5.4 Ambient Air Quality Data and Trends

At 65º latitude, Fairbanks, has a subarctic continental climate, which strongly exacerbates wintertime air pollution and contributes to exceedances of the 24-hour average NAAQS for $PM_{2.5}$. Due largely to the short period of daylight, low sun angle, and relatively dry continental air, average monthly temperatures in Fairbanks are below freezing from October through April,[1] and the average January temperature is -10ºF. The below freezing temperatures result in predictable snow cover and the strong radiation properties of the snow cover help inversion formation. As a result of these climatological influences, Fairbanks is frequently subjected to ground-based temperature inversions that are among the strongest surface-based inversions found anywhere in the United States.[2] A stable air mass is the result of radiation cooling under calm and usually clear weather conditions, and radiational cooling is enhanced by snow cover. A temperature inversion is an extreme form of a stably stratified atmosphere, one in which the temperature increased with height.. A stable air mass can form as result of changing weather conditions, for example where a warm less dense air mass moves over a dense cold air mass. Temperature inversions limit the rate and extent of vertical mixing of surface-based emissions and, together with the low wind speeds, low mixing depths,[3] and extremely low temperatures that commonly accompany them in Fairbanks,[4] create atmospheric conditions that are conducive to the buildup of $PM_{2.5}$ concentrations from little dispersion of low release height emission sources.

Temperature inversions are a semi-permanent feature of the winter atmosphere in Fairbanks, occurring about 80% of the time in December and January[3]. During this period of minimal solar radiation, the midday temperature rarely changes more than a few degrees, and daytime heating is not enough to overcome the stably stratified boundary layer.[5] However, similar inversions can occur anytime during the cold months and can last for days, often accompanied by clear skies, low temperatures, and very poor air pollution dispersion. Because of low vertical mixing accompanying a very stable atmosphere,, the concentration levels of ground level pollutants in the atmosphere in Fairbanks can approach that of much larger metropolitan areas in the contiguous United States.[6] Such conditions in Fairbanks frequently result in elevated $PM_{2.5}$ concentrations and exceedances of the NAAQS. While the annual $PM_{2.5}$ concentrations measured in Fairbanks are approaching the standard, they do not exceed the annual $PM_{2.5}$ NAAQS.

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[1] Climatology of the United States No. 84, "Daily Normals of Temperature, Precipitation and Heating and Cooling Degree Degrees, 1961-1990," Alaska, Fairbanks, WSPO AP, National Oceanic and Atmospheric Administration.
[2] Wendler, Gerd, et al, "Low Level Temperature Inversions in Fairbanks, Central Alaska," *Monthly Weather Review*, January 1975.
[3] Brader, Jim et al, "Meteorology of Winter Air Pollution in Fairbanks," accessible here: ftp://ftp.co.fairbanks.ak.us/AQ-Symposium/Symposium_Presentations_ftp/James_Brader_Weather.pdf
[4] Hartmann, Brian et al, "Climatology of the Winter Surface Temperature Inversion in Fairbanks, Alaska," Geophysical Institute, University of Alaska, Fairbanks, accessible here: https://ams.confex.com/ams/pdfpapers/84504.pdf
[5] Bowling, Sue Ann, 1985, "Climatology of High-Latitude Air Pollution as Illustrated by Fairbanks and Anchorage, Alaska," *Journal of Climate and Applied Meteorology*, **25**, 22-34.
[6] *Ibid*, Low Level Temperature Inversions.

This is mainly due to the low summertime $PM_{2.5}$ levels which offset the elevated winter time values.

5.4.1 Overview of $PM_{2.5}$ Monitoring Network

The FNSB Air Program operates and manages five[7] permanent monitoring stations for $PM_{2.5}$:

- One State and Local Air Monitoring Site (SLAMS);
- One Speciation Trend Network (STN) site; and
- Three Special Purpose Monitoring (SPM) sites for $PM_{2.5}$.

The FNSB SLAMS, STN, and SPM sites for $PM_{2.5}$ are identified below in Table 5.4-1; their locations are presented in Figure 5.4-1. Siting criteria and other details about each site are documented elsewhere.[8] The site at the downtown State Office Building began monitoring $PM_{2.5}$ in 1998. Federal Reference Method (FRM) from these monitoring locations have been used for regulatory purposes to characterize neighborhood scale sites in the nonattainment area. The nonattainment designation and the modeling episode days are from the base year 2008. The State Office Building Monitor FRM data from 2005-2012 is in Appendix III.D.5.4. Most of these sites also house continuous $PM_{2.5}$ monitors (Beta Attenuation Monitors – BAM) which are used to issue air quality advisories. These continuous analyzers do not meet $PM_{2.5}$ Federal Equivalent Method (FEM) criteria and are not used to measure compliance with the NAAQS.

Table 5.4-1
SLAMS and SPM Sites for $PM_{2.5}$ in FNSB

Site Name	Location	AQS-ID	Designation	Install Date	Scale
State Office Building	Fairbanks	02-090-0010	SLAMS/STN	Oct 1998	neighborhood
North Pole Elementary	North Pole	02-090-0033	SPM	Nov 2008-2013	neighborhood
NCore	Fairbanks	02-090-0034	NCore	Oct 2009	neighborhood
North Pole Fire Station	North Pole	02-090-0035	SPM	Mar 2012	microscale

In addition to the fixed location monitors displayed below in Figure 5.4-1, the Borough operates two other types of routine sampling for $PM_{2.5}$; a Relocatable Air Monitoring

[7] The site at North Pole Elementary School was terminated in 2013.
[8] "Alaska 2013 Air Monitoring Network Plan, Chapter 3, Fairbanks North Star Borough," Air Quality Division, Alaska Department of Environmental Conservation, available here: http://dec.alaska.gov/air/am/AK%20Monitoring%20plans-docs/2013%20Network%20Review/2013%20Monitoring%20Plan%20Ch%203%20Fairbanks%20Final.pdf

System (RAMS trailer), and a mobile sampling platform ("sniffer vehicle"). Measurements from these monitors are used to help identify and document $PM_{2.5}$ concentration hotspots in order to better understand the regional and local sources of elevated $PM_{2.5}$ concentrations, and to help ensure the representativeness of FRM monitoring locations. More information about operation of both fixed and mobile monitors is presented in Section III.D.5.5.

Figure 5.4-1. Location of Fixed Site $PM_{2.5}$ Monitors

5.4.2 Trends in Monitored $PM_{2.5}$ Concentrations

The 24-hour $PM_{2.5}$ standard is designed to provide health protection against short-term fine particle exposures, particularly in areas with high peak $PM_{2.5}$ concentrations; the standard is set at 35µg/m^3. A community attains the 24-hour standard when the 98th percentile of 24-hour $PM_{2.5}$ concentrations for each year, averaged over three years, is less than or equal to 35 µg/m^3. Since "the form of the standard" (the basis for attainment) is specified using 98th percentile values, the values calculated for each monitor for each year presented in Table 5.4-2 are 98th percentile values.

Table 5.4-2 shows that with the exception of the 2011 values reported for North Pole Elementary (which had a limited number of measurements) and the NCore site, all values from 2008 to 2013 exceeded 35µg/m^3. Fluctuations in concentrations recorded across the years reflect differences in both meteorology and human activity in areas impacting the monitors. In general, there is a rough correlation (with the exception of the North Pole Elementary value in 2009) among the State Office Building, North Pole Elementary and NCore monitoring sites. In contrast, the concentrations recorded at the North Pole Fire Station are 2-3 times the values recorded at the other monitors in 2012 and 2013.

The Borough and ADEC are still investigating if this site is representative of the North Pole area or indicates an area with unusually high concentrations (commonly referred to as a "hot spot").

While Table 4-2 displays 98th percentile values, another measure of public exposure to elevated $PM_{2.5}$ concentrations is the number of days the 24-hour standard is exceeded each year; this information is presented in Table 5.4-3. It shows that since 2009 there has been a decline in the number of days the standard is exceeded at the State Office Building site. A similar but noisier trend is also evident at the NCore site, which is located less than half a mile to the northwest of the State Office Building monitor. The North Pole sites, located 12-13 miles southeast of the State Office Building monitor, show a different trend—one of stability. The number of days the standard is exceeded at North Pole Elementary has been constant since 2010. Although it is not possible to discern a trend from 2 years of data, the values for the North Pole Fire Station show an increase from 2012 to 2013. When viewing Table 5.4-3 it is important to remember that FRM data in Fairbanks is only collected once every 3 days. Thus, the values displayed are not representative of the days the public is exposed to higher concentrations. If the conditions on the unmonitored days are the same as those on the monitored days, which they are not, the values in Table 5.4-3 could be up 3 times higher.

Table 5.4-2
Trend in 98th Percentile $PM_{2.5}$ Concentrations Recorded at Fairbanks Monitoring Sites (FRM)
2008 – 2013

Site Name	Location	98th Percentile (µg/m^3)					
		2008	2009	2010	2011	2012	2013
State Office Building	Fairbanks	47	51	51	38	49	36[a]
NCore	Fairbanks	NA	44[b]	51	33	50	45
North Pole Elementary	North Pole	NA[c]	114	53	21[d]	68	47
North Pole Fire Station	North Pole	NA	NA	NA	NA	158	122

Notes:
a. Based on exclusion of the proposed exceptional events in 2013. EPA approval is still outstanding.
b. NCore only had 17 measurements in 20098
c. NPe only had 1 measurement in 200
d NPe only had 40 measurements in 2011

Table 5.4-3
Trend in Days Exceeding the 24-hour $PM_{2.5}$ Standard at Fairbanks Monitoring Sites (FRM)
2008 – 2013

Site Name	Location	Days Exceeding 35 µg/m^3 Standard					
		2008	2009	2010	2011	2012	2013
State Office Building	Fairbanks	7	13	11	4	7	3
NCore	Fairbanks	NA	5[b]	9	1	4	3

North Pole Elementary	North Pole	NA[a]	5	8	0[c]	9	8
North Pole Fire Station	North Pole	NA	NA	NA	NA	9	13

Notes:
a. NCore only had 17 measurements in 2009
b. NPe only had 1 measurement in 2008
c. NPe only had 40 measurements in 2011

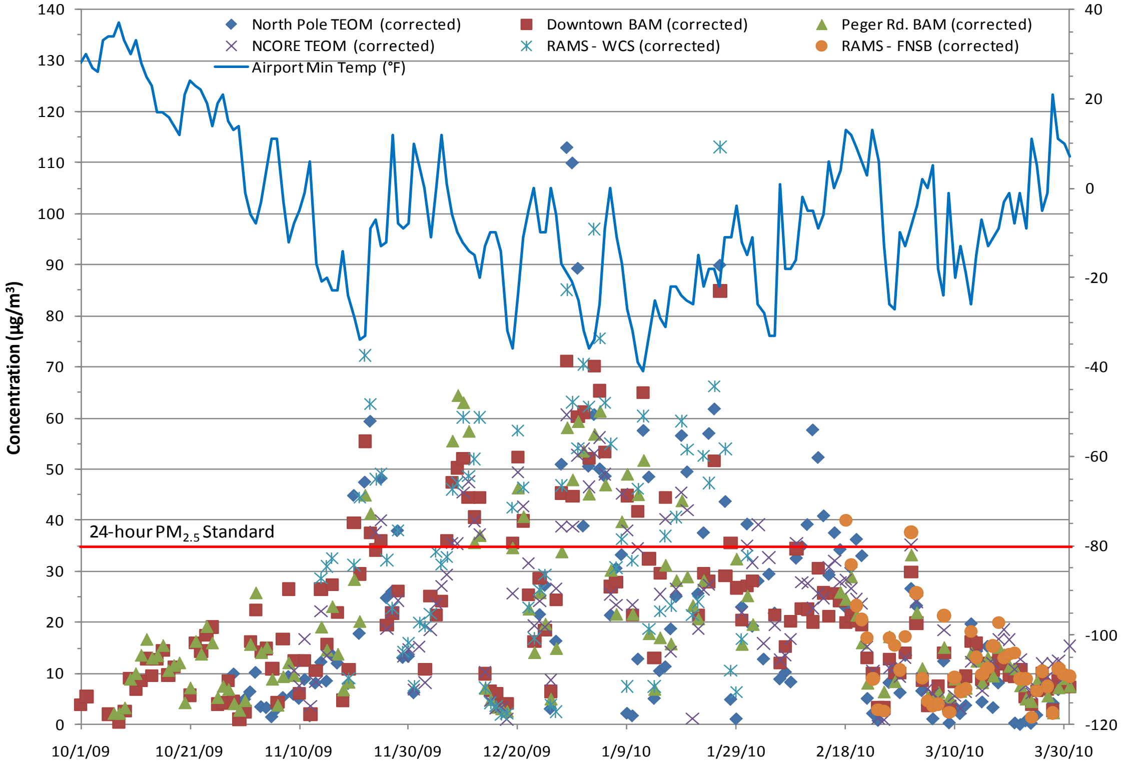
A different view of public exposure to $PM_{2.5}$ concentrations can be seen in the daily concentrations recorded during the course of the winter (October – March). Since multiple graphics would be required to present this information across the years presented in the tables above, as an example data is only displayed for the 2009-2010 winter in Figure 5.4-2. Data are presented for each day for 6 separate monitors: North Pole Elementary (North Pole); NCore; State Office Building (Downtown Fairbanks); a temporary site located at the Borough Transportation Department on Peger Road (Peger Rd.); and mobile monitoring data (Relocatable Air Monitoring System -RAMS) trailer measurements at Watershed Charter School (RAMS - WCS) and downtown Fairbanks (RAMS - FNSB).

Continuous monitors were operated at each of these sites, and measurements of concentrations were recorded on days when the FRMs are not operated. The continuous monitors collect hourly measurements which can be averaged into daily, 24-hour averages. Because of sampling differences and the fact that the continuous monitors are not federally approved as equivalent to the FRM monitors, the daily concentrations from the continuous monitors were compared to the FRM data and then adjusted, or corrected, using a derived correlation factor.[9] The corrected values are displayed in Figure 5.4-2.

Table 5.4-3 shows the total number of days on which the federal daily $PM_{2.5}$ standard threshold (35 µg/m^3) was exceeded at each site. The average number of exceedances was 30, excluding the second RAMS trailer location. The fact that the number of exceedances was the same, or nearly the same at the Downtown, NCORE, and North Pole sites verifies that the $PM_{2.5}$ problem in the Fairbanks area is truly regional, even though the exceedances often did not occur on the same days. The Peger Road location is a more industrial area where fewer residential sources of $PM_{2.5}$ impact the monitor; therefore, the slightly lower number of exceedances at that site is not unreasonable. As for the RAMS – WCS site, the higher number of exceedances is likely due to impacts from sources in the neighborhood, since the trailer was located in a residential area.

[9] Memo from Craig Anderson, Sierra to Cindy Heil, ADEC entitled "Summary and Analysis of Fairbanks $PM_{2.5}$ Data for Winter 2009 – 2010," August 2010.

Figure 5.4-2
Daily $PM_{2.5}$ 24-hour Average Concentrations and Minimum Temperatures



The concentration data shown in Figure 5.4-2 also reveal that nearly all of the exceedances occurred between mid-November and mid-February, roughly a 90-day time span, resulting in exceedances of the daily standard threshold on about one-third of the days. The maximum 24-hour concentration observed at each site was as follows:

- Downtown: 84.9 µg/m^3 on 1/26/2010
- NCORE: 60.6 µg/m^3 on 12/29/2009
- Peger Rd.: 64.5 µg/m^3 on 12/9/2009
- North Pole: 112.8 µg/m^3 on 12/29/2009
- RAMS – WCS: 113.1 µg/m3 on 1/26/2010
- RAMS – FNSB: 39.9 µg/m^3 on 2/18/2010

It should be noted that each site has several days with missing data due to equipment or monitoring site infrastructure problems, such as trailer heater failures, or maintenance. For instance, both the NCORE and Peger Road sites were not operating on January 26, 2010, the day on which the highest concentrations of the season were observed at the other two Fairbanks locations.

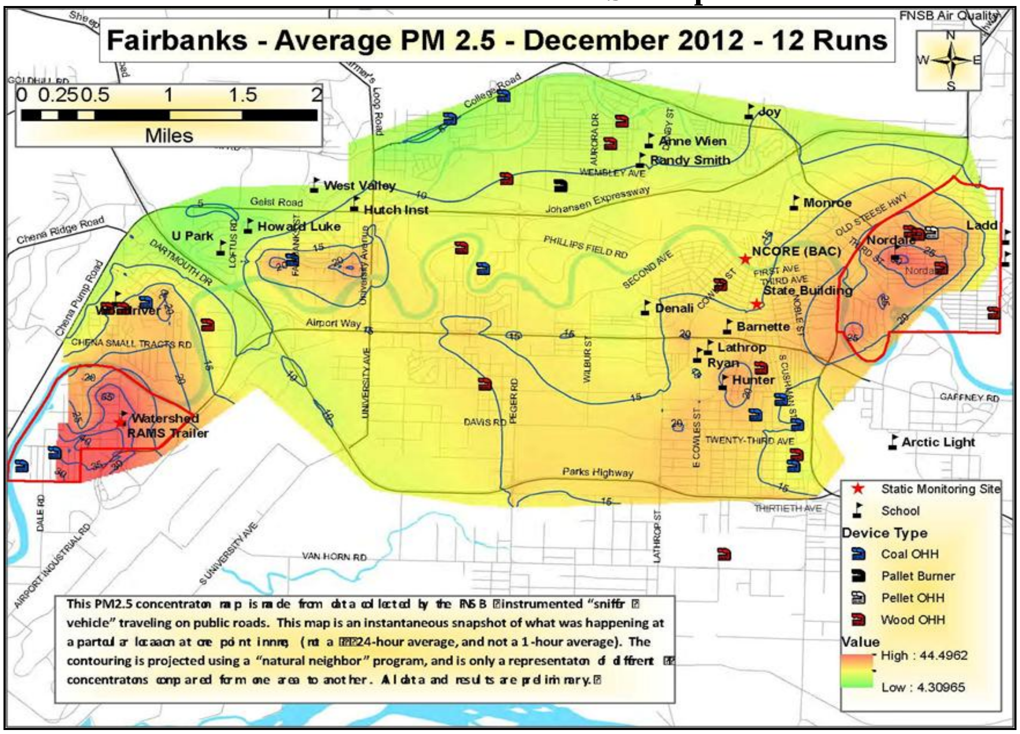
Also displayed in Figure 5.4-2 is the minimum temperature (°F) recorded at Fairbanks International Airport each day. The general trend was that when temperatures decreased, $PM_{2.5}$ concentrations increased, which was similar to patterns observed in previous winters. The minimum temperature on the majority of days on which the daily $PM_{2.5}$ standard threshold was exceeded was below -15 °F. However, it is also clear that exceedances occurred during a wide array of daily minimum temperatures, ranging from +13 °F down to -41 °F.

Overall, the data displayed in Figure 5.4-2 show that daily average concentrations are not uniform across time and display considerable variation across sites on any given day, with less variance on the warmer shoulder months of the winter and more variance as temperatures get colder. Since it is cost prohibitive to place monitors at a wide range of locations throughout the nonattainment area, the Borough has operated a "sniffer vehicle" to collect $PM_{2.5}$ concentration data on regular routes that traverse a larger portion of the nonattainment area. While these measurements are instantaneous, and are therefore not directly comparable to 24-hour average values, data has been collected multiple times per day many days per winter since the 2007-2008 winter. Analysis of that data has confirmed that certain areas within Fairbanks and North Pole regularly have higher concentrations.

FNSB staff use ARC-GIS software with scripted programming to analyze vehicle sampling data. The results are routinely made publicly available in near real time at the Borough's web site.[10] A sample of such data and analysis from recent drives in the cities of Fairbanks and North Pole is shown in Figure 5.4-3. Sampling data like these, collected over multiple years, have provided a detailed picture of both communities and have allowed Borough staff to identify and focus data collection, public information, and SIP mitigation strategies on those areas having the highest $PM_{2.5}$ concentrations. The locations with the highest concentrations identified in Figure 5.4-3 are consistent with those observed in numerous vehicle runs conducted in previous years.

[10] ftp://ftp.co.fairbanks.ak.us/Air%20Quality/SnifferData/schoolssniffermapsDecJan2013.htm.

Watershed/Nordale $PM_{2.5}$ Hotspots



North Pole / Badger Rd $PM_{2.5}$ Hotspots

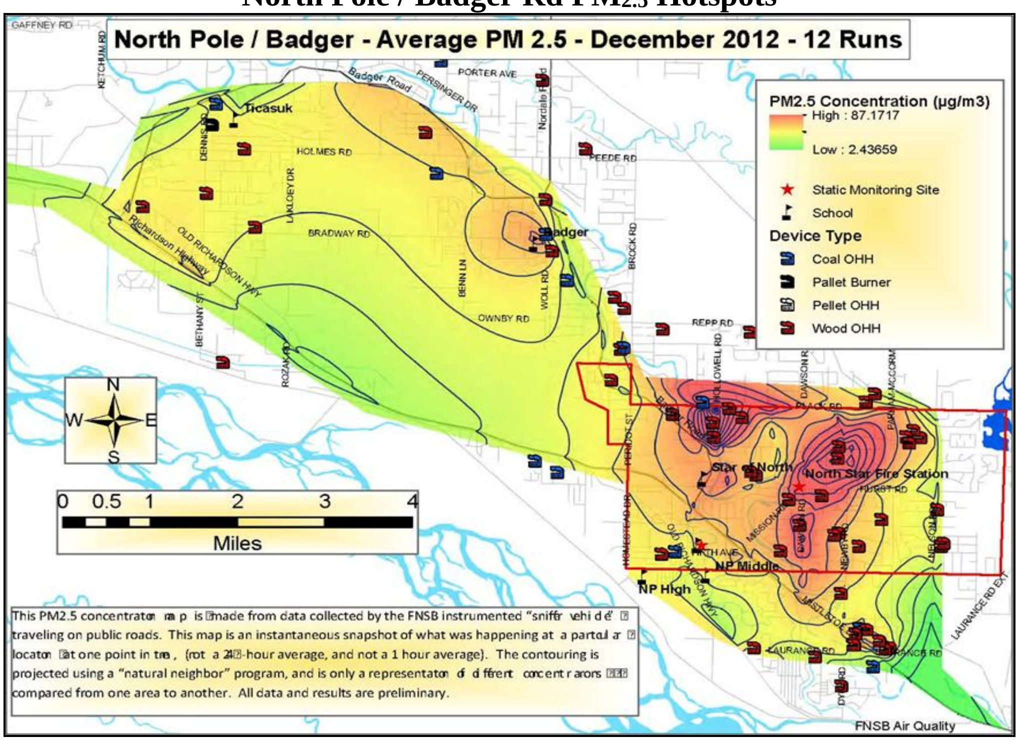
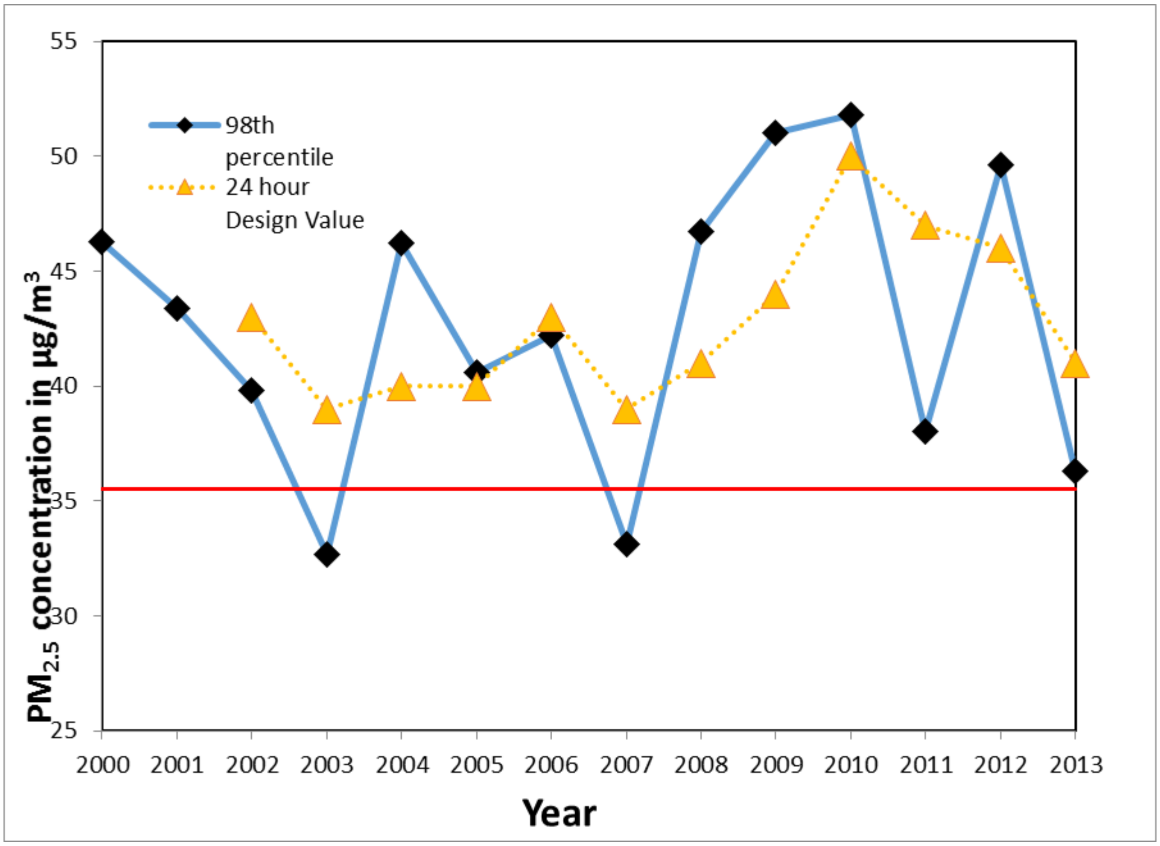


Figure 5.4-3 Multiple $PM_{2.5}$ Hotspots Identified within Nonattainment Area

5.4.3 Calculation of 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 98^{th} percentile values. In 2009, EPA designated Fairbanks as nonattainment for that standard using measurements collected at the State Office Building over the previous 3-year period, 2006 – 2008.[11,12] The 98^{th} percentile value for each of those years was 42.2 µg/m^3, 33.1 µg/m^3 and 46.7 µg/m^3; collectively they produced a $PM_{2.5}$ design value of 41 µg/m^3 for the 3-year period ending in 2008. Design values are updated each year, based on the previous 3-years of data.

Figure 5.4-4 displays both the 98^{th} percentile $PM_{2.5}$ concentrations and the design value calculated for the previous 3-year period at the State Office Building between 2001 and 2013. The recurring pattern of peaks and valleys in the 98^{th} percentile concentrations reflecting the recurring severity and benevolence of meteorology.



[11] At that time, the State Office Building was the only FRM monitoring site with 3-years of $PM_{2.5}$ measurements.

[12] 74 FR 58690 dated November 13, 2009

Figure 5.4-4 State Office Building Historical Design Value and 98th% Percentile 24-hr $PM_{2.5}$ Concentrations

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. That value is calculated as a rolling 3-year average of concentrations recorded over the 5-year period between 2006 and 2010, as recommended by EPA modeling guidance. This approach uses a longer averaging period so that more recent measurements are used to calculate reduction targets; it produces a baseline design value[12] of 44.7 µg/m^3. The difference between that value and the standard, 9.7 µg/m^3, establishes the reductions in projected (i.e., modeled) concentrations the attainment plan needs to achieve. Since EPA strongly suggested the established the base year for attainment planning to be 2008, it means that forecasts of ambient concentrations need to decline 9.7 µg/m^3 or 21.7% relative to the concentration modeled for the 2008 base year. Since 98th percentile concentrations are rounded to the nearest integer (i.e., 35.4 rounds to 35), the reduction target is therefore 9.3 µg/m^3 (44.7 – 34.4).[13] That value is divided by the number of years between designation of nonattainment (2009) and the Moderate Area attainment date (2015), to establish one year's worth of progress for assessing Reasonable Further Progress and compliance with Contingency Measure requirements (1.6 µg/m^3)[14].

5.4.4. Representativeness of Meteorological Conditions Used in Design Value Calculations

ADEC commissioned a statistical assessment of the relationship between $PM_{2.5}$ concentrations and meteorology in Fairbanks to determine which variables are associated with elevated concentrations.[14] The analysis relied upon $PM_{2.5}$ measurements recorded by the BAM located at the State Office Building in downtown Fairbanks, calibrated to the filter-based FRM measurements from the same site. The study also used a range of variables describing the state of the atmosphere near the surface. Besides $PM_{2.5}$ concentrations, the analysis used surface-based meteorological instruments measurements and human observations, upper air soundings, and a variety of computed variables (e.g., temperature profile at fixed heights aloft, height of the mixed layer, etc.). With 16 variables included in the dataset (daily average $PM_{2.5}$ concentrations and 15 meteorological variables), the analysis determined the relationships between the

[12] See Appendix 5.8 SANDWICH Method.
[13] http://www.epa.gov/ttn/oarpg/t1/memoranda/pmfinal.pdf
[14] *http://www.epa.gov/airquality/particulatematter/2014/20140428fr.pdf*

[14] Crawford, Robert et al, "Statistical Assessment of $PM_{2.5}$ and Meteorology in Fairbanks, Alaska" (draft), prepared for the Alaska Department of Environmental Conservation by Rincon Ranch Consulting and Sierra Research, March 2013. The draft study has undergone peer review and has been submitted for EPA review.

meteorological variables and $PM_{2.5}$ concentrations. Six factors (listed below) were identified as the key determinants[15] of $PM_{2.5}$ concentrations:

- Degree of atmospheric stability created by radiative cooling of the surface under clear and dry Arctic skies;
- Surface air temperature;
- Average wind speed through the mixed layer;
- Presence of snow;
- Presence of ice fog; and
- A measure of pollutant trapping aloft.

These variables were incorporated into a simple statistical model that was used to test whether the meteorological conditions recorded during the 2006-2010 design period are representative of the long-term meteorology of Fairbanks (as represented by twenty winters from 1989-90 through 2010-11). The results indicated that the 2006-2010 design period had somewhat more severe meteorology with respect to $PM_{2.5}$ concentrations than would be expected from the 20-year period addressed in the analysis. Several factors influenced this finding, including:

- Somewhat colder surface temperatures during 2006-2010 throughout the full range of winter conditions

- Stronger surface temperature inversions during 2006-2010

- Consistently lower wind speeds through the mixed layer during 2006-2010, through the range of winter conditions

- Fewer instances where the presence of a warm-air layer aloft increased the trapping of pollutants in the local airshed. This is the only major meteorological factor tending to reduce $PM_{2.5}$ concentrations in the design period compared to the 20-winter period analyzed.

To summarize, the 2006-2010 design period's apparent severity for $PM_{2.5}$ concentrations is driven by a combination of colder-than-average surface temperatures coupled with consistently stronger surface inversions and lower average wind speeds in the mixed layer, offset to some extent by fewer instances in which warm air aloft increased trapping. On the coldest days, the severity of $PM_{2.5}$ concentrations are from low wind speed and strong inversions. Overall, there is no indication that the 2006-2010 design period understates the meteorological challenges to reaching $PM_{2.5}$ attainment, and it may be conservative with respect to the severity of meteorology.

5.4.5 Exceptional Events

[15] These first six vectors accounted for 93% of the total variance explained, and Vector 1 alone accounted for 53% of the total variance, i.e., most of the variance in the data.

As noted above, attainment of the 24-hour standard is based on the 3-year average of the 98th percentile values calculated for each NAAQS-comparable monitor using measurements collected over the course of the year. Fairbanks experiences high $PM_{2.5}$ concentrations during the winter that are the result of stable boundary layers, low wind speeds and anthropogenic activity. Fairbanks also experiences high concentrations during the summer that are the result of wild fires (located both near and far from the nonattainment area) and meteorology (wind speed, wind direction, etc). Since most wild fires are caused by non-anthropogenic events (e.g., lightning strikes, etc.), EPA has established a process for not including days with elevated concentrations in regulatory calculations (e.g., the calculation of design values). The process requires states to identify the high concentration days (known as “exceptional events”), their non-anthropological causes (e.g., wild fires, volcanic activity, etc.), and evidence that the causes could not be controlled.

The CAA section 319(b) references the exceptional event exception and the process governing the request to exclude exceptional events from regulatory calculations was established by EPA in 2007 (72 *Fed. Reg.* 13,560 (3/22/07)). The Exceptional Events Rule establishes criteria and procedures for determining if an exceptional event has influenced ambient air quality monitoring data. The Exceptional Events Rule (EER) clarified the CAA in that public health should be protected where and when possible without holding State and Local Agencies accountable for unique events beyond their control such as high winds, wildfires and volcanic activities. The EPA defines an exceptional event as an ambient air quality event that “is not reasonably controllable or preventable, a natural event, and is determined by the Administrator in accordance with 50.14©(3)(iii)to be an exceptional event” (40 CFR 50.1 (j)). The EER gives ADEC the option of presenting the EPA Region 10 with compelling and clear causal evidence of an event with exceptionally high concentration(s) affecting the area of interest in a regulatory manner that cannot be reasonably controlled. ADEC must provide supporting documentation for the following elements in their Exceptional Event Waiver Request (EEWR) package submitted to EPA Region 10:

(A) The event satisfies the criteria set forth in 40 CFR 50.1(j);

(B) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;

(C) The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and

(D) There would have been no exceedance or violation but for the event.

(iv) With the submission of the demonstration, the State must document that the public comment process was followed

Once Region 10 concurs with the ADEC’s EEWR that the event related exceedances are excluded from regulatory calculations, ADEC can delete them from the calculations used to determine the design value, which is used for nonattainment designations, re-designations or reclassifying an extant nonattainment area to higher classification.

In Alaska's case, the State has prepared exceptional events waiver requests (EEWR) for any measured concentrations with regulatory significance: exceedances or not, that could possibly cause areas not previously in danger of a nonattainment designation to be designated nonattainment, whether or not they affect current regulatory designations. ADEC cannot predict future year ambient air quality monitoring results. However, because a number of EPA's regulations include three year averages for design values, it behooves the ADEC to prepare for the worst case scenario ahead of time.

Once exceptional events concentrations are identified, the state and local agencies follow the exceptional events implementation guidance posted on EPA's website May 13, 2013.[16] Once an exceedance is noted by air quality staff, the Air Monitoring and Quality Assurance (AMQA) program manager immediately notifies EPA Region 10. If the exceedance(s) is/are due to an Exceptional Event and the event has regulatory significance, then State staff begin to collect evidence and prepare modeling for preparation of an EEWR demonstration package. All monitor data related to the event(s) are flagged in EPA's national Air Quality System (AQS) database with an exceptional event waiver request (EEWR) before July 1 of the year following the year in which the flagged measurements occurred. Days measuring exceedances and values that may affect the annual design value are qualified with an exceptional events flag consistent with the requirements of 40 CFR 50.14 (for example the AQS flag RT refers to Request Exclusion Wildfire U.S.). These data records are associated with an event description in AQS. ADEC flags other days with concentrations that have been affected by the event(s) but that will not have regulatory significance with informational flags in AQS (for example the AQS flag IT refers to Informational Wildfire U.S.). For the events with regulatory significance, the ADEC prepares an exceptional event waiver request (per the list above).

On September 20, 2012, ADEC submitted an EEWR for Fairbanks, Alaska for nine days in July and early August 2009.[17] On December 19, 2012, EPA Region 10 concurred with 6 of the days that were exceedances, and declined to act on the three dates that were not exceedances because they did not have regulatory significance.

Table 5.4-4
Fairbanks $PM_{2.5}$ Exceptional Event Requests Submitted to EPA for 2009

Date	$PM_{2.5}$ concentration
07/06/2009	**44.1**
07/09/2009	19.3
07/15/2009	**75.3**

[16] ibid
[17] http://dec.alaska.gov/air/am/exceptional_events.htm

07/24/2009	17.7
07/27/2009	25.6
07/30/2009	**159.5***
08/02/2009	**89.7**
08/05/2009	**127.7****
08/08/2009	**61.0**

Notes: Exceedances indicated in **bold** font. * and ** denote sampling times of 16.75 hours and 19 hours respectively. Sampling stopped because filters were clogged by excessive particulate loading and the instrument shut down. The daily concentrations were calculated using the sampling time only.

On September 26, 2013, ADEC submitted an EEWR for Fairbanks, Alaska for four days in May, June and July 2010.[18] On March 11, 2014, EPA concurred with the exceedance EEWR request for July 13, 2010 but declined to act on the three dates that were not exceedances because they did not have regulatory significance.

Table 5.4-5
Fairbanks $PM_{2.5}$ Exceptional Event Requests Submitted to EPA for 2010

	$PM_{2.5}$ Concentration	
Date	State Office Building	
05/29/2010	21.8	
06/01/2010	23.4	
07/13/2010	**44.5**	
07/16/2010	21.3	

Notes: Exceedances indicated in **bold** font.

ADEC did not submit any EEWR for 2006-2008, 2011 and 2012. ADEC is currently working on an EEWR for 2013 and Table 5.4-6 below lists the seven days that ADEC has flagged for exclusion from the State Office Building's 2013 98th %-tile and design value calculation. Pending EPA approval the 2013 98th %-tile calculates as 36 µg/m^{3}and the 2013 design value is 41 µg/m^{3}as shown in Figure 5.4-4.

[18] ibid

Table 5.4-6 Fairbanks $PM_{2.5}$ Exceptional Event Requests Submitted to EPA for 2013	
	$PM_{2.5}$ Concentration
Date	State Office Building
06/27/2013	**58.7**
06/30/2013	32.6
07/06/2013	34.4
07/15/2013	11.9
08/08/2013	12.1
08/11/2013	20.6
08/14/2013	23.4

Notes: Exceedances indicated in **bold** font.