UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
AIR AND WASTE

OCT 31 2018

Ms. Denise Koch
Director
Alaska Department of Environmental Conservation
P.O. Box 111800
Juneau, Alaska 99811

Dear Ms. Koch:

This letter responds to the Alaska Department of Conservation's submittal sent February 20, 2018, regarding the elevated $PM_{2.5}$ concentrations measured at the following monitors at the three air monitoring sites in Fairbanks: the State Office Building (AQS ID 02-090-0010), NCore site (AQS ID 02-090-0034) and the North Pole Fire Station site (AQS ID 02-090-0035). The ADEC has requested that the U.S. Environmental Protection Agency concur that elevated $PM_{2.5}$ concentrations on multiple days in June, July, and August 2015, were caused by exceptional events due to wildfire emissions in Alaska affecting the monitors in the Fairbanks North Star Borough.

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 the ADEC has made the demonstrations referred to in 40 CFR 50.14(a)(2) and (b)(1) regarding the $PM_{2.5}$ concentrations on June 23, June 26, July 2, and July 8, 2015, all of which exceeded the 35 $\mu g/m^3$ $PM_{2.5}$ 24-hour National Ambient Air Quality Standard. In addition, the ADEC has met the schedule and procedural requirements in 40 CFR 50.14(c) with respect to the same information and dates. The EPA has reviewed the documentation provided by the ADEC to demonstrate that the elevated $PM_{2.5}$ concentrations recorded at the Fairbanks and North Pole monitors (which include the State Office Building, Fairbanks NCore, and North Pole Fire Station FRM monitors) on the four dates listed above meet the criteria for concentrations attributable to an exceptional event in the Exceptional Event Rule (as listed in Table 2 of the enclosed Technical Support Document). 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 remaining concentrations measured at the Fairbanks and North Pole monitors do not currently have regulatory significance and were not reviewed at this time. The EPA will retain the ADEC demonstration for future consideration should any of the data on which the EPA is deferring action at this time 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 $PM_{2.5}$ data for the exceedances that occurred on June 23, June 26, July 2, and July 8, 2015. at the Fairbanks and North Pole monitors, 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.

Thank you for ADEC'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,

Tim Hamlin

Timothy B. Hamlin
Director

Enclosure

cc: Ms. Barbara Trost
ADEC

Mr. Mark Smith
ADEC

Ms. Cindy Heil
ADEC

EPA, Region 10 Technical Support Document

Review of Exceptional Event Request
Fairbanks North Star Borough, Alaska
24-hour $PM_{2.5}$ NAAQS
Dates Analyzed: June 23, June 26, July 2, and July 8, 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 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.

Alaska Department of Conservation (ADEC) Request

The ADEC requested concurrence on flagged 24-hour $PM_{2.5}$ data on multiple dates at the following monitors:

Fairbanks State Office Building, Air Quality System Site ID 02-090-0010
- FRM 02-090-0010-88101-1 (collects data every third day)

Fairbanks NCore Site, AQS Site ID 02-090-0034
- FRM 02-090-0034-88101-1 (collects data every third day)
- FRM 02-090-0034-88101-2 (collects data every sixth day)
- BAM 02-090-0034-88501-3 (collects data hourly)

North Pole Fire Station #3, AQS Site ID 02-090-0034
- FRM 02-090-0035-88101-1 (collects data every third day)
- BAM 02-090-0035-88501-3 (collects data hourly)

The recorded 24-hour $PM_{2.5}$ levels for which the ADEC requests the EPA's concurrence is shown in Table 1.

Table 1. Extracted ADEC Table from 2/18/2018 demonstration listing flagged 24-hr $PM_{2.5}$ Values affected by wildland fire exceptional event

June						
24-Hour $PM_{2.5}$ Concentrations (µg/m³)						
Date	NCore FRM 1°	NCore FRM 2°	NCore BAM	NPF FRM	NPF BAM	SOB FRM
18			NA		22.0	
19			8.0		28.3	
20	8.0		10.2	15.3	11.6	8.8
21			25.3		22.2	
22			78.0		72.1	
23	68.8	76.9	76.0	83.2	86.4	68.3
24			134.6		160.2	
25			137.2		96.3	
26	102.4		109.5	95.0	93.4	95.0
27			58.9		42.9	
28			15.1		8.8	

July						
24-Hour $PM_{2.5}$ Concentrations (µg/m³)						
Date	NCore FRM 1°	NCore FRM 2°	NCore BAM	NPF FRM	NPF BAM	SOB FRM
1			26.7		23.5	
2	45.2		48.5	45.4	42.1	44.3
3			30.4		25.0	
4			17.9		17.3	
5	13.8	13.5	57.5	15.4	60.0	14.0
6			13.7		13.6	
7			201.2		134.5	
8	60.0		63.0	54.5	54.8	57.1
9			13.2		15.1	
14	14.7		17.7	14.9	13.8	14.3
20	4.2		4.5	22.1	3.1	4.6
24			14.0		10.8	
25			13.5		9.4	
26	15.2		15.2	9.6	7.3	14.6
27			15.5		7.8	
28			22.3		16.6	
29	15.0	14.5	20.6	11.7	10.3	14.6
31			14.0		10.1	

August						
24-Hour $PM_{2.5}$ Concentrations (µg/m³)						
Date	NCore FRM 1°	NCore FRM 2°	NCore BAM	NPF FRM	NPF BAM	SOB FRM
8			27.7		27.4	

Black Bolded Values indicate an exceedance of the Annual NAAQS (12 µg/m³)

Red Bolded Values indicate an exceedance of the 24-hour NAAQS (35 µg/m³)

The ADEC 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 January 11, 2018. The comment period closed on February 12, 2018 and the ADEC did not receive any public comments. The ADEC submitted the exceptional event demonstration package to the EPA on February 20, 2018. The ADEC requests concurrence from the EPA for the flagged days, based on the ADEC's conclusion that the dates have or may have in the future regulatory significance with regard to the $PM_{2.5}$ 24-hour and annual design value at the Fairbanks and North Pole monitors (which include the State Office Building, Fairbanks NCore, and North Pole Fire Station monitors). The ADEC stated that the dates with current regulatory significance are June 23, June 26, July 2, and July 8, 2015.

The EPA's Exceptional Event Evaluation

The EPA agrees with the ADEC that the $PM_{2.5}$ exceedances on June 23, June 26, July 2, and July 8, 2015, have regulatory significance for use in the Serious Area $PM_{2.5}$ plan for the Fairbanks nonattainment area. Therefore, the EPA has evaluated whether the documentation provided by the ADEC for the $PM_{2.5}$ values on these dates meets the requirements for demonstrating an exceptional event under the Exceptional Event Rule.

The matrix below summarizes the requirements of the Exceptional Events Rule and describes how the ADEC met each requirement. All references to page numbers, tables, and figures relate to the ADEC's February 20, 2018 submittal.

Procedural Requirements:	The EPA's Evaluation of Flagged Exceedances:
• 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).	The ADEC flagged and described the June 23, June 26, July 2, and July 8, 2015, 24-hour $PM_{2.5}$ values as due to a wildland fire exceptional event in the EPA's AQS database. The ADEC 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. The ADEC 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 ADEC 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).	The ADEC provided a 30-day public comment period on the documentation for the claimed exceptional event. The public comment period ran from January 11, 2018 to February 12, 2018. No comments were received. The ADEC 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).	*Conceptual Model* The ADEC describes key elements of a conceptual model early in the demonstration. The conceptual model discussion begins on page 4 and describes how 36 fires were ignited by lightning in central Alaska. These fires were predominantly to the west of Fairbanks, as depicted in Figure 3. Throughout the summer winds from the west pushed the smoke to the east, with the occasional ventilation of the area when there was a wind change or a frontal system passing. As part of the conceptual model, the ADEC's demonstration also pointed to the BLM fire season summary that identified 2015 as the second biggest in Alaska's history based on acres burned.

	Meteorological conditions from nearby Tanana describe interior Alaska as having a warm, dry spring which was more conducive to "favorable fire conditions." Table 3 of the demonstration provides precipitation data from the Fairbanks and Tanana airports supporting that there were drier conditions in June 2015 when compared to June precipitation norms, which made the area more susceptible to wildfire. The information in the ADEC's submission provides a detailed description of the event with multiple wildfires occurring primarily to the west of Fairbanks and the meteorological conditions which allowed for extensive wildfires in the interior of Alaska. The submitted demonstration satisfies the conceptual model criteria.
• The event meets the definition of a "wildfire" in 40 CFR 50.1(n). • 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).	*Wildfire & Natural Event* A "wildfire" is defined in the EER 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" "means 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." The submittal describes in the conceptual model discussion that the events causing emissions were wildfires that were ignited by lighting in central Alaska. Central Alaska is sparsely populated with minimal development and meets the definition of wildland. The ADEC's submittal in conjunction with knowledge of the area support the conclusion that the event meets the definition of a "wildfire" that occurred on "wildland," and meets the definition of "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).	*Clear Causal Relationship* As part of assessing a clear causal relationship, the ADEC provided monitoring data to demonstrate that air quality data was affected at the Fairbanks and North Pole monitoring sites. Table 6 highlights values above both the 24-hr and annual $PM_{2.5}$ NAAQS Then to demonstrate a clear causal relationship between the wildfire event and the elevated PM concentrations at the Fairbanks and North Pole monitors, the ADEC examined a number of factors, including satellite imagery, wind and pollution roses, wind speed

	and direction, and HYSPLIT back trajectories for many days throughout the summer to show how the smoke was being transported from the fire to the monitors. The demonstration provides this information in the clear causal relationship section (p. 23). For the period of time covering the dates under review, June 23, June 26, July 2, and July 8, 2015, the EPA reviewed the prepared daily summaries submitted by the ADEC.[1] ***June 23 and 26*** June 18 through June 20, 2015 showed $PM_{2.5}$ values at or below the 24-hour standard. On June 21, 2015, there was a rise in $PM_{2.5}$ values in the area, with values steadily increasing on June 22, and then staying high above the 24-hr standard from June 23-25. Throughout this period of smoke build up, the back-trajectory charts show the $PM_{2.5}$ coming from the southwest of Fairbanks, where the majority of the wildfires were burning. On June 25, 2015, $PM_{2.5}$ values began to decrease from hourly triple digit values to double digit values above the 24-hour standard, after which the hourly values then rose and fell again on June 26, with the hourly $PM_{2.5}$ values dropping below the 24-hr $PM_{2.5}$ NAAQS on June 27, 2015. ***July 2 & 8*** $PM_{2.5}$ hourly values began to rise again on July 1, 2015, with back-trajectories showing that the smoke was again coming from the southwest. The $PM_{2.5}$ hourly values stayed above the 24-hr standard for most of the day on July 2, 2015, and then dropped below the standard around 4pm. The $PM_{2.5}$ values on July 3, 2015, had a - morning peak above the standard, but stayed below the standard for the rest of the day. On July 6, 2015, $PM_{2.5}$ values were very low with back trajectories from the south east, potentially indicating clearing out of smoke in the Fairbanks area. On July 7, 2015, however, $PM_{2.5}$ values were again above the standard, with the back-trajectory information showing a shift from incoming wind rotating clockwise from the southeast to the southwest, again transporting wildfire smoke into the Fairbanks area. This continued into July 8, 2015, with $PM_{2.5}$ values falling below the standard later in the day continuing to decrease into July 9. Based on the provided information, the EPA concludes that there is a clear causal relationship between the elevated $PM_{2.5}$ concentrations recorded at the Fairbanks monitor on June 23, June 26, July 2, and July 8, 2015, and the wildfire event to the west of Fairbanks.

[1] Although only the dates of June 23, June 26, July 2, and July 8, 2015 have regulatory monitoring data with current regulatory significance, the data collected on other days during that time period provides important context for the clear causal relationship demonstration.

• 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).	*Event-Related Concentrations Compared to Historical Concentrations* In the historical fluctuations section (p. 20), the demonstration compares the event influenced concentrations to concentrations from the same monitoring sites over the course of multiple years and seasons to support the conclusion that the event affected air quality. The demonstration evaluated the summertime (June – August) 95th percentile of low fire years. To do this, the ADEC calculated the 95th percentile for every year between 2002-15 with less than 1,000,000 acres burned (6 of 14 years). Without excluding any wildfire affected dates during these years, the average of these 95th percentile values was 9.3 $\mu g/m^3$. This average 95th value for low fire years is well below the 35 $\mu g/m^3$ 24-hr standard and demonstrates that the requested exceptional event days are much higher than the typically high PM2.5 days in years with low potential for wildfire impact in the historical record. The demonstration also evaluates in Figure 10 all fire seasons from 2000 to 2015. The evaluation shows a high fire season grouping and a low fire season grouping. The high fire season grouping includes 2000, 2002, 2004, 2005, 2009, 2013, and 2015, years characterized by higher $PM_{2.5}$ concentrations. The low fire season grouping includes 2001, 2003, 2008, 2011, 2012, and 2014, years with fewer fires and lower $PM_{2.5}$ concentrations. The ADEC's submittal demonstrates that the background value of $PM_{2.5}$, when there is lower probability of influence by wildfires during the summer, was less than 9.3 $\mu g/m^3$ on 95 percent of days. It also shows that the 2015 wildfire season experienced higher $PM_{2.5}$ concentrations and is considered a high fire season. The EPA finds that this analysis comparing the claimed event-influenced concentrations to concentrations at the same monitoring site at other times supports a "clear causal connection" between the wildfires to the west and the monitors in the Fairbanks area and that $PM_{2.5}$ concentrations were much higher during the 2015 fire season than during years when there were limited wildfires in the area.
• 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).	*Not Reasonably Controllable/Not Reasonably Preventable* In the EER, 40 CFR 50.14(b) 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." As these wildfires were caused by lightning strikes occurring predominantly

	on wildland, and there is no evidence to the contrary in the record, the EPA concludes that these wildfires were not reasonably controllable nor preventable. While not a requirement, the state highlighted efforts taken in the state to manage wildfires. The state has in place both an Alaska Enhanced Smoke Management Plan to manage emissions from prescribed burning, and an Alaska Interagency Wildland Fire Management Plan to assess how to manage wildfires throughout the fire season and to what extent to suppress fires. Prior to the wildfire exceptional events discussed in this analysis, there was prescribed fire activity in the area, primarily in May 2015. Over the course of the year, the prescribed fires burned 4,132 acres and emitted and estimated 16 tons of $PM_{2.5}$. These prescribed fires occurred prior to the exceptional event days in late June, early July, and were a fraction of the wildfire acres burned in 2015.
• The event satisfies the "mitigation" criteria in 40 CFR 51.930 and 40 CFR 51.14(b)(9).	*Mitigation* 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 provide for public notification, education, and protection of public health, the ADEC submitted Appendix B, which provides the daily ADEC Air Quality Advisory reports from wildfire days during the summer of 2015. These reports identify the affected areas, time of update, advisory report of smoke conditions-movement-hazard level-health impacts, AQI reference guide, and a point of contact and phone number. These advisory reports are available at http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories and the public can also sign up for direct notifications. The ADEC has a comprehensive website on wildfires located at http://dec.alaska.gov/air/air-monitoring/wildfire-smoke-info which

	assists with providing education on wildfires and protection of public health. Appendix A provides information on media coverage of the wildfires during the summer of 2015 as evidence of additional outreach and education efforts for the exceptional events. Appendix F provides detailed information of mitigation efforts to manage the wildfires. In addition, the Alaska Interagency Wildland Fire Management Plan mentioned above provides a framework for the management and suppression of wildfires in Alaska. Based on this information, the EPA concludes that the ADEC has met the requirements of 40 CFR 51.930. Because, the ADEC has not requested concurrence on three wildfire events/season within three years, the mitigation plan requirement in 40 CFR 51.930(b) is not applicable at this time.

Conclusion

The EPA has determined that the elevated $PM_{2.5}$ values on June 23, June 26, July 2, and July 8, 2015, were due to a wildfire exceptional event and that these dates have regulatory significance for the ADEC's Fairbanks serious area $PM_{2.5}$ attainment plan. Based on the documentation submitted by the ADEC on February 20, 2018, the EPA concurs with ADEC that the $PM_{2.5}$ data values listed in Table 2, which have been flagged by the ADEC in AQS, were due to a wildfire exceptional event.

Table 2. 24-hr $PM_{2.5}$ Values at the Fairbanks and North Pole Monitors, Flagged by the ADEC and Concurred on by the EPA as Meeting the Exceptional Event Criteria

Date	**24-hr $PM_{2.5}$ Concentration ($\mu g/m^3$)**			
	Fairbanks			North Pole
	NCore FRM1	NCore FRM2	SOB FRM	NPFS FRM
June 23, 2015	68.8	76.9	68.3	83.2
June 26, 2015	102.4	---	105.0	95.0
July 2, 2015	45.2	---	44.3	45.4
July 8, 2015	60.0	---	57.1	54.5

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

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 $PM_{2.5}$ data for the June 23, June 26, July 2, and July 8, 2015, events at the Fairbanks and North Pole monitors, 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.