and compounds that are markers for biomass burning.

- Altered pollutant amounts, ratios, or patterns that indicate the influence of the event rather than non-event sources. This information could include the level, timing and patterns of CO and PM; PM size distribution or composition; indicators of precursor composition and "age," such as oxygenated VOCs, radicals, sulfates, and timing and pattern of $NO_2$ and NO; and pollutant ratios, such as $CO/NO_x$, $CO/PM_{10}$, Elemental Carbon (EC)/Organic Carbon (OC), $O_3/NO_y$ and $O_3/CO$.
- A prediction that the "normal" ozone concentration would have been below the level of the NAAQS. "Normal" ozone concentrations can be predicted using statistical methods based on previous-day ozone and same-day weather variables (like methods used for air quality advisories in some areas) or using air quality models. The EPA asks that demonstration packages using these predictive techniques also include an easily understandable narrative describing the application of the technique and information on the uncertainty of the prediction methods (i.e., information on its past success in predicting normal ozone levels).
- A prediction based on air quality/photochemical modeling of the incremental ozone concentration due to the emissions from the fire, from comparing modeling results with and without the emissions from the fire. A demonstration that includes such evidence should address the uncertainties in the emission estimates for the fire including the speciation of the VOC and $NO_x$ emissions, and the uncertainties due to other aspects of the modeling platform such as grid cell size, etc.

The EPA is currently developing a separate guidance document for preparing a demonstration for wildfire events that are believed to have affected ozone concentrations. In addition, the EPA will post on its exceptional events website example demonstration packages that illustrate the type and scope of analyses that constitute complete submittals for ozone-related exceptional events.[4]

## C. Exceptional Event Data Flagging Schedules

*Note: "Flag" is the common terminology for a data qualifier code in the EPA's AQS (Air Quality System). Unless explicitly noted, the process of "flagging" data refers to adding Request Exclusion ("R") data qualifier codes to selected data in AQS. "R" flags are the only AQS flags that satisfy the EER requirement for initial data flagging. The EPA can act/concur only on an "R" flag.*

7. **Question:** When the EPA revises the National Ambient Air Quality Standards, how will it notify air agencies of the schedules and deadlines for flagging and documenting exceptional event data for designations purposes?

   **Answer:** When the EPA promulgated 40 CFR § 50.14, "Treatment of Air Quality Monitoring Data Influenced by Exceptional Events," in March 2007, the EPA was mindful that designations would be occurring under the then-recently revised $PM_{2.5}$ NAAQS. Exceptions to the generic deadline of July 1 of the calendar year following the

[4] http://www.epa.gov/ttn/analysis/exevents.htm

datum year (see 40 CFR § 50.14(c)(2)(iii)) were included for $PM_{2.5}$ in the rule. The EPA was also mindful that similar issues would arise for subsequent new or revised NAAQS. The Exceptional Events Rule at section 50.14(c)(2)(vi) indicates "when EPA sets a NAAQS for a new pollutant, or revises the NAAQS for an existing pollutant, it may revise or set a new schedule for flagging data for initial designation of areas for those NAAQS." See as examples, the data flagging schedule identified in the 2012 $SO_2$ NAAQS final rule at 75 FR 35592, the data flagging schedule identified in the 2010 $NO_2$ NAAQS final rule at 75 FR 6531, or the data flagging schedule identified in the 2012 $PM_{2.5}$ NAAQS final rule at 78 FR 3086.

## D. General AQS Procedures

8. **Question:** What is the difference between the "R" series flags and the "I" series flags, and how should they be used?

   **Answer:** Within AQS, monitoring agencies can use two types of data validation, or data qualifier, codes: the *Request Exclusion* flags ("R") and the *Informational Only* flags ("I"). Agencies should use the "I" series flags when identifying informational data and the "R" series flags to identify data points for which the agency intends to request an exceptional event exclusion and the EPA's concurrence. As an example, air agencies may use an "I" series flag to initially identify values they believe were affected by an event. Once the air agency collects additional supporting data, it may change the flag to an "R" series flag and submit an initial event description. Or, the air agency may find that additional information does not support flagging the data as an exceptional event, and the air agency may, therefore, delete the flag or retain the "I" series flag. Air agencies may also use the "I" series flags simply to note activities or conditions occurring on the data collection day that are unrelated to exceptional events.

   The EPA does not intend to review or concur on the "I" series flags. Air agencies must submit "R" flags by July 1 of the calendar year following the year in which the flagged measurement occurred or by the other deadlines identified with individual NAAQS revisions (see Question 7). Air agencies intending to change "I" flagged data to "R" flagged data should be aware of the EER flagging and initial event description deadline of July 1 of the year following the sample measurement. Air agencies should change the flag status from "I" to "R" BEFORE the July 1 deadline. Normally, air agencies should not modify the flag status after this date and, therefore, if they went beyond July 1, they may not be able to meet the EER initial flagging and event description deadlines.

9. **Question:** May an air agency flag any data in AQS?

   **Answer:** Yes, but the EPA asks air agencies to use the "R" flags to identify data that might have a regulatory consequence and for which an air agency intends to request exclusion and submit an approvable demonstration. Air agencies should use the "I" series flags to identify values for informational purposes (see Question 8). AQS only allows the EPA to place concurrence flags on data identified with an "R" flag. "I" flags never affect regulatory summary statistics (e.g., design values, number of exceedances, 98$^{th}$ percentile

values) generated by AQS for NAAQS determinations purposes. "R" flags will not affect the regulatory summary statistics unless or until they are concurred by the EPA.

Further, while the EER does not prohibit air agencies from flagging individual concentration values below the level of the NAAQS, in general, air agencies can only request exclusion for data that contribute to a violation or an exceedance of the NAAQS. See Questions 29-31 for more information, including clarifications and examples, particularly for $PM_{2.5}$ and $PM_{10}$, in which flagging individual concentration values below the level of the NAAQS is acceptable.

10. **Question:** The EPA requires air agencies to provide an initial description for data flagged with an "R" data qualifier code. Is it possible for an initial description to be inadequate (for example, "fires in surrounding states")?

    **Answer:** Although the EPA is not specifying pass/fail criteria for the initial description associated with "R" flagged data, it is possible for an air agency to enter inadequate initial descriptions in AQS. The preamble to the Exceptional Events Rule explains: "At the time the [request exclusion] flag is inserted into the AQS database, the State must also provide an initial description of the event in the AQS comment field. This initial description *should include such information as the direction and distance from the event to the air quality monitor in question, as well as the direction of the wind on the day in question.*" 72 FR 13568 (emphasis added). AQS maintains event definitions, including their initial descriptions, in fields separate from the raw data flagging fields. As a result, air agencies can enter more detailed event descriptions either before or after the raw data measurements are flagged. Regardless of precise timing, the intent of this initial description is to initially explain why the flagged data warrant consideration as exceptional events. Although the initial description is not likely to provide enough information to assist the EPA with exceptional event planning and prioritization, the act of providing the initial description encourages air agencies to review and identify data having regulatory consequence and for which they are likely to submit an approvable demonstration. To facilitate the EPA's review of the initial event description, the EPA suggests that air agencies notify the appropriate regional office after the air agency creates the event description. This allows the air agency and the EPA to discuss and, if necessary, develop a mutually agreed-upon description. This initial discussion and the *optional* letter of intent (see Question 27) can assist the EPA and air agencies with exceptional event review and prioritization.

11. **Question:** The "j" flag was "Construction/Demolition." The new "IE/RE" flag is demolition; can it also be used for construction?

    **Answer:** The "j" flag is obsolete and can no longer be used. The "IE/RE" flag should <u>not</u> be used for construction.

    Generally, construction activity is not considered to be exceptional. Reasonable and appropriate controls capable of preventing localized NAAQS exceedances should be available during most construction events. In some cases, however, construction activities

may involve very high-energy, emissions-generating physical processes, such as explosive excavation. Dust control measures may not be adequate to prevent exceedances / violations in the vicinity of this type of activity.

If an agency wishes to "flag" data related to exceedances caused by some construction activity, the agency should use the *Other* ("IL/RL") exceptional events flag. Air agencies should use the "IE/RE" flag only when an exceptional demolition event occurred and the air agency wishes to flag the data for exclusion as an exceptional event. Air agencies using either the "IE/RE" flag or the "IL/RL" flag to identify an exceptional event should show in a demonstration submittal that all reasonable and appropriate controls were in place during the construction / demolition activity, and that those controls proved inadequate to prevent NAAQS exceedances. The demonstration would also need to meet all other requirements of the Exceptional Events Rule.

11a. **Question:** What flags does AQS use to describe fires?

**Answer:** Land Management Agencies modified their fire-related definitions after the EPA promulgated the Exceptional Events Rule. The EPA has incorporated the fire-related terminology in the exceptional events guidance documents to ensure consistency (see also Question 20a). These definitional changes result in corresponding changes to fire-related flags in AQS. The EPA eliminated from AQS the Wildland Fire Use Fire – United States ("IU") and ("RU") flags and the Forest Fire ("E") flag. The EPA continues to use the following flags to describe fires:

- IF – Fire – Canadian (Informational Only)
- IG – Fire – Mexico/Central America (Informational Only)
- IM – Prescribed Fire (Informational Only)
- IP – Structural Fire (Informational Only)
- IT – Wildfire – US (Informational Only)
- RF – Fire – Canadian (Request Exclusion)
- RG – Fire – Mexico/Central America (Request Exclusion)
- RM – Prescribed Fire (Request Exclusion)
- RP – Structural Fire (Request Exclusion)
- RT – Wildfire – US (Request Exclusion)

The EPA believes it is appropriate to retain the Fire – Canadian ("IF/RF") and Fire – Mexico/Central America ("IG/RG") flags because these flags indicate the jurisdictional origin of the fire (i.e., outside of the submitting state/outside of the United States). Emissions from fires originating outside of the United States that affect air quality concentrations in the United States may qualify for regulatory treatment under the international transport provisions of 40 CFR part 179(b) of the Clean Air Act.

12. **Question:** The National Park Service operates ozone monitors in some locations that meet all requirements of 40 CFR part 58. Can an air agency request exclusion of data from such monitors under the EER, and exclusion of other data not collected by the air agency itself that may lead to a nonattainment finding?

**Answer:** Yes. However, air agencies should take special steps with regard to data handling within AQS. To maintain data integrity, AQS is generally designed so that only the agency updating a monitoring site may enter or alter data for that site. Under normal circumstances, an air agency will not have access rights to apply event flags to data from monitors operated by other entities, such as the National Park Service or other state, local, or tribal agencies. When an air agency believes that an exceptional event affected the concentration recorded by monitors operated by other agencies, the air agency should contact the agency operating the monitor and request that the operating agency flag the identified data range for exclusion. The affected air agency should also develop and forward to the operating agency an initial event description that the operating agency can enter in AQS as it enters the appropriate "R" series flags (see Question 10). If an air agency is unsuccessful in requesting that another agency apply the appropriate "R" series flags and initial event description, the air agency should contact the EPA regional office. If the EPA regional office is aware of the request, and if the request was prior to July 1st of the year following the datum year, the EPA will generally still consider the affected air agency's request. Air agencies should notify the EPA regional office of such an instance as soon as possible.

Regardless of whether the monitor operator flags the data in question or the air agency notifies the regional office that a flag is needed, it is the air agency's responsibility to develop an initial event description, prepare the demonstration, and submit it to the EPA under the applicable schedule. The agency operating the monitor may choose to assist in this process.

13. **Question:** Events can make an air concentration significantly higher than it would have been in the absence of the event contribution, and elevate the 3-year design value for a NAAQS pollutant. Depending on the magnitude of the effect and how the "normal" concentration compares to the NAAQS, the "but for" test may not be satisfied in that there may have been a violation with or without the event. Thus, it appears that data associated with the event cannot be handled as an exceptional event. However, retaining such data in the calculation of a design value for a nonattainment area can make it seem that the area needs more emissions reduction to attain the NAAQS than is actually the case. How will the EPA deal with such a situation when reviewing an attainment demonstration? How, if at all, should AQS be used to flag such data?

**Answer:** *(See also Question 19 for a related question regarding $PM_{10}$.)* The question reflects a proper understanding that not every natural or infrequent anthropogenic event that affects air quality is a true "exceptional event" under the definition of that term in the Exceptional Event Rule. Ambient data affected by an event that does not meet the "but for" criterion cannot be excluded under the authority of the Exceptional Events Rule even if in all other respects the event meets the definition of an exceptional event. When the available evidence indicates that there would have been an exceedance of a NAAQS even in the absence of the event, for example when a wildfire makes a summer-time ozone exceedance worse than it otherwise would have been, the event is not a true "exceptional event" under the EER. The Exceptional Events Rule does not address data handling

associated with events that are not considered "exceptional" under the EER, and does not provide the EPA with authority to exclude such data. Yet as the question points out, this event-related concentration could still impact design values. An air agency incorporating the event-related concentration in a design value used for a prospective attainment demonstration might seem to need more emission reductions to attain the NAAQS by its attainment deadline than is actually the case.

However, the EPA intends to achieve much the same effect as if such data were excludable under the Exceptional Events Rule, by addressing this topic in future guidance on the preparation of attainment demonstrations in required SIPs for areas designated as nonattainment. The first pollutant and NAAQS that the EPA will address this way will be the 2008 ozone NAAQS. The EPA plans to more formally describe its intention to develop such ozone guidance in the preamble of a soon-to-be-proposed rulemaking on SIP requirements for areas designated nonattainment for the 2008 ozone NAAQS. Until the planned guidance for a pollutant and NAAQS of interest is issued, air agencies should consult with their EPA regional office if they face this situation. To avoid confusion, air agencies should use AQS informational-only "I" flags on such data, rather than "R" flags.

In the remainder of this response to the question, the EPA describes in more detail the differences between the event scenario described in the question and a true "exceptional event" under the Exceptional Events Rule, for the purpose of clarifying why the planned guidance on attainment demonstrations and the SIP approval process, rather than the Exceptional Event Rule and the associated AQS data flagging, demonstration submittal, and review process, will apply to such an event scenario.

To illustrate an attainment demonstration scenario using the 2006 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$, assume that the three annual 98$^{th}$ percentile 24-hour $PM_{2.5}$ concentrations for a monitoring site for 2006-2008 are 44, 31, and 37 $\mu g/m^3$ for each respective year, with a resulting 3-year design value of 37 $\mu g/m^3$, which is a violation. Also, assume that the next highest concentration in 2006 below the 44 $\mu g/m^3$ was 40 $\mu g/m^3$. The 44 $\mu g/m^3$ concentration in 2006 was affected by a one-day wildfire, and the air agency was able to show that the concentration would have been 41 $\mu g/m^3$ without the fire. Because both 44 $\mu g/m^3$ and 41 $\mu g/m^3$ are exceedances, the event on that day does not meet the "but for" test when viewed from an "exceedance" perspective. Moreover, from a "violations" perspective, the 2006 value also would not meet the "but for" test, because the "no event" concentration value of 41 $\mu g/m^3$ for the event day in 2006 would still be the 98$^{th}$ percentile concentration and would still result in a 3-year design value of 36 $\mu g/m^3$ which is a violation. Thus, the 2006 wildfire does not meet the definition of an exceptional event.

## E. General Exceptional Events Rule Applicability and Implementation Issues

14. **Question:** The Preamble to the Exceptional Events Rule states that the EPA headquarters or the EPA regional office will make its decision on demonstrations public. See 72 FR 13574 ("The EPA regional offices will work with the States, Tribes, and local agencies to ensure that proper documentation is submitted to justify data exclusion. EPA

will make the response and associated explanation publicly available."). What method does the EPA plan to use to make the explanation "publicly available?"

**Answer:** The EPA posts example demonstration packages and decisions (consisting of air agency demonstration submittals, the EPA responses, and the EPA technical support documents) on the EPA regional office websites and/or the Technology Transfer Network website.[5] In certain instances, the EPA's concurrence or non-concurrence determination may be a factor in a rulemaking that includes a public comment period. In these cases, the same information that is posted on the EPA websites, and any additional supporting correspondence, will also be posted in the relevant rulemaking docket. Further, the EPA plans to make the demonstrations and the EPA's concurrence decisions available to interested parties upon request.

14a. **Question:** At what point in the exceptional event development and review process is public notice and opportunity for comment required? How does the EPA determine the need for public comment?

**Answer:** The EER requires that air agencies offer notice and opportunity for public comment as part of the demonstration development process (see 40 CFR 50.14(c)(3)(i) and 40 CFR 50.14(c)(3)(v)). The EPA must also provide notice and opportunity for public comment prior to taking a final Agency action, such as acting on an air agency's request for area redesignation, that may rely upon air quality monitoring data including exceptional event claims. In addition, an air agency may need to provide an additional opportunity for public comment if the EPA requests and/or if the air agency provides supplemental information not included in the original documentation made available 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. 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.

When the EPA concurs based on the weight-of-evidence that the air agency has successfully made the demonstrations referred to in 40 CFR 50.14(a)(2) and (b)(1) to the EPA's satisfaction, the EPA generally will exclude the affected data from the following types of calculations and activities:

- The EPA's AQS will not count these days as exceedances when generating user reports, and will not include them in design values estimates, unless the AQS user specifically indicates that they should be included.[6]
- The EPA will accept the exclusion of these data for the purposes of selecting appropriate background concentrations for New Source Review (NSR) air quality analyses.[7]

[5] http://www.epa.gov/ttn/analysis/exevents.htm

[6]Due to the complexity of the AQS software, inadvertent errors may occur. The EPA asks that agencies provide the EPA with information if/when AQS outputs seem inconsistent with the EPA's intention to exclude concurred upon data.

- The EPA will accept the exclusion of these data for the purposes of selecting appropriate background concentrations for transportation conformity hot spot analyses.[8]
- The data will continue to be publically available, but the EPA's publications and public information statements on the status of air quality in the affected area generally will not reflect these data in any summary statistic of potential regulatory application, unless such inclusion is specifically noted.[9]

In addition, some proposed regulatory actions (e.g., proposed designation, classification, attainment demonstration, or finding as to whether the area has met the applicable NAAQS) will rely on design values that exclude data that the EPA has determined meet the exceptional event weight-of-evidence requirements. These regulatory actions require the EPA to provide an opportunity for public comment prior to taking a final Agency action. If the EPA pursues one of these actions for a given area, the EPA will open a new comment period during which the public may comment on the exceptional event submission and/or the EPA's determinations. The EPA must consider and respond to received comments before taking final regulatory action.

15. **Question:** It is possible for events to affect more than one state. Each state/air agency must then submit its own exceptional events demonstration package, which may result in redundant work. Could the EPA take on multi-state/agency demonstrations?

    **Answer:** The primary responsibility for developing demonstrations lies with state, local, and tribal air agencies. The EPA encourages states and air agencies to coordinate with each other in compiling demonstration packages, and these agencies may submit some of the same data and analyses when a single event affects multiple jurisdictions. Each NAAQS exceedance, however, will likely have some unique properties (e.g., unique monitoring locations, different surrounding and potentially contributing sources with varying levels of control, different historical concentration patterns, etc.). States/agencies need to address these unique characteristics in individual submittal packages. Similarly, where a single event results in exceedances of multiple NAAQS (e.g., annual and 24-hour PM), the submitting agency needs to address the unique features of each NAAQS exceedance or violation (e.g., potentially different monitoring locations, different historical concentration patterns). An air agency could submit a single demonstration package for a single event affecting multiple NAAQS provided the air agency clearly identifies the unique characteristics of each NAAQS.

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[7] If the EPA is the permitting authority, the EPA will propose permits on this basis. If the EPA is commenting on another permitting authority's proposed action, the EPA's comments will be consistent with the determinations in this guidance document and any applicable NSR permitting and/or modeling guidance.
[8] Applicable only to $PM_{10}$ and $PM_{2.5}$. See "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and $PM_{10}$ Nonattainment and Maintenance Areas," EPA-420-B-10-040, US EPA Office of Transportation and Air Quality, December 2010, page 98.
[9] These data may be included in statistics intended to describe current status and trends in actual air quality in the area for public information purposes including reporting of the Air Quality Index.

For example, if multiple states or jurisdictions are affected by a Saharan dust plume, they could collaborate and submit a common demonstration component (e.g., the same or very similar information in multiple submittals) for the "not reasonably controllable or preventable" and "human activity unlikely to occur or natural event" elements. Because the actual event-related exceedance would have been measured by different monitors located in different regions with possibly different contributing factors (e.g., rural monitor affected by both dust from feedlots and Saharan dust and urban monitor affected by both nearby industrial sources and Saharan dust), the "clear causal relationship," "but for," and "historical fluctuations" elements are likely to differ from one submittal to another.

16. **Question:** Does the EER address scenarios in which temporary activities (e.g., multi-month or multi-year road construction / demolition projects) significantly influence measured concentrations at a long-sited monitor such that the nature of the monitor changes from "area-wide" to "unique"?

    **Answer:** Generally, all monitoring data, if meeting applicable CFR regulations, are comparable to the NAAQS. There are special provisions applicable only to the $PM_{2.5}$ NAAQS, which provide that monitors must be representative of area-wide air quality to be comparable to the annual NAAQS, and that monitors representative of unique micro- or middle-scale impact sites are comparable only to the 24-hour $PM_{2.5}$ NAAQS. *See* 40 CFR 58.30. In the provided example, the affected air agency may believe that site meets the criteria for data to be comparable only to the 24-hour $PM_{2.5}$ NAAQS for the period of the construction. The affected air agency could request this type of change through updates to its annual monitoring network plan or in a separate request, subject to review and approval by the EPA regional office.

    The EER does not specifically address temporary, but multi-day or multi-year, anthropogenic emission sources such as construction projects. However, neither does the EER explicitly place a limit on the duration of a single event. A submitting agency could make a showing that a claimed event (e.g., a multi-year road construction project) is not likely to recur at the location in question. If the remaining exceptional event criteria and demonstration criteria are met, including the requirement that the event (including the emissions from the project) is not reasonably controllable, the activity might qualify as being an exceptional event.

    Air agencies not wishing to develop exceptional event demonstration packages for the described scenario can request agreement from the EPA regional office to relocate a monitor that no longer meets monitoring objectives. This process is, however, time consuming and resource intensive, so air agencies usually "monitor through" the disruption or ask their regional offices to support a temporary shut-down. When the EPA regional office approves a temporary shut-down, the operating air agency should assign a Null Data Code in AQS for "construction/repairs in area" (AC) to identify and invalidate data associated with periods of local construction.

16a. **Question:** Are policy relevant background (PRB) ozone concentrations and exceptional events related?

**Answer:** PRB ozone concentrations and exceptional events can include partially overlapping concepts. The 2007 Staff Paper[10] defines policy relevant background ozone "as the distribution of [ozone] concentrations that would be observed in the U.S. in the absence of anthropogenic (man-made) emissions of precursor emissions (e.g., VOC, NOx, and CO) in the U.S., Canada, and Mexico." In the current ozone review process, the EPA has more broadly considered background ozone by assessing three separate definitions of background: natural, North American, and U.S. background.[11] As before, each background is defined as the ozone that would be observed in the absence of specific categories of emissions. For example, North American background (NAB) is equivalent to PRB. An exceptional event is a natural event (excluding stagnations, inversions, high temperatures, or precipitation) or an anthropogenic event that is unlikely to recur in the same location. Both exceptional events and North American background can involve emissions from natural events like forest wildfires or stratospheric ozone intrusions. However, exceedances due to natural emissions that occur every day and contribute to policy relevant background, such as biogenic emissions, do not meet the definition of an exceptional event and are thus not eligible for exclusion under the EER. Routine anthropogenic emissions outside of the U.S. contribute to policy relevant background, but are not exceptional events. Air agency preparation of a demonstration package and the EPA's subsequent review of the demonstration package is case-by-case based on a weight-of-evidence approach and does not explicitly consider whether the event type might contribute to North American background, or any other background definition. However, if a natural event that contributes to background ozone causes an observed concentration that meets the statutory definition of an exceptional event and fulfills all of the exceptional event criteria, the EPA would consider the event to be an exceptional event.

17. **Question:** Volcanoes on Hawaii are causing 1-hour and 24-hour $SO_2$ exceedances, which are clearly volcanic exceptional events. Section 319 of the Clean Air Act and CFR require the EPA to provide air agencies with a method to flag and petition the EPA for exclusion of exceptional events data. When will the EPA provide the method for $SO_2$?

**Answer:** AQS has been modified to allow flags on all criteria pollutant data. The specific schedule for exceptional event flagging and documentation submission for data to be used in designations decisions is identified in the final primary $SO_2$ NAAQS rule

[10] Environmental Protection Agency, Review of the national ambient air quality standards for ozone: assessment of scientific and technical information. OAQPS staff paper. (Updated Final) July 2007. Research Triangle Park, NC: Office of Air Quality Planning and Standards. EPA-452/R-07-007, available online at: http://epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_sp.html.

[11] Environmental Protection Agency, Integrated Science Assessment for Ozone and Related Photochemical Oxidants. (Third External Review Draft) June 2012. Research Triangle Park, NC: National Center for Environmental Assessment – RTP Division, Office of Research and Development. EPA-600/R-10-076C, available online at: http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=242490#Download.

(see preamble at 75 FR 35585-35586 and regulatory text at 75 FR 35592). The correct flag to use for a volcanic eruption event is "RS."

17a. **Question:** The EPA acknowledges that extreme exceptional events may justify more limited demonstration packages. How might the EPA decide whether to consider a particular high wind dust event "extreme" when reviewing a limited demonstration package?

**Answer:** While many dust storms could qualify as exceptional events, the EPA believes that most events that are conventionally referred to as "dust storms" should not be considered "extreme" events for this purpose. The National Weather Service (NWS) defines a "dust storm" as a severe weather condition characterized by strong winds and dust-filled air over an extensive area, but does not include any quantified criteria for the spatial extent or the concentration of the dust. In contrast, a haboob is of the magnitude that could be considered an extreme event. Haboobs are often caused by severe weather (e.g., severe thunderstorm activity, cold frontal passages) and are typically characterized as "solid walls" of dust that can rise up to 2,000 meters and travel hundreds of miles.

Generally, the EPA would consider sustained wind speed, spatial extent, visibility, and PM concentrations in determining whether an event is an extreme event. An example of an event that could be considered an exceptional event but not an extreme event would be the Santa Ana winds blowing at 25-30 mph, creating an exceedance at one monitor, with maximum hourly $PM_{10}$ levels of less than 800 $\mu g/m^3$. In contrast, a haboob that occurred in Phoenix in 2011 had downburst winds of 70 mph, with a wall of dust moving at 30-40 mph for 150 miles; hourly $PM_{10}$ levels of 50,000 $\mu g/m^3$ were monitored during this event. Both of these events could be considered for exclusion under the EER. The South Coast Air Quality Management District prepared a 49-page demonstration package (plus an appendix with additional supporting information) for the Santa Ana winds event, parts of which have been used as examples in the High Winds guidance document. However, the EPA anticipates that much more limited documentation for an event like the haboob would be sufficient to convince the EPA (and all other parties) that the event meets the several criteria for data exclusion (clear causal connection, not reasonably controllable or preventable, etc.).

18. **Question:** Carbon monoxide (CO) flags are in AQS for exceedances caused by fires, but the CO NAAQS (40 CFR 50.8) does not reference the Exceptional Event Rule. What is the EPA's approach for the treatment of CO data affected by exceptional events?

**Answer:** CO flagging, including the option for the EPA's concurrence, has been enabled in AQS. CO flags from structural fires and wildfires that qualify as exceptional events have been allowed in historic EPA guidance. The EER Preamble (72 FR 13563) explains the EPA's position with respect to exceptional event flagging for pollutants for which the statement of the NAAQS in 40 CFR part 50 does not explicitly reference the Exceptional Events Rule: "In the interim, where exceptional events result in exceedances or violations of NAAQS that do not currently provide for special treatment of the data, we intend to use our discretion as outlined under section 107(d)(3) not to redesignate affected areas as

nonattainment based on these events." Therefore, air agencies may flag CO data in AQS and the EPA may apply the same process and approval criteria as in the Exceptional Events Rule.

On August 12, 2011, the EPA issued a decision to retain the current suite of CO standards without revision (see 76 FR 54294). Because the EPA made no revisions to the CO standards, it promulgated no related changes to the Exceptional Events Rule.

19. **Question:** The limited maintenance plan requirements for $PM_{10}$ require a demonstration that the area design value is less than or equal to 98 $\mu g/m^3$. Flagging of values between 98 $\mu g/m^3$ and the NAAQS are therefore relevant for this regulatory decision. Can air agencies flag and request/receive the EPA's concurrence on these values, which are not exceedances and do not contribute to violations?

**Answer:** Yes. The May 7, 2009, memorandum from William T. Harnett to Regional Air Division Directors states the following regarding the $PM_{10}$ limited maintenance plan option: "In determining eligibility for the limited maintenance plan option, the EPA will treat 24-hour average air quality data between 98 $\mu g/m^3$ and 155 $\mu g/m^3$ in a manner analogous to the treatment of exceedance data under the Exceptional Events Rule, provided the impacted data meet the general definition and criteria for exceptional events (natural event, or exceptional event that is not reasonable controllable or expected to recur)." This memorandum is posted on the EPA website at http://www.epa.gov/ttn/oarpg/t1/memoranda/lmp_final_harnett.pdf

19a. **Question:** What does the EPA mean when we say we will review exceptional event demonstration submittals using a "weight-of-evidence" approach?

**Answer:** In using the term "weight-of-evidence," the EPA believes we should consider all relevant evidence and qualitatively "weigh" this evidence based on its relevance to the EER criterion being addressed, the degree of certainty, its persuasiveness, and other considerations appropriate to the individual pollutant and the nature and type of event.

20. **Question:** Exactly which section(s) of the preamble to the final Exceptional Event Rule has been declared a "legal nullity" by the court, and what does that mean?

**Answer:** In *NRDC v. EPA,* No. 07-1151 (D.C. Cir. 3/20/09), the DC Circuit Court states that

> "In one section of the preamble, EPA refers to its 'final rule concerning high wind events', which 'states that ambient particulate concentrations due to dust being raised by unusually high winds will be treated as due to uncontrollable natural events' when certain conditions apply (72 Fed. Reg. 13576). There is no such final rule. The final rule [language in 40 CFR 50 and 40 CFR 51.930] does not mention high wind events or anything about 'ambient particulate matter concentrations.' EPA calls this a drafting error. In light of the error, the high wind events section of the preamble is a legal nullity."

The EPA considers the "high wind events section of the preamble" to which the court referred to be the section titled "*B. High Wind Events*" beginning on 72 FR 13576. This does not necessarily mean that these passages do not reflect the EPA's interpretation of what might be appropriate under the EER. Rather, it means that implementing air agencies and other stakeholders should rely on other parts of the preamble and other EPA guidance instead of statements in these passages of the final rule preamble, which should be treated as not having been published.

20a. **Question:** What fire-related definitions should air agencies use in their exceptional event documentation?

**Answer:** Land Management Agencies modified their fire-related definitions after the EPA promulgated the Exceptional Events Rule. The EPA is using the following fire-related terminology in the interim exceptional events guidance documents to ensure consistency:

Prescribed fire - Any fire intentionally ignited by management under an approved plan to meet specific objectives.

Wildfire – Any fire started by an unplanned ignition caused by lightning; volcanoes; unauthorized activity; accidental, human-caused actions; and escaped prescribed fires.

20b. **Question:** How should air agencies support a claim that emissions from wildfires are "not reasonably controllable or preventable"?

**Answer:** The Clean Air Act and the EER apply the "not reasonably controllable or preventable" requirement to any event that an air agency wishes to be treated as an exceptional event, and thus it applies to wildfires. The current United States Forest Service (USFS) definitions of "wildfire" and "prescribed fire" define these events in terms of purpose and deliberateness of ignition (See definitions in response to Question 20a). Based on the USFS definitions, a wildfire is a fire that has started from an unintentional ignition or an unintentional escape of a prescribed fire. The initiation of a wildfire is thus by definition unplanned, but the concepts of reasonable prevention and control should not be overlooked in an exceptional event demonstration. The EPA recognizes that wildfires and emissions from wildfires are generally not reasonable to prevent or control.

When documenting the "not reasonably controllable or preventable" criterion in their wildfire exceptional event demonstration submittal, air agencies should identify the origin and evolution of the wildfire, describe local efforts to prevent fires due to unauthorized activity or accidental human-caused actions (if relevant given the origin of the fire)[12], and explain how any efforts to limit the duration or extent (and thus the

[12] Prevention/control efforts could include posting High Fire Danger signs to make people more careful and prevent accidental fires, and/or taking reasonable action to contain a fire once it has started.

emissions) from the wildfire were reasonable. During wildfires, fire management resources deployed to the fire event give first priority to protecting life and property. Because wildfires are, by definition, unplanned and unwanted, fire management resources often have limited advance notice of ignition and location, which generally limits preparation time and reasonable efforts to limit the duration or extent of a wildfire. In light of these considerations, the EPA believes that it will generally be sufficient for air agencies to provide a statement such as the following to document the "not reasonably controllable or preventable" criterion for wildfires: "Based on the documentation provided in [section X] of this submittal, [lightning] caused the unplanned, unwanted wildfire event. The responsible agencies did their reasonable best to control the extent of and extinguish the fire by taking the following actions [insert list or description of actions taken]. Therefore, emissions from this wildfire were 'not reasonably controllable or preventable.'" For fires that could have been suppressed or contained but which fire management officials allowed to burn for resource management purposes, air agencies can generally reference or paraphrase a previously adopted resource management plan to support the "not reasonably controllable or preventable" criterion.

21. **Question:** The Exceptional Event Rule allows for exclusion of data affected by a prescribed fire if the usual requirements of the rule are satisfied and if the air agency has adopted and is implementing a Smoke Management Program (SMP) or if the air agency has ensured that the burner employed basic smoke management practices. Are there minimum requirements for a Smoke Management Program? What are "basic smoke management practices?"

    **Answer:** The preamble to the Exceptional Events Rule at 72 FR 13567 describes an SMP as establishing a basic framework of procedures and requirements for managing smoke from a prescribed fire managed for resource benefits. Further, the EPA's "Report to Congress on Black Carbon"[13]describes the intent of SMPs as "mitigat[ing] the public health and welfare impacts from prescribed fires and promot[ing] communication and coordination of prescribed burning among land owners." The Report to Congress also states that basic smoke management practices could "…include, among other practices, steps to minimize air pollutant emissions during and after the burn, evaluate dispersion conditions to minimize exposure of sensitive populations, and identify procedures to ensure that burners are using basic smoke management practices." The EPA intends to develop separate guidance to address this issue, which will be issued at a later date following an opportunity for stakeholder input.

22. **Question:** Is there a tie between the requirements of 40 CFR 51.930 Mitigation of Exceptional Events and the EPA's approval for exclusion of data affected by an exceptional event?

[13] Report to Congress on Black Carbon, EPA-450/R-12-001, US EPA, March 2012, page 230. Available at http://www.epa.gov/blackcarbon/.

**Answer:** The EPA encourages the submittal of mitigation measures with the demonstration package, particularly for those events likely to recur. The Exceptional Events Rule was promulgated pursuant to Section 319 of the Clean Air Act which contains a provision 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 air agencies to prepare or submit a mitigation plan, it does require that air agencies 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.

23. **Question:** Need a state (or tribe) make an argument or submit evidence about control measures for events that took place in other states or countries, on federally-owned and managed land, or on tribal (or state) lands not subject to state (or tribal) regulation?

**Answer:** Under the Clean Air Act, the EPA generally considers a state (not including areas of Indian country) to be a single responsible actor. Accordingly, neither the EPA nor the Exceptional Events Rule provides special considerations for intrastate scenarios when an event in one county affects air quality in another county in the same state, assuming that the event occurs on land subject to state authority (versus tribal government authority). For cases involving intrastate transport, the state or local air agency should evaluate whether emissions from neighboring (or contributing) counties are not reasonably controllable or preventable. As discussed in greater detail in the overview guidance document and the interim High Winds Guidance document, the assessment of "not reasonably controllable or preventable" is based on the existing level of required control, attainment status, and, for high wind dust events, wind speed and other factors. States and tribes should consult with their EPA regional office early in the development of an exceptional event demonstration package if they believe that emissions from sources on federally-owned and managed land (e.g., national parks within the state) have been affected by an event in a way that raises issues of reasonable control.

Interstate and international transport events are different than intrastate events. The EPA believes that generally 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 recommends a similar approach to significant out-of-state anthropogenic sources in the case of a mixed natural/anthropogenic event that the submitting state wishes to consider a natural event of the grounds that all significant anthropogenic sources were reasonably controlled.

As with all exceptional event demonstrations, the EPA will evaluate the information on a case-by-case basis based on the facts of a particular exceptional event including any information and arguments presented in public comments received by the state in its public comment process or by the EPA in a notice-and-comment regulatory action that depends on the data exclusion. This response is not intended to discourage states from working cooperatively to plan and apply controls on both sides of a state boundary for their mutual benefit.

In addition to the provisions in the EER, the Clean Air Act provides mechanisms in sections 110(a)(2)(D) and 126 to address interstate transport issues and mechanisms in section 179(b) to address international transport issues.

24. **Question:** Need an air agency make an argument or submit evidence about control measures for air quality impacts from wind-blown dust from desert land in its natural state?

    **Answer:** While the EPA's position is generally that impacts from wind-blown dust from undisturbed natural deserts are inherently not reasonable to control, the air agency would need to state this and provide appropriate supporting documentation in its demonstration package. The supporting documentation could include descriptions of the geographic area (with maps or available visuals) and a discussion of the historical land use, including prior disturbances, water diversions and other historical practices which may have occurred on the land, even if the land seems or is considered to be "undisturbed" at present. Submitting agencies should also identify all sources contributing to an event and identify appropriate control strategies for each anthropogenic source.

25. **Question:** Is there a template or example for preparing a demonstration document?

    **Answer:** The guidance document, "Interim Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds Under the Exceptional Event Rule" (the High Winds guidance document) provides this type of advice for demonstrations for high wind dust events. While the High Winds guidance document speaks specifically to high wind dust events, the EPA believes that many of the principles discussed therein to extend to all types of exceptional events. The EPA has also developed a presentation entitled, "Presenting Evidence to Justify Data Exclusion as an Exceptional Event: Ideas based on how the EPA has recently documented events to support regulatory decisions." Interested parties can download this presentation from the following site: http://www.epa.gov/ttn/analysis/docs/IdeasforShowingEEEvidence.ppt. Additionally, the EPA is currently developing separate guidance to address the preparation of demonstrations to support wildfire-related ozone event claims.

26. **Question:** Where can an air agency find examples of demonstrations from other air agencies that have been approved by the EPA?

**Answer:** The EPA has posted examples of approved demonstrations at http://www.epa.gov/ttn/analysis/exevents.htm.

27. **Question:** How quickly will the EPA review the demonstration document and provide feedback to the air agency on the approval, or on any suggested improvements?

**Answer:** The EPA generally intends to conduct its initial review of a submitted exceptional event demonstration package within 120 days of receipt. Following this initial review, the EPA will generally send a letter to the submitting agency that includes a completeness determination and/or a request for additional information, a date by which the supplemental information should be submitted (if applicable)[14], and an indicator of the timing of the EPA's final review. The EPA will generally prioritize exceptional event determinations that affect near-term regulatory decisions.[15]

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, if possible within 12 months from the event occurrence, after the agency identifies the event(s) as being significant. A letter of intent is an *option* for the air agency to use in situations where it may help communication and prioritization.[16] This initial notification can assist both the air agency and the EPA in the planning and prioritization process. The EPA intends to respond to such a letter within 60 days of receipt. 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 intends to make a decision regarding concurrence with an air agency's flag as expeditiously as necessary if required by a near-term regulatory action, but no later than 18 months following submittal of a complete package. The EPA intends to communicate with the submitting agency, as needed, during the demonstration review period.

Submitting air agencies that believe their demonstration packages are tied to near-term regulatory actions should submit their demonstration packages well in advance of the regulatory deadline. Air agencies should also identify the relationship between the exceptional event-related flagged data and the anticipated regulatory action in the cover letter that accompanies their initial submittal package to the reviewing EPA regional office.

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[14] The EPA will generally ask that air agencies provide supplemental information within 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 the EPA's actions may limit the response time the EPA allows.
[15] "Regulatory decisions" include findings as to whether the area has met the applicable NAAQS, classification determinations, attainment demonstrations, the development of Limited Maintenance Plans, clean data findings.
[16] The Letter of Intent is an optional step and the EPA recognizes that air agencies 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, an air agency could consider submitting an annual letter of intent if annual submittal makes sense for resource planning or for historically seasonal events.

28. **Question:** Will the EPA ever perform and consider additional data analysis itself before deciding whether to approve an air agency-submitted demonstration in support of data exclusion?

**Answer:** In general, the EPA does not prepare analyses or additional arguments for inclusion in a submitted demonstration package or to support the EPA's concurrence on a demonstration package. Rather, the EPA will recommend demonstration package improvements to the submitting agency. However, if a demonstration package is associated with an imminent regulatory action and the public interest will be best served by the EPA's preparing and/or considering additional analyses, the EPA may either assist with or independently prepare supporting analyses that could become part of the submission package or an EPA-prepared technical support document. Analyses prepared by the EPA could support either approval or disapproval of an air agency's request for concurrence on flagged data.

28a. **Question:** Does the Exceptional Events Rule contain a dispute resolution process that air agencies can use to resolve disagreements regarding non-concurrence on submittal packages?

**Answer:** Several mechanisms currently exist that air agencies can use at various points in the exceptional events process:

- Engage in early dialogue with the appropriate EPA regional office.
- Submit requests for reconsideration to the official who made the determination if a request identifies a clear error or if information submitted by the agency was overlooked
- Elevate the concern within the EPA's chain of command.
- Participate in the public notice and comment process (see Question 14a).
- Challenge in an appropriate court the regulatory decision subsequently made that is based on the EPA's exceptional event determination.

In addition, for complex exceptional events claims or those with significant regulatory or other impacts (e.g., those claims that directly influence proposed designation or redesignation, classifications, and attainment determinations), the EPA regional office staff will generally seek input from other EPA regional offices and/or the EPA headquarters staff.

28b. **Question:** Can air agencies use data from non-regulatory monitors in exceptional events analyses?

**Answer:** Yes, air agencies can use data from non-regulatory monitors to support their exceptional event demonstrations. Generally, monitoring data used for NAAQS regulatory purposes are collected from Federal Reference Method (FRM), Federal Equivalent Method (FEM), and/or Approved Regional Method (ARM) monitors that are sited and operated in accordance with 40 CFR Part 58. Exceedances or violations

identified as exceptional events originate from these same data from FRM/FEM/ARM monitors. The AQS, the EPA's repository of ambient air quality data, stores data from more than 10,000 monitors, about 5,000 of which are currently active. Although not all of these monitors are FRM/FEM/ARM-approved, data from non-FRM/FEM/ARM monitors can be used in exceptional event analyses. For example, air quality data summaries from non-FRM/ FEM/ARM monitors may be helpful in defining the duration and geographic extent of the event, including the area of exceedance/violation and the area containing sources that contribute to the exceedances/violations. Similarly, chemical speciation data from monitor samples can help characterize the nature of the violation and identify contributing emissions sources.

## F. Exceptional Event Data Flagging for Air Quality Concentrations that Could Contribute to an Exceedance or Violation of the National Ambient Air Quality Standards

29. **Question:** Each criteria pollutant except $PM_{10}$ now has multiple NAAQS in effect that differ by averaging period, and/or there is an "original" and a lower "revised" NAAQS level each of which has regulatory significance. If the EPA approves a measurement value for exclusion for one particular NAAQS averaging period and level, does the EPA automatically exclude the same value for all the other NAAQS for that pollutant?

    **Answer:** No. Air agencies should request and support the exclusion of a measured air concentration separately for each NAAQS that applies to the pollutant. The EPA will similarly provide separate concurrences.

    When initially flagging data, an air agency does not need to identify the specific NAAQS for which it seeks to exclude a measured concentration. The EPA's ambient air quality database, AQS, is designed to allow an air agency to apply a single flag to a measured concentration value, which merely indicates the agency's interest in excluding that value with respect to one or more of the applicable NAAQS. Later, in the request for data exclusion (i.e., the demonstration), the air agency can indicate the specific NAAQS for which it seeks exclusion and for which the demonstration addresses the Exceptional Events Rule criteria. When the EPA makes a decision regarding concurrence with an air agency's flag, it will generally identify in its approval/disapproval letter (or other official notice) all of the NAAQS for which the EPA has concurred on the flag. The EPA will also generally set a flag in AQS indicating concurrence with respect to a specific single NAAQS or a specific combination of NAAQS for that pollutant (e.g., in the case of $PM_{2.5}$, the 24-hour NAAQS only, the annual NAAQS only, or both the 24-hour and the annual average NAAQS). The EPA does this by associating one or more "pollutant standard ID" value with the concurrence.

    Air agencies preparing demonstrations to support requests to exclude 24-hour average values for $PM_{2.5}$ and $PM_{10}$ should flag all 24 1-hour values within a given day. If concurred upon, flagging all 1-hour values will ultimately result in the same available remaining data for regulatory analysis and calculation regardless of whether the 24-hour $PM_{2.5}$ or $PM_{10}$ measurement data are collected from filter-based or continuous monitoring

instruments.[17] The EPA believes flagging all 24 hourly values is appropriate because flagging only peak or selected hours could result in the remaining hourly values still meeting the data completeness requirements. Exclusion of only the high hourly concentrations could result in AQS calculating a valid low (or, potentially high) biased 24-hour concentration under the rules for data interpretation.[18]

The EPA concurrence flags entered into AQS prior to the March 2010 re-engineering of AQS to accommodate the Exceptional Events Rule did not indicate the specific single NAAQS or the specific combination of NAAQS for which the exclusion was approved. These "legacy" concurrence flags have been converted to the new approach using the following defaulting scheme:

- For ozone, all legacy flags were treated as applying to both the 0.08 ppm 8-hour NAAQS and the 0.12 ppm 1-hour NAAQS. This default was chosen because as of March 2010, designations under the 2008 NAAQS of 0.075 ppm had been suspended pending reconsideration of that NAAQS, and AQS staff were not aware of any concurrences already granted with respect to the 0.075 ppm NAAQS.
- For $PM_{2.5}$, all concurrences on events with dates prior to January 1, 2005 (meaning the date of the concentration, not the date of the EPA's concurrence) were presumed to be applicable only to the annual $PM_{2.5}$ NAAQS. This default was chosen because prior to the revision of the 24-hour $PM_{2.5}$ NAAQS in 2006, violations of the 1997 24-hour NAAQS were extremely rare.
- For $PM_{2.5}$, all concurrences on events with dates of January 1, 2005 through March 2010 were presumed to be applicable only to the 24-hour NAAQS because there were no revisions to the annual $PM_{2.5}$ NAAQS during this timeframe, so designations to nonattainment for the annual $PM_{2.5}$ standard were extremely rare. This 24-hour $PM_{2.5}$ NAAQS default was chosen because it was possible for designations under the 2008 24-hour NAAQS to be based on data as early as 2005.
- For $PM_{10}$, all concurrences were presumed to apply to the 24-hour NAAQS, as the annual $PM_{10}$ NAAQS was revoked in 2006.[19]

[17] Filter based instruments typically record a single value within a 24-hour period while continuous monitors typically collect 24 1-hour measurements. Because AQS can calculate a valid 24-hour average concentration with as few as 18 hours, it may be necessary to exclude hours not actually affected by the event to ensure the same data exclusion outcome as if the measurement had been made with a 24-hour filter.

[18] The form of the 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$ is $98^{th}$ percentile averaged over 3 years. The form of the primary annual $PM_{2.5}$ NAAQS of 12 $\mu g/m^3$ is an annual mean averaged over 3 years. The form of the 24-hour $PM_{10}$ NAAQS of 150 $\mu g/m^3$ is not to be exceeded more than once per year on average over 3 years. Biased concentrations can potentially skew the determination of the $98^{th}$ percentile and/or the annual mean for $PM_{2.5}$ and the averages for $PM_{2.5}$ or $PM_{10}$ calculated to determine compliance with the relevant NAAQS.

[19] The EPA realizes that many of the defaulted EPA concurrences for pre-2006 $PM_{10}$ concentrations that were below the level of the 24-hour $PM_{10}$ NAAQS actually were applicable to the annual $PM_{10}$ NAAQS, but this approach was the most practical way to ensure that all other concurrences originally intended to be applicable to the 24-hour NAAQS were preserved. Because concentrations below the level of the 24-hour NAAQS have no effect on attainment determinations for the 24-hour NAAQS, no error can come from treating such values as

- For CO, all concurrences were presumed to apply to both the 1-hour and the 8-hour NAAQS. This default was chosen to ensure that the concurrence applied to whichever NAAQS had been exceeded and was the basis for the exclusion request.
- For $SO_2$, all concurrences were presumed to apply to both the 24-hour and the annual NAAQS. This default was chosen to ensure that the concurrence applied to whichever NAAQS had been exceeded and was the basis for the exclusion request. No flags were assumed to apply to the 1-hour NAAQS because the 1-hour $SO_2$ standard was not promulgated until June of 2010, after the AQS re-engineering.
- For Pb, all concurrences (if any existed) were presumed to apply to the quarterly average NAAQS of 1.5 $\mu g/m^3$. This default was chosen because March 2010 was prior to the EPA issuing final designations under the 2008 Pb NAAQS of 0.15 $\mu g/m^3$.
- For $NO_2$, all concurrences were presumed to apply to the annual NAAQS because the 1-hour NO2 standard was not promulgated until February of 2010.

For concurrences on events with dates after the March 2010 re-engineering of AQS, the EPA will specify the NAAQS to which the concurrence applies. If this defaulting scheme does not properly represent the actual concurrence action that was taken by the EPA regional office, the regional office should revise and correct the concurrence flags, if it has not already done so.

Air agencies can find detailed information on the use of events flags in AQS in a tutorial posted at http://www.epa.gov/ttn/airs/airsaqs/manuals/ExceptionalEventTutorial.pdf. The tutorial discusses concurrence flags on page 20.

30. **Question:** For a NAAQS that is defined for a multi-hour or multi-day averaging time, but for which concentrations are measured, reported, and flagged on the basis of a shorter time period, what comparisons between measurements and the NAAQS level should air agencies prepare to satisfy the "but for" test?

**Answer:** One requirement for data exclusion under the Exceptional Events Rule is that there would have been no exceedance or violation of the NAAQS "but for" the event. In AQS, flagging and concurrence are done for each individual reported measurement. When the averaging period for the NAAQS is the same as the measurement duration period, individual measurements that have event flags attached can be compared directly to the level of the NAAQS. This is the case for the 1-hour ozone, 1-hour CO, 1-hour $SO_2$, and 1-hour $NO_2$ NAAQS. This is also the case when 24-hour filter-based $PM_{10}$ or $PM_{2.5}$ concentrations are compared to the respective 24-hour NAAQS.[20] However, a difference

having been concurred. Nevertheless, the EPA regional office may choose to update these concurrence flags as time permits.

[20] Air agencies have for many years reported $SO_2$ concentrations as hourly averages. While some air agencies have also voluntarily reported 5-minute average concentrations also, either for each of the 12 5-minute blocks in an hour or for the maximum 5-minute average concentrations (block or running) during an hour, it is the hourly concentration averages that should be compared to the 1-hour $SO_2$ NAAQS. Under a change in $SO_2$ monitoring

exists for the following NAAQS between the time period for reporting concentrations and the averaging period to which the level of a NAAQS applies.

- Ozone, CO, $NO_2$, and $SO_2$ are reported to AQS as 1-hour measurements, but all three have NAAQS defined for longer averaging periods (3-hours, 8-hours, 24-hours, and/or annual). The longer-period concentration values that are compared to these NAAQS are calculated from the submitted hourly values within AQS and cannot have event flags attached to them.
- Pb is reported as 24-hour measurements, but the old and new NAAQS are both for three-month averages (quarterly averages and 3-month rolling averages, respectively). The quarterly and 3-month concentration values that are compared to these NAAQS are calculated from the submitted 24-hour measurements within AQS and cannot have event flags attached to them.
- When using automated/continuous monitoring equipment, $PM_{2.5}$ and $PM_{10}$ data are reported as 1-hour measurements but there are $PM_{2.5}$ and $PM_{10}$ NAAQS with 24-hour averaging periods and a $PM_{2.5}$ NAAQS with an annual averaging period. The 24-hour and annual values compared to the NAAQS are calculated within AQS and cannot have event flags attached to them. As described in more detail in the response to Question 29, to ensure the same data exclusion outcome regardless of whether $PM_{2.5}$ and $PM_{10}$ measurements are made with filter-based or continuous monitoring equipment, the EPA intends to exclude all 24 1-hour measurements in a given day whenever the "but for" criterion (and other exceptional event criterion) are satisfied for that day even if an event only affected discrete hours of the day. The EPA will be able to do this only if the air agency has applied "R" flags to each of those hours.[21]
- When using filter-based monitoring equipment, $PM_{2.5}$ and $PM_{10}$ are reported as 24-hour measurements but there is a $PM_{2.5}$ NAAQS with an annual averaging period. The annual values used in comparisons the NAAQS are calculated within AQS and cannot have event flags attached to them.

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requirements that accompanied the promulgation of the 1-hour $SO_2$ NAAQS, the EPA now requires that air agencies report the maximum 5-minute block average concentration, as well as the hourly concentration (see 40 CFR § 58.12(g)). Air agencies may satisfy the 5-minute reporting requirement by submitting all twelve 5-minute block averages or by reporting only the maximum 5-minute block average concentration. The EPA's AQS retains the hourly concentration as submitted; AQS does not use 5-minute data to replace the submitted hourly concentration. While 5-minute concentrations may play a role in evaluating whether Exceptional Event criteria are satisfied for a given hour and event, for example to establish a clear causal connection, they are not to be compared to the level of the 1-hour (or any other) NAAQS for $SO_2$ as part of a "but for" demonstration and should not be flagged for exclusion under the EER. Air agencies may, however, use "I" series flags (Information only) with 5-minute $SO_2$ data.

[21] Because AQS can calculate a valid 24-hour average concentration with as few as 18 hours, it may be necessary to exclude hours not actually affected by the event to ensure the same data exclusion outcome as if the measurement had been made with a 24-hour filter. Exclusion of only the high hourly concentrations could result in AQS calculating a valid low (or, potentially high) biased 24-hour concentration under the rules for data interpretation.

The mismatches of time periods make this a question with a complex answer. The following paragraphs, summarized in Table Q30-1, explain the general rationale behind the pollutant and NAAQS-specific entries in Table Q30-2.

To satisfy the "but for" criterion, there must have actually been an exceedance or violation of the NAAQS in a time period overlapping with the event and its effects on air quality, and which would not have occurred "but for" the effects of the event.[22] By definition, an exceedance necessarily involves a comparison between an air concentration, averaged over a time period equal in length to the averaging time of the NAAQS, and the level of the NAAQS. For example, it does not make sense to compare an individual 1-hour ozone concentration to the level of the 8-hour NAAQS as part of a test of whether the "but for" criterion is met, because the outcome of the comparison for a single hour does not indicate whether an exceedance or violation of the 8-hour NAAQS occurred, or whether it would not have occurred "but for" the event. Instead, air agencies should consider whether the event made a "but for" difference in the average concentration over the period that is the same as the averaging period for the NAAQS. That is, air agencies making a "but for" argument should compare the average concentration, rather than the individual concentrations comprising the average, to the identified NAAQS.[23] Air agencies should, however, identify in their exceptional event submission those particular measurements that caused the elevated average.

The preamble to the Exceptional Events Rule provides one exception from this formal definitional approach. The preamble states that in the particular case of $PM_{2.5}$, the direct comparison of a single 24-hour average concentration (determined from a single filter-based measurement or by averaging 24 1-hour measurements from a continuous equivalent instrument) to the level of the annual NAAQS can be the basis for meeting the

[22] The EPA interprets the Exceptional Event Rule and its preamble to mean "exceedance or violation" each time that "exceedance" or "violation" occurs in the text, consistent with the obvious intent of the Clean Air Act amendment requiring the EPA to promulgate the Rule. An "exceedance" occurs each time the concentration in the air for the averaging period applicable to the NAAQS is higher than the level of the NAAQS. Most NAAQS allow some such occurrences in a 1-year or 3-year time period (depending on the NAAQS). A "violation" of the NAAQS occurs when there have been enough high-concentration episodes that the statistical form of the particular NAAQS indicates a failure to meet the NAAQS.

[23] A scenario could exist in which the effect of an event on one or more 24-hour $PM_{2.5}$ concentration creates a "but for" difference on the annual concentration even though the actual 24-hour concentration(s) on the day(s) of the event was below the level of the annual NAAQS. This implies that the EPA could concur with the exclusion request for the 24-hour concentration value. However, the Exceptional Events Rule preamble makes clear that only 24-hour $PM_{2.5}$ concentrations that are above the level of the annual NAAQS maybe excluded. Similarly, the EPA generally does not intend to concur with respect to any NAAQS on a flag for a 1-hour $NO_2$ and $SO_2$ concentration that is below the level of the respective annual NAAQS, regardless of the outcome of "but for" tests based on comparison of 24-hour or annual average concentrations to their same-period NAAQS. Also, the EPA generally does not intend to concur on flags for a 24-hour Pb measurement below the level of the old (fixed quarterly average) Pb NAAQS or the new (rolling 3-month average) Pb NAAQS. The EPA believes that it is generally appropriate to use the similar restriction for $PM_{2.5}$ stated and explained in the preamble to the Exceptional Event Rule. Moreover, it is highly unlikely that even several hourly concentrations below the level of the annual $NO_2$ NAAQS of 53 ppb could include an event contribution that when summed with all other hourly concentrations and then divided by 8760 (24 hours times 365 days), could result in the annual average $NO_2$ concentration crossing from below the level of the annual NAAQS to above the level of the annual NAAQS.

"but for" criterion for exceedances or violations of the annual NAAQS.[24] In context, it is clear that based on this comparison, a 24-hour concentration can be excluded from the calculation of the annual $PM_{2.5}$ NAAQS design value, if other rule criteria are also met. It is therefore not necessary to show that the annual average $PM_{2.5}$ concentration was above 12 or 15 $\mu g/m^3$ with the event and would have been below 12 or 15 $\mu g/m^3$ "but for" the single event at issue. Such a concentration can also be excluded from the calculation of the design value for the 24-hour $PM_{2.5}$ NAAQS, although this is likely to make a difference to meeting the NAAQS only if the actual measured concentration were close to or above 35 $\mu g/m^3$. This special case is reflected in Table Q30-2.

In light of this departure in the preamble from a formal definitional approach in the case of a 24-hour $PM_{2.5}$ measurement and the annual $PM_{2.5}$ NAAQS, Table Q30-2 also provides a parallel special approach for similar comparisons involving Pb, $NO_2$ and $SO_2$ that the EPA generally intends to apply. The EPA believes applying this interpretation for Pb, $NO_2$, and $SO_2$ is consistent with the interpretation in the preamble for $PM_{2.5}$ and is consistent with the EPA's intent in drafting the Exceptional Events Rule. That is, a 24-hour average concentration of Pb, $NO_2$, or $SO_2$ can be compared to the NAAQS level defined for a longer period, for purposes of meeting "but for" with respect to both the 24-hour NAAQS, if applicable, and the NAAQS with the longer averaging period.

**Table Q30-1. Principles for General Approach to Satisfying the "But For" Test**
Note: The principles identified in this table are presented from the more general and/or self-evident to the more specialized and/or derivative.

| | Principle | Application to Specific NAAQS | Exceptions |
|---|---|---|---|
| 1 | A single measurement may be compared directly to the level of the NAAQS if the averaging times are the same. | • 1-hour NAAQS for CO, $SO_2$, $NO_2$, and ozone.<br>• 24-hour filter-based $PM_{2.5}$ or $PM_{10}$ measurements vs. 24-hour NAAQS. | |

[24] When the EPA promulgated the Exceptional Events Rule in 2007, the level of the annual $PM_{2.5}$ NAAQS was 15 $\mu g/m^3$. On December 14, 2012, the EPA promulgated a revised annual $PM_{2.5}$ NAAQS of 12 $\mu g/m^3$ (78 FR 3086). Because both standards apply, an air agency can choose the appropriate level of the annual NAAQS (i.e., either 12 $\mu g/m^3$ or 15 $\mu g/m^3$) as the basis for meeting the "but for" criterion. For example, an air agency developing an exceptional events demonstration package that may influence an attainment demonstration for the annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$ would likely use 15 $\mu g/m^3$ as the basis for meeting the "but for" criterion while an air agency preparing a demonstration package that may influence initial area designation status for the 2012 annual $PM_{2.5}$ NAAQS of 12 $\mu g/m^3$ would likely use 12 $\mu g/m^3$ as the basis for meeting the "but for" criterion.

| | Principle | Application to Specific NAAQS | Exceptions |
|---|---|---|---|
| 2 | When the measurement time is shorter than the averaging time of the NAAQS (e.g., 1-hour $O_3$ measurements and the 8-hour $O_3$ NAAQS), air agencies can compare the average of the multiple measurements within the averaging period of the NAAQS to the level of the NAAQS (e.g., compare the average of eight 1-hour measurements to the 8-hour NAAQS). If this comparison shows that the average is more than the NAAQS but would have been below the NAAQS in the absence of the event, then the "but for" test will have been met for those individual measurements in the longer averaging period that were affected by the event. Air agencies should, however, identify in their exceptional event submission those particular measurements that caused the elevated average. | • 1-hour ozone measurements vs. 8-hour NAAQS.<br>• 1-hour CO measurements vs. 8-hour NAAQS.<br>• 1-hour $SO_2$ measurements vs. 3-hour, 24-hour, and annual NAAQS.<br>• 1-hour $NO_2$ measurements vs. annual average .NAAQS.<br>• 1-hour $PM_{2.5}$ measurements vs. 24-hour and annual average NAAQS.<br>• 1-hour $PM_{10}$ measurements vs. 24-hour average NAAQS.<br>• 24-hour $PM_{2.5}$ measurements vs. annual average NAAQS.<br>• 24-hour Pb measurements vs. quarterly average NAAQS.<br>• 24-hour Pb measurements vs. rolling 3-month average NAAQS. | If a measurement value is below the level of the quarterly, rolling 3-month, or annual average NAAQS, it generally will not be considered for exclusion regardless of the outcome of comparing the longer period average to the NAAQS level. |
| 3 | When the $PM_{2.5}$ or Pb measurement time is 24 hours (and when hourly $PM_{2.5}$ measurements are used to calculate a 24-hour concentration), it is also permitted to compare the 24-hour concentration to the annual average $PM_{2.5}$ NAAQS or the quarterly or rolling 3-month Pb NAAQS. | • 24-hour $PM_{2.5}$ concentrations vs. the annual average NAAQS (expressly permitted in the preamble to the Exceptional Events Rule).<br>• 24-hour Pb filter measurements vs. the quarterly average and rolling 3-month average NAAQS (suggested by this guidance as a consistent with the intent of the $PM_{2.5}$ provision in the preamble). | |
| 4 | 1-hour $SO_2$ measurements may be averaged to 24-hour periods and then compared to the annual average NAAQS. If the "but for" test is supported by this comparison, the showing supports a "but for" finding with respect to the 24-hour NAAQS for those individual 1-hour measurements in the 24-hour averaging period that were affected by the event. | • A comparison of 1-hour $SO_2$ measurements vs. the annual average NAAQS (where the 30 ppb annual $SO_2$ NAAQS still applies) is recommended in this guidance to create a reasonable benchmark for judging the excludability of 1-hour $SO_2$ measurements for the purpose of the annual NAAQS, for cases when the event did not affect the annual average enough to make a "but for" difference relative to the annual average NAAQS. | |
| 5 | When there is no NAAQS for the 24-hour averaging period, 1-hour measurements may be compared directly to the annual NAAQS. | • A comparison of 1-hour $NO_2$ measurements vs. annual average NAAQS is recommended in this guidance to create a reasonable | |

| | Principle | Application to Specific NAAQS | Exceptions |
|---|---|---|---|
| | | benchmark for judging the excludability of 1-hour $NO_2$ measurements for the purpose of the annual NAAQS, for cases when the event did not affect the annual average enough to make a "but for" difference relative to the annual average NAAQS. | |
| 6 | Otherwise, single 1-hour measurements generally may not be compared to the level of the annual average NAAQS. | • Single 1-hour $SO_2$ measurements generally may not be compared the annual average NAAQS (because there is a 24-hour NAAQS for $SO_2$ with a defined averaging methodology).<br>• Single 1-hour $PM_{2.5}$ measurements generally may not be compared to the annual average NAAQS (because there is a 24-hour NAAQS for $PM_{2.5}$ with a defined averaging methodology). | |

Table Q30-2 identifies the comparisons and conclusions that generally would help satisfy the "no exceedance but for" test for each pollutant, for each current NAAQS. Note that for completeness Table Q30-2 addresses some situations that may be very unlikely to actually occur – for example, that a single event might cause an exceedance of the annual average $NO_2$ NAAQS. Also, note that Table Q30-2 addresses only the "no exceedance but for" question. As indicated in the answer to Question 31, even if an event cannot be demonstrated to make a "but for" difference in whether an exceedance occurred, it is possible that it makes a "but for" difference in whether a 3-year violation of the NAAQS occurred, for the NAAQS that are defined based on a 3-year average design value concentration. The logic behind Table Q30-2 applies to a "no violation but for" test also. Air agencies may request assistance from the EPA regional office on applying this logic when performing a "no violation but for" test.

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 1 | Ozone | 0.12 ppm<br>1-hour averaging period<br>1-hour measurement | • If a 1-hour measured concentration was above 0.124 ppm but would have been 0.124 ppm or less in the absence of the event, the 1-hour ozone concentration value meets the "but for" test for purposes of comparison to the 1-hour NAAQS. If other criteria are also met for that hour (e.g., there was a clear causal relationship between the event and that hour's ozone level, among other criteria), then the hour can be flagged and concurred for exclusion. |
| 2 | Ozone | 0.08 ppm<br>8-hour averaging period<br>1-hour measurement | • If the daily maximum 8-hour average of measured concentrations was above 0.084 ppm but would have been 0.084 ppm or less in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to the 0.08 ppm 8-hour ozone NAAQS.<br><br>The exclusion of some or all hours of the 8-hour period that was originally the daily maximum 8-hour period may cause another 8-hour period to become the daily maximum. The "but for" comparison can be repeated for this new 8-hour period, which may result in flagging and concurrence for more 1-hour values. It is also possible for additional hourly concentrations that were not included in the original 8-hour block to be excluded as part of a second 8-hour block. |
| 3 | Ozone | 0.075 ppm<br>8-hour averaging period<br>1-hour measurement | • If the daily maximum 8-hour average of measured concentrations was above 0.075 ppm but would have been 0.075 ppm or less in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to the 0.075 ppm 8-hour ozone NAAQS.<br><br>The exclusion of some or all hours of the 8-hour period that was originally the daily maximum 8-hour period may cause another 8-hour period to become the daily maximum. The "but for" comparison can be repeated for this new 8-hour period, which may result in flagging and concurrence for more 1-hour values. It is also possible for additional hourly concentrations that were not included in the original 8-hour block to be excluded as part of a second 8-hour block. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 4 | $PM_{2.5}$ | 35 µg/m$^3$<br>24-hour averaging period<br>1-hour measurement<br><br>(Note: Air agencies can use either 15.0 µg/m$^3$ or 12.0 µg/m$^3$ as a basis for comparison.) | • If the 24-hour average concentration based on 1-hour measurements was above 35.4 µg/m$^3$ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(c)) but would have been 35.4 µg/m$^3$ or less in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to the 35 µg/m$^3$ 24-hour $PM_{2.5}$ NAAQS.<br>• Also, if the 24-hour average concentration based on 1-hour measurements was above 12.0 / 15.0 µg/m$^3$ (after truncation after the first decimal digit) but would have been 12.0 / 15.0 µg/m$^3$ or less in the absence of the event, those 1-hour concentration values that were affected by the single event are eligible to be considered for exclusion for purposes of comparison to the 35 µg/m$^3$ 24-hour $PM_{2.5}$ NAAQS. |
| 5 | $PM_{2.5}$ | 12.0 µg/m$^3$<br>Annual averaging period<br>1-hour measurement<br><br>(Note: Air agencies preparing demonstrations involving PM concentrations for comparison against the 1997 annual $PM_{2.5}$ standard of 15.0 µg/m$^3$ should substitute 12.0 µg/m$^3$ with 15.0 µg/m$^3$ in the "General Approach" steps in the next column.) | • If the annual average $PM_{2.5}$ concentration was above 12.0 µg/m$^3$ but would have been equal to or less than 12.0 µg/m$^3$ (after rounding to one decimal digit) in the absence of the single event's effect on one or more hours, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to 12 µg/m$^3$ annual $PM_{2.5}$ NAAQS.<br>• Also, if the 24-hour average concentration based on 1-hour measurements was above 12.0 µg/m$^3$ (after rounding to one decimal digit, per 40 CFR 50 Appendix N section 4.3(a)) but would have been equal to or less than 12.0 µg/m$^3$in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to 12 µg/m$^3$ annual $PM_{2.5}$ NAAQS.<br><br>However, an hourly value must be part of a 24-hour average concentration that is above 12 µg/m$^3$ (after rounding to one decimal digit) to be excluded from an annual NAAQS calculation. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 6 | $PM_{2.5}$ | 35 μg/m$^3$<br>24-hour averaging period<br>24-hour measurement<br><br>(Note: Air agencies can use either 15.0 μg/m$^3$ or 12.0 μg/m$^3$ as a basis for comparison.) | • If the 24-hour average concentration was above 35.4 μg/m$^3$ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(b)) but would have been 35.4 μg/m$^3$or less in the absence of the event, the 24-hr concentration value meets the "but for" test for purposes of comparison to 35 μg/m$^3$ 24-hour $PM_{2.5}$ NAAQS.<br>• Also, if the 24-hour average concentration was above 12.0 / 15.0 μg/m$^3$ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(b)) but would have been 12.0 / 15.0 μg/m$^3$or less in the absence of the event, the 24 average concentration meets the "but for" test for purposes of comparison to 35 μg/m$^3$ 24-hour $PM_{2.5}$ NAAQS. |
| 7 | $PM_{2.5}$ | 12 μg/m$^3$<br>Annual averaging period<br>24-hour measurement<br><br>(Note: Air agencies preparing demonstrations involving PM concentrations for comparison against the 1997 annual $PM_{2.5}$ standard of 15.0 μg/m$^3$ should substitute 12.0 μg/m$^3$ with 15.0 μg/m$^3$ in the "General Approach" steps in the next column.) | • If the annual average $PM_{2.5}$ concentration was above 12.0 μg/m$^3$ (after rounding to one decimal digit per 40 CFR 50 Appendix N section 4.2(a)) but would have been equal to or less than 12.0 μg/m$^3$ in the absence of the single event's effect on one or more days, those 24-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to 12 μg/m$^3$ annual $PM_{2.5}$ NAAQS.<br>• Also, if the 24-hour average concentration from the filter-based sampler was above 12.0 μg/m$^3$ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(b)) but would have been equal to or less than 12.0 μg/m$^3$in the absence of the event, the 24-hour value meets the "but for" test for purposes of comparison to 12 μg/m$^3$ annual $PM_{2.5}$ NAAQS. |
| 8 | $PM_{10}$ | 150 μg/m$^3$<br>24-hour averaging period<br>1-hour measurement | • If the 24-hour average concentration based on 1-hour measurements was above 150 μg/m$^3$ (after rounding to the nearest 10 μg/m$^3$, per 40 CFR 50 Appendix K section 1.0(b)) but would have been equal to or less than 150 μg/m$^3$ in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to the 150 μg/m$^3$ 24-hour $PM_{10}$ NAAQS. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 9 | $PM_{10}$ | 150 μg/$m^3$<br>24-hour averaging period<br>24-hour measurement | • If the 24-hour average concentration from the filter-based sampler was above 150 μg/$m^3$ (after rounding to the nearest 10 μg/$m^3$, per 40 CFR 50 Appendix K section 1.0(b)) but would have been equal to or less than 150 μg/$m^3$ in the absence of the event, the 24-hour value meets the "but for" test for purposes of comparison to the 150 μg/$m^3$ 24-hour $PM_{10}$ NAAQS. |
| 10 | CO | 35 ppm<br>1-hour averaging period<br>1-hour measurement | • If a 1-hour measured concentration was above 35.0 ppm (after rounding to one decimal digit per 40 CFR 50.8(d)) but would have been 35.0 ppm or less in the absence of the event, the 1-hour CO concentration value meets the "but for" test for purposes of comparison to the 1-hour NAAQS. |
| 11 | CO | 9 ppm<br>8-hour averaging period<br>1-hour measurement | • If an 8-hour average of measured concentrations is one of the two highest non-overlapping 8-hour periods of the year and was above 9.0 ppm (after rounding to one decimal digit per 40 CFR 50.8(d)) but would have been equal to or less than 9.0 ppm in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to the 9 ppm 8-hour CO NAAQS.<br><br>The exclusion of some or all hours of the 8-hour period that was originally one of the two highest non-overlapping 8-hour periods of the year may cause another 8-hour period to become one of two highest non-overlapping 8-hour periods of the year. The "but for" comparison can be repeated for this new 8-hour period, which may result in flagging and concurrence for more 1-hour values. It is also possible for additional hourly concentrations that were not included in the original 8-hour block to be excluded as part of a second 8-hour block. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 12 | Pb | 1.5 μg/$m^3$<br>Quarterly averaging period<br>24-hour measurement | • If the quarterly mean was above 1.5 μg/$m^3$ (after rounding to one decimal digit) but would have been equal to or less than 1.5 μg/$m^3$ in the absence of the single event's effect on some day(s), the 24-hour value(s) affected by the single event meets the "but for" test for purposes of comparison to the 1.5 μg/$m^3$ quarterly average Pb NAAQS. (Note that given the 1-in-6 sampling schedule for Pb, it will be unusual for a single event to affect multiple sampling days.)<br>• Also, if the 24-hour average concentration from the filter-based sampler was above 1.5 μg/$m^3$ (after rounding to one decimal digit) but would have been equal to or less than 1.5 μg/$m^3$in the absence of the event, the 24-hour value meets the "but for" test for purposes of comparison to 1.5 μg/$m^3$ quarterly average Pb NAAQS.<br><br>A 24-hour Pb concentration that is equal to or less than 1.5 μg/$m^3$ will generally not be considered for exclusion. |
| 13 | Pb | 0.15 μg/$m^3$<br>Rolling 3-month averaging period<br>24-hour measurement | • If a 3-month mean was above 0.15 μg/$m^3$ (after rounding to two decimal digits) but would have been equal to or less than 0.15 μg/$m^3$ in the absence of the single event's effect on some day(s), the 24-hour value affected by the single event meets the "but for" test for purposes of comparison to the 0.15 μg/$m^3$ quarterly average Pb NAAQS. (Note that given the 1-in-6 sampling schedule for Pb, it will be unusual for a single event to affect multiple sampling days.)<br>• Also, if the 24-hour average concentration from the filter-based sampler was above 0.15 μg/$m^3$ (after rounding to two decimal digits per 40 CFR 50 Appendix R section 5(b)) but would have been equal to or less than 0.15 μg/$m^3$ in the absence of the event, the 24-hour value meets the "but for" test for purposes of comparison to the 0.15 μg/$m^3$ quarterly average Pb NAAQS.<br><br>A 24-hour Pb concentration that is equal to or less than 0.15 μg/$m^3$ will generally not be considered for exclusion. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 14 | $NO_2$ | 100 ppb<br>1-hour averaging period<br>1-hour measurement | • If a 1-hour measured concentration was above 100 ppb (after truncating to a whole number per 40 CFR 50 Appendix S section 4.2(c)) but would have been equal to or less than 100 ppb in the absence of the event, the 1-hour $NO_2$ concentration value meets the "but for" test for purposes of comparison to the 1-hour NAAQS. |
| 15 | $NO_2$ | 53 ppb<br>Annual averaging period<br>1-hour measurement | • If the annual average of all the measured 1-hour concentrations in a year was above 53 ppb (after rounding to a whole number per 40 CFR 50 Appendix S section 4.1(b)) but would have been 53 ppb or less in the absence of the event, those 1-hour values that were affected by the single event meet the "but for" test for purposes of comparison to the 53 ppb annual average $NO_2$ NAAQS.<br>• If the 1-hour concentration was above 53 ppb (after truncating to a whole number per 40 CFR 50 Appendix S section 4.2(c)) but would have been equal to or less than 53 ppb in the absence of the event meets the "but for" test for purposes of comparison to annual NAAQS.<br><br>However, a 1-hour $NO_2$ concentration that is below 53 ppb (after rounding to a whole number) will generally not be considered for exclusion. |
| 16 | $SO_2$ | 75 ppb<br>1-hour averaging period<br>1-hour measurement | • If a 1-hour measured concentration was above 75 ppb (after rounding to a whole number per 40 CFR 50 Appendix T section 4(c)) but would have been equal to or less than 75 ppb in the absence of the event, the 1-hour $SO_2$ concentration value meets the "but for" test for purposes of comparison to the 1-hour $SO_2$ NAAQS. |

**Table Q30-2. General Approaches for Satisfying the "No Exceedance But For" Test**

| | Pollutant | Specific Case:<br>NAAQS level<br>NAAQS averaging period<br>Measurement period | General Approach |
|---|---|---|---|
| 17 | $SO_2$ | 140 ppb<br>24-hour averaging period<br>1-hour measurement | • If the 24-hour average concentration based on 1-hour measurements was above 140 ppb (after rounding to the nearest 10 ppb per 40 CFR 50.4(b)) but would have been equal to or less than 140 ppb in the absence of the event, those 1-hour concentration values that were affected by the single event meet the "but for" test for purposes of comparison to 140 ppb 24-hour $SO_2$ NAAQS.<br>• Also, if the 24-hour average concentration based on 1-hour measurements was above 30 ppb (after rounding to the nearest 10 ppb per 40 CFR 50.4(b)) but would have been equal to or less than 30 ppb in the absence of the event, those 1-hour concentration values that were affected by the event meet the "but for" test for purposes of comparison to the 140 ppb 24-hour $SO_2$ NAAQS. |
| 18 | $SO_2$ | 30 ppb<br>Annual averaging period<br>1-hour measurement | • If the annual average of measured 1-hour concentrations was above 30 ppb (after rounding to a whole number per 40 CFR 50.4(a))) but would have been 30 ppb or less in the absence of the event, those 1-hour values that were affected by the single event meet the "but for" test for purposes of comparison to the 30 ppb annual average $SO_2$ NAAQS.<br><br>If the 30 ppb annual $SO_2$ NAAQS still applies in the affected area, a 1-hour concentration equal to or below 30 ppb (after rounding to a whole number per 40 CFR 50.4(a)) will generally not be considered for exclusion. |
| 19 | $SO_2$ (secondary) | 500 ppb<br>3-hour averaging period<br>1-hour measurement | • If the 3-hour average of measured 1-hour concentrations was above 500 ppb (rounded to the nearest 100 ppb per 40 CFR 50.5(a)) but would have been equal to or less than 500 ppb in the absence of the event, those 1-hour values that were affected by the single event meet the "but for" test for purposes of comparison to the 3-hour average secondary $SO_2$ NAAQS. |

31. **Question:** When is it appropriate for air agencies to flag concentration values that are less than the level of the relevant NAAQS? Under what circumstances will the EPA concur on such flags?

**Answer: (**Please read Q30 before reading this response.)

AQS currently allows an air agency to flag any measured concentration values it chooses, including values below the level of the relevant NAAQS. The EPA does not plan to implement any new technical restrictions through the AQS software. Also, the Exceptional Events Rule does not prohibit air agencies from flagging values below the level of the NAAQS. However, the EPA does not intend to review data flags in AQS for concurrence until the air agency submits its evidence/analysis package demonstrating that exclusion of the flagged values is consistent with the criteria in the Exceptional Events Rule, including the "but for" analysis at 40 CFR 50.14(c)(3)(iv)(D). Air agencies wishing to flag values for informational purposes should use the "I" series flags in AQS.

Air agencies may see an advantage in flagging all values they believe were affected by an event (and contribute to a violation of the NAAQS), for purposes of being able to later identify historical data that have not been affected so that "normal" concentration patterns can be presented as part of meeting the "in excess of historical fluctuations" prong of the exclusion criteria. AQS does not prevent such flagging, but air agencies should be aware that agency flagging by itself does not establish that the concentrations were in fact affected by an event and should be excluded from the "normal" baseline.

Of the flagged cases that appear in both AQS and in demonstration packages, the EPA may find it appropriate to concur with flags for concentrations that are below the NAAQS only in five very narrow conditions described below. If the EPA determines that a flag on a value less than the level of the NAAQS cannot meet the "but for" test, it is likely the EPA would nonconcur or leave the default/null value of the AQS concurrence flag (indicating no EPA action) in place.

Except in cases involving $PM_{10}$ limited maintenance plans[25], the EPA intends to prioritize events that result in a violation or exceedance of a NAAQS or those that otherwise impact a regulatory decision. As described below and in the response to Question 30, there may be specific instances where individual measurements fall below a NAAQS but still contribute to a violating design value. There may also be instances where a shorter averaging time measurement (e.g., 1-hour $O_3$ measurement of 100 ppb) is not above the level of that averaging time NAAQS (e.g., 1-hour $O_3$ NAAQS of 120 ppb), but is above a longer averaging time NAAQS (e.g., 8-hour $O_3$ NAAQS of 80 ppb) and contributes to a violation of the longer averaging time NAAQS. In such cases, although the individual measurement may not exceed the level of the shorter-term NAAQS, it may be possible for air agencies to present sufficient evidence to satisfy the "but-for" criterion for a longer-term NAAQS.

*(See Questions 8, 9, 13, and 19 for additional information.)*

[25] See May 7, 2009 policy memorandum from William T. Harnett to Regional Air Division Directors at http://www.epa.gov/ttn/oarpg/t1/memoranda/lmp_final_harnett.pdf that allows $PM_{10}$ values between 98 and 154 $\mu g/m^3$ (inclusive) to be flagged, concurred, and excluded for purposes of qualifying an area for reliance on only a limited maintenance plan.

First, $PM_{10}$ values between 98 and 154 $\mu g/m^3$ (inclusive) may be flagged, concurred, and excluded for purposes of qualifying an area for reliance on only a limited maintenance plan (see footnote 24). Because of the expected exceedance form of the $PM_{10}$ NAAQS, concentrations in this range cannot possibly affect whether a site actually meets the NAAQS, so there is no reason for flagging them except when the acceptability of a limited maintenance plan is an issue. The normal AQS flagging and concurrence procedures may be used in this situation.[26]

A second scenario in which the EPA may find it appropriate to concur with flags for concentrations that are below the NAAQS is indicated at 72 FR 13570. If (i) an event has affected air quality on multiple consecutive days, (ii) at least one measured concentration during the episode can be found to meet the "but for" test using the relevant comparison specified in Table Q30-2, and (iii) the air quality impact on each day is "exceptional," measurements for the entire period are eligible for data exclusion regardless of how they compare to the level of the NAAQS. In the context of this provision, "exceptional" encompasses all the requirements of the Exceptional Events Rule other than the "but for" test (e.g., clear causal connection, "in excess of normal historical fluctuations, including background," not reasonably controllable or preventable).

Scenarios in which the measured concentration is greater than a NAAQS with a longer averaging time but less than the level of a NAAQS with a shorter averaging time

Third, applying Table Q30-2 may result in qualifying a 24-hour $PM_{2.5}$ measurement that is greater than the 12 or 15 $\mu g/m^3$ annual $PM_{2.5}$ NAAQS but not greater than the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ NAAQS for exclusion for the purposes of the 24-hour $PM_{2.5}$ NAAQS. This is the result if the actual 24-hour concentration was between 12 or 15 and 35 $\mu g/m^3$ but would have been below 12 or 15 $\mu g/m^3$ but for the effect of the event. It should be noted that an exclusion made under this very specific provision for the 24-hour $PM_{2.5}$ NAAQS will only affect the outcome of an attainment determination for the 24-hour NAAQS if the concentration value in question is one of the few highest daily concentrations during the year, because only then could it have affected the 3-year design value. When a 24-hour value below the level of the 24-hour NAAQS does affect the 3-year design value, the application of the guidance for the fourth situation (below), which is applicable to all four NAAQS pollutants with multi-year design values, would get to the same result as application of this paragraph.

Fourth, assuming that all other Exceptional Events Rule requirements and conditions are met, the EPA may concur with flags for ozone, $PM_{2.5}$, 1-hour $NO_2$, and 1-hour $SO_2$ that are "less than the level of the NAAQS" if adjusting the flagged concentrations for the estimated contribution from the event would change the 3-year design value from being

[26] Values in this range can potentially affect the design value for $PM_{10}$, but these design values are primarily informational and are not likely to influence designations or regulatory determinations of attainment. The procedure for determining a $PM_{10}$ design value in units of $\mu g/m^3$ is given in section 6.3 of the EPA guidance document "$PM_{10}$ SIP Development Guideline," June 1987, posted at http://www.epa.gov/ttn/oarpg/t1/memoranda/pm10sip_dev_guide.pdf.

above the NAAQS to being equal to or below the NAAQS. However, as indicated in footnote 21, concentrations below certain values generally will not be excluded.

Fifth, a 1-hour measurement of a pollutant that is below the level of the 8-hour, 3-hour, 24-hour, or quarterly NAAQS for that pollutant can be excluded if (1) the event affected the 1-hour measurement, and (2) taking into account the event's effect on all the hours in the longer period the effect of the event on the longer averaging period's concentrations satisfies the "but for" criterion. These situations are described in Table Q30-2 (rows 3, 4, 8, 11, 12, 13, 17, and 19). However, as indicated in Table Q30-2, concentrations below certain values generally will not be excluded.

The following NAAQS-specific discussions provide further explanations regarding some of the situations in which a concentration less than the level of the NAAQS may qualify for exclusion. These discussions are not exhaustive and do not obviate the need to refer to Table Q30-2.

*24-hour $PM_{2.5}$*

Assume for illustration that the three annual 98$^{th}$ percentile 24-hour $PM_{2.5}$ concentrations for a monitoring site for 2006-2008 are 41, 31, and 37 μg/m$^3$ for each respective year with a resulting 3-year design value of 36 μg/m$^3$ which is a violation of the 24-hour $PM_{2.5}$ NAAQS of 35 μg/m$^3$. Also, assume that the next highest concentration in 2007 below the 31 μg/m$^3$ was only 20 μg/m$^3$. The 31 μg/m$^3$ concentration in 2007 was affected by a one-day wildfire. The air agency has been able to show that the concentration would have been 17 μg/m$^3$ without the fire. Because neither 20 μg/m$^3$ nor 31 μg/m$^3$ exceed the NAAQS, the event on that day does not meet the "but for" test when viewed from an "exceedance" perspective. However, the effect of the fire on the 2007 value determines whether the 3-year design value passes the 24-hour NAAQS. Had there been no fire, the 98$^{th}$ percentile concentration in 2007 would have been 20 μg/m$^3$ which would result in a 3-year design value of 33 μg/m$^3$ (i.e., less than the 24-hour $PM_{2.5}$ NAAQS of 35 μg/m$^3$). Therefore, the 2007 value of 31 μg/m$^3$ meets the "but for" test when the focus in on NAAQS violations rather than individual exceedances. Assuming other requirements are met, the 31 μg/m$^3$ concentration would be approved by the EPA for exclusion from the 2006-2008 design value. Note that in doing a "violations-based" "but for" analysis, one does not simply substitute the "no event" concentration for the original 98$^{th}$ percentile day into the design value calculation. Rather, one must re-select the 98$^{th}$ percentile day, which sometimes will result in a different day's actual measured value being used in the design value calculation.[27]

It is conceivable that the effect of an event on a given day is not enough to satisfy the "but for" test with regard to the "violation" perspective explained in the preceding

[27] Note that exclusion of this 24-hour value from design values for the annual average NAAQS is a separate question, the likely answer to which is that the value is not excludable. If the event did not make the 24-hour concentration change from below 12 or 15 to above 12 or 15 μg/m$^3$ the event does not meet the first condition specified in row 7 of Table Q30-2. It is also very improbable that an event affecting a single day would meet the second condition in row 7 of Table Q30-2.

paragraph for one three-year period, but that it does satisfy it for an earlier or later 3-year period when it is combined with one or two different concentrations to calculate a 3-year design values, since the outcome of the "violations" analysis may change. After the EPA has approved the exclusion of a concentration based on a "violations" analysis for one 3-year period, the EPA will also exclude that concentration when calculating design values and attainment for the other two 3-year periods that include that same year.

For the 24-hour $PM_{2.5}$ NAAQS, it is possible that multiple days with concentrations below the NAAQS within one year are flagged. Excluding just one of these concentrations may not change the annual 98$^{th}$ percentile concentration enough to cause the 3-year design value to change from "violating" to "complying," but excluding several of them may. The outcome for the design value may also depend in part on whether exclusion is granted for some other concentrations that are above the level of the NAAQS. In such cases, the exclusion decisions should first be made for each of the flagged concentrations that are above the NAAQS. All remaining flagged concentrations (those meeting all other requirements and conditions of the Exceptional Events Rule) should then be considered in progressively larger groups ranked by concentration. That is, if excluding the highest one of the flagged concentrations below the level of the NAAQS would cause a switch in whether the 3-year design value violates the NAAQS then if the EPA determines that value is to be excluded then there is no impact to retaining all others and, thus, no need to make determinations for those others. If excluding the two highest such concentrations causes a switch, then there is no impact to determining whether others beyond those two should be retained.

However, the preamble to the Exceptional Events Rule explicitly states that $PM_{2.5}$ concentrations below the level of the annual NAAQS cannot be excluded for purposes of comparisons to the annual NAAQS. (72 FR 13570, bottom of middle column) Even if the conditions described in the preceding paragraph are met, values below 12 or 15 $\mu g/m^3$ cannot be excluded.

*Annual $PM_{2.5}$*

The preamble to the Exceptional Events Rule explicitly states that $PM_{2.5}$ concentrations below the level of the annual NAAQS cannot be excluded for purposes of comparisons to the annual NAAQS. (72 FR 13570, bottom of middle column)

*Ozone (0.075 ppm 8-hour NAAQS)*

Assume for illustration that the three annual 4$^{th}$ highest daily 8-hour ozone values in 2006-2008 are 0.077, 0.076, and 0.075 ppm respectively. The 0.075 ppm value in 2008 was affected by an exceptional event. The 3-year average would be 0.076 ppm, a NAAQS violation. If the 0.075 ppm value for 2008 were to be excluded and if, as a result, 2008's new 4$^{th}$ highest value was 0.074 ppm or less, the 3-year average (after Appendix P truncation) would be 0.075 ppm, which is not a NAAQS violation. The 0.075 ppm value may be excluded under these circumstances even though it is not itself an exceedance. Furthermore, the exclusion also applies to the use of this value when

calculating the 2007-2009 and 2008-2010 design values, regardless of whether such exclusion causes those design values to switch from violating to complying with the NAAQS.

For ozone, as for 24-hour $PM_{2.5}$, it is possible that an air agency could flag multiple days within one year with concentrations below the NAAQS. Excluding just one of these concentrations may not change the annual 4$^{th}$ highest concentration enough to cause the 3-year design value to change from "violating" to "complying," but excluding several of them may. Also, the outcome for the design value may depend, in part, on whether exclusion is granted for some other concentrations that are above the level of the NAAQS. In such cases, the exclusion decisions should first be made for each of the flagged concentrations that are above the NAAQS. All remaining flagged concentrations (those meeting all other requirements and conditions of the Exceptional Events Rule) should then be considered in progressively larger groups ranked by concentration. That is, if excluding the highest one of the flagged concentrations below the level of the NAAQS would cause a switch in whether the 3-year design value violates the NAAQS then if the EPA determines that value is to be excluded, all others can be retained without impact. If exclusion of the two highest such concentrations causes a switch, then the EPA may focus first on whether only those are to be excluded.

*$PM_{10}$*

The only current $PM_{10}$ NAAQS is the 24-hour NAAQS based on the expected number of exceedances over a 3-year period. Since a concentration below the level of the NAAQS would not be an exceedance and cannot affect compliance with the NAAQS in any way, a concentration below the level of the NAAQS usually cannot be excluded. However, under an EPA policy memo, for the purpose of the EPA approval of a limited maintenance plan $PM_{10}$ values as low as 98 $\mu g/m^3$ can be concurred for exclusion when determining whether an area is eligible for a limited maintenance plan. (See May 7, 2009 memorandum from William T. Harnett to Regional Air Division Directors, http://www.epa.gov/ttn/oarpg/t1/memoranda/lmp_final_harnett.pdf). Because concentrations less than 98 $\mu g/m^3$ would appear to have little regulatory significance, the EPA discourages the flagging of such data.

*Pb*

The legacy 1.5 $\mu g/m^3$ and current 0.15 $\mu g/m^3$ NAAQS for lead are both based on a maximum three-month average concentration. The 1.5 $\mu g/m^3$ standard is based on the maximum quarterly average, while the 0.15 $\mu g/m^3$ NAAQS is based on the highest rolling 3-month average during a 3-year period. As previously explained, the EPA is not likely to concur on the exclusion of a 24-hour concentration value that is below the level of the NAAQS, and we discourage air agencies from flagging such values.

*$NO_2$*

As previously explained, the EPA is not likely to concur on the exclusion of a 1-hour $NO_2$ concentration that is below the level of the annual $NO_2$ NAAQS, and we discourage air agencies from flagging such values.

*$SO_2$*

As previously explained, the EPA is not likely to concur on the exclusion of a 1-hour SO2 concentration that is below the level of the annual $SO_2$ NAAQS, and we discourage air agencies from flagging such values.