ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Amendments to:

State Air Quality Control Plan

Vol. II: III.D.7.5

$PM_{2.5}$ Network & Monitoring Program

Public Review Draft

May 10, 2019

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7.5. $PM_{2.5}$ Network and Monitoring Program

Air quality monitoring data are used to evaluate trends and determine compliance with the NAAQS. It is also important to monitor and compare ambient air quality concentrations to modeled emission projections to determine if the projections are reasonable and credible. Section 110(a)(2)(B) of the CAA (42 U.S.C. 7410(a)(2)(b)) requires that each implementation plan submitted to EPA provide for the establishment and operation of "appropriate devices, methods, systems, and procedures necessary to monitor, compile, and analyze data on ambient air quality." Details of the DEC $PM_{2.5}$ Network and Monitoring Program can be found in Appendix III.D.7.5.

DEC operates and manages four monitoring sites located within the Fairbanks North Star Borough $PM_{2.5}$ Nonattainment Area: two SLAMS sites for $PM_{2.5}$, one SPM site for $PM_{2.5}$, and one combined multi-pollutant NCore and Chemical Speciation Network (CSN) site. Figure 7.5-1 is a map showing the entire Fairbanks and North Pole area. The red dots indicate the locations of the monitoring sites. The locations of the monitoring network are described in table 7.5-1.

Table 7.5-1 $PM_{2.5}$ Sites in the Fairbanks North Star Borough

Site Name	Location	AQS ID	Designation	Install Date	Scale
State Office Building	Fairbanks	02-090-0010	SLAMS	Oct, 1998	neighborhood
NCore	Fairbanks	02-090-0034	NCore	Oct, 2009	neighborhood
			CSN	Jan, 2015	neighborhood
A Street	Fairbanks	02-090-0040	SPM	Nov, 2018	neighborhood
Hurst Road, *Previously North Pole Fire	North Pole	02-090-0035	SLAMS	Mar, 2012	neighborhood

The State Office Building site is located at 675 Seventh Avenue in the middle of the central business district. Fine particulate matter sources for this site change season to season. During the winter months, the primary sources are home heating (wood, fuel oil, and coal), vehicle exhaust, and wood smoke. During the summer, the main source is wildland fire smoke. This site is the original violating site and is equipped with two filter-based Federal Reference Monitors (FRM) to collect data for comparison to the $PM_{2.5}$ NAAQS.

Table 7.5-2 State Office Building $PM_{2.5}$ Monitors

Pollutant	Parameter-POC	Instrument	Method Designation	Sampling Schedule	Type Designation
$PM_{2.5}$	88101-1	Partisol 2025i	FRM	Daily Sampling	SLAMS
$PM_{2.5}$	88101-2	Partisol 2025i	FRM	1 in 6	SLAMS

The NCore site is located at 809 Pioneer Road, approximately 35 meters north of the Chena River near the Fairbanks North Star Borough building and within one mile of numerous road systems. DEC chose this site for multi-pollutant monitoring because Fairbanks is dealing with the most significant air quality impacts in the state. $PM_{2.5}$ monitoring equipment at the site includes FRM, continuous, and chemical speciation monitors. The FRM monitors run daily to collect $PM_{2.5}$ data for comparison to the NAAQS. The continuous monitors collect hourly data which provides 'real-time' information to the public on DEC's website and is used when issuing Alerts; the continuous monitor is not configured as a Federal Equivalent Method (FEM) and is not used for determining regulatory compliance. Chemical speciation monitors provide data for use in multiple types of studies. The NCore site also contains gaseous and meteorological instruments.

Table 7.5-3 NCore $PM_{2.5}$ Monitors

Pollutant	Parameter-POC	Instrument	Method Designation	Sampling Schedule	Designation
$PM_{2.5}$	88101-1	Partisol 2025i	FRM	Daily Sampling	NCore
$PM_{2.5}$	88101-2	Partisol 2000i	FRM	1 in 6	NCore
$PM_{2.5}$	88501-3	Met-One BAM 1020X	non-FEM	Hourly	NCore
$PM_{2.5}$ Speciation	Multiple Chemical Species	Met-One Super SASS	N/A	1 in 3	CSN
$PM_{2.5}$ Speciation	Multiple Chemical Species	URG 3000N	N/A	1 in 3	CSN

The A Street site is a new Fairbanks maximum-impact site located on the eastern edge of the Nordale Elementary School grounds along A Street between Eureka Avenue and Dunbar Avenue in eastern Fairbanks. The site is currently equipped with a continuous $PM_{2.5}$ monitor to provide 'real-time' information to the public and is used for issuing Alerts, but is not configured as an FEM and is not used for determining regulatory compliance with the NAAQS. DEC plans to compare concentrations measured at this site with those measured at the State Office Building site to determine if it is appropriate to relocate the State Office Building monitoring equipment to this site and shut down the State Office Building site. Wood smoke from wintertime home heating is considered the major pollution source.

Table 7.5-4 A Street $PM_{2.5}$ Monitors

Pollutant	Parameter-POC	Instrument	Method Designation	Sampling Schedule	Designation
$PM_{2.5}$	88501-3	Met-One BAM 1020X	non-FEM	Hourly	NCore

The Hurst Road site, formerly named North Pole Fire Station, is located on the west side of North Pole Volunteer Fire Station #3 at 3288 Hurst Road in the middle of a residential area. This site is equipped with FRM and continuous $PM_{2.5}$ monitors. As with the NCore and A Street sites, the continuous $PM_{2.5}$ monitor provides 'real-time' information to the public and is used for issuing Alerts, but is not configured as an FEM and is not used for determining regulatory compliance with the NAAQS. Wood smoke from wintertime home heating is considered the major pollution source. During the summer months, the main source is wildland fire smoke.

Table 7.5-5 Hurst Road $PM_{2.5}$ Monitors

Pollutant	Parameter-POC	Instrument	Method Designation	Sampling Schedule	Designation
$PM_{2.5}$	88101-1	Partisol 2025i	FRM	Daily Sampling	SLAMS
$PM_{2.5}$	88101-2	Partisol 2000i	FRM	1 in 6	SLAMS
$PM_{2.5}$	88101-4	Partisol 2000i	FRM	1 in 6 (offset 3 days)	SLAMS
$PM_{2.5}$	88501-3	MetOne BAM 1020X	non-FEM	Hourly	SPM

The monitoring network is operated 24 hours each day. Two types of $PM_{2.5}$ monitors are installed in Fairbanks area, Met-One Beta Attenuation Monitors (BAM 1020) which provide information in real time for evaluating current conditions and determining the air quality index and Thermo Fisher Scientific Inc. Partisol 2025i and 2000i samplers which collect daily 24-hour samples at each site for comparison to the $PM_{2.5}$ NAAQS. Filters used in the Partisol samplers are sent to either the DEC gravimetric laboratory or a contract laboratory for gravimetric analysis. $PM_{2.5}$ monitoring is conducted following requirements established in federal regulations, EPA guidance, and instrument manufacturer recommendations.

Figure 7.5-1 Map of the Fairbanks and North Pole Area. Yellow dots indicate the locations of the monitoring sites.