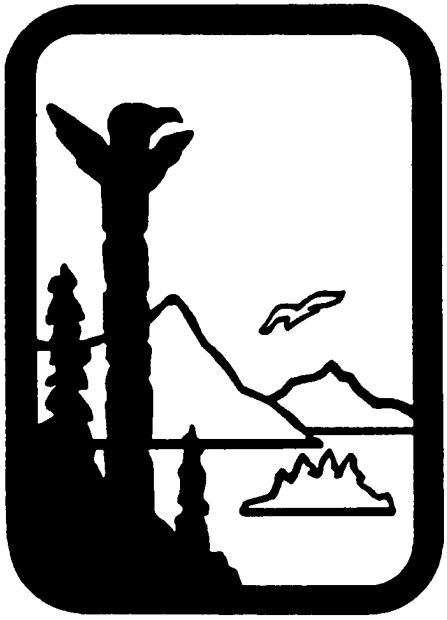
Alaska Department of Environmental Conservation



Amendments to State Air Quality Control Plan

Vol. II: Analysis of Problems, Control Actions

Section III.D.2 Eagle River PM-10 Limited Maintenance Plan

Public Review Draft

June 28th, 2010

(This page serves as a placeholder for two sided printing)

SECTION III.D.2

EAGLE RIVER PM_{10} LIMITED MAINTENANCE PLAN

III.D.2.1. Introduction

Between 1985 and 1987 Eagle River frequently violated the national ambient air quality standard (NAAQS) for particulate matter air pollution with an aerodynamic diameter less than or equal to 10 micrometers (µm) in size. This particulate air pollution is known as $PM_{10.}$ As a consequence, in 1991 the U.S. Environmental Protection Agency (EPA) designated a nine square kilometer area in Eagle River as a moderate nonattainment area for PM_{10} and required the submission of an air quality attainment plan to bring the area into compliance with the NAAQS.*

In 1991, the Municipality of Anchorage (MOA) and the Alaska Department of Environmental Conservation (ADEC) prepared a State Implementation Plan (SIP) to address the PM_{10} problem in Eagle River. This plan was entitled the *Eagle River PM_{10} Control Plan*. The plan identified the main source of PM_{10} as unpaved roads and outlined an ambitious road paving program to reduce emissions from this source. EPA approved the plan as an amendment to the SIP on August 13, 1993 (58 FR 43084).

Air quality monitoring data now show that Eagle River has attained the standard. However, in order for EPA to formally re-designate Eagle River to an attainment area, the Clean Air Act (CAA) requires the State to submit a maintenance plan to EPA that demonstrates that the air quality control measures in place in Eagle River are sufficient to ensure continued maintenance of the PM_{10} NAAQS. Once approved by EPA, this section of the state's Air Quality Control Plan, the *Eagle River PM_{10} Limited Maintenance Plan,* will replace the earlier *Eagle River PM_{10} Control Plan* in the Alaska SIP.

The State has delegated the responsibility for air quality planning in Anchorage and Eagle River to the MOA. The MOA has worked with ADEC to prepare this new plan using the Limited Maintenance Plan (LMP) option provided under EPA guidance. It demonstrates that Eagle River is now in attainment with the federal air quality standard for PM_{10} as a result of the road paving program and that continued maintenance of the standard is expected for a minimum of ten years. The plan also demonstrates that Eagle River qualifies for the LMP option and meets the SIP planning requirements stipulated in the Clean Air Act.

The plan includes a request to the EPA Administrator to re-designate the Eagle River PM_{10} nonattainment area to attainment.

It should be noted that this plan is predicated on the presumption that EPA will approve an exceptional event waiver for a PM-10 exceedance that occurred due to high winds on December 2, 2007.

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* Under the Clean Air Act, states are ultimately responsible for the submission of air quality plans. These plans are known as SIPs or State Implementation Plans.

III.D.2.2. Local Planning Process

This plan was prepared in accordance with the provisions of sections 110 and 174 of the CAA which require the consultation and participation of local political subdivisions and local elected officials. Under Section 174 (42 U.S.C. 7504), the revised plan submitted to EPA as a formal SIP amendment must be prepared by "an organization certified by the State, in consultation with elected officials of local governments." Such an organization is required to include local elected officials and representatives of the state air quality planning agency (i.e., ADEC), the state transportation planning agency (i.e., Alaska Department of Transportation & Public Facilities (ADOT/PF), and the metropolitan planning organization (MPO) responsible for the transportation planning process for the affected area.

In 1976, the governor designated the MOA as the MPO for the Anchorage urbanized area which includes Eagle River. In Anchorage, the MPO is known as Anchorage Metropolitan Area Transportation Solutions or AMATS. Consequently, the MOA conducts the transportation planning process required under federal regulation, in cooperation with ADEC and ADOT/PF, through the AMATS organization. In 1978, the governor designated MOA as the lead air quality planning agency in Anchorage. Based on this designation, MOA has continued its role as the lead planning agency in the Anchorage area and prepared this plan. The air quality planning process is outlined in the AMATS Intergovernmental Operating Agreement for Transportation and Air Quality Planning. This agreement was last revised in August 2002 and became effective January 1, 2003. This operating agreement establishes the roles and relationships between governmental entities involved in the Anchorage air quality planning process.

The *AMATS Policy Committee* provides guidance and control over studies and recommendations developed by support staff. Voting members of the Policy Committee are listed below.

MOA Mayor;
ADOT/PF Central Regional Director;
MOA Assembly representative;
MOA Assembly representative; and
ADEC Commissioner or designee.

The *AMATS Technical Advisory Committee* (TAC) and member support staff analyze transportation and land use issues and develop draft recommendations for the Policy Committee. Voting members include the following:

MOA Traffic Director;
MOA Project Management and Engineering Director;
MOA Planning Director;
MOA Public Transportation Director;
MOA Department of Health & Human Services representative;
MOA Port of Anchorage Director;
ADOT/PF Chief of Planning & Administration;
ADOT/PF Regional Pre-Construction Engineer;

ADEC representative;
Alaska Railroad representative; and
AMATS Air Quality Advisory Committee representative.

In addition, to help provide public input into the current air quality planning process by interested local groups and individual citizens, a third AMATS committee, the *Air Quality Advisory Committee* was appointed by the Policy Committee. The Air Quality Advisory Committee is comprised of nine members. Committee membership has generally included at least one physician or health professional, a representative of the I/M industry, a representative of the environmental community, and a representative from the Municipal Planning and Zoning Commission.

Public Participation Process

Section 110(a) of the CAAA (42 U.S.C. 7410(a)) requires that a state provide reasonable notice and public hearings of SIP revisions prior to their adoption and submission to EPA. To ensure that the public had adequate opportunity to comment on revisions to the Anchorage air quality attainment and maintenance plans, a multi-phase public involvement process, utilizing AMATS and the Anchorage Assembly was used.

AMATS Air Quality Advisory Committee – The AMATS Air Quality Advisory Committee held a public meeting on the limited maintenance plan on October 21, 2009. During this meeting they recommended that the AMATS Technical and Policy Committees adopt the plan as submitted.

AMATS Technical and Policy Committees – The AMATS Technical Advisory Committee released the limited maintenance plan for 30-day public review on September 17, 2009; no comments were received. After reviewing the recommendation of the AMATS Citizen Air Quality Advisory Committee, on September 10, 2009 the AMATS Technical Committee recommended that the AMATS Policy Committee adopt the plan. Subsequent to this recommendation, the AMATS Policy Committee met on November 19, 2009 to review and adopt the the plan.

Anchorage Assembly – The Anchorage Assembly adopted the plan during its regular public meeting held on January 12, 2010. A copy of Assembly Resolution AR 2010-4 is included in the Appendix to Section III.D.2.2.

ADEC hearings – The final opportunity for public involvement occurs at the state administrative level. Prior to regulatory adoption of SIP revisions, ADEC holds public hearings on the revisions in the affected communities. ADEC held a public hearing on the Anchorage maintenance plan on [date to be inserted following public comment period]. This provided another forum for the public to comment on the air quality plan prior to state adoption and submission to EPA.

III.D.2.3. Boundary of the Eagle River Maintenance Area

Eagle River is a community of about 30,000 located roughly 10 miles northeast of downtown Anchorage and is part of the Municipality of Anchorage. It is located at the end of a glacial river valley bounded on the west by Cook Inlet and on the south by the Eagle River and the Chugach Mountains on the northeast. Eagle River is a bedroom community to Anchorage and land use in the area is largely suburban and rural residential with some commercial development. When the *Eagle River PM_{10} Control Plan* was prepared in 1991, it identified a nine square kilometer nonattainment area that encompassed all of the central business district and most of the more densely populated suburban sections of the community. This maintenance plan retains this same boundary. It will become the maintenance area boundary effective upon approval of this plan.

A description of the maintenance area boundary follows.

Beginning from the point where the centerline of the southbound section of the Glenn Highway crosses Eagle River, thence

Northward three kilometers to point approximately 200 meters west of the Glenn Highway along the westward extension of Mercy Street, thence,

Eastward along the alignment of Mercy Street two kilometers to an undeveloped point, thence,

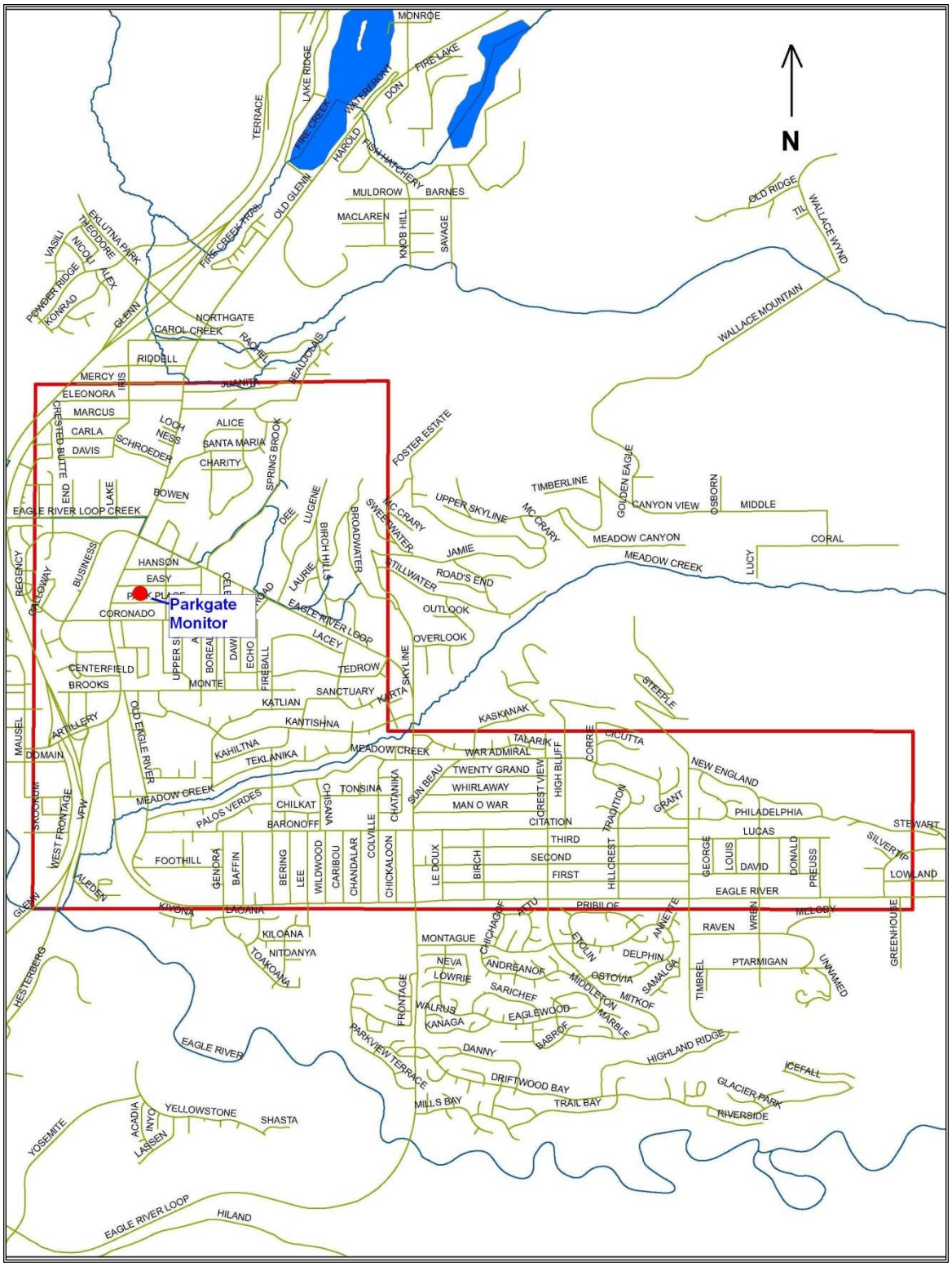
Southward two kilometers to a point approximately 150 meters west of Eagle River Loop Road and approximately 70 meters southwest of the intersection of Kantishna and Iditarod Streets (near the point where the Loop road crosses Meadow Creek); thence,

Eastward three kilometers to an undeveloped point; thence,

Southward one kilometer to a point approximately 100 meters southeast of the intersection Eagle River Road and Greenhouse Street, thence,

Westward five kilometers approximately 70 meters south of the alignment of Eagle River ending at the centerline of the southbound section of the Glenn Highway which is the point of the beginning.

Figure III.D.2-1
Eagle River PM_{10} Limited Maintenance Area Boundary
with Parkgate PM_{10} Monitoring Site



III.D.2.4. Demonstration that Eagle River has Attained the PM_{10} NAAQS

The EPA designated Eagle River as a "moderate" nonattainment for PM_{10} on November 6, 1990 pursuant to Clean Air Act Section 107(d)(4)(B). The nonattainment designation was based on data collected at the Parkgate site in Eagle River. The primary and secondary NAAQS for PM_{10} is set at 150 micrograms per cubic meter ($\mu g/m^3$). The NAAQS used to also include an annual average standard but that standard was recently revoked by the EPA (71FR 61144; October 17, 2006).

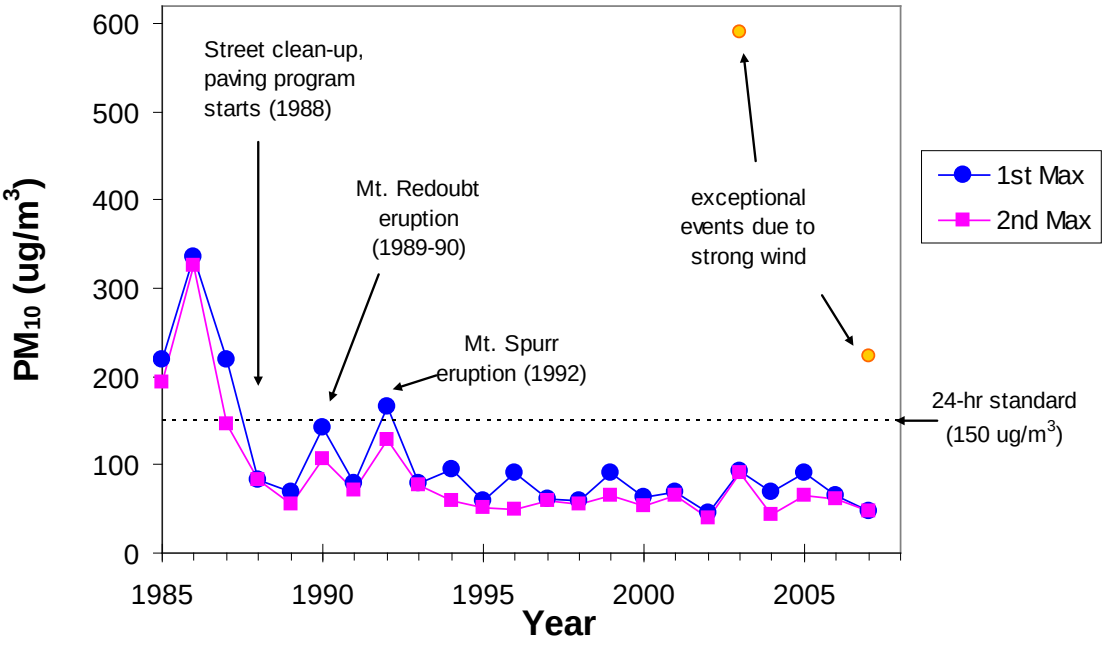
Monitoring has been performed in the nonattainment area at the Parkgate monitoring site since 1985. The Parkgate site is located on the east side of a commercial strip that runs along the Old Glenn Highway. The land use to the north, west and east of the site is generally commercial while the land to the east is primarily residential. Prior to 1988, this site was bounded on two sides by gravel roads. The location of the site is identified in Figure III.D.2-1, presented earlier in this section.

Figure III.D.2- 2
Looking North from the Parkgate Site in Eagle River (2006)

In 1987 there were over 22 miles of unpaved gravel roads in the nonattainment area. The *Eagle River PM_{10} Control Plan* called for paving or surfacing about one-third of the unpaved roads in the area. By 2007, *all* roads in the area had been paved or surfaced with

recycled asphalt. As illustrated in Figure III.D.2-3, data suggest that paving has successfully lowered PM_{10} concentrations. Exclusive of natural events, the highest PM_{10} concentrations measured since 1988 have been roughly half the 24-hour standard.

Figure III.D.2-3
First and Second Highest 24-Hour Average PM_{10} Concentrations
Parkgate Site, Eagle River (1985-2007)



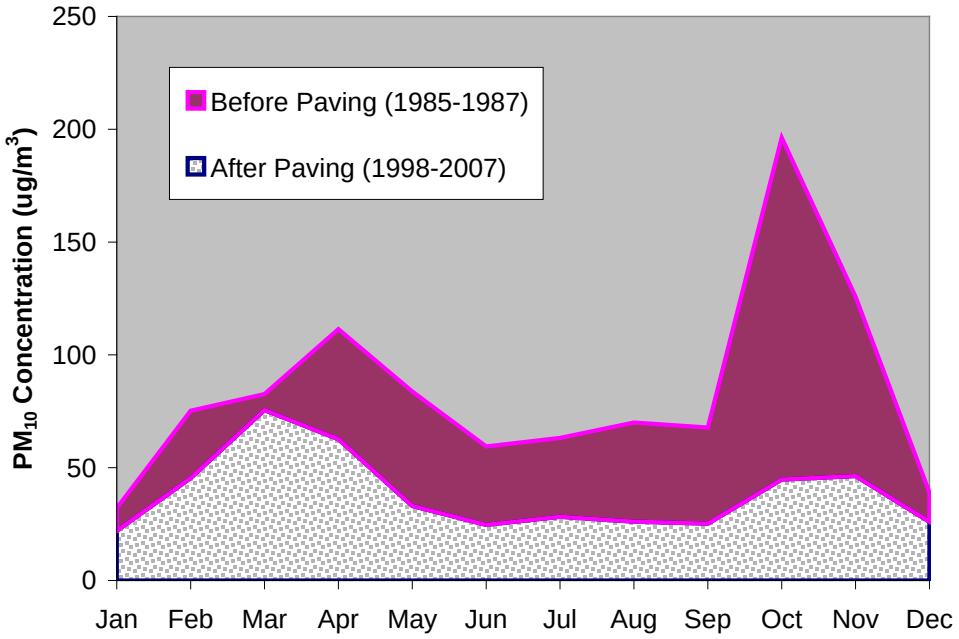
PM_{10} concentrations measured in the Eagle River non-attainment area have been well below the NAAQS for over 15 years. The only incidents that have approached or exceeded the 24-hour NAAQS since 1988 were due to ash from volcanic eruptions or wind/dust storms.

Starting December 1989, Mt. Redoubt, about 100 miles southwest of Eagle River, erupted intermittently for six months. On April 12, 1990, the 24-hour average PM_{10} concentration reached 143 $\mu g/m^3$. However polarized light microscopic (PLM) analysis of PM_{10} filters deployed on April 7, 9, and 11 showed that volcanic ash comprised 40-50% of the total PM_{10} assemblage (Microlab Northwest Laboratory Report No. 1062-94, October 17, 1994).

The eruption of Mt. Spurr (approximately 80 miles west of Eagle River) on August 18, 1992 also raised PM_{10} concentrations in both Anchorage and Eagle River for an extended period following the eruption. PLM analysis indicated that the ash content of the PM_{10} was 87-95% of total assemblage immediately after the eruption (August 19 and 20) and remained as a major component (20-38%) of the PM_{10} for several years. On September 16, 1992 concentrations reached 165$\mu g/m^3$ at the Parkgate site in Eagle River, an exceedance of the 24-hour standard. Similarly high concentrations were observed at other PM_{10} monitors in the Anchorage bowl. This event was attributed to re-entrained volcanic ash.

The *Eagle River PM_{10} Control Plan* identified fall "freeze-up" and spring "break-up" as the two periods when the highest PM_{10} concentrations occur and it focused on controlling emissions during those times. Figure III.D.2-4 compares PM_{10} concentrations before paving (1985-87) with concentrations over the past ten years (1998-2007) after the completion of the paving program. The largest declines in Eagle River PM_{10} have been observed in the fall period. The data show that the 95th percentile PM_{10} concentration during fall freeze-up has dropped by about 75% while the concentration during spring break-up has fallen 5% to 20%. These declines are roughly consistent with those predicted in 1991 when the Control Plan was drafted. In the late-80's and early-90's, high fall season PM_{10} concentrations were a greater concern than spring. The highest PM_{10} concentrations in Eagle River now typically occur in spring break-up rather than the fall freeze-up period.

Figure III.D.2-4
95th Percentile PM_{10} Concentrations Before and After Implementation of Road Paving Program in Eagle River



The highest, second highest and number of days exceeding the NAAQS are tabulated in Table III.D.2-1 for the period 1998-2007. The table provides clear evidence that Eagle River is in attainment with the NAAQS.

Table III.D. 2-1
Maximum, 2nd Maximum and Number of Exceedances at
Parkgate Site, Eagle River 1998-2007

Year	24-hour Max ($\mu g/m^3$)	2nd Highest 24-hour ($\mu g/m^3$)	Number of Days Exceeding NAAQS
1998	59	55	0
1999	90	66	0
2000	64	53	0
2001	69	66	0
2002	46	40	0
2003#	92	90	0
2004	70	43	0
2005	90	65	0
2006	65	60	0
2007#	48	46	0

Note: This table does not include wind-related exceptional events that occurred in 2003 and 2007. The 24-hour PM_{10} concentration was 590 $\mu g/m^3$ on March 12, 2003 and 223 $\mu g/m^3$ on December 2, 2007.

III.D.2.5. Demonstration that Eagle River Qualifies for the LMP Option

On August 9, 2001 EPA issued guidance on streamlined maintenance plan provisions for certain PM_{10} nonattainment areas seeking redesignation to attainment (*Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas, Wegman 2001*). The EPA observed that areas meeting certain statistical criteria have a high degree of probability of continued compliance with the NAAQS. Based on this analysis, they developed specific criteria to qualify for the LMP option. Elements of these criteria follow:

LMP Qualification Criteria

1. The area should be attaining the PM_{10} NAAQS;
2. The average 24-hour PM_{10} design value (DV) for the area, based on the most recent five years of air quality data at all monitors in the area, should be at or below 98 ug/m^3 with no violations at any monitor in the nonattainment area;* and
3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions (including fugitive dust) and should have passed a motor vehicle regional emissions analysis test.

* EPA also established a procedure for determining an alternate, site-specific criteria (called the Critical Design Value) that allows area with design values with little inter-annual variability to qualify for the LMP option if their DV is above 98 $\mu g/m^3$.

The next three sub-sections will demonstrate that Eagle River meets these three criteria.

1. Eagle River is attaining the PM_{10} NAAQS

Section II.D.2-4 provided a demonstration that Eagle River has been in attainment with the NAAQS for over 15 years. Except for uncontrollable natural events such as volcanic eruptions and wind/dust storms, Eagle River last exceeded the NAAQS in 1987.

2. The average DV for the Eagle River area is below 98 ug/m^3

Computational methods for determining the 24-hour DV are outlined in the *PM_{10} SIP Development Guideline (EPA-450/2-86-001, June 1987)*. The empirical frequency distribution approach (see Section 6.3.3. of the guideline) was used to determine the DV which is defined as the site-specific PM_{10} concentration that would be expected to be exceeded at a frequency of once every 365 days. Table III.D.2-2 shows that Eagle River has a computed DV for the last 5 years that is below the LMP criteria of 98 µg/m^3 (details of this computation can be found in the Appendix to III.D.2.5.). The table also demonstrates that there is no increasing trend over the last decade. Exceedances of the NAAQS were recorded on March 12, 2003 and December 2, 2007. Both incidents, however, have been flagged as exceptional events due to blowing dust from high winds. These incidents were therefore not considered when determining attainment or included in the DV computation.

Table III.D. 2-2[*]
DV Computed from Empirical Data Distribution
Parkgate Site, Eagle River 1998-2007

Three-year Period Used to Compute DV	DV (computed from empirical data distribution of 3 years data) (µg/m^3)
1998-2000	84.5
1999-2001	95.5
2000-2002	89.7
2001-2003	108.0
2002-2004	94.1
2003-2005	102.7
2004-2006	88.2
2005-2007	86.0
Average DV for the last 5 years (2003-2007)	**92.3**
LMP criteria	**98.0**

[*] Design value calculations for 2006-2008 and 2007-2009 will be included in the final Eagle River PM-10 LMP to be submitted to EPA.

3. Eagle River Passes Motor Vehicle Regional Emissions Analysis Test

Increases in emissions from on-road mobile sources must be taken into account over the next 10 years to help ensure that PM_{10} concentrations will remain below the NAAQS.* The EPA LMP guidance recommends the use of the following equation to assess the impact of future emission increases from motor vehicle travel:

$$\textbf{Projected DV in 2020} = \mathbf{DV_{2007}} + (\mathbf{VMT_{pi}} \times \mathbf{DV_{mv}}) \leq \mathbf{MOS}$$

Where:

DV = the area's average DV in $\mu g/m^3$ for the period used to demonstrate attainment (base year 2007).

$\mathbf{VMT_{pi}}$ = the projected % increase in vehicle miles traveled (VMT) between 2007 and 2020.

$\mathbf{DV_{mv}}$ = Portion of DV for the attainment year (2007) inventory in $\mu g/m^3$ that is derived from on-road emissions

MOS = margin of safety for the relevant PM_{10} standard in $\mu g/m^3$ for a given area. This can be = 98 $\mu g/m^3$ or a site-specific value computed from data collected at the site of interest using methods outlined in Attachment A of the LMP guidelines. For the Parkgate site in Eagle River this value was computed to be 116.6 $\mu g/m^3$. (See Appendix to III.D.2.5 for details of this computation.)

In the preceding sub-section, the average DV was computed to be 92.3 $\mu g/m^3$.

VMT_{pi} was estimated using VMT estimates made for the air quality conformity analysis for the Chugiak/Eagle River Long Range Transportation Plan (CE/LRTP). The analysis included VMT estimates for analysis years 2007, 2017, and 2027. for the Eagle River PM_{10} non-attainment area. Total VMT in 2007 was 165,934. VMT for year 2020 was estimated by interpolating between 2017 and 2027 VMT. By 2020, VMT is projected to grow by 36.3% to 226,221. Thus the projected increase in VMT (VMT_{pi}) is 0.363.

As will be shown in the PM_{10} emission inventory presented later in Section III.D.2.6, the proportion of total PM_{10} from on-road mobile emissions varies with season in the Eagle River maintenance area. In the base year 2007 emission inventory, on-road mobile emissions, including fugitive dust emissions, were responsible for 50.6% of total daily emissions in spring and 44.4% in the fall (see Table III.D.2-3 for details). For the purposes of the Motor Vehicle Regional Emissions Analysis Test, the higher spring season proportion was assumed. The portion of 2007 DV that is attributed to on-road mobile sources (DV_{mv}) can be readily calculated as follows:

$$DV_{mv} = DV \times 0.506 = 92.3\ \mu g/m^3 \times 0.506 = 46.7\ \mu g/m^3$$

* This emissions analysis demonstration assumes that EPA will re-designate Eagle River a maintenance area in 2010. The year 2020 was selected because it is ten years hence.

Knowing the values of the four variables, the projected DV in 2020 can be readily computed:

$$\text{Projected DV in 2020} = DV_{2007} + (VMT_{pi} \times DV_{mv})$$
$$= 93.6\ \mu g/m^3 + (0.363 \times 47.4\ \mu g/m^3)$$

$$\text{Projected DV in 2020} = 109\ \mu g/m^3 < \text{MOS}$$

The projected DV in 2020 is less than the 116.6 $\mu g/m^3$ margin of safety value or MOS, demonstrating that the Eagle River Maintenance Area meets the Motor Vehicle Regional Emissions Analysis Test.

III.D.2.6. Attainment Year Emission Inventory for Eagle River

The base year attainment inventory for this LMP was selected to be 2007. An emission inventory was also prepared for 2020, the final year of a ten-year maintenance period.[*] As noted in Section III.D.2.4, over the past ten years the highest PM_{10} concentrations have typically occurred during spring break-up and fall freeze-up. For this reason, the emission inventories reflect conditions and activity levels (e.g., amount of silt loading on roads, residential wood heating rates) that commonly occur during these two times of year. The assumptions, methods and computations used to generate the 2007 and 2020 emission inventories are described in detail in the Appendix to III.D.2.6.

Five sources of PM_{10} emissions were identified and inventoried. These include (1) dust from paved roads; (2) wind-generated dust from roads, parking lots and un-vegetated areas; (3) fireplaces and woodstoves, (4) natural gas combustion; and (5) exhaust, tire and brake wear emissions from motor vehicles.

The emission inventory prepared for the *Eagle River PM_{10} Control Plan* (base year 1987) also included emission estimates for unpaved roads. However, as noted earlier in this document, all roads in the maintenance area have been paved since that plan was prepared. Thus, unpaved road emissions are not included in the 2007 or 2020 inventories.

The EPA publication, AP-42, *Compilation of Air Pollutant Emission Factors,* outlines recommended assumptions and methods for estimating emission factors for various sources.[†] AP-42 methods were used to estimate emission factors for four of the five sources inventoried. Instead of AP-42, the EPA mobile source emission factor model, MOBILE6.2 was used to estimate the emission factor for motor vehicle exhaust, tire and brake wear emissions. Methods, assumptions and computations are described in detail in the Appendix to III.D.2.6.

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[*] Again, this assumes that EPA will approve this maintenance plan in 2010.

[†] An emission factor is a representative value that attempts to relate the quantity of a pollutant release to the atmosphere with an activity associated with the release of that pollutant.

The results of the inventory are presented in Table III.D.2-3. Paved road dust, wind blown dust and fireplace and wood stove emissions are the main sources of PM_{10} in the Eagle River maintenance area.

Table III.D. 2-3
Eagle River Limited Maintenance Area PM_{10} Emissions Inventory
(All Emissions in tons/day with % of Total)

	Spring Break-up (March, April)		Fall Freeze-up (October, November)	
Source Category	**2007**	**2020**	**2007**	**2020**
Paved Roads	2.88 (50.6%)	3.97 (57.8%)	0.83 (44.4%)	1.13 (50.8%)
Wind blown Dust from Paved Roads, Parking Lots and Un-Vegetated Areas	2.47 43.5%	2.53 (36.8%)	0.70 (37.6%)	0.72 (32.5%)
Fireplaces and Wood Stoves	0.32 (5.7%)	0.36 (5.2%)	0.32 (17.3%)	0.36 (16.1%)
Natural Gas Combustion	0.008 (0.1%)	0.009 (0.1%)	0.008 (0.4%)	0.009 (0.4%)
Exhaust, Tire and Brake Wear Emissions from Motor Vehicles	0.005 (0.1%)	0.006 (0.1%)	0.005 (0.3%)	0.006 (0.3%)
TOTAL	**5.69 (100%)**	**6.87 (100%)**	**1.87 (100%)**	**2.22 (100%)**

III.D.2.7. Section 110 and Part D Requirements

Before the EPA administrator can re-designate an area to attainment the CAA requires that a state containing a nonattainment area meet all applicable requirements including those in Section 110 and Part D of the Act. Section 110 of the Act outlines requirement for SIPs and Part D contains general requirements applicable to all designated nonattainment areas. Subpart 4 of Part D includes specific provisions for particulate matter nonattainment areas.

Section 110

EPA designated Eagle River as a "moderate" nonattainment for PM_{10} on November 6, 1990 pursuant to Clean Air Act Section 107(d)(4)(B). EPA required nonattainment areas like Eagle River to prepare plans to attain the standard. The approval of the Eagle River nonattainment plan by EPA in 1993 is evidence that applicable requirements of Section 110 have been satisfied. EPA approved the Eagle River PM_{10} attainment plan (58 FR 43084) as an amendment to the Alaska SIP for air quality on August 13, 1993.

Part D Requirements

There are a number of requirements in Part D that are pertinent to the approval of the Eagle River LMP. These include requirements for air quality monitoring, contingency measures, and transportation conformity. These are addressed later in this document.

The Part D NSR rules for PM_{10} nonattainment areas in Alaska were approved by EPA. In Eagle River, NSR requirements will be replaced by the Prevention of Significant

Deterioration (PSD) program in the maintenance area NSR program upon effective date of redesignation. The federal PSD regulations found in 40 CFR 52.21 are the PSD rules in effect for Alaska. These regulations will apply after Eagle River is redesignated as a maintenance area.

Subpart 4 of Part D established an attainment date of December 31, 1994 for Eagle River. Eagle River met this deadline. In addition, a milestone report demonstrating that Eagle River met the milestone requirements was submitted by MOA and approved by EPA in 1995 as required.

III.D.2.8. Maintenance Demonstration

EPA guidance on the LMP option (Wegman, 2001) states that if an area qualifies for the LMP option "demonstration of maintenance is presumed to be satisfied." Section III.D.2.4 of this document shows that monitored PM_{10} concentrations in Eagle River are low and "stable" enough to qualify for the LMP option. Thus, Eagle River has satisfied the maintenance demonstration requirement.

III.D.2.9. Demonstration of Permanent and Enforceable Emission Reductions

As noted earlier in Section III.D.2.4, a large decline in PM_{10} concentrations has been observed in Eagle River and this decline is attributed primarily to the paving of local gravel roads in the area. In 1987, almost one-half of all the roads in the area (22 miles) were unpaved. By 2007 all of these roads were paved either with traditional hot asphalt paving or surfaced with RAP. The MOA is committed to the maintenance of these roads. In particular, all RAP-surfaced roads in the maintenance area have now been chip-sealed to improve their durability. The effective lifetime of these chip-sealed roads is estimated to be 10 to 15 years. When these roads have reached the end of their lifetime a new lift of chip seal (a mix of crushed aggregate or "chips" and asphalt emulsion) is applied which serves as a new wearing course for the road.

The MOA and the Alaska Department of Transportation and Public Facilities (ADOT&PF) have also implemented permanent changes in street maintenance practices on paved roads. Both the MOA and ADOT&PF have set new winter traction sand specifications that limit the amount fines or silt allowed in the material that is applied to roads within the MOA. In addition, the MOA is continuing to explore new and more efficient ways to improve road traction during snow and ice conditions without compromising air quality. New methods for controlling PM_{10} during the spring break-up period are being investigated. These include the use of chemical dust palliatives and the use of new technology "waterless" sweepers which offer promise of more thorough clean-up of roadways.

Eagle River has not violated the NAAQS since 1988; this is clear evidence that the controls implemented have provided permanent and enforceable emission reductions. The Anchorage Assembly recently adopted a revised land use code that requires paving

of all streets except those in low density residential areas zoned R-6, R-7, R-8 or R-9.* Although most of the Eagle River maintenance area is "built out" and few new roads are likely to be constructed, the requirements stipulated in Anchorage Municipal Code 21.08.050 will help ensure that new streets constructed in the Municipality, including Eagle River, will not cause new PM_{10} problems.

The MOA is committed to continued maintenance of existing RAP/chip-sealed roads in the maintenance area and the MOA and ADOT&PF are committed to maintaining traction sand specifications that allow no more than 2% fines or silt. ***All controls that were relied on to demonstrate attainment will remain in place.***

III.D.2.10. Compliance with Air Quality Monitoring Requirements and Verification of Continued Attainment

According to CAA Section 110(a)(2), once an area is redesignated, the State must continue to operate an appropriate air monitoring network in accord with 40 CFR Part 58 to verify the attainment status of the area. The ADEC has delegated responsibility for air quality monitoring to the MOA. The MOA is committed to the continued operation of at least one EPA-approved PM_{10} monitoring site in the Eagle River maintenance area through the end of the maintenance planning period (2020). Monitoring will be conducted in accordance with 40 CFR Part 58.

Monitoring will be used to verify continued maintenance of the standard through the maintenance plan period. The MOA will annually recalculate the design value using the most recent five years of monitor data in order to verify the area continues to qualify for the LMP option. The result will be reported to the EPA.

In the event the area does not continue to qualify for the LMP option a full maintenance plan will be prepared as required by the LMP policy.

III.D.2.11. Natural Events Action Plan

The MOA prepared a Natural Events Action Plan (NEAP) entitled *A Natural Events Action Plan for Windblown Dust Events in Anchorage Alaska* in September 2002. This plan was submitted to ADEC in response to a wind blown dust-related exceedance that occurred in Anchorage on March 18, 2001. ADEC forwarded the NEAP to EPA; EPA approved it on May 5, 2003. A copy of the NEAP is included in the Appendix to III.D.2.11.

One of the most important features of the NEAP is that it outlines procedures for issuing health advisories to help reduce PM_{10} exposure to the public during the events. However the issuance of health advisories for the Eagle River area have been impeded by a lack of "real time" PM_{10} monitoring data. Up until 2008, all PM_{10} data in Eagle River was

* R-6, R-7, R-8 and R-9 are residential zoning designations defined in Title 21 of the Anchorage Municipal Code. R-7 zoning allows between one and two dwelling units per acre. The maximum dwelling unit density allowed in R-6, R-8 and R-9 varies from one per acre (R-6) to one per four acres (R-9).

collected using federal reference method (FRM) monitors. Because FRM monitoring requires that PM_{10} filter samples be retrieved *after* the required 24-hour sampling period, the data necessary to declare a health advisory are not available until the event is over. Although a health advisory was declared for the March 12, 2003 exceptional event in Eagle River, no such advisory was declared for the December 2, 2007 wind-blown dust episode.[*] The MOA has now installed "real time," continuous PM_{10} monitoring equipment in Eagle River that should remedy this shortcoming.

III.D.2.12. Contingency Provisions

Section 175A of the CAA requires that a maintenance plan include contingency measures in order to promptly correct any violation of the standard that occurs after the redesignation of the area to attainment.[†] Normally, the implementation of contingency measures is triggered by a violation of the NAAQS. Contingency measures do not have to be fully adopted at the time of redesignation, but they must be readily adopted if they are triggered.

This section identifies a process and a timeline to identify and evaluate appropriate contingency measures in the event of a violation of the PM_{10} NAAQS.

Contingency Measures Assessment

Within 30 days following a violation of the PM_{10} NAAQS, the MOA will convene an assessment team to identify control measures that appropriately address the source(s) and circumstances causing the violation.

Within 120 days of the violation, the assessment team will prepare a report that identifies the cause or causes of the violation and recommends appropriate measures for mitigating future violations. The report shall be presented to the AMATS Policy Committee for review and adoption and then forwarded to the ADEC for approval.

The report should include an analysis of the PM_{10} monitoring data before and after the violation and a discussion of how the PM_{10} source or sources leading to the violation were determined. Other possible contributing factors such as weather conditions should be discussed. The effectiveness of existing controls, particularly those included in this

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[*] A health advisory was issued during the March 12, 2003 episode because data from "real time" monitors in Anchorage indicated very high PM_{10} levels. Although data in Eagle River, 10 miles north were not available, PM_{10} concentrations were presumed to be high there also. However, on December 2, 2007 real time data from Anchorage suggested that PM_{10} concentrations were not likely to exceed the NAAQS. Without specific data for Eagle River, it was assumed that an exceedance was also unlikely there and no health advisory was declared.

[†] The *Eagle River PM_{10} Control Plan* drafted in 1991 included two contingency measures. The first contingency measure called for the surfacing of two additional miles of gravel roadway in the nonattainment area with RAP. The second called for "sweetening" existing RAP roads with asphalt emulsion to improve their PM_{10} reduction effectiveness. Even though these measures were never triggered by a violation of NAAQS, *all* roads in the nonattainment area have now been surfaced with RAP or paved. In addition, all RAP roads have been enhanced with a chip-seal coating to improve their effectiveness at reducing dust and to increase their durability.

maintenance plan, should be discussed and any lapses in the implementation of such controls should be identified.

The assessment team shall review the list of possible contingency measures offered in this Plan and recommend the implementation of one or more for them to address the source or sources of the PM_{10} violation. The team has the option of recommending alternative measures not included on this list if circumstances warrant.

Local actions resulting from the assessment team recommendations will be at the discretion the Municipal Mayor and Assembly. Several of the possible contingency measures would require changes to local ordinance by the Anchorage Assembly before they could be implemented.

List of Potential Contingency Measures

The attainment inventory suggests that the primary sources of PM_{10} in Eagle River are traffic-related paved road dust emissions, wind blown dust emissions from roadways, parking lots and cleared areas, and fireplace and wood stove emissions. As such, if a future violation were to occur, a combination of one or more of these sources is most likely to be the cause.

A list of potential contingency measures for each of these three sources follows:

Traffic-Related Paved Road Dust

1. Apply chemical dust palliatives to high volume roadways upon prediction of high PM_{10}.

   The highest emissions typically occur along major roads during the spring break-up period when they are heavily laden with a winter's worth of accumulated traction sand and other road sediment. Road sediment accumulates primarily in gutters, shoulders, medians and in the dividing strip between turn lanes and through lanes of high volume roadways. During the spring break-up period of 2008 the MOA performed a field study of the dust palliative magnesium chloride brine ($MgCl_2$).[*] The study concluded that absent significant precipitation, an application of $MgCl_2$ substantially reduced dust emissions for at least a week after application. This suggests that $MgCl_2$ could be used to mitigate roadway PM_{10} emissions when concentrations are predicted to approach or exceed the NAAQS.

2. Sweep major roadways prior to spring break-up and other periods when elevated PM_{10} is anticipated.

   Although sweeping has been included here as a potential contingency measure, it should be noted that its effectiveness and practicality as a control measure during the spring break-up period is questionable. Many studies have shown that without extensive back-flushing, traditional mechanical sweeping methods do not effectively

[*] A draft report, entitled *Field Evaluation of Suitability of Magnesium Chloride Brine for PM_{10} Control on Paved Roads in Anchorage* was completed by the MOA Department of Health and Human Services in September 2008.

reduce PM_{10} emissions. In late March and early April when PM_{10} is often highest, subfreezing temperatures make the use of water back-flushing impractical. Moreover, ice and snow on roadway shoulders prevent effective sweeping where the road is most heavily laden with sediment. The MOA is experimenting with alternatives to "traditional" sweeping such as post-sweep application of a dust palliative and/or "double-pass" waterless sweeping. The MOA plans to continue to experiment with alternative sweeping procedures and one or more may prove viable as a contingency measure in the future.

Wind-blown Dust from Roadways, Parking Lots and Cleared Areas

1. Implement one or more of the traffic-related paved road dust measures discussed above.

   Paved roadways comprise over 75% of the cleared area in the Eagle River PM_{10} maintenance area. Thus, the same measures suggested for controlling traffic-related PM_{10} emissions are suitable for reducing wind blown dust. For example, the application of $MgCl_2$ brine would also be expected to reduce wind-generated dust from roads.

2. Require application of dust palliatives to paved parking areas.

   Parking lots, playgrounds and other similar paved areas comprise about 20% of the cleared area in the maintenance area. The application of dust palliatives to these areas would be expected to reduce emissions.

3. Establish required specifications for traction sand materials applied to parking lots.

   Currently there are no requirements placed on the quality or quantity of traction sand materials applied to parking lots. New MOA regulations could be established that would limit the amount of fines or silt allowed in the traction sand applied to contiguous parking lots and paved areas greater than five acres in size, for example.

Fireplaces and Wood Stoves

1. Curtail fireplace and wood stove use when high PM_{10} is predicted.

   Although fireplace and wood stove emissions currently make up a relatively small part of total PM_{10} emissions, it is possible that future increases in natural gas heating costs could drive more households to heat with wood. If this is the case, emissions of PM_{10} would increase over time. Presumably air quality monitoring data would provide evidence if such a trend were occurring. An increase in wood heating would likely jeopardize attainment of the $PM_{2.5}$ (fine particulate) NAAQS before PM_{10}. Nevertheless, in some circumstances it may be appropriate to consider regulating fire place and wood stove use as means to addressing PM_{10} violations.

III.D.2.13. Air Quality Conformity for LMP Areas

The transportation conformity rule and general conformity rule apply to nonattainment and maintenance areas. Under either rule, an acceptable method of demonstrating that a federal action conforms to the applicable SIP is to demonstrate that expected emissions from the planned action are consistent with emissions budget for the area.

Although EPA policy does not exempt LMP areas from the need to demonstrate conformity, it allows the area to do so without submitting an emissions budget, because data demonstrates no violation of the NAAQS will occur due to reasonable growth projections. For transportation purposes, the emissions in a qualifying LMP area need not be capped for the maintenance period and thus no regional emissions analysis is required. Regional transportation conformity is presumed due to the limited potential for emission growth in the area during the LMP period. A regional emissions analysis and associated regional conformity requirements (40 CFR 93.118 and 93.119) are no longer necessary. Similarly, federal actions subject to the general conformity rule would automatically satisfy the "budget test' specified in Section 93.158(a)(5)(i)(A) for the same reasons.

When Eagle River is designated by EPA as a LMP, transportation conformity determinations will still be required for transportation plans, programs (TIPs) and projects. The conformity determination for the plan and TIP should state that a regional emission analysis is not required because the area has an approved LMP. The Plan and the TIP must still be made available for public review. The portions of the conformity rule that still apply are found in 40 CFR 93.112 and 93.113 and the consultation requirements as specified under state regulation, 18 AAC 50 .715 and 50.720.

In addition transportation projects would still need to meet the criteria for PM_{10} hot spots (40 CFR 93.116 and 93.123) and for PM_{10} control measures (40 CFR 93.117). The MOA will work with ADEC and interested parties to develop an evaluation criteria and process to meet these transportation conformity requirements.

III.D.2.14. Redesignation Request

The MOA and ADEC believe this document contains all necessary information and adequately demonstrates that Eagle River should be reclassified to attainment under the LMP option. Therefore, ADEC, on behalf of the MOA, requests that EPA find this plan complete and approve the redesignation of the Eagle River nonattainment area to attainment under the LMP option.