EPA Region 10

Review of Exceptional Event Request
Salmon, ID
Annual $PM_{2.5}$ NAAQS
Dates Analyzed: Multiple (refer to Table 2)

Background

On March 22, 2007, the EPA adopted a final rule, *Treatment of Data Influenced by Exceptional Events* (Exceptional Events Rule at 72 FR 13560) to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the Exceptional Events Rule, the EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an "exceptional event" caused the exceedances. Before the EPA can exclude data from these regulatory determinations, the state must flag the data in the EPA's Air Quality System (AQS) database and, after notice and opportunity for public comment, submit a demonstration to justify the exclusion. After considering the weight of evidence provided in the demonstration, the EPA decides whether or not to concur with each flag.

IDEQ's Request

The Idaho Department of Environmental Quality (IDEQ) requested concurrence on flagged 24-hour $PM_{2.5}$ data on multiple days for the Salmon monitor (Salmon, Lemhi County Idaho, AQS site 16-059-0004 POC3 and precision AQS 16-059-0004 POC1); herein this will be referred to as the Salmon monitor. The recorded 24-hour $PM_{2.5}$ levels for the Salmon monitor ranged from 214.3 $\mu g/m^3$ to 13.5 $\mu g/m^3$ for the data values for which the IDEQ is requesting the EPA's concurrence as exceptional events. Table 1 lists all of the values for which the IDEQ has requested evaluation and concurrence at the Salmon monitor; there were 63 days submitted for the Salmon monitor.

TABLE 1.

Salmon Monitored Values

Date	Salmon (primary) $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS site 16-059-0004-3-88101	Salmon (precision) $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS 16-059-0004-1-88101
7/30/2012	15.1	
7/31/2012	15.4	
8/5/2012	16.3	
8/6/2012	19.7	
8/7/2012	20.5	
8/8/2012	25.1	
8/9/2012	27.0	
8/10/2012	33.7	

8/11/2012	37.2	
8/12/2012	49.2	
8/13/2012	96.5	85.0
8/14/2012	147.0	
8/15/2012	67.3	
8/16/2012	106.5	
8/17/2012	96.6	
8/18/2012	30.4	
8/19/2012	34.5	31.2
8/20/2012	37.7	
8/21/2012	22.2	
8/22/2012	21.8	
8/23/2012	35.9	
8/24/2012	108.2	
8/25/2012	91.3	77.8
8/26/2012	45.5	
8/28/2012	58.2	
8/29/2012	78.1	
8/30/2012	132.0	
8/31/2012	49.8	45.1
9/1/2012	69.4	
9/2/2012	145.2	
9/3/2012	186.9	
9/4/2012	182.7	
9/5/2012	97.8	
9/6/2012	48.4	
9/7/2012	53.1	
9/8/2012	27.5	
9/10/2012	136.4	
9/11/2012	214.3	
9/12/2012	194.4	
9/13/2012	153.7	
9/14/2012	70.2	
9/15/2012	162.1	
9/16/2012	162.5	
9/17/2012	112.3	
9/18/2012	130.3	
9/19/2012	135.5	
9/20/2012	159.8	
9/21/2012	153.5	
9/22/2012	86.6	
9/23/2012	44.3	
9/24/2012	31.8	
9/25/2012	62.7	
9/26/2012	37.4	
9/27/2012	39.3	

9/28/2012	20.0	
10/1/2012	18.2	
10/3/2012	14.6	
10/5/2012	13.5	
10/8/2012	22.8	
10/9/2012	33.2	
10/10/2012	24.2	
10/11/2012	26.3	
10/12/2012	17.1	14.3

$PM_{2.5}$ levels from many of the submitted days led to exceedance of the 12.0 $\mu g/m^3$ annual $PM_{2.5}$ NAAQS at the Salmon monitor. Documentation provided by the IDEQ demonstrates that there were multiple wildfires occurring in Idaho and surrounding areas in the summer of 2012, notably the Halstead and the Mustang Complex fires in Idaho which were close to Salmon that led to the build-up of smoke ($PM_{2.5}$) that affected air quality in the Salmon area.

The IDEQ flagged the monitored values as wildfire exceptional events before the statutory deadline of July 1, 2013. The agency made the documentation available for public comment for 30 days starting on November 5, 2013, and received no comments. The IDEQ submitted the exceptional event demonstration package to the EPA Region 10 on December 6, 2013, for multiple dates at the site. The agency then prepared an addendum at the EPA's request and made the documentation available for public comment for 30 days starting on March 17, 2014, and received no comments. The IDEQ submitted the addendum to the EPA on April 25, 2014. The IDEQ is requesting concurrence from the EPA on all of these days.

The EPA's Exceptional Event Evaluation

The EPA evaluated whether the documentation provided by the IDEQ for the flagged values at the Salmon monitor demonstrates that the requirements of the Exceptional Events Rule were met. The EPA has determined that only the values listed in Table 2 would be used in a regulatory determination and the EPA has therefore only evaluated the days and values listed in Table 2 with respect to the Exceptional Event Rule requirements.

The matrix below summarizes the requirements of the Exceptional Events Rule and describes how the IDEQ met each requirement. Unless otherwise noted, all references to page numbers, tables, and figures relate to the IDEQ's December 6, 2013 submittal. References to the April 25, 2014 addendum are specifically noted as from "the addendum."

Procedural Requirements:	**EPA's Evaluation of Flagged Exceedances:**
• The data are flagged and include an initial event description in the EPA's AQS database. 40 CFR 50.14(c)(2)(i) and (iii)	The IDEQ flagged and described the multiple summer 2012 elevated $PM_{2.5}$ values as wildfire exceptional events in the EPA's AQS database prior to the July 1, 2013 deadline.

• The public had an opportunity to review and comment on demonstration justifying data exclusion. 40 CFR 50.14(c)(3)(i) and (iv)	The IDEQ provided a 30-day public comment period on the documentation for the multi-day claimed exceptional event. The public comment period occurred between November 5 and December 5, 2013 for the initial demonstration submission and between March 17 and April 16, 2014 for the addendum to the demonstration. The IDEQ received no comments during either public comment period.
• Demonstration justifying data exclusion submitted timely to the EPA. 40 CFR 50.14(c)(3)(i)	The EPA received demonstration documentation from the IDEQ on December 6, 2013 before the deadline of not later than three years following the end of the calendar quarter in which the flagged concentration was recorded (in this case, September 30, 2015) and prior to the December 12, 2013 deadline for 2012 exceptional event submissions as defined in the 2012 Annual $PM_{2.5}$ Standard Rule (78 FR 3086, at 3233). The addendum provided additional documentation for and explanation of the IDEQ's timely December 6, 2013 submittal.

Technical Criteria:	
• The event satisfies the criteria in 40 CFR 50.1(j) (i.e., affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by EPA to be an exceptional event). 40 CFR 50.14(c)(3)(iii)(A)	*Conceptual Model* The IDEQ developed a conceptual model that shows how wildfires in Idaho and surrounding areas affected air quality in the Salmon area during the summer of 2012. In 2012, 1,667,654 acres burned due to wildfires in Idaho; this was more than in any other state in the nation (Figure 2). A number of fires burned throughout Idaho. Salmon was surrounded by fires to the North/Northwest and the Southwest (Figure 3). It was estimated that during these summer fires, 76,300 tons of $PM_{2.5}$ emissions were emitted over the course of the summer, which averaged to 734 tons of $PM_{2.5}$ daily (Figure 4, pages 3-4). Weather conditions in Idaho were warmer and drier than usual, which made the area more susceptible to wildfires and made the wildfires larger. Additionally, high pressure systems in the pacific northwest area disrupted transport by creating stagnant conditions and minimal wind situations. In Salmon, the elevated emissions from these fires were described to occur from direct impact from the wildfire smoke plume (direct plume advection), along with contributions from transport through valleys via daily weather patterns (diurnal valley flows) and a general buildup of $PM_{2.5}$ in the Idaho area from the massive amount of $PM_{2.5}$ being generated by the fires. *Affected Air Quality* As evidence that the event affected air quality, the IDEQ documented that the event exceeded historical fluctuations and demonstrated that there was a clear causal relationship between the event and the exceedances at the Salmon monitor. As discussed above, in 2012, 1,667,654 acres burned due to wildfires in Idaho (Figure 2). As mentioned in the conceptual model section, multiple wildfires burned in the summer of 2012 and large amount of $PM_{2.5}$ emissions were emitted. As shown on Table A (pg xii), monitors in Salmon recorded elevated values of $PM_{2.5}$, especially in August / September 2012. When reviewing $PM_{2.5}$ values over the course of 2012 in Salmon, it is visually obvious that these values are well above all other values measured in 2012 (Figure 21) and above the values for that same time period during the 2008-2011time period (Figure 28). The historical fluctuations criterion is discussed again in further detail later in this analysis. The clear causal relationship criterion (also discussed later in further detail) also supports the conclusion that the event affected air quality by describing conceptually how the emissions generated by the wildfires reached the Salmon

	monitor, and by analyzing each affected day using HYSPLIT air mass back trajectories, hourly $PM_{2.5}$ levels, observed meteorological data, MODIS imagery, and text. Appendices E – F also provide supporting information in the form of newspaper articles and distributed IDEQ air quality alerts. *Natural Event and not Reasonably Controllable or Preventable* In 2012, 1,667,654 acres burned due to wildfires in Idaho; this was more than in any other state in the nation (Figure 2). It was estimated that during these summer fires, 76,300 tons of $PM_{2.5}$ emissions were emitted over the course of the summer which averaged to 734 tons of $PM_{2.5}$ daily (Figure 4, pages 3-4). In 2012, weather conditions in Idaho were warmer and drier than usual, which made the area more susceptible to wildfires and made the wildfires larger. The mean temperature in Idaho in August and September 2012 was in many places 1-5 degrees higher than in the 30 year (1981-2010) recent history (Figure 5, 6). For the same comparison between August/September 2012 and 1981-2010, precipitation was less than 25% of the average in 2012 for these months than in the prior 30 year period (Figure 9 and 10), and from August through October 2012 a majority of Idaho was experiencing drought conditions (Figures 11-13). Additionally, high pressure systems in the pacific northwest area disrupted transport by creating stagnant conditions and minimal wind situations (pages 10-12). While there were at least eight wildfires in Idaho and surrounding areas in the summer of 2012, Salmon was primarily affected by the Halstead and the Mustang Complex fires in Idaho. These fires, and most that occurred during the summer of 2012, were ignited by lightning strikes (Table 3) and exacerbated by the unusually warm, dry, and semi-stagnant air conditions that Idaho was experiencing and described earlier in this section of the analyses. For the major fires that affected Salmon, Halstead and Mustang, there were 607 and 1152 personnel assigned, respectively, at the peak levels and nearly $40 million dollars were allocated in total for these two fires (Table 3, Figure 27). Fires were managed in accordance with each forest's specific Fire Management Plan (Salmon / Challis National Forest 2012 Fire Management Plan) and in coordination with implementation of the IDEQ's air pollution emergency rule, which prohibits open burning and notifies the public of deteriorating air quality during air emergencies. The Salmon / Challis National Forest 2012 Fire Management Plan identifies

	the area covered in the plan, links the associated and relevant planning documents, and sets forth the plan goals, objectives, and priorities when managing fires. (http://gacc.nifc.gov/egbc/dispatch/id-cic/Documents/Reports/SCNF_FMP.pdf) The IDEQ discusses anthropogenic and alternative sources of emissions in section 4.3. These include prescribed fires, crop residue burning, residential wood combustion, other forms of open burning, and on-road mobile sources. Most of these sources did not generate significant amounts of $PM_{2.5}$ compared to wild fire emissions as depicted in Figure 4 and described in section 4.3 (Alternative Hypotheses), most of these forms of burning were restricted at that time, there were no other known major sources of emissions at the time, and the heating season where residential wood combustion would contribute to ambient $PM_{2.5}$ does not start usually until October and would not have affected the background $PM_{2.5}$ levels. Addendum Section 4.3.6 (Industrial Sources) identifies the nearby sources of industrial emissions and confirms that their emissions were part of the historical fluctuations and that there were no unusual emissions from these industrial sources during the times of the wildfires. Based on the submitted information, the EPA concludes that the wildfires were natural events and that they were not reasonably controllable or preventable due to their size and persistence through the summer despite the significant human and financial resources committed to suppression of these fires by the federal land management agencies.
• There is a clear causal relationship between the exceedance and the claimed exceptional event. 40 CFR 50.14(c)(3)(iii)(B)	*Overview* The IDEQ established the clear causal relationship by first describing how in Salmon the elevated emissions from these fires are attributed to three mechanisms: direct impact from the wildfire smoke plume (direct plume advection), contributions from transport through valleys via daily weather patterns (diurnal valley flows), and a general buildup of $PM_{2.5}$ in the Idaho area from the massive amount of $PM_{2.5}$ being generated by the fires. The IDEQ documented the general build-up of $PM_{2.5}$ on a regional scale by weight of evidence in the form of MODIS satellite images of the 2012 wildfires in Appendix B and Figure 24 that shows 2012 statewide averages of $PM_{2.5}$ during fire season were sizably larger than values for the same period in each of the four proceeding years.

	The IDEQ documented the diurnal valley wind flows in Salmon by plotting wind direction, the associated percentage, and hourly $PM_{2.5}$ values as a function of time. The connection between the wind direction percentage and elevated $PM_{2.5}$ levels was pronounced due to Salmon's proximity to the wildfires; Figure 19 shows clear causal connection between wildfire emissions being generated and then transported through the valleys to Salmon. Often the highest $PM_{2.5}$ values were generated during the peak of the diurnal valley flows, with secondary contribution coming from general regional $PM_{2.5}$ buildup and direct plume advection from the wildfires. The IDEQ documented direct advection (along with diurnal valley flows and regional transport) of wildfire emissions using a weight of evidence approach, twice daily MODIS images, and NOAA Ready-HYSPLIT model generated back trajectories that track the path of wildfire generated $PM_{2.5}$ to the Salmon monitor. This analysis is coupled with time series charts that include 2012 $PM_{2.5}$-average-95^{th} percentile data, surface wind speed and wind direction data, and solar radiation-temperature-vertical temperature gradient data. The weight of evidence supports the clear causal relationship of $PM_{2.5}$ between the fires and the Salmon monitor through multiple transport scenarios as illustrated in Figure 34. Scenario 1 documents the diurnal valley flow from the Mustang fire from the north flowing south into Salmon (Section 4.5). Scenario 2 documents the direct advection flow from the Mustang Complex fire flowing directly southeast into Salmon (Section 4.6). Scenario 3 documents direct advection from the Halstead fire flowing east and dropping into a valley that flows north-northeast into Salmon (Section 4.7). Scenario 4 documents the direct advection flow from the Halstead fire flowing directly northeast into Salmon (Section 4.8). Scenario 5 documents the general build-up of wildfire $PM_{2.5}$ in the area and is referred to as regional transport (Section 4.9). The weight of evidence analyses was done to show the clear causal relationship between the Halstead and Mustang fires and the Salmon elevated monitor values. Appendix B includes this weight of evidence analysis for the Salmon days being analyzed. *Conclusion* Based on the suite of evidence provided, including MODIS imagery, HYSPLIT back trajectories, surface wind speed and wind direction data, and no evidence of significant sources of anthropogenic $PM_{2.5}$ (as discussed in the Not Reasonably

	Controllable or Preventable section of this analysis), the EPA concludes that there is a clear causal connection between the Salmon monitor values for the days listed in Table 2 of this analysis and the multiple wildfires that occurred in Idaho and surrounding states during the summer of 2012.
• The event is associated with measured concentrations in excess of normal historical fluctuations including background. 40 CFR 50.14 (c)(3)(iii)(C)	When reviewing $PM_{2.5}$ values over the course of 2012 in Salmon, it is visually obvious that the values in Table 2 are well above all other values measured in 2012 (Figure 21) and well above the values for that same time period during 2008-2011 (Figure 28). Table 4 quantitatively shows how both the mean value and highest values in 2012 are approximately 10 times higher than for the same period in 2008-2011. Based on the presented data, the EPA concludes that the values listed in Table 2 for Salmon are in excess of normal historical fluctuations, including background.
• There would have been no exceedances "but for" the event. 40 CFR 50.14(c)(3)(iii)(D)	To show there would have been no exceedances "but for" the event, the IDEQ demonstrated through historical fluctuations that the average $PM_{2.5}$ values for the July 30 – October 12 period for 2008-2011 in Salmon were relatively low at 5.8μg/m^3 (Table 4,5). It then showed through a clear causal relationship that wildfires were causing elevated $PM_{2.5}$ values through direct advection, diurnal valleys flows, and regional transport. The IDEQ also showed that there were no other significant sources of $PM_{2.5}$ that would have contributed at the time or in the quantity needed to result in the elevated values that were recorded at the Salmon monitor during this time period. The IDEQ showed that the exceedances in Table 2 submitted were above the 12.0μg/m^3 $PM_{2.5}$ annual standard, above the 35μg/m^3 24-hr $PM_{2.5}$ standard, and well above the background concentration levels. The IDEQ demonstrated a clear causal relationship between the fire events and the elevated emissions, and that there were no other reported irregular emissions events during that time period. Given this, the EPA concludes that but for the multiple wildfires in Idaho, particularly those near Salmon, and nearby states in the summer of 2012, and there would have been no exceedances of the annual $PM_{2.5}$ NAAQS at the monitor in Salmon, Idaho.
• Mitigation, 40 CFR 51.930	The IDEQ implemented its Air Pollution Emergency Rule by issuing a Stage 1 Forecast and Caution that prohibits open burning (Table 12) for multiple days in 2012. The IDEQ issued multiple press releases, Stage 1 Forecast and Caution notification, and completed daily wildfire reports; the Idaho

	Department of Health and Welfare also issued press releases (Appendix E). Additionally, the IDEQ purchased 43 HEPA filters for the Salmon School District to mitigate student health risk. The EPA concludes that the necessary mitigation steps were taken during this event.

Conclusion

Based on the documentation submitted by the IDEQ on December 6, 2013 and April 25, 2014, the EPA concurs on the $PM_{2.5}$ data values for the Salmon monitor listed in the following table, which have been flagged by the IDEQ in AQS as exceptional events. We concur with the exceptional events flags for these 46 days at the Salmon monitor listed in Table 2.

TABLE 2.

Salmon Monitored Values

Date	Salmon (primary) $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS site 16-059-0004-3-88101	Salmon (precision) $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS 16-059-0004-1-88101
8/10/2012	33.7	
8/11/2012	37.2	
8/12/2012	49.2	
8/13/2012	96.5	85.0
8/14/2012	147.0	
8/15/2012	67.3	
8/16/2012	106.5	
8/17/2012	96.6	
8/18/2012	30.4	
8/19/2012	34.5	31.2
8/20/2012	37.7	
8/23/2012	35.9	
8/24/2012	108.2	
8/25/2012	91.3	77.8
8/26/2012	45.5	
8/28/2012	58.2	
8/29/2012	78.1	
8/30/2012	132.0	
8/31/2012	49.8	45.1
9/1/2012	69.4	
9/2/2012	145.2	
9/3/2012	186.9	
9/4/2012	182.7	
9/5/2012	97.8	
9/6/2012	48.4	
9/7/2012	53.1	
9/8/2012	27.5	
9/10/2012	136.4	
9/11/2012	214.3	
9/12/2012	194.4	
9/13/2012	153.7	
9/14/2012	70.2	
9/15/2012	162.1	

9/16/2012	162.5	
9/17/2012	112.3	
9/18/2012	130.3	
9/19/2012	135.5	
9/20/2012	159.8	
9/21/2012	153.5	
9/22/2012	86.6	
9/23/2012	44.3	
9/24/2012	31.8	
9/25/2012	62.7	
9/26/2012	37.4	
9/27/2012	39.3	
10/9/2012	33.2	

The information and analyses presented in the IDEQ's exceptional event demonstration package provided a weight of evidence sufficient for the EPA's concurrence on the flagged data from the Salmon monitor on the dates listed in Table 2 above and as described in this document. Accordingly, we are placing a concurrence indicator in the EPA's AQS database for these dates at this monitor.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an approval of a non-attainment plan, maintenance plan or other regulatory decision.

EPA Region 10

Review of Exceptional Event Request
Pinehurst, ID
Annual $PM_{2.5}$ NAAQS
Dates Analyzed: Multiple (refer to Table 2)

Background

On March 22, 2007, the EPA adopted a final rule, *Treatment of Data Influenced by Exceptional Events* (Exceptional Events Rule at 72 FR 13560) to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the Exceptional Events Rule, the EPA may exclude data from use in determinations of National Ambient Air Quality Standard (NAAQS) exceedances and violations if a state demonstrates that an "exceptional event" caused the exceedances. Before the EPA can exclude data from these regulatory determinations, the state must flag the data in the EPA's Air Quality System (AQS) database and, after notice and opportunity for public comment, submit a demonstration to justify the exclusion. After considering the weight of evidence provided in the demonstration, the EPA decides whether or not to concur with each flag.

IDEQ's Request

The Idaho Department of Environmental Quality (IDEQ) requested concurrence on flagged 24-hour $PM_{2.5}$ data on four days for the Pinehurst monitor (Pinehurst, Shoshone County, AQS site 16-079-0017 POC4); herein this will be referred to as the Pinehurst monitor. The recorded 24-hour $PM_{2.5}$ levels for this monitor ranged from 43.6 $\mu g/m^3$ to 18.4 $\mu g/m^3$ for the data values for which the IDEQ is requesting the EPA's concurrence as exceptional events. Table 1 lists all of the values for which the IDEQ has requested evaluation and concurrence at the Pinehurst monitor.

TABLE 1.

Pinehurst Monitored Values

Date	Pinehurst monitor - $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS site 16-079-0017-4-88101
9/14/2012	31.3
9/15/2012	43.6
9/22/2012	20.8
9/25/2012	18.4

$PM_{2.5}$ levels from these days led to exceedance of the 12.0 $\mu g/m^3$ annual $PM_{2.5}$ NAAQS in Pinehurst. Documentation provided by the IDEQ demonstrates that there were multiple wildfires occurring in Idaho as well as Washington and Oregon during the summer of 2012. The build-up of smoke ($PM_{2.5}$)

was a result of regional transport of the emissions from these wildfires and stagnant local air conditions that affected air quality in the Pinehurst area.

The IDEQ flagged the monitored values as wildfire exceptional events before the statutory deadline of July 1, 2013. The agency made the documentation available for public comment for 30 days starting on November 5, 2013, and received no comments. The IDEQ submitted the exceptional event demonstration package to the EPA Region 10 on December 6, 2013, for multiple dates at the site. The agency then prepared an addendum at the EPA's request and made the documentation available for public comment for 30 days starting on March 17, 2014, and received no comments. The IDEQ submitted the addendum to the EPA on April 25, 2014. The IDEQ is requesting concurrence from the EPA on all of these days given that the data has regulatory significance for Pinehurst with regard to the area designations process for the 2012 annual $PM_{2.5}$ standard.

The EPA's Exceptional Event Evaluation

The EPA evaluated whether the documentation provided by the IDEQ for the flagged values at the Pinehurst monitor demonstrates that the requirements of the Exceptional Events Rule were met. The EPA has determined that each of the values identified by Idaho had regulatory significance and therefore has evaluated each of the days and values with respect to the Exceptional Event Rule requirements.

The matrix below summarizes the requirements of the Exceptional Events Rule and describes how the IDEQ met each requirement. Unless otherwise noted, all references to page numbers, tables, and figures relate to the IDEQ's December 6, 2013 submittal. References to the April 25, 2014 addendum are specifically noted as from "the addendum."

Procedural Requirements:	**EPA's Evaluation of Flagged Exceedances:**
• The data are flagged and include an initial event description in the EPA's AQS database. 40 CFR 50.14(c)(2)(i) and (iii)	The IDEQ flagged and described the four September 2012 elevated $PM_{2.5}$ values as wildfire exceptional events in the EPA's AQS database prior to the July 1, 2013 deadline.
• The public had an opportunity to review and comment on demonstration justifying data exclusion. 40 CFR 50.14(c)(3)(i) and (iv)	The IDEQ provided a 30-day public comment period on the documentation for the multi-day claimed exceptional event. The public comment period occurred between November 5 and December 5, 2013 for the initial demonstration submission and between March 17 and April 16, 2014 for the addendum to the demonstration. The IDEQ received no comments during either public comment period.

• Demonstration justifying data exclusion submitted timely to the EPA. 40 CFR 50.14(c)(3)(i)	The EPA received demonstration documentation from the IDEQ on December 6, 2013 before the deadline of not later than three years following the end of the calendar quarter in which the flagged concentration was recorded (in this case, September 30, 2015) and prior to the December 12, 2013 deadline for 2012 exceptional event submissions as defined in the 2012 Annual $PM_{2.5}$ Standard Rule (78 FR 3086, at 3233). The addendum provided additional documentation for and explanation of the IDEQ's timely December 6, 2013 submittal.

Technical Criteria:	
• The event satisfies the criteria in 40 CFR 50.1(j) (i.e., affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by EPA to be an exceptional event). 40 CFR 50.14(c)(3)(iii)(A)	*Conceptual Model* The IDEQ developed a conceptual model that shows how wildfires in Idaho and surrounding areas affected air quality in Pinehurst during the summer of 2012. In 2012, 1,667,654 acres burned due to wildfires in Idaho; this was more than in any other state in the nation (Figure 2). A number of fires, especially the Powell SBW Complex, burned to the southeast of Pinehurst, as well as fires in eastern Washington and northeastern Oregon (Figure 3). These fires burned for a prolonged period throughout the summer which led to a buildup of emissions from the wildfires in the region. It was estimated that during these summer fires, 76,300 tons of $PM_{2.5}$ emissions were emitted over the course of the summer, which averaged to 734 tons of $PM_{2.5}$ daily (Figure 4, pages 3-4). Weather conditions in Idaho were warmer and drier than usual, which made the area more susceptible to wildfires and made the wildfires larger. Additionally, high pressure systems in the pacific northwest area disrupted transport by creating stagnant conditions and minimal wind situations. In Pinehurst, the elevated emissions from these fires were described to occur from long range transport of wildfire emissions in Idaho as well as from fires in Washington and Oregon. Local stagnation conditions also contributed to the buildup of emissions in the area. *Affected Air Quality* As evidence that the event affected air quality, the IDEQ documented that the event exceeded historical fluctuations and demonstrated that there was a clear causal relationship between the event and the exceedances at the Pinehurst monitor. As discussed above, in 2012, 1,667,654 acres burned due to wildfires in Idaho (Figure 2). As mentioned in the conceptual model section, multiple wildfires burned in the summer of 2012 and large amount of $PM_{2.5}$ emissions were emitted. As shown on Table A (pg xii), the monitor in Pinehurst recorded elevated values of $PM_{2.5}$, especially in September 2012. The review of the 2012 Pinehurst elevated values shows that generally during the June through September time periods in 2008-2011 the average was 7.0$\mu g/m^3$ with a few peaks above 20$\mu g/m^3$ (Figure 31). When comparing the 2008-2011 $PM_{2.5}$ levels to 2012 $PM_{2.5}$ levels in this summer fire period, both the average (7.0$\mu g/m^3$ to 11.1$\mu g/m^3$) and maximum values (23$\mu g/m^3$ to 43.6$\mu g/m^3$) were higher in 2012, the latter value (Table 7). The historical fluctuations criterion is discussed again in further detail later in this analysis. The

	clear causal relationship criterion (also discussed later in further detail) also supports the conclusion that the event affected air quality by describing conceptually how the emissions generated by the wildfires reached the Pinehurst monitor, and by analyzing each affected day using HYSPLIT air mass back trajectories, hourly $PM_{2.5}$ levels, observed meteorological data, MODIS imagery, and text. Appendices E – F also provide supporting information in the form of newspaper articles and distributed the IDEQ air quality alerts. *Natural Event and not Reasonably Controllable or Preventable* In 2012, 1,667,654 acres burned due to wildfires in Idaho (Figure 2). It was estimated that during these summer fires, 76,300 tons of $PM_{2.5}$ emissions were emitted over the course of the summer which averaged to 734 tons of $PM_{2.5}$ daily (Figure 4, pages 3-4). In 2012, weather conditions in Idaho were warmer and drier than usual, which made the area more susceptible to wildfires and made the wildfires larger. The mean temperature in Idaho in August and September 2012 was in many places 1-5 degrees higher than in the 30 year (1981-2010) recent history (Figure 5, 6). Precipitation in 2012 was less than 25% of the average for these months than in the prior 30 year period of 1981-2010 (Figure 9 and 10), and from August through October 2012 a majority of Idaho was experiencing drought conditions (Figures 11-13). Additionally, high pressure systems in the pacific northwest area disrupted transport by creating stagnant conditions and minimal wind situations (pages 10-12). While there were at least eight wildfires in Idaho and surrounding areas in the summer of 2012, Pinehurst was primarily affected by the Mountain Fires (WA) – Cache Creek (OR) – Powell SBW Complex (ID). These fires burned for a prolonged period throughout the summer which led to a gradual buildup of emissions from the wildfires in the region. These fires, and most that occurred during the summer of 2012, were ignited by lightning strikes (Table 3) and exacerbated by the unusually warm, dry, and semi-stagnant air conditions that Idaho was experiencing and described earlier in this section of the analyses. For the major fires that affected Pinehurst, an estimated $23 million dollars were allocated for suppression of these fires (Table 3). Fires were managed in accordance with each forest's specific Fire Management Plan and in coordination with implementation of the IDEQ's air pollution emergency rule, which prohibits open burning and notifies the public of

	deteriorating air quality during air emergencies. The forest specific Fire Management Plans identify the area covered in the plan, links the associated and relevant planning documents, and set forth the plan goals, objectives, and priorities when managing fires. The IDEQ discusses anthropogenic and alternative sources of emissions in section 4.3. These include prescribed fires, crop residue burning, residential wood combustion, other forms of open burning, and on-road mobile sources. Most of these sources did not generate significant amounts of $PM_{2.5}$ compared to wild fire emissions as depicted in Figure 4 and described in section 4.3 (Alternative Hypotheses), most of these forms of burning were restricted at that time, there were no other known major sources of emissions at the time, and the heating season where residential wood combustion would contribute to ambient $PM_{2.5}$ does not start usually until October and would not have affected the background $PM_{2.5}$ levels. Addendum Section 4.3.6 (Industrial Sources) identifies the nearby sources of industrial emissions and confirms that their emissions were part of the historical fluctuations and that there were no unusual emissions from these industrial sources during the times of the wildfires. Based on the submitted information, the EPA concludes that the wildfires were natural events and that they were not reasonably controllable or preventable due to their size and persistence through the summer despite the significant human and financial resources committed to suppression of these fires by the federal land management agencies.
• There is a clear causal relationship between the exceedance and the claimed exceptional event. 40 CFR 50.14(c)(3)(iii)(B)	*Overview* The IDEQ established the clear causal relationship by first describing how in Pinehurst, the elevated emissions from these fires are attributed to two primary mechanisms: a general buildup of $PM_{2.5}$ in the Idaho area from the massive amount of $PM_{2.5}$ being generated by the fires, and local stagnation. Wildfire emissions from massive fires in the tri-state area were regionally transported (Figure 57) and the stagnant local air conditions led to the buildup of monitored $PM_{2.5}$ emissions in Pinehurst during these periods (Figure 61). The IDEQ documented the general build-up of $PM_{2.5}$ on a regional scale by weight of evidence in the form of MODIS satellite images with NOAA Ready-HYSPLIT model generated back trajectories to track the path of wildfire generated $PM_{2.5}$ to the Pinehurst monitor. This analysis is coupled with time series charts that include 2012 $PM_{2.5}$-

	average-95th percentile data, surface wind speed and wind direction data, and solar radiation-temperature-vertical temperature gradient data. These data can be found in Figure 57, Figure 61, and Appendix C. The IDEQ documented stagnant local air conditions in Figure 59 using a 500mb chart identifying pressure system locations that inhibited mixing in the region including northern Idaho. Local stagnation conditions were further illustrated by Figure 61 which shows HYSPLIT model back trajectories on a MODIS image; the shortened back trajectories are indicative of stagnant local air conditions. For the Pinehurst monitor, the weight of evidence supports the clear causal relationship of $PM_{2.5}$ between the fires and the Pinehurst monitor through a regional transport and local stagnation model as described in sections 4.10 and 4.11 respectively. Appendix C includes additional weight of evidence for Pinehurst. *Conclusion* Based on the suite of evidence provided, including MODIS imagery, HYSPLIT back trajectories, 500 mb chart data, surface wind speed and wind direction data, and no evidence of significant sources of anthropogenic $PM_{2.5}$ (as discussed in the Not Reasonably Controllable or Preventable section of this analysis), the EPA concludes that there is a clear causal connection between the Pinehurst monitor values for the days listed in Table 2 of this analysis and the multiple wildfires that occurred in Idaho and surrounding states during the summer of 2012.
• The event is associated with measured concentrations in excess of normal historical fluctuations including background. 40 CFR 50.14 (c)(3)(iii)(C)	The data for Pinehurst shows that generally during the June through September time periods in 2008-2011, the average is 7.0μg/m^3 with a few peaks above 20μg/m^3. When comparing the 2012 $PM_{2.5}$ levels in this summer fire period to the values in 2008-2011, the average (7.0μg/m^3 to 11.1μg/m^3) and maximum values (23μg/m^3 to 43.6μg/m^3) are higher in 2012 (Table 7). Based on the presented data, the EPA concludes that the values listed in Table 2 for Pinehurst are in excess of normal historical fluctuations, including background.
• There would have been no exceedances "but for" the event. 40 CFR 50.14(c)(3)(iii)(D)	To show there would have been no exceedances "but for" the event, the IDEQ demonstrated through historical fluctuations that the average $PM_{2.5}$ values for the July 30 – October 12 period for 2008-2011 for Pinehurst were relatively low at 7.0μg/m^3 (Table 7,8). It then showed through a clear causal

	relationship that wildfires were causing elevated $PM_{2.5}$ value through regional transport of wildfire emissions and local stagnation. The IDEQ also showed that there were no other significant sources of $PM_{2.5}$ that would have contributed at the time or in the quantity needed to result in the elevated values that were recorded at the Pinehurst monitor during this time period. The IDEQ showed that the exceedances submitted were above the 12.0μg/m^3 $PM_{2.5}$ annual standard, above the 35μg/m^3 24-hr $PM_{2.5}$ standard, and well above the background concentration levels. The IDEQ demonstrated a clear causal relationship between the fire events and the elevated emissions, and that there were no other reported irregular emissions events during that time period. Given this, the EPA concludes that but for the multiple wildfires in Idaho and nearby states in the summer of 2012, there would have been no exceedances of the annual $PM_{2.5}$ NAAQS at the monitor in Pinehurst, Idaho.
• Mitigation, 40 CFR 51.930	The IDEQ implemented its Air Pollution Emergency Rule by issuing a Stage 1 Forecast and Caution that prohibits open burning (Table 12) for multiple days in 2012. The IDEQ issued multiple press releases, Stage 1 Forecast and Caution notification, and completed daily wildfire reports; the Idaho Department of Health and Welfare also issued press releases (Appendix E). The EPA concludes that the necessary mitigation steps were taken during this event.

Conclusion

Based on the documentation submitted by the IDEQ on December 6, 2013 and April 25, 2014, the EPA concurs on the $PM_{2.5}$ data values for the Pinehurst monitor listed in the following table, which have been flagged by the IDEQ in AQS as exceptional events. We concur with the exceptional events flags for all four of the days at the Pinehurst monitor as listed in Table 2 below.

TABLE 2.

Pinehurst Monitored Values

Date	Pinehurst monitor - $PM_{2.5}$ concentration ($\mu g/m^3$) – AQS site 16-079-0017-4-88101
9/14/2012	31.3
9/15/2012	43.6
9/22/2012	20.8
9/25/2012	18.4

The information and analyses presented in the IDEQ's exceptional event demonstration package provided a weight of evidence sufficient for the EPA concurrence on the flagged data from the Pinehurst monitor on the dates listed in Table 2 above and as described in this document. Accordingly, we are placing a concurrence indicator in the EPA's AQS database for these dates at this monitor.

Note that the EPA's decisions on exceptional event exclusions are not considered final agency action until they are acted upon as part of a final regulatory action subject to public notice and comment. Such actions would include, for example, decisions to exclude the affected data from use in an approval of a non-attainment plan, maintenance plan or other regulatory decision.