ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Amendments to:

State Air Quality Control Plan

Vol. II: III.D.7.4

Ambient Air Quality Data and Trends

Public Notice Draft

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Note: This document provides revised and/or new language proposed for inclusion in this section of the State Air Quality Control Plan addressing the Fairbanks North Star Borough $PM_{2.5}$ Serious nonattainment area. The revised and/or new proposed language is in bold and underlined format. Language proposed to be deleted or replaced is shown in strikeout format. These revisions are the only part of this section that are open for public review and comment in this update to the plan. To aid in the public comment process, the currently adopted sections of the air quality plan can be found and referenced at the following internet site: http://dec.alaska.gov/air/anpms/communities/fbks-pm2-5-serious-sip/

7.4.6 2020 Amendment Updates

Below is a description of the changes to the monitoring network and the design values since the development and adoption of the Serious Area SIP update in 2019.

7.4.6.1 Changes to the Monitoring Network

Since the development of the Serious Area SIP, DEC has made changes to the monitoring network. In 2019, a new maximum impact SLAMS site was established in Fairbanks, the A-Street site, while the original violating site, the State Office Building site, was shut down in July of 2019. Additionally, a new Speciation Trend Site was established at the North Pole Hurst Road Site. The network now consists of the following sites:

- **Three State and Local Air Monitoring Sites (SLAMS); and**
- **Two Chemical Speciation Network (CSN) sites, one of which is located at the Multipollutant (NCore) Site.**

All of these sites employ Federal Reference Method (FRM) $PM_{2.5}$ sequential samplers and also house continuous $PM_{2.5}$ monitors (Beta Attenuation Monitors – BAM) which are used to issue air quality advisories. Table 7.4.-9 summarizes the current site designations and start dates for the new sites.

Table 7.4-9
Monitoring Sites for $PM_{2.5}$ in FNSB

Site Name	Location	AQS-ID	Designation	Install Date	Scale
State Office Building	Fairbanks	02-090-0010	SLAMS	Oct, 1998 (discontinued Jul 2019)	neighborhood
NCore	Fairbanks	02-090-0034	NCore	Oct, 2009	neighborhood
			CSN	Jan, 2015	neighborhood
A Street	Fairbanks	02-090-0040	SLAMS	Jul, 2019	neighborhood
Hurst Road, *Previously North Pole Fire Station	North Pole	02-090-0035	SLAMS	Mar, 2012	neighborhood
			CSN	Aug, 2019	neighborhood
North Pole Elementary (discontinued)	North Pole	02-090-0033	SPM	Nov, 2008 (discontinued Mar, 2013)	neighborhood

7.4.6.2 Changes to the Design Values

Compliance with ambient air quality standards is based on the calculation of a "design value" for individual monitors consistent with the form of the standard. For the 24-hour ambient $PM_{2.5}$ standard, the design value is calculated from the 3-year average of annual 98th percentile values. The design value for each monitoring site for 2019 averages the 98th percentile values for the years 2017, 2018 and 2019. The highest design value becomes the design value for the entire nonattainment area.

DEC is in the process of developing an Exceptional Event Waiver Request (EEWR) for days during the 2019 summer season impacted by wildland fire smoke and where concentrations exceeded 35 µg/m3. DEC has flagged a total of ten separate days for exclusion from the 2019 98th percentile and design value calculations for the nonattainment area. Pending EPA approval, the 2019 98th percentile concentrations used to calculate design value concentrations are as shown in Table 7.4-10.

Table 7.4-10
Trend in 98th Percentile $PM_{2.5}$ Concentrations Recorded at Fairbanks Monitoring Sites (FRM) 2017-2019

Site Name	Location	98th Percentile (µg/m3)		
		2017	2018	2019
State Office Building	Fairbanks	38.0	27.0 [a]	27.7 [a]
NCore	Fairbanks	34.4 [a]	25.3[a]	27.7[a]
Hurst Road[b]	North Pole	75.5	52.8	65.0

Notes:
a.Based on exclusion of proposed summertime wildland fire exceptional events in 2019
b.Formerly North Pole Fire Station

Table 7.4-11 shows the 3-year design values calculated for the State Office Building site, NCore site, North Pole Elementary site, and Hurst Road site between 2011 and 2019. Since the A-Street site only started operation in 2019, no design value was calculated for this site.

Table 7.4-11
Fairbanks and North Pole FRM 3-Year Design Values

	2011	2012	2013	2014	2015	2016	2017	2018	2019
State Office Building 3Year DV	47	46	41	40	35	37	38	35	31[a]
NCore 3Year DV	43	45	40	39	35	33	34	30	29[a]
Hurst Road 3Year DV	-	-	-	139	124	106	85	65	64[a]
North Pole Elementary 3Year DV	63	47	45	-	-	-	-	-	-

[a] Dependent on EPA Approval of 2019 Exceptional Events Waiver Requests

If EPA does not concur with the EEWR, the 98th percentile for the State Office Building site would change from 27.7 to 34.7, for the NCore site from 27.7 to 60 and for the Hurst Road site from 65.0 to 78.3. In turn, this would affect the 2019 design values to 33 for the State Office Building, 40 for NCore site, and 69 for Hurst Road.

While the design values described above are used to assess compliance with the ambient 24-hour $PM_{2.5}$ standard, a different design value is calculated to provide guidance on the emission reductions needed for attainment planning. Typically, that value is calculated as a rolling 3-year average of concentrations recorded over the 5-year period, as recommended by EPA modeling guidance. For the 2020 Amendment DEC decided to use a 4-year design value for the modeling years 2016-2019 in consultation with EPA, using metrological analysis and including the modeling base year. This approach uses a longer averaging period so that more recent measurements are used to calculate reduction targets; it produces the 4-year baseline design values shown in Table 7.4-12. For information on the use of the 4-year baseline design values in modeling, refer to Section III.D.7.8 – Modeling.

Table 7.4-12
Calculation of 4-Year Baseline Design Values for 2016-2019 at Sites in Fairbanks and North Pole

Site	2016-2018 3-yr DV[a]	2017-2019 3-yr DV[a]	2016-2019 4-yr Baseline DV
State Office Building	34.9	30.9	32.9
NCore	30.0	29.1	29.6
Hurst Road	65.0	64.4	64.7

[a] Not rounded to the nearest integer. Unrounded 3-yr DVs are used to compute the 4-yr DV.

7.4.6.3. 2019 Exceptional Events

As noted above, EPA has established a process for excluding days with elevated concentrations caused by non-anthropogenic events from regulatory calculations (e.g., the calculation of design values). The process requires states to identify the high concentration days (known as "exceptional events"), their causes (e.g., wildland fires, volcanic activity, etc.), and provide evidence that the causes could not be controlled. DEC did not submit any exceptional events waiver request to EPA for data in 2017 and 2018, since none of the days would have been of regulatory significance and would not change the design value appreciably.

In 2019 ten days were impacted by wildland fire smoke that moved into the nonattainment area. The data in Table 7.4.-13 have been flagged, and DEC is in the process of developing the waiver request that will be submitted to EPA for concurrence.

Table 7.4-13
2019 Fairbanks and North Pole $PM_{2.5}$ Exceptional Event Data by DEC for submission to EPA

Date	State Office Building $PM_{2.5}$ Concentration	NCore Primary Sampler $PM_{2.5}$ Concentration	NCore Secondary Sampler $PM_{2.5}$ Concentration	Hurst Road $PM_{2.5}$ Concentration
6/27/2019	57.8	59.1	-	70.3
6/28/2019	37.9	39.5	-	41.7
6/29/2019	50.2	52.7	53.4-	106.2
6/30/2019	-	60	-	56
7/7/2019	[a]	102.7	-	314.5
7/8/2019	[a]	112	-	-
7/9/2019	[a]	130.9	130.9-	327
7/10/2019	[a]	185.1	-	278.4
7/11/2019	[a]	211.6	212.4-	210
7/12/2019	[a]	65.5	-	57.4

[a] The SOB site was shut down in July 2019. The A Street site started operations after the wildland fire smoke incident in July.