

Appendix C.2 Monitoring Documentation - EPA Concurrence Letters

C.2.1 EPA Concurrence Letter for 2013 EE Demo

2013 Demo-<https://fortress.wa.gov/ecy/publications/SummaryPages/1502018.html>

C.2.2 EPA Concurrence Letter for 2015 EE Demo

2015 Demo-<https://fortress.wa.gov/ecy/publications/SummaryPages/1702015.html>

C.2.3 EPA Concurrence Letter for 2017 EE Demo

2017 Demo-<https://fortress.wa.gov/ecy/publications/SummaryPages/1902004.html>

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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MAY 23 2016

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OFFICE OF THE REGIONAL ADMINISTRATOR

MAY 26 2016
DEPARTMENT OF ECOLOGY
OFFICE OF DIRECTOR

Ms. Maia Bellon, Director
Washington Department of Ecology
Post Office Box 47600
Olympia, WA 98504-7600

Dear Ms. Bellon:

This letter responds to the Washington Department of Ecology's submittal dated January 15, 2016 regarding the elevated 24-hour PM₁₀ National Ambient Air Quality Standard levels at the Kennewick, Metaline monitoring station. The monitor exceeded the 150 µg/m³ PM₁₀ 24-hour NAAQS on September 15, October 28, and November 2, 2013. Ecology has requested that the Environmental Protection Agency concur that the PM₁₀ levels for the three submitted dates were due to exceptional events where dust was entrained and transported by high winds.

Our response to Ecology's request is governed by the "Treatment of Data Influenced by Exceptional Events" rule (72 FR 13560, March 22, 2007). After careful consideration of the information provided, we concur with Ecology's exceptional events flags for September 15, October 28, and November 2, 2013 at the Kennewick, Metaline monitoring station. The basis for our decisions on these concurrences are set forth in the enclosed document.

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 determination of attainment.

Thank you for Ecology's timely submittal of this exceptional event documentation. If you have any questions or wish to discuss this matter further, please contact me or have your staff contact Justin Spenillo, Air Programs Unit in the Office of Air, Waste and Toxics at (206) 553-6125.

Sincerely,

Dennis J. McLerran
Regional Administrator

Enclosure

cc: Stu Clark, Program Manager, Air Quality Program
Washington Department of Ecology

Jason Alberich, Supervisor, Rules and Policy Unit
Washington Department of Ecology

Laurie Hulse-Moyer, Air Quality Planner, Rules and Policy Unit
Washington Department of Ecology

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EPA Region 10

Review of Exceptional Event Request
Kennewick, WA
24-hour PM₁₀ NAAQS
Dates Analyzed: Multiple (refer to Table 1)

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.

Ecology's Request

The Washington Department of Ecology (Ecology) requested concurrence on flagged 24-hour PM₁₀ data on September 15, October 28, and November 2, 2013, at the Kennewick Metaline monitoring station (AQS site 53-005-0002, POC3); herein referred to as the Kennewick monitor. The recorded 24-hour PM₁₀ levels ranged from 227 µg/m³ to 620 µg/m³ during the exceptional events for which Ecology is requesting the EPA's concurrence.

Table 1. 24-hr PM₁₀ values at the Kennewick monitor flagged by Ecology due to exceptional events

Date	Kennewick - PM ₁₀ concentration (µg/m ³)
September 15, 2013	227
October 28, 2013	224
November 2, 2013	620

PM₁₀ levels from the submitted days exceeded the 150 µg/m³ PM₁₀ NAAQS. Documentation provided by Ecology demonstrates that preceding and during those days there were high winds entraining dust particles from the surrounding area and transporting the dust towards the Kennewick monitor. For the events on September 15 and November 2, 2013 the dust was entrained from the southwest and for the event on October 28, 2013 the dust was entrained from the northeast.

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Ecology flagged the monitored values as high wind exceptional events before the statutory deadline of July 1, 2014. The agency made the documentation available for public comment for 30 days starting on September 3, 2015, and received two comments. Ecology submitted the exceptional event demonstration package to the EPA Region 10 on January 15, 2016 and met the requirement of submission within in three years of end of the quarter in which the exceedance occurred (September 30 2016/ December 31 2016). Ecology requests concurrence from the EPA on these days, based on Ecology's conclusion that the data has regulatory significance with regard to the Kennewick / Wallula PM₁₀ maintenance plan which relies on data from the monitor.

The EPA's Exceptional Event Evaluation

The EPA evaluated whether the documentation provided by Ecology for the flagged values of the 24-hour PM₁₀ National Ambient Air Quality Standard (NAAQS) for the three days listed in Table 1 at the Kennewick Metaline (KENMETA) monitoring station (AQS site number 53-005-0002) in Washington demonstrates that the requirements of the Exceptional Events Rule were met. The EPA has determined that each of the values identified by Washington 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 Ecology met each requirement. All references to page numbers, tables, and figures relate to Ecology's January 15, 2016 submittal.

Procedural Requirements:	The EPA's Evaluation of Flagged Exceedances:
<ul style="list-style-type: none">• 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)	Ecology flagged and described the September 15, October 28, and November 2, 24-hour PM ₁₀ values as high-wind entrained dust exceptional events in the EPA's AQS database prior to the July 1, 2014 deadline.
<ul style="list-style-type: none">• The public had an opportunity to review and comment on demonstration justifying data exclusion. 40 CFR 50.14(c)(3)(i) and (iv)	Ecology provided a 30-day public comment period on the documentation for the claimed exceptional events. The public comment period began on September 3, 2015 and Ecology received and responded to two comments, available in Appendix J (sequentially after appendix H) of the demonstration. Both comments addressed existing controls on agriculture land.

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<ul style="list-style-type: none"> Demonstration justifying data exclusion submitted timely to the EPA. 40 CFR 50.14(c)(3)(i) 	<p>The EPA received demonstration documentation from Ecology on January 15, 2016 before the deadline of not later than 3 years following the end of the calendar quarter in which the flagged concentration was recorded (in this case, September 30 2016 and December 31 2016).</p>
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<p>Technical Criteria:</p> <ul style="list-style-type: none"> 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) 	<p><i>Conceptual Model</i></p> <p>Ecology developed a conceptual model that shows how a high wind event affected air quality by entraining dust and transporting it to the Kennewick monitor. High winds from all three events were generated as a result of thunderstorms in the area.</p> <p>The main source of the entrained dust were agricultural lands in Washington, however for the September 15 and November 2 events, contributions from agricultural land in Oregon could not be ruled out. The soils on the Columbia Plateau are fine grained and well suited for agriculture, but are highly susceptible to erosion. The land uses in the area are dryland agriculture and irrigation agriculture, with some natural desert and rangeland. During 2013 there were drought conditions and periods of high temperatures which exacerbated these qualities by reducing moisture content in the soil and killing cover crops before the events in Fall 2013. Figure 14 identifies that there were drought conditions during September 2013 in Washington and Oregon days before the first event and Figure 13 identifies that much of the Pacific Northwest was experiencing precipitation below 50% of normal levels during the Fall of 2013. (Section 5.1.2)</p> <p>September 15, 2013 – Thunder storms in central Oregon generated high winds that blew to the northeast entraining dust, likely both from Oregon and the Horse Heaven Hills, Washington area approximately 10 miles from the monitor. The wind gusts entrained enough dust to create a type of intense dust storm called a haboob (Section 5.2).</p> <p>October 28, 2013 – Thunderstorms in western Montana generated high winds which traveled westward and entrained dust from the agricultural lands up to 50 miles to the northeast of the Kennewick monitor (Section 5.3).</p> <p>November 2, 2013 – Thunder storms in central Oregon generated high winds that blew to the northeast entraining dust, likely both from Oregon and the Horse Heaven Hills in Washington</p>
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	<p>approximately 10 miles from the monitor (Section 5.4). Details for all three events will be discussed in further detail in the Clear Causal Relationship section later in this analysis.</p> <p><i>Affected Air Quality</i> As evidence that the events affected air quality, Ecology documented that the events exceeded historical fluctuations and demonstrated that there was a clear causal relationship between the events and the exceedances at the monitors. Section 1 and Section 6.1 of the demonstration list the recorded values above the PM₁₀ 24-hr standard on September 15, October 28, and November 2, 2013. The Historical Fluctuations section (Section 6.5) depicts in Tables 14-16 and Figures 49-50 that values rarely occur over the PM₁₀ NAAQS. The clear causal relationship (Sections 5.2, 5.3, 5.4 and 6.4) supports the conclusion that the event affected air quality by describing entrainment and transport of the dust to the monitor as well as the conditions before and after the event. Historical fluctuations and Clear Causal Relationship will be discussed in further detail later in this analysis</p> <p><i>Natural Event and not Reasonably Controllable or Preventable</i> Ecology identified that the areas over which the exceptional events occurred were primarily agriculture, dryland and irrigated land on the Columbia Plateau. The soil type is classified as the Ritzville Soil Series, a fine grained soil well suited for farming and prone to erosion. For the October 28, 2013 event, dust was entrained from the Columbia Plateau agricultural areas to the northeast of the monitor and for the September 15 and November 3, 2013 events the dust was entrained from Oregon and the Horse Heaven Hills, Washington agricultural areas to the southwest of the monitor. As already described, conditions prior to and during the Fall of 2013 were dry and hot, reducing soil moisture, further weakening the surface layer and making it more susceptible to erosion and entrainment by high winds.</p> <p><i>Wind</i> High winds were the cause of the entrainment of the dust and elevated PM₁₀ values recorded at the monitor. In the EPA's <i>Interim Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds Under the Exceptional Events Rule (Interim Guidance)</i>, the EPA generally stated that it would accept a threshold of a sustained wind of 25 mph for areas in the West provided the agencies submit evidence of this as the level at which they expect stable surfaces to be overwhelmed. A sustained wind of 25 mph could be shown by at least one hourly average over the threshold or by weight of evidence citing shorter periods of time exceeding the general 25 mph threshold (6.3.2.2, <i>Interim Guidance</i>). Data supporting the sustained</p>
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	<p>across approximately 50 miles of agricultural lands upwind of the Kennewick monitor. The upwind Spokane monitor, and upwind regional met monitors at Lind, Juniper Dunes Wilderness, and Escure showed the storm's progress and impact. At the Spokane Augusta Avenue monitor, PM₁₀ spiked just after 4:00 pm on the 27th and again on the 28th just about 8:00 am, corresponding with elevated wind speeds at that monitor. As the storm got closer to the Kennewick, the Lind, Juniper Dunes, and Escure met monitors, these monitors registered sustained, elevated wind speeds. In particular, Table 7 shows maximum gusts and maximum 1-hour wind speeds for Lind of 52.6 and 34.5 mph, for Juniper Dunes of 47 and 32 mph, and for Escure of 52 and 32 mph, respectively, during the event. The Kennewick station had gusts over 25 mph, but no one-hour periods that exceeded that level. All upwind monitors in Table 7 recorded gusts above 39 mph, and four upwind monitors recorded 1-hour averages above 29 mph.</p> <p>The November 2 event started when strong sustained winds from the southwest began in central Oregon, up to 180 miles away from Kennewick. These winds likely carried dust from Oregon and from nearby hills and agricultural lands in Washington southwest of Kennewick, to the Kennewick monitor. Winds first rose above 25 mph at 10:20 am in Kennewick and stayed elevated for approximately 6 hours. PM₁₀ first exceeded 150 µg/m³ at 10:23 am and peaked at 5,445 µg/m³ at 12:29 pm. For November 2, Table 9 identifies the Kennewick monitor and two local met monitors, BPKEN and BPHOR, and their maximum gust speed, maximum 1-hour speed, and number of hours with wind speeds above 25 mph. All three monitors recorded gusts above 47 mph, and all monitors recorded 1-hour averages above 35 mph. Of particular note, the BPKEN met monitor recorded a maximum wind gust of 101 mph, and a maximum 1-hour average wind speed of 86 mph.</p> <p>Based on the EPA <i>Interim Guidance</i> and weight of evidence provided, the EPA concludes that high wind thresholds were exceeded and that winds were of sufficient speed to cause high wind exceptional events on all three days.</p> <p>Controls</p> <p>It is also necessary to evaluate the events to ensure that steps were taken to prevent and control dust on anthropogenically disturbed land. For the areas of entrainment, the Horse Heaven Hills and Columbia Plateau, Ecology identifies the following measures were in place to manage the land so as to prevent or control the dust in the case of wind events: USDA-NRCS Conservation measures for Agriculture; Washington's NEAP; Washington State Fugitive Emissions rules; Wallula Maintenance Plan Control Strategies; and Benton Clean Air Agency Urban Fugitive Dust Policy. These plans</p>
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	<p>and strategies include a variety of controls including but not limited to: planting cover crops, keeping crop residues on surface, requirements to conduct a minimum level of surface tillage, reducing unsheltered distance along the wind erosion direction, producing and maintaining stable clods or aggregates on the land surface, and roughening the land. Additionally, many of these controls are regulated with spot checks and penalties, and supported by funding programs (Section 6.2.1).</p> <p>For the September 15 and November 2 events, Ecology believes that much of the dust could have been entrained on the Washington side of the Columbia River, but the agency could not rule out the possibility that some of the dust came from Oregon. Other than windblown dust, during the time of the three events at Kennewick, there were no other known sources of emissions that may have contributed to the recorded exceedances of the PM₁₀ NAAQS. Ecology confirmed that fires and industrial sources did not contribute to the high values and that there were no unusual occurrences during that time (Section 4.1).</p> <p>With the information provided in Ecology's submittal, they were able to support through weight of evidence that on the days of the recorded exceedances, wind thresholds for soil disturbance were exceeded and that there were multiple controls in place on the affected agricultural areas to prevent and control emissions from dust. The EPA concludes that the event was not reasonably controllable or preventable, and meets the exceptional event criteria.</p>
<ul style="list-style-type: none"> There is a clear causal relationship between the exceedance and the claimed exceptional event. 40 CFR 50.14(c)(3)(iii)(B) 	<p>Ecology described the clear causal relationship for each exceedance day: September 15 in Section 5.2; October 28 in Section 5.3; November 3 in Section 5.4. In general, a 'clear and causal relationship' between the exceedance on each day and the claimed exceptional event was made based on: 1) high winds caused by thunderstorms that entrained soils and created dust clouds, 2) PM₁₀ concentration that increased in proportion to the wind speeds, 3) backward wind trajectories that generally correlate well with upwind meteorological readings and hourly PM₁₀ increases, and 4) pollution roses showing that when the PM₁₀ concentrations exceeded 150 µg/m³, the wind direction was from the direction of the storm.</p> <p>For each day, conditions were evaluated prior to the event and during the event, and, where available, after the event. The evaluations utilize wind speed maps, satellite images with wind trajectories, speed and wind direction charts, HYSPLIT back trajectories, pollution/wind roses for the Kennewick monitor for each day, and hourly and 2-minute wind data for all impacted</p>

	<p>monitors. This information, shows the clear causal relationship between the wind storms and the elevated concentrations of PM₁₀ measured at the Kennewick monitor for each day. Additionally, other nearby or regional met monitors, and the PM₁₀ monitor at Spokane Augusta Avenue, are also analyzed to support the clear causal relationship by showing the wind speeds and PM₁₀ levels spatially and temporally. Specific explanations for a clear causal relationship for each event are described below.</p> <p>The September 15 event occurred when thunderstorms and strong winds created a dramatic dust storm that affected much of the region. High winds originated in central to northeastern Oregon, crossed the Columbia River and impacted Kennewick and points north on the Columbia Plateau. The time-series graphs in Figure 18 show elevated wind speeds at two upwind stations, Pendleton and The Dalles in Oregon, about an hour before the storm arrived in Kennewick. Figure 21 shows a good correspondence between elevated wind speeds and PM₁₀ concentrations at the Kennewick monitor. A regional weather synopsis identified a ridge of high pressures settling over Washington which caused the 2nd week of September to be unseasonably warm. For example, at Hanford, temperatures were over 90 degrees for ten of the first 15 days of the month and reached 99 degrees, just two days prior to the wind storm. While precipitation for the month ended up higher than normal at 0.42 inches, there was no rain for a week before the event. Because of the high temperatures and abnormally dry conditions at the beginning of September (see Figure 14), the soils in the immediate area of the Kennewick monitor were very dry and susceptible to wind erosion. A pollution/wind rose shows that when PM₁₀ concentrations were over 150 µg/m³ on September 15 at Kennewick, wind was from the southwest, the direction of the dust storm.</p> <p>The October 28 event began with strong winds that started on October 27 in western Montana. As the storm got closer to Kennewick, the upwind met monitors at Lind, Juniper Wilderness and Escure sites registered sustained, elevated wind speeds. A MODIS satellite image at 2:00 pm showed dust along the trajectory of the storm. HYSPLIT back trajectory figures on October 28 at 50, 100 and 500 m over Kennewick show that the winds associated with the storm originated in Montana within 24 hours of arriving in Kennewick. An extensive period of high pressure over Washington resulted in a dry spell for much of the month and there had been no precipitation since October 9, for three weeks prior to the event, leaving the area dry and vulnerable to wind erosion. Graphs show a good correlation between 1-minute average wind speeds, wind direction, and PM₁₀ concentrations at Kennewick. The pollution rose for the Kennewick monitor shows that when the monitored</p>
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	<p>values were above $150 \mu\text{g}/\text{m}^3$, the winds were from the north and northeast, the direction of the storm.</p> <p>The November 2 event started with strong sustained winds from the southwest which began in central Oregon. These winds likely carried dust from Oregon and nearby hills and agricultural lands in Washington southwest of Kennewick, to the Kennewick monitor. Winds first rose above 25 mph at 10:20 am in Kennewick and stayed above that speed for approximately 6 hours. PM_{10} concentrations first exceeded $150 \mu\text{g}/\text{m}^3$ at 10:23 am, and peaked at $5,445 \mu\text{g}/\text{m}^3$ at 12:29 pm, about the time that the wind speed peaked at 47 mph. A MODIS satellite image taken at 2:00 pm shows dust tracks along the trajectory of the storm path. HYSPLIT back trajectory figures on November 2 at 50, 100 and 500 m over Kennewick show that the wind associated with the storm initiated in central and western Oregon within 24 hours of arriving in Kennewick. As for soil moisture conditions, Pasco, a nearby city, had only 0.40 inches of precipitation in November, which was Pasco's fifth driest month since records began in 1945. Figures 44 and 45 shows good correspondence between 1-minute average wind speeds, wind direction, and PM_{10} concentrations at Kennewick. A pollution/wind rose shows that when PM_{10} concentrations were highest on November 2, winds were from the southwest, the direction of the storm.</p> <p>Based on the suite of evidence provided, including MODIS imagery, HYSPLIT back trajectories, surface wind speed and wind direction data, and other meteorological and monitoring data, the EPA concludes that there is a clear causal connection between the Kennewick PM_{10} monitor values recorded on September 15, October 28, and November 3, and the high wind events that entrained and transported dust on those days.</p>
<ul style="list-style-type: none"> The event is associated with measured concentrations in excess of normal historical fluctuations including background. 40 CFR 50.14 (c)(3)(iii)(C) 	<p>Section 6.5 of the submittal identifies the PM_{10} exceedances at the Kennewick monitor dating from 2004 through 2014. Figures 49-50 in this section show the limited number of times where the monitor exceeded the NAAQS. A comparison, of PM_{10} values and wind speeds on the three event day to historical values, is shown in Tables 15. This table shows that PM_{10} concentrations on the three event days exceeded 99.2% of all values collected at the Kennewick monitor in the 4th quarter since the monitor was established in 2004, and shows that wind speeds associated with the three events exceeded 95.8% of all wind speeds on days with 1-minute wind speeds greater than 25 mph. Based on the presented data, the EPA concludes that the values recorded on September 15, October 28, and November 3 are in excess of normal historical fluctuations including background.</p>

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<ul style="list-style-type: none"> There would have been no exceedances "but for" the event. 40 CFR 50.14(c)(3)(iii)(D) 	<p>To show there would have been no exceedances "but for" the event, Ecology demonstrated that wind-blown dust was the only source capable of being able to generate concentrations above the standard of 150 $\mu\text{g}/\text{m}^3$ in the recent past. The exceedances submitted were well above the 150 $\mu\text{g}/\text{m}^3$ standard (ranging from 224 -- 620 $\mu\text{g}/\text{m}^3$), and well above the levels had there been no wind, as cited in Table 17. Additionally, the demonstration of a clear causal relationship between the high wind event and the elevated PM_{10} concentrations, and that there were no other reported irregular emissions events during that time period, further support that there would have been no exceedance but for the high wind event. The EPA concludes that but for the high wind event entraining and transporting dust to the Kennewick monitor, there would have been no exceedances of the PM_{10} NAAQS at the Kennewick monitor on the days in question.</p>
<ul style="list-style-type: none"> Mitigation, 40 CFR 51.930 	<p>Ecology provided public notification through a variety of means as described in Section 6.8 and Appendix B, C, D, E, and I. Annually, Ecology provides dust education by releasing a series of documents on its websites. Ecology also provides real time monitoring data on its website and for each of the events it broadcast wind warnings through the National Weather Service. Given the short duration of these events, their unexpected occurrence, and the rare frequency of occurrence, the EPA concludes that the necessary mitigation steps were taken during these events.</p>

Conclusion

Based on the documentation submitted by Ecology on January 15, 2016, the EPA concurs on the PM_{10} data values listed in Table 2, which have been flagged by Ecology in AQS as exceptional events.

Table 2. 24-hr PM_{10} values at the Kennewick monitor that EPA concurs are exceptional events

Date	Kennewick - PM_{10} concentration ($\mu\text{g}/\text{m}^3$)
September 15, 2013	227
October 28, 2013	224
November 2, 2013	620

The information and analyses presented in Ecology's exceptional event demonstration package provided weight of evidence sufficient for the EPA concurrence on the flagged data from the Kennewick monitor on the dates listed 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.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

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MAR 21 2018

OFFICE OF
AIR AND WASTE

Ms. Maia Bellon
Director
Washington Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Bellon:

This letter responds to the Washington Department of Ecology's submittal dated November 30, 2017, regarding the elevated PM₁₀ concentration measured at the Kennewick Metaline Road monitoring station (AQ5 site # 53-005-0002, POC 3) on August 14, 2015. This PM₁₀ concentration exceeded the 150 µg/m³ PM₁₀ 24-hour National Ambient Air Quality Standard. Ecology has requested that the U.S. Environmental Protection Agency concur that the 24-hour PM₁₀ concentration on August 14, 2015, was caused by exceptional events due to dust entrained by high winds and transported to the Kennewick monitor.

In 2016, the EPA revised the Exceptional Events Rule found in 40 CFR 50.14 and 51.930. See "Treatment of Data Influenced by Exceptional Events" rule (81 FR 68216, October 3, 2016). After careful consideration of the information provided, we concur, based on the weight of evidence, that Ecology has made the demonstrations referred to in 40 CFR 50.14(a)(2) and (b)(1). In addition, Ecology has met the schedule and procedural requirements in 40 CFR 50.14(c) with respect to the same information. The EPA has reviewed the documentation provided by Ecology to demonstrate that the elevated PM₁₀ concentration recorded at the KENMETA monitoring station on August 14, 2015 meets the criteria for an exceptional event in the EER. The basis for our concurrence is set forth in the enclosed technical support document. My staff has entered or will shortly enter a "concurrence flag" for this data into the EPA's Air Quality System data repository.

The EPA's concurrence is a preliminary step in the regulatory process for actions that may rely on the dataset containing the event-influenced data and does not constitute final agency action. When the EPA takes a regulatory action that is affected by exclusion of the PM₁₀ data for the August 14, 2015 event at the KENMETA, the EPA intends to publish notice of its proposed action in the Federal Register. The EPA's concurrence letter and accompanying technical support document will be included in the record as part of the technical basis for that proposal. When the EPA issues that regulatory action, it will be a final agency action subject to judicial review.

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Thank you for Ecology's submittal of this exceptional event documentation. If you have any questions or wish to discuss this matter further, please contact me or have your staff contact Justin Spenillo, Air Planning Unit, Office of Air and Waste, at (206) 553-6125.

Sincerely,



Timothy B. Hamlin
Director

Enclosure

cc: Mr. Jason Alberich
Ecology

Ms. Caroline Sun
Ecology

Ms. Laurie Hulse-Moyer
Ecology

Appendix C.2 Monitoring Documentation - EPA Concurrence Letters

EPA, Region 10

Review of Exceptional Event Request
Kennewick, Washington
24-hour PM₁₀ NAAQS
Date Analyzed: August 14, 2015

Background

On October 3, 2016, the EPA published a final rule, *Treatment of Data Influenced by Exceptional Events*, with an effective date of September 30, 2016 (Exceptional Events Rule or EER at 81 FR 68216). The 2016 Exceptional Events Rule governs the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate and revises the rule initially adopted by the EPA on March 22, 2007 (72 FR 13560). 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 notify the Administrator of its intent to exclude data by flagging the data in the EPA’s Air Quality System database and engaging in the initial notification process. Then, after notice and opportunity for public comment at the state level, the state must 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. Final action on the data exclusion does not occur until it is acted upon as part of a final regulatory action subject to public notice and comment.

Washington Department of Ecology (Ecology) Request

Ecology requested concurrence on flagged 24-hour PM₁₀ data on August 14, 2015, at the Kennewick Metaline Road monitoring station (AQS site # 53-005-0002, POC 3). The recorded 24-hour PM₁₀ level for which Ecology requests the EPA’s concurrence is shown in Table 1. The PM₁₀ level from the submitted day exceeded the 150 µg/m³ PM₁₀ NAAQS.

Table 1. Ecology Flagged 24-hr PM₁₀ Values at the KENMETA Monitor Due to a High Wind Dust Exceptional Event

Date	PM ₁₀ Concentration (µg/m ³)
August 14, 2015	589

Ecology flagged the monitored values as due to a high wind dust exceptional event. The agency made the documentation available for public comment for 30 days starting on September 25, 2017. The comment period closed on October 25, 2017 and Ecology did not receive any public comments. Ecology submitted the exceptional event demonstration package to the EPA on November 30, 2017. Ecology requests concurrence from the EPA for the flagged day, based on Ecology’s conclusion that the data has

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regulatory significance with regard to the PM₁₀ 24-hour design value at the KENMETA monitor and the upcoming submission of its second ten-year PM₁₀ Maintenance Plan.

The EPA's Exceptional Event Evaluation

The EPA has determined that the PM₁₀ exceedance on August 14, 2015, has regulatory significance for use in Ecology's second ten-year PM₁₀ maintenance plan demonstration currently in development. Therefore, the EPA has evaluated whether the documentation provided by Ecology for the PM₁₀ value on August 14, 2015, meets the requirements of an exceptional event under the Exceptional Event Rule.

The matrix below summarizes the requirements of the Exceptional Events Rule and describes how Ecology met each requirement. All references to page numbers, tables, and figures relate to Ecology's November 30, 2017 submittal.

Procedural Requirements:	The EPA's Evaluation of Flagged Exceedances:
<ul style="list-style-type: none"> The state must notify the EPA of its intent to request exclusion of data as due to an exceptional event by creating an initial event description and flagging the associated data in the EPA's AQS database, and engaging in the Initial Notification of Potential Exceptional Event Process. 40 CFR 50.14(c)(2)(i). 	<p>Ecology flagged and described the August 14, 2015, 24-hour PM₁₀ value as due to a high wind dust exceptional event in the EPA's AQS database in June 2016.</p> <p>Ecology has also participated in the EPA, R10 Annual Exceptional Events teleconference on March 10, 2016 and April 6, 2017, and subsequent meetings to discuss data potentially influenced by an exceptional event, to determine if the identified data may affect a regulatory determination, and to discuss development of an exceptional event demonstration.</p> <p>Ecology has met the Initial Notification and Flagging requirements for this demonstration.</p>
<ul style="list-style-type: none"> The public had an opportunity to review and comment on the demonstration justifying data exclusion; any public comments received by Ecology were included in the demonstration; and the demonstration addresses those comments disputing or contradicting factual evidence provided in the demonstration. 40 CFR 50.14(c)(3)(v). 	<p>Ecology provided a 30-day public comment period on the documentation for the claimed exceptional event. The public comment period ran from September 25, 2017 to October 25, 2017. No comments were received.</p> <p>Ecology has met the public comment requirements for this demonstration.</p>

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Technical Criteria:	
<ul style="list-style-type: none"> The demonstration includes a narrative conceptual model that describes the event as provided in 40 CFR 50.14(c)(3)(iv)(A). 	<p><i>Conceptual Model</i></p> <p>Ecology describes key elements of a conceptual model throughout the demonstration, predominantly in Sections 1 through Section 3. The conceptual model describes a high wind event that was generated southwest of the KENMETA monitor on August 14, 2015, traveled northeast, and then entrained and transported the dust to the monitor, which recorded the elevated values for that area in the afternoon.</p> <p>In Section 3.2.1, Ecology explains that the area where the high winds entrained dust had been experiencing drought conditions since 2013 based on the USDA Drought Monitor. Figure 16 shows that, on August 11, 2015, days before the event, all of Washington was experiencing severe/extreme drought conditions. Figures 5 provides imagery of the dust plume travelling on the day of the recorded exceedance. Conditions were conducive to erosion and entrainment. The entrained dust primarily came from agricultural lands in the Horse Heaven Hills agricultural area located in Benton and Klickitat Counties in Washington as shown in Figures 1, 2, 3, and 4.</p> <p>Sections 3.1 and 3.2 explain that the wind event was generated to the southwest of the KENMETA monitor. Figure 10 depicts the temporal progression of the wind storm and PM₁₀ values at KENMETA. Wind speeds on August 14, 2015 increased through the early morning and peaked above 25mph between noon and 4:00 p.m. with the speeds subsiding after 4:00 p.m. The recorded PM₁₀ concentrations followed this same progression, with concentrations rising at 10:00 a.m., peaking between 1:00 -2:00 p.m., and quickly decreasing in the afternoon. Section 3.1 provides multiple wind and pollution roses in Figures 11, 12, and 14 that demonstrate that the winds and pollution were coming from the southwest. Table 2 and Figures 10 and 13 demonstrate that during the high wind event, 1-hour average wind speeds ranged from 28.6 mph to 54 mph at or upwind of the KENMETA monitor and that wind speed exceeded 25 mph from noon to 4:00 p.m. at the KENMETA site. The BPKEN monitor station ~10 miles to the southeast recorded higher winds speeds for longer durations.</p> <p>The information in Ecology's submission provides a detailed description of the event, including the entrainment and transport of the dust, which satisfies the conceptual model criteria.</p>

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<ul style="list-style-type: none"> • The event meets the definition of a “high wind dust event” in 40 CFR 50.1(p). 	<p><i>High Wind Dust Event</i></p> <p>A “high wind dust event” is defined as an event that includes high-speed wind and the dust that the wind entrains and transports to a monitoring site.</p> <p>As described in Ecology’s conceptual model, the event included high wind speeds that entrained dust and transported the dust to the KENMETA monitor during a period where drought conditions made the soil more susceptible to entrainment. The EER contains a presumptive 25 mph (1-hour average wind speed) high wind threshold for identified Western states. 40 CFR 51.14(b)(5)(iii). As described in the Washington Natural Events Action Plan, Columbia Plateau in eastern Washington has a state established, area-specific high wind threshold of 18 mph for two or more hours, as discussed in Section 3.1. In Table 2 and Figures 10, 13, and 15, Ecology shows that both the presumptive high wind threshold in the EER for Western states and the Washington area-specific thresholds were met as all three monitors in the area experienced 1 hour sustained winds over 25 mph, and multi-hour sustained winds over 18 mph.</p> <p>The weight of evidence supports the conclusion that the event meets the definition of a high wind dust event under the Exceptional Events Rule.</p>
<ul style="list-style-type: none"> • The event satisfies the “clear causal relationship” criteria in 40 CFR 50.1(j); 40 CFR 50.14(c)(3)(iv)(B). 	<p><i>Clear Causal Relationship</i></p> <p>As evidence that the event affected air quality, the Executive Summary and Section 1 show that the August 14, 2015 589 $\mu\text{g}/\text{m}^3$ recorded concentration exceeded the 150 $\mu\text{g}/\text{m}^3$ PM_{10} 24-hour standard. To demonstrate a clear causal relationship between the high wind dust event and the elevated PM concentrations at the KENMETA monitor, Ecology examined a number of factors including satellite imagery, wind and pollution roses, wind speed and direction, and HYSPLIT back trajectories. Most of these analyses have already been discussed in the Conceptual Model and Natural Event/High Wind Dust Event sections above, except for the back trajectories.</p> <p>The NOAA HYSPLIT back trajectories have been analyzed at 50m, 100m, and 500m as depicted in Figures 20, 21, 22, and 23. All of these figures clearly show that the winds transporting the dust plume approached from the southwest of the KENMETA monitor. This approach occurred over the Horse Heaven Hills agricultural area where the dust entrainment occurred.</p> <p>Based on the weight of evidence provided, the EPA concludes that there is a clear causal relationship between the elevated PM_{10}</p>

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	concentration recorded at the KENMETA monitor on August 14, 2015, and the high wind dust event.
<ul style="list-style-type: none"> The demonstration includes an analysis comparing the claimed event-influenced concentrations to concentrations at the same monitoring site at other times to support the “clear causal connection” requirement. 40 CFR 50.14(c)(3)(iv)(C). 	<p><i>Event-Related Concentrations Compared to Historical Concentrations</i></p> <p>Section 3.4 of the demonstration compares the event influenced concentrations to concentrations from the same monitoring site over the course of multiple years and seasons to support that the event affected air quality and that there was a clear causal relationship between the event and the monitored exceedance.</p> <p>In Figures 24 and 30, Ecology plotted all PM₁₀ concentrations at the KENMETA monitor from 2012-2016. Both plots showed that all values, except for seven, were below the 150 µg/m³ standard. Table 6 showed that three of the dates with recorded concentrations above the 150 µg/m³ standard were claimed by Ecology as due to high wind exceptional events, with which the EPA concurred, and the remaining four were suspected of being due to high wind exceptional events. Figure 25 and Table 6 showed that these exceedances all occurred when wind speeds were above 20 mph. Figure 29 and Table 7 both show that these high values occur infrequently and that the value recorded on August 14, 2015 was over the 99.9% percentile ranking.</p> <p>Ecology’s submittal demonstrates that the PM₁₀ concentration in Kennewick on the event day was in excess of normal historical fluctuations, including background, and supports the conclusion that there is a clear causal connection between the high winds entraining dust on August 14, 2015 and the elevated PM₁₀ concentration at the KENMETA monitor that day.</p>
<ul style="list-style-type: none"> The event satisfies the “not reasonably controllable and not reasonably preventable” criteria in 40 CFR 50.1(j); 40 CFR 50.14(b)(5)(iv), (b)(5)(v), (b)(8), and (c)(3)(iv)(D). 	<p><i>Not Reasonably Controllable/Not Reasonably Preventable</i></p> <p>High wind events under the 2016 exceptional event rule are not required to address the not reasonably preventable prong. 50.14(b)(5)(iv).</p> <p>To meet the not reasonably controllable prong of the requirement, in Section 3.5, Ecology explained that the primary sources of emissions in the area that affected the monitor were from agricultural activities along the wind path on the day of the exceedance. Ecology investigated other potential sources of emissions and found that there were no emissions from industrial sources or wildfires that may have contributed to the exceedance. Ecology discusses in Section 3.5.2 the controls in place and in Section 3.5.3 assesses the implementation of these controls.</p> <p><i>Controls in Place in Washington</i></p>

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	<p>Ecology's submittal describes agricultural controls in place that are designed to reduce wind erosion and fugitive dust, to support its conclusion that appropriate controls were in place at the time of the high wind event.</p> <p>Ecology identified controls housed and implemented in the following agencies/programs: USDA-NRCS Conservation Measures for Agriculture including three Conservation Title Programs designed to reduce erosion through conservation; Washington's NEAP, which documents and establishes conservation practices; Washington's and Benton County's rules to address fugitive dust/emissions; and federal legislation that also supports conservation efforts. These plans and strategies include a variety of controls including but not limited to: removing land from crop production, planting cover crops, keeping crop residues on surface to prevent erosion, minimizing surface tillage, reducing unsheltered distance along the wind erosion direction, producing and maintaining stable clods or aggregates on the land surface, development of plans to prevent fugitive dust emissions, and roughening the land to reduce erosion.</p> <p>To show that these practices were in place and being implemented on August 14, 2014, Ecology identified in Figure 32 the number of acres participating in conservation programs, along with additional narrative information on participation in the individual conservation programs. Figures 33 and 34 show pictures of efforts within the two counties to utilize innovative technologies and measures (stripper header and deep furrow seeding) to reduce tillage and minimize fugitive dust. Table 9 identifies how these conservation practices are estimated to reduce erosion by 25 percent of cropped acres and 100 percent for acres utilizing cover. The narrative also explains that these conservation programs ensure that participants are complying with the programs through a variety of means including requiring certification that they are in compliance with an NRCS approved conservation plan, performing random compliance audits annually for those participating in the NRCS and FSA programs, and performing spot checks annually on approximately 5 percent of participants in the EQUIP, CSP, and CRP programs. Failure to comply can result in loss of funding, and, in some cases, refunding funding with interest. Both Benton County and Washington State have staff resources in place to enforce their rules.</p> <p>Ecology's submittal does not contain a showing that the controls in place on affected agricultural areas render the agricultural lands as resistant to high winds as natural undisturbed lands in the area. See 40 CFR 50.14(b)(5)(v). It does show, however, that there were multiple controls in place on the affected agricultural areas at the time of the high wind event to prevent and control emissions from</p>
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	<p>anthropogenic sources, primarily agricultural sources. In addition, as part of its efforts to address emissions from lands disturbed by agriculture, Ecology continues to engage with the land management agencies responsible for these lands and supports their efforts. Ecology is also developing a mitigation plan for this area which will also address efforts to continue to control emissions from the agriculturally disturbed lands in the area. The EPA, therefore, concludes on the weight of evidence and the specific facts presented here that Ecology has shown that reasonable measures to control the impact of the event on air quality were applied at the time of the event.</p>
<ul style="list-style-type: none"> The event satisfies the “unlikely to recur at a particular location or a natural event” criteria in 40 CFR 50.1(k); 40 CFR 51.14(c)(iv)(E). 	<p><i>Natural Event</i></p> <p>A high wind dust event can be considered a natural event if all anthropogenic sources were reasonably controlled as determined in accordance with 40 CFR 50.14(b)(8). This high wind dust event meets this requirement as described in the <i>Not Reasonably Controllable or Preventable</i> section of this analysis above. Additional information to support that this was a natural wind event include the technical information that documented the high wind event including the satellite images, wind speed and direction information, and the outreach materials that included advisories notifications, blog postings, and media advisories that documented the high wind event. The EPA concludes that this high wind event can be considered a natural event.</p>
<ul style="list-style-type: none"> The event satisfies the “mitigation” criteria in 40 CFR 51.930 and 40 CFR 51.14(b)(9). 	<p><i>Mitigation</i></p> <p>40 CFR 51.930 requires that a state requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the NAAQS. At a minimum, the State must:</p> <ol style="list-style-type: none"> 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. <p>To meet the public notification requirements, Ecology identified a variety of pathways. These include the Northwest Weather Service</p>

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	<p>advisories which provide media and radio advisories, Ecology air quality notifications which provide notifications via the web and social media, and Benton County efforts to provide notification locally. For the August 14, 2015 high wind event, the submittal (Section 3.7) identified notification through an Ecology tweet notification, multiple NWS advisories released prior to and during the high wind, and media reports related to the high wind event. Additionally, in Appendix D, Ecology showed that it provided information throughout the year to educate the public on dust storms, including information on the Ecology website explaining how individuals can reduce exposures to unhealthy emissions levels, and distribution of a windblown dust informational brochure.</p> <p>The information provided in Ecology's submittal is sufficiently detailed to document that the mitigation requirements of the Exceptional Event Rule have been met. The area has triggered the mitigation plan requirement of 40 CFR 51.930(b), with the mitigation plan being due in Fall 2018. This was detailed in the October 3, 2016 EER at 81 FR 68216; the areas that triggered the mitigation requirement are listed in Table 6, 81 FR 68272. Efforts to meet this requirement have been underway since 2017. The plan is not currently due and does not need to be evaluated for this submittal.</p>
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Conclusion

The EPA has determined that the PM₁₀ value of 589 µg/m³ that occurred on August 14, 2015, was due to a high wind dust exceptional event and has regulatory significance for use in Ecology's Wallula second ten-year PM₁₀ maintenance plan. Based on the documentation submitted by Ecology dated November 30, 2017, the EPA concurs on the PM₁₀ data value listed in Table 2, which has been flagged by Ecology in AQS as due to a high wind dust exceptional event.

Table 2. 24-hr PM₁₀ Value Flagged by Ecology at the KENMETA Monitor and Concurred on by the EPA as Meeting the Exceptional Event Criteria

Date	PM ₁₀ Concentration (µg/m ³)
August 14, 2015	589

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

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3140

AIR AND RADIATION
DIVISION

SEP 11 2019

Ms. Maia Bellon
Director
Washington Department of Ecology
P.O. Box 47600
Olympia, Washington 98504

Dear Ms. Bellon:

This letter is in response to the Washington Department of Ecology submission sent March 20, 2019, regarding the elevated 24-hour PM₁₀ concentrations measured at the monitoring site in Kennewick, Washington (KENMETA, AQS site number 53-005-0002, POC3) on September 5-7, 2017. Ecology also submitted information regarding the monitoring site in Yakima, Washington (YAK4S, AQS site number 53-077-0009, POC3) for the same time period, which we plan to respond to in a separate letter. Ecology has requested that the U.S. Environmental Protection Agency concur that these elevated PM₁₀ concentrations on these three days in September 2017 at the Kennewick monitoring station were caused by exceptional events due to wildfire emissions in Washington, Northern California, Oregon, Idaho, and Montana.

In 2016, the EPA revised the Exceptional Events Rule found in 40 CFR 50.14 and 51.930. See "Treatment of Data Influenced by Exceptional Events" rule (81 FR 68216, October 3, 2016). The 2016 rule revisions at 40 CFR 50.14(a)(1)(i) limit the applicability of the Exceptional Event Rule to exceedances or violations of the National Ambient Air Quality Standards that have relevance to specific regulatory determinations by the EPA, or otherwise as approved by the EPA administrator on a case-by-case basis. After careful consideration of the information provided, we concur, based on the weight of evidence, that Ecology has made the demonstrations referred to in 40 CFR 50.14(a)(2) and (b)(1) for a limited subset of days included in Ecology's request. Ecology has met the schedule and procedural requirements in 40 CFR 50.14(c) with respect to the same information; however, only a portion of the days currently meet the regulatory significance requirement. The EPA has reviewed the documentation provided by Ecology to demonstrate that the elevated PM₁₀ concentrations recorded at the Kennewick monitoring station on September 5 and 6, 2017 (but not September 7, 2017), meet the criteria for an exceptional event in the Exceptional Event Rule. The basis for our concurrence is set forth in the enclosed technical support document. My staff has entered or will shortly enter a "concurrence flag" for this data into the EPA's Air Quality System data repository. The EPA will retain the Ecology's demonstration for September 7, 2017, for future consideration should this data become significant for a future regulatory action.

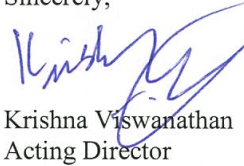
The EPA's concurrence is a preliminary step in the regulatory process for actions that may rely on the dataset containing the event-influenced data and does not constitute final agency action. When the EPA takes a regulatory action that is affected by exclusion of the PM₁₀ data for the exceedances that occurred at the Kennewick monitoring station on September 5 and 6, 2017, the EPA intends to publish notice of

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its proposed action in the Federal Register. The EPA's concurrence letter and accompanying technical support document will be included in the record as part of the technical basis for that proposal. When the EPA issues that regulatory action, it will be a final agency action subject to judicial review.

Thank you for Ecology's submission of this exceptional event documentation. If you have any questions or wish to discuss this matter further, please contact me or have your staff contact Matthew Jentgen, Air Planning Section, Division of Air and Radiation, at (206) 553-0340.

Sincerely,



Krishna Viswanathan
Acting Director

Enclosure

cc: Ms. Kathy Taylor
Ecology

Mr. Jason Alberich
Ecology

Ms. Laurie Hulse-Moyer
Ecology

Mr. Jacob Berkey
Ecology

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EPA, Region 10 Technical Support Document

Review of Exceptional Event Request Kennewick, Washington PM₁₀ NAAQS Dates Analyzed: September 5-7, 2017

Background

On October 3, 2016, the U.S. Environmental Protection Agency published a final rule, *Treatment of Data Influenced by Exceptional Events*, with an effective date of September 30, 2016, (Exceptional Events Rule or EER at 81 FR 68216). The 2016 Exceptional Events Rule governs the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate and revises the rule initially adopted by the EPA on March 22, 2007, (72 FR 13560). 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 notify the Administrator of its intent to exclude data by flagging the data in the EPA’s Air Quality System database and engaging in the initial notification process. Then, after notice and opportunity for public comment at the state level, the state must submit a demonstration to justify the exclusion. After considering the weight of evidence provided in the demonstration, the EPA decides whether the requirements for concurring on the flag have been met. Final action on the data exclusion does not occur until it is acted upon as part of a final regulatory action subject to public notice and comment.

Washington Department of Ecology Request

Ecology requested concurrence on flagged 24-hour PM₁₀ concentrations that occurred over a three-day period at the Kennewick, Washington monitoring station (KENMETA, AQS site number 53-005-0002, POC3) (“Kennewick monitoring station”). The recorded PM₁₀ concentrations for which Ecology requests the EPA’s concurrence are shown in Table 1.

Table 1. PM₁₀ concentrations for which the Ecology requests the EPA’s concurrence¹

Date	PM ₁₀ Concentration (µg/m ³) KENMETA, 53-005-0002, POC3
9/5/2017	261
9/6/2017	207
9/7/2017	195

¹ Note: Ecology included in its submittal a data table (Table 1) that had the following values: 292 µg/m³ for September 5, 2017; 238 µg/m³ for September 6, 2017; and 212 µg/m³ for September 7, 2017. These are the same values as the Burbank-Maple St monitor (53-071-0006), which was not the regulatory monitor for the Kennewick/ Wallula Maintenance Area during the 2015-17 time period, indicating Burbank-Maple St monitoring data was included by mistake. The values from the Kennewick monitor are included above.

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Ecology flagged the monitored values as due to a wildland fire exceptional event. The agency made the documentation available for public comment for 30 days starting on August 13, 2018.² The comment period closed on September 14, 2018, and Ecology received six comments and has included its response to the comments in its submission. Ecology submitted the exceptional event demonstration package to the EPA on March 20, 2019. Ecology requests concurrence from the EPA for the flagged days, based on Ecology's conclusion that the dates at the Kennewick monitoring station have regulatory significance with regard to the PM₁₀ 24-hour standard and the criteria for submission of a second 10-year maintenance plan. Ecology identified the dates with current regulatory significance as September 5-7, 2017.

The EPA's Exceptional Event Evaluation

The EPA agrees with the Ecology that the PM₁₀ exceedances on September 5 and 6, 2017, have regulatory significance for purposes of the Kennewick PM₁₀ second 10-year maintenance plan. However, after evaluating the criteria in the Exceptional Events Rule, the EPA determined that September 7, 2017, does not have regulatory significance and will not be evaluated as due to a wildfire exceptional event in this action. The 2016 rule revisions at 40 CFR 50.14(a)(1)(i) limit the applicability of the EER to NAAQS exceedances or violations that have relevance to specific regulatory determinations by the EPA or otherwise as approved by the EPA administrator on a case-by-case basis. The September 7, 2017, data does not have regulatory significance at this time because the area attains the PM-10 NAAQS once the September 5 and 6, 2017 data is excluded from consideration.

Table 2. PM₁₀ Concentrations that Have Regulatory Significance

Date	PM ₁₀ Concentration (µg/m ³) KENMETA, 53-005-0002, POC3
9/5/2017	261
9/6/2017	207

Below is a summary of the requirements of the Exceptional Events Rule and a description of how Ecology met each requirement. All references to page numbers, tables, and figures relate to Ecology's March 20, 2019 submission.

Procedural requirements

- **The state must notify the EPA of its intent to request exclusion of data as due to an exceptional event by creating an initial event description, flagging the associated data in the EPA's AQS database, and engaging in the Initial Notification of Potential Exceptional Event Process. 40 CFR 50.14(c)(2)(i).**

Ecology flagged and described the September 5 and 6, 2017, 24-hour PM₁₀ values as due to a wildland fire exceptional event in the EPA's AQS database. Ecology met the Exceptional Event Initial Notification requirements through multiple EPA -Ecology calls since December 2017 and Ecology's

² Note: Ecology included in its submittal the dates of the public comment period as September 25 – October 25, 2017. These were the dates of a public comment period for a previous August 14, 2015, Exceptional Event demonstration. The correct dates for the public comment period are included above.

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participation in the EPA, Region 10 Annual Exceptional Events teleconference on May 31, 2018. Thus, Ecology has met the Initial Notification and Flagging requirements for this demonstration.

- **The public had an opportunity to review and comment on the demonstration justifying data exclusion; any public comments received by Ecology were included in the demonstration; and the demonstration addresses those comments disputing or contradicting factual evidence provided in the demonstration. 40 CFR 50.14(c)(3)(v).**

Ecology provided a 30-day public comment period on the documentation for the claimed exceptional event. The public comment period ran from August 13, 2018 to September 14, 2018. Six comments were received that Ecology organized into four different topics. Ecology included the comments and its response to the comments in the March 20, 2019, demonstration, and its submission addressed the comments that disputed or contradicted factual evidence provided in Ecology's demonstration. Thus, Ecology has met the public comment requirements for this demonstration.

Technical Criteria

- **The demonstration includes a narrative conceptual model that describes the event as provided in 40 CFR 50.14(c)(3)(iv)(A).**

Ecology explained that in 2017 there were extensive wildfires occurring throughout Washington, Northern California, Oregon, Idaho, and Montana. Figure 1 displays the daily and 5-day average acres burned in the Western U.S. and Canada from June to September 2017. The actual acres burned in 2017 in these areas are noted in Table 3. The PM₁₀ exceedances at the Kennewick monitoring station on September 5 and 6, 2017, correspond with the spike in acres burning during early September 2017. To demonstrate the impact from the wildfires, Ecology compared the average annual anthropogenic PM_{2.5} and PM₁₀ county-level emissions (Benton County, Washington) to the emissions per day from the wildfires occurring in the Western U.S. and Canada from September 3-7, 2017. Of note, the PM_{2.5} and PM₁₀ emissions in Washington from the September 3-7, 2017, wildfires were larger than the annual PM_{2.5} and PM₁₀ emissions inventory in Benton County. Ecology provided numerous media reports on the wildfire and air quality impacts and a copy of Governor Jay Inslee's statewide wildfire emergency announcement, issued on September 2, 2017.

Ecology also included a description of the general weather conditions during the period of September 3-7, 2017. According to weather data Ecology provided from the National Oceanic and Atmospheric Administration, the entire Pacific Northwest was under a strong upper level ridge pattern that began to establish itself on September 3, 2017. The ridge pattern was strongest on September 5 and remained in place through September 7. The high pressure shifted between eastern Oregon and the tri-state (Oregon, Washington, and Idaho) boundary before breaking on September 8 due to a low pressure system that approached the coast of Northern California. This provides evidence that the upper level ridge pattern and high-pressure system contributed to wildfire smoke settling in areas near the monitor's location.

Ecology also included, as Figure 3, data from a vertical wind profiler in Troutdale, Oregon, located at the west end of the Columbia River Gorge (Kennewick is located further east along the Columbia River Gorge). The wind profiler shows the progression of airflows up to 6 km above ground level between September 4-7, 2017. According to Ecology, a low-level jet brought east winds from the morning of September 4 through the afternoon of September 5, which decoupled from the upper level winds. There

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was likely a subsidence inversion present during the wildfire event, with mixing heights dropping by September 7, 2017. Low level east winds carried smoke from Idaho and Montana into the region, after which SSW upper level winds transported Oregon and California smoke and forced the smoke down to the surface by the subsidence inversion. Surface winds then slackened and made the smoke from all these sources linger in the area until the ridge began to degrade on September 8, 2017. Ecology concludes that the strong ridge, coupled with dry conditions at the beginning of September, caused rapid fire growth which led to increased smoke production. The smoke, trapped by stagnant conditions, continued to accumulate each day the ridge was in place.

Ecology's submission provides a detailed description of the claimed exceptional event, with multiple wildfires occurring throughout the Western U.S. surrounding Kennewick and the meteorological conditions which allowed for the build-up of PM₁₀ from these extensive wildfires. The submitted demonstration satisfies the conceptual model criteria.

- **The event meets the definition of a “wildfire” in 40 CFR 50.1(n). Also, the event satisfies the “unlikely to recur at a particular location or a natural event” criteria in 40 CFR 50.1(k); 40 CFR 50.1(n); 40 CFR 50.1(o); 40 CFR 51.14(c)(iv)(E).**

A “wildfire” is defined in the Exceptional Events Rule as “any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event.” “Wildland” is defined as an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered.” A “natural event” is described as “an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role.” See 40 CFR 50.1.

Ecology's submission explains that the “natural events” were extensive wildfires that were occurring throughout the Western U.S and Canada. As seen in Figures 8, these large wildfire incidents were occurring in forested areas with minimal human activity and development and, therefore, meet the definition of wildland. Additionally, Ecology evaluated other source category emissions, including prescribed fires, agriculture burning, residential wood combustion, open burning, and vehicle emissions. Ecology notes that there was a burn ban in effect at the time of this event so there were no prescribed fires, agriculture burning, open burning or residential wood combustion sources allowed. Also, windblown dust was not a likely contributor on the event days because of low wind speeds and evidence of high PM_{2.5}/PM₁₀ ratios, further explained below. Ecology's submission supports the conclusion that the event meets the definition of a “wildfire” that occurred on “wildland,” and meets the definition of a “natural event” in the Exceptional Events Rule.

- **The event satisfies the “clear causal relationship” criteria in 40 CFR 50.1(j); 40 CFR 50.14(c)(3)(iv)(B).**

As part of assessing a clear causal relationship, Ecology provided monitoring data to demonstrate that air quality data was affected at the Kennewick monitoring station on the days in question (Table 1 and 7). Then to demonstrate a clear causal relationship between the wildfire event and the elevated PM-10 concentrations at the monitoring station, Ecology examined meteorology, satellite data, back trajectories, and time series data for the September 5-7, 2017, period and surrounding days.

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Ecology observes that the series of true color satellite photos with HYSPLIT back trajectories for Kennewick show the presence and movement of smoke during early September 2017 (Figures 4-7). On September 4, the winds transported smoke mainly from Northern California, Western Oregon and Washington local fires to the Kennewick monitoring station. On September 5, the strong upper level ridge trapped smoke in Washington, and the east wind also transported smoke from Idaho and Montana to Washington. On September 6 and 7, thick smoke covered all three Pacific Northwest states, Washington, Oregon, and Idaho, as well as western Montana. The wind barbs showed no or very light wind that led to low smoke dispersion. The PM₁₀ monitor data included in Tables 1 and 7 clearly show that on the event days, the PM₁₀ concentrations far exceed the NAAQS, and are elevated on the surrounding days.

Ecology also notes that, generally, 85 percent of particulate matter in smoke from fires is fine particulate matter (PM_{2.5}), while the mean PM_{2.5}/PM₁₀ ratios outside of exceptional events during the 2015-2017 period was around 50 percent. This correlation was not evident at the Kennewick monitoring station because Ecology asserts that PM_{2.5} is estimated at that station using a non-regulatory correlated nephelometer and the correlation was developed using wintertime data. The correlation did not account for the significantly higher PM_{2.5} concentrations during the event period. However, PM₁₀ concentrations were well-correlated with the estimated PM_{2.5} levels at Kennewick during this event as smoke accumulated in the area, even though the nephelometer likely underestimated PM_{2.5}. The Yakima and nearby Spokane monitoring stations use Federal Equivalent Method (FEM) Beta Attenuation Monitors, which did show that the PM_{2.5} concentrations recorded by the FEM monitors at Spokane and Yakima were all around 85 percent of the PM₁₀ concentrations during the wildfire event. This supports Ecology's conclusion that the wildfire smoke impacted the air quality monitors in the area.

Based on Ecology's submission, the EPA concludes that there is a clear causal relationship between the wildfires and elevated PM₁₀ concentrations recorded at the Kennewick monitoring station on September 5 and 6, 2017.

- **The demonstration includes an analysis comparing the claimed event-influenced concentrations to concentrations at the same monitoring site at other times to support the "clear causal connection" requirement. 40 CFR 50.14(c)(3)(iv)(C).**

Ecology compared the event-influenced concentrations to concentrations from the same monitoring site over the course of multiple years and seasons to support its conclusion that the wildfires affected air quality. For Kennewick, data from 2013-17 (Figure 10) shows that the 24-hour PM₁₀ concentrations only exceeded the NAAQS (150 µg/m³) during high wind and wildfire events. A frequency distribution of the daily PM₁₀ data at the Kennewick monitoring station during the 2013-17 period (Figure 15) also shows that the exceedances during the September 2017 wildfire event were higher than 99 percent of values during the most recent five years.

Figures 17-18 in Ecology's submission are annual time series plots that provide further evidence that the data during the September 2017 wildfire event are outliers. Figures 18-19 plot diurnal patterns at the Kennewick and Yakima monitors, which showed much greater volatility during the three event days compared to the relatively flat pattern under normal conditions. All of the 2013-17 exceedances at each monitor are described in Table 8. Ecology observes in Figures 12-14 that a nearby PM₁₀ regulatory monitor in Spokane, Washington had similar PM₁₀ exceedances during the event period, and the PM₁₀ concentrations correlated well with PM_{2.5} at all three monitors. Ecology also notes that this 2017 wildfire

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event was the first wildfire event that caused PM₁₀ exceedances at the Kennewick, Spokane and Yakima PM₁₀ monitors at the same time.

- **The event satisfies the “not reasonably controllable and not reasonably preventable” criteria in 40 CFR 50.1(j); 40 CFR 50.14(b)(4), (b)(8), and (c)(3)(iv)(D).**

The Exceptional Event Rule states that “provided the Administrator determines that there is no compelling evidence to the contrary in the record, the Administrator will determine every wildfire occurring predominantly on wildland to have met the requirements identified in (c)(3)(iv)(D) of this section regarding the not reasonably controllable or preventable criterion.” (40 CFR 50.14(b)(4)).

Ecology thoroughly documented through the conceptual model that there were extensive wildfires occurring in the Western U.S. and Canada. Ecology also analyzed alternative sources that potentially could have contributed emissions and found that none were contributing significant or elevated emissions during the time of the event. The EPA is not aware of any information to the contrary. Therefore, based on 40 CFR 50.14(b)(4), the EPA determines that these wildfires were not reasonably controllable or preventable.

- **The event satisfies the “mitigation” criteria in 40 CFR 51.930.**

40 CFR 51.930 requires that a state requesting to exclude air quality data due to exceptional events must take appropriate and reasonable actions to protect public health from exceedances or violations of the NAAQS. 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.

To protect the public health from exceedances or violations of the NAAQS, Ecology developed a number of methods to provide notification to the public and educate the public concerning actions to reduce exposure during an exceptional event. For Kennewick, Ecology issued Air Quality Alert Messages along with health information and the alert was in effect from September 4 to 11, 2017. The National Weather Service in Pendleton, Oregon relayed the messages. Additionally, Ecology posted public notifications on the Washington Smoke Blog website (<http://wasmoke.blogspot.com/>), including: smoke forecasts, smoke updates, meteorological conditions, and health information. Ecology also posted daily smoke information on Ecology’s Twitter and Facebook pages and joined the effort with the Washington Department of Health and Department of Natural Resources in sending out social media public notifications. Ecology did five radio interviews, put out two YouTube videos and took numerous phone calls from the public. The local air agency, Benton County Air Agency, disseminated information through television interviews, press releases, and other local outreach.

The information in Ecology’s submission is sufficient to demonstrate that it has met the mitigation requirements of 40 CFR 51.930. Ecology has not requested concurrence on three wildfire events/seasons

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within three years. Therefore, the mitigation plan requirement in 40 CFR 51.930(b) is not applicable at this time.

Conclusion

Based on the documentation submitted by Ecology on March 20, 2019, the EPA concurs with Ecology that the PM₁₀ data values listed in Table 3 have regulatory significance and were due to a wildfire exceptional event.

Table 3. 24-hr PM₁₀ values at the Kennewick monitoring station flagged by Ecology and concurred on by the EPA as meeting the Exceptional Event Criteria

Date	PM ₁₀ Concentration (µg/m ³) KENMETA, 53-005-0002, POC3
9/5/2017	261
9/6/2017	207

The information and analyses presented in Ecology's exceptional event demonstration package provided weight of evidence sufficient for the EPA's concurrence on the flagged data from the Kennewick monitoring station on the dates listed above in Table 3 and as described in this document. Accordingly, the EPA is placing a concurrence indicator in the EPA's AQS database for these dates at this monitor.

The EPA's concurrence is a preliminary step in the regulatory process for actions that may rely on the dataset containing the event-influenced data and does not constitute final agency action. When the EPA takes a regulatory action that is affected by exclusion of the PM₁₀ data at the Kennewick monitoring station on September 5 and 6, 2017, the EPA intends to publish notice of its proposed action in the Federal Register. The EPA's concurrence letter and this accompanying technical support document will be included in the record as part of the technical basis for that proposal. When the EPA issues that regulatory action, it will be a final agency action subject to judicial review.