

ATTACHMENT 1

Exceptional Events Rule Frequently Asked Questions

The Exceptional Events Rule of 2007¹ supersedes EPA's previous Exceptional Events guidance and policy documents and creates 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 potential event can have different or unique characteristics, and thus, requires a case-by-case demonstration and evaluation. Therefore, the EER adopts a "weight of evidence" approach in evaluating each demonstration to justify excluding data affected by an exceptional event.

Technical questions and issues related to implementation have arisen since the EER was promulgated. This Question and Answer (Q&A) document is intended to respond to some of these frequently asked questions and to provide instruction and clarification to state², local, and tribal agencies implementing the EER. 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
- 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 EPA's Exceptional Events website located at <http://www.epa.gov/ttn/analysis/exeevents.htm>.

Disclaimer

The Exceptional Events Rule is the source of the regulatory requirements for exceptional events and exceptional event demonstrations. This 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.

¹ "Treatment of Data Influenced by Exceptional Events; final Rule," 72 FR at 13563, March 22, 2007.

² All subsequent references to "state" are meant to include state, local and tribal agencies responsible for implementing the EER.

A. Historical Fluctuations

40 CFR 50.14(c)(3)(iv): “The demonstration to justify data exclusion shall provide evidence that:

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(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 point in the historical data?

Answer: It is a test, but there is no specific percentile point that EPA will use to determine whether the test has been passed. EPA has not set pass/fail statistical criteria for this element but will use a weight of evidence approach to assess each demonstration on a case-by-case basis. The state’s role in satisfying this element is to provide analyses and statistics. EPA will use the information provided by the state to determine whether the event was in excess of normal historical fluctuations. “Normal historical fluctuations” will generally be defined by those days without events for the previous years. It is not the state’s role to show that the event was above a particular threshold since EPA is not establishing a threshold. 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 EPA determine whether the “clear causal relationship,” “but for,” and “affects air quality” criteria have been satisfied. These EER criteria, as well as “not reasonably controllable or preventable,” need to be satisfied for EPA to concur on an exceptional event claim. EPA expects that failure on this element indicates likely failure for “clear causal relationship” and/or “but for” as well, and thus does not expect that non-concurrence will result from failure of this element alone. However, failure to submit a comparison would prevent EPA from being able to approve exclusion of the data in question.

EPA recommends that each “historical fluctuation” demonstration submittal contain a minimum set of statistical analyses described in more detail in subsequent questions. Submission of the identified statistical analyses will be considered 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 that the clear causal relationship and “but for” elements will also be successfully demonstrated. 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 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 will not by itself provide much support for “but for” in the weight-of-evidence consideration.

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

Answer: EPA would prefer an analysis showing how the observed concentration compares to the distribution of historical concentrations. To speed EPA review, avoid the need for EPA to request additional information, and ensure that EPA understands the position of the submitting agency; this analysis should consist of the following types of statistics, graphics, and explanatory text:

- Comparison of concentrations on the claimed event day with past historical data (see Question A3 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 can be expected throughout the year, analysis of annual data would likely be more appropriate. For seasonal comparisons, EPA recommends using all available seasonal data from at least three but preferably five or more years and 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, 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, all data should be 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 A3.

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 giving a full and accurate portrayal of 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 other days with similar meteorological conditions (possibly from other years). The objective of such a comparison would be to demonstrate that the event caused higher concentrations than would be expected for given meteorological and/or local emissions conditions.
- Percentile of concentration relative to annual data. The percentile 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, EPA expects a minimum of 300 data points to be included in this calculation. The daily statistic should be appropriate for the form of the standard being considered for data exclusion (see Question 30).
- Percentile of concentration relative to seasonal data. The percentile 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 appropriate to use the same time horizon as used for the percentile calculated relative to annual data.

(Note: The use of percentiles 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 submitted “historical fluctuations” evidence be considered when EPA assesses whether the “but for,” and “clear causal relationship” criteria are met?

Answer: 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), EPA may need less additional evidence to demonstrate the “but for” finding. When the concentration is similar to or higher than a larger number of normal historical values, 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, EPA’s intended use of the data is to determine whether the historical fluctuations prong has been met and to 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.

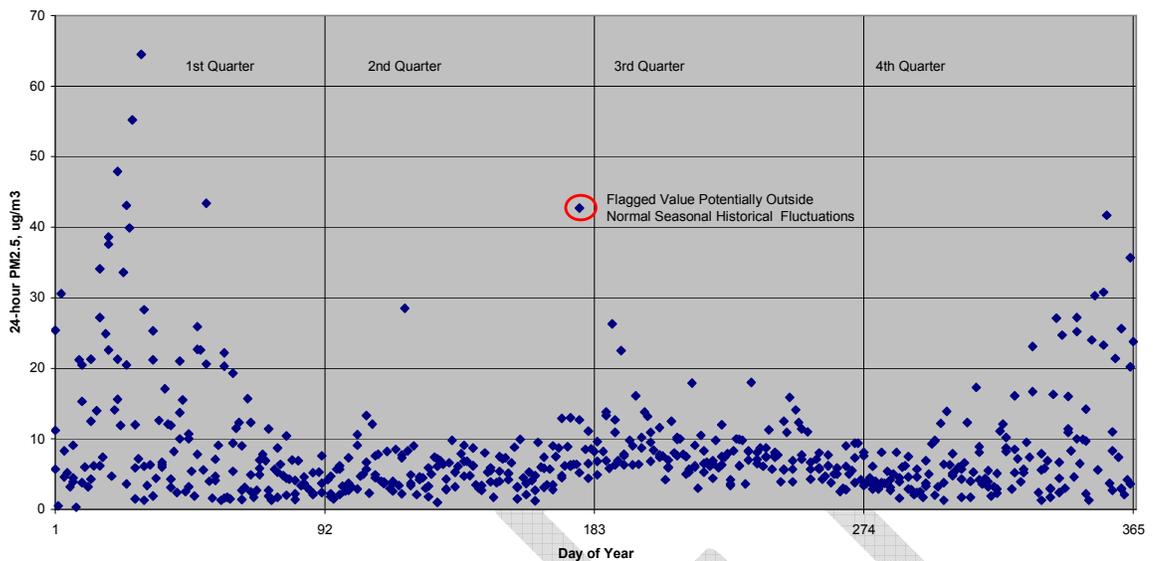
Additional Examples and Explanation Concerning “Historical Fluctuations” Evidence

(Note: The discussion and graphics that follow illustrate the type of analyses and discussion that are described in this question and in Question A2 and that might be included in a submittal showing that an event is associated with a measurement “in excess of normal historical fluctuations.”)

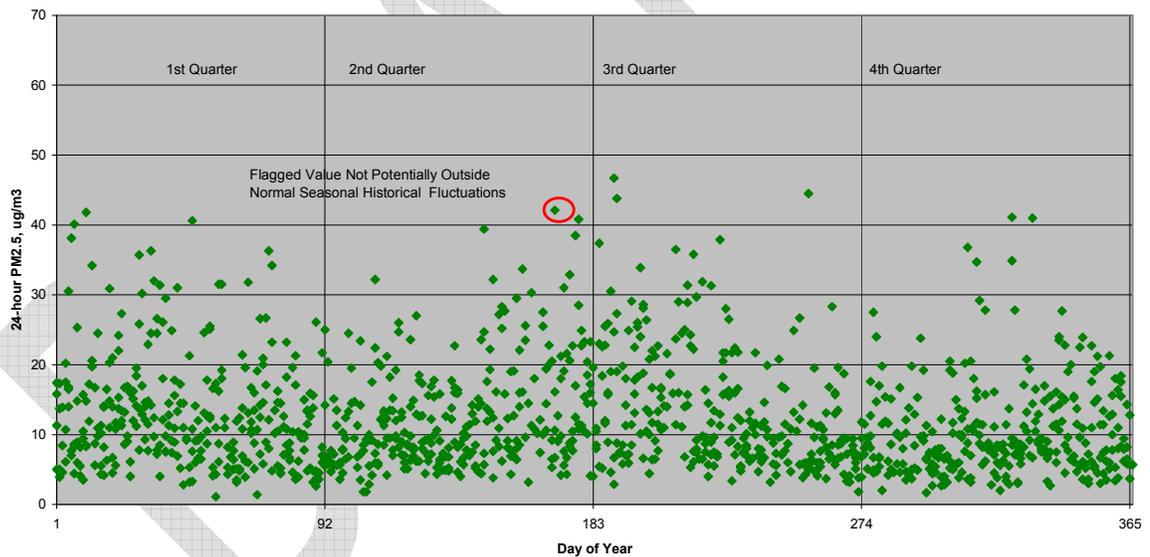
The evidence comparing the event-affected concentration with historical concentrations is most helpful to a state’s demonstration if it shows that the event-affected concentration is high compared to all, or nearly all, historical concentrations generated by normal emissions and ambient conditions. This 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 EPA’s understanding of the impact of these events, states 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 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.

Historical Seasonal Fluctuations in PM_{2.5}, Seasonal Data, 2005-2009



Historical Seasonal Fluctuations in PM_{2.5}, Non-Seasonal Data, 2005-2009



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, PM₁₀ 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 EPA accept less documentation to demonstrate that an event affected air quality simply because an event-affected concentration is above the 95th 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 can have no effect on whether an area is found to meet or violate one of these NAAQS, making a discussion of such flagging irrelevant. 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, 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, states need only submit (with appropriate descriptions and discussion) the type of statistical analyses described in the responses to Questions A2 and A3, and EPA will determine whether these analyses show that the event met this criterion. In addition, as part of its review, EPA will 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 A2, we identified that 3 to 5 years of data should be evaluated to ensure some degree of statistical validity. 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:

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

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

Answer: States may include any evidence that they consider relevant to the “but for” requirement. However, because the effects of a fire on ozone are complex, such evidence may or may not be sufficient to make a convincing demonstration. 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. Generally, the more types of evidence the demonstration includes, the stronger the case for the exceptional event. Demonstrations that include only one of these types of evidence are unlikely to provide sufficient evidence to enable EPA concurrence.

- 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 that 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 affect 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 NO₂ and NO; and pollutant ratios, such as CO/NO_x, CO/PM₁₀, Elemental Carbon (EC)/Organic Carbon (OC), O₃/NO_y and O₃/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. If either type of prediction is included in a demonstration, EPA will likely give it consideration only if the demonstration package also includes information on the uncertainty of the prediction methods, i.e., information on its past success in predicting normal ozone levels. The demonstration should also explain the predictive method in terms that are understandable enough to allow informed public comment.
- 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.

EPA is preparing a separate document that provides more guidance for preparing a demonstration for wildfire events that are believed to have affected ozone concentrations. In addition, 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.³

C. Exceptional Event Data Flagging Schedules

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

Answer: When 40 CFR § 50.14, “Treatment of Air Quality Monitoring Data Influenced by Exceptional Events,” was revised in March 2007, 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 datum year (see 40 CFR § 50.14(c)(2)(iii)) were included for PM_{2.5} in the rule. 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

³ <http://www.epa.gov/ttn/analysis/exevents.htm>

flagging data for initial designation of areas for those NAAQS.” See as examples, the data flagging schedule identified in the SO₂ NAAQS final rule at 75 FR at 35592 or the data flagging schedule identified in the NO₂ NAAQS final rule at 75 FR at 6531.

D. General AQS Procedures

8. **Question:** May a state flag any data in EPA’s ambient air quality database, Air Quality System (AQS), it wishes?

- **Answer:** Yes, but EPA encourages states to only flag data that might have a regulatory consequence and for which an approvable demonstration is likely. In particular, while the EER does not prohibit states from flagging individual concentration values below the level of the NAAQS, in general only such data that contribute to a violation of the NAAQS are excludable. See Questions 29-31 for more information. Should states wish to flag values for informational purposes, EPA prefers that they use the “I” series flags (see Question D10 below).

9. **Question:** Is it possible for an initial description to be inadequate (for example, "fires in surrounding states")?

Answer: Yes, initial descriptions could be inadequate, in which case they will need to be improved. The preamble to the Exceptional Events Rule explains: "At the time the 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 at 13568 (emphasis added). The intent of this initial description is to provide a preliminary minimum explanation as to why the flagged data warrant consideration as exceptional events. EPA believes that providing this initial description will encourage states to only flag data that might have a regulatory consequence and for which an approvable demonstration is likely. The initial event description also notifies EPA of potential forthcoming demonstration packages and assists EPA with its review and prioritization. While EPA is not specifying pass/fail criteria for the initial description, Regional Offices should discuss with the originating submitting agency any description the Regional Office determines to be inadequate. Submitting agencies should then insert in AQS a mutually agreed-upon description.

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

Answer: The “I” series flags (Information only) and “R” series flags (Request Concurrence) are both available for use by monitoring agencies. The “I” series are for information only and the “R” series are for use where the state requests or expects to request EPA concurrence. As an example, states may use an “I” series flag to initially identify values they believe were affected by an event. Once the state collects additional supporting data, they may change the flag to an “R” series flag and submit an initial event description. Or, the state may find that additional information does not support flagging

the data as an exceptional event, and the state may, therefore, delete the flag or retain the “I” series flag. EPA does not intend to review or concur on the Information Only “I” series flags. States should ensure that they have submitted the correct flag 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 C7).

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

Answer: No, the IE/RE flag should not be used for construction.

Generally, construction activity is not considered to be exceptional. Reasonable and appropriate controls capable of preventing localized NAAQS exceedances are expected to 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. This might be a scenario in which dust control measures are not adequate to prevent exceedances / violations in the vicinity of the activity.

If an agency wishes to “flag” data related to exceedances caused by some construction activity, the agency should use the IL/RL “other” exceptional events flag. The IE/RE flag should only be used when an exceptional demolition event occurred and the agency wishes to flag the data for exclusion as an exceptional event. States using either the IE/RE (demolition) flag or the IL/RL (other, including construction) flag to identify an exceptional event would be expected to 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.

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

Answer: Yes. However, special steps need to be taken with regard to data handling within AQS. Under normal circumstances, a state will not have access rights to apply event flags to data from monitors operated by the National Park Service or other federal agencies. The state should first contact the agency operating the monitor to request it to flag the data in question. If the request is unsuccessful, the state should contact the EPA Regional Office for assistance. Regardless of whether the monitor operator or the EPA Regional Office flags the data in question, it is the state’s responsibility to prepare the demonstration and submit it to 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

ozone or PM_{2.5}. Depending on the magnitude of the effect and how the “normal” concentration compares to the NAAQS, the “but for” test may not be satisfied. However, retaining such data in the calculation of a design value for a nonattainment area can elevate the classification status of a nonattainment area (e.g., serious instead of moderate) or make it seem that the area needs more emissions reduction to attain the NAAQS than is actually the case. How will EPA deal with such a situation when reviewing classification status or an attainment demonstration? How, if at all, should AQS be used to flag such data?

Answer: When the available evidence indicates that there would have been an exceedance of a NAAQS even in the absence of the event, the event is not “exceptional” under the EER because the “no exceedance but for” criterion is not satisfied. Yet, this event-related concentration could still impact design values. If the design value is used for an classification of an ozone nonattainment under Subpart 2 of Part D of Title I of the CAA, then it may seem that the area should be classified into a higher category (e.g., severe instead of serious). Similarly, a state incorporating the event-related concentration in a design value used for an attainment demonstration might seem to need more emission reductions to attain the NAAQS than is actually the case.

To illustrate the classification scenario using the 1997 8-hour ozone NAAQS of 0.08 ppm assume that the three annual 4th highest daily maximum 8-hour ozone concentrations for a monitoring site for 2001-2003 were 0.105, 0.105, and 0.115 ppm for each respective year with a resulting 3-year design value of 0.108 ppm which is a violation of the NAAQS. Also, assume that the 5th highest concentration in 2001 below the 0.105 ppm was 0.085. The 0.105 ppm concentration in 2001 was affected by a one-day wildfire, and the state was able to show that the concentration would have been 0.087 ppm without the fire. Because both 0.105 and 0.087 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 2001 value also would not meet the “but for” test, because the “no event” concentration value of 0.087 for the event day in 2001 would still be the 4th highest concentration in 2001 and would still result in a 3-year design value of 0.102 ppm which is a violation. However, a design value of 0.108 ppm corresponds to a classification of serious, while the no-event design value of 0.102 ppm would correspond to a classification of moderate.

To illustrate the attainment demonstration scenario, assume that the three annual 98th percentile 24-hour PM_{2.5} concentrations for a monitoring site for 2006-2008 are 44, 31, and 37 µg/m³ for each respective year, with a resulting 3-year design value of 37 µg/m³ which is a violation. Also, assume that the next highest concentration in 2006 below the 44 µg/m³ was 40 µg/m³. The 44 µg/m³ concentration in 2006 was affected by a one-day wildfire, and the state was able to show that the concentration would have been 41 µg/m³ without the fire. Because both 44 µg/m³ and 41 µg/m³ 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 $\mu\text{g}/\text{m}^3$ for the event day in 2006 would still be the 98th percentile concentration and would still result in a 3-year design value of 36 $\mu\text{g}/\text{m}^3$ which is a violation. However, an attainment control strategy based on a design value of 37 $\mu\text{g}/\text{m}^3$ might be more stringent than needed to attain by the attainment deadline.

States that have measured pollutant concentrations that were affected by an event that do not pass the “but for” determination and that are affecting the 3-year design value in a manner similar to those in the examples should document their analysis of the event as part of their designation/classification recommendations or attainment demonstration SIP submission, as applicable. EPA believes it may be appropriate, on a case-by-case basis, for the classification status or attainment demonstration to reflect the lower concentration that would have occurred without the event, since the strategies in the SIP should not be required to control the event-related emissions contribution to the concentration or to reduce future emissions of other sources to compensate for the air quality effect of the event-related emissions. It may be possible for the state to make and support an explicit adjustment to the concentration value to “back out” the non-controllable influence of the event. States could accomplish this by consulting with their EPA Regional Office and by using techniques similar to those that might be used in a “but for” demonstration under the EER, including the identification of that portion of the event-related emissions that were controllable. These techniques are described in more detail in other questions in this Q&A document (see Questions B6 and E25).

To avoid confusion when EPA reports data to the public or makes retrospective attainment demonstrations, states should not use AQS “request exclusion” flags on such data. EPA Regional Offices will not concur on flags for data that do not meet all requirements of the EER. AQS “information only” flags may be used if this assists the state with tracking data affected by such events.

EPA may develop additional guidance on this topic in the future in the context of modeled attainment demonstrations. States should consult with their EPA Regional Office if they face this situation.

E. General Exceptional Events Rule Applicability and Implementation Issues

14. **Question:** The Preamble to the Exceptional Events Rule states that EPA Headquarters or the EPA Regional Office will make its decision on demonstrations public. See 72 FR at 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 EPA plan to use to make the explanation “publicly available?”

Answer: EPA posts demonstration packages and decisions (consisting of state demonstration submittals, EPA responses, and EPA technical support documents) on EPA Regional Office web sites and/or the Technology Transfer Network web site.⁴ In

⁴ <http://www.epa.gov/ttn/analysis/exevents.htm>

certain instances, an EPA 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 EPA websites, and any additional supporting correspondence, will also be posted in the relevant rulemaking docket. Further, EPA plans to make the demonstrations and Regional decisions available to interested parties upon request.

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

Answer: The primary responsibility for developing demonstrations lies with state and local monitoring agencies. States are encouraged to coordinate with each other in compiling demonstration packages and may submit some of the same data, if appropriate. 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.). Individual submittal packages will be necessary to address these unique characteristics.

For example, if multiple states 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 state 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 impact a previously-sited monitor such that the monitor is no longer representative of the area, but rather functions more like a “hot-spot” monitor?

Answer: Except for PM_{2.5}, there is no difference in how monitoring data are treated from “area-wide” monitors (i.e., neighborhood scale) and hot-spot monitors (i.e., microscale). All such data, if meeting applicable CFR regulations, are comparable to the NAAQS. For PM_{2.5} a unique microscale or hot-spot monitor is only comparable to the 24-hour NAAQS and not to the annual PM_{2.5} NAAQS. A state may indicate in its annual monitoring plan (or an update to that plan) that a monitor affected by temporary, localized activities should be considered as a microscale rather than a neighborhood scale monitor. If approved by the Regional Office, this will prevent the data being used to compare with the annual PM_{2.5} NAAQS (see 40 CFR § 58.30). Note also that designating a monitor as “special purpose” does not disqualify its data meeting the applicable 40 CFR

part 50 and 58 requirements from comparison to the NAAQS when EPA makes an attainment determination.

The EER does not specifically address temporary 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.

States 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 states usually "monitor through" the disruption or ask their Regional offices to support a temporary shut-down. When EPA Regional Offices approve temporary shut-downs, states 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.

17. **Question:** Volcanoes on Hawaii are causing 24-hour SO₂ exceedances, which are clearly volcanic exceptional events. Section 319 of the Clean Air Act and CFR require EPA to provide states with a method to flag and petition EPA for exclusion of exceptional events data. When will EPA provide the method for SO₂?

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 SO₂ NAAQS rule (see preamble at 75 FR at 35585-35586 and regulatory text at 75 FR at 35592). The correct flag to use for a volcanic eruption event is "RS."

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

Answer: CO flagging, including the option for EPA 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 at 13563) explains 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, states may flag CO data in AQS and EPA may apply the same process and approval criteria as in the Exceptional Events Rule.

On February 11, 2011, EPA proposed to retain the current suite of CO standards without revision (see 76 FR at 8158). Because EPA proposed no revisions to the CO standards, it proposed no related changes to the Exceptional Events rule. If, however, the CO NAAQS are revised, EPA would explicitly address CO flagging schedules and exceptional events in rule language concurrent with re-proposal or promulgation of the CO NAAQS.

19. **Question:** The limited maintenance plan requirements for PM₁₀ require a demonstration that the area design value is less than or equal to 98 µg/m³. Flagging of values between 98 µg/m³ and the NAAQS are therefore relevant for this regulatory decision. Can these values, which are not exceedances and do not contribute to violations, be flagged and receive EPA concurrence?

Answer: Yes. The May 7, 2009, memorandum from William T. Harnett to Regional Air Division Directors states the following regarding the PM₁₀ limited maintenance plan option: “In determining eligibility for the limited maintenance plan option, EPA will treat 24-hour average air quality data between 98 µg/m³ and 155 µg/m³ 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

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.”

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 at 13576. This does not necessarily mean that these passages do not reflect EPA’s interpretation of what might be appropriate under the EER. Rather, it means that other parts of the preamble and other EPA guidance should be relied upon instead of statements in these passages of the final rule preamble, which should be treated as not having been published.

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 state has adopted and is implementing a Smoke Management Program or if the state 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: EPA is developing 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 EPA approval for exclusion of data affected by an exceptional event?

Answer: While the granting of data exclusion under the EER does not depend on state actions to meet the requirements of 40 CFR § 51.930, EPA encourages the submittal of a mitigation plan with the demonstration package. The Exceptional Events Rule was promulgated pursuant to Section 319 of the Clean Air Act which contains a provision that each state “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 states must “notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard.” The language at 40 CFR §51.930 requires that:

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

- (1) Provide for prompt public notification whenever air quality concentrations exceed or are expected to exceed an applicable ambient air quality standard;
- (2) Provide for public education concerning actions that individuals may take to reduce exposures to unhealthy levels of air quality during and following an exceptional event; and
- (3) Provide for the implementation of appropriate measures to protect public health from exceedances or violations of ambient air quality standards caused by exceptional events.”

Although the language at 40 CFR §51.930 does not require the preparation or submittal of a mitigation plan, it does require that the state develop and implement processes and measures that could easily become the elements of a formal, written plan. For this reason, and because having a mitigation plan in place will help states meet the EER requirements at 40 CFR §50.14(c)(1)(i) related to public notification more systematically, 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: EPA does not expect a demonstration to address the status of control measures for sources in other countries or other states. Submissions by states do not need to address control measures for Indian country, and submissions by tribes do not need to address control measures for lands under state jurisdiction. EPA believes that controls on sources over which a state or tribe has no jurisdiction would not constitute reasonable controls for such state or tribe to impose. 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 have been affected by an event in a way that raises issues of reasonable control. Note, however, that demonstrations should not ignore the role of such lands, because their proximity and contribution to a measured concentration can be important to understanding an event overall.

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

Answer: While EPA's position is generally that impacts from wind-blown dust from undisturbed natural deserts are inherently not reasonable to control, the state would need to assert this and provide appropriate supporting documentation in its demonstration package. The supporting documentation should include 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. Similarly, emissions from wild fires ignited by natural sources are also generally not reasonable to control. Like the previous example, states should present information that supports the claim that these emissions are "not reasonably controllable or preventable."

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

Answer: The guidance document, "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," provides this type of advice for demonstrations for high wind dust events. EPA has also developed a presentation entitled, "Presenting Evidence to Justify Data Exclusion as an Exceptional Event: Ideas based on how EPA has recently documented events to support regulatory decisions." This presentation can be downloaded from the following site:

<http://www.epa.gov/ttn/analysis/docs/IdeasforShowingEEEvidence.ppt>. Additionally, EPA is developing a separate guidance document addressing the preparation of demonstrations to support wildfire-related ozone event claims.

26. **Question:** Where can a state find examples of demonstrations from other states that have been approved by EPA?

Answer: Approved demonstrations are posted at <http://www.epa.gov/ttn/analysis/exevents.htm>.

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

Answer: EPA generally intends to conduct its initial review of a submitted exceptional event demonstration package within 120 days of receipt. During this time, EPA will generally determine whether to review the package in the near-term or to defer review. For those packages that are reviewed in the near-term, EPA will also assess completeness. Following this initial review, EPA will generally send a letter to the submitting agency that includes the status of review. For those packages that EPA will review in the near-term, EPA will generally include the following: a completeness determination and/or a request for additional information, a deadline by which the supplemental information should be submitted (if applicable), and an indicator of the timing of EPA's final review. EPA will generally give priority to exceptional event determinations that affect near-term regulatory decisions and may defer review of demonstration packages that are not associated with near-term regulatory decisions. If an agency wants to know whether EPA intends to review an exceptional event in the near-term, it can send a letter indicating its intent to submit a package prior to preparation of the exceptional events package. EPA intends to respond to such a letter within 60 days indicating whether the package is expected to be reviewed in the near-term, thus allowing an agency to prioritize resources for those packages that will be reviewed in the near-term.

EPA intends to make a decision regarding concurrence with a state's flag within 18 months of receipt of a complete package for those demonstrations that impact a near-term regulatory action, or sooner if necessary to support a regulatory action. EPA intends to communicate with the submitting agency, as needed, during the demonstration review period. EPA will not generally be able to consider state-provided information that is submitted after a concurrence or non-concurrence determination for a submitted demonstration is made unless the information is provided as a timely comment during, for example, a public comment period on a related regulatory action.

Submitting 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. States 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.

28. **Question:** Will EPA ever perform and consider additional data analysis itself before deciding whether to approve a state/tribe-submitted demonstration in support of data exclusion?

Answer: In general, EPA will not prepare analyses or additional arguments to be included as components in a submitted demonstration package. Rather, 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 EPA preparing and/or considering additional analyses, EPA may choose to 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 EPA could support either approval or disapproval of a state's request for concurrence on flagged data.

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 PM₁₀ 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 a measurement value is approved by EPA for exclusion for one particular NAAQS averaging period and level, is it automatically excluded for all the other NAAQS for that pollutant?

Answer: No. The exclusion of a measured air concentration is to be justified and approved separately for each NAAQS that applies to the pollutant.

When initially flagging data, a state does not need to commit to the specific NAAQS for which it seeks to exclude a measured concentration. EPA's ambient air quality database, AQS, is designed to allow a state to apply a single flag to a measured concentration value, which merely indicates the state's interest in excluding that value with respect to one or more of the applicable NAAQS. Later, in the justification (i.e., the demonstration) for exclusion, the state can indicate the specific NAAQS for which it seeks exclusion and for which the demonstration addresses the Exceptional Events Rule criteria. When EPA makes a decision regarding concurrence with a state's flag, it will generally identify in its approval/ disapproval letter (or other official notice) all of the NAAQS for which EPA has concurred on the flag. 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). This is done by associating one or more "pollutant standard ID" value with the concurrence.

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 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 PM₁₀, all concurrences were presumed to apply to the 24-hour NAAQS, as the annual PM₁₀ NAAQS was revoked in 2006.⁵
- 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 logically was the basis for the exclusion request.
- For SO₂, 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 logically was the basis for the exclusion request. No flags were assumed to apply to the 1-hour NAAQS because the 1-hour SO₂ 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 µg/m³. This default was chosen because March 2010 was prior to EPA issuing final designations under the 2008 Pb NAAQS of 0.15µg/m³.
- For NO₂, 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, EPA will specify the NAAQS to which the concurrence applies. If this defaulting scheme does

⁵ EPA realizes that many of the defaulted EPA concurrences for pre-2006 PM₁₀ concentrations that were below the level of the 24-hour PM₁₀ NAAQS actually were applicable to the annual PM₁₀ 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 having been concurred. Nevertheless, EPA Regional Office may choose to update these concurrence flags as time permits.

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 they have not already done so.

Detailed information on the use of events flags in AQS can be found in a tutorial posted at <http://www.epa.gov/ttn/airs/airsaqs/manuals/ExceptionalEventTutorial.pdf>. Concurrence flags are discussed on page 20 of this tutorial.

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 be done 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 can be compared directly to the level of the NAAQS. This is the case for the 1-hour ozone, 1-hour CO, 1-hour SO₂, and 1-hour NO₂ NAAQS.⁶ However, a difference 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, NO₂, and SO₂ 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).
- Pb is reported as 24-hour measurements, but the old and new NAAQS are both for three-month averages (quarterly averages and three-month rolling averages, respectively).
- When using automated/continuous monitoring equipment, PM_{2.5} and PM₁₀ are sometimes reported as 1-hour measurements but there are PM_{2.5} and PM₁₀ NAAQS with 24-hour averaging periods and a PM_{2.5} NAAQS with an annual averaging period.

⁶ States have for many years reported SO₂ concentrations as hourly averages. While some states 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 SO₂ NAAQS. Under a change in SO₂ monitoring requirements that accompanied the promulgation of the 1-hour SO₂ NAAQS, states are now required to report the maximum 5-minute block average concentration, as well as the hourly concentration (see 40 CFR § 58.12(g)). States 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. 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 have a role to play 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 SO₂ as part of a “but for” demonstration and should not be flagged for exclusion under the EER.

- When using filter-based monitoring equipment, PM_{2.5} and PM₁₀ are sometimes reported as 24-hour measurements but there is a PM_{2.5} NAAQS with an annual averaging period.

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.⁷ 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, one 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, states making a “but for” argument should compare the average concentration to the identified NAAQS rather than the individual concentrations that comprise the average. States should, however, identify in their exceptional event submission those cases in which a single measurement or several, but not all, measurements cause 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 (currently 15 µg/m³) can be the basis for meeting the “but for” criterion for exceedances or violations of the annual NAAQS. 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 15 µg/m³ with the event and would have been below 15 µg/m³ “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

⁷ 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 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.

NAAQS only if the actual measured concentration were close to or above 35 µg/m³. 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, NO₂ and SO₂. EPA believes applying this interpretation for Pb, NO₂, and SO₂ is consistent with the interpretation in the preamble for PM_{2.5} and is consistent with EPA's intent in drafting the Exceptional Events Rule that should be applicable to all pollutants. That is, a 24-hour average concentration of Pb, NO₂, or SO₂ can be compared to the NAAQS level defined for a longer period, for purposes of meeting "but for" with respect to the NAAQS with the longer averaging period. However, EPA does not intend to concur on flags for a 1-hour NO₂ and SO₂ concentration that is below the level of the annual NAAQS, regardless of the outcome of "but for" comparisons based on 24-hour or annual averaging periods.⁸ Also, EPA 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.

Table Q30-1. Principles for Correct Approaches for Helping to Show That the "But For" Test Is Met

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.	<ul style="list-style-type: none"> • 1-hour NAAQS for CO, SO₂, NO₂, and ozone. • 24-hour filter-based PM_{2.5} or PM₁₀ measurements vs. 24-hour NAAQS. 	

⁸ This restriction is intended to parallel the similar restriction for PM_{2.5} stated in the preamble to the Exceptional Event Rule. It likely has no practical effect. It is highly unlikely that even several hourly concentrations below the level of the annual NO₂ NAAQS (53 ppb) could include an event contribution that would, when divided by 8760 (24 hours times 365 days), result in the annual average NO₂ concentration crossing from below to above the level of the annual NAAQS. Similarly, it is highly unlikely that even several hourly concentrations below the level of annual SO₂ NAAQS (30 ppb) could include an event contribution that would, when divided by 24, result in the 24-hour average SO₂ concentration crossing from below to above the level of the 24-hour SO₂ NAAQS (140 ppb).

	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), states can compare the average of 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. States should, however, identify in their exceptional event submission those cases in which a single measurement or several, but not all, measurements cause the elevated average.	<ul style="list-style-type: none"> • 1-hour ozone measurements vs. 8-hour NAAQS. • 1-hour CO measurements vs. 8-hour NAAQS. • 1-hour SO₂ measurements vs. 3-hour, 24-hour, and annual NAAQS. • 1-hour NO₂ measurements vs. annual average NAAQS. • 1-hour PM_{2.5} measurements vs. 24-hour and annual average NAAQS. • 1-hour PM₁₀ measurements vs. 24-hour average NAAQS. • 24-hour PM_{2.5} measurements vs. annual average NAAQS. • 24-hour Pb measurements vs. quarterly average NAAQS. • 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 cannot be excluded, 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, it is also permitted to compare the 24-hour measurement to the annual average PM _{2.5} NAAQS or the quarterly or rolling 3-month Pb NAAQS.	<ul style="list-style-type: none"> • 24-hour PM_{2.5} filter measurements vs. the annual average NAAQS (expressly permitted in the preamble to the Exceptional Events Rule). • 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). 	If a measurement value is below the level of the quarterly, rolling 3-month, or annual average NAAQS, it cannot be excluded.
4	1-hour PM _{2.5} and 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 for those individual 1-hour measurements in the 24-hour averaging period that were affected by the event.	<ul style="list-style-type: none"> • 1-hour PM_{2.5} measurements vs. annual average NAAQS (suggested by this guidance to create a level playing field between filter-based and continuous PM_{2.5} measurements). • 1-hour SO₂ measurements vs. annual average NAAQS (where the 30 ppb annual SO₂ NAAQS still applies) 	If the average of the 24 1-hour measurements is below the level of the annual average NAAQS, it cannot be excluded.
5	When there is no NAAQS for the 24-hour averaging period, 1-hour measurements may be compared	<ul style="list-style-type: none"> • 1-hour NO₂ measurements vs. annual average NAAQS (suggested by this guidance to 	If a measurement value is below the level of the annual average NAAQS, it cannot

	Principle	Application to Specific NAAQS	Exceptions
	directly to the annual NAAQS.	create a benchmark for judging the excludability of 1-hour NO ₂ measurements, other than whether the event affected the annual average enough to make a “but for” difference relative to the annual average NAAQS).	be excluded.
6	Otherwise, single 1-hour measurements may not be compared to the level of the annual average NAAQS.	<ul style="list-style-type: none"> • Single 1-hour SO₂ measurements may not be compared the annual average NAAQS (because there is a 24-hour NAAQS for SO₂ with a defined averaging methodology). • Single 1-hour PM_{2.5} measurements 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 would help satisfy the “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 NO₂ NAAQS.

	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
1	Ozone	0.12 ppm 1-hour averaging period 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.

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
2	Ozone	0.08 ppm 8-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> 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. <p>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. If the original daily maximum 8-hour period and the new daily maximum period overlap, it is possible for a specific hourly concentration that was not originally concurred to be concurred as part of the new 8-hour maximum period.</p>
3	Ozone	0.075 ppm 8-hour averaging period 1-hour measurement <i>(Note: This example may be replaced following EPA’s promulgation of the 2011 Reconsidered Ozone NAAQS)</i>	<ul style="list-style-type: none"> 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. <p>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. If the original daily maximum 8-hour period and the new daily maximum period overlap, it is possible for a specific hourly concentration that was not originally concurred to be concurred as part of the new 8-hour maximum period.</p>

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
4	PM _{2.5}	35 µg/m ³ 24-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> • If the 24-hour average concentration based on 1-hour measurements was above 35.4 µg/m³ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(c)) but would have been 35.4 µg/m³ 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 35 µg/m³ 24-hour PM_{2.5} NAAQS. • Also, if the 24-hour average concentration based on 1-hour measurements was above 15.0 µg/m³ (after truncation after the first decimal digit) but would have been 15.0 µg/m³ 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 35 µg/m³ 24-hour PM_{2.5} NAAQS.
5	PM _{2.5}	15.0 µg/m ³ Annual averaging period 1-hour measurement	<ul style="list-style-type: none"> • If the annual average PM_{2.5} concentration was above 15.0 µg/m³ but would have been equal to or less than 15.0 µg/m³ (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 15 µg/m³ annual PM_{2.5} NAAQS. • Also, if the 24-hour average concentration based on 1-hour measurements was above 15.0 µg/m³ (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 15.0 µg/m³ 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 15 µg/m³ annual PM_{2.5} NAAQS. <p>However, an hourly value must be part of a 24-hour average concentration that is above 15 µg/m³ (after rounding to one decimal digit) to be excluded from an annual NAAQS calculation.</p>

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
6	PM _{2.5}	35 µg/m ³ 24-hour averaging period 24-hour measurement	<ul style="list-style-type: none"> • If the 24-hour average concentration was above 35.4 µg/m³ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(b)) but would have been 35.4 µg/m³ 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/m³ 24-hour PM_{2.5} NAAQS. • Also, if the 24-hour average concentration was above 15.0 µg/m³ (after truncating after the first decimal digit, per 40 CFR 50 Appendix N section 3.0(b)) but would have been 15.0 µg/m³ or less in the absence of the event, the 24 average concentration meets the “but for” test for purposes of comparison to 35 µg/m³ 24-hour PM_{2.5} NAAQS.
7	PM _{2.5}	15 µg/m ³ Annual averaging period 24-hour measurement	<ul style="list-style-type: none"> • If the annual average PM_{2.5} concentration was above 15.0 µg/m³ (after rounding to one decimal digit per 40 CVFR 50 Appendix N section 4.2(a)) but would have been equal to or less than 15.0 µg/m³ 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 15 µg/m³ annual PM_{2.5} NAAQS. • Also, if the 24-hour average concentration from the filter-based sampler was above 15.0 µg/m³ (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 15.0 µg/m³ in the absence of the event, the 24-hour value meets the “but for” test for purposes of comparison to 15 µg/m³ annual PM_{2.5} NAAQS. <p>Note that a 24-hour concentration that is equal to or less than 15.0 µg/m³ (after truncation to one decimal digit) cannot be approved for exclusion, regardless of the outcome of the comparison just described.</p>

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
8	PM ₁₀	150 µg/m ³ 24-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> If the 24-hour average concentration based on 1-hour measurements was above 150 µg/m³ (after rounding to the nearest 10 µg/m³, per 40 CFR 50 Appendix K section 1.0(b)) but would have been equal to or less than 150 µg/m³ 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/m³ 24-hour PM₁₀ NAAQS.
9	PM ₁₀	150 µg/m ³ 24-hour averaging period 24-hour measurement	<ul style="list-style-type: none"> If the 24-hour average concentration from the filter-based sampler was above 150 µg/m³ (after rounding to the nearest 10 µg/m³, per 40 CFR 50 Appendix K section 1.0(b)) but would have been equal to or less than 150 µg/m³ in the absence of the event, the 24-hour value meets the “but for” test for purposes of comparison to the 150 µg/m³ 24-hour PM₁₀ NAAQS.
10	CO	35 ppm 1-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> 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 8-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> 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. <p>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. If the original 8-hour period and the new 8-hour period overlap, it is possible for a specific hourly concentration that was not originally concurred to be concurred as part of the new 8-hour period.</p>

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
12	Pb	1.5 µg/m ³ Quarterly averaging period 24-hour measurement	<ul style="list-style-type: none"> • If the quarterly mean was above 1.5 µg/m³ (after rounding to one decimal digit) but would have been equal to or less than 1.5 µg/m³ 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/m³ 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.) • Also, if the 24-hour average concentration from the filter-based sampler was above 1.5 µg/m³ (after rounding to one decimal digit) but would have been equal to or less than 1.5 µg/m³ in the absence of the event, the 24-hour value meets the “but for” test for purposes of comparison to 1.5 µg/m³ quarterly average Pb NAAQS. <p>A 24-hour Pb concentration that is equal to or less than 1.5 µg/m³ can never be excluded, regardless of the outcome of the comparison just described.</p>
13	Pb	0.15 µg/m ³ Rolling 3-month averaging period 24-hour measurement	<ul style="list-style-type: none"> • If a 3-month mean was above 0.15 µg/m³ (after rounding to two decimal digits) but would have been equal to or less than 0.15 µg/m³ 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/m³ 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.) • Also, if the 24-hour average concentration from the filter-based sampler was above 0.15 µg/m³ (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/m³ in the absence of the event, the 24-hour value meets the “but for” test for purposes of comparison to the 0.15 µg/m³ quarterly average Pb NAAQS. <p>A 24-hour Pb concentration that is equal to or less than 0.15 µg/m³ can never be excluded, regardless of the outcome of the comparison just described.</p>

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
14	NO ₂	100 ppb 1-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> 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 NO₂ concentration value meets the “but for” test for purposes of comparison to the 1-hour NAAQS.
15	NO ₂	53 ppb Annual averaging period 1-hour measurement	<ul style="list-style-type: none"> 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 NO₂ NAAQS. Provided there is an exceedance of the annual standard, 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. <p>However, a 1-hour NO₂ concentration that is below 53 ppb (after rounding to a whole number) can never be excluded, regardless of the outcome of the comparison just described.</p>
16	SO ₂	75 ppb 1-hour averaging period 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.
17	SO ₂	140 ppb 24-hour averaging period 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.

Table Q30-2. Correct Approaches for Helping to Show That the “But For” Test Is Met			
	Pollutant	Specific Case: NAAQS level NAAQS averaging period Measurement period	Correct Approach
18	SO ₂	30 ppb Annual averaging period 1-hour measurement	<ul style="list-style-type: none"> • 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 SO₂ NAAQS. • Also, 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 event meet the “but for” test for purposes of comparison to the 30 ppb annual SO₂ NAAQS. <p>If the 30 ppb annual SO₂ 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)) may never be excluded, regardless of the outcome of the comparison just described.</p>
19	SO ₂ (secondary)	500 ppb 3-hour averaging period 1-hour measurement	<ul style="list-style-type: none"> • 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 SO₂ NAAQS.

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

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

AQS currently allows a state to flag any measured concentration values it chooses, including values below the level of the relevant NAAQS. EPA does not plan to implement any new technical restrictions through the AQS software. Also, EPA does not consider the Exceptional Events Rule to prohibit states from flagging values below the level of the NAAQS. However, EPA does not intend to review data flags in AQS for concurrence until the state 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). State flagged values that are not included in any demonstration package may unnecessarily consume state resources. In addition, EPA’s evaluation of flagged data that are addressed in demonstration packages is more time consuming when EPA must differentiate these data from numerous unsubstantiated flags in AQS. Therefore, EPA encourages states to exercise restraint in flagging values less than the level of the NAAQS. Should states wish to flag values for informational purposes, they should use the “I” series flags in AQS.

States may see an advantage in flagging all values they believe were affected by an event, 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 states should be aware that state 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, EPA can concur with flags for concentrations that are below the NAAQS only in five very narrow conditions described below. If EPA can determine that a flag on a value less than the level of the NAAQS cannot meet the “but for” test, EPA may choose to nonconcur or leave the default/null value of the AQS concurrence flag (indicating no EPA action) in place.

Except in cases involving PM₁₀ limited maintenance plans⁹, 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 O₃ measurement of 100 ppb) is not above the level of that averaging time NAAQS (e.g., 1-hour O₃ NAAQS of 120 ppb), but is above a longer averaging time NAAQS (e.g., 8-hour O₃ 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 (short-term) NAAQS, it may be possible for states to present sufficient evidence to satisfy the “but-for” criterion.

First, PM₁₀ values between 98 and 154 µg/m³ (inclusive) may be flagged, concurred, and excluded for purposes of qualifying an area for reliance on only a limited maintenance plan.¹⁰ Because of the expected exceedance form of the PM₁₀ NAAQS, concentrations in

⁹ 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 PM₁₀ values between 98 and 154 µg/m³ (inclusive) to be flagged, concurred, and excluded for purposes of qualifying an area for reliance on only a limited maintenance plan.

¹⁰ 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.

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.¹¹

A second scenario in which EPA can concur with flags for concentrations that are below the NAAQS is indicated at 72 FR at 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 15 µg/m³ annual PM_{2.5} NAAQS but not greater than the 35 µg/m³ 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 15 and 35 µg/m³ but would have been below 15 µg/m³ 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, EPA may concur with flags for ozone, PM_{2.5}, 1-hour NO₂, and 1-hour SO₂ 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 above the NAAQS to being equal to or below the NAAQS. However, as indicated in Table Q30-2, concentrations below certain values may never be excluded.

¹¹ The procedure for determining a PM₁₀ design value in units of µg/m³ is given in section 6.3 of the EPA guidance document “PM₁₀ SIP Development Guideline,” June 1987, posted at http://www.epa.gov/ttn/oarpg/t1/memoranda/pm10sip_dev_guide.pdf.

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 may never 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 98th percentile 24-hour PM_{2.5} concentrations for a monitoring site for 2006-2008 are 41, 31, and 37 µg/m³ for each respective year with a resulting 3-year design value of 36 µg/m³ which is a violation of the 24-hour PM_{2.5} NAAQS of 35 µg/m³. Also, assume that the next highest concentration in 2007 below the 31 µg/m³ was only 20 µg/m³. The 31 µg/m³ concentration in 2007 was affected by a one-day wildfire. The state has been able to show that the concentration would have been 17 µg/m³ without the fire. Because neither 28 µg/m³ nor 31 µg/m³ 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 98th percentile concentration in 2007 would have been 20 µg/m³ which would result in a 3-year design value of 33 µg/m³ (i.e., less than the 24-hour PM_{2.5} NAAQS of 35 µg/m³). Therefore, the 2007 value of 31 µg/m³ meets the "but for" test when the focus is on NAAQS violations rather than individual exceedances. Assuming other requirements are met, the 31 µg/m³ concentration would be approved by 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 98th percentile day into the design value calculation. Rather, one must re-select the 98th percentile day, which sometimes will result in a different day's actual measured value being used in the design value calculation.¹²

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 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 value, since the outcome of the "violations" analysis may change. After EPA has

¹² 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 15 to above 15 µg/m³, 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.

approved the exclusion of a concentration based on a “violations” analysis for one 3-year period, 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 98th 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 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 at 13570, bottom of middle column) Even if the conditions described in the preceding paragraph are met, values below $15 \mu\text{g}/\text{m}^3$ 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 at 13570, bottom of middle column)

Ozone (0.075 ppm 8-hour NAAQS)

(Note that this example may be replaced following EPA’s promulgation of the 2011 Reconsidered Ozone NAAQS)

Assume for illustration that the three annual 4th 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 4th 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 a state could flag multiple days within one year with concentrations below the NAAQS. Excluding just one of these concentrations may not change the annual 4th 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 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 EPA may focus first on whether only those are to be excluded.

PM₁₀

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 EPA approval of a limited maintenance plan PM_{10} values as low as $98 \mu\text{g}/\text{m}^3$ 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 $98 \mu\text{g}/\text{m}^3$ would appear to have little regulatory significance, EPA discourages the flagging of such data.

Pb

The current $1.5 \mu\text{g}/\text{m}^3$ and $0.15 \mu\text{g}/\text{m}^3$ NAAQS for lead are both based on a maximum three-month average concentration. The $1.5 \mu\text{g}/\text{m}^3$ standard is based on the highest quarterly average in each year individually, while the $0.15 \mu\text{g}/\text{m}^3$ NAAQS is based on the highest rolling 3-month average during a 3-year period. EPA will not concur on the exclusion of a 24-hour concentration value that is below the level of the NAAQS, and we discourage states from flagging such values.

NO₂

EPA will not 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 states from flagging such values.

SO₂

EPA will not concur on the exclusion of a 1-hour SO₂ concentration that is below the level of the annual SO₂ NAAQS, and we discourage states from flagging such values.

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