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

Air quality monitoring data are used to determine compliance with the NAAQS. It is 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 CAAA (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 are quality." Details of the ADEC $PM_{2.5}$ Network and Monitoring Program and be found in the Appendix III.D.5.5.

The Fairbanks North Star Borough (FNSB) Air Program operates and manages four monitoring stations located within the Northern Alaska Air Quality Control Region: one SLAMS site for $PM_{2.5}$, one Speciation Trend Network (STN) site, one multi pollutant Ncore site and two Special Purpose Monitoring (SPM) sites for $PM_{2.5}$. Both, the SLAMS and STN sites are currently located at the Fairbanks State Office Building. The STN site will be relocated to the NCore site in January 2015. Figure 5.5-1 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 the table below.

Table 5.5-1 SLAMS and SPM sites in the Fairbanks North Star Borough

$PM_{2.5}$					
Site Name	**Location**	**AQS ID**	**Designation**	**Install Date**	**Scale**
State Office Building	Fairbanks	02-090-0010	SLAMS	Oct, 1998	neighborhood
			STN	Mar, 2005	neighborhood
NCore	Fairbanks	02-090-0034	NCore	Oct, 2009	neighborhood
North Pole Fire	North Pole	02-090-0035	SPM	Mar, 2012	Undetermined (microscale or neighborhood)
North Pole Water	North Pole	02-090-039-01	SPM	2014	neighborhood

The State Office Building site at 675 Seventh Ave is located 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, while during the summer, the main source is from wildland fire smoke. This site is equipped with a Federal Reference Monitor (FRM) for $PM_{2.5}$ (SLAMS), and the $PM_{2.5}$ speciation monitors (STN). Both filter based samplers are set to the national 1 in 3 day sampling schedule.

The NCORE site is located at 809 Pioneer Road. The site is located approximately 35 meters north of the Chena River near the Fairbanks North Star Borough building and within one mile of numerous road systems. ADEC chose this site for multi pollutant monitoring since Fairbanks is dealing with the most significant air quality impacts in the state. This is a neighborhood-scale population orientated site. The site is equipped with FRM PM_{10} and $PM_{2.5}$ (SLAMS), continuous

PM_{10} and $PM_{2.5}$, $PM_{10-2.5}$ (SPM), speciated $PM_{2.5}$ (SPM) monitors, hourly CO (SLAMS quality), SO_2 (SLAMS quality), total reactive nitrogen (NO_y), and ozone (O_3) (SLAMS),surface meteorology for wind speed/direction, ambient temperature, relative humidity (RH) and barometric pressure. While the site houses continuous $PM_{2.5}$ analyzers that should be capable of measuring "FRM-like" data, the samplers do not meet EPA performance requirements as Class III Federal Equivalence method (FEM) and are not used for regulatory purposes. The data therefore are only used for trend analyses, supporting documentation and air quality advisories.

North Pole Fire Station site is located on the west side of North Pole Fire Station #3 at 3288 Hurst Road in the middle of a residential area. This site houses a FRM $PM_{2.5}$ sampler operating on the national 1 in 3 day sampling schedule. As with the NCore site, a continuous $PM_{2.5}$ analyzer (non FEM) is also located at the site, which is used for air quality advisories. The dominant source of $PM_{2.5}$ for this site changes from season to season. The source contribution to winter time $PM_{2.5}$ is still being studied. Wood smoke from home heating is currently considered one of the major sources. During the summer months, the main source is wildland fire smoke. ADEC and FSNB believe that North Pole Fire Station #3 is in a hot spot location and will continue to investigate the size of an area this site represents. Monitoring data from supplemental stations indicate that North Pole Fire Station #3 might represent a far smaller area than neighborhood scale.

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) provide information in real time for evaluating the air quality index and Thermo Electron Inc. Partisol 2000 samplers follow the national 1-in-3 day sampling schedule. The filters from the Partisol 2000 samplers are sent to the ADEC laboratory for gravimetric analysis and the data are reduced to produce the 24-hour average particulate concentrations. The continuous data from BAM 1020 monitors are uploaded hourly to the State and Borough websites and to the State's central air quality monitoring database. $PM_{2.5}$ monitoring is conducted following requirements established in federal regulations, EPA guidance and instrument manufacturer recommendations.

Figure 5.5-1 Map of the Fairbanks and North Pole Area. Red dots indicate the locations of the monitoring sites.